

Chapter 1 objectives can be found in an accompanying folder.
These objectives, which form the basis of each chapter, were developed from the new Education Standards and Instructional Guidelines.

Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 6. The National Highway Traffic Safety Administration and Health Resources and Services Administration published the <i>National EMS Core Content</i> in 2005. 7. The National Highway Traffic Safety Administration published <i>The National EMS Scope of Practice Model</i> in 2006. 8. The Institute of Medicine published <i>The Future of EMS Care: EMS at the Crossroads</i> in 2006. 9. The National Highway Traffic Safety Administration's National EMS Education Standards outlined objectives for entry-level EMS personnel. 	<p>Model, the CDC Weekly Morbidity and Mortality Report, and the EMS Agenda for the Future.</p>
20	<p>III. The Emergency Medical Services System—Technical Assistance Program Assessment Standards (NHTSA)</p> <p>A. Standards</p> <ol style="list-style-type: none"> 1. Regulation and Policy 2. Resource Management 3. Human Resources and Training 4. Transportation 5. Facilities 6. Communications 7. Public Information and Education 8. Medical Direction 9. Trauma Systems 10. Evaluation <p>B. Access to the EMS System—Using 911</p> <ol style="list-style-type: none"> 1. 911 is the universal phone number used to access emergency services such as police, fire, and EMS. 2. Enhanced 911 (E911) system provides automatic number identification (ANI) and automatic location identification (ALI). 3. Benefits <ol style="list-style-type: none"> a. A public service answering point (PSAP) receives calls. A PSAP is generally staffed by trained communications personnel and likely Emergency Medical Dispatchers (EMDs). b. Using 911 reduces the time it takes the caller to access the emergency services system. 4. Calling 911 on a cell phone may cause problems with caller location and possibly delay response. Some EMS systems are now using global-positioning-satellite (GPS) technology. 	<p>Discussion Question How do people in your community access EMS?</p> <p>Teaching Tip Play 911 recordings from your local agency and discuss them with students. Be careful that the recordings contain no confidential information.</p> <p>Class Activity Arrange a tour of a PSAP to see how calls are received and dispatched.</p> <p>Knowledge Application Describe a vehicle collision scenario. Ask students how they would access EMS and describe the location and situation.</p>

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	<p>C. Levels of Training—<i>National Scope of Practice Model</i></p> <ol style="list-style-type: none"> 1. Emergency Medical Responder (EMR) 2. Emergency Medical Technician (EMT) 3. Advanced Emergency Medical Technician (AEMT) 4. Paramedic <p>D. The Health Care System</p> <ol style="list-style-type: none"> 1. EMTs provide prehospital care—emergency medical treatment given to patients before they are transported to a hospital or other facility. 2. An EMT may be required to decide on the facility to which the patient must be transported. <ol style="list-style-type: none"> b. Hospital emergency department c. Trauma center d. Burn center e. Obstetrical center f. Pediatric center g. Poison center h. Stroke center i. Cardiac center j. Hyperbaric center k. Spine injury center l. Psychiatric center 	<p>Discussion Question What are the differences in the scopes of practice of EMRs, EMTs, AEMTs, and paramedics?</p> <p>Knowledge Application Describe a scenario where EMRs are on the scene first. Ask students to describe: 1) what care they should expect the EMRs to provide; 2) how they will interact with EMRs on the scene.</p> <p>Discussion Question What are the specialty medical care facilities in your area?</p> <p>Class Activity Tour an emergency department to familiarize students with the facility.</p>
8	<p>IV. The EMT—Roles and Responsibilities</p> <p>A. Personal Safety and the Safety of Others</p> <ol style="list-style-type: none"> 1. Ensure scene safety (downed power lines, chemical spills, and so on). 2. Drive safely and wear seatbelt unless helping patient. 3. Follow direction from police, fire, utility, and other expert personnel. 4. Wear reflective and protective gear when necessary. <p>B. Patient Assessment and Emergency Care</p> <ol style="list-style-type: none"> 1. Perform primary assessment to identify life-threatening problems. 2. Complete secondary assessment to treat other conditions or injuries you discover. <p>C. Safe Lifting and Moving</p> <p>D. Transport and Transfer of Care</p> <ol style="list-style-type: none"> 1. Determine which facility will be most appropriate. 2. Use communication equipment to notify/update facility. 3. Drive safely, and use lights and sirens as appropriate. 4. Report verbally and in writing to facility about injuries, care given, and 	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on EMS, the community, and children.</p> <p>Critical Thinking Discussion What factors should you consider when deciding which hospital to transport a patient to?</p>

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	<p>patient response.</p> <ol style="list-style-type: none"> 5. Provide assistance as needed at facility. <p>E. Record Keeping and Data Collection—Fill out prehospital care report</p> <p>F. Patient Advocacy</p> <ol style="list-style-type: none"> 1. Collect and safeguard a patient’s valuables. 2. Shield the patient from bystanders and curious onlookers. 3. Inform patient’s friends and loved ones at the scene about the facility to which the patient is being transferred. 4. Provide necessary information to facility personnel. 5. Adhere to confidentiality rules. 	<p>Discussion Question What are some examples of patient advocacy?</p>
7	<p>V. The EMT—Professional Attributes</p> <p>A. Appearance</p> <ol style="list-style-type: none"> 1. Neat, clean appearance 2. Complete uniform or other appropriate dress <p>B. Knowledge and Skills</p> <ol style="list-style-type: none"> 1. Completion of basic training program for EMT 2. Use and maintenance of common emergency equipment 3. Assistance with the administration of medications 4. Cleaning, disinfection, and sterilization of nondisposable equipment 5. Safety and security measures 6. Territory and terrain 7. State and local traffic laws and ordinances <p>C. Physical Demands</p> <ol style="list-style-type: none"> 1. Lift and carry up to 125 pounds 2. Good eyesight and color vision 3. Communicate effectively both orally and in writing 4. Good hearing <p>D. Personal Traits</p> <ol style="list-style-type: none"> 1. Calm and reassuring personality 2. Leadership ability 3. Good judgment 4. Good moral character 5. Stability and adaptability 6. Ability to listen 7. Resourcefulness and ability to improvise 8. Cooperativeness <p>E. Maintenance of Certification and Licensure</p>	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Have students close their books and describe the traits and attributes they feel are important to being excellent EMTs. • Explain the importance of getting to know classmates. Learning in the course depends on teamwork, and teamwork is an important EMS competency. <p>Class Activity Have pairs of students interview each other for ten minutes, and then have them introduce each other to the class.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Assign groups of students to each of the characteristics listed under <i>Personal Traits</i>. Give each group ten minutes to come up with examples of their characteristic and explain the consequences of having EMS providers without these traits. • Explain your state’s requirements for maintaining certification and licensure.

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	<ol style="list-style-type: none"> 1. Meet necessary continuing education requirements. 2. Verify skill competency. 3. Avoid criminal or unethical behavior. 4. Submit all fees to maintain current certification and licensure. 	<p>Critical Thinking Discussion What are some ways you can ensure that your knowledge and skills are up-to-date?</p>
5	<p>VI. The EMT—Medical Direction and Oversight</p> <ol style="list-style-type: none"> A. An EMT is a designated agent of the medical direction of the EMS system. B. The medical director provides medical oversight. <ol style="list-style-type: none"> 1. Found in every emergency medical service 2. Legally responsible for the clinical and patient care aspects of the EMS system 3. Oversees and provides continuing education 4. Facilitates the quality improvement system 5. Provides medical direction by establishing guidelines, or protocols <ol style="list-style-type: none"> a. Off-line medical direction b. On-line medical direction c. Standing orders 	<p>Teaching Tip Have the course medical director speak about his roles and responsibilities in the EMS system.</p> <p>Discussion Question What are the differences between on-line and off-line medical direction?</p> <p>Critical Thinking Discussion Why is medical direction a critical component of EMS?</p>
5	<p>VII. The EMT—Quality Improvement (QI or CQI)</p> <ol style="list-style-type: none"> A. System of internal and external reviews and audits of all aspects of an emergency medical system B. Identifies aspects of the system that can be improved and implements plans and programs to remedy shortcomings C. Should be used as a tool to improve overall system improvement, not to penalize individuals D. EMT role in QC <ol style="list-style-type: none"> 1. Document carefully. 2. Perform reviews and audits. 3. Obtain feedback. 4. Maintain equipment. 5. Participate in continuing education. 6. Maintain skills. 	<p>Teaching Tip Describe the quality improvement process in your EMS system.</p> <p>Discussion Question What are ways EMTs can participate in EMS quality improvement programs?</p> <p>Class Activity Have groups of students develop a list of five to ten benchmarks for EMS system quality improvement. Have students determine how the benchmarks could be measured and present their ideas to the class.</p> <p>Knowledge Application List several areas of focus from your local quality improvement program. Ask students</p>

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		to discuss how improvements could be made in each area.
5	<p>VIII. The EMT—Issues in Patient Safety</p> <p>A. Safety of care is one of most important issues</p> <p>B. High-risk activities</p> <ol style="list-style-type: none"> 1. Transfer of care 2. Poor communication 3. Carrying and moving patients in a risky manner 4. Involvement in an ambulance crash 5. Lack of spinal immobilization or improper spinal immobilization procedure <p>C. Steps to prevent errors during patient care</p> <ol style="list-style-type: none"> 1. Develop clear protocols. 2. Light the scene effectively. 3. Minimize interruptions during assessment and emergency care. 4. Clearly mark all drugs and packages so each is distinct. 5. Reflect on all actions. 6. Question all assumptions. 7. Use decision aids if necessary. 8. Ask for assistance if needed. 	<p>Discussion Question</p> <p>How can EMTs reduce risk of patient injury during high-risk EMS activities?</p>
20	<p>IX. Research and EMS Care</p> <p>A. Medical practice has evolved to evidence-based medicine.</p> <p>B. Evidence-based medicine focuses on clear evidence that procedures, medications, and equipment improve patient's outcome.</p> <p>C. Evidence-based decision making</p> <ol style="list-style-type: none"> 1. Formulate a question about emergency care. 2. Search medical literature for data related to the question. 3. Appraise the evidence for validity and reliability. 4. Change protocol if evidence supports a change in practice. <p>D. Initiatives are underway to increase the amount of research conducted to support or change delivery of prehospital emergency care.</p>	<p>Teaching Tip</p> <p>Provide examples of peer-reviewed research articles. Students can look at them during class breaks.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • Why is it not always possible to apply emergency medicine research to prehospital care? • What are reliability and validity in research? <p>Class Activity</p> <p>Have students read a short research article. Discuss the applicability and limitations of the article.</p>

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20	<p>X. Public Health</p> <ul style="list-style-type: none"> A. Identifies problems that affect the health of a particular population B. Reduces the incidence of injury and illness through preventative strategies C. Enforces laws and regulations that protect the health and safety of the public D. Vision: “Healthy people in healthy communities” E. Mission: “Promote physical and mental health and prevent disease, injury, and disability” F. Greatest public health achievements in the 20th century <ul style="list-style-type: none"> 1. Vaccinations 2. Motor-vehicle safety 3. Workplace safety 4. Control of infectious disease 5. Reduction in deaths from coronary heart disease and stroke 6. Safer and more healthful foods 7. Decline in maternal and infant mortality 8. Use of barrier devices during sexual contacts 9. Flouridation in drinking water 10. Reduction in the use of tobacco products G. Roles of EMS in public health <ul style="list-style-type: none"> 1. Health prevention and promotion 2. Disease surveillance 3. Injury prevention and surveillance 	<p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some reasons that research in EMS may be difficult? • What is the benefit of a peer-review process for research articles? <p>Video Clip</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on Healthy People 2010.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Invite a guest speaker from the health department. • Arrange for students to assist at a health fair sometime during the course. <p>Discussion Question</p> <p>What are some examples of prevention programs?</p> <p>Class Activity</p> <p>Give groups of students ten minutes to identify a public health problem in their community and develop ideas for addressing the problem. Have each group share their ideas with the rest of the class.</p> <p>Knowledge Application</p> <p>Present a public health concern from the community to the class. Ask for ideas about ways in which EMS could be involved in prevention and education.</p> <p>Critical Thinking Discussion</p> <p>If you could expand the role of EMTs, what</p>

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		would you add that would contribute to public health?
10	<p>XI. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 1 Summary. 2. Complete Chapter 1 In Review questions. 3. Complete Chapter 1 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 1 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What roles and responsibilities of the EMT were demonstrated in the case study? • What are some ways Mr. Robinson's injuries could have been prevented? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 2

Workforce Safety and Wellness

100–120 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about methods of safeguarding themselves from stress, body substances, and other hazards.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What are your priorities in this situation? • What are your thoughts about how to proceed?
6	<p>II. Emotional Aspects of Emergency Care—Death and Dying</p> <p>A. The five emotional stages can apply to dying patients, family members, or patients experiencing nonfatal emergencies.</p> <p>B. Five emotional stages</p> <ol style="list-style-type: none"> 1. Denial 2. Anger 3. Bargaining 4. Depression 5. Acceptance <p>C. Dealing with the dying patient, family, and bystanders</p> <ol style="list-style-type: none"> 1. Do everything possible to maintain the patient's dignity. 2. Show the greatest possible respect for the patient. 3. Communicate to the patient and family members. 4. Allow family members to express themselves. 5. Listen empathetically. 6. Do not give false assurances. 7. Use a gentle tone of voice with the patient and family. 8. Take appropriate steps if the family wants to touch or hold the body after death. 9. Do what you can to comfort the family. 	<p>Teaching Tip</p> <p>To help students relate to the five emotional stages of loss, ask them to think of examples of each of the emotional reactions in response to a loss or disappointment in their own lives, such as loss of a job or important relationship. Even the impending loss of an important basketball or football game can bring about these feelings, although not as intensely.</p> <p>Class Activity</p> <p>Have students divide into small groups and role play communicating with a dying patient or family members of a patient who has died, using the guidelines under <i>Dealing with the Dying Patient, Family, and Bystanders</i>. After ten to 15 minutes, ask each group to share examples of things that demonstrated each of the guidelines listed.</p>

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		<p>Critical Thinking Discussion What impact can EMTs have on the family members of a dying patient?</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on grief and a child's death.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the Hospice Foundation of America.</p>
6	<p>III. Emotional Aspects of Emergency Care—High Stress Situations</p> <p>A. The EMT experiences stress when external demands become greater than personal resources.</p> <ol style="list-style-type: none"> 1. Long hours 2. Boredom between calls 3. Working too much, too hard 4. Getting little recognition 5. Having to respond instantly 6. Making life-and-death decisions 7. Fearing serious errors 8. Dealing with dying people and grieving survivors 9. Being responsible for someone's life <p>B. Some situations produce extreme levels of stress.</p> <ol style="list-style-type: none"> 1. Multiple-casualty incidents (MCIs) 2. Abuse and neglect of children and adults 3. Emergencies involving infants and children 4. Injury or death of a coworker 5. Responding and providing emergency care to a relative or bystander 6. Severe traumatic injuries such as amputations 	<p>Discussion Question What are some examples of high-stress situations in EMS?</p> <p>Critical Thinking Discussion Why is it important for EMT students to understand the emotional aspects of EMS early in the EMT course?</p>

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6	<p>IV. Emotional Aspects of Emergency Care—Stress Reactions</p> <p>A. Types</p> <ol style="list-style-type: none"> 1. Acute stress reaction—Symptoms occur immediately 2. Delayed stress reaction—Symptoms are delayed (PTSD) 3. Cumulative stress reaction—Common cause of burnout <p>B. Common signs and symptoms of stress reactions</p> <ol style="list-style-type: none"> 1. Irritability with coworkers, family, and friends 2. Inability to concentrate 3. Difficulty sleeping and nightmares 4. Anxiety 5. Indecisiveness 6. Guilt 7. Loss of appetite 8. Loss of sexual desire or interest 9. Isolation 10. Loss of interest in work <p>C. General categories of stress signs and symptoms</p> <ol style="list-style-type: none"> 1. Thinking (e.g., confusion) 2. Psychological (e.g., mood swings) 3. Physical (e.g., headaches) 4. Behavioral (e.g., grinding teeth) 5. Social (e.g., increased interpersonal conflicts) 	<p>Teaching Tip Ask students to recall some of the emotions and physical feelings they have felt when they have experienced a stressful situation.</p> <p>Discussion Question How would you recognize a coworker who was experiencing signs and symptoms of a stress reaction?</p>
6	<p>V. Emotional Aspects of Emergency Care—Stress Management</p> <p>A. Make lifestyle changes.</p> <ol style="list-style-type: none"> 1. Take a look at diet. 2. Exercise more often. 3. Learn to relax. 4. Avoid self-medication. <p>B. Keep balance in your life.</p> <ol style="list-style-type: none"> 1. Assess priorities. 2. Share your worries with someone. 3. Accept that you will make mistakes. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on stress management.</p> <p>Discussion Question How can you “eat on the run” as EMS providers sometimes do, and still make healthy choices about food and drink?</p>

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	<p>C. Recognize the response of your family and friends.</p> <ol style="list-style-type: none"> 1. Points of stress for family and friends <ol style="list-style-type: none"> a. Lack of understanding b. Fear of separation or of being ignored c. Worry about on-call situations d. Inability to plan e. Frustrated desire for you to share 2. Way to deal with family and friends <ol style="list-style-type: none"> a. Describe your feelings about what you do. b. Explain safety precautions you take. c. Answer their questions. d. Encourage them to stay fit with you. e. Make time to spend with them. <p>D. Make changes in your work environment.</p> <ol style="list-style-type: none"> 1. Develop a “buddy” system with a coworker. 2. Encourage and support your coworkers. 3. Request work shifts that allow you more time to relax with loved ones. 4. Request a rotation of duty assignment. <p>E. Seek professional help.</p> <ol style="list-style-type: none"> 1. Mobilize your best coping strategies. 2. Learn effective ways to deal with stress in the future. 	<p>Class Activity Divide students into small groups. Have each group plan a healthy menu for breakfast, lunch, and dinner for a day at work. Have groups share their ideas with the rest of the class.</p> <p>Knowledge Application</p> <ul style="list-style-type: none"> • Give a scenario in which a friend or family member is experiencing stress due to the EMT’s job. Ask students for responses to help the friend or family member understand and cope. • Describe various EMS work situations to the class. Ask what changes can be made to manage job-related stress.
6	<p>VI. Emotional Aspects of Emergency Care—Critical Incident Stress Management</p> <p>A. Critical incident stress debriefing</p> <ol style="list-style-type: none"> 1. Held within 24 to 72 hours of critical incident 2. Peer counselors and mental health professionals help emergency service personnel work through seven phases. 3. Includes anyone involved in the incident <p>B. Critical incident defusing</p> <ol style="list-style-type: none"> 1. Version of CISD held within one to four hours following a critical incident 2. Attended only by those most directly involved in incident 3. Gives emergency service personnel an opportunity to vent their emotions and get information they may need before the larger group meets for CISD <p>C. Controversy over whether CISD really helps emergency care personnel resolve stress</p> <p>D. Comprehensive critical incident stress management components</p>	

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	<ol style="list-style-type: none"> 1. Preincident stress education 2. On-scene peer support 3. One-on-one support 4. Disaster support services 5. Defusing 6. CISD 7. Follow-up services 8. Spouse and family support 9. Community outreach programs 10. Other health and welfare programs 	
15	<p>VII. Scene Safety—Protecting Yourself from Disease</p> <ol style="list-style-type: none"> A. Diseases are caused by pathogens. B. Types of pathogens <ol style="list-style-type: none"> A. Bacteria B. Viruses C. Fungi D. Protozoa E. Helminths C. How diseases spread <ol style="list-style-type: none"> 1. Blood to blood contact 2. Contact with open wounds and exposed tissue 3. Contact with mucous membranes 4. Contaminated objects 5. Air D. Standard Precautions <ol style="list-style-type: none"> 1. Handwashing 2. Personal protective equipment (PPE) (e.g., eye protection, protective gloves, gown, and masks) 3. Additional guidelines <ol style="list-style-type: none"> a. Cleaning is the process of washing a soiled object with soap and water. b. Disinfecting includes cleaning but also involves using a hospital-grade disinfectant or germicide to kill many of the microorganisms that may be present on the surface of the object. c. Sterilization is the process by which an object is subject to a chemical or physical substance that kills all microorganisms on the 	<p>Discussion Question What are simple ways you can protect yourself from on-the-job illness and injury every day?</p> <p>Teaching Tip Have examples of gloves, eye and face protection, gowns, and other personal protective equipment available for students to see and try out.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on proper hand washing techniques.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on putting on gloves.</p> <p>Knowledge Application</p>

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	<p style="padding-left: 40px;">surface of an object.</p> <p>d. Dispose of, clean, disinfect, and sterilize all equipment according to local guidelines and protocols.</p> <p>4. Immunizations</p> <p>a. Purified protein derivative (PPD) tuberculin test</p> <p>b. Tetanus prophylaxis</p> <p>c. Hepatitis B vaccine</p> <p>d. Influenza vaccine</p> <p>e. Polio immunization</p> <p>f. Rubella (German measles) vaccine</p> <p>g. Measles vaccine</p> <p>h. Mumps vaccine</p> <p>i. Varicella vaccine</p> <p>5. Reporting exposure</p>	<p>Give several descriptions of patients. Ask what types of PPE should be used.</p> <p>Class Activity Have students research information from the newspaper (or other news media) or EMS websites for articles that involved an EMS response. Have students bring in their articles and discuss what actions EMS personnel might have taken to protect their health and safety.</p>
10	<p>VIII. Scene Safety—Infectious Diseases of Concern to the EMT</p> <p>A. Hepatitis B</p> <p style="padding-left: 20px;">1. Contracted through blood and body fluids</p> <p style="padding-left: 20px;">2. Signs and symptoms (Chronic carrier may have no signs or symptoms)</p> <p style="padding-left: 20px;">3. Standard Precautions</p> <p>B. Hepatitis C</p> <p style="padding-left: 20px;">A. Transmitted through needle stick</p> <p style="padding-left: 20px;">B. Signs and symptoms (Carriers often have no signs or symptoms.)</p> <p style="padding-left: 20px;">C. Standard Precautions</p> <p>C. Tuberculosis</p> <p style="padding-left: 20px;">1. Transmitted by droplets in cough or sputum</p> <p style="padding-left: 20px;">2. Signs and symptoms</p> <p style="padding-left: 20px;">3. Standard Precautions</p> <p>D. Acquired Immune Deficiency Syndrome (AIDS)</p> <p style="padding-left: 20px;">1. Caused by HIV</p> <p style="padding-left: 20px;">2. Modes of transmission include sexual contact, infected needles, infected blood or blood products, and mother-child transmission.</p> <p style="padding-left: 20px;">3. Signs and symptoms</p> <p style="padding-left: 20px;">4. Standard Precautions</p> <p>E. Severe Acute Respiratory Syndrome (SARS)</p> <p style="padding-left: 20px;">1. Transmitted by respiratory droplets from a cough or sneeze</p>	<p>Discussion Question What are some examples of airborne and blood-borne communicable diseases?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on hepatitis B and the health care worker.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on the epidemiology of AIDS.</p>

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	<ul style="list-style-type: none"> 2. Signs and symptoms 3. Standard Precautions F. West Nile Virus <ul style="list-style-type: none"> 1. Transmitted through the bite of an infected mosquito 2. Signs and symptoms (Many people may not show signs or symptoms.) 3. Standard Precautions G. Multidrug-Resistant Organisms <ul style="list-style-type: none"> 1. Pathogens that have adapted to and have developed the ability to resist standard antimicrobial drugs 2. Common types <ul style="list-style-type: none"> a. Methicillin/oxacillin-resistant Staphylococcus aureus (MSRA) b. Vancomycin-resistant enterococci (VRE) c. Penicillin-resistant Streptococcus pneumoniae (PRSP) d. Drug-resistant Streptococcus pneumoniae (DRSP) 3. Standard Precautions 	<p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some communicable diseases that have received attention in the media recently? • What are the implications for EMS providers?
15	<p>IX. Scene Safety—Protecting Yourself from Accidental and Work-Related Injury</p> <ul style="list-style-type: none"> A. Hazardous materials <ul style="list-style-type: none"> 1. Use binoculars to look for signs or placards before approaching. 2. Identify the substance using the <i>Emergency Response Guidebook</i>. 3. If possible, call in a specialized hazardous materials team. 4. Provide emergency care only after scene is safe and patients have been decontaminated. B. Rescue situations <ul style="list-style-type: none"> 1. Life-threatening rescue situations <ul style="list-style-type: none"> a. Downed power lines or other potential for electrocution b. Fire or threat of fire c. Explosion or threat of explosion d. Hazardous materials e. Possible structural collapse f. Low oxygen levels in confined spaces g. Trenches that are not properly secured h. Biological, nuclear, and chemical weapons 2. Call for assistance from specialized teams as needed. 3. Wear at least the protective equipment that others on the scene are required to wear. 	<p>Discussion Question What kinds of calls may put you at risk for exposure to hazardous materials?</p> <p>Teaching Tip Pass around a copy of the DOT <i>Emergency Response Guidebook</i> for students to review.</p> <p>Class Activity Give small groups of students five to ten minutes to think of potential response-related hazards in addition to those listed in the text. Have each group share their ideas with the rest of the class.</p> <p>Knowledge Application Give several descriptions of scene situations. Ask what actions and additional resources are necessary to ensure EMT and patient safety.</p>

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Minutes	Content Outline	Master Teaching Notes
	<p>4. Rescue personnel responding to accidents or other emergencies on or near a roadway are required to wear high-visibility apparel (Class 1, Class 2, or Class 3).</p> <p>C. Violence and crime</p> <ol style="list-style-type: none"> 1. If you suspect potential violence, call law enforcement before entering the scene. 2. While providing emergency care, take specific precautions to preserve the chain of evidence. 	
25	<p>X. Wellness Principles—Physical Well-Being</p> <p>A. Physical fitness</p> <ol style="list-style-type: none"> 1. Cardiovascular endurance—Calculating target heart rate 2. Muscle strength 3. Muscle endurance 4. Muscle flexibility 5. Body composition <p>B. Adequate sleep</p> <ol style="list-style-type: none"> A. Select an environment that mimics nighttime (cool and dark). B. Select a time when a block of sleep can be achieved uninterrupted. C. Do not eat a heavy meal, drink caffeine, or exercise immediately prior to sleep time. D. Reduce the amount of interruptions (e.g., turn of pager, put a sign on your door). <p>C. Smoking cessation</p> <p>D. Alcohol- and drug-related issues</p>	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Plan a stretching or relaxation exercise for the class. • Have a personal trainer or exercise physiologist present a lecture on physical fitness. <p>Class Activity Ask each student to calculate his target heart rate for aerobic exercise.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • Besides jogging or running, what are some examples of aerobic exercise? • What are some ways to improve sleep habits? • What are some of the health risks associated with tobacco use?
15	<p>XI. Wellness Principles—Mental Well-Being</p> <p>A. Stress associated with EMS can easily affect mental well-being.</p> <p>B. Improve mental well-being</p> <ol style="list-style-type: none"> 1. Talk to family members or friends 2. Exercise. 3. Relax. 4. Engage in activities you enjoy. 	<p>Knowledge Application Ask each student to write down three goals for improving or maintaining well-being.</p> <p>Critical Thinking Discussion What are some ways EMTs can incorporate wellness principles into a, sometimes hectic, work day?</p>
5	<p>XII. Follow-Up</p> <p>A. Answer student questions.</p>	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What are the various factors that

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	<p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 2 Summary. 2. Complete Chapter 2 In Review questions. 3. Complete Chapter 2 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 2 quiz 	<p>make this a stressful incident?</p> <ul style="list-style-type: none"> • What can you do to lessen the personal impact of such events—before, during and after the event? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 3

Workforce Safety and Wellness

100–120 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about special legal and ethical considerations that have an impact on the medical care an EMT administers to patients.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What are some possible explanations for the situation described? • What additional information do you need to determine the nature of the situation? • What are your thoughts about the legal and ethical issues this situation presents?
15	<p>II. The Scope of Practice—Legal Duties</p> <p>A. Scope of practice is the actions and care that the EMT is legally allowed to perform by the state in which he is providing medical care.</p> <p>B. Standard of care is the care that is expected to be provided by an EMT with similar training managing a patient in a similar situation.</p> <p>C. Duty to act is the legal obligation to provide service, whether you think the patient needs an ambulance or not.</p> <ol style="list-style-type: none"> 1. On duty you are required to care for a patient who requires and consents to it. 2. Off duty you may or may not be required to stop and render aid, depending on the state. 3. If you are off duty and publicly respond to a page for assistance at an emergency call or if you come across a scene and decide to stop and provide emergency care, you create a duty to act. 4. Duty to patient <ol style="list-style-type: none"> a. Respect the right of the patient. b. Maintain the patient's privacy and confidentiality. c. Provide complete and competent care. 5. Duty to self—Credentials and physical and mental health 6. Duty to partner—Ensuring partner is physically and mentally fit 7. Duty to equipment—Ensuring equipment is in working order 	<p>Teaching Tip</p> <p>Ask students to give examples of actions that are within the EMT's scope of practice and actions that are not within the EMT's scope of practice.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • How are scope of practice and standard of care different? What is an example that illustrates this difference? • How are scopes of practice and standards of care determined? <p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the National EMS Education Standards.</p>

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	<p>D. Good Samaritan laws protect a person who is not being paid for his services from liability for acts performed in good faith unless those acts constitute gross negligence.</p> <ol style="list-style-type: none"> 1. Most states have laws authorizing EMTs to perform prehospital emergency medical procedures without a medical license. 2. Always render care to the best of your ability, work within your scope of practice and standard of care, behave in a professional manner, and ensure that you have adequate liability insurance. <p>E. Other legal protections</p> <ol style="list-style-type: none"> 1. Sovereign immunity (governmental immunity) prevents persons treated by governmentally operated EMS systems from suing the government for civil liability. 2. Each state has a statute of limitations relative to negligence claims, meaning that the patient only has a certain amount of time to file a negligence claim following the event or from the point of discovering the problem existed. 3. Contributory negligence exists when there is a finding that the patient, through his own negligence, caused or contributed to the damage that was done to him. <p>F. An EMT's legal right is contingent upon medical direction.</p> <ol style="list-style-type: none"> 1. Follow standing orders and protocols, as approved by medical direction. 2. Establish cell phone, telephone, and radio communications with medical direction when appropriate. 3. Communicate clearly and completely with medical direction, and follow orders medical direction gives in response. 4. Any time there is a question about the scope or direction of care, consult medical direction. 	<p>Knowledge Application Given various examples of EMT actions, determine whether or not the actions are within the scope of practice. Given various scenarios in which an EMT encounters an ill or injured patient, determine whether or not the EMT has a duty to act.</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some pros and cons of Good Samaritan Laws? • Why is it important for EMT students to understand the legal and ethical issues of EMS early in the EMT course?
15	<p>III. The Scope of Practice—Ethical Responsibilities</p> <ol style="list-style-type: none"> A. Serve the needs of the patient with respect for human dignity and without regard to nationality, race, gender, creed, or status. B. Maintain skill mastery. Demonstrate respect for the competence of other medical professionals. C. Keep abreast of changes in EMS that affect patient care. Assume responsibility in defining and upholding professional standards. D. Critically review performances, seeking ways to improve response time, patient outcome, and communication. Assume responsibility for individual 	<p>Teaching Tip Ask students to give examples to illustrate each of the ethical responsibilities listed in the text.</p> <p>Discussion Question Can you think of an example of something that is legal, but not ethical? What is an example of something that is ethical, but</p>

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	<p>professional actions and judgments.</p> <p>E. Report with honesty. Hold in conference all information obtained in the course of professional work unless required by law to divulge such information.</p> <p>F. Work harmoniously with other EMTs, nurses, physicians, and other members of the health care team.</p>	<p>not legal?</p> <p>Class Activity Have students divide into small groups and draft a class code of ethics. Allow ten to 15 minutes for the activity, and then have groups read their codes aloud for class discussion.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the National Association of EMTs Oath and Code of Ethics.</p>
<p style="text-align: center;">10</p>	<p>IV. Issues of Patient Consent and Refusal—Types of Consent</p> <p>A. The conscious, competent, and rational patient has the right to accept or refuse emergency medical care.</p> <p>B. Informed consent is permission for care given after the patient has been informed of the care to be provided and the associated risks and consequences.</p> <ol style="list-style-type: none"> 1. Inform the patient that you would like to perform an assessment, provide emergency care, and transport him to a medical facility. 2. Do not touch a patient’s body or clothing without first obtaining the proper consent. <p>C. Expressed consent is obtained from every conscious, mentally competent adult before treatment is started and includes either verbal confirmation or nonverbal cues such as nodding.</p> <p>D. Implied consent occurs when you assume that a patient who is unresponsive, who is not competent, or who is unable to make a rational decision would consent to emergency care if he could.</p> <p>E. Consent to treat a minor must be obtained from a parent, legal guardian, or other person who has been granted limited rights of decision making by the parent or guardian.</p> <ol style="list-style-type: none"> 1. Implied consent is used in the absence of a parent or guardian. 	<p>Discussion Question How is expressed consent different from informed consent?</p> <p>Teaching Tip Have students role play both EMTs and patients. Have the EMTs obtain expressed, informed consent and counsel patients who refuse treatment.</p>

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	<p>2. Document the circumstances in making the decision to render emergency care.</p> <p>F. Involuntary consent can be applied when you are dealing with a mentally incompetent adult or with an individual who is in custody of law enforcement or is incarcerated and often involves a third party.</p>	
15	<p>V. Issues of Patient Consent and Refusal—Advance Directive</p> <p>A. An advance directive is a legally recognized document, signed by the patient, that states the chronically or terminally ill patient’s wish not to be resuscitated and legally allows the health care provider to withhold resuscitation</p> <p>B. Types</p> <ol style="list-style-type: none"> 1. Do not resuscitate order (DNR)—Most often governs resuscitation issues only 2. Living will—Often used to cover more general health care issues, including long-term life support and feeding tubes 3. Durable power of attorney (health care proxy)—Designates a person who is legally empowered to make health care decisions for the signer of the document if he is unable to do so for himself 4. Physician orders for life-sustaining treatment (POLST) <ol style="list-style-type: none"> a. Used in patients with serious or terminal illness who are not expected to survive for longer than one year b. Designed to allow the patient to choose and express the level of treatment he desires in the case of deterioration prior to the need for resuscitation <p>C. Check the validity of any advanced directive such as a DNR and follow laws and protocols for your state.</p> <p>D. When faced with questions about whether or not to provide care, err by providing treatment.</p>	<p>Discussion Question How is a DNR different from a living will?</p> <p>Class Activity Ask students to draft living wills. Have them document what types of end-of-life care they would consent to and under what conditions. Have several students volunteer to read their document aloud to illustrate that people have different beliefs and wishes about what kind of health care they want and do not want at the end of life.</p> <p>Knowledge Application</p> <ul style="list-style-type: none"> • Given a scenario in which a family member states a patient has a DNR, describe what actions EMTs should take. • Given a scenario in which a patient has a DNR, describe what actions EMTs can take in caring for the patient. <p>Critical Thinking Discussion What are some reasons patients may refuse medical care, even though they are ill?</p>
15	<p>VI. Issues of Patient Consent and Refusal—Refusing Treatment</p> <p>A. Competency</p> <ol style="list-style-type: none"> 1. A competent person is one oriented to person, place, and time. 2. A competent person has the right to refuse care even if it results in the patient’s death. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some indications that a patient is not competent to consent to or refuse treatment? • What actions can you take to protect

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	<p>3. When in doubt, always err in favor of providing care to the patient.</p> <p>B. Protecting yourself in refusal situations</p> <ol style="list-style-type: none"> 1. Try again to persuade the patient to accept treatment or transport to a hospital by explaining why treatment or transport is essential. 2. Make sure the patient is competent and able to make a rational, informed decision. 3. Consult medical direction as needed, or as required by local protocol. 4. If the patient still refuses, clearly document what was told to the patient and his response. 5. Have the patient (and possibly a witness) sign a refusal form. 6. Before you leave the scene, encourage the patient to seek help if certain symptoms develop. 7. If you are unsure whether the patient is able to make a rational decision or not, contact medical direction. 	<p>yourself in situations in which a patient refuses treatment?</p> <p>Critical Thinking Discussion What are some of the difficulties in determining whether or not a patient is competent to consent to or refuse medical care?</p> <p>Teaching Tip Pass around copies of refusal-of-treatment forms from local EMS agencies.</p> <p>Class Activity Have pairs of students role play EMTs and patients refusing treatment. Have the EMT document the refusal. Pairs can read their documentation aloud to the class for discussion and feedback.</p>
5	<p>VII. Other Legal Aspects of Emergency Care—Negligence</p> <ol style="list-style-type: none"> A. In a criminal liability case, the government, on behalf of the public, brings legal action against the EMT, and the EMT faces a possible fine or incarceration. B. In a civil liability case, an individual (plaintiff) files a lawsuit for monetary compensation against an individual EMT, the EMS agency or company, or others involved with the patient’s care. <ol style="list-style-type: none"> 1. Tort—A wrongful act, injury, or damage 2. Negligence—A tort in which there is no intent to do any harm to the patient but in which a breach in duty to act occurred 3. Four elements the plaintiff must prove <ol style="list-style-type: none"> a. EMT had a duty to act. b. EMT breached that duty to act. c. Patient suffered an injury or harm. d. Injuries were the result of the breach of duty. 4. Res ipsa loquitur—Concept used in cases where a care giver’s inappropriate actions are obviously that cause of patient harm 	<p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on negligence and the EMS professional on EMSlive.com and some EMS laws in the United States.</p> <p>Knowledge Application Give several scenarios of EMTs’ actions. Ask students to determine whether or not a claim of negligence could be supported.</p>

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	<ul style="list-style-type: none"> 5. Negligence per se—Act is considered to be negligent simply because it is in violation of a statute or regulation such as written EMS protocols or approved scope of practice C. Duty to act—Obligation of the EMT to respond to the scene and provide emergency care to the patient D. Breach of duty to act <ul style="list-style-type: none"> 1. Negligence—Deviation from standard 2. Simple negligence—EMT fails to perform care or makes a mistake in treatment. 3. Gross negligence—Willful, wanton, or extremely reckless patient care far beyond being negligent or careless E. Damages—Must be real, demonstrable, and recognizable by law F. Proximate cause—Injuries suffered by the patient were the direct result of the EMT's negligence. 	<p>Critical Thinking Discussion A patient in a motor vehicle collision refuses to allow EMTs to immobilize his spine. The patient's X-ray shows a fracture of his spine. The patient receives surgery and recovers. Are the EMTs negligent? Why or why not?</p>
5	<p>VIII. Other Legal Aspects of Emergency Care—Intentional Tort</p> <ul style="list-style-type: none"> A. Act knowingly committed by an individual that is considered to be civilly wrong according to law B. Types <ul style="list-style-type: none"> 1. Abandonment—Stopping treatment of the patient without transferring the care to another competent professional of an equal or higher level of training and certification or licensure 2. Assault—Willful threat to inflict harm on a patient; can occur without actually touching the patient 3. Battery—Act of touching a patient unlawfully without his consent 4. False imprisonment or kidnapping—Intentionally transporting a competent patient without his consent 5. Defamation—Releasing information to the public in either written or spoken form that is construed to be damaging to that person's character, reputation, or standing within the community <ul style="list-style-type: none"> a. Slander—Spoken form of defamation b. Libel—False or damaging statement in written form or via mass media 	<p>Discussion Question How can you protect yourself from claims of patient abandonment?</p> <p>Critical Thinking Discussion An EMT becomes angry at a patient whom he thinks is “faking” unresponsiveness. The EMT tells the patient if she doesn't open her eyes he will have to stick a big tube up her nose. Of what tort could the EMT be accused?</p>
5	<p>IX. Other Legal Aspects of Emergency Care—Confidentiality</p> <ul style="list-style-type: none"> A. Do not speak to the press, your family, friends, or other members of the public about details of the emergency care you provided to the patient. B. Most of the time, releasing confidential information requires a written release 	

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Minutes	Content Outline	Master Teaching Notes
	<p>form signed by the patient or a legal guardian.</p> <p>C. Circumstances that do not need a patient's or guardian's permission to release confidential information</p> <ol style="list-style-type: none"> 1. Another health care provider needs to know the information in order to continue medical care. 2. An official public health or governmental agency requires mandatory reporting of information related to your contact with the patient. 3. You are requested by the police to provide the information as part of a potential criminal investigation. 4. A third-party billing form requires the information. 5. You are required by legal subpoena to provide the information in court. 	<p>Discussion Question Under what conditions are you allowed to share a patient's protected (confidential) health information?</p>
3	<p>X. Other Legal Aspects of Emergency Care—Health Insurance Portability and Accountability Act (HIPAA)</p> <p>A. Federal law that protects the privacy of patient health care information and gives the patient control over how the information is distributed and used</p> <p>B. EMT practices in regard to HIPAA</p> <ol style="list-style-type: none"> 1. You will be limited to discussing patient-specific information only with individuals with whom it is medically necessary to do so. 2. You will be trained on specific policies and procedures regarding privacy issues by your EMS agency. 3. You are the patient will be provided with the policies and procedures. 4. Your EMS agency will have a designated Privacy Officer who will oversee HIPAA regulations. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on U.S. Department of Health and Human Services HIPAA information.</p>
2	<p>XI. Other Legal Aspects of Emergency Care—COBRA and EMTALA</p> <p>A. Federal regulations that ensure the public's access to emergency health care regardless of ability to pay</p> <p>B. Prevent discrimination in medical care and patient dumping</p> <p>C. EMS personnel are affected by certain aspects of the regulations, especially if the ambulance service is owned and operated by the hospital.</p>	<p>Discussion Question What types of situations does EMTALA apply to?</p>
5	<p>XII. Other Legal Aspects of Emergency Care—Protecting Yourself in Transport and Transfer Situations</p> <p>A. Do not make a decision to transport to a specific medical facility based on the patient's ability to pay.</p> <p>B. Do not bypass a medical facility that is able to treat the patient unless you</p>	<p>Knowledge Application Give a scenario in which EMTs are called to transfer a patient from one hospital to another. Have students discuss considerations in determining whether the</p>

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Minutes	Content Outline	Master Teaching Notes
	<p>are directed to do so by medical direction or predetermined protocol.</p> <p>C. Transferring between hospital or medical facilities</p> <ol style="list-style-type: none"> 1. Get a full and clear report about the patient's condition. 2. Ensure that you are able to provide the level of care necessary during the transport and it is within your scope of practice. 3. Obtain the informed consent form signed by the patient or his legal guardian allowing for the transfer. 4. Obtain the written certification of transfer that includes the transferring physician's name and address, facility receiving the patient, and the reason for the transfer. 5. Know where you are going and take the quickest possible route. 	<p>EMT should perform the transfer.</p>
<p style="text-align: center;">5</p>	<p>XIII. Other Legal Aspects of Emergency Care—Special Situations</p> <p>A. Donors and organ harvesting</p> <ol style="list-style-type: none"> 1. Organs can be donated only if there is a legal signed document giving permission to harvest the organs (e.g., signed organ donor card) 2. Assist the organ harvesting procedure <ol style="list-style-type: none"> a. Identify the patient as a potential donor based on the type of injuries or illness and treatment that was rendered. b. Communicate with medical direction regarding the possibility of organ donation. c. Provide emergency care, such as CPR, that will help maintain vital organs in case harvesting is attempted. <p>B. Medical identification insignia—Look for insignia during assessment.</p> <p>C. Recognizing death in the field</p> <ol style="list-style-type: none"> 1. Presumptive signs of death (for DNR) 2. Obvious signs of death (resuscitative efforts not necessary) 3. Cases for which medical examiner or coroner should be called <p>D. Crime scenes</p> <ol style="list-style-type: none"> 1. For potential crime scenes, dispatch should also notify the police. 2. If you suspect that a crime is in progress or the criminal is still active at the scene, do not attempt to provide care to any patient. 3. Wait until the police declare the scene is safe before entering, but remember that the scene could still be dangerous. 4. While your priority is emergency care for the patient, try to avoid disturbing anything that may be considered evidence (e.g., clothing, knots). <p>E. Special reporting situations</p>	<p>Teaching Tip Have someone from the local organ procurement services talk to students about organ donation.</p> <p>Class Activity Have students research the tissues and organs that can be donated and write a one-page report on tissue and organ donation.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on organ donation.</p> <p>Discussion Question What are some considerations for preserving evidence at a crime scene while caring for a patient?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 1. Abuse (e.g., child abuse, elder abuse, spousal abuse) 2. Crime (e.g., gunshot wounds, suspicious burns) 3. Drug-related injuries (Remember that drug addiction is considered an illness, not a crime). 4. Infectious disease exposure 5. Use of patient restraints 6. Mentally incompetent patients 7. Attempted suicides 8. Dog bites 	
10	<p>XIV. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 3 Summary. 2. Complete Chapter 3 In Review questions. 3. Complete Chapter 3 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 3 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What are the indications that Mr. and Mrs. Schuman are not competent to consent to or refuse care? • Was there any legal risk to the EMTs in making the decision to treat and transport Mr. Schuman? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 4

Documentation

200–240 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about the importance of documenting all their encounters with patients as well as the types of information that go into such documentation.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • Based on what you know so far, what are some things you would document when you write your PCR or refusal of treatment? • Why do you think each of these things is important?
3	<p>II. Functions of the Prehospital Care Report—Continuity of Medical Care</p> <p>A. Prime reason for high-quality documentation is high-quality patient care.</p> <p>B. Documentation gives emergency department personnel the information they need to provide the most appropriate treatment in a timely manner.</p> <ol style="list-style-type: none"> 1. Change in vital signs 2. Change in signs and symptoms 3. Details from sources to which personnel have no access (e.g., bystanders, family, awake patient) 	<p>Teaching Tip</p> <p>Give examples of calls in which your documentation or that of another EMT's has made a difference.</p>
3	<p>III. Functions of the Prehospital Care Report—Administrative Uses</p> <p>A. Becomes part of the patient's permanent hospital record</p> <p>B. Used in preparing bills and submitting records to insurance companies</p> <p>C. Used to contribute to statistics regarding emergency medical service (e.g., response time, time on scene, and so on)</p>	<p>Discussion Question</p> <p>Why is it important that EMS services bill patients and submit insurance claims?</p>

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3	<p>IV. Functions of the Prehospital Care Report—Legal Document</p> <p>A. Documentation may be used if run may have been the result of a crime or the incident leads to a civil lawsuit.</p> <p>B. Documentation should be legible, accurate, and complete as you may have to refer to the documentation months or years later or use it for your own defense.</p>	<p>Teaching Tip</p> <p>Ask several students to recall what they ate for breakfast one week ago. Use this to illustrate the difficulty in remembering things that are routine—as EMS calls will one day be for them—even after a short period of time.</p>
3	<p>V. Functions of the Prehospital Care Report—Educational and Research Uses</p> <p>A. Documentation provides data for researchers studying a whole range of issues.</p> <p>B. Documentation may be used to track or identify various patient presentations and conditions that may require additional education and training.</p>	<p>Discussion Question</p> <p>How can PCR data be useful in research?</p>
3	<p>VI. Functions of the Prehospital Care Report—Evaluation and Continuous Quality Improvement</p> <p>A. Reviews of documentation are an integral part of the quality improvement process.</p> <p>B. Documentation may be used in medical oversight to determine if EMTs are adhering to protocols and the set standard of care for your area.</p>	<p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some reasons EMS documentation may not be as good as it should be? • What are some ideas for improving documentation?
10	<p>VII. Collection of Data in Prehospital Care Reports—PCR Formats</p> <p>A. The PCR can have different names in different parts of the country and look different depending on the format.</p> <p>B. Written report—Check boxes, write-on lines, and space for narrative</p> <p>C. Computerized report—Computer, laptop, person digital assistant (PDA), electronic (computer) clipboard</p> <ol style="list-style-type: none"> 1. Can store more information in a more legible format 2. Has greater efficiencies in storing, retrieving, and utilizing data 3. Ensures a more accurate report 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Provide students with copies of PCRs used locally. • If possible, demonstrate an electronic documentation system.
50	<p>VIII. Collection of Data in Prehospital Care Reports—PCR Data</p> <p>A. To protect yourself, remember that if it wasn't written down than it wasn't done, and if it wasn't done, than don't write it down.</p> <p>B. The minimum data set—Information the Department of Transportation wants</p>	<p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web</p>

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	<p>on all PCRs</p> <ol style="list-style-type: none"> 1. Patient information <ol style="list-style-type: none"> a. Chief complaint b. Level of responsiveness (AVPU)—mental status c. Blood pressure for patients greater than three years old d. Skin perfusion (capillary refill) for patients less than six years old e. Skin color, temperature, and condition f. Pulse rate g. Respiratory rate and effort h. Patient demographics (age, sex, race, weight) 2. Administrative information—Taken with accurate and synchronous clocks <ol style="list-style-type: none"> a. Time the incident was reported b. Time the unit was notified c. Time of arrival at the patient d. Time the unit left the scene e. Time the unit arrived at its destination f. Time of transfer of care C. Administrative information—Sometimes referred to as run data <ol style="list-style-type: none"> 1. EMS unit number and run or call number 2. Names of crew members and their levels of certification 3. Address to which unit is dispatched D. Patient demographics and other patient data <ol style="list-style-type: none"> 1. Patient’s legal name, age, sex, race, and birth date 2. Patient’s home address 3. Insurance or billing information 4. Location where patient was found 5. Any care given before the arrival of the EMTs E. Vital signs <ol style="list-style-type: none"> 1. Ideally, record two complete sets of vital signs 2. Note patient’s position 3. Note time vital signs were taken F. Patient narrative <ol style="list-style-type: none"> 1. Document patient’s chief complaint—Use the patient’s own words and put them in quotation marks. 2. Document patient’s SAMPLE history or description of mechanism of injury. <ol style="list-style-type: none"> a. Objective information is measurable and verifiable in some way 	<p>resources on the National EMS Information System.</p> <p>Teaching Tip Since students have not yet covered patient assessment and history-taking, explain the meaning of each of the components under the <i>Patient Information</i> heading.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the purposes of a standard minimum data set? • What are some examples of administrative information in the minimum data set? • Why are synchronous clocks important in EMS systems? <p>Knowledge Application Students may not be familiar with military time. Explain it, then give several 12-hour clock times and ask for the military time equivalent.</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • Why is it important that more than one set of vital signs are recorded whenever possible? • A patient’s family member tells you the patient is an alcoholic. How will you document the information? <p>Discussion Question What is included in the narrative portion of a PCR?</p>

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	<p>(e.g. sign such as discoloration below both eyes.)</p> <ul style="list-style-type: none"> b. Subjective information is information based on an individual's perceptions or interpretations (e.g., symptom such as light-headedness) c. Information should be pertinent to the medical circumstances. d. Be alert to pertinent negatives—Signs and symptoms that might be expected, based on the chief complaint, but that the patient denies having. <ul style="list-style-type: none"> 3. Document the physical assessment in the order it was performed. 4. Document pertinent information about the scene and patient. 5. Document the time and findings of each patient reassessment. 6. Write in a simple, direct style, using standard abbreviations and accurate medical terminology. <p>G. Treatment</p> <ul style="list-style-type: none"> 1. Detail in chronological order all treatment you administer to the patient. 2. Detail how the patient responded to treatment. 	<p>Knowledge Application Give several patient complaints and findings, one at a time, and ask students to tell you whether each is subjective or objective.</p> <p>Teaching Tip Bring an up-to-date medical dictionary to class and show students how to find official abbreviations.</p> <p>Class Activity Have students close their books. Read the information below aloud and have students use as many abbreviations as they can in writing it down. Afterward, ask for a volunteer to write on the board.</p> <p>“The patient is a 58 year old male who complains of shortness of breath after walking. He has a history of chest pain and takes nitroglycerin sublingually. His symptoms decreased after receiving oxygen.”</p>
5	<p>IX. Legal Concerns—Confidentiality</p> <ul style="list-style-type: none"> A. Remember that the PCR and the information on it are considered confidential. B. Be familiar with the limitations of release of information mandated by the Health Information Portability and Accountability Act of 1996 (HIPAA). 	<p>Critical Thinking Discussion How could sharing a patient's protected health information result in harm?</p>
5	<p>X. Legal Concerns—Distribution</p> <ul style="list-style-type: none"> A. You are generally permitted to provide confidential information about a patient to the following people. <ul style="list-style-type: none"> 1. Health care provider who needs information to continue care 2. Police if they request it for an investigation 3. Third party for billing 	

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	<p>4. Court if required by legal subpoena</p> <p>B. A copy of the PCR is generally left with the patient in the emergency department or receiving facility.</p>	
10	<p>XI. Legal Concerns—Refusal of Treatment</p> <p>A. Take extra effort to ensure that a patient refusing treatment understands what he is doing and to document your efforts completely.</p> <p>B. Try to perform as much of the assessment as possible.</p> <p>C. Before leaving the scene, always try to make one more effort to persuade the patient to allow transport.</p> <p>D. Inform that patient as clearly as possible why he should go to the hospital.</p> <p>E. If the patient still refuses, discuss the situation with medical direction as directed by local protocol.</p> <p>F. If the patient still refuses to accept emergency care and/or transport, document the following information in the PCR.</p> <ol style="list-style-type: none"> 1. Any assessment findings you have made 2. Any emergency care you have given 3. Explanation you gave the patient of the consequences of failing to accept care and/or transport 4. The fact that the patient is alert and oriented to time, place, and person/self <p>G. Have the patient sign a refusal-of-care form as well as a witness.</p> <p>H. Before leaving the scene, offer alternative methods of getting care.</p> <p>I. Explain that you or another EMT crew will be happy to come back if the patient changes his mind and decides to accept treatment.</p>	<p>Teaching Tip Prior to class, devise a scenario with an assistant so that you can role play obtaining a refusal of treatment for the class. See below under Class Activity.</p> <p>Class Activity Using the role play under Teaching Tips, above, have students document the pertinent information from the refusal. Ask for volunteers to read their documentation aloud.</p> <p>Knowledge Application Give several scenarios of patients refusing care. Ask the class for ideas on handling each situation.</p>
10	<p>XII. Legal Concerns—Falsification</p> <p>A. Never falsify information on a PCR; it could lead to suspension or revocation of EMT certification or license, criminal charges, or catastrophic results for the patient.</p> <p>B. If you make an error on a PCR</p> <ol style="list-style-type: none"> 1. Draw a single horizontal line through the error and initial it. 2. Write the correct information beside it. <p>C. If an error is discovered after the report form is submitted</p> <ol style="list-style-type: none"> 1. Use a different color ink, if possible, to draw a single horizontal line through the error. 2. Add a note with the correct information 3. Initial the entry and include the date and time of the correction. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the consequences to a patient of falsifying documentation? • You have inadvertently written that a patient is 58 years old, instead of 68 years old. What is the acceptable way of correcting this on a written PCR? <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web</p>

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	<ol style="list-style-type: none"> 4. If information was omitted, add a note with the correct information, date, and your initials. 5. Be sure to bring such changes to the attention of those to whom the incorrect report was submitted. <p>D. Most electronic PCR formats provide a method to amend the report if an error is discovered; however, if there is no way to electronically amend, correct a printed copy using traditional methods.</p>	resources on Documentation and the PCR by Steve Wirth.
10	<p>XIII. Special Situations—Transfer-of-Care Report</p> <ol style="list-style-type: none"> A. Ideally, the EMT completes a full PCR containing the patient data, obtains a transfer-of-care signature from the medical professional who is assuming responsibility, and leaves a copy of the full report with the facility. B. Sometimes the EMT may not be able to submit this full PCR; in such cases an abbreviated transfer-of-care form or “drop report” may be used to provide patient data and collect transfer-of-care signature. 	<p>Teaching Tip Show students any special reporting forms used locally.</p>
10	<p>XIV. Special Situations—Multiple-Casualty Report</p> <ol style="list-style-type: none"> A. An EMT may be too consumed with patient care to complete the standard PCR before turning to the next patient. B. Each EMS system has its own MCI plan for recording important medical information and keeping that information with the patient as he is moved. <ol style="list-style-type: none"> 1. Triage tags 2. Less-detailed PCRs 	
10	<p>XV. Special Situations—Special Reports</p> <ol style="list-style-type: none"> A. Situations often requiring special reports <ol style="list-style-type: none"> 1. Suspected abuse of a child or elderly person 2. Possible exposure to infectious disease (e.g., meningitis, hepatitis, TB, HIV) 3. Injury to an EMS team member 4. Other situations that the EMT feels might require special documentation and/or informing of another agency B. Follow state law and local protocol when filling out and submitting reports. 	<p>Discussion Question Why is it important that some events be recorded separately from the PCR?</p>
20	<p>XVI. Alternative Documentation Methods—SOAP</p> <ol style="list-style-type: none"> A. S—Subjective—Refers to information that the patient tells you (symptoms) B. O—Objective—Refers to information that you identify in the physical examination (signs) 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • If not handed out previously, hand out a photocopied fictitious PCR and explain the method used to format the narrative.

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	<p>C. A—Assessment—Refers to the field assessment or general idea you form about the patient’s condition</p> <p>D. P—Plan—Refers to the plan of action and the emergency care provided to the patient</p>	<ul style="list-style-type: none"> • Explain that this introduction of documentation is necessary to structure students’ thinking about collecting information, but that they will increase their understanding of documentation throughout the course.
20	<p>XVII. Alternative Documentation Methods—CHART</p> <p>A. C—Chief complaint</p> <p>B. H—History of the patient (included the SAMPLE history)</p> <p>C. A—Assessment—Findings gathered in the primary assessment, secondary assessment, detailed physical exam, and ongoing assessment</p> <p>D. R—Rx for treatment that was provided to the patient</p> <p>E. T—Transport—Any change in the patient condition en route and the type of transport (e.g., emergency)</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are advantages and possible disadvantages of each of the methods of documentation? • How can mnemonics such as these be helpful in documentation?
20	<p>XVIII. Alternative Documentation Methods—CHEATED</p> <p>A. C—Chief complaint</p> <p>B. H—History of the patient (including the SAMPLE history)</p> <p>C. E—Exam—Information that was found in the physical examination of the patient</p> <p>D. A—Assessment—Field impression you derive by processing the history and physical exam findings and determining a condition the patient may be suffering from</p> <p>E. T—Treatment that was provided to the patient</p> <p>F. E—Evaluation—Information that is found during reassessment and identified improvement or deterioration of the patient’s condition</p> <p>G. D—Disposition—Transfer of patient care at the medical facility or to another health care provider</p>	<p>Knowledge Application</p> <p>Select one of the documentation methods covered. Call out various pieces of information for a PCR narrative in random order. Have students identify where in the narrative each piece of information fits.</p>
20	<p>XIX. Medical Abbreviations</p> <p>A. Abbreviations save room and time when writing the prehospital care report.</p> <p>B. Use only universally accepted medical abbreviations.</p> <p>C. Table 4-2 listed standard medical abbreviations.</p>	<p>Teaching Tip</p> <p>Review Table 4-2 with students. Call out a category or type of patient information and ask students for the abbreviation.</p> <p>Discussion Question</p> <p>What are advantages and possible disadvantages of medical abbreviations?</p>

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		<p>Class Activity Divide students into teams. Give each team a bell to ring. Write a medical abbreviation on the board. The first team to ring their bell answers. If they answer correctly, the team gets 5 points. If they answer incorrectly, the other team gets an opportunity to answer.</p> <p>Knowledge Application As class proceeds, have students write PCRs for their lab scenarios using standard abbreviations.</p>
10	<p>XX. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 4 Summary. 2. Complete Chapter 4 In Review questions. 3. Complete Chapter 4 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 4 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why should a refusal of treatment be witnessed and signed by someone other than your partner? • Can you think of anything else the EMTs could have said or done in this situation <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be

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Detailed Lesson Plan

Chapter 5

Communication

130–150 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about the elements of emergency prehospital care communications and communications systems.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • Why is it important to attempt to obtain more information about the nature of the call? • What is the first thing you would say as you approach the patient? • At what points will it be necessary to communicate with dispatch and the receiving facility during this call?
30	<p>II. EMS Communications System—Components of an Emergency Communications System</p> <p>A. Base station</p> <ol style="list-style-type: none"> 1. Serves as a dispatch and coordination area 2. Preferably located on a hill and in close proximity to hospital that serves as a medical command center <p>B. Mobile radios (transmitter/receiver)</p> <ol style="list-style-type: none"> 1. Vehicle-mounted devices used to communicate within the EMS system 2. Able to transmit over a ten to 15 mile range on average terrain <p>C. Portable radios</p> <ol style="list-style-type: none"> 1. Portable, hand-held transmitter/receiver useful if you are out of your vehicle but must stay in communication with base, one another, or medical direction. 2. Usually have a limited range <p>D. Repeaters</p> <ol style="list-style-type: none"> 1. Devices that receive transmission from a relatively low-powered source 2. Make communication possible in EMS systems that cover a wide area or where terrain makes transmission and reception difficult <p>E. Digital equipment</p>	<p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the National Emergency Number Association.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Show examples of base station, mobile, and portable radios, as well as mobile data terminals or digital pagers used in area EMS systems. • Discuss specific communication issues in your area that can interfere with communication, such as mountains, buildings, tunnels, subways, and so on. <p>Class Activities</p> <ul style="list-style-type: none"> • Tour the dispatch center or emergency

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	<ol style="list-style-type: none"> 1. Encoder breaks down sound waves into unique digital codes. 2. Decoder recognizes and responds to only those codes. 3. Mobile data terminal is mounted in the cab of the ambulance and displays the information on a terminal screen. 4. EMT can respond to dispatch using the mobile data terminal. <p>F. Cell phones</p> <ol style="list-style-type: none"> 1. Benefits <ol style="list-style-type: none"> a. Excellent sound quality b. Availability of channels c. Easy maintenance d. Increased privacy of communications 2. Disadvantage—Can be easily overwhelmed during multiple-casualty disasters <p>G. Broadcast regulations—Federal Communication Commission (FCC) has jurisdiction over all radio operations in the United States.</p> <p>H. System maintenance</p> <ol style="list-style-type: none"> 1. Check batteries for mobile and portable radios on a daily basis. 2. Regularly clean equipment with a damp cloth and mild detergent. 3. Do not mishandle or unnecessarily expose equipment to harsh environmental conditions 4. EMS system should have some provision for backing up its communication system. 	<p>department communications center with students.</p> <ul style="list-style-type: none"> • Arrange to have an ambulance present at the class location to demonstrate mobile radio equipment. <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are encoders and decoders with respect to radio communications? • What are the advantages and disadvantages to using cell phones for EMS system communication? <p>Knowledge Application</p> <p>Describe a radio communication situation and have students determine whether you are describing a base station, mobile radio, portable radio, repeater, or mobile data terminal.</p> <p>Discussion Question</p> <p>What is the role of the FCC?</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Show examples of FCC notices on communication devices. • Demonstrate equipment to charge portable radios. <p>Discussion Question</p> <p>What are ways EMTs can participate in maintenance of EMS communication equipment?</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some ways EMS communication technology may improve

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		<p>in the future?</p> <ul style="list-style-type: none"> • What would be the consequences of failure of the EMS communication system in your area? • What are some communication problems you could predict if the EMS system continues to grow?
5	<p>III. Communicating within the System—Ground Rules for Radio Communication</p> <p>A. Turn on the radio and select the correct frequency.</p> <p>B. Listen before transmitting.</p> <p>C. Push the “press to talk” (PPT) button and wait one second before speaking.</p> <p>D. Speak clearly, calmly, and slowly about two to three inches from the microphone.</p> <p>E. Address the unit being called by its name and number, and then identify your name.</p> <p>F. Listen for either “go ahead” or “stand by.”</p> <p>G. Keep transmissions brief.</p> <p>H. Keep your transmission organized and to the point.</p> <p>I. When transmitting a number that might be confused with another, say the number and then the individual digits that make up the number.</p> <p>J. Give only objective information and relevant subjective information.</p> <p>K. Use the “echo” method when receiving orders or information from dispatch, medical direction, or other medical personnel.</p> <p>L. Write down important information.</p> <p>M. Remember that airwaves are public and scanners can pick up radio and cell phone messages.</p> <p>N. Use “we” rather than “I”.</p> <p>O. Use “affirmative” and “negative” rather than “yes” and “no”.</p> <p>P. When you are finished, say “over.”</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some of the guidelines used for radio communications? • Why are “please,” “thank you,” and other courtesy phrases not used in EMS radio communication? • What is the purpose of saying “over” when you have finished speaking on the radio? <p>Teaching Tip Explain any unique guidelines or conventions used by your local EMS system.</p> <p>Critical Thinking Discussion Why should radio transmissions be kept to approximately 30 seconds or less?</p>
5	<p>IV. Communicating within the System—Phone/Cell Phone Communication</p> <p>A. An EMT should be familiar with cellular technology being used and be aware of dead spots.</p> <p>B. A plan should be in place in case a cellular transmission fails while giving a</p>	

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	<p>report or communicating with another agency.</p> <p>C. EMT should be familiar with commonly used telephone numbers (e.g., medical direction).</p>	
<p style="text-align: center;">5</p>	<p>V. Communicating within the System—Communicating with Dispatch</p> <p>A. First contact on a run will probably be with EMS system’s dispatch.</p> <p>B. Dispatch obtains as much information as possible about the emergency and records all conversations (which become part of the legal record).</p> <p>C. Communicate with dispatch on the following points.</p> <ol style="list-style-type: none"> 1. Acknowledge dispatch call was received. 2. Advise dispatch when the unit is en route to the call. 3. Estimate your time of arrival at scene. 4. Announce your unit’s arrival and request additional resources. 5. Announce the unit’s departure from the scene, destination, number of patients, and estimated time of arrival to hospital or facility. 6. Announce your arrival at hospital or facility. 7. Announce that you are leaving the hospital or facility. 8. Announce arrival back at the station. 	<p>Teaching Tip Give several examples of radio report information to illustrate the information in the text.</p> <p>Discussion Question What are the important EMS call times that should be recorded with dispatch?</p> <p>Knowledge Application Suggest that students start developing their sense of travel time estimations when traveling by automobile by determining what their ETAs are from one place to another.</p>
<p style="text-align: center;">15</p>	<p>VI. Communicating within the System—Communicating with Health Care Professionals</p> <p>A. Communicating with medical direction</p> <ol style="list-style-type: none"> 1. Information to give medical direction <ol style="list-style-type: none"> a. Unit’s identification and level of service b. Patient’s age and sex c. Patient’s chief complaint d. Brief and pertinent history of the present illness or injury e. Major past illnesses f. Patient’s mental status g. Patient’s baseline vital signs h. Pertinent findings of your physical examination i. Description of emergency medical care given to the patient j. Patient’s response to emergency medical care k. Patient’s current condition l. Request for further action/interventions at the receiving facility 	<p>Teaching Tip Give students mock medical orders and ask them to repeat the order back to you.</p> <p>Class Activity Divide the class into small groups. Hand out prepared lists of patient information in random order. Each group will take about ten minutes to organize the patient information according the format in the text. Next, have each group take turns using one of the portable radios to go out of the classroom and present their patient information. Ask the class to discuss whether or not they received a clear picture of the patient’s presentation.</p>

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	<ul style="list-style-type: none"> m. Estimated time of arrival 2. Be sure to repeat back orders that you receive from medical direction and ask questions if you do not understand an order or if an order appears to be inappropriate. 3. Use the acronym SBAR to organize communication into a standard format. <ul style="list-style-type: none"> a. Situation—Problem or reason you are calling and chief complaint b. Background—Past medical history and patient’s response to treatment c. Assessment—Pertinent objective and subjective assessment findings d. Recommendation—What you are requesting for the patient B. Communicating with the receiving facility—Information to supply <ul style="list-style-type: none"> 1. Unit’s identification and level of service 2. Patient’s age and sex 3. Patient’s chief complain 4. Brief and pertinent history of the present illness or injury 5. Major past illnesses 6. Patient’s mental status 7. Patient’s baseline vital signs 8. Pertinent findings of your physical examination 9. Description of the emergency medical care given to the patient 10. Patient’s response to emergency medical care 11. Patient’s current condition 12. Estimated time of arrival 13. Reassessment findings, if required by protocol C. Oral report <ul style="list-style-type: none"> 1. Delivered to receiving facility 2. Information to include <ul style="list-style-type: none"> a. Patient’s chief complaint b. Patient’s vital signs taken en route c. Treatment given to patient en route and his response to it d. Pertinent history not given in earlier report to the facility 3. Remember to also supply the facility with a copy of your written report (PCR). D. Transferring care to another EMS provider <ul style="list-style-type: none"> 1. Information to include in verbal report <ul style="list-style-type: none"> a. Patient’s current condition 	<p>Critical Thinking Discussion What are some consequences to patient care of giving a disorganized patient report?</p> <p>Discussion Question What are important things the receiving facility needs to know about a patient?</p> <p>Knowledge Application Describe a scenario in which students will be transferring care of a patient to paramedics on the scene. What are the important facts the paramedics need to</p>

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	<ul style="list-style-type: none"> b. Patient's age and gender c. Patient's chief complaint d. Brief, pertinent history of what happened e. Description of how you found the patient f. Major past illnesses g. Vital signs you obtained from the patient h. Pertinent findings of the physical exam i. Emergency medical care given j. Patient's response to given emergency medical care <p>2. Remember to ask EMS if he needs any additional information and to obtain any information that you will need to complete documentation.</p>	<p>know?</p> <p>Critical Thinking Discussion What are some ways you can develop your skills in EMS communication?</p>
5	<p>VII. Team Communication and Dynamics—Taking Charge</p> <ul style="list-style-type: none"> A. Maintain personal appearance and professional manner. B. If patient is alert and without life-threatening conditions, you may be briefed by First Responders or bystanders before making contact with the patient. C. If the patient is unresponsive or with life-threatening emergencies, go directly to the patient. D. If a doctor, fire-rescue personnel, or police are on scene, a transfer of authority must occur. 	
5	<p>VIII. Team Communication and Dynamics—Radio Codes</p> <ul style="list-style-type: none"> A. Advantages <ul style="list-style-type: none"> 1. Can shorten radio air time 2. Provide clear and concise information 3. Allow transmission of information in a format not understood by the patient, family members, or bystanders B. Disadvantages <ul style="list-style-type: none"> 1. Useless unless everyone in the system understands the codes 2. Medical information is often too complex for codes. 3. Valuable time may be wasted looking up a code's meaning. C. Ten-Code system 	<p>Teaching Tip If your system uses ten codes or another system of codes, provide a handout for students.</p>
	<p>IX. Team Communication and Dynamics—Times</p>	<p>Teaching Tip</p>

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10	<p>A. U.S. Department of Transportation calls for the use of accurate and synchronous clocks</p> <p>B. Most EMS systems use military time.</p> <ol style="list-style-type: none"> 1. 1:00 a.m. to 12 Noon = 0100 to 1200 hours 2. 1:00 p.m. to Midnight = 1300 to 2400 hours 	<p>Give students several 12-hour clock times and have them give the military time equivalents.</p>
10	<p>X. Team Communication and Dynamics—Radio Terms</p> <p>A. <i>Break</i>—Afford a “pause” so that the hospital can respond or interrupt if necessary</p> <p>B. <i>Clear</i>—End of transmission</p> <p>C. <i>Come in</i>—Requesting acknowledgement of transmission</p> <p>D. <i>Copy</i>—Message received and understood</p> <p>E. <i>ETA</i>—Estimated time of arrival</p> <p>F. <i>Go ahead</i>—Proceed with your message</p> <p>G. <i>Landline</i>—Refers to telephone communication</p> <p>H. <i>Over</i>—End of <i>message; awaiting reply</i></p> <p>I. <i>Repeat/say again</i>—Did not understand message</p> <p>J. <i>Spell out</i>—Asking sender to spell out phonetically words that are unclear</p> <p>K. <i>Stand by</i>—Please wait</p> <p>L. <i>10-4</i>—Acknowledging that message is received and understood</p>	<p>Teaching Tip Give examples of the use of radio terms as you explain them.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • How can radio codes both enhance and interfere with communication? • What does the term <i>copy</i> mean in radio communications? • When would you use the term <i>stand by</i> in radio communications? <p>Class Activity Have pairs of students take a portable radio out of the classroom. Contact them by radio and initiate a conversation, giving them an opportunity to both hear and use radio terms. The conversations need not be EMS-related. The point is to use terms than enhance radio communication in general.</p>
2	<p>XI. Therapeutic Communication—Principles of Patient Communication</p> <p>A. Communication is a dynamic process that incorporates verbal and nonverbal expressions into meaningful messages that are received by others.</p> <p>B. Factors such as gender, culture, age, environment, and personal experience can influence how one sends and interprets these messages.</p> <p>C. EMTs need to know how to communicate with patients to establish a positive relationship with them.</p>	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on effective communications.</p>
2	<p>XII. Therapeutic Communication—The Communication Process</p> <p>A. The sender uses encoding, the process of converting information into a message.</p> <p>B. The receiver, the person for whom the message is intended, uses decoding,</p>	<p>Teaching Tip Write the following phrase on the white board: <i>I didn't say he was a terrible EMT.</i> Select eight students to repeat the phrase,</p>

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	<p>the process by which a message is translated and interpreted.</p> <p>C. The more closely the decoded message matches the intended meaning of the encoded message, the more effective communication will be.</p> <p>D. Use feedback to determine if the message is being received as it was meant to be.</p>	<p>each one placing emphasis on a different word in the phrase. Ask students how the meaning of the message changes based on voice inflection.</p>
5	<p>XIII. Therapeutic Communication—Communication Responses</p> <p>A. Clarification</p> <p>B. Summary</p> <p>C. Explanation</p> <p>D. Silence</p> <p>E. Reflection</p> <p>F. Empathy</p> <p>G. Confrontation</p> <p>H. Facilitated communication</p>	<p>Class Activity</p> <p>Divide students into seven groups. Assign each group one of the techniques that facilitate communication (clarification, summary, explanation, silence, reflection, empathy, and confrontation). Each group will spend about 15 minutes developing a short (one to two minutes) skit that illustrates their assigned communication technique to the rest of the class.</p>
2	<p>XIV. Therapeutic Communication—Communicating with the Patient</p> <p>A. High-intensity emotions at a scene can make communication difficult.</p> <p>B. Keep in mind the three Cs.</p> <ol style="list-style-type: none"> 1. Competence 2. Confidence 3. Compassion 	
5	<p>XV. Therapeutic Communication—Patient Contact</p> <p>A. Remember that first impressions are critical, and be sure that your physical appearance reflects the health care professional that you are.</p> <p>B. Introduce yourself and ask for the patient’s name.</p> <p>C. Introduce the rest of your team to the patient.</p> <p>D. Be sure to say “I’m going to help you. Is that all right?” to gain consent.</p> <p>E. Be aware of defense mechanisms.</p> <p>F. Speak clearly, calmly, and slowly.</p> <p>G. Use a professional tone of voice.</p> <p>H. Respect the patient’s privacy.</p> <p>I. Limit interruptions when communicating with your patient.</p> <p>J. Be aware of your body language and space between you and your patient.</p> <p>K. Try to control the physical environment.</p> <p>L. Be courteous.</p> <p>M. Actively listen to your patient.</p>	<p>Teaching Tip</p> <p>Ask for a student volunteer so that you can demonstrate to the class how to properly introduce yourself and initiate a patient interview.</p> <p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on defense mechanisms.</p> <p>Discussion Question</p> <p>What does active listening mean?</p>

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	N. Be honest with your patient.	
2	XVI. Therapeutic Communication—The Patient Interview A. Know the types of questions to ask your patients and how to ask them. B. Combine effective interviewing techniques with compassion and concern.	
5	XVII. Therapeutic Communication—Nonverbal Communication A. Posture B. Distance—In American culture, the intimate zone is the space within less than one and a half feet of an individual. C. Gestures—Nonverbal body movement that convey meaning D. Eye contact E. Haptics—Study of touching	Discussion Question What are some nonverbal forms of communication? Teaching Tip Ask students what they notice about others' nonverbal communications and what message they get from it. Critical Thinking Discussion Start a discussion on how students feel about someone touching them during communication. Have different students share their points of view about whether or not they would be comfortable about an EMT touching them on the arm or shoulder, or giving them a hug. Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i> , 9 th edition to access a video on nonverbal communication.
6	XVIII. Therapeutic Communication—Asking Questions A. Ask one question at a time and give the patient time to respond. B. Choose language that the patient can understand. C. Take notes to remember information. D. Types of questions 1. Open-ended questions—Questions that allow the patient to give a	Knowledge Application Give several examples of patient interview questions. Have students determine if each question is open-ended or closed.

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	<p>detailed response in his own words</p> <p>2. Closed questions—Questions that call for specific information from the patient</p>	
6	<p>XIX. Therapeutic Communication—Considerations in Interviewing</p> <p>A. Do not ask leading or biased questions. B. Do not interrupt your patient when he is speaking. C. The patient or the EMT may talk too much. D. Do not provide false assurance. E. Do not give inappropriate advice. F. Do not ask “why” questions that imply blame. G. Family preference issues H. Motivating the unmotivated patient to talk I. Interviewing a hostile patient</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What is an example of a leading question? • What are some ways to encourage a silent patient to communicate? <p>Knowledge Application Ask for a student volunteer and pull them aside to prepare for a short role play scenario. You will act as the EMT, interviewing the student (patient). Work in various pitfalls (asking why, providing false assurance, and talking too much). Ask the class to critique your interview and see if they recognize your planned pitfalls.</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some statements you could use to discourage a family member from answering in place of the patient during your interview? • What are some reasons patients might be reluctant to answer an EMT’s questions? How could you overcome this reluctance?
5	<p>XX. Therapeutic Communication—Special Circumstances</p> <p>A. Transcultural considerations</p> <ol style="list-style-type: none"> 1. Culture is comprised of the thoughts, communications, actions, and values of a racial, ethnic, religious, or social group. 2. Understand that both the EMT and the patient bring cultural stereotypes that may affect communication. 3. EMTs should look to overcome stereotypes and avoid ethnocentrism. 4. Remember that various cultures view space, nonverbal signs, and sick 	<p>Teaching Tip Discuss languages that are common in your community. Ask how many students speak more than one language.</p> <p>Critical Thinking Discussion What are possible drawbacks to using a language interpreter when interviewing a</p>

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	<p>people differently.</p> <ol style="list-style-type: none"> 5. Use bystanders or a toll-free interpreter if the patient does not speak English. <p>B. Considerations for elderly patients</p> <ol style="list-style-type: none"> 1. Take extra time when communicating with elderly people. 2. Do not assume that all elderly patients have hearing or vision problems; however, if a patient has a vision or hearing problem, make adjustments to help the patient communicate with you. 3. Get a patient's glasses or hearing aid for them if need be. 4. Always be sure to treat elderly patients with respect and compassion. <p>C. Considerations for children</p> <ol style="list-style-type: none"> 1. Remind patients to remain calm and confident in front of the child. 2. Position yourself close to the child's eye level. 3. Give clear explanations of what you are doing by using simple language and without talking down to the child. 4. Be honest with the child. 	<p>patient?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on cultural competence.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on alternative methods of communicating with children.</p>
10	<p>XXI. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 5 Summary. 2. Complete Chapter 5 In Review questions. 3. Complete Chapter 5 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 5 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What information are you able to obtain from Mr. Behrens' verbal and nonverbal communication? • What communication techniques can you use to establish rapport with Mr. Behrens and gain his confidence? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions

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		again as they study the chapter. <ul style="list-style-type: none">• The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 6

Lifting and Moving Patients

180–200 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about how to lift and move patients using good body mechanics and equipment designed to assist in patient movement.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <p>What are the concerns for your safety and the patient's as you plan how you will get him from his home, to the ambulance, and to the dialysis center?</p>
5	<p>II. Body Mechanics for Safe Lifting—Four Basic Principles</p> <p>A. Body mechanics describe the safest and most efficient methods of using the body to gain mechanical advantage.</p> <p>B. There are four basic principles of body mechanics.</p> <ol style="list-style-type: none"> 1. Keep the weight of the object close to the body. 2. Use the leg, hip, and gluteal muscles along with contracted abdominal muscles to move heavy objects. 3. Move the shoulders, hips, and feet as a stacked unit. 4. Reduce the distance through which the object must be moved. <p>C. Correct alignment of the spine is an important key to avoiding injury.</p> <ol style="list-style-type: none"> 1. Maintain a normal inward curve in the lower back. 2. Keep wrists and knees in normal alignment. 	<p>Teaching Tip</p> <p>Use a ball or book to demonstrate the four principles of good body mechanics.</p> <p>Discussion Question</p> <p>What are the four principles of good body mechanics?</p>
7	<p>III. Body Mechanics for Safe Lifting—Posture and Fitness</p> <p>A. An important aspect of body mechanics is proper posture.</p> <p>B. Poor posture can fatigue back and abdominal muscles.</p> <ol style="list-style-type: none"> 1. Lordosis, or swayback, causes excessive stress on the lumbar region. 2. Kyphosis, or slouch, results in fatigue of the lower back. <p>C. Proper standing posture involves ears, shoulders, and hips in vertical alignment with knees slightly bent and pelvis tucked forward.</p>	<p>Critical Thinking Discussion</p> <p>How can you apply the principles of good body mechanics in everyday life?</p> <p>Teaching Tip</p> <p>Demonstrate proper posture.</p>

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	<ul style="list-style-type: none"> D. Proper sitting posture involves evenly-distributed weight, vertical alignment of ears, shoulders, and hips, and feet flat on the floor. E. A well-balanced fitness program is necessary for proper body mechanics. 	
8	<p>IV. Body Mechanics for Safe Lifting—Communication and Teamwork</p> <ul style="list-style-type: none"> A. Teamwork and effective communication are essential in an emergency. B. All team members should be trained in proper techniques. C. Problems can occur when partners are mismatched. <ul style="list-style-type: none"> 1. The weaker partner can be overloaded. 2. The stronger partner can be injured if the weaker partner fails to lift. D. Partners need to communicate throughout the lifting process. <ul style="list-style-type: none"> 1. Use commands that are easy to understand. 2. Verbally coordinate each lift. E. Good teamwork is required for safe lifting. <ul style="list-style-type: none"> 1. Size up the scene accurately. 2. Consider the weight of the patient. 3. Recognize the need for additional help. 4. Be aware of physical abilities of each team member. 5. Select appropriate equipment. F. Communication with patient is important. 	<p>Discussion Question What are some of the principles of teamwork and communication in moving and lifting patients?</p> <p>Class Activity Have students stand up and use a book to demonstrate proper body mechanics in lifting.</p> <p>Critical Thinking Discussion What would you do if you injured your back and were unable to work in EMS or any other occupation that required lifting?</p>
5	<p>V. General Guidelines for Lifting and Moving—The Power Lift</p> <ul style="list-style-type: none"> A. The power lift is a technique that offers defense against injury and keeps the patient safe. <ul style="list-style-type: none"> 1. Feet about shoulder-width apart 2. Feet turned slightly outward 3. Knees bent 4. Back and abdomen muscles tightened 5. Object straddled 6. Hands about ten inches apart 7. Power grip used B. Steps of the power lift are reversed to lower an object. 	<p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on lifting and moving patients.</p>

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4	<p>VI. General Guidelines for Lifting and Moving—The Squat Lift</p> <p>A. The squat lift is a technique that is useful with a weak leg or ankle.</p> <ol style="list-style-type: none"> 1. Weaker leg slightly forward 2. Squat position 3. Stronger leg pushes <p>B. All lifts should be accomplished with leg muscles.</p> <p>C. Weight should be kept close to the body.</p>	<p>Teaching Tip Use one or more assistant instructors to demonstrate the power lift and squat lift.</p> <p>Discussion Question How do the power lift and squat lift reduce the possibility of injury?</p> <p>Knowledge Application Ask students to give examples of how they can use the power lift or squat lift to replace techniques they use to lift things in everyday life?</p>
4	<p>VII. General Guidelines for Lifting and Moving—One-Handed Equipment Carrying Technique</p> <p>A. A technique for carrying objects with one hand</p> <p>B. Back remains in a locked position.</p> <p>C. Avoid leaning to the opposite side.</p> <p>D. Steps</p> <ol style="list-style-type: none"> 1. Stagger your feet. 2. Point one knee up and one toward the ground. 3. Bend at the hips. 4. Drive upward through the arch and heel of the front foot. 5. Drive up through the ball of the back foot. 	<p>Teaching Tip Demonstrate the one-handed equipment carrying technique.</p>
4	<p>VIII. General Guidelines for Lifting and Moving—Reaching</p> <p>A. Avoid reaching when possible.</p> <ol style="list-style-type: none"> 1. Reposition an object or get closer. 2. Avoid prolonged strenuous effort (more than one minute). <p>B. When reaching cannot be avoided, reach no more than 15–20 inches.</p> <ol style="list-style-type: none"> 1. Keep the back in locked position. 2. Avoid twisting. 3. Use free arm to support upper body when possible. 4. Avoid hyperextending when reaching overhead. 5. Lean from the hips and keep back straight to perform a log roll. 	<p>Discussion Question How can you reduce muscle fatigue when lifting and moving patients and equipment?</p> <p>Class Activity Divide the class into small groups. Have each group demonstrate and explain to the rest of the class one of the techniques discussed in this section: power lift, squat lift, one-handed equipment carrying technique, and safe reaching.</p>

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4	<p>IX. General Guidelines for Lifting and Moving—Pushing and Pulling</p> <ul style="list-style-type: none"> A. Push instead of pull an object whenever possible. B. What to do when an object must be pulled <ul style="list-style-type: none"> 1. Keep the load between shoulders and hips. 2. Keep the load close to the body. 3. Keep back straight. 4. Keep knees slightly bent. C. What to do when an object is pushed <ul style="list-style-type: none"> 1. Push from the areas between the waist and shoulders. 2. Use a kneeling position to avoid bending. 3. Keep elbows bent, with arms close to the sides. D. Avoid pushing or pulling overhead objects. 	
20	<p>X. Lifting and Moving Patients—Emergency Moves</p> <ul style="list-style-type: none"> A. An emergency move should be performed when there is immediate danger to the patient or rescuer. B. Take precautions not to become an additional victim of the emergency. C. Situations that may require emergency moves <ul style="list-style-type: none"> 1. Fire or danger of fire 2. Exposure to explosives or other hazardous materials 3. Inability to protect the patient from other hazards at the scene 4. Inability to gain access to other patients who need lifesaving care 5. Inability to provide lifesaving care because of location or position. D. Make every effort to provide protection to the spine. E. Always pull the patient in the direction of the long axis of the body. F. Three types of emergency moves <ul style="list-style-type: none"> 1. Armpit-forearm drag 2. Shirt drag 3. Blanket drag 	<p>Teaching Tip Use assistant instructors to demonstrate emergency moves on a mannequin (armpit-forearm drag, shirt drag, and blanket drag).</p> <p>Discussion Question What are examples of situations in which you should use an emergency move?</p>
20	<p>XI. Lifting and Moving Patients—Urgent Moves</p> <ul style="list-style-type: none"> A. An urgent move is performed when the patient is suffering an immediate threat to life. B. Rapid extrication move indications <ul style="list-style-type: none"> 1. Altered mental status 2. Inadequate respiratory rate or tidal volume 	<p>Discussion Question When would you use an urgent move?</p>

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	<ul style="list-style-type: none"> 3. Indications of shock 4. Injuries to the head, neck, chest, abdomen, or pelvis 5. Fracture of both femurs 6. Major bleeding C. Rapid extrication procedure from a motor vehicle <ul style="list-style-type: none"> 1. The patient's head is brought into a neutral in-line position. 2. A cervical-spine immobilization collar is applied. 3. The patient's thorax is supported as the legs are freed. 4. The patient is rotated in short, coordinated moves. 5. The end of a long backboard is placed next to the patient's buttocks. 6. The patient is slid onto the board while in-line stabilization of the head and neck is maintained. D. The most critical factor of rapid extrication is speed, without compromising the patient's spine. E. The rescuer's weight must be supported in the vehicle. 	
20	<p>XII. Lifting and Moving Patients—Nonurgent Moves</p> <ul style="list-style-type: none"> A. A nonurgent move is one in which no immediate threat to life exists. B. Walk a patient while supporting him. C. Reasons not to “walk” a patient <ul style="list-style-type: none"> 1. Lightheaded 2. Sweaty upon standing 3. Chest pain 4. Respiratory problems 5. Injured lower extremity 6. Suspected spine injury D. Points to remember when moving, lifting, or carrying a patient <ul style="list-style-type: none"> 1. Keep the patient's head and neck in a neutral position. 2. Take all necessary spine precautions. 3. Make sure all rescuers understand what is to be done. 4. Make one rescuer responsible for giving commands. E. Methods for moving patients <ul style="list-style-type: none"> 1. Direct ground lift 2. Extremity lift 3. Direct carry method 4. Draw sheet method 	<p>Teaching Tip Use assistant instructors to demonstrate nonurgent moves (direct ground lift, extremity lift, direct carry method, and draw sheet method).</p> <p>Discussion Question When would you use nonurgent moves?</p> <p>Class Activity Divide students into small groups and assign each group one of the lifting or moving techniques discussed in this section. Each group will demonstrate and explain the assigned technique to the rest of the class.</p> <p>Knowledge Application Describe several EMS scenarios. Have students determine whether the situation requires an emergency, urgent, or</p>

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Minutes	Content Outline	Master Teaching Notes
		nonurgent move.
30	<p>XIII. Packaging for Transportation—Equipment</p> <p>A. Packaging means readying a patient for transport.</p> <p>B. General considerations</p> <ol style="list-style-type: none"> 1. Make sure the carrying device is locked in open position. 2. Use an appropriate lifting, moving, or carrying technique. 3. Place a sheet or blanket on the carrying device. 4. Cover the patient with sheets or blankets. 5. Secure the patient with straps. 6. Tuck straps and ties in position. 7. Be sure patient and carrying device are secured properly in the ambulance. <p>C. Choose the appropriate equipment.</p> <ol style="list-style-type: none"> 1. Wheeled stretcher <ol style="list-style-type: none"> a. Accommodates weights up to 400 pounds b. Serves to secure and carry equipment with patient c. Rolls on smooth surfaces d. Can move on rough ground with four rescuers e. Types include lift-in cot and roll-in cot. 2. Bariatric stretchers and devices <ol style="list-style-type: none"> a. Accommodates patients up to 1,600 pounds b. Have larger wheels, wider cots, and more heavily constructed frames 3. Portable stretcher <ol style="list-style-type: none"> a. Generally lightweight and can be folded b. Convenient for removing patients from confined spaces c. Can be easily loaded into and off-loaded from an ambulance 4. Stair chair <ol style="list-style-type: none"> a. Useful for narrow corridors, small elevators, and stairways b. Not to be used for patients with altered mental status, suspected spine injury, or injuries to lower extremities c. Basic procedure <ol style="list-style-type: none"> i. One rescuer stands behind the chair, one at the foot, and a third spotting behind the first. ii. Rescuer at the head tilts back the chair as the rescuer at the foot grasps the chair by its legs. iii. Both rescuers lift and carry simultaneously. 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Demonstrate loading and unloading a wheeled stretcher into the ambulance. • Demonstrate the use of a stair chair, long backboard, and other devices used in your EMS system. <p>Knowledge Application</p> <p>Give several descriptions of patient conditions and locations. Ask students to select the device most suited for packaging the patient.</p> <p>Critical Thinking Discussion</p> <p>How would you explain to a patient what you are going to do, and what you would like him to do, when carrying him up or down stairs?</p> <p>Class Activity</p> <p>Supervise small groups of students as they practice using the devices you have demonstrated in class.</p>

Chapter 6 objectives can be found in an accompanying folder.
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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> iv. Spotter counts out steps and identifies any obstacles. d. Tracked stair chair <ul style="list-style-type: none"> i. Track comes into contact with steps. ii. Allows the chair to glide with minimal effort by the EMT 5. Backboard <ul style="list-style-type: none"> a. Standard operating equipment b. Acts as a spine immobilizer c. Long and short versions <ul style="list-style-type: none"> i. Farrington is rectangular with rounded corners. ii. Ohio has mitered corners and tapering sides. iii. Ferno Kendrick Extraction Device (KED) is a vest-type immobilizer. iv. Full body vacuum mattress conforms to the shape necessary for the patient. 6. Scoop stretcher <ul style="list-style-type: none"> a. Designed for patients up to 300 pounds b. Assembled and disassembled around the patient c. Useful in confined areas d. Not recommended for patients with spine injuries 7. Basket stretcher <ul style="list-style-type: none"> a. One style has a welded metal frame fitted with a contoured chicken-wire web. b. One style has a tubular aluminum frame riveted to a polyethylene shell. c. EMT is able to move a patient who is already immobilized on a backboard over any kind of terrain. 8. Flexible stretcher <ul style="list-style-type: none"> a. Made of canvas or synthetic materials b. Has six large handles c. Useful for narrow hallways 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • When would you use a portable, flexible, or scoop stretcher instead of a wheeled stretcher? • Other than carrying patients up and down stairs, when might a stair chair be useful?
15	<p>XIV. Packaging for Transportation—Patient Positioning</p> <ul style="list-style-type: none"> A. An unresponsive patient with no suspected head, neck, or spine injury should be placed in a left lateral recumbent position to face the rescuer once in the ambulance. B. A patient with chest pain or discomfort or with breathing difficulties should be 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How would you position a patient who is nauseated? • How would you position a patient in her third trimester of pregnancy?

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Minutes	Content Outline	Master Teaching Notes
	<p>placed in a position of comfort.</p> <p>C. A patient with suspected spinal injury should be immobilized on a long backboard.</p> <p>D. A patient in shock should be placed in a supine position.</p> <p>E. An alert patient who is nauseated or vomiting should be transported in a sitting or recovery position.</p> <p>F. A pregnant patient in her third trimester should be positioned on her left side.</p>	<p>Teaching Tip Allowing students to be packaged helps to develop empathy for the patients they will be caring for.</p> <p>Critical Thinking Discussion Why is a patient carried head first up stairs and feet first down stairs?</p>

15	<p>XV. Packaging for Transportation—Packaging Patients for Air Transport</p> <p>A. There are special considerations in packaging patients for air transport.</p> <ol style="list-style-type: none"> 1. Be sure patient has been decontaminated from hazardous materials if necessary. 2. Have the patient's airway managed prior to arrival of aircraft. 3. Leave the chest accessible if the patient is intubated. 4. Make sure the backboard can be accommodated in the helicopter. 5. Make sure the patient is well secured to the backboard. 6. Secure all equipment on the patient and at the scene. 7. Communicate to the patient what you are doing. 8. Cover the patient to protect him from the noise and rotor wash. 9. Consider having an engine company wet the landing zone. 10. Have rescuers remove loose articles. 11. Approach the aircraft properly when instructed by the pilot or crew. 12. Lay an IV bag on the patient's chest instead of holding it up. <p>B. Follow local protocols for use of air ambulance service.</p>	<p>Teaching Tip Hand out copies of any local protocols for packaging patients for air medical transportation.</p> <p>Discussion Question What are some special considerations when packaging patients for air medical transportation?</p>
5	<p>XVI. General Guidelines for Carrying a Patient Using a Backboard, Portable Stretcher, or Flexible Stretcher—Two-Person Carry</p> <p>A. Position one EMT at the head of the patient and the other at the foot, with the stronger person at the head.</p> <p>B. The EMTs face each other, requiring the EMT at the foot to walk backward.</p> <p>C. If available, place a third EMT as a spotter to identify hazards or obstacles.</p>	<p>Teaching Tip Allow students ample opportunity to practice these skills.</p>
	<p>XVII. General Guidelines for Carrying a Patient Using a Backboard,</p>	<p>Knowledge Application</p>

5	<p>Portable Stretcher, or Flexible Stretcher—Four-Person Carry</p> <p>A. Position one rescuer at the patient’s head, facing forward.</p> <p>B. Position a second rescuer at the foot, facing forward with his hands behind his body</p> <p>C. Position two additional rescuers on each side, facing forward.</p>	<p>Given several scenarios of patient locations and conditions, students should be able to select the proper device for moving the patient.</p>
5	<p>XVIII. General Guidelines for Carrying a Patient Using a Backboard, Portable Stretcher, or Flexible Stretcher—Carrying a Supine Patient on Stairs</p> <p>A. Determine if patient must be placed in a supine position.</p> <ol style="list-style-type: none"> 1. Be sure the patient is secured to the device. 2. Be sure to secure the patient’s hands within the device. <p>B. Place one EMT at the head of the device facing the patient and the other at the foot facing the patient.</p> <p>C. Use a spotter when available to identify obstacles and call out directions.</p>	<p>Discussion Question</p> <p>Why is a spotter used when carrying a patient up or down stairs?</p>
5	<p>XIX. General Guidelines for Carrying a Patient Using a Backboard, Portable Stretcher, or Flexible Stretcher—Neonatal Isolette</p> <p>A. An isolette is designed to prevent hypothermia.</p> <p>B. Ensure that the isolette can be secured in the ambulance.</p>	<p>Discussion Question</p> <p>Why are neonates transported in a neonatal isolette?</p>
10	<p>XI. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 6 Summary. 2. Complete Chapter 6 In Review questions. 3. Complete Chapter 6 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 6 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What principles of lifting and moving patients were demonstrated by the EMTs? • What can you infer from this case study about patients’ concerns when being moved and readied for transport? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package

		contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com .
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Detailed Lesson Plan

Chapter 7

Anatomy and Physiology, and Medical Terminology

360–420 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will read a brief overview of the human body.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What body systems might be affected by the woman's injuries? • How will a thorough understanding of these systems help you assess and care for the patient?
60	<p>II. Anatomical Terms</p> <p>A. Anatomy refers to the structure of the body and the relationship of its parts to each other.</p> <p>B. Physiology refers to the function of the living body and its parts.</p> <p>C. Anatomical position</p> <ol style="list-style-type: none"> 1. Supine—Patient is lying face up on his back. 2. Prone—Patient is lying face down on his stomach. 3. Lateral recumbent position—Patient is lying on his left or right side. 4. Fowler position—Patient is lying on his back with his upper body elevated at 45° to 60° angle. 5. Semi-Fowler position—Patient is lying on his back with his upper body elevated at an angle less than 45°. 6. Trendelenburg position—Patient is lying on his back with the legs elevated higher than the head and body on an inclined plane. 7. Shock position—Patient is lying on his back with the feet and legs elevated approximately 12 inches. <p>D. Anatomical planes and descriptions</p> <ol style="list-style-type: none"> 1. Sagittal plane 2. Frontal or coronal plane 3. Transverse or horizontal plane 4. Midline 5. Midaxillary line 6. Transverse line 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Position a lightweight mannequin in supine, prone, and lateral recumbent positions and ask students to identify each position. • Ask students to use the terms <i>proximal</i>, <i>distal</i>, <i>medial</i>, and <i>lateral</i> to describe the relationship of various body parts to each other, such as the ankle, knee, wrist, elbow, and shoulder. • Use a mannequin or skeleton to demonstrate planes and lines. <p>Class Activity</p> <p>Divide students into pairs. Give each pair a length of masking or adhesive tape that the students will tear into smaller pieces during the exercise. During the exercise, two pairs of students at a time will come to the front of the class. The first pair will turn their backs so they cannot see the second pair. One of the second pair will place a piece of</p>

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	7. Anterior and posterior 8. Superior and inferior 9. Dorsal and ventral 10. Medial and lateral 11. Proximal and distal 12. Right and left 13. Midclavicular and midaxillary 14. Plantar and palmer	<p>tape somewhere on his partner. The class will describe to the first pair, using anatomical and directional terms, the location of the tape. For example, "Two inches inferior to the right elbow, on the posterior aspect." Without looking, one of the first pair will try to place a piece of tape in the location described by the class. This will assist students in accurately using these terms when communicating with other health care providers.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • How are the terms <i>anterior</i> and <i>posterior</i> related to the terms <i>ventral</i> and <i>dorsal</i>? • How would you describe a transverse (horizontal) plane? • What are Fowler's and semi-Fowler's positions? <p>Knowledge Application</p> <ul style="list-style-type: none"> • Point to several locations on your body. Have students describe the locations using anatomical terms. • Upon hearing "plain English" descriptions of patient positions, students will substitute the anatomically correct term. <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are the pros and cons of using anatomical terms of position and direction? • Why is it important for EMTs to understand this terminology? <p>Weblinks</p>

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		Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i> , 9 th edition to access web resources on anatomy and physiology.
40	<p>III. Body Systems—The Musculoskeletal System</p> <p>A. The musculoskeletal system consists of the bony framework held together by ligaments, muscles, tendons, and other connective tissues.</p> <p>B. The skeletal system</p> <ol style="list-style-type: none"> 1. Functions <ol style="list-style-type: none"> a. Gives body shape b. Protects vital organs c. Allows for movement d. Stores minerals and produces blood cells 2. Components <ol style="list-style-type: none"> a. Skull houses and protects the brain. <ol style="list-style-type: none"> i. Cranium forms top, back, and sides of the skull plus the forehead. ii. Face is the area between the brow and chin, which includes the orbits, maxillae, zygomatic bones, and mandible. b. Spinal column, or vertebral column, is the principal support system of the body, which is made up of vertebrae separated by intervertebral disks. <ol style="list-style-type: none"> i. Cervical spine—First seven vertebrae (neck) ii. Thoracic spine—Twelve thoracic vertebra inferior to the cervical spine (upper back) iii. Lumbar spine—Five vertebrae inferior to thoracic spine that form the lower back (lower back) iv. Sacral spine—Five vertebrae inferior to lumbar spine that are fused together (back wall of pelvis) v. Coccyx—Last four vertebrae that are fused together (tailbone) c. Thorax, or chest, is composed of the sternum and thoracic spine. <ol style="list-style-type: none"> i. Sternum is a flat, narrow bone in the middle of the anterior chest. ii. Clavicle is attached to the superior portion of the sternum, known as the manubrium. iii. The ribs are attached to the body of the sternum. 	<p>Class Activity Play a game of “Mother May I” using the motions allowed by joints (flexion, extension, abduction, and so on).</p> <p>Teaching Tip Have students come up and point out the bones of different parts of the skeleton on a model skeleton.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the functions of the musculoskeletal system? • What are examples of each of the three different types of muscle in the body? <p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation labeling the bones of the skeletal system.</p>

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	<ul style="list-style-type: none"> iv. The inferior portion of the sternum is the xiphoid process. d. Pelvis is a structure consisting of several bones, including the sacrum and the coccyx. <ul style="list-style-type: none"> i. Iliac crest is a wing-like structure on either side of the pelvis. ii. Pubis is the anterior and inferior portion of the pelvis. iii. Ischium is the posterior and inferior portion of the pelvis. e. Lower extremities are the legs from the hip to the toes. f. Upper extremities are the shoulders, arms, forearms, wrists, and hands. g. Joints are places where bones connect to one another. <ul style="list-style-type: none"> i. Types of motion <ul style="list-style-type: none"> • Flexion • Extension • Abduction • Adduction • Circumduction • Pronation • Supination ii. Types of joints <ul style="list-style-type: none"> • Ball-and socket joint • Hinged joint • Pivot joint • Gliding joint • Saddle joint • Condylloid joint C. Bone injury <ul style="list-style-type: none"> 1. Fracture breaks continuity in structure. 2. May injure surrounding tissue 3. May result in blood loss D. Muscular system <ul style="list-style-type: none"> 1. Skeletal muscle, or voluntary muscle, is responsible for all deliberate movement. 2. Smooth muscle, or involuntary muscle, is made up of large fibers that carry out the automatic muscular functions of the body. 3. Cardiac muscle is a special type of involuntary muscle found only in the heart. 	

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Minutes	Content Outline	Master Teaching Notes
40	<p>IV. Body Systems—The Respiratory System</p> <p>A. Functions</p> <ol style="list-style-type: none"> 1. Respiration, which is the process of moving oxygen and carbon dioxide across membranes 2. Ventilation, which is the mechanical process by which air is move in and out of the lungs 3. Oxygenation, which is the process through which oxygen molecules move across a membrane from an area of high concentration to an area of low concentration, and the removal of carbon dioxide 4. Maintenance of a normal acid-base balance <p>B. Components</p> <ol style="list-style-type: none"> 1. Nose and mouth 2. Pharynx 3. Trachea and larynx 4. Epiglottis 5. Bronchi 6. Lungs 7. Diaphragm <p>C. Anatomy in infants and children</p> <ol style="list-style-type: none"> 1. Extra attention is required because mouth and nose are smaller than those of adults and can be more easily obstructed. 2. The tongue can block the pharynx more easily. 3. The trachea is narrower and can be more easily obstructed. 4. Hyperextension can occlude the trachea. 5. The cricoids cartilage is less developed and much less rigid. 6. Excessive movement of the diaphragm is a sign of respiratory distress. <p>D. Mechanics of ventilation</p> <ol style="list-style-type: none"> 1. Inhalation occurs when the intercostals muscles contract and the diaphragm moves downward, creating negative pressure in the chest. 2. Exhalation occurs when the intercostals muscles relax and the diaphragm moves upward, creating a positive pressure in the chest. 3. Diaphragm receives its stimulation from the phrenic nerve that exits the spinal cord at the cervical spine. <p>E. Physiology of respiration</p> <ol style="list-style-type: none"> 1. At the alveoli, oxygen enters the bloodstream while carbon dioxide and other wastes leave the bloodstream. 2. At the capillaries, oxygen moves from the blood into the cells while carbon dioxide moves from the cells into the blood. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How are respiration, ventilation, and oxygenation different from each other? • What is the path of a molecule of oxygen as it moves from the atmosphere to the level of the cell? • What are some differences between the respiratory systems of infants and children and those of adults? <p>Critical Thinking Discussion Why might a patient with a respiratory problem feel weak?</p> <p>Discussion Question What are the muscles used in breathing?</p> <p>Teaching Tip Demonstrate increased resistance to airflow by having students breathe through coffee stirrers or drinking straws to simulate reduced diameter of airways.</p>

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	<p>F. Adequate and inadequate breathing</p> <ol style="list-style-type: none"> 1. Characteristics of adequate breathing <ol style="list-style-type: none"> a. Adequate respiratory rate, which is the number of breaths a patient takes in one minute b. Adequate tidal volume, which is the amount of air the patient breathes in and out with one regular breath 2. Characteristics of inadequate breathing <ol style="list-style-type: none"> a. Rates that are too slow or too fast as compared with what is normal for the patient b. Irregular pattern of breathing c. Diminished or absent breath sounds d. Unequal chest expansion e. Pale or bluish mucous membranes or skin f. Use of accessory muscles g. Nasal flaring h. “Seesaw” breathing i. Heading bobbing j. Agonal respirations k. Grunting 	<p>Discussion Question What are signs that breathing is inadequate?</p>
<p style="text-align: center;">10</p>	<p>V. Body Systems—The Circulatory System</p> <ol style="list-style-type: none"> A. Functions <ol style="list-style-type: none"> 1. Provides a medium for perfusion of cells with oxygen and other nutrients and removes carbon dioxide and other wastes 2. Transports blood to cells and alveoli for gas exchange 3. Serves as a reservoir to house blood 4. Serves as a medium for buffering the body’s acid-base balance 5. Provides a mechanism to deliver immune cells and other substances to fight infection 6. Contains substances that promote clotting B. Basic anatomy <ol style="list-style-type: none"> 1. Heart pumps blood throughout the body. <ol style="list-style-type: none"> a. Pericardium is a double-walled sac that encloses the heart, gives support, and prevents friction. b. Atria are the upper chambers of the heart, which receive blood from the veins. c. Ventricles are the lower chambers of the heart, which pump blood to the arteries. 	<p>Teaching Tip Write “right atrium” on the white board. Have students come up one at a time to write in the next structure through which a drop of blood would pass to complete the circuit.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • Where is each of the heart valves located? • What is the relationship between hydrostatic pressure and edema?

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	<ul style="list-style-type: none"> d. Valves keep blood flowing in one direction. <ul style="list-style-type: none"> i. Tricuspid valve ii. Pulmonary valve iii. Mitral valve, or bicuspid valve iv. Aortic valve 2. Arteries carry blood away from the heart. <ul style="list-style-type: none"> a. Aorta is the major artery of the heart, which supplies blood to all other arteries. b. Coronary arteries supply the heart with blood. c. Carotid arteries supply the brain and head with blood. d. Femoral arteries supply the groin and legs with blood. e. Dorsalis pedis arteries extend into the feet. f. Posterior tibial arteries travel from the calf to the feet. g. Brachial arteries are the major arteries of the upper arm. h. Radial arteries are the major arteries of the arm distal to the elbow joint. i. Pulmonary arteries carry oxygen-depleted blood to the lungs. 3. Arterioles are the smallest kinds of arteries, which carry blood from the arteries to the capillaries. 4. Capillaries are tiny blood vessels that connect arterioles to venules and act as sites for the exchange of materials between the blood and the cells. 5. Venules are the smallest branches of veins. 6. Veins carry blood back to the heart. <ul style="list-style-type: none"> a. Vena cavae carry oxygen-depleted blood back to the right atrium. b. Pulmonary veins carry oxygen-rich blood from the lungs to the left atrium. C. Composition of the blood <ul style="list-style-type: none"> 1. Red blood cells carry oxygen to the body cells and carry carbon dioxide away from the cells. 2. White blood cells help defend the body against infection. 3. Platelets, along with other clotting factors, are necessary to stop bleeding. 4. Plasma is the liquid part of the blood, which carries blood cells and transports nutrients. D. Physiology of circulation <ul style="list-style-type: none"> 1. Pulse is a wave of blood propelled thorough the arteries. 2. Blood pressure is the force exerted by the blood on the interior walls of 	<p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation identifying the structures of the heart and the purpose of the cardiovascular system.</p> <p>Teaching Tip Have students locate their carotid, dorsalis pedis, posterior tibial, brachial, and radial pulses.</p>

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	<p>the arteries.</p> <ol style="list-style-type: none"> a. Systolic blood pressure is exerted against the walls of the arteries when the left ventricle contracts. b. Diastolic blood pressure is exerted against the walls of the arteries when the left ventricle is at rest. c. Hydrostatic pressure is the force exerted on the inside of the vessel walls as a result of blood pressure and volume. d. Perfusion is the delivery of oxygen, glucose, and other nutrients to the cells, and the elimination of carbon dioxide and other waste products. e. Hypoperfusion is the insufficient supply of oxygen and other nutrients to some of the body's cells and the inadequate elimination of carbon dioxide and other waste products. <p>E. Transport of gases in the blood</p> <ol style="list-style-type: none"> 1. Oxygen is attached to hemoglobin and dissolved in plasma. 2. Carbon dioxide is transported in the blood as bicarbonate, attached to hemoglobin, and dissolved in plasma. <p>F. Cell metabolism</p> <ol style="list-style-type: none"> 1. Aerobic metabolism is the release of energy from glucose in the presence of oxygen. 2. Anaerobic is the release of a small amount of energy from glucose in the absence of oxygen. 	<p>Discussion Question What is perfusion?</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some things that could lead to hypoperfusion? • What would happen in the body if the heart rate became very slow? • What would happen if the smooth muscle in the blood vessels relaxed and the blood vessels throughout the body dilated? <p>Discussion Question How are carbon dioxide and oxygen carried in the blood?</p>
25	<p>VI. Body Systems—The Nervous System</p> <p>A. Functions</p> <ol style="list-style-type: none"> 1. Controls and maintains a conscious and aware state 2. Transmits sensory stimuli to the brain 3. Controls motor function and transmits motor impulses to muscles 4. Controls body functions through the autonomic nervous system <p>B. Structural divisions of the nervous system</p> <ol style="list-style-type: none"> 1. Central nervous system <ol style="list-style-type: none"> a. Brain is the control center of the nervous system. <ol style="list-style-type: none"> i. Cerebrum controls specific body functions and initiates and manages motions under conscious control. ii. Cerebellum coordinates muscles activity and maintains balance through impulses from the eyes and ears. iii. Brain stem contains the mesencephalon, the pons, and the medulla oblongata and controls respiration, heart activity, and 	

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Minutes	Content Outline	Master Teaching Notes
	<p style="padding-left: 40px;">blood vessels.</p> <p style="padding-left: 20px;">iv. Pons acts as a bridge to connect the other three parts of the brain.</p> <p style="padding-left: 20px;">b. Spinal cord is an extension of the brain stem, which conducts nerve impulses.</p> <p>2. Peripheral nervous system</p> <p style="padding-left: 20px;">a. Afferent nerves carry sensory information from the body to the spinal cord and brain.</p> <p style="padding-left: 20px;">b. Efferent nerves carry motor information from the brain and spinal cord to the body.</p> <p>C. Functional divisions of the nervous system</p> <p style="padding-left: 20px;">1. Voluntary nervous system influences the activity of skeletal muscles and movement.</p> <p style="padding-left: 20px;">2. Autonomic nervous system influences the activities of smooth muscles and glands.</p> <p style="padding-left: 40px;">a. Sympathetic nervous system</p> <p style="padding-left: 40px;">b. Parasympathetic nervous system</p> <p>D. Consciousness and unconsciousness</p> <p style="padding-left: 20px;">1. Cerebral hemispheres are the large right and left sides of the cerebrum.</p> <p style="padding-left: 20px;">2. Reticular activating system is a group of nerves that determine whether a patient remains aware of his surroundings.</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are examples of voluntary and involuntary functions of the nervous system? • What is the reticular activating system?
25	<p>VII. Body Systems—The Endocrine System</p> <p>A. Produces hormones that regulate the activities of certain organs</p> <p>B. Hormones are secreted by endocrine glands.</p> <ol style="list-style-type: none"> 1. Thyroid gland 2. Parathyroid gland 3. Adrenal gland 4. Gonads 5. Islets of Langerhans 6. Pituitary gland <p>C. Epinephrine and norepinephrine are the two primary hormones secreted by the sympathetic nervous system.</p> <ol style="list-style-type: none"> 1. Alpha₁ effects cause the vessels to constrict. 2. Alpha₂ effects are thought to regulate the release of alpha₁. 3. Beta₁ effects relate to heart rate, cardiac contraction, and the heart's electrical conduction system. 4. Beta₂ effects cause smooth muscle to dilate. 	<p>Discussion Question</p> <p>What are some examples of endocrine glands?</p> <p>Critical Thinking Discussion</p> <p>What is the relationship among the nervous, circulatory, and respiratory systems? How does the endocrine system interact with these systems?</p> <p>Animation</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation identifying the structure and function of the endocrine system.</p>

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 These objectives, which form the basis of each chapter, were developed from the new Education Standards and Instructional Guidelines.

Minutes	Content Outline	Master Teaching Notes
		<p>Discussion Question What are epinephrine's alpha₁, alpha₂, beta₁, and beta₂ effects?</p>
20	<p>VIII. Body Systems—The Integumentary System (Skin)</p> <p>A. Functions</p> <ol style="list-style-type: none"> 1. Protects the body from the environment 2. Regulates body temperature 3. Serves as a receptor for heat, cold, touch, pain, and pressure 4. Aids in the regulation of water and electrolytes <p>B. Layers</p> <ol style="list-style-type: none"> 1. Epidermis is the outermost layer of the skin. 2. Dermis is the second layer of the skin. 3. Subcutaneous layer is a layer of fatty tissue below the dermis. <p>C. Accessory structures</p> <ol style="list-style-type: none"> 1. Nails 2. Hair 3. Sweat glands 4. Oil glands 	<p>Critical Thinking Discussion How does loss of skin affect patients who are burned?</p>
20	<p>IX. Body Systems—The Digestive System</p> <p>A. Basic Anatomy</p> <ol style="list-style-type: none"> 1. Alimentary tract 2. Accessory organs <p>B. Abdominal cavity</p> <ol style="list-style-type: none"> 1. Stomach is a large, hollow organ in which the majority of digestion takes place. 2. Pancreas secretes pancreatic juices that aid in the digestion of fats, starches, and proteins. 3. Liver produces bile; stores sugars; produces components necessary for immune function, blood clotting, and plasma production; and renders toxic substances produced by digestion harmless. 4. Spleen helps in the filtration of blood and serves as a reservoir of blood. 5. Gallbladder acts as a reservoir for bile, which aids in the digestion of fats. 	<p>Discussion Question What are the accessory organs of the digestive system?</p>

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	<ol style="list-style-type: none"> 6. Small intestine is the organ in which food is completely broken down into a form that can be used by the body. <ol style="list-style-type: none"> a. Duodenum b. Jejunum c. Ileum 7. Large intestine, also known as the colon, is the organ that absorbs water from wastes products that cannot be broken down by the small intestine and passes the remains to the rectum. <p>C. Digestive process</p> <ol style="list-style-type: none"> 1. Mechanical—Includes chewing, swallowing, peristalsis, and defecation 2. Chemical—Occurs when enzymes break down food in components that can be absorbed by the body 	
15	<p>X. Body Systems—The Urinary or Renal System</p> <p>A. Functions</p> <ol style="list-style-type: none"> 1. Filters and excretes wastes from the blood 2. Maintains balance of water and chemicals in the body 3. Helps maintain normal acid-base balance in the body <p>B. Components</p> <ol style="list-style-type: none"> 1. Kidneys filter waste from the bloodstream. 2. Ureters carry wastes from the kidneys to the bladder. 3. Urinary bladder stores urine prior to excretion. 4. Urethra carries urine from the bladder out of the body. 	<p>Teaching Tip Ask students to repeat the correct pronunciation of anatomical structures.</p>
15	<p>XI. Body Systems—The Reproductive System</p> <p>A. Consists of organs that can function to accomplish human reproduction</p> <p>B. Male</p> <ol style="list-style-type: none"> 1. Sperm 2. Testes 3. Prostate gland 4. Penis <p>C. Female</p> <ol style="list-style-type: none"> 1. Ovaries 2. Fallopian tubes 3. Uterus 4. Vagina 5. External genitals 	<p>Teaching Tip Ask students to explain back to you the physiology of each of the systems.</p>

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Minutes	Content Outline	Master Teaching Notes
60	<p>XII. Medical Terminology—Medical Words and Word Parts</p> <ul style="list-style-type: none"> A. Refers to specialized language used in all fields of medicine B. Every medical word contains a combining form, which is a root, a combining vowel, and a hyphen. C. Suffix is a word part added to the end of a combining form that modifies or gives specific meaning. D. Prefix is a word part that comes before a combining form or forms, often indicating direction, time, or orientation. 	<p>Class Activities</p> <ul style="list-style-type: none"> • Have groups of students select medical terms from the glossary in the text or from a medical dictionary and break them down for the class. • Have students divide into three groups. One group will be assigned the list of prefixes in the text, one will be assigned combining forms, and one will be assigned suffixes. The first group will call out a prefix, the second will add to it by calling out a combining form, and the third group will complete the term by calling out a suffix. Write each term on the board and discuss it. Be sure to indicate if the term is a legitimate medical term or just a fun term created by the exercise. <p>Teaching Tip Give examples of medical terms using the lists of prefixes, suffixes, and combining forms in the book.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the benefits of understanding medical terminology? • What are some medical terms you found interesting in your reading? <p>Knowledge Application Given a passage in the text, students should be able to determine the meaning of medical terms.</p> <p>Weblinks</p>

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Minutes	Content Outline	Master Teaching Notes
		Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i> , 9 th edition to access web resources on medical terminology.
10	<p>XI. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 7 Summary. 2. Complete Chapter 7 In Review questions. 3. Complete Chapter 7 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 7 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why is assessment of the face and mouth important in this patient? • What are some explanations for the patient's increased pulse and blood pressure? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 8

Pathophysiology

165–180 minutes

MASTER TEACHING NOTES

- Case Study Discussion
- Teaching Tips
- Discussion Questions
- Class Activities
- Media Links
- Knowledge Application
- Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about processes that occur in the human body.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • How does the patient's loss of blood place his life in jeopardy? • What actions can you take to address the patient's immediate threats to life?
25	<p>II. Cellular Metabolism—Aerobic Metabolism</p> <p>A. Cellular metabolism, or cellular respiration, is the process through which cells break down glucose to produce energy for the body.</p> <p>B. Aerobic respiration is cellular respiration in the presence of oxygen.</p> <p>C. Glycolysis is the process through which glucose is broken down into pyruvic acid molecules.</p> <ol style="list-style-type: none"> 1. Occurs in the cytosol 2. Releases only a small amount of energy (two moles of ATP) <p>D. The process continues in the mitochondria in the presence of oxygen to release a much large amount of energy (36 moles of ATP).</p> <p>E. By-products include heat, carbon dioxide, and water.</p>	<p>Discussion Question</p> <p>Why do all cells of the body need oxygen?</p> <p>Animation</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation describing cellular structures and respiration.</p>
20	<p>III. Cellular Metabolism—Anaerobic Metabolism</p> <p>A. Anaerobic metabolism is cellular respiration in the absence of oxygen.</p> <ol style="list-style-type: none"> 1. As in aerobic respiration, glucose is converted to pyruvic acid in the cytosol. 2. Without oxygen, the pyruvic acid is converted into lactic acid. 3. By-products are lactic acid and two moles of ATP. 4. High levels of acid inactivate enzyme function, disrupt cell membranes, and lead to cell death. <p>B. Sodium/potassium pump failure</p>	<p>Critical Thinking Discussion</p> <p>What are some reasons why cells might not receive the glucose they need for metabolism?</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the consequences of inadequate oxygenation of the body's

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Minutes	Content Outline	Master Teaching Notes
		tissues? <ul style="list-style-type: none"> • What causes cells to swell and burst if hypoxia continues?
15	<p>IV. Components Necessary for Adequate Perfusion—Composition of Ambient Air</p> <p>A. Perfusion is the delivery of oxygen, glucose, and other substances to the cells and the elimination of waste products from the cells.</p> <p>B. The concentration of oxygen in ambient air will determine the proportion of oxygen molecules that end up in the alveoli to be available for gas exchange with the blood.</p> <ol style="list-style-type: none"> 1. The concentration of oxygen the patient is breathing should be at least 21 percent. 2. If the concentration is lower, less oxygen will be available for cells to use for metabolism. <p>C. One way to improve cellular oxygenation is by increasing the concentration of oxygen in the air breathed in by the patient.</p> <ol style="list-style-type: none"> 1. FiO_2 is the fraction of inspired oxygen administered to a patient who is breathing on his own. 2. FDO_2 is a fraction of delivered oxygen delivered by a ventilation device to a patient who is not able to breathe on his own. <p>D. Toxic gases</p> <ol style="list-style-type: none"> 1. Some toxic gases displace the amount of oxygen in the air and suffocate the patient. 2. Some gases disrupt the ability of the blood to carry adequate amounts of oxygen to the cells. 3. Some toxic gases may interfere with the ability of the cells to use oxygen. 	<p>Critical Thinking Discussion What are some reasons why cells might not receive an adequate amount of oxygen?</p>

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Minutes	Content Outline	Master Teaching Notes
10	<p>V. Components Necessary for Adequate Perfusion—Patency of Airway</p> <p>A. A patent airway is one that is not obstructed.</p> <p>B. Nasopharynx</p> <ol style="list-style-type: none"> 1. Blood, vomitus, or other substances that occlude the nasopharynx may drain into the pharynx and lead to aspiration or occlusion. 2. The nasopharynx must be kept clear in case it needs to be used as an alternative location to establish an airway. <p>C. Oropharynx and pharynx</p> <ol style="list-style-type: none"> 1. Can become obstructed by the tongue, foreign bodies, tissue swelling, hematomas, vomitus, and other substances 2. Obstructions must be removed immediately because aspirated substances can damage lung tissue or fill the alveoli, thereby interfering with gas exchange. <p>D. Epiglottis</p> <ol style="list-style-type: none"> 1. The flap of cartilaginous tissue that covers the opening of the larynx 2. Can become inflamed and occlude the airway <p>E. Larynx</p> <ol style="list-style-type: none"> 1. The structure that contains the vocal cords 2. Obstructions will prevent airflow into the trachea and lungs, resulting in poor oxygen levels in the blood and cellular hypoxia. <ol style="list-style-type: none"> a. Can be obstructed by laryngeal spasm, where the vocal cords spasm and close together b. Fracture of the larynx may cause the laryngeal structures to be drawn inward. <p>F. Trachea and bronchi</p> <ol style="list-style-type: none"> 1. Trachea extends downward and bifurcates at the carina. 2. Trachea bifurcates into the left and right bronchi. 3. Obstructions of the trachea or bronchi reduce the concentration of oxygen in the alveoli, leading to cellular hypoxia. 	

VI. Components Necessary for Adequate Perfusion—Respiratory Compromise Associated with Mechanics of Ventilation

- A. Boyle's Law applied to ventilation
 1. An increase in pressure will decrease the volume of gas.
 2. A decrease in pressure will increase the volume of gas.
- B. Accessory Muscles
 1. Accessory muscles may be required to increase chest size or force air out of the lungs and chest.
 - a. Inhalation involves sternocleidomastoid muscles, scalene muscles, and pectoralis minor muscles.
 - b. Exhalation involves abdominal muscles and internal intercostal muscles.
- C. Compliance and airway resistance
 1. Compliance is a measure of the ability of the chest wall and lungs to stretch, distend, and expand.
 2. Airway resistance relates to the ease of airflow down the conduit of airway structures leading to the alveoli.
- D. Pleural space
 1. Any break in the pleura creates negative pressure, which draws air into the pleural space.
 2. Occluding any open wound to the chest must be done early in the primary assessment of a patient.
- E. Minute ventilation is the amount of air moved in and out of the lungs in one minute.
 1. Determined by multiplying the tidal volume by the frequency of ventilation in one minute
 2. Tidal volume is the volume of air breathed in with each individual breath.
 3. Frequency of ventilation is the number of ventilations in one minute.
 - a. A decrease in tidal volume or frequency of ventilation will decrease the minute ventilation.
 - b. A decrease in the minute ventilation will reduce the amount of air available for gas exchange in the alveoli and lead to cellular hypoxia.
- F. Alveolar ventilation
 1. Alveolar ventilation is the amount of air moved in and out of the alveoli in one minute.
 2. Dead air space (V_D) consists of anatomical areas in the respiratory tract where air collects during inhalation.

Discussion Questions

- How do patients compensate for a condition that decreases tidal volume?
- If a patient's tidal volume is 300 mL and his respiratory rate is 20, what is the alveolar ventilation? Is this adequate or not?

Critical Thinking Discussion

Will applying oxygen by nonrebreather mask improve tidal volume? Why or why not?

Teaching Tip

Give several examples of how changing the tidal volume and respiratory rate change the minute volume.

Knowledge Application

Given several scenarios including a patient's respiratory rate and tidal volume, determine if the patient's alveolar ventilation is likely to be adequate or inadequate.

Teaching Tip

Ask students to breathe normally through a drinking straw to demonstrate the effect of dead air space on alveolar ventilation.

<p>10</p>	<p>VII. Components Necessary for Adequate Perfusion—Regulation of Ventilation</p> <p>A. Chemoreceptors monitor pH, carbon dioxide, and oxygen levels in arterial blood.</p> <ol style="list-style-type: none"> 1. Central chemoreceptors are most sensitive to carbon dioxide and changes in the pH of the cerebrospinal fluid (CSF). 2. Peripheral chemoreceptors are most sensitive to the level of oxygen in the arterial blood. 3. Hypoxic drive is a condition in which hypoxia becomes the stimulus for ventilation in place of hypercarbia. <p>B. Lung receptors provide impulses to regulate respiration.</p> <ol style="list-style-type: none"> 1. Irritant receptors 2. Stretch receptors 3. J-receptors <p>C. Respiratory centers in the brain stem</p> <ol style="list-style-type: none"> 1. Dorsal respiratory group (DRG) 2. Ventral respiratory group (VRG) 3. Apneustic center 4. Pneumotaxic center 	<p>Discussion Question How can an injury to the brain interfere with perfusion?</p>
<p>10</p>	<p>VIII. Components Necessary for Adequate Perfusion—Ventilation/Perfusion Ratio</p> <p>A. The ventilation/perfusion (V/Q) ratio relates the amount of ventilation the alveoli receive to the amount of perfusion through the capillaries surrounding the alveoli.</p> <ol style="list-style-type: none"> 1. In the apexes of the lungs, the amount of available ventilation in the alveoli exceeds the amount of perfusion through the pulmonary capillaries. 2. In the bases of the lungs, the amount of perfusion exceeds the amount of ventilation. <p>B. Pressure imbalances</p> <ol style="list-style-type: none"> 1. If the pressure in an alveolus exceeds the blood pressure in the capillary bed, blood flow through the capillary stops. 2. Pressure imbalance will result in poor pulmonary perfusion, hypoxemia, and cellular hypoxia. <p>C. Ventilatory disturbances</p> <ol style="list-style-type: none"> 1. If less oxygenated air is available in the alveoli for the amount of blood flowing through the pulmonary capillaries, less oxygen will be delivered to the cells. 2. Ventilatory disturbances can lead to hypoxemia and cellular hypoxia. 3. Managing such a disturbance should focus on improving ventilation and 	<p>Discussion Question What is the concept of the ventilation/perfusion ratio?</p> <p>Critical Thinking Discussion A patient takes a drug that prevents the heart rate from increasing. What are the consequences if the patient lost a large quantity of blood?</p>

	<p>oxygenation.</p> <p>D. Perfusion disturbances</p> <ol style="list-style-type: none"> 1. If adequate oxygenated air is moving into the alveoli, but there is not enough blood to pick it up due to decreased blood flow, less oxygen will be delivered to the cells. 2. A perfusion disturbance can lead to severe cellular hypoxia. 3. Managing such a disturbance should focus on increasing blood flow through the pulmonary capillaries, the availability of hemoglobin, and the delivery of oxygen to the cells. 	
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<p>15</p>	<p>IX. Components Necessary for Adequate Perfusion—Transport of Oxygen and Carbon Dioxide by the Blood</p> <p>A. A disturbance in the transport system may lead to cellular hypoxia and hypercarbia.</p> <ol style="list-style-type: none"> 1. Cellular hypoxia is a lack of oxygen available to the cells. 2. Hypercarbia is a buildup of carbon dioxide in the blood. <p>B. Oxygen transport</p> <ol style="list-style-type: none"> 1. About 1.5 to 3 percent of oxygen is dissolved in plasma. 2. About 97 to 98.5 percent of oxygen is transported by attaching to hemoglobin molecules. 3. Hemoglobin is a protein molecule that has four iron sites for oxygen to bind to. 4. Oxyhemoglobin describes an oxygen molecule once it binds with hemoglobin. 5. Deoxyhemoglobin describes a hemoglobin molecule without any oxygen attached to it. <p>C. Carbon dioxide transport</p> <ol style="list-style-type: none"> 1. About 7 percent of carbon dioxide is dissolved in plasma. 2. About 23 percent of carbon dioxide is attached to hemoglobin. 3. About 70 percent of carbon dioxide is in the form of bicarbonate. <p>D. Alveolar/capillary gas exchange</p> <ol style="list-style-type: none"> 1. Gases move from areas of higher concentration to areas of lower concentration. 2. Oxygen moves from alveoli into capillaries while carbon dioxide moves from capillaries into alveoli. 3. Carbon-dioxide rich air is then expelled during exhalation while oxygen is carried to the left atrium of the heart to the left ventricle and then throughout the body. <p>E. Cell/capillary gas exchange</p> <ol style="list-style-type: none"> 1. Oxygen-rich blood from the left ventricle travels through an artery to 	<p>Critical Thinking Discussion</p> <p>A blood clot obstructs blood flow through the pulmonary artery. Explain how this affects perfusion.</p> <p>Class Activity</p> <p>Perfusion biographies. Assign students to play the role of various components of perfusion (red blood cells, right ventricle, and so on). Encourage students to select a name for their component, such as Larry the Left Ventricle. Students will spend five to ten minutes writing the biography of their component and will then present it to the class.</p> <p>Animations</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital</i></p>
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	<p>arterioles to capillaries.</p> <ol style="list-style-type: none"> 2. In the capillaries, oxygen breaks free of hemoglobin and diffuses out of the plasma and into the cell. 3. In the capillaries, carbon dioxide leaves the cell and crosses over into the capillary where it dissolves, attaches to hemoglobin, or is converted to bicarbonate. 4. Blood rich in carbon dioxide is then transported back to the right atrium of the heart, to the right ventricle, and then pumped to the lungs. 	<p><i>Emergency Care</i>, 9th edition to access animations describing the transport of carbon dioxide in the human body and the process of gas exchange.</p>
<p>15</p>	<p>X. Components Necessary for Adequate Perfusion—Blood Volume</p> <ol style="list-style-type: none"> A. Composition of blood <ol style="list-style-type: none"> 1. About 45 percent of blood composition is made up of cells and proteins. 2. About 55 percent of blood composition is made up of plasma. B. Plasma suspends and carries the formed elements in blood. <ol style="list-style-type: none"> 1. About 91 percent of plasma consists of water. 2. Much of the remaining portion of plasma consists of proteins. <ol style="list-style-type: none"> a. Albumin plays a major role in maintaining the fluid balance in blood. b. Antibodies are responsible for the defense against infectious organisms. c. Clotting factors, such as fibrinogen, are key in coagulation of blood from damaged vessels. C. Formed elements include red blood cells, white blood cells, and platelets. <ol style="list-style-type: none"> a. Red blood cells, which contain hemoglobin, are responsible for carrying oxygen and delivering it to cells. b. White blood cells protect the body against infection and eliminate dead and injured cells. c. Platelets are cell fragments that play a role in clotting. D. Distribution of blood <ol style="list-style-type: none"> a. Most blood is housed within the venous system. b. The venous system changes size to respond to changes in blood volume. c. The venous system supplies the right side of the heart with an adequate volume of blood. E. Hydrostatic pressure <ol style="list-style-type: none"> a. Hydrostatic pressure is the force inside the vessel or capillary bed generated by the contraction of the heart and blood pressure. b. A high hydrostatic pressure forces more fluid out of the vessel or capillary, thereby promoting edema. F. Plasma oncotic pressure <ol style="list-style-type: none"> a. Plasma oncotic pressure is responsible for keeping fluid inside the vessels. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource describing the composition of blood.</p> <p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation showing changes in pressure described by Starling's Law.</p> <p>Weblink</p>

	<ul style="list-style-type: none"> b. This pressure, generated by large plasma proteins, acts opposite to hydrostatic pressure. c. A balance between hydrostatic pressure and plasma oncotic pressure must be maintained for equilibrium of fluid balance. 	<p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources exploring Frank Starling's Law.</p>
<p>10</p>	<p>XI. Components Necessary for Adequate Perfusion—Pump Function of the Myocardium</p> <ul style="list-style-type: none"> A. Cardiac output <ul style="list-style-type: none"> 1. Cardiac output is the amount of blood ejected by the left ventricle in one minute. 2. Cardiac output equals the heart rate times the stroke volume. B. Heart rate <ul style="list-style-type: none"> 1. The heart rate is the number of times the heart contracts in one minute. 2. The heart rate is influenced by the sinoatrial (SA) node along with hormones and the automatic nervous system. 3. The sympathetic and parasympathetic nervous systems exert control through the cardiovascular control center in the brain stem. <ul style="list-style-type: none"> a. An increase in stimulation by the sympathetic nervous system or a decrease in stimulation by the parasympathetic nervous system increases heart rate. b. An increase in stimulation by the parasympathetic nervous system or a decrease in stimulation by the sympathetic nervous system decreases heart rate. C. Stroke volume <ul style="list-style-type: none"> 1. Stroke volume is the volume of blood ejected by the left ventricle with each contraction. 2. Preload is the pressure generated in the left ventricle at the end of diastole. 3. Frank Starling's law of the heart describes that the stretch of the muscle fiber at the end of diastole determines the force available to eject the blood from the ventricle. 4. Afterload is the resistance in the aorta that must be overcome by contraction of the left ventricle to eject blood. 	<p>Discussion Question What is meant by cardiac output?</p> <p>Teaching Tip Explain the similarities in the concepts of minute ventilation and cardiac output.</p> <p>Critical Thinking Discussion You've just been scared by a near collision as you are driving to class. Explain how your perfusion will be affected.</p> <p>Discussion Question What are the effects of the sympathetic and parasympathetic nervous systems on cardiac output?</p> <p>Knowledge Application Given several scenarios including a patient's stroke volume and heart rate, calculate the cardiac output.</p> <p>Discussion Question How do changes in preload and afterload affect cardiac output?</p>
<p>10</p>	<p>XII. Components Necessary for Adequate Perfusion—Systemic Vascular Resistance</p> <ul style="list-style-type: none"> A. Systemic vascular resistance is the resistance offered to blood flow through a vessel. <ul style="list-style-type: none"> 1. Vasoconstriction is the decrease in vessel diameter. 2. Vasodilation is the increase in vessel diameter. B. The basic measure of systemic vascular resistance is the diastolic blood pressure. 	

	<p>C. A chronically elevated diastolic blood pressure will lead to heart failure.</p> <p>D. The systemic vascular resistance is influenced by the autonomic nervous system.</p> <ol style="list-style-type: none"> 1. The sympathetic nervous system causes the vessels to constrict. 2. The parasympathetic nervous system causes the vessels to dilate. <p>E. Systemic Vascular Resistance Effect on Pulse Pressure</p> <ol style="list-style-type: none"> 1. An increase in the systemic vascular resistance increases the diastolic blood pressure. 2. A decrease in the systemic vascular resistance decreases the diastolic blood pressure. 3. Pulse pressure is the difference between the systolic and diastolic blood pressure readings. 	<p>Knowledge Application Given several blood pressure values, determine the pulse pressure.</p> <p>Discussion Question What is the significance of a narrow pulse pressure?</p>
10	<p>XIII. Components Necessary for Adequate Perfusion—Microcirculation</p> <p>A. Microcirculation is the flow of blood through the arterioles, capillaries, and venules.</p> <p>B. Arterioles control the movement of blood into the capillaries.</p> <ol style="list-style-type: none"> 1. Vasoconstriction reduces blood flow to the capillaries. 2. Vasodilation increases blood flow to the capillaries. <p>C. Metarterioles connect arterioles and venules.</p> <p>D. Percapillary sphincters control the movement of blood through the true capillaries.</p> <p>E. Control of blood flow through capillaries</p> <ol style="list-style-type: none"> 1. Local factors, such as temperature, hypoxia, and acidosis 2. Neural factors, which are associated with the influence of the sympathetic and parasympathetic nervous systems 3. Hormonal factors, such as the α_1 stimulation from epinephrine 	<p>Discussion Question How does the release of epinephrine and norepinephrine increase perfusion?</p>
10	<p>XIV. Components Necessary for Adequate Perfusion—Blood Pressure</p> <p>A. Blood pressure equals the cardiac output times the systemic vascular resistance.</p> <ol style="list-style-type: none"> 1. An increase in the cardiac output or the heart rate will increase blood pressure. 2. A decrease in the cardiac output or the heart rate will decrease blood pressure. 3. An increase in the stroke volume or the systemic vascular resistance will increase blood pressure. 4. A decrease in the stroke volume or the systemic vascular resistance will decrease blood pressure. <p>B. Perfusion of cells is linked to blood pressure.</p> <ol style="list-style-type: none"> 1. An increase in blood pressure will increase cellular perfusion. 2. A decrease in blood pressure will decrease cellular perfusion. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource relating cardiac output to blood pressure.</p>

	<p>C. Regulation of blood pressure by baroreceptors and chemoreceptors</p> <ol style="list-style-type: none"> 1. Baroreceptors are stretch-sensitive receptors that detect changes in blood pressure and send impulses to the brain stem to make alterations in blood pressure. 2. Chemoreceptors monitor the content of oxygen, carbon dioxide, and pH of the blood, and cause the brainstem to trigger changes in the sympathetic nervous system. 	<p>Critical Thinking Discussion How do the nervous, respiratory, and circulatory systems all have to work together to maintain adequate perfusion?</p>
10	<p>XI. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 8 Summary. 2. Complete Chapter 8 In Review questions. 3. Complete Chapter 8 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 8 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What is going on at the patient's cellular level? • How can your actions help address the problems at the patient's cellular level? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 9

Life Span Development

60–75 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

Chapter 9 objectives can be found in an accompanying folder.
 These objectives, which form the basis of each chapter, were developed from the new Education Standards and Instructional Guidelines.

Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about the stages of life span development and how to apply this knowledge to emergency care.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • How does the age of the patient impact your approach to him? • What are typical concerns of children of this age?
10	<p>II. Life Span Development—Infancy</p> <p>A. Neonate is the term referring to a child from birth to one month of age.</p> <p>B. Vital signs</p> <ol style="list-style-type: none"> 1. At birth <ol style="list-style-type: none"> a. Respiratory rate is 40–60 breaths per minute. b. Tidal volume is 6–8 mL/kg. c. Heart rate is 140–160 beats per minute. d. Average systolic blood pressure is 70 mmHg. 2. By one year of age <ol style="list-style-type: none"> a. Respiratory rate is 20–30 breaths per minute. b. Tidal volume is 10–15 mL/kg. c. Heart rate is about 120 beats per minute. d. Average systolic blood pressure is 90 mmHg. <p>C. Physiological changes</p> <ol style="list-style-type: none"> 1. Physical structure <ol style="list-style-type: none"> a. The head accounts for 25 percent of the weight of a neonate. b. Weight drops during first two weeks but then is regained. c. Infants require breast milk or formula, followed by soft foods and then solid foods once primary teeth appear. 2. Pulmonary system <ol style="list-style-type: none"> a. The airways of an infant are shorter, narrower, less stable, and more easily obstructed than those of an adult. 	<p>Video Clip</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip addressing health supervision during infancy.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> b. Infants are primary nose breathers until four weeks of age. c. The lung tissue of infants is fragile and prone to trauma. d. The accessory muscles are immature, and the chest wall is rigid. 3. Immune system <ul style="list-style-type: none"> a. Most of a neonate's immunity arises from antibodies received through the placenta. b. Passive immunity is retained through the first six months of life or as long as breast feeding continues. c. Childhood immunizations normally begin after birth. 4. Nervous system <ul style="list-style-type: none"> a. Infants have reflexes, or instantaneous and involuntary movements, that result from a stimulus. b. Well-flexed extremities move equally when stimulated. 5. Skeletal system <ul style="list-style-type: none"> a. Fontanelles are soft spots on the skull that allow the head to compress in the birth canal during delivery and to allow for the growth of the brain during infancy. b. Fontanelles should not be pressed but will be depressed if child is dehydrated. c. Bones grow throughout infancy, so the EMT should know what activities are normally present at various stages of infancy. D. Psychosocial changes <ul style="list-style-type: none"> 1. Most infants will protest when separated from their care givers. 2. In an infant does not seem upset when separated from a parent, the EMT should consider underlying causes. 3. Infants communicate all of their needs by crying. 4. Some crying can be avoided if the parent is allowed to hold the infant during assessment. 5. By the end of infancy, a favorite toy may calm a child during assessment, as long as the toy cannot cause an airway obstruction. 6. A calm voice during assessment will help calm both the child and the parents. 	<p style="text-align: center;">Discussion Question</p> <p>What are the psychosocial characteristics of infants?</p>

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Minutes	Content Outline	Master Teaching Notes
10	<p>III. Life Span Development—Toddlers and Preschool-Age Children</p> <p>A. A toddler is a child who is one to three years of age.</p> <p>B. A preschooler is a child who is three to six years of age.</p> <p>C. Vital signs</p> <ol style="list-style-type: none"> 1. Heart and respiratory rates tend to decrease as a child ages. 2. Systolic blood pressure increases as a child ages. <p>D. Physiological changes</p> <ol style="list-style-type: none"> 1. Physical structure <ol style="list-style-type: none"> a. The bones of the musculoskeletal system continue to grow. b. Children have their primary teeth by the end of this period. c. Muscle mass increases, but weight gain slows down. 2. Pulmonary system <ol style="list-style-type: none"> a. Terminal airways continue to branch. b. Alveoli continue to grow in number. 3. Immune system <ol style="list-style-type: none"> a. Passive immunity from mother is lost. b. Active immunity to common pathogens develops. 4. Nervous system <ol style="list-style-type: none"> a. Brain is the fastest growing part of the body. b. Fine motor skills begin to develop. 5. It is important for the EMT to recognize what activities toddlers and preschoolers are capable of performing. <p>E. Psychosocial changes</p> <ol style="list-style-type: none"> 1. Language takes the place of crying as the sole form of communication. 2. Separation anxiety begins at approximately 18 months of age. 3. By age five, a preschooler can say his name and address, recall stories, and tell stories. 4. Children can play simple games and follow basic rules. 5. Children begin to develop friendships outside the immediate family. 6. The EMT should communicate with the child on a level he understands by choosing phrases carefully and demonstrating equipment. 	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip about pediatric growth and development.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • At what age should you expect pediatric patients to experience separation anxiety? • What are some techniques for establishing trust with a toddler or preschooler?
10	<p>IV. Life Span Development—School-Age Children</p> <p>A. School-age children are between six and 12 years of age.</p> <p>B. Vital signs</p> <ol style="list-style-type: none"> 1. Normal heart rates range from 70–110 beats per minute. 2. Respiratory rates range from 20–30 breaths per minute. 3. Systolic blood pressure is between 80–120 mmHg. 	<p>Knowledge Application Given several scenarios of patients of various ages, determine if the patient's vital signs should be considered normal or cause for concern.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> C. Physiological changes <ul style="list-style-type: none"> 1. Bones increase in density and grow in size. 2. Primary teeth are replaced with permanent teeth. 3. Brain function increases. 4. Some children struggle with nocturnal enuresis. D. Psychosocial changes <ul style="list-style-type: none"> 1. Develop relationships outside the home 2. Participate in social activities 3. Capable of fundamental reasoning and problem solving 4. Develop a self-concept, self-esteem, and morals 5. Understand pain, illness, death, and loss 6. Identify EMTs, firefighters, and law enforcement officers as people who can help 	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip promoting healthy lifestyles for school-aged children.</p>
10	<p>V. Life Span Development—Adolescence</p> <ul style="list-style-type: none"> A. An adolescent is between 12 and 18 years of age. B. Vital signs <ul style="list-style-type: none"> 1. Normal heart rates range from 55–105 beats per minute. 2. Respiratory rates range from 12–20 breaths per minute. 3. Systolic blood pressure is between 100–120 mmHg. C. Physiological changes <ul style="list-style-type: none"> 1. Generally experience growth spurt beginning with enlarged feet and hands, followed by extremities, followed by chest and trunk 2. Adolescents go through puberty, during which sexual organs mature. D. Psychosocial changes <ul style="list-style-type: none"> 1. Experience changes that cause family conflicts, mostly revolving around the adolescent and his parents 2. Become more argumentative and aware of the shortcomings of others 3. May participate in risky or self-destructive behaviors. 4. Want to be treated as adults, but parents’ consent is required for medical treatment 5. Want privacy and may disclose more information when parents are not present 6. Develop their identity 7. Increase in self-consciousness and concern about body image 8. Antisocial behavior peaking around eighth or ninth grade 9. Increased interest in opposite sex and may participate in unprotected sexual activity 	<p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on developmental stages and psychological issues related to development.</p> <p>Discussion Question What are some of the causes of conflict between adolescents and their parents?</p>

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Minutes	Content Outline	Master Teaching Notes
5	<p>VI. Life Span Development—Early Adulthood</p> <p>A. Early adulthood is the stage of development from 20 to 40 years of age.</p> <p>B. Vital signs</p> <ol style="list-style-type: none"> 1. Average heart rate is 70 beats per minute. 2. Average respiratory rate is 16–20 breaths per minute. 3. Average blood pressure is 120/80 mmHg. <p>C. Physiological changes</p> <ol style="list-style-type: none"> 1. Peak physical condition occurs between 19 and 26 years of age. 2. After peak physical condition, physical condition begins to slow down. 3. Adults gain weight, store fat, and experience decreased muscle tone. 4. Adults’ spinal disks begin to settle. 5. Adults develop lifelong habits during this period. <p>D. Psychosocial changes</p> <ol style="list-style-type: none"> 1. Take on more responsibility 2. Leave parents’ home 3. Develop romantic relationships, some of which lead to marriage 4. Childbirth is common. 5. More capable of dealing with stress than when younger 	<p>Knowledge Application</p> <p>Given several scenarios of patients of various ages, describe special considerations in the EMT’s approach to the patient, based on the physical and psychosocial characteristics of each age group.</p>
5	<p>VII. Life Span Development—Middle Adulthood</p> <p>A. Middle adulthood is the stage of development from 41 to 60 years of age.</p> <p>B. Vital signs</p> <ol style="list-style-type: none"> 1. Average heart rate is 70 beats per minute. 2. Average respiratory rate is 16–20 breaths per minute. 3. Average blood pressure is 120/80 mmHg. <p>C. Physiological changes</p> <ol style="list-style-type: none"> 1. Adults become more susceptible to chronic illness and disease. 2. Cardiovascular health becomes a concern. 3. Cardiac output decreases. 4. Cholesterol levels increase. 5. Weight is gained. 6. Vision changes may require corrective lenses. 7. Hearing may decrease. 8. Women go through menopause, which is the end of menstruation and fertility. <p>D. Psychosocial changes</p> <ol style="list-style-type: none"> 1. May perceive problems as challenges rather than threats 2. May help younger generations 	<p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the process of aging.</p> <p>Teaching Tip</p> <p>Ask students for examples that illustrate the psychosocial development stages.</p> <p>Critical Thinking Discussion</p> <p>How do you think differences between the age of an EMT and the age of a patient may affect their interaction?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 3. May question their own accomplishments 4. May set new goals for the remainder of their lives 5. May delay seeking help for health issues 6. May be burdened by financial commitments 7. May experience empty-nest syndrome 8. May take care of grown children and/or elderly parents 9. May become grandparents 	
10	<p>IX. Life Span Development—Late Adulthood</p> <p>A. Late adulthood is the stage of development 61 years of age and older.</p> <p>B. Vital signs</p> <ol style="list-style-type: none"> 1. Heart rate, respiratory rate, and blood pressure depend on physical and health status. 2. Underlying diseases, poor physical conditioning, and medications can alter vital signs. <p>C. Physiological changes</p> <ol style="list-style-type: none"> 1. The maximum life span is 120 years for a human being. 2. Life expectancy is the average years of life remaining based on an individual's year of birth. 3. Cardiovascular system becomes less efficient, putting more strain on myocardium. <ol style="list-style-type: none"> a. Blood vessels thicken. b. Functional blood volume is decreased. 4. Respiratory system is weakened. <ol style="list-style-type: none"> a. Chest wall and bone structure weaken, and elasticity of the diaphragm is diminished. b. Diffusion of gases through the alveoli is diminished. 5. Nervous system undergoes changes. <ol style="list-style-type: none"> a. Brain gets smaller and neurons are lost. b. Sleep cycle may be disrupted. c. Reaction time to stimuli is increased. d. Senses may become dulled. 6. Endocrine, reproductive, and renal systems are affected. <ol style="list-style-type: none"> a. Metabolism and insulin production decrease. b. Reproductive organs atrophy. c. Elimination of urine decreases. d. Permanent teeth are often lost. 7. EMTs must be aware of underlying health conditions in addition to any 	<p>Class Activity</p> <p>Divide students into groups. Have all students place cotton balls in their ears before giving instructions in a normal voice. Instruct students in each group to take turns putting on the gardening gloves; smear a small amount of petroleum jelly on the reading glasses, and then try to thread a needle while wearing the gloves and glasses. After ten minutes, ask students to discuss their experience with the task. Explain that you have simulated some of the effects of aging, such as loss of sensation, stiffness of joints in the hands, and cataracts.</p> <p>Video Clip</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on challenges and techniques involved in notifying a family about a serious condition or death of a loved one.</p> <p>Discussion Question</p> <p>How do psychosocial concerns change through early, middle, and late adulthood?</p>

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Minutes	Content Outline	Master Teaching Notes
	<p>emergency situation.</p> <p>8. Psychosocial changes</p> <ol style="list-style-type: none"> a. Wisdom is attributed to age in some cultures. b. Some adults in this stage are cared for by family. c. Some adults in this stage are isolated and alone. d. Leaving a long-established home is often required. e. Difficult decisions often center on financial burdens and requirements. f. Independence must often be given up. g. The loss of loved ones and friends must be acknowledged. 	<p>Critical Thinking Discussion</p> <p>You have an elderly patient who does not want to leave his home despite the fact that he is ill and needs to go to the hospital. What might explain his reluctance? What are some ways you can address the patient's reluctance to leave his home?</p>
10	<p>XI. Follow-Up</p> <ol style="list-style-type: none"> A. Answer student questions. B. Case Study Follow-Up <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. C. Follow-Up Assignments <ol style="list-style-type: none"> 1. Review Chapter 9 Summary. 2. Complete Chapter 9 In Review questions. 3. Complete Chapter 9 Critical Thinking. D. Assessments <ol style="list-style-type: none"> 1. Handouts 2. Chapter 9 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What could you say to the patient before asking personal questions to minimize his potential embarrassment? • What kind of conversation starters could be used with a patient of this age to put them at ease during transport? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 10

Airway Management, Artificial Ventilation, and Oxygenation

480–540 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn special considerations of assessment and management of the airway and breathing status and techniques of oxygen administration.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • Are there any obvious reasons to suspect problems with the patient's airway, breathing, and circulation? • What actions will you take to determine any problems with the patient's airway, breathing, and circulation?
10	<p>II. Respiration</p> <p>A. Respiration refers to the gas exchange process that occurs between the alveoli or cells and the capillaries, or to the utilization of glucose and oxygen during normal metabolism in cells.</p> <p>B. Respiration has four distinct components.</p> <ol style="list-style-type: none"> 1. Pulmonary ventilation—The mechanical process of moving air in and out of the lungs 2. External respiration—The gas exchange process that occurs between the alveoli and the surrounding pulmonary capillaries 3. Internal respiration—The gas exchange process that occurs between the cells and the systemic capillaries 4. Cellular respiration and metabolism—The process through which glucose is broken down in the presence of oxygen to produce ATP, carbon dioxide, and water 	<p>Teaching Tip</p> <p>Ask students to explain back to you the four components of respiration to ensure their understanding before moving to the next section.</p> <p>Critical Thinking Discussion</p> <p>Without glucose circulating in the blood, what component or components of respiration will be affected? Why?</p>

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Minutes	Content Outline	Master Teaching Notes
20	<p>III. Respiratory System Review—Anatomy of the Respiratory System</p> <p>A. The upper airway—Extends from the nose and mouth to the cricoid cartilage</p> <ol style="list-style-type: none"> 1. Nose and mouth 2. Pharynx 3. Epiglottis 4. Larynx <p>B. The lower airway—Extends from the cricoid cartilage to the alveoli of the lungs</p> <ol style="list-style-type: none"> 1. Trachea 2. Bronchi and bronchioles 3. Lungs 4. Diaphragm 	
35	<p>IV. Respiratory System Review—Mechanics of Ventilation (Pulmonary Ventilation) Review</p> <p>A. Ventilation is the passage of air into and out of the lungs.</p> <ol style="list-style-type: none"> 1. Inhalation, or inspiration, is the process of breathing air in. 2. Exhalation, or expiration, is the process of breathing air out. <p>B. Inhalation</p> <ol style="list-style-type: none"> 1. The diaphragm and the intercostals muscles contract. 2. The diaphragm moves slightly downward. 3. The size of the chest cavity increases. 4. Negative pressure is created inside the chest cavity. 5. Air is drawn in by way of the nose, mouth, trachea, and bronchi into the lungs. <p>C. Exhalation</p> <ol style="list-style-type: none"> 1. The diaphragm and the intercostals muscles relax. 2. The diaphragm moves slightly upward to its resting position. 3. The size of the chest cavity is reduced. 4. The pressure in the chest cavity becomes positive. 5. Air is forced out of the lungs. <p>D. Control of respiration</p> <ol style="list-style-type: none"> 1. Respirations are controlled by the nervous system. 2. The respiratory centers that control impulses sent to respiratory muscles include the dorsal respiratory group (DRG), ventral respiratory group (VRG), apneustic center, and pneumotaxic center in the brain stem. 3. Chemoreceptors monitor levels of oxygen, carbon dioxide, and pH in arterial blood. 	<p>Teaching Tip Allow students to demonstrate and increase learning by asking them to explain concepts first, and then fill in gaps and correct inaccuracies.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> a. Patients with chronic obstructive pulmonary disease (COPD) have chronically elevated carbon dioxide levels in arterial blood. b. Chemoreceptors in COPD patients become insensitive to changes in carbon dioxide and instead rely on oxygen levels to regulate breathing. 	
30	<p>V. Respiratory System Review—Respiratory Physiology Review</p> <ul style="list-style-type: none"> A. Oxygenation is the process by which the blood and the cells become saturated with oxygen. B. Hypoxia is an inadequate amount of oxygen being delivered to the cells. <ul style="list-style-type: none"> 1. Causes <ul style="list-style-type: none"> a. Occluded airway b. Inadequate breathing c. Inadequate delivery of oxygen to cells by the blood d. Inhalation of toxic gases e. Lung and airway diseases f. Drug overdose that suppresses respiratory center g. Stroke h. Injury to the chest or respiratory structures i. Head injury 2. Signs <ul style="list-style-type: none"> a. Tachypnea b. Dyspnea c. Pale, cool, clammy skin d. Tachycardia e. Elevation in blood pressure f. Restlessness and agitation g. Disorientation and confusion h. Headache i. Cyanosis j. Loss of coordination k. Sleepy appearance l. Head bobbing m. Slow reaction time n. Altered mental status o. Bradycardia 3. Response to signs of hypoxia <ul style="list-style-type: none"> a. If airway is open and breathing is adequate, apply a nonrebreather 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What is the process by which body cells receive oxygen? • What are signs of early hypoxia and late hypoxia? <p>Critical Thinking Discussion A trauma patient has an injury to the lung that has allowed air to separate the pleural layers (pneumothorax). How will this affect ventilation?</p>

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Minutes	Content Outline	Master Teaching Notes
	<p style="text-align: center;">mask and administer high-flow, high-concentration oxygen.</p> <p style="text-align: center;">b. If breathing status is inadequate, begin positive pressure ventilation.</p> <p>C. Alveolar/capillary exchange (external respiration)</p> <ol style="list-style-type: none"> 1. Deoxygenated blood moves into the capillaries surrounding the alveoli. 2. Oxygen-rich air moves into the alveoli. 3. Oxygen diffuses into the capillaries and carbon dioxide diffuses into the alveoli. 4. Hemoglobin in the blood picks up most of the oxygen. 5. The blood carries oxygen through the arterial system to the capillaries of the body. 6. Carbon dioxide is exhaled from the alveoli and out of the lungs. 7. Despite adequate oxygenation, cellular hypoxia may still result from any disturbance in the delivery or the off-loading of the oxygen. <p>D. Capillary/cellular exchange (internal respiration)</p> <ol style="list-style-type: none"> 1. Oxygenated blood moves into the capillaries surrounding the body cells. 2. Cells have high levels of carbon dioxide and low levels of oxygen. 3. Oxygen diffuses into the cells and carbon dioxide diffuses into the blood. 4. Deoxygenated blood moves into the venous system, where it is transported back to the lungs for has exchange. 	
25	<p>VI. Respiratory System Review—Pathophysiology of Pulmonary Ventilation and External and Internal Respiration</p> <p>A. A disturbance in pulmonary ventilation, oxygenation, external respiration, internal respiration, or circulation can lead to cellular hypoxia and anaerobic metabolism.</p> <ol style="list-style-type: none"> 1. Anaerobic metabolism is associated with insufficient energy production and the buildup of lactic acid. 2. A severe alteration in perfusion can decrease glucose delivery to cells. 3. Without fuel, cells will eventually die. <p>B. Causes for disruption in the mechanical process of pulmonary ventilation</p> <ol style="list-style-type: none"> 1. Interruption of nervous system's control 2. Structural damage to the thorax 3. Increased airway resistance 4. Disruption of airway patency <p>C. The exchange of gas can be disrupted.</p> <ol style="list-style-type: none"> 1. Pneumonia, pulmonary edema, and drowning cause fluid to hinder the movement of oxygen from the alveoli to the capillaries. 	<p>Discussion Question What are some illnesses and injuries that can impair oxygenation?</p> <p>Knowledge Application Describe patient situations with various cardiac, cardiovascular, respiratory, or nervous system problems. Have students explain how each problem can lead to hypoxia and anaerobic metabolism.</p>

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	<ul style="list-style-type: none"> 2. Diseases such as emphysema distort the alveoli and change the surface for effective gas exchange. 3. Inhaled toxic gases interfere with oxygen use by the cell. 4. Poor perfusion or a decreased ability to carry blood can lead to cellular hypoxia. <ul style="list-style-type: none"> a. Pulmonary embolism b. Tension pneumothorax c. Heart failure d. Cardiac tamponade e. Anemia f. Hypoemia 	
10	<p>VII. Respiratory System Review—Airway Anatomy in Infants and Children</p> <ul style="list-style-type: none"> A. Mouth and nose <ul style="list-style-type: none"> 1. Mouths and noses are smaller and more easily obstructed. 2. Infants are obligate nose breathers. B. Pharynx <ul style="list-style-type: none"> 1. Children are more prone to posterior displacement of tongue at level of pharynx. 2. Epiglottis can protrude into the pharynx, causing obstruction. C. Trachea and lower airway <ul style="list-style-type: none"> 1. Passages are narrow, softer, and more flexible than those of adults. 2. Obstructions are more likely with flexion or extension. 3. Padding under the shoulders is necessary to keep trachea open. D. Cricoid cartilage <ul style="list-style-type: none"> 1. Cartilage is less developed and less rigid. 2. Under ten years of age, cricoid is narrowest portion of upper airway. E. Chest wall and diaphragm <ul style="list-style-type: none"> 1. Chest wall is softer and more pliable, leading to greater compliance. 2. Infants and children rely more on diaphragm than intercostals muscles. 3. If chest does not rise easily during artificial ventilation, assume an airway is not open, the airway is occluded by an obstruction, or the ventilation volume is inadequate. F. Oxygen reserves <ul style="list-style-type: none"> 1. Less oxygen is available during periods of inadequate breathing or apnea. 2. Twice the metabolic rate of adults 	<p>Discussion Question What are differences in pediatric respiratory systems as compared to adults'?</p>

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	3. Become hypoxic more rapidly than adult patients	
10	VIII. Airway Assessment—Airway Functions and Considerations A. A patent airway is an open airway. B. Airway functions and considerations <ol style="list-style-type: none"> 1. Airway and respiratory tract is the conduit that allows air to move from the atmosphere into the alveoli. 2. The airway must remain patent. 3. Any obstruction of the airway will lead to poor gas exchange and potential hypoxia. 4. The degree of obstruction will directly affect the amount of air available for gas exchange. C. Mental status of a patient typically correlates with the status of the airway. <ol style="list-style-type: none"> 1. An alert, responsive patient has an open airway. 2. A patient with an altered mental status or who is unresponsive has the potential for airway occlusion. 	Discussion Questions <ul style="list-style-type: none"> • What are indications that a patient has a patent airway? • Why is opening the airway the first step in the primary survey?
10	IX. Airway Assessment—Abnormal Upper Airway Sounds A. When assessing the airway of a patient with a severely altered mental status <ol style="list-style-type: none"> 1. Open the mouth manually. 2. Perform a manual airway maneuver. 3. Inspect the inside of the mouth. 4. Listen for any abnormal sounds. B. Sounds that indicate airway obstruction <ol style="list-style-type: none"> 1. Snoring—Upper airway is partially obstructed by the tongue or relaxed tissues in the pharynx. 2. Crowning—Muscles around the larynx spasm and narrow the opening into the trachea. 3. Gurgling—Blood, vomitus, secretions, or other liquids are present in the airway. 4. Stridor—Swelling in the larynx causes significant upper airway obstruction. 	Discussion Question What are indications that a patient’s airway is not patent?
10	X. Airway Assessment—Opening the Mouth A. Crossed-finger technique <ol style="list-style-type: none"> 1. Kneel above and behind the patient. 2. Cross the thumb and forefinger of one hand. 	Teaching Tip Ensure all equipment necessary to demonstrate each skill is readily available.

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	<ol style="list-style-type: none"> 3. Place the thumb on the patient’s lower incisors and forefinger on the upper incisors. 4. Use a scissors motion to open the mouth. <p>B. Inspect the airway</p> <ol style="list-style-type: none"> 1. Suction any foreign substances. 2. If suction equipment is not available and no spine injuries are suspected, turn the patient on his side and wipe the fluids or sweep the mouth to remove them. 	
10	<p>XI. Airway Assessment—Opening the Airway</p> <p>A. Open and maintain a patent airway.</p> <ol style="list-style-type: none"> 1. Manual airway maneuvers <ol style="list-style-type: none"> a. Head-tilt, chin-lift b. Jaw-thrust 2. Suction 3. Mechanical airways <ol style="list-style-type: none"> a. Oropharyngeal airway b. Jaw-nasopharyngeal airway <p>B. Head-tilt, chin-lift maneuver</p> <ol style="list-style-type: none"> 1. Usage <ol style="list-style-type: none"> a. Should be used when opening the airway in a patient who has no suspected spine injury b. Must be supplemented with a mechanical airway device if the airway cannot be adequately maintained 2. Procedure <ol style="list-style-type: none"> a. Apply pressure with one hand backward on patient’s forehead. b. Place tips of fingers of the other hand underneath the bony part of the lower jaw. c. Lift the jaw upward. d. Continue pressing on the forehead to keep the head tilted backward. e. Lift the chin and jaw so the teeth are brought nearly together. <p>C. Head-tilt, chin-lift maneuver in infants and children</p> <ol style="list-style-type: none"> 1. Same as for adults except for a variation in head positioning 2. With an infant, head should be tilted back into a neutral position. 3. Place a pad behind the shoulders to keep the airway open. 4. Only the index finger of one hand lifts the chin and jaw. 5. Take care not to press on soft tissue beneath the chin. 	<p>Discussion Question Explain the steps used in opening and maintaining a patient's airway.</p> <p>Teaching Tip Demonstrate each skill first in “real-time,” then step-by-step with explanations, and then in “real time” again.</p> <p>Class Activity Give students the opportunity for guided practice of airway management skills.</p>

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	<p>D. Jaw-thrust maneuver</p> <ol style="list-style-type: none"> 1. Usage <ol style="list-style-type: none"> a. Patient's head and neck must be brought into a neutral, in-line position if a spine injury is suspected. b. This maneuver is used to open the airway without tilting back the head and neck. c. The jaw is displaced by the EMT's fingers. d. Must be supplemented with a mechanical airway device if the airway cannot be adequately maintained 2. Procedure <ol style="list-style-type: none"> a. Kneel at the top of the patient's head. b. Place your elbows on the surface upon which the patient is lying. c. Put your hands at the side of the patient's head. d. Grasp the angles of the patient's lower jaw on both sides. e. Use the thumb to retract the lower lip if the lips close. <p>E. Jaw-thrust maneuver in infants and children</p> <ol style="list-style-type: none"> 1. Follow the same procedure as for adults. 2. Insert an airway adjunct if the jaw thrust does not open the airway. <p>F. Positioning the patient for airway control</p> <p>G. Modified lateral position is used if patient has altered mental status and may be at risk for aspirating blood, secretions, or vomitus.</p> <ol style="list-style-type: none"> 1. Place patient's arm flat on the ground at a right angle to the body. 2. Log roll the patient onto his side. 3. Place the hand of the opposite arm under his lateral face and cheek. 4. Bend the leg at the hip and knee to stabilize. 5. If a spine injury is suspected, the patient must remain supine. 	
10	<p>XII. Airway Assessment—Suctioning</p> <p>A. Standard Precautions during suctioning</p> <ol style="list-style-type: none"> 1. Protective eyewear, mask, and gloves should be worn. 2. An N-95 or high-efficiency particulate air (HEPA) respirator should be worn if a patient is known to have tuberculosis. <p>B. Suction equipment</p> <ol style="list-style-type: none"> 1. Mounted suction devices 2. Portable suction devices 3. Suction catheters <ol style="list-style-type: none"> a. Hard or rigid catheter—A Yankauer catheter, commonly known as a tonsil tip or tonsil sucker, is used to suction the mouth and 	<p>Discussion Question What precautions should be taken when suctioning?</p>

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	<p style="padding-left: 40px;">oropharynx of an unresponsive patient.</p> <p style="padding-left: 20px;">b. Soft catheter—Known as a French catheter, it is used in suctioning the nose and nasopharynx and in other situations where the rigid catheter cannot be used.</p> <p>C. Technique of suctioning</p> <ol style="list-style-type: none"> 1. Position yourself at the patient's head. 2. Turn on the suction unit. 3. Select the appropriate catheter. 4. Measure the catheter and insert it into the oral cavity without suction. 5. Apply suction only on the way out of the airway. 6. If necessary, rinse the catheter with water to prevent obstruction of the tubing. <p>D. Special considerations when suctioning</p> <ol style="list-style-type: none"> 1. Log roll the patient on his side and clear the oropharynx with a finger if secretions or vomitus cannot be removed quickly by suctioning. 2. If both suctioning and artificial ventilation are needed, apply suction for 15 seconds followed by positive pressure ventilation with supplemental oxygen for two minutes, and then repeat. 3. Monitor the patient's pulse, heart rate, and pulse oximeter reading while suctioning to identify any decrease in blood oxygen levels due to the removal of the residual volume of air. 4. Before suctioning a patient who is being artificially ventilated, ventilate at a rate of 12 ventilations per minute for five minutes, then suction and resume ventilation. 	<p>Critical Thinking Discussion What will happen if you ventilate a patient who has blood or vomit in the airway?</p> <p>Teaching Tip Cover all steps and criteria on the skill check-sheets used for later student testing. It is more difficult to change behaviors, once learned, than to teach them initially.</p>
10	<p>XIII. Airway Assessment— Airway Adjuncts</p> <p>A. Oropharyngeal (oral) airway</p> <ol style="list-style-type: none"> 1. Consists of a semicircular device of hard plastic or rubber that holds the tongue away from the back of the airway. 2. Patient must be completely unresponsive and have no gag or cough reflex. 3. If the patient gags at any time during insertion, the device must be removed. 4. Size and method must be appropriate for the patient <ol style="list-style-type: none"> a. If the device is too long, it can push the epiglottis over the opening of the larynx. b. If the device is inserted improperly, it may push the tongue back into the airway. 	<p>Discussion Question What are advantages and disadvantages of oral and nasal airways?</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip describing OPA insertion.</p>

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	<p>B. Procedure</p> <ol style="list-style-type: none"> 1. Select the proper size airway. 2. Open the patient's mouth using the crossed-finger technique. 3. Gently rotate the airway 180 degrees when it comes in contact with the soft palate at the back of the roof of the mouth. 4. Alternate method involves the use of a tongue depressor (blade). <p>C. Nasopharyngeal (nasal) airway</p> <ol style="list-style-type: none"> 1. Consists of a curved hollow tube of soft plastic or rubber with a flange or flare at the top end and a bevel at the distal end. 2. Use of this device is indicated for patients in whom the oral airway cannot be inserted. 3. It can be used on a patient who is not fully responsive and needs assistance in maintaining an open airway. 4. Avoid using in patients with a suspected fracture to the base of the skull or severe facial trauma. <p>D. Procedure</p> <ol style="list-style-type: none"> 1. Measure the airway. 2. Lubricate the outside of the airway well. 3. Insert the device in the larger or more open nostril, with the bevel facing the septum or floor of the nostril. 4. Check that air is flowing through the airway. 	<p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation reviewing OPA, NPA, and suction techniques.</p> <p>Knowledge Application After students have practiced rote skills, put the skills in context by providing lab scenarios that call for decision-making.</p>
45	<p>XIV. Assessment of Breathing—Relationship of Tidal Volume and Respiratory Rate in Assessment of Breathing</p> <p>A. Minute volume</p> <ol style="list-style-type: none"> 1. Minute volume typically correlates to how adequately a patient is breathing. 2. A decrease in either tidal volume or respiratory rate may lead to a severe decrease in minute volume. 3. The EMT must know both respiratory rate and tidal volume before making any decision about the adequacy of breathing. <p>B. Alveolar ventilation</p> <ol style="list-style-type: none"> 1. Alveolar ventilation is the amount of air breathed in that reaches the alveoli. 2. Decreases in tidal volume can reduce the amount of air reaching the alveoli. 3. A high respiratory rate can lead to a decrease in alveolar ventilation. 	<p>Teaching Tip Draw a simple sketch of the respiratory system on the white board and shade in the dead space to illustrate the concept.</p> <p>Critical Thinking Discussion What are some things that would cause changes in tidal volume and respiratory rate?</p> <p>Discussion Question Why does tidal volume decrease at abnormally high respiratory rates?</p>

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		<p>Knowledge Application</p> <ul style="list-style-type: none"> • Give several pairs of respiratory rate and tidal volume values and have students calculate the minute volume to illustrate the effects of changes in the values. • Give several tidal volumes and respiratory rates and have students calculate alveolar ventilation.
30	<p>XV. Assessing For Adequate Breathing—Adequate Breathing</p> <p>A. Rate, rhythm, quality, and depth of respirations should be assessed.</p> <p>B. Look</p> <ol style="list-style-type: none"> 1. Inspect the chest. 2. Observe the patient's general appearance. 3. Decide if the breathing pattern is regular or irregular. 4. Look at the nostrils to see if they are open wide during inhalation. <p>C. Listen</p> <ol style="list-style-type: none"> 1. Assess the patient's speech. 2. If the patient is unresponsive, listen for air escaping from the nose and mouth. 3. If an adequate volume of air is not heard being exhaled, the tidal volume should be considered inadequate, and the patient must be ventilated. <p>D. Feel</p> <ol style="list-style-type: none"> 1. Feel the volume of air escaping from the patient's nose and mouth during exhalation. 2. If you do not feel an adequate volume of air, the tidal volume should be considered inadequate, and the patient must be ventilated. <p>E. Auscultate</p> <ol style="list-style-type: none"> 1. Place stethoscope at the second intercostals space at the midclavicular line. 2. Listen to one full inhalation and exhalation. 3. Determine if breath sounds are present and equal bilaterally. <p>F. Adequate breathing characteristics</p> <ol style="list-style-type: none"> 1. Rate—Respiratory rate within appropriate range of respirations depending on age 	<p>Teaching Tip</p> <p>Explain to students that they will more readily recognize what is abnormal if they take every opportunity to observe what is normal, in terms of respiration.</p> <p>Class Activity</p> <p>Provide pairs of students with stethoscopes and have them practice listening for one full inspiration and expiration for the presence of breath sounds.</p>

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	<ol style="list-style-type: none"> 2. Rhythm—Pattern is regular. 3. Quality—Breath sounds are equal and bilateral. 4. Depth—Chest rises fully with each inhalation. <p>G. Respiratory distress occurs when a patient is working harder to breathe and needs supplemental oxygen.</p>	
30	<p>XVI. Assessing For Adequate Breathing—Inadequate Breathing</p> <p>A. Inadequate breathing leads to inadequate oxygen exchange and inadequate delivery of oxygen to cells.</p> <p>B. Inadequate breathing leads to inadequate elimination of carbon dioxide.</p> <p>C. Inadequate breathing leads to inadequate cellular hypoxia.</p> <p>D. Categories</p> <ol style="list-style-type: none"> 1. Respiratory failure—Respiratory rate and/or tidal volume is insufficient. 2. Respiratory arrest—Patient completely stops breathing. <ol style="list-style-type: none"> a. Stroke b. Myocardial infarction c. Drug overdoes d. Toxic inhalation e. Electrocution and lightning strike f. Suffocation g. Traumatic injuries to the head, spine, chest, or abdomen h. Airway obstruction by a foreign body <p>E. Agonal respirations are gasping-type breaths.</p> <ol style="list-style-type: none"> 1. Ineffective respirations 2. Require positive pressure ventilation 3. Often associated with cardiac arrest <p>F. Signs of inadequate breathing</p> <ol style="list-style-type: none"> 1. Rate—Respiratory rate is either too fast or too slow. <ol style="list-style-type: none"> a. Tachypnea is excessively rapid breathing rate. b. Bradypnea is an abnormally slow breathing rate. 2. Rhythm—Pattern is irregular. 3. Quality—Breath sounds are decreased or absent. 4. Depth—Chest wall movement is minimal and does not rise adequately during inhalation. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are signs of inadequate breathing? • What are causes of inadequate breathing and respiratory arrest? <p>Critical Thinking Discussion</p> <p>In what circumstances could a patient with a normal respiratory rate and tidal volume be hypoxic?</p> <p>Discussion Question</p> <p>What are agonal respirations?</p> <p>Knowledge Application</p> <p>Describe several patient presentations and have students determine if breathing is adequate or inadequate.</p>
15	<p>XVII. Making the Decision to Ventilate or Not</p> <p>A. Deciding whether to ventilate or to use oxygen alone can mean the difference in whether a patient survives.</p>	<p>Knowledge Application</p> <p>Describe several patient presentations and have students determine if breathing is</p>

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	<p>B. If either the respiratory rate or the tidal volume is inadequate, the patient needs to be ventilated.</p>	adequate or inadequate.
10	<p>XVIII. Techniques of Artificial Ventilation—Differences between Normal Spontaneous Ventilation and Positive Pressure Ventilation</p> <p>A. Positive pressure ventilation (PPV) is a technique in which air is being forced into the patient’s lungs.</p> <p>B. Physiological differences in patient receiving PPV</p> <ol style="list-style-type: none"> 1. Air movement 2. Airway wall pressure 3. Esophageal opening pressure 4. Cardiac output 	
10	<p>XIX. Techniques of Artificial Ventilation—Basic Considerations</p> <p>A. Methods of artificial ventilation</p> <ol style="list-style-type: none"> 1. Mouth to mask 2. Bag-valve mask (BVM) operated by two people 3. Flow-restricted, oxygen-powered ventilation device 4. Bag-valve mask (BVM) operated by one person <p>B. Considerations</p> <ol style="list-style-type: none"> 1. Maintain a good mask seal. 2. Deliver adequate volume of air to sufficiently inflate the lungs. 3. Allow for simultaneous oxygen delivery. <p>C. Standard Precautions</p> <ol style="list-style-type: none"> 1. Risks of coming in contact with secretions, blood, or vomitus are relatively high. 2. Use gloves and eyewear. 3. Use a face mask if necessary. 4. Use a HEPA or N-95 respirator if tuberculosis is suspected. <p>D. Adequate ventilation</p> <ol style="list-style-type: none"> 1. Ventilation must not be interrupted for greater than 30 seconds. 2. Indications of adequate ventilation <ol style="list-style-type: none"> a. Rate of ventilation is sufficient. b. Tidal volume is consistent and sufficient to cause the chest to rise during each ventilation. c. Patient’s heart rate returns to normal. d. Color improves. 3. Indications of inadequate ventilation <ol style="list-style-type: none"> a. Ventilation rate is too fast or too slow. 	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip reviewing the components of two-person BVM.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on effective BVM ventilations.</p>

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	<ul style="list-style-type: none"> b. Chest does not rise and fall. c. Heart rate does not return to normal. d. Color does not improve. E. Cricoid pressure <ul style="list-style-type: none"> 1. Also known as Sellick maneuver 2. Can be used to reduce complications associated with positive pressure ventilation 3. Used only in unresponsive patients 4. Requires an EMT to apply pressure to the cricoid cartilage 	<p>Discussion Question What are signs of inadequate ventilation?</p>
10	<p>XX. Techniques of Artificial Ventilation—Mouth-to-Mouth Ventilation</p> <ul style="list-style-type: none"> A. Mouth-to-mouth and mouth-to-nose technique <ul style="list-style-type: none"> 1. The EMT forms a seal with his mouth around the patient’s mouth or nose. 2. The nose is pinched during mouth-to-mouth ventilation and the mouth is closed during mouth-to-nose ventilation. 3. The EMT uses his exhaled air to ventilate. B. Limitations <ul style="list-style-type: none"> 1. Inability to deliver high concentrations of oxygen 2. Risk posed to EMT by contact with patient’s body fluids 	<p>Critical Thinking Discussion Demonstrate both adequate and inadequate ventilations and have students critique your technique.</p>
10	<p>XXI. Techniques of Artificial Ventilation—Mouth-to-Mask and Bag-Valve Ventilation: General Considerations</p> <ul style="list-style-type: none"> A. Ventilation volumes and duration of ventilation <ul style="list-style-type: none"> 1. Adjust the rate of ventilation based on whether the patient has a pulse. <ul style="list-style-type: none"> a. If the patient has a pulse, the tidal volume should be enough to make the chest rise during each ventilation. b. If the patient does not have a pulse, the ventilation rates are reduced and are performed in conjunction with chest compressions. B. Gastric inflation <ul style="list-style-type: none"> 1. Decreasing the ventilation volume is aimed at reducing the incidence of gastric distension and potential regurgitation. 2. A smaller tidal volume reduces airway pressure and avoids causing the lower sphincter in the esophagus to open. 3. Higher tidal volumes can force the esophageal sphincter to open, causing gastric inflation. <ul style="list-style-type: none"> a. An air-filled stomach can cause contents to enter the esophagus, leading to regurgitation and aspiration. b. Aspiration of gastric contents may interfere with gas exchange and 	<p>Discussion Question What are the advantages and disadvantages of mouth-to-mask ventilation?</p>

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	<p>cause pneumonia.</p> <p>c. Inflated stomach places pressure on the diaphragm, which can lead to ineffective ventilation.</p>	
10	<p>XXII. Techniques of Artificial Ventilation—Mouth-to-Mask Ventilation</p> <p>A. A plastic pocket mask is used to form a seal around the patient’s nose and mouth.</p> <p>B. The EMT blows into the mask to deliver ventilation.</p> <p>C. Advantages</p> <ol style="list-style-type: none"> 1. One EMT can achieve a better mask seal. 2. Direct contact is eliminated. 3. Exposure to patient’s exhaled air is prevented. 4. Adequate tidal volumes can be achieved. 5. Supplemental oxygen can be administered. <p>D. Disadvantages</p> <ol style="list-style-type: none"> 1. Some EMTs perceive the mask as posing a greater risk of infection. 2. The EMT may fatigue after a period of time. 3. The highest possible concentration of oxygen cannot be delivered. <p>E. Mask requirements</p> <ol style="list-style-type: none"> 1. Transparent material 2. Tight fit 3. Oxygen inlet 4. Variety of sizes 5. One-way valve at the ventilation port <p>F. Mouth-to-mask technique—No suspected spine Injury</p> <ol style="list-style-type: none"> 1. Connect one-way valve to ventilation port and tubing to an oxygen supply. 2. Use cephalic technique or lateral technique. 3. Place the mask on the patient’s face so that a tight seal is achieved. 4. Blow into the ventilation port of the mask. <p>G. Mouth-to-mask technique—Suspected spine injury</p> <ol style="list-style-type: none"> 1. Connect one-way valve to ventilation port and tubing to an oxygen supply. 2. Position yourself at the top of the patient or at the side. 3. Place the mask on the patient’s face so that a tight seal is achieved. 4. Deliver ventilation. <p>H. Ineffective ventilation</p> <ol style="list-style-type: none"> 1. Reposition the head and neck. 	

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	<ol style="list-style-type: none"> 2. Maneuvers must be performed with care to avoid movement of the head or spine. 3. Ideally, the technique is best performed by three EMTs. 4. If only two EMTs are at the scene, it may be necessary for one to hold the in-line stabilization with his thighs and knees. 5. Apply cricoid pressure if possible. 	<p>when ventilating a patient with suspected spine injury?</p>
10	<p>XXIV. Techniques of Artificial Ventilation—Flow-Restricted, Oxygen-Powered Ventilation Device (FROPVD)</p> <ol style="list-style-type: none"> A. Flow-restricted, oxygen-powered ventilation device (FROPVD) is a method of positive pressure ventilation that will deliver 100 percent oxygen to the patient. B. Advantages <ol style="list-style-type: none"> 1. Delivers 100 percent oxygen 2. Can be used by one EMT C. Disadvantages <ol style="list-style-type: none"> 1. Can be used on adults only 2. Not carried on all EEMS units 3. EMT is unable to feel the compliance of air. 4. Gastric distention often occurs with this device. 5. Improper use can rupture a patient's lungs. D. FROPVD <ol style="list-style-type: none"> 1. Check the unit for proper functioning. 2. Check the oxygen source for adequate supply. 3. Open the airway. 4. Insert an oropharyngeal or nasopharyngeal airway. 5. Apply the adult mask. 6. Connect the flow-restricted, oxygen-powered ventilation device to the mask. 7. Activate the valve, and deactivate as soon as the chest begins to rise. 8. Monitor for adequate rise and fall of the chest. E. FROPVD problems <ol style="list-style-type: none"> 1. Reevaluate the position of the head and chin. 2. Check the mask seal. 3. Check for foreign body obstruction of the airway. 	<p>Knowledge Application</p> <p>Provide several patient scenarios and ask students to select the preferred way of ventilating the patient and have them defend their selection.</p>
10	<p>XXV. Techniques of Artificial Ventilation—Automatic Transport Ventilator (ATV)</p>	<p>Teaching Tip</p>

Chapter 10 objectives can be found in an accompanying folder.

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Minutes	Content Outline	Master Teaching Notes
	<p>A. The automatic transport ventilator (ATV) is a device use for positive pressure ventilation.</p> <ol style="list-style-type: none"> 1. Provide and maintain a constant rate and tidal volume. 2. Maintain adequate oxygenation of arterial blood. 3. Most use oxygen as their power source, delivering 100 percent oxygen. 4. Can deliver oxygen at lower inspiratory flow rates for longer inspiratory times 5. Less likelihood of gastric distention 6. Most use oxygen as their power source, delivering 100 percent oxygen. <p>B. Advantages</p> <ol style="list-style-type: none"> 1. EMT is free to use both hands to hold the mask and maintain the airway. 2. Device can be set to specific values. 3. Alarms indicate low pressure or disconnection. 4. EMT can apply cricoids pressure. <p>C. Disadvantages</p> <ol style="list-style-type: none"> 1. The device cannot be used once the oxygen supply is depleted. 2. Some ATVs cannot be used in children less than five years of age. 3. It is not possible to feel an increase in airway resistance or decrease in the compliance of the lungs. <p>D. ATV recommended features</p> <ol style="list-style-type: none"> 1. Time- or volume-cycled 2. Lightweight 15/22 connector 3. Rugged design 4. Default peak inspiratory pressure limit of 60 cm H₂O that is adjustable 5. Audible alarms 6. Ability to deliver 50-100 percent oxygen 7. Inspiratory time of one second 8. An adjustable inspiratory flow of 30 lpm for adults and 15 lpm for children 9. Rate of ten breaths per minute for adults and 20 breaths per minute for children <p>E. ATV techniques</p> <ol style="list-style-type: none"> 1. Check that ATV is properly functioning. 2. Attach the ATV to a mask. 3. Seal the mask on the face. 4. Select tidal volume and rate. 5. Turn on the unit. 6. Observe the chest for rise and fall, and adjust if needed. 	<p>Emphasize the importance of learning and performing skills correctly and with great care to avoid complications.</p>

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Minutes	Content Outline	Master Teaching Notes
	7. Monitor continuously.	
10	<p>XXVI. Techniques of Artificial Ventilation—Ventilation of the Patient Who Is Breathing Spontaneously</p> <p>A. Assess the patient and recognize the need for ventilation.</p> <p>B. Signs of inadequate breathing</p> <ol style="list-style-type: none"> 1. Altered mental status 2. Inadequate respiratory rate 3. Poor chest rise and fall 4. Fatigue from increased work of breathing <p>C. Problems that may be encountered</p> <ol style="list-style-type: none"> 1. Combativeness in the hypoxic patient who does not cooperate 2. Inadequate mask seal 3. Overventilation leading to lung injury 4. Risk of regurgitation and aspiration <p>D. Explain the procedure to the patient</p> <p>E. Breathing patients who would need ventilation</p> <ol style="list-style-type: none"> 1. Patient with reduced minute volume (hypoventilation) 2. Patient with adequate respiratory rate but inadequate tidal volume (hypopnea) 3. Patient with adequate tidal volume but a slow respiratory rate (bradypnea) 4. Patient with a fast respiratory rate (tachypnea) that leads to hypopnea. 	
10	<p>XXVII. Techniques of Artificial Ventilation—Continuous Positive Airway Pressure (CPAP)</p> <p>A. Continuous positive airway pressure (CPAP) is a form of noninvasive positive pressure ventilation.</p> <ol style="list-style-type: none"> 1. Used in awake and spontaneously breathing patients 2. Delivered via a tightly fitted mask 3. Generates a continuous flow of air under positive pressure. 4. Delivery of air is intended to inflate collapsed alveoli, improve oxygenation, and reduce patient’s work of breathing. 5. The continuous pressure created by CPAP prevents fluid leakage into the alveoli and forces fluid that has leaked out of the alveoli. <p>B. Indications for CPAP</p> <ol style="list-style-type: none"> 1. Patient criteria <ol style="list-style-type: none"> a. Awake and alert b. Able to maintain airway 	<p>Discussion Question What are advantages and disadvantages of CPAP?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> c. Able to breathe on his own 2. Indications for patient in severe respiratory distress <ul style="list-style-type: none"> a. Congestive heart failure b. Pulmonary edema c. Chronic obstructive pulmonary disease (COPD) d. asthma C. Contraindications for CPAP <ul style="list-style-type: none"> 1. Apnea 2. Inability to understand or obey commands 3. Inability to maintain his own airway 4. Unresponsiveness 5. Responsiveness only to verbal or painful stimuli 6. Cardiac arrest 7. Need for frequent suctioning D. Relative contraindications <ul style="list-style-type: none"> 1. Pulmonary trauma 2. Increased intracranial pressure 3. Abdominal distention with a risk of vomiting 4. Hypotension E. Administering CPAP <ul style="list-style-type: none"> 1. Inform the patient about the CPAP device. 2. Coach patients to decrease their anxiety. 3. Work quickly yet slowly enough to allow the patient to become comfortable. F. BiPAP <ul style="list-style-type: none"> 1. Bilevel positive airway pressure 2. Similar to CPAP but allows for different airway pressures 3. Use in prehospital care is not recommended 	
10	<p>XXVIII. Techniques of Artificial Ventilation—Hazards of Overventilation</p> <ul style="list-style-type: none"> A. Overventilation can lead to serious complications. B. Cardiac arrest patients <ul style="list-style-type: none"> 1. Can lead to a decrease in cardiac output, blood pressure, and perfusion 2. May not allow for the development of negative pressure between compressions 3. May lead to decrease in the perfusion of both the coronary vessels in the heart and cerebral vessels in the brain C. Spontaneously breathing patient 	<p>Discussion Question What are signs of overventilation?</p>

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	<ol style="list-style-type: none"> 1. Large amounts of air may become trapped in the alveoli. 2. Pressure in the chest will remain higher than it should. 3. May cause capillaries in the lungs to become compressed and obstruct blood flow 4. Would reduce the negative pressure in the chest 5. May reduce cardiac output, blood pressure, and perfusion of essential organs 	
10	<p>XXIX. Special Considerations of Airway Management and Ventilation— A Patient with a Stoma or Tracheostomy Tube</p> <p>A. A stoma is a surgical opening in the front of the neck.</p> <p>B. Tracheostomy</p> <ol style="list-style-type: none"> 1. Stoma may result from a tracheostomy, in which a cut was made in the trachea 2. A tracheostomy tube is often inserted into the stoma to hold it open. <p>C. Laryngectomy</p> <ol style="list-style-type: none"> 1. Stoma may result from a laryngectomy, in which all or part of the larynx has been removed. 2. Total laryngectomy—No longer any connection of the trachea to the mouth and nose 3. Partial laryngectomy—Some of the tracheal connection to the mouth and nose remains <p>D. Bag-valve-mask-to-tracheostomy-tube ventilation</p> <ol style="list-style-type: none"> 1. Device is designed so it can connect to the tracheostomy tube. 2. It may be necessary to seal the patient’s mouth and nose. 3. You may need to use a soft suction catheter first. 4. You may need to seal the tube and ventilate through the mouth and nose. <p>E. Bag-valve-mask-to-stoma ventilation</p> <ol style="list-style-type: none"> 1. Remove all coverings from the stoma. 2. Clear the stoma of foreign matter. 3. Keep the patient’s head straight. 4. Fit a mask over the stoma and hold the mask seal in place. 5. Squeeze the bag delivering ventilation and watch for adequate chest rise and fall. 6. Seal the nose and mouth if needed. <p>F. Mouth-to-stoma ventilation</p> <ol style="list-style-type: none"> 1. This method is not recommended because of exposure to respiratory 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are reasons a patient may have a stoma? • What is the difference between a partial and a total laryngectomy? <p>Teaching Tip Show students examples of tracheostomy tubes and demonstrate how the standard adapter for the bag-valve-mask fits the tube.</p>

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Minutes	Content Outline	Master Teaching Notes
	<p style="text-align: center;">secretions and droplets.</p> <ol style="list-style-type: none"> 2. Follow the same procedure for adult ventilation with a bag-valve mask, but form the mask seal over the stoma instead of the mouth. 3. If there is no other option, use a barrier device over the stoma. 	
5	<p>XXX. Special Considerations of Airway Management and Ventilation—Infants and Children</p> <ol style="list-style-type: none"> A. Establishing an airway <ol style="list-style-type: none"> 1. Place the infant’s head in a neutral position without hyperextension. 2. Place the child’s head in a neutral position and then only slightly extended. B. Providing positive pressure ventilation <ol style="list-style-type: none"> 1. Avoid excessive ventilation volume and pressures. 2. Gastric distension can impede lung inflation, cause vomiting or rupturing. C. Choosing a bag-valve-mask device <ol style="list-style-type: none"> 1. Use a device with a minimum volume of 450-500 mL without a pop-off valve. 2. Disable a pop-off valve if it is present. D. Maintaining a patent airway <ol style="list-style-type: none"> 1. Insert an oropharyngeal or nasopharyngeal airway if the airway cannot be maintained. 2. Insert an airway if prolonged ventilation is necessary. 	<p>Knowledge Application Ask students to instruct you in providing airway management and ventilation on a pediatric airway mannequin.</p>
5	<p>XXXI. Special Considerations of Airway Management and Ventilation—Patients with Facial Injuries</p> <ol style="list-style-type: none"> A. Blunt injury can cause swelling that may occlude the airway. <ol style="list-style-type: none"> 1. An airway adjunct may be necessary. 2. Avoid the use of a nasopharyngeal airway with mid-face trauma. 3. Positive pressure ventilation may be needed to force ventilation past the swollen airway. B. Bleeding into the pharynx may cause problems with airway management. 	<p>Discussion Question What are the challenges of airway management in patients with facial trauma?</p>
5	<p>XXXII. Special Considerations of Airway Management and Ventilation—Foreign Body airway Obstruction</p> <ol style="list-style-type: none"> A. Follow the procedure for foreign body airway obstruction to establish an airway in patients with known upper airway foreign body obstruction. B. Check for foreign body obstruction in unresponsive patients for whom attempts at ventilation have been unsuccessful. C. Responsive, choking patients 	

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 1. Instruct patient to cough. 2. Do not perform abdominal thrusts. 3. Place patient on high-concentration oxygen/ 4. Manage the patient as complete foreign body obstruction if breathing becomes weak and ineffective. 5. Signs of severe partial airway obstruction <ol style="list-style-type: none"> a. Cough that becomes silent b. Stridor heard on inhalation c. Increase in labored breathing 	
5	<p>XXXIII. Special Considerations of Airway Management and Ventilation—Dental Appliances</p> <ol style="list-style-type: none"> A. Dentures <ol style="list-style-type: none"> 1. If secure, leave in place. 2. If loose, remove them. B. Reassess mouth frequently 	
6	<p>XXXIV. Oxygen Therapy—Oxygen Cylinders</p> <ol style="list-style-type: none"> A. Cylinders are given letter designations according to their size. B. Duration of flow <ol style="list-style-type: none"> 1. The amount of oxygen in a tank can be determined from the gauge and the psi of pressure remaining. 2. Use a simple formula to determine the oxygen duration of a tank. 3. The flow rate is directly related to how fast oxygen is depleted from the tank. 	
6	<p>XXXV. Oxygen Therapy—Safety Precautions</p> <ol style="list-style-type: none"> A. Keep combustible materials away from the cylinder. B. Never smoke in any area where oxygen cylinders are in use or on standby. C. Store the cylinders below 125° F. D. Never use without a properly fitting regulator valve. E. Keep valves closed when cylinder is not in use. F. Keep cylinders secured. G. Never place any part of your body over the cylinder valve. 	<p>Discussion Question What precautions must be taken when handling and administering oxygen?</p>
6	<p>XXXVI. Oxygen Therapy—Pressure Regulators</p> <ol style="list-style-type: none"> A. A regulator reduces the high pressure in the cylinder to a safe range. <ol style="list-style-type: none"> 1. A regulator is attached by a yoke. 2. The yoke prevents a regulator from being attached to other types of gas. B. Types of regulators 	<p>Teaching Tip Show students examples of various oxygen delivery devices, cylinders, and regulators to familiarize them with the equipment.</p>

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	<ol style="list-style-type: none"> 1. High-pressure regulator <ol style="list-style-type: none"> a. Can provide 50 psi to power a flow-restricted, oxygen-powered ventilation device b. Has only one gauge and a threaded outlet c. No mechanism for controlling and adjusting the flow rate 2. Therapy regulator <ol style="list-style-type: none"> a. It can administer oxygen from 0.5 lpm to 25 lpm. b. It typically has two gauges, one indicating pressure and the other indicating measured flow of oxygen. c. The pressure decreases with the volume. d. The pressure is directly affected by ambient temperature. 	
6	<p>XXXVII. Oxygen Therapy—Oxygen Humidifiers</p> <ol style="list-style-type: none"> A. Oxygen humidifiers add moisture to oxygen that exits the tank. B. It consists of a container filled with sterile water. C. Oxygen leaving the regulator is forced through the water. D. Generally required only if oxygen is delivered over a long period of time. E. Humidified oxygen is recommended in asthma patients. 	<p>Teaching Tip Show and explain each of the devices as you talk about them. Pass equipment (as appropriate) around the classroom for students to touch and examine.</p>
6	<p>XXXVIII. Oxygen Therapy—Indications for Oxygen Use</p> <ol style="list-style-type: none"> A. Recognized indications <ol style="list-style-type: none"> 1. Cardiac or respiratory arrest 2. Positive pressure ventilation 3. Signs of hypoxia 4. SpO₂ reading less than 95% 5. Medical conditions 6. Altered mental status 7. Unresponsive 8. Injuries to any body cavity pr central nervous component 9. Multiple fractures and multiple soft tissue injuries 10. Severe bleeding 11. Hypoperfusion 12. Exposure to toxins B. Carefully asses the patient to determine the breathing status before deciding the method by which to supply oxygen. <ol style="list-style-type: none"> a. Determine if the respiratory rate is adequate and if the tidal volume is adequate in order to apply oxygen by mask or cannula. b. If either the respiratory rate or the tidal volume is inadequate, begin positive pressure ventilation with oxygen connected and flowing to 	<p>Discussion Question What are the indications for oxygen administration?</p>

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Minutes	Content Outline	Master Teaching Notes
	the ventilation device.	
6	<p>XXXIX. Oxygen Therapy—Hazards of Oxygen Administration</p> <p>A. Hazards</p> <ol style="list-style-type: none"> 1. Oxygen toxicity 2. Damage to the retina in premature newborns 3. Respiratory depression or respiratory arrest in patients with COPD <p>B. Never withhold oxygen from a COPD patient who is displaying any signs of hypoxia or who is suffering from respiratory failure or arrest.</p>	<p>Critical Thinking Discussion</p> <p>What are some situations in which you should be cautious in administering oxygen to patients?</p>
6	<p>XL. Oxygen Therapy—Oxygen Administration Procedures</p> <p>A. Explain to the patient why oxygen is needed, how it will be administered, and how the oxygen delivery device will fit.</p> <p>B. Procedure</p> <ol style="list-style-type: none"> 1. Check the cylinder to be sure it contains oxygen. 2. Remove the protective seal on the tank valve. 3. Open and then shut the valve to remove debris. 4. Place the yoke over the valve and align the pins. 5. Tighten the T-screw on the regulator. 6. Open the main cylinder valve about one-half turn to charge the regulator. 7. Attach the oxygen mask or nasal cannula tubing to the nipple of the regulator. 8. Open the flowmeter control. 9. Apply the oxygen mask or nasal cannula to the patient. 	<p>Teaching Tip</p> <p>If supply levels allow, give students the experience of having an oxygen mask on the face (with oxygen flowing) to increase empathy for patients.</p>
6	<p>XLI. Oxygen Therapy—Terminating Oxygen Therapy</p> <ol style="list-style-type: none"> A. Remove the mask or cannula. B. Turn off the oxygen regulator flowmeter control. C. Turn off the cylinder valve. D. Open the regulator valve. E. Turn the regulator flowmeter control off. 	
6	<p>XLII. Oxygen Therapy—Transferring the Oxygen Source: Portable to On-Board</p> <p>A. Switching over from a portable oxygen tank</p> <ol style="list-style-type: none"> 1. Do not disconnect the oxygen tubing while the mask is on the patient. 2. Remove the mask from the patient before attempting to switch over. 3. Reapply the mask once the oxygen has been reconnected and is flowing. <p>B. Oxygen tubing can become caught on equipment and stop the flow of</p>	<p>Class Activity</p> <p>Provide students with the opportunity for guided practice of the skills presented in this section.</p>

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Minutes	Content Outline	Master Teaching Notes
	oxygen, causing the patient to become hypoxic.	
6	<p>XLIII. Oxygen Therapy—Oxygen Delivery Equipment</p> <p>A. Nonrebreather mask</p> <ol style="list-style-type: none"> 1. It has an oxygen reservoir bag attached to the mask with a one-way valve that prevents the patient's exhaled air from mixing with the oxygen in the reservoir. 2. The flow from the oxygen cylinder should be set at a rate that prevents the reservoir bag from collapsing during inhalation. 3. You may need to coach the patient to breathe at a normal rate and depth. <p>B. Nasal cannula</p> <ol style="list-style-type: none"> 1. It provides a very limited oxygen concentration. 2. Delivered oxygen concentration ranges from 24 to 44 percent. 3. Indicated for a patient who is not able to tolerate a nonrebreather mask. 4. Consists of two soft nasal prongs connected by a thin tubing to the main oxygen source. <p>C. Other oxygen delivery devices</p> <ol style="list-style-type: none"> 1. Simple face mask 2. Partial rebreather mask 3. Venturi mask 4. Tracheostomy mask 	<p>Knowledge Application Describe a variety of patient conditions and ask students what type of oxygen delivery device would best suit the patient's needs.</p> <p>Class Activity Supply groups of students with a selection of oxygen delivery devices so that they can practice applying the devices on each other under your supervision.</p> <p>Video Clips Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access video clips on different types of oxygen delivery devices and pulse oximetry.</p>
10	<p>XI. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 10 Summary. 2. Complete Chapter 10 In Review questions. 3. Complete Chapter 10 Critical Thinking. <p>D. Assessments</p>	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why was the patient's mouth suctioned before manual airway maneuvers were used? • If the patient's gag reflex was intact, what other techniques could be used to keep the airway patent? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 1. Handouts 2. Chapter 10 quiz 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 11

Baseline Vital Signs, Monitoring Devices, and History Taking

170–180 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about taking vital signs, monitoring devices, and gathering patient history.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • How will the patient’s vital signs help you determine what is wrong with the patient? • What aspects of the patient’s medical history are important in determining the problem? • At what point is it appropriate to obtain the history and vital signs?
5	<p>II. Gathering Patient Information</p> <p>A. Assessment is the process of finding out about a patient’s condition.</p> <p>B. Some information gained during assessment is obvious—items at the scene, bruises, difficulty breathing.</p> <p>C. Some indications of a patient’s condition are less obvious—vital signs and medical history.</p> <p>D. Be aware of a patient’s feelings.</p> <p>E. Respect a patient’s dignity.</p>	<p>Teaching Tip</p> <p>Ask how students feel when asked medical questions by a health care provider</p> <p>Critical Thinking Discussion</p> <p>What are actions that show a health care provider respects a patient’s dignity?</p>
5	<p>III. Baseline Vital Signs—Breathing (Respiration)</p> <p>A. Breathing (respiratory) rate</p> <ol style="list-style-type: none"> 1. Observe the patient’s chest rise and fall. 2. Determine if the patient is in respiratory distress. 3. Assess the patient’s mental status. 4. Pay attention to speech patterns. 5. Count the number of breaths in a three-second period and multiply by two. <p>B. Breathing (respiratory) ruality</p>	<p>Video Clip</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a</p>

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	<ol style="list-style-type: none"> 1. Normal breathing 2. Shallow breathing 3. Labored breathing 4. Noisy breathing <p>C. Breathing (respiratory) rhythm</p> <ol style="list-style-type: none"> 1. The breathing rhythm is the regularity of respirations. 2. An abnormal respiratory rhythm in a patient with altered mental status may indicate medical illness, chemical imbalance, or brainy injury. 	<p>video clip providing an overview of vital sign assessment.</p>
<p>10</p>	<p>IV. Baseline Vital Signs—Pulse</p> <p>A. Location of pulses</p> <ol style="list-style-type: none"> 1. Carotid artery 2. Femoral artery 3. Radial artery 4. Brachial artery 5. Popliteal artery 6. Posterior tibial artery 7. Dorsalis pedis artery <p>B. Pulse rate</p> <ol style="list-style-type: none"> 1. 60–80 bpm in adults 2. 60–105 bpm in adolescents 3. 60–120 bpm for school aged-children 4. 80–150 bpm for preschoolers 5. 120–150 bpm for infants 6. 100–180 bpm for newborns <p>C. Irregular pulses</p> <ol style="list-style-type: none"> 1. Tachycardia is a heart rate greater than 100 bpm in adults. 2. Bradycardia is a heart rate less than 60 bpm in adults. <p>D. Taking a pulse</p> <ol style="list-style-type: none"> 1. Position the patient. 2. Use the tips of two or three fingers to palpate the artery. 3. Count the number of beats in a 30-second period, and then multiply by two. 4. If pulse is irregular, take it for a full minute. <p>E. Pulse quality and rhythm</p> <ol style="list-style-type: none"> 1. Strong pulse 2. Weak pulse 3. Regular pulse 	<p>Teaching Tip Have students locate their radial, brachial, carotid, and dorsalis pedis pulses.</p> <p>Discussion Question When should the carotid pulse be assessed?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource showing how to take a pulse.</p>

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Minutes	Content Outline	Master Teaching Notes
	4. Irregular pulse	
10	<p>V. Baseline Vital Signs—Skin</p> <p>A. Skin color</p> <ol style="list-style-type: none"> 1. Paleness, or pallor 2. Blue-gray color, or cyanosis 3. Red color, or flushing 4. Yellow color, or jaundice 5. Mottling <p>B. Skin temperature</p> <ol style="list-style-type: none"> 1. Relative skin temperature is common measurement. 2. Place back of your hand against the patient's skin. 3. Normal skin feels warm to the touch. 4. Abnormal skin temperatures <ol style="list-style-type: none"> a. Hot b. Cool c. Cold 5. Changes in skin temperature over a period of time, or different temperatures in various parts of the body can be significant. <p>C. Skin condition</p> <ol style="list-style-type: none"> 1. Normal skin is dry. 2. Wet or moist skin <ol style="list-style-type: none"> a. Hypoperfusion b. Poisoning c. A heat-related, cardiac, or diabetic emergency 3. Cool and moist skin is described as clammy. 4. Diaphoreses describes profuse sweating. 5. Abnormally dry skin may be a sign of spine injury or dehydration. <p>D. Capillary refill</p> <ol style="list-style-type: none"> 1. Capillary refill time is the time it takes for compressed capillaries to fill up again with blood. 2. Reliable in infants and younger children 3. Affected by a cold environment, preexisting conditions of poor circulation, and certain medications 4. Count the time it takes a location on the skin to turn from white to color after pressing. 5. A longer than normal time may indicate hypoperfusion. 	

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Minutes	Content Outline	Master Teaching Notes
	<p>6. Capillary refill time alone cannot be used to determine shock but can be combined with other signs and symptoms.</p>	
<p style="text-align: center;">10</p>	<p>VI. Baseline Vital Signs—Pupils</p> <p>A. Size</p> <ol style="list-style-type: none"> 1. Pupils that are dilated may indicate cardiac arrest or use of certain drugs. 2. Pupils that are constricted may indicate a central nervous system disorder, the use of narcotics, glaucoma medications, or a brightly lit environment. <p>B. Equality</p> <ol style="list-style-type: none"> 1. Pupils of unequal size <ol style="list-style-type: none"> a. Stroke b. Head injury c. Artificial eye d. Disease of the eye e. Use of certain eye drops f. Injury to the eye or nerve that controls the pupil 2. Anisocoria is a condition in which the pupils are slightly unequal but remain reactive to light. <p>C. Reactivity</p> <ol style="list-style-type: none"> a. Pupils will constrict when light is shined on them. b. Pupils will dilate when shaded. c. Consensual reflex indicates that both pupils will respond in the same way even if only one is exposed to a stimulus. d. Fixed and dilated pupils <ol style="list-style-type: none"> i. Pupils do not change when exposed to light. ii. Can result from cardiac arrest, severe head injury, severe hypoxia, or extremely poor perfusion to the brain 	<p>Discussion Question What is consensual pupil response?</p>
<p style="text-align: center;">10</p>	<p>VII. Baseline Vital Signs—Blood Pressure</p> <p>A. Blood pressure is the pressure exerted on the walls of the arteries by the blood flowing through them.</p> <ol style="list-style-type: none"> 1. Systolic blood pressure is the amount of pressure exerted on the walls of the arteries during the contraction of the left ventricle. <ol style="list-style-type: none"> a. Pulse is an assessment of the systolic blood pressure. b. The systolic blood pressure is identified by the first distinct sound 	<p>Discussion Question What do systolic and diastolic pressures each represent?</p>

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Minutes	Content Outline	Master Teaching Notes
	<p style="text-align: center;">(Korotkoff sound) heard when measuring the blood pressure by auscultation.</p> <ol style="list-style-type: none"> 2. Diastolic blood pressure is the amount of pressure exerted on the walls of the arteries while the ventricle is at rest. <ol style="list-style-type: none"> a. Diastolic blood pressure depends on the amount of blood in the artery and the diameter of the artery. b. The diastolic blood pressure is recorded when the systolic sound disappears or changes drastically. B. Normal range of systolic blood pressure <ol style="list-style-type: none"> 1. Adult male: Add the patient's age to 100 mmHg. 2. Adult female: Add the patient's age to 90 mmHg. 3. Child age one to ten years: Multiply age by two and then add 80 mmHg. 4. Child or adolescent greater than ten years: Minimum of 90 mmHg C. Blood pressure alone cannot be used to determine shock but can be combined with other signs and symptoms. D. Blood pressure should not be measured in children less than three years of age. E. Pulse pressure is the difference between systolic blood pressure and diastolic blood pressure. <ol style="list-style-type: none"> 1. Increases or decreases in the pulse pressure can indicate possible conditions or injuries. 2. EMT should record any abnormalities in the pulse pressure. F. Low blood pressure <ol style="list-style-type: none"> 1. Can cause an inadequate delivery of oxygen to cells and organs, known as shock or hypoperfusion 2. Can decrease as a result of blood or fluid loss, or blood vessel dilation 3. Conditions that may cause shock or hypoperfusion include severe bleeding, heart attack, heart failure, or spine injury. G. High blood pressure (hypertension) <ol style="list-style-type: none"> 1. Can result from a variety of causes 2. Can cause damage to heart and blood vessels leading to heart failure, stroke, ruptured blood vessels, and kidney disease H. Methods of measuring blood pressure <ol style="list-style-type: none"> 1. Auscultation—Listening for the systolic and diastolic sounds through a stethoscope 2. Palpation—Feeling for the return of the pulse as the cuff is deflated 	<p>Discussion Question What are the expected vital signs for adults?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access the AHA blood pressure site.</p> <p>Class Activity Have pairs of students assess each others' pulse, breathing, blood pressure, and pupils and record the values on a piece of paper.</p>
	VIII. Baseline Vital Signs—Testing Orthostatic Vital Signs	Knowledge Application

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Minutes	Content Outline	Master Teaching Notes
10	<p>A. Obtaining orthostatic vital signs</p> <ol style="list-style-type: none"> 1. Place the patient in a supine position. 2. Measure blood pressure and heart rate. 3. Then stand the patient up and reassess blood pressure and heart rate. 4. Orthostatic test is positive if heart rate increases by greater than 10–20 bpm and the systolic blood pressure decreases by 10–20 mmHg. 5. Orthostatic vital signs test is commonly known as tilt test. <p>B. Be aware of false positive results, as in the case of elderly patients who experience a normal drop in systolic blood pressure when rising.</p> <p>C. If a patient cannot be placed in a standing position, move him to a seated position.</p> <p>D. Do not perform this test on patients with possible spine injuries.</p>	<p>Give several sets of vital signs and have students determine if they are within expected ranges for the patient’s age. For abnormal values, ask students what the findings might indicate.</p> <p>Discussion Question How do breathing, pulse, and blood pressure change with age?</p>
5	<p>IX. Baseline Vital Signs—Vital Sign Reassessment</p> <ol style="list-style-type: none"> A. Vital signs should be taken and recorded at least every 15 minutes. B. Take and record vital signs every five minutes if the patient is unstable. C. Reassess vital signs immediately following every medical intervention. 	<p>Critical Thinking Discussion What changes would you expect in the vital signs of a patient with on-going bleeding?</p>
15	<p>X. Monitoring Equipment—Pulse Oximeter: Oxygen Saturation Assessment</p> <p>A. Pulse oximetry is a method of detecting hypoxia by measuring oxygen saturation levels in the blood.</p> <p>B. A pulse oximeter is used to measure the level of hemoglobin saturated with oxygen.</p> <ol style="list-style-type: none"> 1. Device is clipped onto or attached to a patient’s finger, toe, earlobe, or across the bridge of the nose. 2. A red light or infrared light shines through the tissue to a photosensor, detecting the amount of hemoglobin saturated with oxygen. 3. The read is provided as a percent of hemoglobin saturated with oxygen, as percent SpO₂. <p>C. Indications for pulse oximetry</p> <ol style="list-style-type: none"> 1. The pulse oximeter should be applied in any situation where the patient’s oxygen status is a concern or when hypoxia may be suspected. 2. This reading is commonly described as the “sixth vital sign.” <p>D. Limitations of the pulse oximeter</p> <ol style="list-style-type: none"> 1. Any conditions that interfere with the blood flowing to the area where the probe is attached may produce an erroneous reading. 2. The device does not provide a direct measurement of the blood oxygen content. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How does pulse oximetry work? • What are some reasons pulse oximetry readings may be inaccurate? <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource about pulse oximetry.</p>

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	<ul style="list-style-type: none"> 3. The reading does not indicate the amount of oxygen being off-loaded to the cells, the oxygenation status of the cells, or the ability of the cells to use the oxygen. E. Procedure for determining the SpO₂ reading <ul style="list-style-type: none"> 1. Connect the sensor to the SpO₂ monitor device. 2. Attach the probe to the fingertip. 3. Turn on the device and wait for a reading. 4. Match the pulse reading on the monitor with the patient's. 5. If a poor signal is detected, check that the probe is on properly. 6. Once an accurate reading is achieved, reassess every five minutes in an unstable patient or every 15 minutes in a stable patient. 	
15	<p>XI. Monitoring Equipment—Noninvasive Blood Pressure Monitor</p> <ul style="list-style-type: none"> A. A noninvasive blood pressure monitor is a device that automatically measures a blood pressure. <ul style="list-style-type: none"> 1. Can be set to reassess at selected intervals 2. Can be activated manually 3. Alarms can be set to signal upper and lower limits. B. Procedure for noninvasive blood pressure monitoring <ul style="list-style-type: none"> 1. Obtain blood pressure reading by the auscultation method first. 2. Position the cuff. 3. Activate the device. 4. Obtain the reading. 	<p>Class Activity Give students the opportunity for guided practice using pulse oximetry and noninvasive blood pressure monitors.</p> <p>Critical Thinking Discussion Why should you first obtain a blood pressure by auscultation before relying on noninvasive blood pressure monitor values?</p>
5	<p>XII. Preparing to Take the History—Gain Control of the Scene</p> <ul style="list-style-type: none"> A. Display competence, confidence, and compassion through appearance and professional manner. B. Obtain the history or parts of the history from Emergency Medical Responders, relatives, or other care givers at the scene. C. Gain cooperation from the patient and others at the scene. 	<p>Teaching Tip Give examples from your experience of how you have gained control of scenes.</p>
5	<p>XIII. Preparing to Take the History—Achieve a Smooth Transition of Care</p> <ul style="list-style-type: none"> A. Announce your arrival at the scene. B. Gain information from Emergency Medical Responders before making patient contact. C. Give immediate attention to an unresponsive or obviously injured patient. 	<p>Class Activity Provide students with opportunities to establish control of scenes and establish rapport with patients during lab scenarios.</p>
5	<p>XIV. Preparing to Take the History—Reduce the Patient's Anxiety</p> <ul style="list-style-type: none"> A. Bring order to the environment. 	

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	<ol style="list-style-type: none"> 1. Have televisions and radios turned down. 2. Ask that dogs be removed from the area. 3. Make sure that children are supervised. <p>B. Introduce yourself.</p> <ol style="list-style-type: none"> 1. Give your name. 2. Ask for the patient's name. <p>C. Gain patient consent.</p> <ol style="list-style-type: none"> 1. Ask the patient for consent. 2. Assume implied consent if the patient is unable to answer. 3. Talk with a patient who refuses consent to describe the need for treatment. 4. Enlist the aid of a family member for help in obtaining consent. <p>D. Position yourself.</p> <ol style="list-style-type: none"> 1. Position yourself at a comfortable level in relation to the patient. 2. Maintain a distance of about 18 inches from the patient during conversation. <p>E. Use communication skills.</p> <ol style="list-style-type: none"> 1. Maintain eye contact as much as possible. 2. Speak calmly and deliberately. 3. Speak slowly and clearly to elderly patients. 4. Speak in a calm and confident manner to others at the scene. 5. Make your body movements purposeful. 6. Actively listen to what the patient is telling you. <p>F. Be courteous.</p> <p>G. Use touch when appropriate.</p>	<p>Teaching Tip Demonstrate to students how you would introduce yourself to a patient.</p> <p>Discussion Question What are some ways you can establish rapport with patients and gain their confidence?</p> <p>Critical Thinking Discussion What are some things that could alienate a patient during your initial approach to him?</p> <p>Teaching Tip Give examples from your experience that illustrate how courtesy can make a difference.</p>
5	<p>XV. Preparing to Take the History—Maintain Control</p> <p>A. The greater the distractions at the scene, the higher the anxiety level of the patient.</p> <p>B. Some scenes cannot be controlled.</p> <ol style="list-style-type: none"> 1. Crowd is hostile. 2. Family is emotionally charged or upset. 3. Threats are being made toward you. 4. There is a risk of fire, explosion, or other hazards. <p>C. If the scene is uncontrolled, move as rapidly as possible to remove yourself and the patient.</p>	<p>Discussion Question What are some distractions that you can control on emergency scenes?</p>
10	<p>XVI. Taking the History—Statistical and Demographic Information</p> <p>A. Chief complaint is the reason why the EMS crew was called to the scene.</p>	

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	<ul style="list-style-type: none"> B. Proceed with the history once the chief complaint is obtained. C. Statistical and demographic data <ul style="list-style-type: none"> 1. Date 2. Time 3. Identifying data 	<p>Teaching Tip Take the history of a preprogrammed assistant instructor to demonstrate the technique to students.</p>
10	<p>XVII. Taking the History—Current Health Status</p> <ul style="list-style-type: none"> A. Current health status focuses on patient’s present state of health. B. Factors of current health <ul style="list-style-type: none"> 1. Current medications 2. Allergies 3. Tobacco use 4. Alcohol, drugs, and related substances 5. Diet 6. Recent screening tests 7. Immunizations 8. Exposure to environmental hazards 9. Use of safety equipment 10. Family history 	<p>Discussion Question What are the components of the current health status?</p>
10	<p>XVIII. Taking the History—Techniques for Taking a Patient History</p> <ul style="list-style-type: none"> A. Note taking <ul style="list-style-type: none"> 1. Document the information. 2. Do not try to remember all the information provided. B. Types of questions <ul style="list-style-type: none"> 1. Open-ended questions—Require the patient to provide a description 2. Closed-ended questions—Require a “yes” or “no” answer from the patient C. Active listening techniques <ul style="list-style-type: none"> 1. Facilitation 2. Reflection 3. Clarification 4. Empathetic response 5. Confrontation 6. Interpretation 	<p>Teaching Tip Give several examples of open-ended and closed-ended questions.</p> <p>Discussion Question Describe each of the following active listening techniques: facilitation, reflection, clarification, confrontation, empathetic response, and interpretation.</p>
20	<p>XIX. Taking the History—Standardized Approach to History Taking</p> <ul style="list-style-type: none"> A. The SAMPLE history <ul style="list-style-type: none"> 1. A medical history gathered by asking questions 	<p>Teaching Tip Remind students that SAMPLE and OPQRST are only memory aids. Have</p>

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	<ol style="list-style-type: none"> 2. Mnemonic <ol style="list-style-type: none"> a. Signs and symptoms b. Allergies c. Medications d. Pertinent past history e. Last oral intake f. Events leading to the injury or illness B. Assessing patient complaints: OPQRST <ol style="list-style-type: none"> 1. Questions to ask when assessing the patient's chief complaint or major symptoms 2. Mnemonic <ol style="list-style-type: none"> a. Onset b. Provocation/palliation/position c. Quality d. Radiation e. Severity f. Time 	<p>students give you examples of actual questions that would be used to obtain the information represented by the mnemonics. Hold students to this concept throughout the class. Do not allow students to simply say, "I would get a SAMPLE history," when discussing case studies and scenarios.</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • Why is it important to ask about all of the medications a patient takes, including herbal medications, over-the-counter medications, and prescribed drugs? • How do you determine what is pertinent in a medical history and what is not? <p>Knowledge Application</p> <p>Have students suggest pertinent questions for a selection of chief complaints.</p> <p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource describing OPQRST information.</p>
10	<p>XX. Taking the History—Sensitive Topics or Special Challenges</p> <ol style="list-style-type: none"> A. Sensitive topics <ol style="list-style-type: none"> 1. Remain nonjudgmental. 2. Only ask questions that are pertinent to your assessment. 3. Respect the patient's privacy. B. Special challenges <ol style="list-style-type: none"> 1. Silence 2. Overly talkative patient 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some ways to get information from a silent patient? • How should you approach history-taking

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	<ol style="list-style-type: none"> 3. Patient with multiple symptoms 4. Anxious patient 5. Angry and hostile patient 6. Intoxicated patient 7. Crying patient 8. Depressed patient 9. Confusing behavior or history 10. Patient with limited intelligence 11. Language barrier 12. Hearing impairment 13. Visual impairment 14. Talking with friends and family 15. Pediatric patient 16. Elderly patient 	<p style="text-align: center;">with elderly patients?</p> <p>Class Activity Have students divide into groups of three or four. Each student should practice taking the history of another student while the remaining student or students observe the process, then give constructive feedback. Debrief the class at the end of the activity and record important learning points on the white board.</p>
10	<p>XXI. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 11 Summary. 2. Complete Chapter 11 In Review questions. 3. Complete Chapter 11 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 11 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why did the EMTs first ask Mr. Li for history, then confirm with his daughter? • Why were Mr. Li's vital signs checked repeatedly? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at

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		www.bradybooks.com

Detailed Lesson Plan

Chapter 12

Scene Size-Up

205–240 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about the special considerations of scene size-up.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What are some reasons the house may be dark? • What actions should you take to ensure your safety at this scene?
20	<p>II. Take the Necessary Standard Precautions and Other Personal Protection Precautions</p> <p>A. Size up the scene to ensure safety.</p> <p>B. Standard Precautions</p> <ol style="list-style-type: none"> 1. Appropriate Standard Precautions will reduce risk. 2. Plan Standard Precautions when you receive the call from dispatch. 3. Make additional assessment of equipment needed at the scene. 4. Consider gloves standard protective equipment. <p>C. Personal protective equipment (PPE)</p> <ol style="list-style-type: none"> 1. PPE is any type of equipment that can be put on to reduce the risk of personal injury or illness. 2. PPE may range from simple gloves to complex breathing apparatus. 3. Do not use any PPE for which you have not been specially trained. 4. Use the same level of personal protection required for other personnel on the scene. 	<p>Teaching Tip</p> <p>Show students examples of protective equipment, such as eye protection, helmets, and turnout gear. Pass the equipment around to allow students to touch and examine the equipment.</p> <p>Discussion Question</p> <p>Why is the EMT's safety placed above that of the patient and bystanders?</p> <p>Critical Thinking Discussion</p> <p>You have forgotten to put on gloves at the scene of a vehicle collision and have gotten some of the patient's blood on your hands? What should you do?</p> <p>Weblink</p> <p>Go to www.bradybooks.com</p>

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		<p>and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access International Association of Fire Fighters Occupational Health Resources.</p>
15	<p>III. Determine Scene Safety—Consider Dispatch Information</p> <ul style="list-style-type: none"> A. Ensuring scene safety should begin well before the EMT reaches the scene. B. The dispatch call provides some information about the necessary Standard Precautions. C. Dispatchers may not have complete information or may have been given false information. D. A seemingly routine call may involve unexpected hazards. E. Remain on alert to the possibility of different circumstances than expected upon arrival. 	<p>Teaching Tip Discuss any particular industries or situations in your area that pose particular hazards to emergency personnel.</p> <p>Class Activity Divide students into small groups of three or four students. Provide each group with an index card describing dispatch information and an initial description of the scene. Give each group ten minutes to discuss potential hazards and how they will minimize danger to themselves, the patient, and bystanders. Each group will then read their card aloud to the class and describe their assessment of the situation and proposed actions to minimize hazards.</p>
20	<p>IV. Determine Scene Safety—Consider the Need for Additional or Special Resources</p> <ul style="list-style-type: none"> A. Call for additional resources or specially trained personnel. B. Not calling for additional resources or specially trained personnel may put everyone at the scene at considerable risk. 	<p>Teaching Tip Describe your system's procedures for requesting additional resources.</p>

V. Determine Scene Safety—Consider Scene Characteristics

A. Crash scenes

1. Determine if the vehicle is stable or if you can make it stable.
2. Look for power lines.
3. Check for jagged metal or broken glass.
4. Find out if the air bags have been deployed.
5. Determine if fuel is leaking.
6. Identify fire or hazardous materials.
7. Protect yourself and others from traffic.

B. Other rescue scenes

1. The EMT must take responsibility for summoning appropriate rescue personnel and equipment to the scene.
2. Examples
 - a. Unstable surfaces and slopes
 - b. Ice
 - c. Water
 - i. Swimming pools
 - ii. Open water
 - iii. Moving water
 - d. Toxic substances and low-oxygen areas
 - i. A spill, leak, or fire
 - ii. A confined space
 - iii. Multiple patients with similar symptoms

C. Crime scenes

1. Allow police to secure the scene before attempting to enter a known crime scene.
2. If you suspect a crime even though one has not been reported, wait for police backup.
3. Take precautions at known or suspected crime scenes.
 - a. Arriving at the scene
 - i. Turn off siren and emergency lights several blocks from the scene.
 - ii. If the scene appears hostile, drive on and await police backup.
 - iii. Assess the scene before becoming involved in it.
 - b. Studying the crowd
 - i. Assess any crowd that may have gathered.
 - ii. Do not become pulled into a chaotic or hysterical crowd.
 - iii. Await backup if the crowd seems hostile.
 - c. Approaching the scene
 - i. Walk on the grass when possible.

Weblink

Go to www.bradybooks.com and click on the mykit link for *Prehospital Emergency Care*, 9th edition to access a NHTSA roadside vehicle safety article.

Discussion Questions

- What hazards can you anticipate at crash scenes?
- How can you make crash scenes safer?
- What additional resources may you need to control a crash scene?

Weblinks

Go to www.bradybooks.com and click on the mykit link for *Prehospital Emergency Care*, 9th edition to access web resources on power line safety and ice hazards.

Discussion Questions

- What are some indications that a scene might involve toxic substances or low-oxygen atmosphere?
- What are some safety guidelines for approaching a potential crime scene?

Critical Thinking Discussion

You have an injured patient on the sidewalk in an urban area. A number of bystanders have begun to gather. Someone shouts, "Just take him to the hospital. Why aren't you moving him?" Another person shouts,

- ii. Hold a flashlight at your side.
 - iii. Walk in single file, with the last person carrying the jump kit.
 - iv. Have only the first person carry a flashlight.
 - v. Make a mental map of possible places for concealment.
 - vi. Look at windows and corners.
 - vii. Stand to the side of a door when you knock on it.
- d. At the patient's side
- i. Make your first priority protecting yourself and your partner.
 - ii. Limit the number of responders to the number required to care for the patient.
 - iii. Do not allow bystanders to disturb the patient.
 - iv. Introduce yourself to the patient carefully.
 - v. Be alert to the possibility that the patient may be a perpetrator.
 - vi. Have one EMT keep a watch on the bystanders and area if possible.
 - vii. Remember that your task is to help the patient not to solve the crime.
 - viii. Follow local protocol for assisting police in collecting evidence.
 - ix. Do not disturb evidence if possible.
 - x. Follow local protocol and standard operating policies and procedures for patients who are dead upon arrival.

D. Barroom scenes

1. People consuming alcohol makes any situation volatile and unpredictable.
2. Problems in barrooms are compounded because the patrons often know each other and have long-standing friendships or feuds.
3. The darkness of a barroom makes it difficult for the EMTs eyes to adjust.
4. Be patient and do not antagonize patrons to avoid violent confrontations.
5. Have your partner survey the patrons at all times.
6. Do not reply to verbal threats, but do not ignore them.
7. Call for police support if the situation becomes threatening.

E. Car passengers

1. EMTs can be misinterpreted by occupants of a vehicle.
2. Approach a parked vehicle carefully.
 - a. Park at least one car-length behind the vehicle with wheels turned slightly to the left.
 - b. Align your headlights in the middle of the trunk of the vehicle.
 - c. Turn your headlights to high beam.
 - d. Write down the license number of the vehicle and leave it at the radio.
 - e. Note the number of people in the car and their positions.

“They’d be moving him if he was a cop or somebody they knew, that’s for sure.” How should you handle this situation?

	<ul style="list-style-type: none"> f. Be alert to unseen occupants as you approach the vehicle. g. Have your partner open the passenger door a split second before you open the driver's door. h. Carry an object that you can throw if the occupant becomes violent. i. If you have to retreat, immediately get into your vehicle and back up rapidly. 	
20	<p>VI. Determine Scene Safety—Protect the Patient</p> <ul style="list-style-type: none"> A. Emergencies outside of the home can expose the patient to a wide range of environmental factors. B. Emergencies outside of the home can expose the patient to the curiosity of the public. C. Be aware of how external factors affect the patient. D. Control the scene to make it safe for the patient or move the patient quickly to a safer environment. 	<p>Discussion Question What are some ways of protecting patients from additional harm at the scene?</p>
10	<p>VII. Determine Scene Safety —Protect Bystanders</p> <ul style="list-style-type: none"> A. Making sure the bystanders are safe is one of your responsibilities during scene size-up. B. If hazards cannot be eliminated, remove the bystanders from the scene. C. Bystanders who do not disperse should be dealt with by police. 	
15	<p>VIII. Determine Scene Safety—Control the Scene</p> <ul style="list-style-type: none"> A. The EMT must take action to create a workable environment. B. Follow a list of basic measures. <ul style="list-style-type: none"> 1. Provide light. 2. Consider moving furniture. 3. Consider moving the patient. 4. Maintain an escape route. 5. Pay attention to bystanders. 6. Control the scene. 7. Stay calm. 8. Use tact and diplomacy. 9. Be flexible. 10. Be open-minded. 11. Be alert. 12. Be compassionate. 	
10	<p>IX. Determine Scene Safety—Maintain Situation Awareness</p> <ul style="list-style-type: none"> A. Scene size-up is a dynamic process. B. EMS personnel must continuously assess the emergency scene for unusual characteristics. C. Always maintain a situational awareness. 	<p>Teaching Tip Emphasize that it is important to be comfortable with skills and knowledge. The less comfortable you are, the more attention you must focus on the task, and</p>

		the less attention you will be able to pay to things going on around you.
40	<p>X. Determine the Nature of the Problem— Determine the Mechanism of Injury</p> <p>A. The mechanism of injury (MOI) refers to how the patient was injured.</p> <p>B. The index of suspicion is the degree of your anticipation that the patient has been injured based on your knowledge that certain mechanisms produce certain types of injuries.</p> <p>C. Only physical examination can be used to determine the actual patient injuries.</p> <p>D. Falls</p> <ol style="list-style-type: none"> 1. Evidence <ol style="list-style-type: none"> a. Fallen ladders b. Collapsed scaffolding c. Ropes in a tree or on buildings d. Trees in immediate proximity to patient e. Stairs f. Balconies g. Roofs h. Windows 2. Inspect the scene to develop an idea of the types of injuries. <ol style="list-style-type: none"> a. Distance patient fell b. Surface patient landed on c. Body part that impacted first <p>E. Motor vehicle crashes</p> <ol style="list-style-type: none"> 1. Common types of crashes <ol style="list-style-type: none"> a. Head-on or frontal collision b. Rear-end collision c. Side or lateral-impact collision d. Rotational impact collision e. Rollover 2. Look for signs of external impact. <ol style="list-style-type: none"> a. Deformity to the vehicle greater than 20 inches b. Intrusion into the passenger compartment c. Displacement of a vehicle axle d. Rollover 3. Look for signs of patient impact inside the passenger compartment. <ol style="list-style-type: none"> a. Impact marks on the windshield b. Missing rearview mirror c. Collapsed steering wheel d. Broken seat 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What is the index of suspicion? • What types of events have a high index of suspicion for injuries? <p>Teaching Tip</p> <p>Assure students that this is a broad overview of types of trauma and illnesses for illustrative purposes and that much more time will be devoted to learning about trauma and illnesses throughout the course</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are factors that can influence the severity of injuries sustained from a fall? • What are factors that can influence the index of suspicion for injuries in motor vehicle collisions? <p>Knowledge Application</p> <p>Show students photographs of motor vehicle collisions and ask them to determine how each picture compares with the considerations for determining severity that are described in this section of the text.</p>

	<ul style="list-style-type: none"> e. Side-door damage f. Cracked or smashed dashboard g. Deformed pedals h. Use of restraint devices and deployment of air bags <p>F. Motorcycle crashes</p> <ul style="list-style-type: none"> 1. Types of impacts <ul style="list-style-type: none"> a. Head-on b. Angular impact c. Ejection d. Laying the bike down 2. Determine whether the patient was wearing a helmet. <p>G. Recreational vehicle crashes</p> <ul style="list-style-type: none"> 1. Crush-type injuries are common. 2. Collisions with trees, rocks and other vehicles may occur. 3. Be alert for “clothesline” -type injuries. <p>H. Penetrating trauma</p> <ul style="list-style-type: none"> 1. Expose and assess the body to look for stabbing or gunshot wounds when reported, even if blood is not visible. 2. Be sure to log roll the patient to inspect the posterior body for open wounds. 3. Inspect the body carefully for open wounds. <p>I. Blast injuries</p> <ul style="list-style-type: none"> 1. Common causes of explosions <ul style="list-style-type: none"> a. Gasoline b. Fireworks c. Natural gas d. Propane e. Acetylene f. Grain dust in grain elevators g. Criminal intent 2. Look for injuries caused by the associated pressure wave. <ul style="list-style-type: none"> a. Blast b. Flying debris c. Collision between patient and the ground or another object 	<p>Critical Thinking Discussion In what ways should an emergency scene look different to an EMT than it does to a lay person?</p>
20	<p>XI. Determine the Nature of the Problem—Determine the Nature of the Illness</p> <ul style="list-style-type: none"> A. The nature of the illness (NOI) is the cause of the medical condition. B. Do not attempt to diagnose the patient’s illness. C. Gather information about the nature of the patient’s complaint. D. Base your initial questions on the information provided by the dispatcher. 	<p>Discussion Question What are some potential clues to medical conditions that you might note at the scene?</p>

	<p>E. Be aware that some patients and their families may mislead you about the actual nature of the illness.</p> <p>F. Inspect the scene for clues about the illness.</p> <p>G. Assess the physical position and condition of the patient for clues about the illness.</p> <ol style="list-style-type: none"> 1. Tripod position may indicate respiratory distress or cardiac compromise. 2. Lying very still with legs drawn up to the chest may indicate abdominal pain. 3. A fruit odor may indicate a diabetic condition. 4. A loss of bowel or bladder control may indicate a seizure or stroke. <p>H. Environmental conditions may provide clues about the illness.</p> <ol style="list-style-type: none"> 1. Cold, wet clothing suggest hypothermia. 2. A hot, humid environment suggests a heat emergency. 3. Wooded areas suggest a possible snakebite or spider bite. 4. A beach suggests bites and stings from marine life. 5. More than one person complaining of similar symptoms suggests the possibility of poisoning from some gas. 	<p>Critical Thinking Discussion What can you do to develop your skills in noticing pertinent things at emergency scenes?</p>
5	<p>XII. Determine the Number of Patients</p> <ol style="list-style-type: none"> A. The last major element of the scene size-up is determining the total number of patients. B. The number of patients may be obvious, as in the case of a single patient with chest pain. C. The number of patients may be difficult to determine, as in a multiple-vehicle accident or carbon monoxide poisoning. D. Call for additional resources if the conditions are beyond your ability to handle. E. Initiate you local multiple-casualty plan if there are more patients than your unit can effectively handle. F. Try to call for additional assistance before making contact with patients. 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Describe any experiences you've had in which there was an additional patient who was not immediately apparent to illustrate the importance of thoroughly assessing the scene. • Give a brief overview of your system's MCI plan. <p>Discussion Question In what types of situations should you suspect that there is more than one patient?</p> <p>Critical Thinking Discussion What are some distractions that might prevent you from considering the presence of additional patients?</p>
10	<p>XIII. Follow-Up</p> <ol style="list-style-type: none"> A. Answer student questions. 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why did EMT McKeown leave the door

B. Case Study Follow-Up

1. Review the case study from the beginning of the chapter.
2. Remind students of some of the answers that were given to the discussion questions.
3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers.

C. Follow-Up Assignments

1. Review Chapter 12 Summary.
2. Complete Chapter 12 In Review questions.
3. Complete Chapter 12 Critical Thinking.

D. Assessments

1. Handouts
2. Chapter 12 quiz

- open when she entered the residence?
- What can be learned about this patient's situation from the scene size-up?

Class Activity

Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.

Teaching Tips

- Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter.
- The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 13

Patient Assessment

500–600 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about all of the components of the patient assessment procedures they will perform on every patient they encounter during their career as EMTs.</p> <p>B. Case Studies</p> <ol style="list-style-type: none"> 1. Present Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion: Call One</p> <ul style="list-style-type: none"> • Is the scene safe? • What are some possible mechanisms of injury? • What will you do first? <p>Case Study Discussion: Call Two How will you respond to the daughter? Do any initial questions come to mind?</p>
	PART 1. SCENE SIZE-UP	
20	<p>II. Scene Size-Up</p> <p>A. Take necessary Standard Precautions.</p> <p>B. Evaluate scene hazards and ensure scene safety.</p> <ol style="list-style-type: none"> 1. Personal protection 2. Protection of the patient 3. Protection of bystanders <p>C. Determine the mechanism of injury or the nature of the illness.</p> <ol style="list-style-type: none"> 1. Trauma patient 2. Medical patient <p>D. Establish the number of patients.</p> <p>E. Ascertain the need for additional resources to manage the scene or the patients.</p>	<p>Teaching Tip Use questioning to determine what students recall from your initial discussion of scene size-up.</p> <p>Discussion Question What are the purposes of the scene size-up?</p>
	PART 2. PRIMARY ASSESSMENT	

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Minutes	Content Outline	Master Teaching Notes
5	<p>III. Primary Assessment</p> <p>A. Purposes</p> <ol style="list-style-type: none"> 1. Determine if the patient is injured or ill. 2. Identify and manage immediate life threats (PRIORITY). 3. Decide whether to transport immediately, or to proceed with further assessment and care on the scene. <p>B. Steps</p> <ol style="list-style-type: none"> 1. Form a general impression of the patient. 2. Assess the level of consciousness (mental status). 3. Assess the airway. 4. Assess breathing. 5. Assess circulation. 6. Establish patient priorities. 	<p>Teaching Tip</p> <p>Write the six steps of the primary assessment on the white board to give students a map for the upcoming information.</p>
5	<p>IV. Form a General Impression of the Patient—Determine if the Patient Is Injured or Ill</p> <p>A. Form a general impression as you approach the patient.</p> <ol style="list-style-type: none"> 1. Age group and sex of the patient 2. Well or ill 3. Stable or unstable 4. Injured or uninjured <p>B. Immediately address obvious severe or life-threatening injuries.</p> <ol style="list-style-type: none"> 1. If you suspect spine injury, stabilize the patient's head and spine. 2. Control severe bleeding. <p>C. Remember that your general impression may change as you gather more information.</p> <p>D. Be alert for general clues to the patient's condition throughout the assessment.</p> <p>E. Condition of an injured patient</p> <ol style="list-style-type: none"> 1. Penetrating trauma: result of force that pierces the skin and body tissues 2. Causes include bullet, knife, or other hard and sharp object (screwdriver, ice pick, and so on). 3. Blunt trauma: a force that impacts the body without penetration 4. Causes include a blow, car crash, fall, fight, or collapse of a building. <p>F. Clues to an ill patient</p> <ol style="list-style-type: none"> 1. Presence of pills in the room 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some initial indications that a patient is sick? • What might indicate to you that a patient has been injured? <p>Critical Thinking Discussion</p> <p>Why is it important to develop a general impression before proceeding with further assessment of the patient?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 2. Patient in bed/undressed in the daytime 3. Evidence of vomiting 	
5	<p>V. Form a General Impression of the Patient—Obtain the Chief Complaint</p> <ol style="list-style-type: none"> A. Chief complaint is patient’s answer to the question “Why did you call us?” B. If patient cannot answer, ask family or bystanders. C. If no one knows, you will have to infer from observation. D. Common categories of chief complaint <ol style="list-style-type: none"> 1. Pain 2. Abnormal function 3. EMT observation of something not right E. Patient may be suffering more serious condition(s) than the chief complaint. F. Ask additional questions that refine the chief complaint. G. Use the information to make decisions about treatment and transport. 	
5	<p>VI. Form a General Impression of the Patient—Identify Immediate Life Threats During the General Inspection</p> <ol style="list-style-type: none"> A. Obvious life threats are those you can see right away as you first approach the patient. B. Treat immediately before continuing assessment. 	
5	<p>VII. Form a General Impression of the Patient—Establish In-Line Stabilization</p> <ol style="list-style-type: none"> A. If you suspect spine injury <ol style="list-style-type: none"> 1. Place one hand on each side of the patient’s head. 2. Gently bring the head into a position in which the nose is in line with the navel. 3. Position the head neutrally so it is not tipped backward or forward. B. Maintain manual in-line stabilization until patient is completely immobilized to a backboard. 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Emphasize the importance of establishing stabilization of the cervical spine in patients who may have spine trauma. • Demonstrate in-line manual stabilization of the cervical spine.
5	<p>VIII. Form a General Impression of the Patient—Position the Patient for Assessment</p> <ol style="list-style-type: none"> A. If patient is prone (face down), quickly log roll him into a supine position (facing up). B. Before performing the log roll, assess the following areas. <ol style="list-style-type: none"> 1. Posterior thorax and lumbar regions 	

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 2. Vertebral column 3. Buttocks 4. Posterior aspects of the lower extremities <p>C. Inspect and palpate for the following.</p> <ol style="list-style-type: none"> 1. Major bleeding 2. Deformities 3. Open wounds 4. Bruises 5. Burns 6. Swelling or tenderness <p>D. Occlude any open wounds to posterior thorax quickly before log roll.</p> <p>E. If you suspect spine injury, establish in-line stabilization before log rolling patient onto his back.</p>	
20	<p>IX. Assess Level of Consciousness (Mental Status)—Assess the Level of Responsiveness</p> <p>A. Assess the patient using the AVPU mnemonic.</p> <ol style="list-style-type: none"> 1. A: Alertness and orientation <ol style="list-style-type: none"> a. Are the patient’s eyes open? b. Is he able to speak to you? c. Does he appear agitate, confused, or disoriented? 2. V: Responsiveness to verbal stimulus <ol style="list-style-type: none"> a. Does the patient open his eyes and respond, or try to respond, only when you speak to him? b. If he does not speak, does he obey your commands (such as “squeeze my fingers”)? c. Does he stare off, talk inappropriately, mumble, or do nothing? 3. P: Responsiveness to painful stimulus <ol style="list-style-type: none"> a. Central painful stimuli <ol style="list-style-type: none"> i. Trapezius pinch ii. Supraorbital pressure iii. Sternal rub iv. Earlobe pinch v. Armpit pinch b. Peripheral painful stimuli <ol style="list-style-type: none"> i. Nail bed pressure ii. Pinch to web between thumb and index finger 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Use examples from your experience to illustrate each level of responsiveness represented by AVPU. • Explain that the purpose of applying a painful stimulus to a patient who is not alert and who has not responded to verbal stimuli is to assess the nervous system response, not to unnecessarily inflict discomfort. • Show students (without actually inflicting pain) how each of the suggested methods for assessing response to pain is performed. <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are acceptable ways of determining a patient’s response to painful stimuli? • What are the differences between decorticate and decerebrate posturing? • What are the concerns for patients who have an altered mental status?

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> iii. Pinch to finger, toe, hand, or foot c. Patient response <ul style="list-style-type: none"> i. Purposeful movement: patient tries to remove stimulus or avoid pain (pushes you away, grabs your hand). ii. Nonpurposeful movement: flexion or extension posturing d. Problems with some types of painful stimuli <ul style="list-style-type: none"> i. Always assess central painful stimuli, as peripheral painful stimuli are less accurate indicators of brain's responsiveness. ii. Sternal rub has been questioned as producing possibly inaccurate results and being too damaging to patient. 4. U: Unresponsiveness <ul style="list-style-type: none"> a. No response to verbal or painful stimuli b. Loss of gag and cough reflexes c. Inability to control tongue and epiglottis d. Priority for emergency care and transport B. Document the level of responsiveness in very specific language (such as "made a facial grimace and grasped my hand"). C. Take only a few seconds to assess patient's mental status. 	<p>Class Activity Have students use one of the methods described to apply painful stimuli to themselves to increase their awareness of what it is they will be subjecting patients to.</p> <p>Knowledge Application Give several descriptions of patients and ask students to determine the level of consciousness for each patient.</p> <p>Critical Thinking Discussion What is the importance of determining the patient's mental status early in the assessment process?</p>
5	<p>X. Assess the Airway—Determine Airway Status</p> <ul style="list-style-type: none"> A. In the responsive patient <ul style="list-style-type: none"> 1. If alert patient is talking without difficulty, or crying, assume airway is patent and move on to assessment of breathing. 2. If alert patient has stridor, has difficulty speaking, is gasping, or is not speaking at all, examine for a partially blocked airway. 3. If you have any doubt at all that airway is open, open it. B. In the unresponsive or severely altered mental status patient, check and open airway. 	
5	<p>XI. Assess the Airway—Open the Airway</p> <ul style="list-style-type: none"> A. Open and maintain airway with any or all of the following techniques. <ul style="list-style-type: none"> 1. Manual airway maneuvers <ul style="list-style-type: none"> a. Head-tilt (if you do not suspect spine injury) b. Chin-lift (if you do not suspect spine injury) c. Jaw-thrust (if you suspect a spine injury) 2. Suction and/or finger sweeps 3. Airway adjuncts to maintain patient airway 4. Manual thrusts to abdomen, or chest thrust and back blows for infants 5. Positioning of patient without spine injury in a modified lateral position 	

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Minutes	Content Outline	Master Teaching Notes
5	<p>XII. Assess the Airway—Indications of Partial Airway Occlusion</p> <p>A. Snoring</p> <ol style="list-style-type: none"> 1. Indicates that tongue and epiglottis are partially blocking the airway 2. Use the head-tilt, chin-lift, or jaw-thrust maneuver to relieve the obstruction. 3. If you still hear snoring, insert an oropharyngeal airway (for unresponsive patient without gag reflex). 4. If patient gags <ol style="list-style-type: none"> a. Remove oropharyngeal airway immediately. b. Be prepared to suction. c. Consider insertion of a nasopharyngeal airway. <p>B. Gurgling</p> <ol style="list-style-type: none"> 1. Indicates that a liquid substance is in the airway 2. Open the patient's mouth and suction out the contents. 3. If necessary, turn the patient onto his side and sweep out the mouth with your fingers. 4. Patient may unintentionally bite down on your fingers; place a bite stick between his teeth if necessary. 5. Be prepared and do not waste time; use whatever device or technique is most readily available to clear the airway. <p>C. Crowing and stridor</p> <ol style="list-style-type: none"> 1. Indicates swelling or muscle spasms 2. Inserting anything (fingers or tools) into the patient's mouth can cause dangerous spasms and total obstruction of airway. 3. Begin ventilation with a bag-valve-mask device with supplemental oxygen. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What action should you take when a patient is snoring? • What do gurgling sounds in the airway indicate? • What should be suspected when stridor or crowing sounds are heard? <p>Critical Thinking Discussion</p> <p>Why would using an oral or nasal airway be unlikely to improve the airway of a patient with stridor or crowing noises?</p>
15	<p>XIII. Assess Breathing—Assess Rate and Quality of Breathing</p> <p>A. Look at the chest for the following.</p> <ol style="list-style-type: none"> 1. Inadequate tidal volume 2. Abnormal respiratory rate 3. Bradypnea (breathing too slowly) causes <ol style="list-style-type: none"> a. Hypoxia (especially child or infant) b. Drug overdose (depressants) c. Head injury d. Stroke 	<p>Teaching Tip</p> <p>Much of this section is review for students. Ask questions to determine students' comprehension and retention of the material to guide your approach to the material.</p> <p>Discussion Question</p> <p>What are signs of inadequate oxygenation?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> e. Hypothermia f. Toxic inhalation 4. Tachypnea (breathing too rapidly) causes <ul style="list-style-type: none"> a. Hypoxia b. Fever c. Pain d. Drug overdose e. Stimulant drug use f. Shock g. Head or chest injury h. Stroke i. Other medical conditions 5. Retractions 6. Use of the neck muscles 7. Nasal flaring 8. Excessive abdominal muscle use 9. Tracheal tugging 10. Pale, cool, clammy skin 11. Cyanosis 12. A pulse oximeter reading of less than 95 percent 13. Asymmetrical movement of the chest wall B. Listen and feel for air movement and escape of warm, humidified air. C. Absent or inadequate breathing: Immediately begin positive pressure ventilation with supplemental oxygen. <ul style="list-style-type: none"> 1. Absence of breathing <ul style="list-style-type: none"> a. No chest wall movement b. No sound of air moving in or out of nose or mouth 2. Inadequate breathing <ul style="list-style-type: none"> a. Insufficient or ineffective respiratory rate b. Inadequate tidal volume c. Signs of inadequate oxygenation d. Signs of serious respiratory distress D. Adequate breathing <ul style="list-style-type: none"> a. Chest is rising and falling adequately. b. You hear and feel good air exchange. c. Respiratory rate is adequate. d. No evidence of serious respiratory distress. e. Consider administering oxygen if adequately breathing patient is 	<p>Knowledge Application Describe the findings of breathing assessment for several patients. Ask students whether breathing is adequate or inadequate, and what interventions may be needed.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are ways in which EMTs can provide positive pressure ventilation for patients with inadequate breathing? • What oxygen delivery device provides the highest concentration of oxygen for spontaneously breathing patients?

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Minutes	Content Outline	Master Teaching Notes
	<p style="text-align: center;">injured or ill.</p> <p>E. Oxygen therapy in the patient with adequate breathing</p> <ol style="list-style-type: none"> 1. Based on the following <ol style="list-style-type: none"> a. Patient's condition b. Signs and symptoms of hypoxia, poor perfusion, or respiratory distress c. SpO₂ reading 2. Adminster oxygen at 15 lpm by nonrebreather mask if you have any doubt about whether patient needs it or if any of the following are present. <ol style="list-style-type: none"> a. Shows deteriorating mental status b. Becomes anxious, confused, sleepy, or disoriented c. Exhibits hypoxia, poor perfusion, or respiratory distress d. Complains of chest discomfort or shortness of breath <p>F. Adequate oxygen based on SpO₂ reading of 95 percent or higher</p>	
3	<p>XIV. Assess Circulation—Assess the Pulse</p> <ol style="list-style-type: none"> A. If you cannot feel a radial (wrist) pulse, check for carotid (neck) pulse. B. Find the groove between the larynx and bulk of neck muscles; feel carotid pulse there with index and middle fingers. C. Maintain in-line stabilization when assessing trauma patient for pulse. D. If patient is an infant, check brachial (upper arm) pulse instead of carotid. E. Palpate pulse to determine the following. <ol style="list-style-type: none"> 1. If pulse is present or absent 2. Approximate heart rate 3. Regularity and strength F. Note if the pulse is less than 60 or more than 100. G. If carotid pulse is absent, begin CPR and apply automatic external defibrillator (AED). H. If patient is in cardiac arrest and is at least one year old, immediately apply AED and begin rhythm analysis. I. If you did not witness cardiac arrest and more than four to five minutes have passed since onset, immediately begin CPR and perform five cycles of 30 compressions followed by two ventilations; then apply AED and begin rhythm analysis. 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Ask students to recall the locations at which the pulse can be assessed. • Remind students to consider isolated findings, such as an irregular pulse, in the context of the patient's overall presentation.
	<p>XV. Assess Circulation—Identify Major Bleeding</p>	

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Minutes	Content Outline	Master Teaching Notes
2	<ul style="list-style-type: none"> A. If you see large pools of blood or blood-soaked clothing, cut clothing away to expose area. B. Major bleeding is either arterial (bright red and spurting) or venous (dark red, steady, and rapid). C. Immediately place gloved hand on wound and apply direct pressure. D. Once bleeding is controlled, apply a pressure dressing. E. If there is only minor bleeding, do not waste time dealing with it during primary assessment. 	
10	<p>XVI. Assess Circulation—Assess Perfusion</p> <ul style="list-style-type: none"> A. Skin color <ul style="list-style-type: none"> 1. Observe color in the following locations. <ul style="list-style-type: none"> a. Lips; mucous membranes of the mouth b. Mucous membranes of the eyelids c. Under the tongue d. At the nail beds (least accurate indicator) 2. Be aware that temperature affects skin color (colder = more pale; hotter = more flushed). 3. Pale skin <ul style="list-style-type: none"> a. Decrease in perfusion, onset of shock (hypoperfusion) b. May be due to bleeding, internal bleeding, or other cause of shock 4. Cyanotic skin (blue-gray) <ul style="list-style-type: none"> a. Reduced oxygenation from chest injuries, blood loss, pneumonia or pulmonary edema b. Late sign of hypoperfusion 5. Red skin <ul style="list-style-type: none"> a. Increase in amount of blood circulating in blood vessels in skin b. May be due to anaphylactic or vasogenic shock, poisoning, overdose, diabetes or other medical condition, alcohol ingestion, local inflammation, cold exposure, or severe heat stroke 6. Yellow skin (jaundice) indicates liver damage, chronic alcoholism, or endocrine disturbance caused by increased bilirubin. B. Skin temperature—Test by placing your bare fingers or back of your hand on patient’s abdomen, face, or neck (warm = normal). <ul style="list-style-type: none"> 1. Hot skin may result from a hot environment or elevated body temperature. 2. Causes of cool skin 	<p>Discussion Question What are causes of pale, cool, and moist skin?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> a. Decreased perfusion (shock) b. Exposure to cold temperatures c. Fright or anxiety d. Drug overdose e. Other medical conditions that interfere with the body's ability to regulate temperature 3. Cause of cold skin (may also be firm or stiff) <ul style="list-style-type: none"> a. Frostbite b. Significant exposure to cold c. Immersion in cold water d. Severe hypothermia 4. Causes of cool and clammy (moist) skin <ul style="list-style-type: none"> a. Blood loss b. Fright, nervousness, or anxiety c. Pain d. Other medical conditions e. Shock (hypoperfusion) (most common sign) C. Skin condition <ul style="list-style-type: none"> 1. Dry skin may indicate dehydration or heat stroke. 2. Moist skin may indicate the following. <ul style="list-style-type: none"> a. Sweating in a hot environment b. Exercise or exertion c. Fever d. Heart attack e. Hypoglycemia f. Shock (hypoperfusion) g. Many other conditions D. Capillary refill <ul style="list-style-type: none"> 1. More reliable indicator for children than adults 2. Most reliable when assessed at room temperature 3. Infant, child, and adult male: no more than two seconds 4. Adult female: no more than three seconds 5. Elderly patient: no more than four seconds E. Shock (hypoperfusion) <ul style="list-style-type: none"> 1. Life-threatening condition 2. Signs <ul style="list-style-type: none"> a. Pale, cool, clammy skin b. Altered mental status 	<p>Class Activity Ask students to check their capillary refill under different conditions, such as when they are warm and when their hands are cold, and to compare the results.</p> <p>Discussion Question What are indications of hypoperfusion?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> c. Severe bleeding 3. Treatment (begin during primary assessment) <ul style="list-style-type: none"> a. Control major bleeding. b. Splint bone or joint injuries if this does not delay transport. c. Provide positive pressure ventilation with supplemental oxygen or oxygen at 15 lpm by nonrebreather mask. d. Keep the patient warm. e. Consider immediate transport. 	<p>Critical Thinking Discussion How are the body's compensatory mechanisms responsible for the signs of hypoperfusion?</p>
15	<p>XVII. Establish Patient Priorities</p> <ul style="list-style-type: none"> A. If the patient is unstable <ul style="list-style-type: none"> 1. Conduct a rapid secondary assessment (60–90 seconds). 2. Transport the patient immediately. 3. Consider requesting advanced life support (ALS) intercept en route. 4. Conduct a full secondary assessment en route to the hospital. B. If the patient is stable, conduct a full secondary assessment and further treatment at the scene before transporting. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are factors that would increase the patient's priority for transport? • What things need to be done prior to transport, even when immediate transport is needed? <p>Knowledge Application Given a number of primary survey descriptions, students should be able to differentiate between patients needing immediate transport and those whose need is less immediate.</p>
	<p>PART 3. SECONDARY ASSESSMENT</p>	
5	<p>XVIII. Secondary Assessment</p> <ul style="list-style-type: none"> A. Identify additional signs, symptoms, and complaints. B. Manage any potential immediate life threats as found. C. Note non-life-threatening injuries and treat after examination or en route. D. If patient is stable and noncritical, manage injuries on scene as found. E. Cut away any clothing that interferes with your ability to properly examine a trauma patient. F. When in doubt about how detailed an assessment is needed, complete the entire secondary assessment. 	

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75	<p>XIX. Overview of Secondary Assessment: Anatomic and Body Systems Approaches, Baseline Vital Signs, and History—Performing the Secondary Assessment: An Anatomic Approach</p> <p>A. Assess the head.</p> <ol style="list-style-type: none"> 1. Skull and scalp <ol style="list-style-type: none"> a. Inspect for deformities, contusions, abrasions, burns, lacerations, or swelling. b. Maintain spinal stabilization if applicable. c. Palpate the entire head from the top down using your palms, not your fingers. d. Note any crepitation, depressions, deformities, protrusions, tenderness, or evidence of bleeding (look at your gloved hands). 2. Ears <ol style="list-style-type: none"> a. Inspect for trauma to external auditory canal, deformities, contusions, abrasions, burns, lacerations, or swelling. b. Look inside the ear for blood or other fluid. c. Do not pack the ears; use a loose dressing to absorb any blood or fluid. d. Look behind the ears for discoloration over the mastoid process (late indication of skull or head injury). 3. Face <ol style="list-style-type: none"> a. Inspect the entire facial region for deformities, contusions, abrasions, burns, lacerations, or swelling. b. Palpate for deformity, swelling, and tenderness. c. Clear the airway with suction and insert oropharyngeal airway if necessary. d. Palpate facial bones for deformity, instability, and crepitation. e. See if the patient can move his lower jaw without pain. f. Look for singed or burned eyebrows, nasal hair, beard, or hairline (likely sign of upper airway burn). g. If you note stridor, consider positive pressure ventilation with supplemental oxygen, immediate transport, and advanced life support intervention. h. If a medical patient, ask him for a big smile with teeth showing to check for facial asymmetry (sign of paralysis of facial muscles on one side). 4. Eyes 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Demonstrate the assessment of each anatomical region of the body as you discuss it. • Use a whole-part-whole approach to demonstrating the secondary assessment. Demonstrate a head-to-toe assessment at the beginning of this section. As you discuss each anatomical region, demonstrate the assessment of that region only. At the end of the section, combine all of the parts to demonstrate the whole skill. <p>Discussion Question</p> <p>What should you look for when assessing the head, face, eyes, ears, nose, and mouth?</p>

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	<ul style="list-style-type: none"> a. Inspect for deformities, contusions, abrasions, punctures, burns, lacerations, or swelling. b. Look especially for lacerations or trauma to eyelids and eyeballs. c. Do not try to remove any foreign objects imbedded in eyes. d. If the patient has any injuries to eyelids, assume eyes are also injured. e. Do not force eyelids open. f. Do not apply any pressure to eyes. g. If patient is unresponsive and wearing hard contact lenses, remove them; place in marked containers and transport with patient. h. Check that both pupils respond equally and simultaneously to light. i. Sluggish response to light is indication of poor perfusion to brain, high level of carbon dioxide, or brain injury. j. Unequal size of pupils usually indicates head injury or stroke; but if patient is otherwise alert and oriented, cause may be eyedrops, direct trauma to one eye, or localized nerve injury. k. Fixed and dilated pupils usually indicate injury to brain stem or influence of narcotic. l. Test visual acuity and extraocular muscle movement. m. Inspect sclera (whites of eyes) for red or yellow coloring. n. Blood in anterior eye is sign of a forceful blow to the head. <p>5. Nose</p> <ul style="list-style-type: none"> a. Inspect for deformities, contusions, abrasions, punctures, burns, lacerations, or swelling. b. Look for fluid or blood, drainage, nasal flaring, and singed nasal hair. c. Control nosebleed by pinching nostrils together. d. If the patient has a nosebleed that cannot easily be controlled, he may swallow and vomit blood; do not incorrectly assess this as internal bleeding in stomach. e. Leakage of cerebrospinal fluid indicates a skull fracture. f. Singed nasal hair may indicate an upper airway burn. g. Palpate for deformity, swelling, or instability. h. Be prepared to suction airway. <p>6. Mouth</p> <ul style="list-style-type: none"> a. Inspect inside of mouth for deformities, contusions, abrasions, punctures, burns, lacerations, or swelling. b. Look for loose or missing teeth/dentures and discoloration of mucosa. 	<p>Class Activity Have students practice each step of the secondary assessment before having them attempt an entire head-to-toe survey. Establish that students are successful in each sub-part before combining the parts into a complete assessment.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on simulated patient assessments.</p>

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	<p>significant pneumothorax).</p> <ol style="list-style-type: none"> 4. Look for paradoxical movement (sign of flail segment). 5. Feel the chest to confirm findings. 6. Palpate the sternum. 7. Inspect and palpate the shoulder girdle for deformity, crepitation, and tenderness. 8. If the patient is not immobilized, roll him forward to assess posterior thorax. 9. Inspect and palpate entire anterior and lateral chest. 10. Auscultation <ol style="list-style-type: none"> a. Listen with stethoscope for breathing—present/absent, equal/unequal, normal/abnormal. b. Compare the sounds of lobes on both sides of chest. c. If patient is wheezing, note whether it is diffuse or isolated. d. Fluid collection in lung produces crackles (rales). e. Coughing may indicate inhalation of smoke, chemicals, or other gases. f. If cough is productive, note color, consistency, amount, and odor of mucus. D. Assess the abdomen. <ol style="list-style-type: none"> 1. Examine the abdomen with the patient lying flat, if possible. 2. Signs that patient is in great abdominal pain <ol style="list-style-type: none"> a. Knees drawn up to chest b. Fast, shallow breathing 3. Expose abdomen and inspect all four anterior quadrants and lateral aspects for deformities, contusions, abrasions, punctures, burns, or lacerations. 4. Look for impaled objects or open wounds with protruding organs. 5. Look for swelling (may be from air, fluid, or blood). 6. Note any discoloration around navel or in flank areas. 7. If patient has a colostomy or ileostomy bag, leave in place, cover, and be careful not to cut. 8. Before you palpate, ask patient about any pain; palpate for rigidity, stiffness, tenderness, pain, or distention, and watch for patient's response. 9. Pulsating abdominal mass may indicate weakened abdominal aorta; complete rapid secondary assessment and transport immediately. 10. If patient can stand up, perform heel drop test for pain; if he cannot 	<p>Discussion Question What are alternate ways of assessing the abdomen for pain?</p>

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	<p style="text-align: center;">stand, perform heel-jar test.</p> <ol style="list-style-type: none"> 11. Stabilize any impaled object in place. 12. Cover evisceration with moist sterile dressing and seal with occlusive dressing. <p>E. Assess the pelvis.</p> <ol style="list-style-type: none"> 1. Expose and examine for deformities, contusions, abrasions, punctures, burns, lacerations, or swelling. 2. Do not palpate if there is an obvious injury. 3. Note any loss of bladder control, bleeding, or priapism (persistent erection of penis; sign of possible spinal cord injury). 4. Assess pelvis and pubic bone for instability, tenderness, and crepitation. 5. Expose and inspect genitalia if injury is suspected; control bleeding with direct pressure. 6. During genital examination, treat patient with respect regardless of gender, explain what you are doing and why, and shield him from other people's view. <p>F. Assess the lower extremities.</p> <ol style="list-style-type: none"> 1. Assess for deformities, contusions, abrasions, punctures, burns, lacerations, swelling, or abnormal positioning. 2. In a medical patient, look for excessive swelling around the ankles. 3. Palpate the extremity beginning with groin area and moving toward foot for deformities, angulation, crepitation, or depressions. 4. Remove shoes/boots (except ski boots) if you suspect injury to ankles/feet; cut socks away if necessary. 5. Assess pulses. <ol style="list-style-type: none"> a. Dorsalis pedis pulse (top surface of foot) b. Posterior tibial pulse (inner ankle bone) c. Compare pulses; check skin color, temperature, and condition. d. Absent pulses and cyanotic or pale and cool skin indicate possible blocked artery. e. Absent pulses indicate severe blood loss and shock. 6. Motor function <ol style="list-style-type: none"> a. Have patient move his toes and push his feet against your hands to check for equality of strength in both legs. b. Paralysis may indicate head or spine injury or stroke. 7. Sensation <ol style="list-style-type: none"> a. Ask patient to identify which toe you touch, without him seeing. b. Pinch the foot to elicit a pain response. 	<p>Discussion Question What is the process of assessing the extremities?</p>

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	<ul style="list-style-type: none"> c. Repeat for both feet, making sure patient cannot see which foot you are testing. d. If patient is unresponsive, watch his face for a response. G. Assess the upper extremities. <ul style="list-style-type: none"> 1. Assess for deformities, contusions, abrasions, punctures, burns, lacerations, or swelling. 2. Palpate from shoulder to fingertips for deformity, crepitation, swelling, pain, or tenderness. 3. Pulses <ul style="list-style-type: none"> a. Assess radial (wrist) pulse in both arms. b. Assess color, temperature, and condition of both hands. 4. Motor function <ul style="list-style-type: none"> a. Check equality of strength in both hands by having patient squeeze your fingers. b. Ask medical patient to close both eyes and hold arms straight out for ten seconds to test for arm drift (inability to hold both arms out steady). 5. Sensation <ul style="list-style-type: none"> a. Ask patient to identify which finger you are touching without letting him see. b. Pinch his hand and note the response. c. If patient is unresponsive, watch his face for a response to hand pinch. d. Repeat process for other hand and document responses. H. Assess the posterior body. <ul style="list-style-type: none"> 1. If spine injury is not suspected and patient is not immobilized, roll him onto his side. 2. Assess posterior body for deformities, contusions, abrasions, punctures, burns, lacerations, or swelling. 3. Palpate for deformities and tenderness. 4. Use caution; do not palpate if patient complains of any pain or tenderness around vertebrae. 5. If patient is already immobilized, do not roll him onto his side; slide your hand under him to check for any obvious deformity or pain. 	
20	XX. Overview of Secondary Assessment: Anatomic and Body Systems Approaches, Baseline Vital Signs, and History—A Body Systems	

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	<p>Approach</p> <p>A. Realize that all body systems are linked and that an injury in one part of the body may affect other parts.</p> <p>B. Body system assessment should include, but not be limited to, the following.</p> <ol style="list-style-type: none"> 1. Respiratory (pulmonary) system <ol style="list-style-type: none"> a. Chest shape and symmetry b. Accessory muscle use (retractions) c. Auscultation (normal and abnormal breath sounds) 2. Cardiovascular system <ol style="list-style-type: none"> a. Peripheral and central pulse (rate, rhythm, strength, location) b. Blood pressure (systolic, diastolic, pulse pressure) 3. Neurologic system <ol style="list-style-type: none"> a. Mental status (AVPU, orientation) b. Posture and motor activity (appropriateness of posture and movement, arm drift) c. Facial expression (anxiety, depression, anger, fear, sadness, pain, facial symmetry or droop) d. Speech and language (slurred, garbled, aphasia) e. Mood (nature, intensity, suicidal ideation) f. Thought and perceptions <ol style="list-style-type: none"> i. Thought process (logic, organization) ii. Thought content (unusual, unpleasant) iii. Perceptions (unusual, auditory hallucinations, visual hallucinations) g. Memory and attention (orientation to person, place, time, purpose) 4. Musculoskeletal system <ol style="list-style-type: none"> a. Pelvic region (symmetry, tenderness) b. Lower extremities (symmetry, superficial findings, range of motion, sensory, motor function) c. Upper extremities (symmetry, superficial findings, range of motion, sensory, motor function) d. Peripheral vascular system (tenderness, temperature, distal pulses) e. Perfusion (distal pulses, skin color, temperature, condition) f. Posterior body (symmetry, contour, superficial findings, flank tenderness, spinal column tenderness) 	
	XXI. Overview of Secondary Assessment: Anatomic and Body Systems	

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Minutes	Content Outline	Master Teaching Notes
10	<p>Approaches, Baseline Vital Signs, and History—Assess Baseline Vital Signs</p> <ul style="list-style-type: none"> A. Breathing (rate and tidal volume) B. Pulse (location, rate, strength, regularity) C. Skin (temperature, color, condition) D. Capillary refill E. Blood pressure (both systolic and diastolic) F. Pupils (equality, size, rate of reactivity) G. SpO₂ 	
10	<p>XXII. Overview of Secondary Assessment: Anatomic and Body Systems Approaches, Baseline Vital Signs, and History—Obtain a History</p> <ul style="list-style-type: none"> A. Mnemonic SAMPLE can help EMT remember to collect all necessary information. <ul style="list-style-type: none"> 1. S: Signs and symptoms 2. A: Allergies 3. M: Medications 4. P: Pertinent past medical history 5. L: Last oral intake 6. E: Events prior to the incident B. Mnemonic OPQRST is used to evaluate chief complaint and any other complaints. C. When the EMT takes the history depends on whether the patient is trauma or medical, responsive or unresponsive, stable or unstable. D. History is much more important in assessing medical patient than trauma patient. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • Why should the vital signs and physical exam precede the history in trauma patients? • Why should the history precede the physical exam and vital signs in responsive medical patients?
10	<p>XXIII. Secondary Assessment: Trauma Patient</p> <ul style="list-style-type: none"> A. Rapid secondary assessment (rapid head-to-toe exam) B. Modified secondary assessment (exam focused on a specific injury site) C. Choice of which type of secondary assessment <ul style="list-style-type: none"> 1. Depends on mechanism of injury 2. Depends on findings in primary assessment 	<p>Teaching Tip Give examples of how the approach to the secondary assessment is modified according to the patient's needs.</p> <p>Discussion Question What are examples of patients who should receive a modified secondary assessment?</p>

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		<p>Knowledge Application Give examples of medical complaints and trauma situations and ask students how they would adapt their approach to the secondary assessment in each case.</p> <p>Critical Thinking Discussion What additional kinds of knowledge will help you determine how to modify the secondary exam for various patients?</p>
10	<p>XXIV. Reevaluate the Mechanism of Injury—Significant Mechanisms of Injury</p> <p>A. Mechanisms of injury that often produce critical trauma</p> <ol style="list-style-type: none"> 1. Ejection (partial or complete) from vehicle in crash 2. Crash that kills anyone in same passenger compartment as patient 3. Fall of greater than 20 feet 4. Rollover of vehicle the patient was in 5. High-speed vehicle collision 6. Intrusion of greater than 12 inches into passenger compartment or greater than 18 inches at any site on vehicle 7. Pedestrian/bicyclist struck by a vehicle 8. Motorcycle crash at greater than 20 mph with separation of rider from motorcycle 9. Blunt or penetrating trauma resulting in altered mental status 10. Penetrating injuries to head, neck, torso, or extremities above knee or elbow 11. Blast injuries from explosion 12. Seat-belt injuries 13. Collisions in which seat belts were not worn (even with air bags) 14. Impact causing deformity to steering wheel 15. Collision that results in prolonged extrication <p>B. Special considerations for infants and children</p> <ol style="list-style-type: none"> 1. Fall of greater than ten feet, or two to three times the child's height 2. Bicycle collision with a motor vehicle 3. Pedestrian occupant in vehicle collision at a medium speed 4. Any vehicle collision in which infant or child was unrestrained 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are significant mechanisms of injury? • In addition to the significant mechanisms of injury in adults, what are some other considerations for infants and children? <p>Class Activity Bring in news stories about injuries, from the newspaper or television station web page. Read the stories and have students determine the mechanism of injury.</p>

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	<ul style="list-style-type: none"> 5. All other mechanisms of injury listed above as significant for adult 6. Physiological differences between adult and child <ul style="list-style-type: none"> a. Children compensate for blood loss for longer than adults but then decompensate faster. b. Therefore, child may appear to be well even though he is as severely injured as adult who shows obvious signs of shock. c. It is therefore crucial to rely on mechanism of injury, not on appearance, when assessing a child. d. Provide treatment according to mechanism of injury. 	
5	<p>XXV. Rapid Secondary Assessment: Trauma Patient with Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Continue Spine Stabilization</p> <ul style="list-style-type: none"> A. Maintain in-line spine stabilization until patient is completely immobilized to a backboard. B. One EMT can perform rapid secondary assessment while the other maintains manual stabilization. C. Never release manual spine stabilization until immobilization is completed. 	<p>Teaching Tip Reassure students that they are constructing an important foundation of knowledge, upon which they will continue to build through the rest of the course.</p>
5	<p>XXVI. Rapid Secondary Assessment: Trauma Patient with Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Consider an Advanced Life Support Request</p> <ul style="list-style-type: none"> A. Life-threatening problems which justify calling for advanced life support <ul style="list-style-type: none"> 1. Airway trauma 2. Occluded airway 3. Suspicion that air from injured lung may be trapped in chest cavity B. Advanced airway maneuvers or chest decompression can save these patients. C. Follow local protocols and consult medical direction. 	
5	<p>XXVII. Rapid Secondary Assessment: Trauma Patient with Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Reconsider the Transport Decision</p> <ul style="list-style-type: none"> A. Transport usually occurs after the following. <ul style="list-style-type: none"> 1. Rapid secondary assessment 2. Assessment of baseline vital signs 	

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	<ol style="list-style-type: none"> 3. Gathering of SAMPLE history 4. Completion of appropriate emergency care <p>B. New information discovered during assessment can necessitate immediate transport at any stage in the process.</p>	
15	<p>XXVIII. Rapid Secondary Assessment: Trauma Patient with Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Reassess Mental Status</p> <p>A. Causes of decreased mental status</p> <ol style="list-style-type: none"> 1. Compromised airway 2. Inadequate breathing 3. Hypoxia 4. Blood loss 5. Poor perfusion 6. Poor oxygenation 7. Brain injury <p>B. Types of injury causing the above</p> <ol style="list-style-type: none"> 1. Bleeding or trauma to mouth, face, or neck 2. Head injuries 3. Chest injuries 4. Abdominal injuries 5. Bone injuries associated with blood loss <p>C. Assessment—Alert and oriented patient should be able to identify the following.</p> <ol style="list-style-type: none"> 1. Today's year, month, and day 2. Where he is at this moment 3. Person with him 4. Himself, by his full name <p>D. Verbal stimulus—Possible patient responses</p> <ol style="list-style-type: none"> 1. Inappropriate words 2. Incomprehensible sounds (mumbling) 3. Eye opening; obeying a command 4. No response <p>E. Painful stimulus—Possible patient responses</p> <ol style="list-style-type: none"> 1. Purposeful movements (grabbing your hand, pushing you away) 2. Nonpurposeful movements (flexion or extension posturing) 3. No response 	
	XXIX. Rapid Secondary Assessment: Trauma Patient with Significant	Teaching Tips

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30	<p>Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Perform a Rapid Secondary Assessment</p> <p>A. General procedure for rapid secondary assessment</p> <ol style="list-style-type: none"> 1. Inspect for deformities, contusions, abrasions, punctures, penetrating wounds, burns, lacerations, swelling, unusual chest wall movements, angulated extremities, bleeding, discoloration, open wounds, and significant bleeding. 2. Palpate for tenderness, deformities, swelling, masses, muscle spasms, skin temperature, and pulsations. 3. If patient is unresponsive, watch his face for grimaces when palpating. 4. Auscultate for presence and equality of breath sounds. 5. Listen for sucking, gurgling, stridor, and crepitation. 6. Use your sense of smell to detect any unusual odors on the patient's breath, body, or clothing. 7. Talk calmly to the patient while you work, indicating what areas you are going to assess. 8. If the patient is responsive, ask any relevant questions before assessing each area of his body. 9. First priority is to identify potentially life-threatening injuries; manage these immediately upon discovery. 10. Do not move the patient unnecessarily, even to remove clothing (it can be cut away). 11. Be aware that one injury may be so painful that the patient does not mention other injuries that may be less painful but more serious. 12. When exposing the patient for assessment, treat him with respect and consideration. <ol style="list-style-type: none"> a. Respect patient's modesty regardless of age or sex. b. Do not expose a patient in front of a crowd or TV cameras. c. Cover an exposed patient with a sheet. d. Do not put a patient at risk for hypothermia by exposing him in severe cold. e. Consider moving a patient into the ambulance before exposure. <p>B. Assess the head.</p> <ol style="list-style-type: none"> 1. Scalp and skull <ol style="list-style-type: none"> a. Inspect for obvious deformities, contusions, abrasions, punctures, buns, lacerations, swelling, depressions, protrusions, impaled 	<ul style="list-style-type: none"> • Reassure students that, although their skills are performed slowly now, they will develop both speed and accuracy as they practice. • Provide ample time for skills practice, varying the scenarios and criticality of patients. <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are examples of critical findings in the rapid secondary assessment? • What things should be treated immediately if noted in the rapid secondary assessment?

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	<p>objects, or bleeding.</p> <ul style="list-style-type: none"> b. Palpate skull from front to back for crepitation, depressions, protrusions, swelling, bloody areas, instability, or lack of symmetry. c. Listen for any sounds; watch for any flinching or grimacing. d. If you find singed hair or burns, suspect exposure to fire and assess airway, breathing, and oxygenation status. e. Check your gloved hands for evidence of blood (difficult to see at night, or if patient has dark hair). f. If you find signs of brain herniation (severely altered mental status, abnormal posturing, fixed or unequal pupils), treat immediately. g. Initiate positive pressure ventilation at 20 per minute if patient is not breathing adequately. h. Apply nonrebreather mask at 15 lpm if patient is breathing adequately. i. If patient is wearing a hairpiece or wig, do not remove; feel gently through it for injuries. <p>2. Face</p> <ul style="list-style-type: none"> a. Inspect for deformities, contusions, abrasions, penetrating wounds, lacerations, swelling, or other evidence of trauma. b. Palpate for deformities, instability, and swelling. c. If there is trauma to the face, assess airway for occlusion; insert oropharyngeal airway and use suction if appropriate. d. Look for singed or burned nasal hair, eyebrows, and facial hair that may indicate an upper airway burn. e. If you hear stridor, begin positive pressure ventilation with supplemental oxygen. <p>3. Ears—Look inside with a flashlight for leakage of blood or cerebrospinal or other fluid (signs of head injury).</p> <p>4. Pupils</p> <ul style="list-style-type: none"> a. Shine a penlight into each eye, checking for equality of pupil size and reactivity. b. In an alert, oriented patient, unequal pupils usually do not indicate head injury; be alert instead for possible eye injury, effect of eye medication, or other condition. c. Remember that six to ten percent of the population has unequal pupils. <p>5. Nose</p> <ul style="list-style-type: none"> a. Inspect for bleeding and leakage of cerebrospinal fluid. 	

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	<ul style="list-style-type: none"> b. Suction if blood is draining posteriorly into the nasopharynx. c. Check for burned nasal hair or black discharge, which may indicate upper airway burn. <p>6. Mouth</p> <ul style="list-style-type: none"> a. Inspect for bleeding, bone fragments, or dislodged teeth; suction or sweep out with fingers. b. Inspect for swelling, lacerations to tongue, and tissue damage. c. Look at color of mucous membranes; should be pink. d. If patient is being ventilated, never interrupt ventilations for more than 30 seconds during mouth inspection. <p>C. Assess the neck.</p> <ol style="list-style-type: none"> 1. Inspect for deformities, contusions, abrasions, punctures, lacerations, swelling, or other evidence of trauma. 2. Immediately cover any large puncture wound or laceration with an occlusive dressing. 3. Inspect for bloated or inflated skin (indication of subcutaneous emphysema). 4. Determine whether trachea is midline (shift to one side indicates severe chest injury). 5. Assess jugular veins for distention; veins should be flat if patient is at a 45 degree angle, slightly engorged if he is lying flat). 6. Do not disturb in-line stabilization to assess posterior portion of neck; gently palpate what you can easily reach. 7. If you detect muscle spasms, patient requires spine immobilization. 8. Inspect larynx for deformity and swelling; if larynx is injured, provide positive pressure ventilation for inadequate breathing; apply nonrebreather mask at 15 lpm for adequate breathing. 9. If patient has a stoma (surgical opening) at the base of the throat, make sure the breathing tube is not occluded. <p>D. Apply a cervical spine immobilization collar (CISC)</p> <ol style="list-style-type: none"> 1. Apply if there is a suspected spine injury as soon as neck has been assessed. 2. One EMT applies CISC while another maintains manual in-line spine stabilization. 3. Do not move or manipulate head or neck while applying CISC. 4. Maintain manual in-line stabilization until patient is completely immobilized to a backboard. 5. If patient is already wearing a CISC, do not remove it to assess the 	

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	<p>neck; inspect and palpate as best you can through opening in front.</p> <p>E. Assess the chest.</p> <ol style="list-style-type: none">1. Expose chest for assessment; cut clothing away.2. Inspect anterior, lateral, and axial regions for open wounds and cover immediately with gloved hand.3. Apply occlusive dressing taped on three sides over open chest wound.4. Inspect for deformities, contusions, abrasions, burns, lacerations, swelling, lack of symmetry, or other evidence of trauma.5. Look for paradoxical chest movement (opposite to air flow)—Indicates flail segment.6. Immediately place your hand over a flail segment to stabilize it in an inward position; then fix patient's arm, pillow, or bulky dressing over site of injury.7. Initiate positive pressure ventilation if breathing is inadequate.8. Inspect chest muscles to determine presence of respiratory distress; begin positive pressure ventilation if necessary.9. Palpate chest to confirm findings of your inspection; check for symmetry of chest movement.10. Auscultate for breath sounds, both inspiration and exhalation; determine if they are present and equal on both sides.11. Prompt transport and calling for ALS intercept is very important if you discover evidence of tension pneumothorax (breath sounds absent or severely diminished on one side). <p>F. Assess the abdomen.</p> <ol style="list-style-type: none">1. Inspect for deformities, contusions, abrasions, penetrations, burns, lacerations, or other evidence of trauma.2. Look for discoloration around navel and flank area (late sign of blood collecting in abdomen).3. Palpate all four quadrants with pads of your fingers for tenderness, guarding, and rigidity.4. Watch the face of an unresponsive patient for grimacing.5. Firm or rigid abdomen indicates organ injury or irritation of abdominal lining; soft abdomen is normal.6. Administer Markle (heel-jar) test to assess for rebound tenderness and possible internal injury. <p>G. Assess the pelvis.</p> <ol style="list-style-type: none">1. Inspect for deformities, contusions, abrasions, penetrations, burns, lacerations, swelling, or other evidence of trauma.	

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	<ul style="list-style-type: none"> 2. Obvious deformity indicates pelvic injury; do not palpate in this case. 3. If patient has no pain in pelvic region and you see no deformities, gently palpate for instability, crepitation, tenderness, or deformity. 4. Watch for facial grimace if patient is unresponsive. 5. If you suspect a pelvic fracture, be prepared to treat for hemorrhagic shock. <p>H. Assess the extremities.</p> <ul style="list-style-type: none"> 1. Assess lower extremities before upper extremities. 2. Inspect and palpate for deformities, contusions, abrasions, penetrations, burns, tenderness, lacerations, swelling, or other evidence of trauma. 3. Major bleeding is major concern; trauma is often not life threatening. 4. Exception to this rule is injury to femur: if thigh is painful, swollen, or deformed, immobilize patient and transport promptly. 5. Apply necessary splinting en route to hospital, not at scene, for a critical patient. 6. Check for pulses (distal in lower extremity, radial in upper), motor function, and sensation. <ul style="list-style-type: none"> a. Pulses <ul style="list-style-type: none"> i. Bare the area where the pulse is to be felt. ii. Determine if pulse is present. iii. Compare strength of pulses. iv. Note skin color, temperature, and condition. b. Motor function—Ask patient to wiggle his toes and squeeze your fingers. c. Sensation <ul style="list-style-type: none"> i. Have the patient identify which finger or toe you are touching (without letting him see). ii. Pinch patient’s hand or foot and ask him to identify where he feels the pinch. iii. Assess both hands and both feet. iv. If the patient is unresponsive, watch his face for a response to a pinch. <p>I. Assess the posterior body.</p> <ul style="list-style-type: none"> 1. Maintain in-line spine stabilization while rolling patient to inspect and palpate posterior body. 2. Inspect posterior thorax, lumbar region, buttocks, and backs of legs. 3. Inspect and palpate for deformities, contusions, abrasions, punctures, burns, lacerations, swelling, or other evidence of injury. 	

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	<ol style="list-style-type: none"> 4. Cover any open wound to posterior thorax with occlusive dressing. 5. If patient feels no pain along vertebrae, gently palpate vertebral column for deformity and tenderness; do not move patient or cause pain. 6. If patient complains of pain, assume spine injury and immobilize spine. 	
10	<p>XXX. Rapid Secondary Assessment: Trauma Patient with Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Assess Baseline Vital Signs</p> <p>A. What to assess</p> <ol style="list-style-type: none"> 1. Breathing <ol style="list-style-type: none"> a. Rate, tidal volume, quality b. Normal, shallow, labored, deep, or noisy c. Adequate or inadequate 2. Pulse <ol style="list-style-type: none"> a. Radial pulse (adult patient) b. Brachial pulse (infant less than one year old) c. Carotid pulse (if radial pulse is not present) 3. Skin <ol style="list-style-type: none"> a. Pale or cyanotic nail beds b. Pale skin, oral mucosa, conjunctiva c. Temperature and condition (Remove your glove to test with back of your hand.) 4. Capillary refill 5. Pupils <ol style="list-style-type: none"> a. Equal size and reactivity b. Brisk or immediate reactivity 6. Blood pressure <ol style="list-style-type: none"> a. Auscultate for systolic and diastolic if possible. b. Palpate for systolic. 7. Pulse oximeter—Should be 95 percent or higher 8. Blood glucose test <ol style="list-style-type: none"> a. Not a vital sign but can establish that low blood sugar level (hypoglycemia) is responsible for altered metal status b. One drop of patient’s blood and electronic glucose meter <p>B. How often to reassess and record</p> <ol style="list-style-type: none"> 1. Every five minutes if patient is unstable or has any significant mechanism of injury 	

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	2. At least every 15 minutes if patient is stable	
5	<p>XXXI. Rapid Secondary Assessment: Trauma Patient with Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Obtain a SAMPLE History</p> <p>A. Signs—Correlate signs of trauma with mechanism of injury.</p> <p>B. Symptoms</p> <ol style="list-style-type: none"> 1. Ask how patient feels, if there is any pain, and where the pain is. 2. If patient is unresponsive, ask bystanders. 3. Correlate symptoms with signs and mechanism of injury. <p>C. Allergies—Ask patient about allergies or look for identifying medical tags.</p> <p>D. Medications—Find out what medications patient is taking since medications can alter signs and symptoms and lead you to false conclusions.</p> <p>E. Pertinent past medical history</p> <p>F. Last oral intake (Hospital requires this information if patient is going to go under anesthesia.)</p> <p>G. Events leading to injury—Can shed light on mechanism of injury and on whether illness exists</p>	
5	<p>XXXII. Rapid Secondary Assessment: Trauma Patient with Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Prepare the Patient for Transport</p> <p>A. Prepare critical trauma patient for transport simultaneously with rapid secondary assessment.</p> <p>B. Immobilize patient on backboard and secure with straps.</p> <p>C. Do not delay transport once patient is immobilized.</p> <p>D. If any critical findings are present and patient is unstable, transport within ten minutes of your arrival on scene.</p> <p>E. Transport to appropriate trauma center if necessary; follow <i>National Trauma Triage Protocol</i>.</p>	<p>Critical Thinking Discussion</p> <p>Why is a thorough head-to-toe secondary examination deferred for a critically injured patient?</p>
5	<p>XXXIII. Rapid Secondary Assessment: Trauma Patient with Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Provide Emergency Care</p> <p>A. Prior to transport</p> <ol style="list-style-type: none"> 1. Manage any life-threatening injuries or conditions as soon as you discover them. 2. Transport promptly if there are any critical findings. 	

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	<p>B. En route</p> <ol style="list-style-type: none"> 1. Reassess life threats. 2. Evaluate patient further and provide care for additional conditions or injuries. 3. Reassess components of primary assessment, vital signs, and effectiveness of interventions. 4. Airway management takes precedence over any other condition/assessment. 	
5	<p>XXXIV. Rapid Secondary Assessment: Trauma Patient with Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Unstable</i>)—Trauma Score</p> <p>A. Purpose—Identifies severity of trauma</p> <p>B. Systems in use</p> <ol style="list-style-type: none"> 1. Vary by region 2. Revised Trauma Score <ol style="list-style-type: none"> a. Assigns number to each parameter b. Totals numbers to derive score c. The lower the score, the more severe the condition <p>C. Major components</p> <ol style="list-style-type: none"> 1. Respiratory rate 2. Systolic blood pressure 3. Glasgow Coma Score 	
15	<p>XXXV. Modified Secondary Assessment: Trauma Patient with <u>NO</u> Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Stable</i>)—Perform a Modified Secondary Assessment</p> <p>A. Do not perform head-to-toe rapid secondary assessment in the following situations.</p> <ol style="list-style-type: none"> 1. Mechanism of injury does not suggest additional injury (such as badly cut finger or broken ankle). 2. Patient is alert. 3. No critical findings are present. <p>B. Conduct modified secondary assessment (only on localized site of injury).</p> <p>C. Fully assess bone or joint injury on site, splint, then transport.</p> <p>D. Inspect injured extremity for deformity, contusions, and swelling.</p> <p>E. Palpate from point closest to heart outward/downward.</p>	<p>Knowledge Application</p> <p>Give examples of various trauma complaints and have students demonstrate their assessment.</p>

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	F. Assess pulses, motor function, and sensation both before and after injury is splinted.	
8	XXXVI. Modified Secondary Assessment: Trauma Patient with <u>NO</u> Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Stable</i>)—Obtain Baseline Vital Signs and SAMPLE History A. Assess baseline vital signs and obtain SAMPLE history. B. Provide emergency care for injuries and prepare patient for transport. C. En route—Reassess airway, breathing and perfusion; reassess vital signs; and check effectiveness of emergency care provided.	
7	XXXVII. Modified Secondary Assessment: Trauma Patient with <u>NO</u> Significant Mechanism of Injury, Altered Mental Status, Multiple Injuries, or Critical Finding (<i>Stable</i>)—Perform a Rapid Secondary Assessment if Needed A. If you develop a suspicion that patient has more injuries than he initially complained of B. If the patient begins to deteriorate C. If the modified secondary assessment discloses a critical finding D. If there are multiple injuries which would not be critical by themselves E. If there is any doubt in your mind as to whether patient needs a complete secondary assessment	
10	XXXVIII. Secondary Assessment: Medical Patient A. Medical patient is ill, not injured. B. Categorize the patient. 1. Responsive—Alert, oriented, and responsive 2. Unresponsive—Not alert, disoriented, responsive only to verbal or painful stimuli; or entirely unresponsive C. Differences in conducting secondary assessment 1. Sequence of steps a. Responsive patient: history, physical exam, vital signs b. Unresponsive patient: physical exam, vital signs, history 2. Kind of physical exam you will conduct a. Responsive patient: modified secondary assessment (focus on chief complaint, signs and symptoms) b. Unresponsive patient: rapid secondary assessment (head to toe)	Teaching Tip Tell students that they will learn more about adapting their approach according to a patient's chief complaint as they learn about specific types of medical problems. Discussion Question What is the sequence of secondary assessment for responsive medical patients?

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25	<p>XXXIX. Medical Patient Who is Not Alert or Is Disoriented, Is Responding Only to Verbal or Painful Stimuli, or Is Unresponsive—Perform a Rapid Secondary Assessment for the Medical Patient</p> <p>A. Assess the head.</p> <ol style="list-style-type: none"> 1. Any evidence of trauma 2. Deformities 3. Inside of mouth: pale mucosa, bleeding, secretions, vomitus 4. Patent airway 5. Nose and ears: fluid discharge or blood 6. Pupils: equality, size, and reactivity 7. Droop to one side of the face <p>B. Assess the neck.</p> <ol style="list-style-type: none"> 1. Jugular vein distention (JVD) 2. Excessive accessory muscle use 3. Medical identification necklace 4. Tracheotomy tube at base of neck <p>C. Assess the chest.</p> <ol style="list-style-type: none"> 1. Adequate rise and fall 2. Retraction of intercostal muscles 3. Symmetrical movement 4. Scars and other evidence of implanted cardiac devices 5. Breath sounds (crackles or wheezing) <p>D. Assess the abdomen.</p> <ol style="list-style-type: none"> 1. Abnormal distention or discoloration 2. Evidence of scars from surgery 3. Tenderness, rigidity, pulsating masses 4. Rebound tenderness (indicates peritonitis) <p>E. Assess the pelvic region.</p> <ol style="list-style-type: none"> 1. Signs of incontinence 2. Tenderness or distension 3. Ectopic pregnancy (surgical emergency requiring prompt transport) <ol style="list-style-type: none"> a. Abdominal pain especially in lower quadrants b. Missed menstrual period(s) c. Signs and symptoms of poor perfusion <p>F. Assess the extremities.</p> <ol style="list-style-type: none"> 1. Excessive peripheral edema 2. Pulse, motor function, sensation 	<p>Teaching Tip Make a list of students' responses to the discussion questions below on the white board.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are examples of critical findings in the rapid secondary assessment? • What things should be treated immediately if noted in the rapid secondary assessment? <p>Critical Thinking Discussion How do the secondary assessments for trauma and medical patients compare?</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on abdominal assessment techniques.</p>

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	3. Radial and dorsalis pedis pulses 4. Medical ID tags around wrist or ankle G. Assess the posterior body: discoloration, edema, tenderness.	
5	XL. Medical Patient Who is Not Alert or Is Disoriented, Is Responding Only to Verbal or Painful Stimuli, or Is Unresponsive—Assess Baseline Vital Signs A. Breathing B. Pulse C. Skin D. Pupils E. Blood pressure F. Pulse oximeter: should be 95 to 99 percent G. Blood glucose test	
5	XLI. Medical Patient Who is Not Alert or Is Disoriented, Is Responding Only to Verbal or Painful Stimuli, or Is Unresponsive—Position the Patient A. Place the patient in the recovery position (coma position): modified left lateral position. B. Have a suction device available to assist with clearing the airway. C. Keep patient in supine position if he needs to be ventilated.	
15	XLII. Medical Patient Who is Not Alert or Is Disoriented, Is Responding Only to Verbal or Painful Stimuli, or Is Unresponsive—Obtain a SAMPLE History A. Question family or bystanders. B. Symptoms of patient <ol style="list-style-type: none"> 1. Shortness of breath? 2. Chest pain or other pain? 3. Severe headache? 4. Lightheadedness, dizziness, faintness? 5. Severe itching? 6. Excessive heat or cold? 7. Abdominal or lumbar pain? C. Symptoms: other questions <ol style="list-style-type: none"> 1. Onset sudden or gradual? 2. Did anything provoke the symptom? 	Teaching Tip Tell students that the key questions to ask when obtaining the history of a medical patient will become clearer as they learn more about medical emergencies.

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	<ul style="list-style-type: none"> 3. How severe was the symptom? 4. How long was the patient complaining? 5. Where exactly was the symptom felt? 6. Did the patient do or take anything to relieve the symptom? D. Allergies: Ask and check for ID tag. E. Medications <ul style="list-style-type: none"> 1. Ask someone to gather patient's medications. 2. Have your partner investigate and locate medications on the scene (e.g., bedroom, bathroom, kitchen). 3. Look in refrigerator for insulin. F. Pertinent past medical history: date/length of any hospital stays G. Last oral intake: information required by anesthesiologist at hospital H. Events leading to present illness 	
5	<p>XLIII. Medical Patient Who is Not Alert or Is Disoriented, Is Responding Only to Verbal or Painful Stimuli, or Is Unresponsive—Provide Emergency Care</p> <ul style="list-style-type: none"> A. Provide emergency care based on signs, symptoms, and history. B. All unresponsive patients and those with altered mental status must be placed on nonrebreather mask at 15 lpm, or on positive pressure ventilation. 	
5	<p>XLIV. Medical Patient Who is Not Alert or Is Disoriented, Is Responding Only to Verbal or Painful Stimuli, or Is Unresponsive—Make a Transport Decision</p> <ul style="list-style-type: none"> A. Patient with altered mental status needs prompt transport. B. Manage life-threatening conditions and injuries prior to transport. C. En route, monitor airway, breathing, and circulation. D. Reassess vital signs every five minutes. E. Check for change in patient's condition following any intervention. 	
10	<p>XLV. Responsive Medical Patient Who Is Alert and Oriented—Assess Patient Complaints: OPQRST</p> <ul style="list-style-type: none"> A. O: Onset <ul style="list-style-type: none"> 1. When and how did the symptom begin? 2. Was onset sudden or gradual? 3. Was onset associated with a particular activity? B. P: Provocation/palliation <ul style="list-style-type: none"> 1. What makes the symptom worse/better? 2. Have you taken any medication for relief? 	<p>Teaching Tip Demonstrate different ways of modifying the line of questioning in the history according to the patient's chief complaint.</p> <p>Knowledge Application Give students examples of chief complaints. Have them ask questions to obtain a medical history. Encourage</p>

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	<p>3. What effect did medication have on symptom?</p> <p>C. Q: Quality: What does the pain feel like?</p> <p>D. R: Radiation</p> <ol style="list-style-type: none"> 1. Where do you feel the pain? 2. Where does the pain go (radiate to)? <p>E. S: Severity</p> <ol style="list-style-type: none"> 1. How bad is the symptom, on a scale of one to ten? 2. How does it compare with pain from any previous condition? 3. What does patient's appearance and manner tell you about the pain? <p>F. T: Time: How long have you had the symptom?</p>	<p>students to ask questions in terms the patient can understand, rather than in terms of the SAMPLE and OPQRST mnemonics.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on assessment of pain.</p>
2	<p>XLVI. Responsive Medical Patient Who Is Alert and Oriented—Complete the SAMPLE History</p> <p>A. Determine allergies, medication, pertinent past medical history, last oral intake, and events leading to present illness.</p> <p>B. Consider any other questions that might provide useful and helpful information.</p>	
3	<p>XLVII. Responsive Medical Patient Who Is Alert and Oriented—Perform a Modified Secondary Assessment</p> <p>A. Focus exam on source of patient's complaint if signs and symptoms are specific enough to identify it.</p> <p>B. Otherwise, perform rapid head-to-toe secondary assessment.</p>	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on conducting a detailed physical exam.</p>
5	<p>XLVIII. Responsive Medical Patient Who Is Alert and Oriented—Assess Baseline Vital Signs</p> <p>A. Breathing rate and quality</p> <p>B. Pulse rate and quality</p> <p>C. Skin temperature, color, and condition</p> <p>D. Capillary refill</p> <p>E. Pupil size and reactivity</p> <p>F. Blood pressure</p> <p>G. SpO₂ reading</p>	
5	<p>XLIX. Responsive Medical Patient Who Is Alert and Oriented—Provide Emergency Care</p> <p>A. Maintain patent airway.</p> <p>B. Administer oxygen.</p>	

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	C. Assist ventilation.	
5	<p>L. Responsive Medical Patient Who Is Alert and Oriented—Make a Transport Decision</p> <p>A. Prior to transport</p> <ol style="list-style-type: none"> 1. Critical patient <ol style="list-style-type: none"> a. Manage any life-threatening conditions and transport immediately. b. One EMT can assess while the other prepares patient for immediate transport. 2. Noncritical patient—Perform secondary assessment and emergency care. <p>B. En route</p> <ol style="list-style-type: none"> 1. Critical patient <ol style="list-style-type: none"> a. Perform secondary assessment and emergency care. b. Reassess vital signs every five minutes. c. Reassess effectiveness of interventions. d. Consult with medical direction as needed. 2. Noncritical patient <ol style="list-style-type: none"> a. Reassess vital signs every 15 minutes. b. Reassess effectiveness of interventions. c. Consult with medical direction as needed. 	
	PART 4. REASSESSMENT	
5	<p>LI. Purposes of the Reassessment—Detect any Change in Condition</p> <p>A. Always watch for signs of deterioration, which can occur at any time.</p> <p>B. Common causes of rapid deterioration</p> <ol style="list-style-type: none"> 1. Continued blood loss 2. Airway compromise 3. Inadequate breathing 4. Poor perfusion 5. Brain injury 	<p>Critical Thinking Discussion</p> <p>What are potential consequences of failing to reassess patients?</p>
5	<p>LII. Purposes of the Reassessment—Identify Any Missed Injuries or Conditions</p> <p>A. Common reasons for an EMT missing injury or condition on scene</p> <ol style="list-style-type: none"> 1. Extremely dark environment 2. Noisy conditions (hostile crowd, busy highway) 	

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	<ul style="list-style-type: none"> 3. Weather conditions (rain, glaring sunshine, high winds) 4. Unstable vehicle(s) 5. Threat of explosion 6. Smoke <p>B. Reassessment provides more stable and favorable environment (usually ambulance interior).</p>	
5	<p>LIII. Purposes of the Reassessment—Adjust the Emergency Care</p> <ul style="list-style-type: none"> A. Repeat the primary assessment. B. Reassess and record the vital signs. C. Repeat the secondary assessment for other complaints, injuries, or change in chief complaint. D. Check interventions. E. Note trends in the patient’s condition. F. Repeat and record assessment findings every five minutes for unstable patients, every 15 minutes for stable patients. 	<p>Discussion Question What are some specific things that should be rechecked in the reassessment process?</p> <p>Knowledge Application Given several scenarios, students should be able to direct the reassessment of a patient, based on the primary and secondary assessments and treatments provided.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on reassessment of patients.</p>
2	<p>LIV. Repeat the Primary Assessment—Reassess Mental Status</p> <ul style="list-style-type: none"> A. If patient continues talking to you, reassess for any change in speech pattern and appropriateness of responses. B. Assess patient’s continued ability to obey commands. C. Repeat Glasgow Coma Scale; compare scores. D. If patient is not alert or loses alertness, reassess response based on AVPU mnemonic. E. Record any change in status, whether improved or deteriorating. 	
3	<p>LV. Repeat the Primary Assessment—Reassess the Airway</p> <ul style="list-style-type: none"> A. Open unresponsive patient’s mouth and look inside for blood, secretions, or vomitus. 	

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	<ul style="list-style-type: none"> B. Suction mouth if necessary. C. Listen for snoring, gurgling, or stridor. D. Reassess position of nasopharyngeal or oropharyngeal airway if applicable. E. Find out if patient is resisting ventilation. F. If patient's condition is improving and he begins to gag on airway adjunct, remove it; position him on his side first, if possible. G. If patient's condition is deteriorating, you may need to insert airway. 	
2	<p>LVI. Repeat the Primary Assessment—Reassess Breathing</p> <ul style="list-style-type: none"> A. If breathing is inadequate, begin positive pressure ventilation with supplemental oxygen. B. If patient is already being ventilated, reassess effectiveness. <ul style="list-style-type: none"> 1. Look at rise and fall of chest. 2. Watch for improvement in patient's color and mental status. 3. Ask ventilating EMT if he feels any unusual resistance from patient. C. Apply oxygen if the patient experiences any of the following. <ul style="list-style-type: none"> 1. Becomes unresponsive 2. Has an alteration in mental status 3. Becomes anxious or agitated 4. Suddenly becomes sleepy 5. Exhibits decrease in SpO₂ reading 	
3	<p>LVII. Repeat the Primary Assessment—Reassess Circulation</p> <ul style="list-style-type: none"> A. Reassess pulse. <ul style="list-style-type: none"> 1. Increasing with poor quality: may be a sign of continued bleeding 2. Decreasing with poor quality: may indicate head injury or severe hypoxia 3. Increasing in patient who initially had low rate: may indicate improvement in breathing and oxygenation 4. Decreasing in patient who initially had elevated rate: may indicate reduction in bleeding and improvement in condition B. Reassess bleeding. <ul style="list-style-type: none"> 1. Check site of major bleeding for blood seeping through dressing/bandage; reapply direct pressure. 2. If bleeding cannot be controlled through direct pressure, apply tourniquet. 3. Continue to treat for shock. C. Reassess skin. <ul style="list-style-type: none"> 1. Feel for changes in temperature and condition. 2. Reassess capillary refill. 	

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	<ol style="list-style-type: none"> 3. Skin color improving indicates improvement in oxygenation. 4. Skin color becoming cyanotic indicates poor oxygenation or breathing compromise. 5. Skin color growing paler indicates continued bleeding. 6. Continue to treat for shock. 	
5	<p>LVIII. Repeat the Primary Assessment—Reestablish Patient Priorities</p> <ol style="list-style-type: none"> A. If on-scene reassessment indicates deterioration in patient's condition, reconsider transport and emergency care decisions. B. If patient becomes a priority patient, transport promptly and continue emergency treatment en route. C. Reassess and adjust interventions as needed. 	
3	<p>LIX. Complete the Reassessment—Reassess and Record Vital Signs</p> <ol style="list-style-type: none"> A. Breathing rate and quality B. Pulse rate and quality C. Perfusion status D. Pupils E. Blood pressure F. SpO₂ 	
2	<p>LX. Complete the Reassessment—Repeat Components of the Secondary Assessment for Other Complaints</p> <ol style="list-style-type: none"> A. If patient complains of new symptom, or change in old symptom, conduct relevant portions of secondary assessment. B. Obtain additional history information if necessary. 	
5	<p>LXI. Complete the Reassessment—Check Interventions</p> <ol style="list-style-type: none"> A. Have vital signs improved or deteriorated? B. Is the airway still patent? C. Are the oxygen mask and liter flow adequate? Is oxygen connected and flowing to the bag-valve-mask device? D. Has patient's color improved with oxygen, or should I consider positive pressure ventilation? E. Is chest rising and falling adequately with the ventilations? F. Are chest compressions producing pulses? Are the rate and depth of compressions adequate? G. Has a cardiac arrest patient whose heartbeat was restored lapsed into arrest again? H. Is the AED indicating that a shock is needed/not needed? 	

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	<ul style="list-style-type: none"> I. Is pressure dressing adequately controlling bleeding? Has bleeding stopped or do I need to proceed to next step in bleeding control? J. Is spine completely immobilized? K. Are bone/joint injuries adequately immobilized? 	
5	<p>LXII. Complete the Reassessment—Note Trends in Patient Condition</p> <ul style="list-style-type: none"> A. Changes in patient’s condition will be basis for interventions, or changes to interventions, en route to hospital. B. Document changes in patient’s condition and report to staff of receiving facility. C. Not only patient’s condition but trends in his condition are important. 	
10	<p>LXIII. Follow-Up</p> <ul style="list-style-type: none"> A. Answer student questions. B. Case Study Follow-Up <ul style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. C. Follow-Up Assignments <ul style="list-style-type: none"> 1. Review Chapter 13 Summary. 2. Complete Chapter 13 In Review questions. 3. Complete Chapter 13 Critical Thinking. D. Assessments <ul style="list-style-type: none"> 1. Handouts 2. Chapter 13 quiz 	<p>Case Study Follow-Up Discussion: Call One What factors led to the EMTs’ decision to initiate a rapid transport?</p> <p>Case Study Follow-Up Discussion: Call Two Why was a body systems approach, rather than an anatomic approach, used in Mrs. Ortega’s secondary assessment?</p> <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important

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Minutes	Content Outline	Master Teaching Notes
		information in each chapter. This can be found under mykit at www.bradybooks.com .

Detailed Lesson Plan

Chapter 14

Pharmacology and Medication Administration

200–220 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency care for a patient whose condition may require administration of a medication.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • How will you know what medications a patient needs? • What are the safety precautions to observe when giving medications?
10	<p>II. Administering Medications</p> <p>A. A medication is a drug or other substance used as a remedy for illness</p> <p>B. A drug is a chemical substance used to treat or prevent a disease or condition.</p> <p>C. Pharmacology is the study of drugs.</p> <ol style="list-style-type: none"> 1. When the correct dose of a medication is administered appropriately, the patient's condition may improve significantly. 2. When a medication is administered inappropriately, some drugs can cause serious side effects and deterioration in the patient's condition. <p>D. EMT's responsibility</p> <ol style="list-style-type: none"> 1. Administer medications under the direct order of a physician only. 2. Administer only medications identified in local protocols. <p>E. EMT's role</p> <ol style="list-style-type: none"> 1. Administration implies that the EMT will take all the steps necessary to give the patient a medication. 2. Assisting means that the EMT will prepare the medication and then hand it to the patient who will take the medication. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What is a drug? • What are some examples of drugs? • How can these drugs be used to treat or prevent diseases or conditions? <p>Teaching Tip Give examples of how a medication can help if used appropriately, such as nitroglycerin used for chest pain; also explain how the same medication can have detrimental effects if used inappropriately (too much, wrong patient, and so on).</p> <p>Class Activity Have small groups of students work together to generate a list of drugs they are familiar with.</p>

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		<p>Critical Thinking Discussion What are the pros and cons of the many advertisements on television for prescription medications?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access the National Institutes of Health/National Library of Medicine Drug Resource.</p>
30	<p>III. Medications Commonly Administered by the EMT— Medications Carried on the EMS Unit</p> <p>A. Oxygen</p> <ol style="list-style-type: none"> Oxygen is an odorless, tasteless, colorless gas. Makes up 21 percent of ambient air Indicated for patients with medical or trauma condition and who may be hypoxic <p>B. Oral glucose</p> <ol style="list-style-type: none"> Glucose is a simple sugar found in blood. It is the primary energy source for body cells. If brain cells are deprived of glucose, they die. Oral glucose is administered to patients with a history of diabetes who are suspected of having low blood glucose levels. <p>C. Activated charcoal</p> <ol style="list-style-type: none"> Activated charcoal is a fine black powder designed to absorb an ingested poison. Poison attached to activated charcoal will be carried through the digestive tract and eliminated. The use of activated charcoal has been questioned and has been removed from many protocols. <p>D. Aspirin</p> <ol style="list-style-type: none"> Aspirin is administered to a patient who is having chest pains or pain related to a lack of oxygen to the heart. Aspirin may keep the vessels that deliver blood to the heart from closing shut. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> Why is oxygen considered a medication? Under what circumstances might you administer activated charcoal? Why is aspirin used in the prehospital setting? <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> Why are there only a limited number of drugs carried on the EMT's ambulance? Why must EMTs have a physician's order to administer medications? <p>Teaching Tip Show as many examples as possible of the medications described. Pass the medication containers around the classroom so students can see and touch them.</p> <p>Weblink</p>

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30	<p>IV. Medications Commonly Administered by the EMT— Medications Prescribed for the Patient</p> <p>A. Inhaled bronchodilator</p> <ol style="list-style-type: none"> 1. Metered-dose inhaler (MDI) <ol style="list-style-type: none"> a. Used by a patient with a respiratory disease, such as asthma, emphysema, and chronic bronchitis b. Patient will experience shortness of breath and signs and symptoms of respiratory difficulty. c. Only MDIs that contain a beta₂-agonist drug can be administered. d. Delivers medication with one inhalation 2. Small-volume nebulizer (SVN) <ol style="list-style-type: none"> a. Uses a different route of delivery than an MDI b. Place the medication into a specialized chamber and pass oxygen or compressed air through it. c. The fine vapor that is produced is expelled through a T-tube and into a mouthpiece or mask. d. Creates a continuous flow of vapor containing medication <p>B. Nitroglycerin</p> <ol style="list-style-type: none"> 1. Nitroglycerin is a medication used to treat cardiac patients with diseases of the coronary arteries. 2. This medication is a vasodilator, which dilates the blood vessels. 3. It decreases the demand for oxygen by the heart muscle and increases the supply of oxygenated blood to the heart. 4. The major side effect of this medication is hypotension. 5. It should not be administered to patients taking other medications known to lower blood pressure. <p>C. Epinephrine</p> <ol style="list-style-type: none"> 1. Epinephrine is a drug used to treat patients suffering from anaphylaxis. 2. During an anaphylactic reaction, a patient's blood vessels dilate, the bronchioles constrict, and the capillaries leak fluid. 3. Epinephrine constricts the vessels, dilates the bronchioles, and decreases capillary permeability. 	<p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on medications that can be administered by an EMT.</p> <p>Class Activity Instead of lecturing on this section, assign each of the drugs listed to a group of students and provide them with several resources in addition to their texts. Each group should take about 15 minutes to research their assigned drug, and then present their findings to the rest of the class. Be sure to emphasize key points and fill in any gaps.</p> <p>Knowledge Application Give several examples of patient problems (asthma, chest pain, anaphylactic reaction, or poisoning) and ask students what drug used by EMTs may be indicated for the patient.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the consequences of administering nitroglycerin to a patient who has recently taken a drug for erectile dysfunction? • Why is epinephrine used for severe allergic reactions? <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip describing the actions and use of an epinephrine auto-injector.</p>

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15	<p>V. Medication Names</p> <p>A. Chemical name</p> <ol style="list-style-type: none"> 1. Describes the chemical structure of the drug 2. Is usually the first name associated with the drug <p>B. Generic name</p> <ol style="list-style-type: none"> 1. Also known as nonproprietary name 2. Shorter than full chemical name 3. Independent of manufacturer 4. Listed in the U.S. Pharmacopoeia <p>C. Trade name</p> <ol style="list-style-type: none"> 1. Also known as brand name 2. Assigned when drug is released for commercial distribution <p>D. Official name</p> <ol style="list-style-type: none"> 1. Assigned to drugs meeting the requirement of the U.S. Pharmacopoeia or National Formulary 2. Is commonly the generic name followed by the initials U.S.P. or N.F. 	<p>Teaching Tip Give examples of a generic drug name, such as ibuprofen, and several of the trade names it is marketed under.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What is the generic name of a drug? • How is the generic name of a drug different from the official name? <p>Critical Thinking Discussion Why must EMTs know both generic and trade names for drugs?</p> <p>Knowledge Application List examples of the generic names of drugs commonly administered by the EMT and have students match it with trade names, and vice versa.</p> <p>Class Activity Give over-the-counter medication containers to small groups of students. Have them search for the generic and trade names and report them to the class.</p>
15	<p>VI. Routes of Administration</p> <p>A. The route describes how a medication is given to or taken by a patient.</p> <p>B. The route controls how fast the medication is absorbed by the body.</p> <p>C. The EMT prepares the medication in a form that allows the quickest and safest absorption by the body.</p> <ol style="list-style-type: none"> 1. Sublingual—Under the tongue <ol style="list-style-type: none"> a. Nitroglycerin tablets b. Nitroglycerin spray 2. Oral—Swallowed 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How does the absorption of drugs administered into the muscle compare with the absorption of drugs administered orally? • What is the difference between oral administration and sublingual administration routes?

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	<ul style="list-style-type: none"> a. Aspirin b. Oral glucose c. Activated charcoal 3. Inhalation—Breathed in by the patient <ul style="list-style-type: none"> a. Oxygen b. Metered-dose inhaler c. Small-volume nebulizer 4. Intramuscular injection—Injected into muscle mass <ul style="list-style-type: none"> a. Epinephrine with auto-injector 	<p>Teaching Tip Reinforce learning by naming drugs administered by EMTs and having students state the route by which it is administered.</p> <p>Class Activity Pass out small tablet-shaped candies. Tell students not to eat them until you explain the instructions to them. First instruct students as if you were instructing a patient to take an oral medication. Then instruct students as if you were instructing a patient to take a sublingual medication.</p> <p>Video Clips Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access video clips describing oral glucose administration, nitroglycerin administration, activated charcoal administration, and MDI administration.</p> <p>Critical Thinking Discussion How do you think poor perfusion might affect drug absorption?</p>
10	<p>VII. Medication Forms</p> <ul style="list-style-type: none"> A. Medications come in different forms. B. The form limits administration to one specific route. C. The form determines the effects of the drug. D. Common forms of medications administered by the EMT <ul style="list-style-type: none"> 1. Compressed powder or tablet 2. Liquid for injection 3. Gel 4. Suspension 5. Fine powder for inhalation 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What form of medication is used in a small-volume nebulizer? • What medication can be administered as a spray? <p>Teaching Tip Refer to the equipment and medications you brought in as you discuss each form.</p>

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	6. Small-volume nebulizer 7. Gas 8. Spray	
5	VIII. Essential Medication Information—Indications A. Indications include the most common uses of the drug in treating a specific condition. B. Indications are geared toward the relief of signs, symptoms, or specific conditions.	Discussion Question What is an indication for nitroglycerin?
3	IX. Essential Medication Information—Contraindications A. Contraindications are situations in which the drug should not be administered because of potential harm to the patient. B. In some cases, the drug may not have any benefit to the patient.	Discussion Question What is a contraindication for nitroglycerin?
3	X. Essential Medication Information—Dose A. The dose indicates how much of the drug should be given to the patient. B. It is important to distinguish between dosages for adults, children, and infants.	Teaching Tip Explain the essential information of several drugs to illustrate the concepts in this section.
3	XI. Essential Medication Information—Administration A. Administration refers to the route and form in which the drug is given. B. The EMT will administer medications sublingually, orally, by inhalation, or by injection.	Critical Thinking Discussion How does the SAMPLE history assist you with considering whether or not to give a patient a medication?
3	XII. Essential Medication Information—Actions A. The action is the effect the drug has on the body. B. The therapeutic effect is the intended positive response by the body. C. The mechanism of action is how the drug works to create its effect on the body.	Knowledge Application Hand out several over-the-counter medication containers. Have students apply the information from this section to describe the indications, contraindications, dosage, and side effects for the medications.
3	XIII. Essential Medication Information—Side Effects A. Side effects are actions that are not desired and that occur in addition to the desired therapeutic effects. B. Side effects are not allergic reactions. C. The EMT must be prepared to manage expected and unexpected side effects.	Discussion Question What is a side effect of nitroglycerin?
	XIV. Key Steps in Administering Medications—Obtain an Order from	

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5	<p>Medical Direction</p> <p>A. A medical order can be obtained on-line by direct communication with medical direction or off-line through protocols or standing orders.</p> <p>B. It is important to know and understand local protocols prior to an emergency call.</p> <p>C. Verify an on-line order by restating the drug, dose, and route.</p> <p>D. Make judgments as to whether the patient can tolerate the administration of a medication.</p>	
5	<p>XV. Key Steps in Administering Medications—Select the Proper Medication</p> <p>A. EMT must ensure that the proper medication is selected.</p> <p>B. Read the label to check that the medication is consistent with the order.</p>	
5	<p>XVI. Key Steps in Administering Medications—Verify the Patient’s Prescription</p> <p>A. Verify that the medication is prescribed for the patient.</p> <p>B. The EMT should not administer medication that is not prescribed for the patient unless ordered to do so by medical direction.</p> <p>C. If the label is on separate packaging, determine through careful questioning if the prescription belongs to the patient.</p>	<p>Discussion Question Why is it important to verify a patient’s prescription before assisting with medication administration?</p>
5	<p>XVII. Key Steps in Administering Medications—Check the Expiration Date</p> <p>A. Check the expiration date of the medication.</p> <p>B. Do not administer expired medication.</p> <p>C. Dispose of medications according to your state drug or pharmacy guidelines.</p>	<p>Discussion Question What things should you be looking for as you inspect a container of medication?</p>
5	<p>XVIII. Key Steps in Administering Medications—Check for Discoloration or Impurities</p> <p>A. Inspect liquid medications for discoloration or cloudiness.</p> <p>B. Do not administer cloudy or discolored medication.</p> <p>C. Discard cloudy or discolored medication appropriately.</p>	
5	<p>XIX. Key Steps in Administering Medications—Verify the Form, Route, and Dose</p> <p>A. Be sure the proper drug form is used for the route selected.</p> <p>B. Verify the dose is correct.</p> <p>C. Match the medication label to the drug order.</p>	<p>Critical Thinking Discussion How do you think medication errors can occur?</p>
	<p>XX. Key Steps in Administering Medications—Medication</p>	<p>Discussion Question</p>

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5	<p>Administration: The Five “Rights”</p> <ul style="list-style-type: none"> A. Right patient B. Right medication C. Right route D. Right dose E. Right date (time) 	<p>What are the “rights” of medication administration?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the “rights” of medication administration.</p>
5	<p>XXI. Key Steps in Administering Medications—Documentation</p> <ul style="list-style-type: none"> A. Document the drug, dose, route, and time the medication was administered. B. Report any changes in the patient’s condition. 	<p>Teaching Tip Demonstrate the steps in the medication administration process, explaining each step and verbalizing your actions.</p>
10	<p>XXII. Reassessment Following Administration</p> <ul style="list-style-type: none"> A. Repeat measurement of vital signs. B. Assess for any changes in the patient’s condition. <ul style="list-style-type: none"> 1. Mental status 2. Patency of airway 3. Breathing rate and quality 4. Pulse rate and quality 5. Skin color, temperature, and condition 6. Blood pressure 7. Change or relief of complaints 8. Relief of signs and symptoms associated with complaints 9. Medication side effects 10. Improvement or deterioration in the patient’s condition C. Check the adequacy of oxygen administration. D. Document your reassessment. 	<p>Teaching Tip To review what was learned about the drugs administered by EMTs, list each drug and ask students what changes they should be looking for in the reassessment.</p> <p>Discussion Question What are some specific things you should reassess after giving a medication?</p> <p>Critical Thinking Discussion Why is it important to document any changes, or lack of changes, in the reassessment?</p>
20	<p>XXIII. Sources of Medication Information</p> <ul style="list-style-type: none"> A. American Hospital Formulary Service B. AMA Drug Evaluation C. Physicians’ Desk Reference (PDR) D. Package inserts E. Poison control centers F. EMS pocket drug reference guide G. ePocrates for the PDA 	<p>Teaching Tip Demonstrate the use of several drug reference resources.</p> <p>Critical Thinking Discussion How soon do you think sources of drug information are outdated?</p>

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	<p>H. On-line sources approved by your medical direction</p>	<p>Class Activity Provide small groups of students with drug reference material. Have students look up essential information about the drugs discussed.</p>
<p>10</p>	<p>XXIV. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 14 Summary. 2. Complete Chapter 14 In Review questions. 3. Complete Chapter 14 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 14 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why is oxygen the first drug used for this patient? • Why is aspirin given to this patient? • What side effects should you anticipate from administering nitroglycerin? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> c. Inadequate vessel tone may result from an injury to the spinal cord or released chemical mediators that cause a systemic dilation of vessels. 	
10	<p>III. Shock—Categories of Shock</p> <ul style="list-style-type: none"> A. Hypovolemic shock <ul style="list-style-type: none"> 1. Caused by low blood volume 2. Most common type of shock 3. Generally caused by hemorrhage 4. Also be caused by burns and dehydration B. Distributive shock <ul style="list-style-type: none"> 1. Associated with a decrease in intravascular volume 2. Massive systemic vasodilation 3. Increase in capillary permeability 4. Reduction in systemic and peripheral vascular resistance 5. Reduction in systolic blood pressure C. Cardiogenic shock <ul style="list-style-type: none"> 1. Caused by ineffective pump function of the heart 2. Patient is prone to cardiogenic shock when more than 40 percent of the left ventricle is lost. D. Obstructive shock <ul style="list-style-type: none"> 1. Results from a condition that obstructs forward blood flow 2. Possible causes <ul style="list-style-type: none"> a. Blood clot b. Tension pneumothorax c. Pericardial tamponade E. Metabolic or respiratory shock <ul style="list-style-type: none"> 1. Described as a fifth type of shock in some sources 2. Dysfunction in the ability of oxygen to diffuse into the blood, be carried by hemoglobin, off-load at the cell, or be used by the cell for metabolism 	<p>Discussion Question What are the categories of shock from each etiology?</p>
10	<p>IV. Shock—Specific Types of Shock</p> <ul style="list-style-type: none"> A. Hemorrhagic hypovolemic shock <ul style="list-style-type: none"> 1. Results from the loss of whole blood from the intravascular space. 2. Relates to whole blood loss that can occur from traumatic injury or medical illness. 3. Reduction in pressure and a decrease in oxygen-carrying capability. 4. Poor perfusion state from an inadequate intravascular volume. 	<p>Discussion Question How can hypovolemia occur without hemorrhage?</p>

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	<ul style="list-style-type: none"> 5. Bleeding must be stopped. 6. Administration of whole blood or blood components B. Nonhemorrhagic hypovolemic shock <ul style="list-style-type: none"> 1. Results from the loss of fluid from the intravascular space 2. Red blood cells and hemoglobin remain within the vessels. 3. Water, plasma proteins, and electrolytes are lost. 4. Blood volume, pressure and perfusion of cells are reduced. 5. Administration of intravenous fluids may be beneficial. C. Burn shock <ul style="list-style-type: none"> 1. Nonhemorrhagic hypovolemic shock resulting from a burn injury 2. Burns may interrupt the integrity of the capillaries and vessels. 3. "Pull" effect draws fluid into the interstitial space, causing edema. 4. Establish and maintain an adequate airway, ventilation, and oxygenation. 5. Prevent further contamination of the burn injury. D. Anaphylactic shock <ul style="list-style-type: none"> 1. This is a type of distributive shock. 2. Chemical mediators in the anaphylactic reaction cause massive and systemic vasodilation. 3. Capillaries become permeable and leak. 4. Fluid is forced out into the interstitial space. 5. Systemic vascular resistance is reduced. 6. Blood pressure and perfusion are decreased. 7. Epinephrine is the medication of choice. E. Septic shock <ul style="list-style-type: none"> 1. This is a type of distributive shock. 2. Results from an infection that releases bacteria or toxins in the blood. 3. Vessels dilate and become permeable. 4. Fluid leaks into the interstitial space. 5. Systemic vascular resistance, blood pressure, and perfusion are reduced. 6. Intravascular volume, preload, stroke volume, cardiac output, systolic blood pressure, and perfusion are decreased. 7. Manage the airway, ventilation, and oxygenation. 8. Administer intravenous fluids and medication to constrict the vessels. F. Neurogenic shock <ul style="list-style-type: none"> 1. This is a type of distributive shock, also known as vasogenic shock. 2. May be caused by spinal cord injury 	<p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on types of shock.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on toxic shock syndrome.</p>

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	<ul style="list-style-type: none"> a. May damage the sympathetic nerve fibers that control vessel tone b. Vessels dilate. c. Systemic vascular resistance, blood pressure, and perfusion may drop. d. Blood will pool in the peripheral vessels. e. Preload, stroke volume, cardiac output, and systolic blood pressure will decrease. <ul style="list-style-type: none"> 3. Emergency care focuses on spinal immobilization and management of the airway, ventilation, and oxygenation. 4. Patient may also benefit from intravenous fluids and medication to constrict the vessels. <p>G. Cardiogenic shock</p> <ul style="list-style-type: none"> 1. Most common causes <ul style="list-style-type: none"> a. Myocardial infarction b. Congestive heart failure c. Abnormal cardiac rhythm d. Overdose on drugs that depress the pumping function of the heart 2. Emergency care focuses on management of the airway, ventilation, and oxygenation. 	
10	<p>V. Shock—The Body’s Response to Shock</p> <ul style="list-style-type: none"> A. The body attempts to compensate for a disturbance and returns perfusion and tissue function to a normal state. B. Compensatory mechanisms <ul style="list-style-type: none"> 1. Direct nerve stimulation <ul style="list-style-type: none"> a. Increase in heart rate b. Increase in force of ventricular contraction c. Vasoconstriction d. Stimulation of the release of epinephrine and norepinephrine 2. Release of hormones <ul style="list-style-type: none"> a. Epinephrine stimulates alpha and beta receptors. b. Norepinephrine stimulates alpha receptors. c. Other hormones decrease urine output, cause further vasoconstriction, cause an increase in heart rate and contractility, and cause an increase in glucose in the blood. 	<p>Discussion Question What are the general signs and symptoms of shock?</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip on bleeding control in shock management.</p>

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10	<p>VI. Shock—Stages of Shock</p> <p>A. Compensatory shock</p> <ol style="list-style-type: none"> 1. A near normal blood pressure and perfusion of the vital organs is maintained. 2. If the etiology of shock is reversed at this stage, the compensatory mechanisms will continue to maintain the blood pressure and perfusion. 3. A narrow pulse pressure should be noted as an early sign of shock. <p>B. Decompensatory shock</p> <ol style="list-style-type: none"> 1. An advanced stage of shock in which the compensatory mechanisms are no longer able to maintain a blood pressure and perfusion to vital organs. 2. If the shock state continues, the compensatory mechanisms will become exhausted. 3. Cells, tissues, and organs become ischemic. 4. Heart function is depressed. 5. Blood in the capillaries begins to sludge and form microemboli. 6. Blood leaks out of the vessels into the interstitial space. 7. When the vasomotor in the medulla becomes hypoxic, sympathetic nervous system stimulation is reduced. 8. Aggressive shock management may or may not reverse the process. <p>C. Irreversible shock</p> <ol style="list-style-type: none"> 1. A stage where the patient outcome is death 2. Cell, tissue, and organ failure is so severe that it cannot be reversed. 3. Microemboli block capillaries throughout the body. 4. Fibrinolysis leads to widespread uncontrolled bleeding. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on stages of shock.</p>
10	<p>VII. Shock—Shock Assessment</p> <p>A. History</p> <ol style="list-style-type: none"> 1. Pay attention to chief complaint. 2. Identify signs or symptoms that might provide clues to the etiology of the shock. 3. Gather information about allergies, medications, past medical history, last oral intake, and events prior to the incident. <p>B. Physical exam</p> <ol style="list-style-type: none"> 1. Assess for physical signs of shock. 2. Obtain vital signs. <ol style="list-style-type: none"> a. Blood pressure b. Heart rate 	<p>Knowledge Application Given several descriptions of patient problems, students should be able to match the description to the patient's type of shock.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> c. Pulse character d. Respiratory rate and tidal volume e. Skin color, temperature, and condition f. Pulse oximeter reading <p>3. Note signs of poor perfusion.</p> <ul style="list-style-type: none"> a. Altered mental status b. Pale, cool, clammy skin c. Delayed capillary refill d. Decreased urine output e. Weak or absent peripheral pulses 	
5	<p>VIII. Shock—Age Considerations in Shock</p> <ul style="list-style-type: none"> A. Elderly persons and infants deteriorate rapidly. B. Children and young adults exhibit minor signs over a long period of time and then decompensate suddenly. C. Medications in the elderly patient may prevent some signs and symptoms from appearing. D. An altered mental status and tachypnea may be most profound signs of shock in the elderly. 	<p>Teaching Tip Use questioning to assess students' retention of material from pathophysiology.</p>
10	<p>IX. Shock—General Goals of Prehospital Management of Shock</p> <ul style="list-style-type: none"> A. Management of shock is geared to improving oxygenation of the blood and delivery of oxygen and glucose to the cells. B. General goals <ul style="list-style-type: none"> 1. Secure and maintain a patent airway. 2. Establish and maintain adequate ventilation. 3. Establish and maintain adequate oxygenation. 4. Do not hyperventilate. 5. Stop the bleeding using direct pressure. 6. Splint fractures. 7. Do not remove impaled objects. 8. Maintain the body temperature. 9. Keep the patient in a supine position. 10. Apply the pneumatic antishock garment (PASG). <ul style="list-style-type: none"> a. A pelvic fracture is suspected. b. Systolic blood pressure is less than 90 mmHg. c. Profound hypertension is present. d. Intra-abdominal hemorrhage is suspected with sever hypotension. e. Retroperitoneal hemorrhage is suspected with hypotension. 	<p>Discussion Question What are the general management goals for patients in shock?</p> <p>Critical Thinking Discussion Why is maintaining the body temperature so critical in patients in shock?</p>

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Minutes	Content Outline	Master Teaching Notes
	11. Rapidly transport patient. 12. Consider ALS intercept.	
15	<p>X. Resuscitation in Cardiac Arrest— Pathophysiology of Cardiac Arrest</p> <p>A. Resuscitation is bringing a patient back from a potential or apparent death.</p> <p>B. Cardiac arrest occurs when the ventricles of the heart are not contracting or when the cardiac output is completely ineffective.</p> <p>C. Sudden death occurs when the patient dies within one hour of the onset of the signs and symptoms.</p> <p>D. Three phases the patient goes through following cardiac arrest that lead to biological death</p> <ol style="list-style-type: none"> 1. Electrical phase <ol style="list-style-type: none"> a. Begins immediately upon cardiac arrest and ends four minutes afterward. b. Heart is in good condition for resuscitation. c. Restore an effective electrical rhythm. 2. Circulatory phase <ol style="list-style-type: none"> a. Begins at four minutes and last through ten minutes following a cardiac arrest. b. Myocardial cells shift from aerobic to anaerobic metabolism. c. Myocardial cells become ischemic. d. Heart is not prepared for defibrillation and is not prone to restarting. e. CPR will provide oxygen and glucose to the heart, improving chances for defibrillation. 3. Metabolic phase <ol style="list-style-type: none"> a. Begins ten minutes after a cardiac arrest. b. Heart is starved of oxygen and glucose. c. Acid has built up in the heart. d. Tissues are very ischemic and may begin to die. e. The sodium/potassium pump fails. f. The sodium that stays in the cells attracts water. g. Cells swell, rupture, and die. h. Resuscitation during this phase is typically unsuccessful. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • Why is defibrillation in the first four minutes of cardiac arrest more likely to be successful than delayed defibrillation? • How can cardiac arrest patients benefit from CPR prior to defibrillation in the circulatory phase of cardiac arrest? <p>Critical Thinking Discussion</p> <p>If you were a researcher trying to improve survival from cardiac arrest, what kind of study would you design?</p>
10	<p>XI. Resuscitation in Cardiac Arrest—Terms Related to Resuscitation</p> <p>A. Downtime—The time the patient goes into cardiac arrest until CPR is effectively being performed</p> <p>B. Total downtime—The total time from when the patient goes into cardiac</p>	<p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access the</p>

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	<p>arrest until the patient is delivered to the emergency department</p> <p>C. Return of spontaneous circulation (ROSC)—The patient regains a spontaneous pulse during resuscitation.</p> <p>D. Survival—A patient who survives to be discharged from the hospital</p>	American Heart Association’s site on therapeutic hypothermia after cardiac arrest.
10	<p>XII. Resuscitation in Cardiac Arrest—Withholding a Resuscitation Attempt</p> <p>A. DNR—Patient’s do not resuscitate order</p> <p>B. POLST—Physician’s orders for life-sustaining treatment</p> <p>C. MOLST—Medical orders for life-sustaining treatment</p> <p>D. A patient with injuries that are not compatible with life</p> <p>E. Obvious death in patients who are beyond the point of resuscitation</p>	
10	<p>XIII. Resuscitation in Cardiac Arrest—The Chain of Survival</p> <p>A. Early access</p> <ol style="list-style-type: none"> 1. Early recognition of cardiac event 2. Easy access to the EMS system <p>B. Early CPR</p> <ol style="list-style-type: none"> 1. Immediate CPR can double or even triple a patient’s chance of survival from ventricular-fibrillation-induced sudden cardiac arrest (VF SCA). 2. It is important to begin CPR within two minutes of the cardiac arrest. <p>C. Early defibrillation</p> <ol style="list-style-type: none"> 1. Survival of VF SCA patients decreases approximately seven to ten percent for every minute that defibrillation is delayed. 2. Defibrillation is the procedure of sending an electrical current through the chest. <p>D. Early advanced life support</p> <ol style="list-style-type: none"> 1. Advanced life support (ALS) is delivered most often by paramedics who can provide advanced cardiac life support (ACLS). 2. Advanced EMTs may be able to provide either all or certain components of ALS interventions. 	<p>Discussion Question What are the links in the Chain of Survival?</p> <p>Teaching Tip Motivate students by emphasizing the importance of the basic skills they can perform in resuscitation from cardiac arrest: high quality CPR and early defibrillation.</p> <p>Class Activity Have small groups of students brainstorm ways to improve each of the links in the Chain of Survival in the local community.</p>
15	<p>XIV. Automated External Defibrillation and Cardiopulmonary Resuscitation—Types of Defibrillators</p> <p>A. External defibrillators are applied to the outside of the chest.</p> <ol style="list-style-type: none"> 1. Manual 2. Automated (AED) <p>B. Advantages of AEDs</p>	<p>Teaching Tip Have at least one AED visible to students while teaching this section.</p> <p>Discussion Questions</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 1. Initial training and education 2. Speed of operation 3. Safer, more effective delivery 4. More efficient monitoring <p>C. Types of AEDs</p> <ol style="list-style-type: none"> 1. Fully automated AEDs 2. Semiautomated AEDs 	<ul style="list-style-type: none"> • What is the rationale for early defibrillation? • What is the rationale for the “push hard and push fast” approach to chest compressions in CPR? • What is meant by monophasic and biphasic defibrillation? • What is the difference between a fully automatic AED and a semi-automatic AED?
15	<p>XV. Automated External Defibrillation and Cardiopulmonary Resuscitation—Analysis of Cardiac Rhythms</p> <p>A. Ventricular fibrillation (VF or V-Fib)</p> <ol style="list-style-type: none"> 1. Disorganized cardiac rhythm 2. No pulse or cardiac output 3. Commonly associated with advanced coronary disease <p>B. Ventricular tachycardia (V-Tach)</p> <ol style="list-style-type: none"> 1. Described as a very fast heart rhythm 2. Generated in the ventricle instead of the sinoatrial node in the atrium 3. Cardiac output is sharply reduced. 4. Be aware that some V-Tach patients are not appropriate candidates for defibrillation. 5. AED should only be used on patients who are pulseless, not breathing, and unresponsive. <p>C. AED will detect rhythms for which no shock is indicated.</p> <ol style="list-style-type: none"> 1. Asystole—Electrical activity and pumping action in the heart is absent. 2. Pulseless electrical activity (PEA)—The heart has an organized rhythm but does not pump. <p>D. The AED is very sensitive.</p> <ol style="list-style-type: none"> 1. No one should be touching the patient. 2. The ambulance should be stopped with the motor turned off. 	<p>Knowledge Application List each of the cardiac rhythms described in this section and have students indicate if it can be successfully treated with an AED or not.</p> <p>Critical Thinking Discussion How does defibrillation work?</p>
15	<p>XVI. Automated External Defibrillation and Cardiopulmonary Resuscitation—When and When Not to Use the AED</p> <p>A. Infants—Do not apply the AED to infants.</p> <p>B. Patients between one and eight years of age—Use an AED preferably with a dose attenuating system to reduce defibrillation energy.</p> <p>C. Patients over eight years of age</p>	<p>Teaching Tip Discuss specific protocols for your area.</p>

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	<ol style="list-style-type: none"> 1. Within five minutes, immediately apply the AED. 2. If it has been more than five minutes, immediately perform five cycles of CPR at a ratio of 30 compressions to two ventilations and then apply the AED. <p>D. The AED is not intended for trauma patients.</p> <p>E. Consult medication direction and local protocols if you are unsure about whether to use the AED.</p>	
15	<p>XVII. Recognizing and Treating Cardiac Arrest—Assessment-Based Approach: Cardiac Arrest</p> <p>A. Scene size-up and primary assessment</p> <ol style="list-style-type: none"> 1. Take appropriate Standard Precautions. 2. Ensure the scene is secure. 3. Form a general impression of the patient. 4. If a suspected cardiac patient is unresponsive, follow procedures for assessment and care for cardiac-related emergencies. <p>B. With unresponsive patients</p> <ol style="list-style-type: none"> 1. Open the airway. 2. Assess breathing and pulse. 3. If there is no breathing and pulse, the patient is in cardiac arrest. 4. One member of the team should deliver CPR. 5. Deliver emergency care appropriate for age. <p>C. Secondary assessment</p> <ol style="list-style-type: none"> 1. Gather the history from bystanders and relatives. 2. Identify signs and symptoms of cardiac arrest <ol style="list-style-type: none"> a. No breathing b. No pulse c. Unresponsiveness to stimuli <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Follow the proper steps to provide emergency care with an AED to cardiac arrest patients. 2. Use CPR and defibrillation as appropriate according to age and downtime. <p>E. Reassessment</p> <ol style="list-style-type: none"> 1. Once pulse is restored, continue to perform reassessments. 2. Monitor patient's pulse, breathing, and mental status. 	<p>Discussion Question In what situations is CPR begun prior to applying the AED?</p> <p>Knowledge Application Describe several patient presentations and ask students to determine whether or not the AED should be applied.</p>
15	<p>XVIII. Recognizing and Treating Cardiac Arrest—Performing Defibrillation</p>	

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	<p>A. Using a semiautomated AED</p> <ol style="list-style-type: none"> 1. Take Standard Precautions. 2. Perform a primary assessment of the patient. 3. Begin or resume CPR. 4. Attach the adhesive monitoring-defibrillation pads to the cables. 5. Turn on the power to the AED. 6. Apply the two defibrillation pads to the patient's bared chest. 7. Stop ongoing CPR and clear anyone from touching the patient. 8. Begin analysis of the patient's heart rhythms. 9. Deliver shock if indicated on the AED and then resume CPR. 10. Check for a pulse for no longer than ten seconds. 11. If a pulse is present, check for breathing to apply ventilation as needed. 12. If no pulse is present, deliver a second shock, and then resume CPR. 13. If ALS is not responding to the scene, transport after three shocks are delivered. <p>B. Use of the AED by a single EMT</p> <ol style="list-style-type: none"> 1. Only one EMT may be available for a cardiac arrest patient. 2. Adjust the procedure to the situation until help arrives. <p>C. Using a fully automated AED</p> <ol style="list-style-type: none"> 1. The fully automated AED will deliver the shock to the patient. 2. The device gives directions to the EMT throughout the defibrillation process. 	<p>Discussion Question Why is the pulse not checked immediately after the shock is delivered?</p> <p>Class Activity Ensure that students have ample opportunity for supervised practice of resuscitation scenarios.</p>
10	<p>XIX. Recognizing and Treating Cardiac Arrest—Transporting the Cardiac Arrest Patient</p> <p>A. Transporting a patient with a pulse</p> <ol style="list-style-type: none"> 1. Check airway and provide oxygen. 2. Provide pressure ventilation if breathing is inadequate. 3. Have suction ready for use. 4. Secure the patient to a stretcher or transfer to an ambulance. 5. Consult with dispatch to find out how to connect with an ALS unit. 6. Continue to keep the AED attached to the patient. 7. Perform the secondary assessment en route every five minutes. <p>B. Patients brought out of a ventricular fibrillation through use of AED have a high likelihood of slipping back into that state.</p> <ol style="list-style-type: none"> 1. Be alert if patient becomes unresponsive. 2. Check for breathing and pulse. 3. If the patient shows no breathing or pulse 	<p>Critical Thinking Discussion Why is a patient who remains in cardiac arrest not transported until three shocks or three no-shock messages have been delivered?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> a. Stop the vehicle. b. Start CPR. c. Stop CPR and initiate rhythm analysis. d. Deliver a shock if warranted. e. Resume CPR for two minutes. f. Deliver a second shock if warranted. g. Resume CPR for two minutes. h. Reanalyze until two or three “no shock” messages. i. Continue as per local protocol. j. Continue transport. <p>C. Transporting a patient without a pulse</p> <ul style="list-style-type: none"> 1. Provide CPR. 2. Contact medical direction. 3. Follow local protocol. 	
10	<p>XX. Recognizing and Treating Cardiac Arrest—Providing for Advanced Cardiac Life Support</p> <ul style="list-style-type: none"> A. Keep the AHA’s Chain of Survival in mind. B. Inform medical direction and request ACLS backup as soon as you can. C. Minimize the time from the delivery of CPR and defibrillatory shocks to the arrival of ACLS. 	
10	<p>XXI. Recognizing and Treating Cardiac Arrest—Summary: Assessment and Care</p> <ul style="list-style-type: none"> A. Review assessment findings associated with cardiac arrest. B. Review assessment findings associated emergency care for cardiac arrest. 	<p>Teaching Tip Demonstrate several cardiac arrest scenarios for students, explaining the steps as you go through the scenarios.</p>
5	<p>XXII. Special Considerations for the AED—Safety Considerations</p> <ul style="list-style-type: none"> A. The shock from an AED can travel through different substances. B. No one should be in contact with the patient during rhythm analysis or delivery of defibrillating shocks. C. The AED should not be operated if the machine or patient is in contact with water. D. Ensure that no one else is directly in contact with metal that is touching the patient before delivering a shock. E. Use gloves to remove any transversal medication patches and dry the area before delivering a shock. F. Do not put an AED adhesive pad on top of a surgically implanted pacemaker. 	<p>Discussion Question What are the safety precautions that must be observed when using an AED?</p>

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Minutes	Content Outline	Master Teaching Notes
	G. Make sure that electrodes are adhering properly to a very hairy chest.	
4	XXIII. Special Considerations for the AED—AED Maintenance A. Scheduled maintenance is crucial to ensuring proper functioning. B. Follow local protocols and manufacturer’s directions. C. Batteries should be replaced on a set schedule. D. Extra, fully charged batteries should always be available.	
3	XXIV. Special Considerations for the AED—Training and Skills Maintenance A. EMTs should be properly educated in operating the AED. B. Operators should review incidents of AED use, study new protocols, and practice working with the device. C. EMTs should check updated research on AED procedures at sources such as EMS journals, state EMS offices, and the AHA.	Teaching Tip Show any mechanical CPR devices or circulation-enhancing devices used in your local EMS system.
3	XXV. Special Considerations for the AED—Medical Direction and the AED A. Medical direction plays a significant role in providing AED services. B. Medical direction involvement <ol style="list-style-type: none"> 1. Make sure the EMS system has necessary links in the AHA Chain of Survival. 2. Oversee all levels of EMTs. 3. Review the continual competency skill review program. 4. Engage in audit and/or quality improvement. 	Discussion Question What is the role of a medical director with regard to AED use?
3	XXVI. Special Considerations for the AED—Energy Levels of Defibrillators A. Electrical current for defibrillators is measured in joules. B. It is important that EMTs know how to deliver the appropriate amount of energy for their type of AED.	
3	XXVII. Special Considerations for the AED—Cardiac Pacemakers A. A cardiac pacemaker is placed under the skin with electrodes connecting to the heart. B. Cardiac pacemakers are usually positioned beneath one of the clavicles. C. An AED can still be used in a patient with a cardiac pacemaker. D. The adhesive pad should not be placed directly over the pacemaker.	
	XXVIII. Special Considerations for the AED—Automatic Implantable	

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4	<p>Cardioverter Defibrillators</p> <p>A. An automatic implantable cardioverter defibrillators (AICD) is used for ventricular heart rhythm disturbances that cannot be controlled by medication.</p> <p>B. For a responsive cardiac patient with an AICD, allow the device to operate, stabilize the patient, and prepare for transport.</p> <p>C. For an unresponsive cardiac patient, look for surgical scars or medical identification tags.</p> <ol style="list-style-type: none"> 1. Treat as other unresponsive cardiac patients. 2. Do not apply the AED's adhesive pads directly over the implanted AICD. 	
5	<p>XXIX. Special Considerations for the AED—Automated Chest Compression Devices</p> <p>A. Mechanical piston device</p> <ol style="list-style-type: none"> 1. Apparatus that depresses the sternum with a compressed-gas-powered plunger that has been affixed to a backboard 2. Can be configured to deliver a specific rate and depth of compressions 3. Delivers uniform compressions with no diminishment 4. Frees up an EMS provider 5. Can become useless if compressed gas runs out <p>B. Load-distributing-band CPR or vest CPR</p> <ol style="list-style-type: none"> 1. Composed of a wide band applied to the chest circumferentially 2. Is either pneumatically or electrically driven to provide an inward constrictive pressure on the thorax 3. Frees up an EMS provider 4. Has been shown to improve coronary and cerebral blood flow over traditional CPR <p>C. Impedance threshold device</p> <ol style="list-style-type: none"> 1. Piece of equipment with a valve that limits the air that enters the chest and lungs during the chest recoil phase of active compressions 2. Has been shown to improve blood flow through the heart during CPR 3. May be considered for use in a nonintubated patient 4. A tight mask seal must constantly be maintained. <p>D. Other circulation-enhancing devices</p> <ol style="list-style-type: none"> 1. Other devices have been developed to actively compress and decompress the thorax during resuscitation. 2. The compression phase generates the positive pressure to move blood out of the heart. 	<p>Discussion Question What are the advantages and disadvantages of adjunctive equipment used for CPR?</p>

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	<p>3. The decompression is designed to increase the negative pressure inside the thorax to improve blood return to the heart.</p>	
10	<p>XI. Follow-Up</p> <p>B. Answer student questions.</p> <p>C. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>D. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 15 Summary. 2. Complete Chapter 15 In Review questions. 3. Complete Chapter 15 Critical Thinking. <p>E. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 15 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What is your general impression of the patient's condition? • What priority will you assign this patient? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 16

Respiratory Emergencies

300–330 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency care for a patient suffering from respiratory distress.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What are the patient's immediate needs? • What is your general impression of the patient?
10	<p>II. Respiratory Anatomy, Physiology, and Pathophysiology—Normal Breathing</p> <p>A. Respiratory systems can be divided into three portions.</p> <ol style="list-style-type: none"> 1. Upper airway works with lower airway to conduct air into and out of the lungs. 2. Lower airway is separated from the upper airway by the vocal cords. 3. Lungs and accessory structures allow oxygenation of body cells and elimination of carbon dioxide from the blood stream. <p>B. Patient who is breathing adequately</p> <ol style="list-style-type: none"> 1. Intact (open) airway 2. Normal respiratory rate 3. Normal rise and fall of the chest 4. Normal respiratory rhythm 5. Breath sounds that present bilaterally 6. Chest expansion and relaxation that occurs normally 7. Minimal-to-absent use of accessory muscles to aid in breathing <p>C. Following should also occur provided no other condition or injury is involved.</p> <ol style="list-style-type: none"> 1. Normal mental status 2. Normal muscle tone 3. Normal pulse oximeter reading 4. Normal skin condition findings 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the characteristics of normal breathing? • How does the body respond to decreases in oxygen and increases in carbon dioxide levels?

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10	<p>III. Respiratory Anatomy, Physiology, and Pathophysiology—Abnormal Breathing</p> <p>A. Conditions that can decrease the efficiency of gas exchange across the alveolar-capillary membrane</p> <ol style="list-style-type: none"> 1. Increased width of the space between the alveoli and blood vessels 2. Lack of perfusion of the pulmonary capillaries from the right ventricle of the heart 3. Filling of the alveoli with fluid, blood, or pus <p>B. Accessory muscles, the inspiratory and expiratory centers in the medulla and pons, stretch receptors in the walls of the lungs, irritant receptors in the walls of the bronchioles, and juxta-capillary receptors all monitor breathing and any contribute to signs and symptoms of respiratory distress.</p> <p>C. Assessing breath sounds</p> <ol style="list-style-type: none"> 1. Have the patient sit upright (if possible). 2. Using the diaphragm end of your stethoscope over bare skin, instruct the patient to take deep rhythmic breaths with his mouth open. 3. Place the head of the stethoscope on the patient's thorax, and listen the whole way through the phases of inhalation and exhalation. 4. Listen to sounds on one location of the body, and then listen to the exact location on the other side before moving on. 5. Types of breath sounds <ol style="list-style-type: none"> a. Wheezing <ol style="list-style-type: none"> i. High-pitched, musical, whistling sound best heard initially on exhalation ii. Usually heard in asthma, emphysema, and chronic bronchitis (but could be heard in pneumonia, congestive heart failure, and other conditions) iii. Diffuse wheezing is primary indication for administration of a beta agonist medication by metered-dose inhaler or small-volume nebulizer. b. Rhonchi <ol style="list-style-type: none"> i. Snoring or rattling noises heard upon auscultation ii. Indication of obstruction of larger conducting airways of the respiratory tract by thick secretions of mucus iii. Quality of sound changes if the person coughs or even changes positions. c. Crackles (rales) 	<p>Critical Thinking Discussion Why is increased respiratory rate an indication of respiratory distress?</p> <p>Teaching Tip Demonstrate the correct locations for assessing breath sounds.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What conditions are associated with wheezing? • What conditions are associated with rhonchi? • What conditions are associated with crackles in the lungs? <p>Class Activity Have pairs of students practice listening to each other's breath sounds in the proper locations.</p> <p>Knowledge Application Given several descriptions of breath sounds, students should be able to suggest general causes of abnormal sounds.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> i. Bubbly or crackling sounds heard during inhalation ii. Associated with fluid that has surrounded or filled the alveoli iii. Associated with alveoli and terminal bronchioles “popping” open with each inhalation iv. May indicate pulmonary edema or pneumonia 	
20	<p>IV. Respiratory Distress</p> <ul style="list-style-type: none"> A. Be aware that failing to breathe adequately will result in hypoxemia (decreased oxygen in the bloodstream) and cellular death, which lead to all other body systems starting to falter as well. B. Respiratory emergencies may range from dyspnea (shortness of breath) to apnea (respiratory arrest). C. Hypoxia occurs when cells of the body are not getting an adequate supply of oxygen. D. If adequate breathing and gas exchange are not present, body cells begin to die or function abnormally. E. Findings in the patient with respiratory distress <ul style="list-style-type: none"> 1. Subjective complaint of shortness of breath 2. Restlessness 3. Increased (early distress) or decreased (late distress) pulse rate 4. Changes to the rate or depth of breathing 5. Skin color changes 6. Abnormal breathing, lung, or airway sounds 7. Difficulty or inability to speak 8. Muscle retractions 9. Altered mental status 10. Abdominal breathing 11. Excessive coughing 12. Tripod positioning 13. Decrease in pulse oximetry reading (especially below 95 percent) F. Bronchoconstriction or bronchospasm is a condition in which there is a significant narrowing of the bronchioles of the lower airway from inflammation, swelling, or constriction of the muscle layer. (Patient may be prescribed a bronchodilator to dilate the bronchioles and increase effectiveness of breathing.) G. Breathing difficulty may be a symptom of injuries to the head, face, neck, spine, chest, or abdomen, or associated with cardiac compromise, 	<p>Discussion Question What are indications of respiratory distress?</p> <p>Class Activity Have students attempt to breathe normally through drinking straws or coffee stirrers to demonstrate the increased respiratory effort and decreased airflow associated with severe bronchoconstriction.</p>

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	<p>hyperventilation, and various abdominal conditions.</p> <p>H. Common causes of respiratory system dysfunction</p> <ol style="list-style-type: none"> 1. Mechanical disruption to the airway, lung, or chest wall that prevents effective mechanical ventilation 2. Stimulation of the receptors in the lungs 3. Inadequate gas exchange at the level of the alveoli and capillaries <ol style="list-style-type: none"> a. Ventilation disturbance is an inadequate amount of oxygen-rich air entering the alveoli and passing across the alveolar membrane to the capillary b. Perfusion disturbance is an inadequate amount of blood traveling through the pulmonary capillaries, decreasing the number of red blood cells available to pick up the oxygen and transport it to the cells c. Both a ventilation and perfusion disturbance in the lungs leads to hypoxemia and hypercarbia (increased carbon dioxide levels in the blood). <p>I. Respiratory distress means a patient has an adequate tidal volume and respiratory rate but is having difficulty breathing. (Provide oxygen via a nonrebreather mask at 15 lpm.)</p> <p>J. Respiratory failure means a patient's tidal volume or respiratory rate is inadequate. (Immediately begin ventilation with a bag-valve-mask device or other ventilation device, and deliver supplemental oxygen through the device.)</p> <p>K. Respiratory arrest is when breathing effort ceases completely (and can lead to cardiac arrest in minutes).</p>	<p>Teaching Tip Emphasize that all respiratory problems discussed in the upcoming section will have at least one of these underlying causes.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What is an example of mechanical disruption of breathing? • What are examples of conditions causing inadequate gas exchange? <p>Knowledge Application Give several examples of conditions leading to hypoxia, such as an inadequate number of red blood cells, constricted airways, a blood clot in the pulmonary artery, and so on, and ask students to explain how each condition leads to hypoxia and respiratory distress.</p> <p>Critical Thinking Discussion What is the significance of the patient's experience of anxiety in respiratory distress?</p>
60	<p>V. Pathophysiology of Conditions that Cause Respiratory Distress—Obstructive Pulmonary Diseases</p> <p>A. An obstructive lung disease causes an obstruction of airflow through the respiratory tract, leading to a reduction in gas exchange (and possibly hypoxia).</p> <p>B. Emphysema</p> <ol style="list-style-type: none"> 1. Chronic obstructive pulmonary disease (COPD) 2. Characterized by destruction of the alveolar walls and distention of the alveolar sacs 3. Primary causation is cigarette smoking. 4. Pathophysiology 	<p>Class Activity Before lecturing on this section, assign small groups of students to each disorder this section. Give students 15 minutes to read about and do more research on their topic before presenting their information to the class. Be prepared to correct any misunderstandings and fill in any gaps.</p>

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	<ul style="list-style-type: none"> a. Lung tissue loses elasticity, alveoli become distended with trapped air, and the walls of the alveoli are destroyed. b. Drastic reduction in gas exchange occurs, and the patient becomes hypoxic and retains carbon dioxide. c. Exhaling becomes an active rather than a passive process. d. Barrel-chest appearance is typical with the disease. 5. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. Thin, barrel-chest appearance b. Coughing but with little sputum c. Prolonged exhalation d. Diminished breath sounds e. Wheezing and rhonchi on auscultation f. Pursed-lip breathing g. Extreme difficulty of breathing on minimal exertion h. Pink complexion i. Tachypnea j. Tachycardia k. Diaphoresis l. Tripod position m. May be on home oxygen C. Chronic bronchitis <ul style="list-style-type: none"> 1. Chronic pulmonary obstructive disease (COPD) 2. Associated with cigarette smoking 3. Characterized by a productive cough that persists for at least three consecutive months a year for at least two consecutive years 4. Pathophysiology <ul style="list-style-type: none"> a. Involves inflammation, swelling, and thickening of the lining of the bronchi and bronchioles and excessive mucus production (restricting airflow to the alveoli) b. Recurrent infections leave scar tissue. 5. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. Typically overweight b. Chronic cyanotic complexion c. Difficulty in breathing d. Vigorous productive chronic cough with sputum e. Coarse rhonchi usually heard upon auscultation of the lungs f. Wheezes and crackles at the bases of the lungs 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Draw a grid on the white board with a respiratory disorder at the top of each column. Label two rows at the left “similar” and “different.” Have students state what is similar about all respiratory emergencies, and what is unique or distinguishing about each disorder, to help them learn about the disorders. • Discuss specific protocols for your area.

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	<p>6. Emergency medical care for emphysema and bronchitis</p> <ol style="list-style-type: none"> a. Ensure an open airway and adequate breathing. b. Assume a position of comfort. c. Administer supplemental oxygen and possibly a prescribed metered-dose inhaler or small-volume nebulizer. <ol style="list-style-type: none"> i. If patient is high priority, respiratory distress is evident, and trauma, shock, cardiac compromise, or other potentially life-threatening conditions exist, administer high concentrations of oxygen via a nonrebreather mask at 15 lpm. ii. If patient is not in significant distress or a high priority patient, medical direction may order you to place the patient on a nasal cannula at two to three liters per minute (or one lpm higher than the home oxygen setting). d. Follow local protocol or medical direction's orders, and never withhold oxygen from any patient that requires it. e. Oxygen administration should take precedence over a concern about whether the hypoxic drive is going to be lost and cause the patient to stop breathing. <p>D. Asthma</p> <ol style="list-style-type: none"> 1. Many asthma patients are aware of their condition and have medication to manage the disease and its sign and symptoms. 2. Pathophysiology <ol style="list-style-type: none"> a. Characterized by an increased sensitivity of the lower airways to irritants and allergens b. Conditions contributing to the increasing resistance to air flow and difficulty in breathing <ol style="list-style-type: none"> i. Bronchospasm ii. Edema iii. Increased secretion of mucus that causes plugging of the smaller airways 3. Patients usually suffer acute, irregular, period attacks, but have few or no signs and symptoms between attacks. 4. Status asthmaticus is a severe asthmatic attack that does not respond to either oxygen or medication and requires rapid transport to the hospital. Consider ALS backup. 5. Extrinsic asthma ("allergic" asthma) usually results from a reaction to dust, pollen, smoke, or other irritants in the air. 6. Intrinsic asthma ("nonallergic" asthma) is the most common in adults and 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the major differences between asthma, emphysema, and chronic bronchitis? • What are the similarities in treatment of all patients with obstructive pulmonary diseases?

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	<p>usually results from infection, emotional stress, or strenuous exercise.</p> <p>7. Assessment</p> <ul style="list-style-type: none"> a. Signs and symptoms of asthma <ul style="list-style-type: none"> i. Dyspnea; may progressively worsen ii. Nonproductive cough iii. Wheezing on auscultation iv. Tachypnea v. Tachycardia vi. Anxiety and apprehension vii. Possible fever viii. Typical allergic signs and symptoms (e.g., runny nose, sneezing) ix. Chest tightness x. Inability to sleep xi. SpO₂ less than 95 percent before oxygen administration b. Signs and symptoms of severe condition with inadequate breathing (Begin positive pressure ventilation with supplemental oxygen.) <ul style="list-style-type: none"> i. Extreme fatigue or exhaustion ii. Inability to speak iii. Cyanosis to the core of the body iv. Heart rate less than 150 per minute or slow rate v. Quiet or absent breath sounds on auscultation of the lungs vi. Tachypnea (respiratory rate greater than 32 breaths per minute) vii. Excessive diaphoresis viii. Accessory muscle use ix. Confusion x. SpO₂ less than 90 percent with patient on oxygen <p>8. Emergency medical care</p> <ul style="list-style-type: none"> a. Establish and maintain airway (primary assessment). b. Apply oxygen or begin positive pressure ventilation with supplemental oxygen (primary assessment). c. Assess the adequacy of circulation (primary assessment). d. Watch for chest rise when providing ventilation to determine the necessary volume and pressure needed to effectively ventilate the patient. e. Allow sufficient time for exhalation (avoid increasing the pressure inside the chest and causing lung injury). f. During physical exam, calm the patient to reduce workload of 	

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	<p>breathing and oxygen consumption.</p> <ul style="list-style-type: none"> g. Patient may have a prescribed metered-dose inhaler or small-volume nebulizer to administer beta agonist medication. h. Transport the patient and continuously reassess breathing status. 	
60	<p>VI. Pathophysiology of Conditions that Cause Respiratory Distress— Other Diseases that Cause Respiratory Distress</p> <p>A. Pneumonia</p> <ul style="list-style-type: none"> 1. Pathophysiology <ul style="list-style-type: none"> a. Primarily an acute infectious disease caused by bacterium or a virus that affects the lower respiratory tract and causes lung inflammation and fluid- or pus-filled alveoli b. May also be caused by inhalation of toxic irritants or aspiration of vomitus and other substances 2. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. Malaise and decreased appetite b. Fever (may not occur in elderly) c. Cough d. Dyspnea (less frequent in the elderly) e. Tachypnea and tachycardia f. Chest pain g. Decreased chest wall movement and shallow respirations h. Patient's splinting of thorax with arm i. Crackles and rhonchi (on auscultation) j. Altered mental status k. Diaphoresis l. Cyanosis m. SpO₂ less than 95 percent 3. Emergency medical care—Managed the same as any patient having difficulty in breathing <p>B. Pulmonary embolism</p> <ul style="list-style-type: none"> 1. Patients at risk are those who experience long periods of immobility, heart disease, recent surgery, long-bone fracture, venous pooling associated with pregnancy, cancer, deep vein thrombosis, estrogen therapy, and those who smoke. 2. Pathophysiology 	<p>Critical Thinking Discussion What is the relative importance of determining the exact cause of the patient's problem?</p> <p>Discussion Question What are some risk factors for pneumonia?</p> <p>Discussion Question What are risk factors for pulmonary embolism?</p>

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	<ul style="list-style-type: none"> a. Sudden blockage of blood flow through a pulmonary artery or one its branches (blood clot, air bubble, fat particle, foreign body, amniotic fluid) b. Leads to decrease in gas exchange and subsequent hypoxia 3. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. Sudden onset of unexplained dyspnea (one of the most common signs) b. Signs of difficulty in breathing or respiratory distress c. Sudden onset of sharp, stabbing chest pain (one of the most common signs) d. Cough e. Tachypnea (one of the most common signs) f. Tachycardia g. Syncope (fainting) h. Cool, moist skin i. Restlessness, anxiety, or sense of doom j. Decrease in blood pressure (late sign) k. Cyanosis (late sign) l. Distended neck veins (late sign) m. Crackles n. Fever o. SpO₂ less than 95 percent 4. Emergency medical care <ul style="list-style-type: none"> a. Open the airway and initiate positive pressure ventilation with supplemental oxygen or oxygen via nonrebreather mask. b. Begin oxygen administration early on and continuously monitor patient for signs of respiratory arrest. c. Immediately transport the patient. C. Acute pulmonary edema <ul style="list-style-type: none"> 1. Most frequently seen in patient with cardiac function leading to congestive heart failure 2. Pathophysiology <ul style="list-style-type: none"> a. Occurs when an excessive amount of fluid collects in the spaces between the alveoli and the capillaries, disturbing normal gas exchange and leading to hypoxia b. Cardiogenic pulmonary edema is typically related to an inadequate pumping function of the heart, increasing the pressure in the pulmonary capillaries and forcing fluid to lead into the space 	

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	<p style="padding-left: 40px;">between the alveoli and capillaries (and eventually into the alveoli).</p> <p>c. Noncardiogenic pulmonary edema results from destruction of the capillary bed that allows fluid to leak out (occurs with severe pneumonia, aspiration of vomit, narcotic overdose, trauma, and so on).</p> <p>3. Assessment—Signs and symptoms</p> <ul style="list-style-type: none"> a. Dyspnea (especially on exertion) b. Difficulty in breathing when lying flat c. Frothy sputum d. Tachycardia e. Anxiety, apprehension, combativeness, confusion f. Tripod position with legs dangling g. Fatigue h. Crackles and possibly wheezing on auscultation i. Cyanosis or dusky-color skin j. Pale, moist skin k. Distended neck veins l. Swollen lower extremities m. Cough n. Symptoms of cardiac compromise o. SpO₂ less than 95 percent <p>4. Emergency medical care</p> <ul style="list-style-type: none"> a. If breathing is inadequate, begin positive pressure ventilation. b. If breathing is adequate, administer oxygen via nonrebreather mask at 15 lpm, and monitor breathing status closely. c. Keep the patient in upright sitting position and transport without delay. <p>D. Spontaneous pneumothorax</p> <ul style="list-style-type: none"> 1. Males with history of smoking or connective tissue disorder and patients with a history of COPD are more at risk. 2. Pathophysiology <ul style="list-style-type: none"> a. Portion of the visceral pleura ruptures without any trauma and allows air to enter the pleural cavity, causing the lung to collapse. b. Collapsed lung leads to disturbance in gas exchange and can lead to hypoxia. 3. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. Sudden onset of shortness of breath b. Sudden onset of sharp chest pain or shoulder pain 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the treatment needs of patients with pulmonary edema? • What would you expect to find in the history and assessment of a patient with a spontaneous pneumothorax?

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	<ul style="list-style-type: none"> c. Decreased breath sounds to one side of the chest d. Subcutaneous emphysema e. Tachypnea f. Diaphoresis g. Pallor h. Cyanosis (late and large pneumothorax) i. SpO₂ less than 95 percent 4. Emergency medical care <ul style="list-style-type: none"> a. Apply oxygen via a nonbreather mask at 15 lpm if breathing is adequate or positive pressure ventilation with supplemental oxygen if breathing is inadequate. (Take care not to create tension pneumothorax). b. Suspect tension pneumothorax with cyanosis, hypotension, significant resistance to ventilation, and severe decline in pulse oximeter reading. (Contact ALS if tension pneumothorax is suspected.) E. Hyperventilation syndrome <ul style="list-style-type: none"> 1. Can be caused when patient is emotionally upset or very excited or be a sign of a serious underlying medical problem 2. Pathophysiology <ul style="list-style-type: none"> a. Patient is often anxious and feels unable to catch his breath. b. Patient “blows off” excessive amounts of carbon dioxide from breathing faster and deeper. 3. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. Fatigue b. Nervousness and anxiety c. Dizziness d. Shortness of breath e. Chest tightness f. Numbness and tingling around the mouth, hands, and feet g. Tachypnea h. Tachycardia i. Spasms of the fingers and feet, causing them to cramp j. May precipitate seizures in a patient with a seizure disorder 4. Emergency medical care <ul style="list-style-type: none"> a. Get the patient to calm down and slow his breathing (have patient close his mouth and breathe through his nose). b. Remove the patient from the source of anxiety. 	

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	<ul style="list-style-type: none"> c. Do NOT have the patient breathe into a paper bag or oxygen mask not connected to oxygen. d. Only use a carbon dioxide rebreathing technique if no underlying medical conditions exist and you are specifically instructed by medical direction to do so. e. Apply a pulse oximeter and measure the oxygen content of the blood. <p>F. Epiglottitis</p> <ul style="list-style-type: none"> 1. In previous years, most common cause was <i>H influenzae</i> Type B; however, Hib vaccination has reduced incidence in children. 2. Other organisms such as viruses, fungi, and bacteria are now the causes, especially among adults. 3. Pathophysiology <ul style="list-style-type: none"> a. Epiglottitis and the structures connected to or immediately surrounding it become inflamed and swollen, leading to compromised airway and respiratory compromise. b. If untreated, condition eventually leads to death. 4. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. Dyspnea, usually with more rapid onset b. High fever c. Sore throat d. Inability to swallow with drooling e. Anxiety and apprehension f. Tripod position, usually with jaw jutted forward g. Fatigue h. High pitched inspiratory stidor i. Cyanosis or dusky-color skin j. Trouble speaking k. SpO₂ less than 95 percent 5. Emergency medical care <ul style="list-style-type: none"> a. Ensure oxygenation by administering oxygen via a nonrebreather mask at 15 lpm if breathing is adequate. b. Maintain a calm and quiet environment. c. Keep the patient in a position of comfort and expedite transport with ALS if possible. d. Do not force an inspection of the airway so long as the patient is adequately exchanging air (may result in additional swelling that totally occludes the airway). 	<p>Discussion Question</p> <p>Why is breathing into a paper bag not an appropriate treatment for patients who are hyperventilating?</p>

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	<ul style="list-style-type: none"> e. Airway maneuvers in a patient with epiglottitis are only warranted in extreme cases of respiratory occlusion. f. If patient continues to deteriorate and assisted ventilations with a bag-valve-mask device are not effective, ALS may need to consider other advanced airway techniques. <p>G. Pertussis</p> <ol style="list-style-type: none"> 1. Highly contagious disease that affects respiratory system and is caused by bacteria that reside in the upper airway 2. Spread by respiratory droplets that are discharged from the nose and mouth 3. The younger the patient, the more severe the clinical condition 4. Pathophysiology <ul style="list-style-type: none"> a. Starts out as cold or mild respiratory infection b. Within two weeks, patient develops episodes of rapid coughing, followed by “crowing” or “whooping”. c. Complications include pneumonia, dehydration, seizures, brain injuries, ear infections, and even death. 5. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. History of upper respiratory infection b. Sneezing, runny nose, low grade fever c. General malaise d. Increase in frequency and severity of coughing e. Coughing fits, usually more common at night f. Vomiting g. Inspiratory “whoop” heard at the end of coughing burst h. Cyanosis during coughing burst i. Diminishing pulse oximetry finding j. Exhaustion from coughing burst k. Trouble speaking and breathing during coughing burst 6. Emergency medical care <ul style="list-style-type: none"> a. Allow patient to remain in a position of comfort. b. Apply high-flow, high-concentration oxygen (humidified) via nonrebreather mask at 15 lpm. c. Encourage the patient to expectorate any mucus that is brought up with coughing. d. Ensure a quiet and calm environment. e. Expedite transport and consider ALS intercept. f. Take all precautions to prevent cross-contamination (patient mask, if 	<p>Discussion Question What is pertussis?</p>

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	<p style="text-align: center;">appropriate, and disinfecting patient compartment).</p> <p>H. Cystic fibrosis</p> <ol style="list-style-type: none"> 1. Hereditary disease that causes patients to die at a young age (20s to 30s) from pulmonary failure 2. Pathophysiology <ol style="list-style-type: none"> a. Abnormal gene alters the functioning of the mucous glands lining the respiratory system, producing overabundance of very thick and sticky mucus. b. Mucus blocks the airway and causes an increase in the incidence of lung infections. c. Progressive diminishment in the efficiency of respiratory function 3. Assessment—Signs and symptoms <ol style="list-style-type: none"> a. Commonly a known history of the disease b. Recurrent coughing c. General malaise d. Expectoration of thick mucus during coughing e. Recurrent episodes or history of pneumonia, bronchitis, and sinusitis f. GI complaints that may include diarrhea and greasy, foul smelling bowel movements g. Abdominal pain from intestinal gas h. Malnutrition or low weight despite a healthy appetite i. Dehydration j. Clubbing of the digits k. Trouble speaking and breathing with mucus buildup 4. Emergency medical care <ol style="list-style-type: none"> a. Care geared toward symptomatic relief b. Apply oxygen (humidified) via a nonrebreather mask at 15 lpm if breathing is adequate or positive pressure ventilation if breathing is inadequate. c. Consider administering normal saline through a small-volume nebulizer to aid patient by thinning secretions. (Follow local protocol or medical direction.) d. Allow patient to maintain position of comfort (sitting). e. Establish ongoing pulse oximetry and, in serious cases, attempt to rendezvous with an ALS unit. I. Poisonous exposures—Umbrella label for any type of inhalation injury that occurs secondary to exposure to toxic substances that can cause airway occlusion and/or pulmonary dysfunction by inhibiting the normal exchange of 	<p>Discussion Question How is cystic fibrosis different from other respiratory diseases?</p>

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	<p>gasses at the cellular level</p> <ol style="list-style-type: none"> 1. Pathophysiology <ol style="list-style-type: none"> a. Majority of toxic inhalation occurs as a result of a fire. b. Commonly inhaled poisons <ol style="list-style-type: none"> i. Carbon monoxide ii. Carbon dioxide iii. Natural gas iv. Chlorine gas v. Liquid chemicals or sprays vi. Ammonia vii. Sulfur dioxide viii. Anesthetic gases ix. Solvents x. Industrial gases xi. Hydrogen sulfide xii. Fumes/smoke from fire xiii. Paints or Freon xiv. Glue xv. Nitrous oxide xvi. Amyl or butyl nitrate c. Can cause cellular hypoxia, upper airway to swell, displacement of oxygen in the alveoli, damage to the alveolar lining, and action on the body leading to cellular death and possible death to the patient 2. Assessment—Signs and symptoms <ol style="list-style-type: none"> a. History consistent with inhalation injury b. Presence of chemicals about the face c. Findings of respiratory distress d. Cough, stridor, wheezing, or crackles e. Oral or pharyngeal burns, possible hoarseness f. Dizziness, feelings of malaise g. Headache, confusion, altered mental status h. Seizures i. Cyanosis or other skin changes j. Nausea, vomiting, or abdominal distress k. Copious secretions l. Vital sign changes 3. Emergency medical care <ol style="list-style-type: none"> a. Limit the exposure if the patient is still in the toxic environment (Be 	<p>Discussion Question What are some sources of toxic inhalation exposures?</p>

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	<p>sure that the scene is safe to enter or wait until properly trained and equipped providers can bring the patient to you.)</p> <ol style="list-style-type: none"> b. Ensure an open airway, and either move the patient into a position of comfort (if alert and no trauma) or into a supine position (if traumatized or unresponsive). c. Apply oxygen via nonrebreather mask at 15 lpm if patient is breathing adequately, or positive pressure ventilation with supplemental oxygen if patient is breathing inadequately. d. Treat any other injuries or abnormal findings. e. Ascertain as much information as possible about the inhaled poison for the receiving facility and notify the facility. f. Arrange for ALS intercept en route if possible. <p>J. Viral respiratory infections (VRI)</p> <ol style="list-style-type: none"> 1. Pathophysiology <ol style="list-style-type: none"> a. Commonly referred to as upper respiratory infections (URIs) b. In small children, VRIs can also cause infection in lower airway structures. c. Known viruses that can cause VRIs include rhinoviruses, parainfluenza, influenza viruses, enteroviruses, respiratory syncytial virus (RSV), and some strains of the adenovirus. 2. Assessment—Signs and symptoms <ol style="list-style-type: none"> a. Nasal congestion b. Sore or scratchy throat c. Mild respiratory distress, coughing d. Fever e. Malaise f. Headaches and body aches g. Irritability in infants and poor feeding habits h. Tachypnea i. Exacerbation of asthma if patient is asthmatic 3. Emergency medical care <ol style="list-style-type: none"> a. In most cases, supportive treatment of positioning, oxygen therapy, emotional support, and gentle transport to the hospital is all that is necessary. b. For serious cases, use high-flow oxygen and mechanical ventilation as necessary, and call ALS for potential medication administration in patients with obvious or potential deterioration. 	<p>Knowledge Application</p> <ul style="list-style-type: none"> • Have students explain how each disorder can lead to dyspnea and hypoxia. • Given several respiratory patient descriptions, students should be able to defend their opinion about what is wrong with the patient.

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15	<p>VII. Metered-Dose Inhalers and Small-Volume Nebulizers—Using a Metered-Dose Inhaler</p> <ul style="list-style-type: none"> A. Patients with chronic history of breathing problems are commonly prescribed a beta₂ specific bronchodilator that comes in a metered-dose inhaler (MDI) or small-volume nebulizer (SVN); medication is dispensed as a mist. B. Metered-dose inhaler is also known as an “inhaler” or “puffer”. C. Metal canister containing the medication fits inside a plastic container. When depressed, the canister delivers a precise dose of medication for the patient to inhale. D. Medication is directly deposited on the bronchioles at the site of bronchoconstriction. E. Some MDIs are connected to a spacer, a chamber that holds the medication until it is inhaled. F. If patient is having breathing difficulty that is not related to trauma or a chest injury, contact medical direction for permission to administer the prescribed drug or follow local protocol. G. Instruct your patient as to what he should do, even if he claims to know how to use the MDI. H. During administration, coach the patient to breathe in slowly and deeply, to hold his breath as long as he comfortably can, and to breathe out slowly through pursed lips. I. If the patient is unable to follow the procedure, you may need to administer the inhaler to the patient. J. Review Table 16-2. 	<p>Teaching Tip Pass MDI demonstrators and SVN equipment around the classroom so students can inspect and handle the devices.</p> <p>Discussion Question Why does prehospital administration of bronchodilators require a physician’s order?</p> <p>Class Activity Have pairs of students instruct each other as if they were instructing a patient on the use of an MDI or SVN.</p>
10	<p>VIII. Metered-Dose Inhalers and Small-Volume Nebulizers—Using a Small-Volume Nebulizer</p> <ul style="list-style-type: none"> A. A small-volume nebulizer has a drug reservoir into which the patient places the beta₂ medication in liquid form. B. Device is then attached to a small electrical compressor that delivers compressed air (or oxygen source) to the nebulizer by tubing. C. Patient inhales by way of a mouthpiece attached to the top of the device (or a face mask in case of some hospitals and home settings). D. Patient continues to inhale the mist until it stops. E. Indications for administration, how to coach the patient, and how to assess the patient are the same as for the metered-dose inhaler. F. Following administration, remove the nebulizer and place the patient back on oxygen if it was removed during the drug administration. 	<p>Discussion Question What is the difference between MDIs and SVNs?</p> <p>Knowledge Application Have students role-play with a partner, with one student acting as a patient who asks how his MDI medication works. The other student will explain the medication to his or her classmate.</p>

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Minutes	Content Outline	Master Teaching Notes
5	<p>IX. Metered-Dose Inhalers and Small-Volume Nebulizers—Advair: Not for Emergency Use</p> <ul style="list-style-type: none"> A. Drug that is commonly prescribed for patients with uncontrolled asthma B. Long-acting beta₂-specific drug that also contains a steroid drug used as a maintenance drug C. Drug comes in a rotodisk or discus delivery device and requires a different method of administration than the MDI or SVN. D. It is not used as a rescue inhaler for the patient experiencing an acute asthma attack. 	<p>Critical Thinking Discussion Why are some inhaled medications not appropriate as rescue inhalers?</p>
5	<p>X. Age-Related Variations: Pediatrics and Geriatrics—Pediatric Patients</p> <ul style="list-style-type: none"> A. Respiratory failure is the most likely cause of both respiratory arrest and cardiac arrest in infants and children. B. Respiratory failure for the pediatric patient is defined as inadequate oxygenation of the blood and an inadequate elimination of carbon dioxide from the body. <ul style="list-style-type: none"> 1. Most likely result of inadequate respiratory rate and/or tidal volume 2. Most likely caused by upper airway blockage or lower airway disease C. Recognize the early signs of respiratory distress or respiratory failure and provide emergency care. 	<p>Teaching Tip Ask any students with children or young siblings to describe the signs and symptoms of croup.</p>
20	<p>XI. Age-Related Variations: Pediatrics and Geriatrics—Respiratory Distress in the Pediatric Patient: Assessment and Care</p> <ul style="list-style-type: none"> A. Scene size-up and primary assessment <ul style="list-style-type: none"> 1. Look for clues to help rule out trauma as a cause of the problem. 2. Many signs and symptoms of breathing difficulty can be spotted during your general impression during the primary impression. 3. Additional signs and symptoms will be discovered as you contact the infant or child to assess mental status, airway, breathing, and circulation. B. Secondary assessment <ul style="list-style-type: none"> 1. Early signs of breathing difficulty (respiratory distress) in the infant or child <ul style="list-style-type: none"> a. Increased use of accessory muscles to breathe b. Sternal and intercostal retractions during inspiration c. Tachypnea d. Tachycardia e. Nasal flaring 	<p>Discussion Question Why is rapid progression from respiratory distress to respiratory failure of high concern in pediatric and geriatric patients?</p>

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	<ul style="list-style-type: none"> f. Prolonged exhalation g. Frequent coughing h. Cyanosis to the extremities i. Anxiety 2. Signs of inadequate breathing (respiratory failure) in the infant or child—Immediately intervene and begin positive pressure ventilation with supplemental oxygen; respiratory arrest is a condition where there are no respirations or respiratory effort; however, a pulse is present. <ul style="list-style-type: none"> a. Altered mental status (listless or unresponsive) b. Bradycardia c. Hypotension d. Extremely fast, slow, or irregular breathing pattern e. Cyanosis f. Loss of muscle tone g. Diminished or absent breath sounds h. Head bobbing i. Grunting j. See-saw or rocky breathing k. Decreased response to pain l. Inadequate tidal volume C. Emergency medical care <ul style="list-style-type: none"> 1. Prompt intervention and transport are especially critical for the infant and child. 2. Allow the child to assume a position of comfort (reduce apprehension and stress levels by allowing the parent to hold the child). 3. Apply oxygen by nonrebreather mask to a child who is sitting up in his parent's lap. 4. If at any time the infant or child's breathing becomes inadequate, remove him from the parent, establish an open airway, and begin positive pressure ventilation with supplemental oxygen. 5. Follow the same emergency care procedures for administration of the medication via MDI or SVN as for the adult. 6. If a foreign body obstruction is suspected and the airway is completely blocked, perform foreign-body airway obstruction (FBAO) maneuvers to attempt to relieve the obstruction. 7. If the airway is partially blocked, place the patient on a nonrebreather mask at 15 lpm and immediately begin transport. 8. Use the gathered history to help you distinguish blockage from a foreign 	

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	<p>body in the airway from blockage caused by disease in order to administer appropriate emergency care. In some airway diseases, inserting anything into the airway may make the condition worse (e.g., epiglottitis, croup).</p> <p>D. Reassessment</p> <ol style="list-style-type: none"> 1. Transport any infant or child with difficulty breathing or signs of inadequate breathing or airway blockage. 2. Provide assessment en route and be prepared to intervene more aggressively if the condition deteriorates. 	
5	<p>XII. Age-Related Variations: Pediatrics and Geriatrics—Geriatric Patients</p> <p>A. Respiratory distress in the geriatric patient can be the primary symptom of a pulmonary problem or a symptom secondary to failure of a different body system.</p> <p>B. Elderly already have diminished respiratory function, and any additional burden can easily overwhelm the respiratory system and lead to inadequate breathing.</p> <p>C. Common causes of upper airway obstruction</p> <ol style="list-style-type: none"> 1. Croup 2. Foreign body aspiration 3. Epiglottitis 4. Tracheostomy dysfunction <p>Common causes of lower airway disease</p> <ol style="list-style-type: none"> 5. Asthma 6. Bronchiolitis 7. Pneumonia 8. Foreign body lower airway obstruction 9. Pertussis 10. Cystic fibrosis 	
15	<p>XIII. Age-Related Variations: Pediatrics and Geriatrics—Respiratory Distress in the Geriatric Patient: Assessment and Care</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Look for clues to help rule out trauma as a cause of the problem. 2. Many signs and symptoms of breathing difficulty can be spotted as you form your general impression (e.g., labored or noisy breathing). 3. Additional signs and symptoms will be discovered as you contact the 	<p>Knowledge Application</p> <p>Ask students how to adapt their assessment to patients of various ages.</p>

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	<p>patient to assess mental status, airway, breathing, and circulation.</p> <p>B. Secondary assessment</p> <ol style="list-style-type: none"> 1. Only briefly will signs and symptoms of respiratory distress usually precede respiratory failure in the geriatrics. (Geriatric patients do not have the compensatory mechanisms younger adults have.) 2. Early signs of breathing difficulty (respiratory distress) in the geriatric <ol style="list-style-type: none"> a. Increased use of accessory muscles to breathe b. Sternal and intercostal retractions during inspiration c. Tachypnea d. Tachycardia e. Nasal flaring, breathing with the mouth open f. Prolonged exhalation g. Frequent coughing h. Cyanosis i. Anxiety j. Inability to speak in full sentences 3. Signs of inadequate breathing (respiratory failure) in the geriatric (indication to begin positive pressure ventilation with supplemental oxygen) <ol style="list-style-type: none"> a. Altered mental status b. Vital signs changes c. Extremely fast, slow, or irregular breathing pattern d. Cyanosis to the core of the body and mucous membranes e. Loss of muscle tone f. Diminished or absent breath sounds g. Decreased response to pain h. Inadequate tidal volume i. Retractions 4. Emergency medical care <ol style="list-style-type: none"> a. Prompt intervention and transport is critical. b. Reduce any patient anxiety or stress. c. Place the patient in a position of comfort. d. Apply oxygen by nonrebreather mask. e. If at any time the geriatric's breathing becomes inadequate (respiratory failure) lay them down flat, establish an open airway, and begin pressure ventilation with supplemental oxygen. 5. Reassessment <ol style="list-style-type: none"> a. Transport any geriatric patient with difficulty breathing or signs of 	<p style="text-align: center;">Critical Thinking Discussion</p> <p>How can you help reduce a patient's stress associated with a respiratory emergency?</p>

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	<p style="text-align: center;">inadequate breathing.</p> <p>b. Provide reassessment en route.</p> <p>c. Be prepared to intervene more aggressively if the condition deteriorates.</p>	
80	<p>XIV. Assessment and Care: General Guidelines—Assessment-Based Approach: Respiratory Distress</p> <p>A. Information provided by the dispatcher may be the first indication that a patient may be suffering from respiratory distress.</p> <p>B. Scene size-up</p> <ol style="list-style-type: none"> 1. Seek clues to determine whether the breathing difficulty is due to trauma or to a medical condition. 2. Scan the scene for mechanism of injury. <p>C. Primary assessment</p> <ol style="list-style-type: none"> 1. Form a general impression and assess the mental status, airway, breathing, and circulation. 2. General impression <ol style="list-style-type: none"> a. Patient's position (tripod position or supine position) b. Patient's face c. Patient's speech d. Altered mental status e. Use of the muscles in the neck and retractions of the muscles between the ribs (intercostal muscles) f. Cyanosis g. Diaphoresis h. Pallor i. Nasal flaring j. Pursed lips 3. Mental status—Restlessness, agitation, confusion, and unresponsiveness are frequently associated with breathing difficulty. 4. Airway—Assess the airway for any indication of complete or partial obstruction. 5. Breathing—Look at chest rise and fall, listen and feel for air flowing in and out of the mouth and nose, and quickly auscultate the lungs. <ol style="list-style-type: none"> a. If the chest is not rising adequately with each breath or you do not hear or feel an adequate volume of air escaping on exhalation, begin positive pressure ventilation with supplemental oxygen. b. If either the rate or the tidal volume is inadequate, the patient must 	<p>Teaching Tip Role-play the assessment and management of a patient with respiratory distress.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What should you look for in the scene size-up? • What should you look for in the primary assessment?

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	<p>be provided positive pressure ventilation (resting respiratory rate in elderly is typically 20 per minute).</p> <ul style="list-style-type: none"> c. Shallow breathing is an indication of inadequate breathing. d. If breathing is adequate, administer oxygen via a nonrebreather mask at 15 lpm. <p>6. Circulation—Inspect the patient’s skin and mucous membranes.</p> <p>7. Priority</p> <ul style="list-style-type: none"> a. Patient with breathing difficulty is considered a high priority; consider ALS support and expeditious transport. b. For patient with severe respiratory distress, respiratory failure, or respiratory arrest, continue your secondary assessment en route to the hospital. c. Signs for expeditious transport include inadequate breathing, irregular pulse or increased pulse rate, slow pulse rate in newborns with breathing difficulty, altered mental status, or cyanosis. <p>D. Secondary assessment</p> <ul style="list-style-type: none"> 1. If the patient is responsive, obtain a history using the OPQRST questions to evaluate the history of the present illness. 2. If the patient is unresponsive, perform a rapid physical exam and collect as much information as possible from any family or bystanders at the scene. 3. History <ul style="list-style-type: none"> a. Does the patient have any known allergies to medications or other substances that may be related to the episode of difficulty in breathing? b. What medications, prescription or nonprescription, is the patient taking? (Bring them to the hospital, and be sure to ask about medications the patient has already taken.) c. Does the patient have a preexisting respiratory or cardiac disease? d. Has the patient ever been hospitalized for a chronic condition that produces recurring episodes of difficulty in breathing? 4. Physical exam <ul style="list-style-type: none"> a. If the patient is unresponsive, perform a rapid assessment. b. In the responsive patient, focus the exam on the areas that might provide you with clues as to the severity of the condition. c. Note the patient’s posture. d. Inspect the lips and around the nose and inside the mouth for cyanosis. 	<p>Class Activity Give students ample opportunity to practice assessment and management of patients with respiratory emergencies.</p>

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	<ul style="list-style-type: none"> e. Assess the neck for jugular vein distention, tracheal deviation, and retractions. f. Inspect and palpate the chest for retraction of the muscles between the ribs, asymmetrical chest wall movement, and subcutaneous emphysema. g. Auscultate the lungs to determine whether the breath sounds are equal on both sides of the chest. (Assess for wheezing, crackles, and rhonchi.) <p>5. Vital signs</p> <ul style="list-style-type: none"> a. Watch for pulsus paradoxus. b. The heart rate may be increased (tachycardia) or decreased (bradycardia). c. Apply a pulse oximeter; a SpO₂ reading less than 95 percent is a concern, and a reading less than 90 percent is a significant indication of severe hypoxemia. d. If the respiratory rate and tidal volume are adequate, administer oxygen via a nonrebreather mask at 15 lpm; if they are inadequate, begin positive pressure ventilation. <p>6. Signs and symptoms</p> <ul style="list-style-type: none"> a. There is a wide variety of signs and symptoms that may be associated with breathing difficulty, depending on the location of the obstruction or disease process. b. The degree of shortness of breath or the severity of the complaint of shortness of breath does not necessarily correlate with the level of hypoxia. c. Common signs of breathing difficulty <ul style="list-style-type: none"> i. Shortness of breath (dyspnea) ii. Restlessness, agitation, and anxiety iii. Increased heart rate or irregular heart rate in adults and children and a sudden decrease in heart rate in newborns iv. Tachypnea v. Bradypnea vi. Cyanosis to the core of the body (late sign) vii. Abnormal upper airway sounds: crowing, snoring, and stridor viii. Audible wheezing upon inhalation and exhalation ix. Diminished ability or inability to speak x. Retractions from the use of accessory muscles in the upper chest and between the ribs and use of the muscles of the neck 	<p>Critical Thinking Discussion How do you think signs and symptoms of respiratory distress can be missed by EMTs? What is the key to recognizing the patient's problem?</p> <p>Teaching Tip Emphasize that patients do not need to have all signs and symptoms of respiratory distress to be in respiratory distress.</p>

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	<p>in breathing</p> <ul style="list-style-type: none"> xi. Excessive use of the diaphragm to breathe, producing abdominal breathing in which the abdomen is moving significantly during the breathing effort xii. Shallow breathing, identified by very little chest rise and fall, and poor movement of air in and out of the mouth xiii. Coughing, especially if it is a productive cough that produces mucus xiv. Irregular breathing patterns xv. Tripod position xvi. Barrel chest indicating emphysema, a chronic respiratory condition xvii. Altered mental status—from disorientation to unresponsiveness xviii. Nasal flaring, when the nostrils widen and flare out upon inhalation xix. Tracheal indrawing xx. Paradoxical motion, in which an area of the chest that moves inward during inhalation and outward during exhalation xxi. Indications of chest trauma xxii. Pursed-lip breathing <p>E. Emergency medical care</p> <ol style="list-style-type: none"> 1. Do not take the time to try to determine the exact cause of the breathing difficulty unless it is in the trauma patient with a possible chest injury that must be managed in addition to the breathing injury. 2. Inadequate breathing (respiratory failure) 3. Establish an open airway (oropharyngeal or nasopharyngeal airway if necessary). 4. Begin positive pressure ventilation with supplemental oxygen. 5. Expediently transport the patient to the hospital. 6. Adequate breathing (respiratory distress) 7. Continue oxygen administration at 15 liters per minute via a nonrebreather mask. 8. Assess the baseline vital signs. 9. Determine if the patient has a prescribed beta₂ metered-dose inhaler. (Contact medical direction before administering or assisting the patient with administering medication.) 10. Complete the secondary assessment. 11. Place the patient in a position of comfort (Fowler's or semi-Fowler's) and 	

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	<p>begin transport.</p> <p>F. Reassessment</p> <ol style="list-style-type: none"> 1. Perform a reassessment to determine if your emergency care has improved the respiratory distress or respiratory failure or if further intervention is necessary. 2. Closely monitor the patient's airway, SpO₂ reading, and pulse. 3. Reassess and record the blood pressure. 4. Reassess the breath sounds. 5. The patient with breathing difficulty is considered a priority patient, especially if the condition does not respond to your emergency care. 6. Consider ALS backup. 7. If the patient's complaint changes, repeat the physical exam and vital signs. 	
5	<p>XV. Assessment and Care: General Guidelines—Summary: Assessment and Care</p> <ol style="list-style-type: none"> A. Review assessment findings that may be associated with breathing difficulty and emergency care for breathing difficulty. B. Review Figures 16-17 and 16-18. 	<p>Knowledge Application</p> <p>Given a number of scenarios, students should be able to recognize respiratory distress and intervene appropriately.</p>
5	<p>XVI. Follow-Up</p> <ol style="list-style-type: none"> A. Answer student questions. B. Case Study Follow-Up <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. C. Follow-Up Assignments <ol style="list-style-type: none"> 1. Review Chapter 16 Summary. 2. Complete Chapter 16 In Review questions. 3. Complete Chapter 16 Critical Thinking. D. Assessments <ol style="list-style-type: none"> 1. Handouts 2. Chapter 16 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • How quickly were the EMTs able to determine the seriousness of the problem? • Why is it still necessary to obtain a history and perform a secondary assessment, even though the problem may seem obvious? • What effects and side effects should you expect from the albuterol? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p>

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		<ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 17

Cardiovascular Emergencies

270–300 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency care for a patient suffering from cardiovascular emergencies such as chest discomfort or pain and cardiac arrest.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What is your general impression of the patient? • What questions should you ask the patient to find out more about what is going on?
15	<p>II. Review of the Circulatory System Anatomy and Physiology—The Circulatory System</p> <p>A. Circulatory system—Heart, blood vessels, and blood</p> <p>B. Conduction system</p> <ol style="list-style-type: none"> 1. Heart contains conductive tissue or cells. <ol style="list-style-type: none"> a. Conductive cells are grouped in three areas of the heart, or pacemaker sites <ol style="list-style-type: none"> i. Sinoatrial (SA) node ii. Atrioventricular (AV) node iii. Purkinje fibers or network b. Heart’s electrical impulses travel through the heart from the pacemaker site via a conduction pathway that is comprised of cells that rapidly conduct each impulse to the rest of the heart. 2. Heart contains contractile tissue or cells. <ol style="list-style-type: none"> a. Primary purpose is to contract in response to the electrical impulses provided by the conduction system. b. Characteristics of both smooth and skeletal muscle 3. The autonomic nervous system (sympathetic and parasympathetic) monitors the heart’s activity and modifies it as necessary to ensure the heart performs its sole purpose—pumping blood—effectively. 	<p>Teaching Tip</p> <p>An anatomical model of the heart will be helpful in explaining the concepts of this section.</p> <p>Discussion Question</p> <p>How do the sympathetic and parasympathetic nervous systems influence the heart?</p>

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	<p>the oxygenated blood to the heart muscle.</p> <p>F. Cardiac contraction</p> <ol style="list-style-type: none"> 1. Heart's electrical impulse is first generated in the sinoatrial (SA) node. 2. It travels through the Bachman's bundle, and both atria contract simultaneously as a result of the electrical impulse (atrial systole), ejecting blood into the ventricles. 3. Impulse then travels to the atrioventricular node (AV) by way of the intranodal tract. The impulse is briefly inhibited to allow blood to fill the ventricles. 4. Then the impulse travels down the bundle of His, to the left and right ventricles, to the Purkinje fibers (ventricular systole). Blood from the right ventricle is propelled toward the lungs, and blood from the left ventricle is propelled throughout the body. 5. After the systolic phases, the diastolic phase allows the heart cells to repolarize and await the next impulse. 6. Occluded arteries may lead to dysrhythmias and possibly sudden death. 	<p>Discussion Question Describe the conduction of an impulse from the SA node through the heart.</p>
5	<p>III. Review of the Circulatory System Anatomy and Physiology—The Electrocardiogram</p> <ol style="list-style-type: none"> A. The electrocardiogram (ECG or EKG) is a graphic representation of the heart's electrical activity as detected from the chest wall surface. B. Depolarization is when electrical charges of the heart muscle change from positive to negative and cause heart muscle contraction. C. Repolarization is when the electrical charges of the heart muscle return to a positive charge and cause relaxation of the heart muscle. D. Waves, or deflections, of a normal ECG <ol style="list-style-type: none"> 1. P wave—First wave form of the ECG and represent depolarization of the atria 2. QRS complex—Second wave form and represents the depolarization of the ventricles and main contraction of the heart 3. T wave—Third wave form and represents the repolarization of the ventricles E. PRI represents the time it takes the heart's electrical impulse to travel from the atria to the ventricles. F. Normal electrical activity is called normal sinus rhythm (peaks that occur between 60 and 100 times each minute, separated by nearly flat lines. G. Premature ventricular complexes (PVCs) in succession may produce 	<p>Discussion Question What do the p, qrs, and t waves represent on the ECG?</p> <p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation</p>

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	ventricular tachycardia (V-Tach) and degenerate into ventricular fibrillation (V-Fib).	reviewing some cardiac rhythms.
5	<p>IV. Review of the Circulatory System Anatomy and Physiology—Blood Pressure</p> <p>A. Blood pressure is defined as the amount of pressure exerted against the arterial wall during circulation.</p> <p>B. Systolic blood pressure is the measured force exerted during the contraction of the heart.</p> <p>C. Diastolic blood pressure is the pressure inside the artery when there is no contraction.</p> <p>D. Vasoconstriction increases vessel resistance and blood pressure, and vasodilation causes resistance to decrease and the pressure to fall.</p>	
5	<p>V. Review of the Circulatory System Anatomy and Physiology—Inadequate Circulation</p> <p>A. Perfusion is the delivery of oxygen and nutrients from the blood through the thin capillary walls into the cells and the removal of carbon dioxide and other wastes.</p> <p>B. Hypoperfusion (shock), or a profound depression of cell perfusion, results from inadequate circulation.</p> <ol style="list-style-type: none"> 1. Hypovolemia 2. Heart failure 3. Vasodilation (leaking) 	
20	<p>VI. Cardiac Compromise and Acute Coronary Syndrome (ACS)—Atherosclerosis</p> <p>A. It is important for the EMT to recognize the signs and symptoms of the many possible cardiac conditions, referred to collectively as cardiac compromise.</p> <p>B. EMT should also provide emergency care and expeditious transport to a medical facility that is prepared to manage such a condition (fibrinolytics, antiplatelet agents, angioplasty).</p> <p>C. Arteriosclerosis is a condition that causes the smallest of arterial structures to become stiff and less elastic.</p> <p>D. Atherosclerosis, a type of arteriosclerosis, is an inflammatory disease that starts with the intimal lining of the blood vessels, where endothelial cells become damaged. This eventually leads to fibrous caps that attempt to close</p>	<p>Class Activity</p> <p>To reinforce important concepts, ask students to write down questions they predict will be on their next examination or quiz. Also have them write their answer to the questions. You can use these questions to assess whether or not students are focusing on important concepts, and you may get some ideas for quiz questions.</p>

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	<p>off the fatty streaks created by different cells responding to the irritated and inflamed blood vessels. These fibrous caps may rupture and possibly lead to a thrombus occluding the blood vessel.</p> <p>E. When a patient has a build up of fatty deposits (atherosclerosis) on the inside of the coronary arteries, the condition is called coronary artery disease (CAD).</p>	
65	<p>VII. Cardiac Compromise and Acute Coronary Syndrome (ACS)—Acute Coronary Syndrome</p> <p>A. Acute coronary syndrome (ACS) results from any of a variety of conditions that can affect the heart in which the coronary arteries are narrowed or occluded by fat deposits (plaque), clots, or spasms.</p> <ol style="list-style-type: none"> 1. Unstable angina 2. Myocardial infarction 3. Cardiac cell hypoxia (myocardial ischemia) results when heart muscle is not receiving an adequate amount of oxygenated blood. <ol style="list-style-type: none"> a. Typical response is chest discomfort. b. Patient describes as crushing chest pressure that is dull and aching. <p>B. Angina pectoris</p> <ol style="list-style-type: none"> 1. Pathophysiology <ol style="list-style-type: none"> a. Symptom of inadequate oxygen supply to the heart muscle, or myocardium b. Generally occurs during periods of physical or emotional stress c. Lasts about two to 15 minutes 2. Assessment—Signs and symptoms <ol style="list-style-type: none"> a. Steady discomfort in center of chest b. Discomfort usually described as pressure, tightness, aching, crushing, or heavy c. Discomfort that radiates to shoulders, arms, neck, jaw, back, or epigastric region. d. Cool, clammy skin e. Anxiety f. Dyspnea g. Diaphoresis h. Nausea and/or vomiting i. Complaint of indigestion pain j. Possible unusual presentation for women, diabetics, or elderly 3. Emergency medical care 	<p>Teaching Tip Provide examples from your experience to illustrate atypical presentations of ACS.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on coronary heart disease.</p> <p>Discussion Question What is the pathophysiology of angina pectoris?</p> <p>Animations Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access animations reviewing coronary artery disease, angina pectoris, and nitroglycerin.</p>

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	<ul style="list-style-type: none"> a. Recognize acute coronary syndrome emergency versus classic angina (length of time; worsening pain). b. Establish an open and patent airway. c. Provide oxygen via nonrebreather mask at 15 lpm. d. Provide positive pressure ventilation, if necessary. e. Apply the pulse oximeter. f. Administer nitroglycerin if patient has prescription and cleared by medical direction. g. Administer 160–325 of aspirin if you suspect coronary artery occlusion and protocol allows it. h. Consider ALS and continue to perform reassessment. <p>C. Acute myocardial infarction (heart attack)</p> <ul style="list-style-type: none"> 1. Pathophysiology <ul style="list-style-type: none"> a. Occurs when a portion of the heart muscle dies because of the lack of an adequate supply of oxygenated blood. b. Result of coronary artery disease that causes severe narrowing or complete blockage of the coronary arteries c. Rarely a heart attack occurs from a spasm of the coronary artery. d. Heart muscle becomes ischemic and tissue becomes irritable, producing abnormal beats which could lead to possibly fatal dysrhythmias. 2. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. Symptoms similar to angina but last longer b. Chest discomfort radiating to jaw, arms, shoulders, or back c. Anxiety d. Dyspnea e. Sense of impending doom f. Diaphoresis g. Nausea and/or vomiting h. Lightheadedness or dizziness i. Weakness j. Possibly atypical presentation for diabetics, elderly, or women 3. Emergency medical care <ul style="list-style-type: none"> a. Rapidly proceed with management b. Keep vigilant eye on patient since he has the potential to go into cardiac arrest. c. Ensure a patent airway and provide positive pressure ventilation with oxygen. 	<p>Critical Thinking Discussion Is it necessary to differentiate between angina pectoris and myocardial infarction in the prehospital setting?</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on myocardial infarctions.</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on acute myocardial infarction and American Heart Association heart attack information.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> b. Pressure in the chest c. Pains in the back, breast, or upper abdomen d. Tingling of the fingers e. Unexplained fatigue or weight gain (water weight gain) f. Insomnia 4. Since the death rate for females who suffer heart attacks is higher than males when the event occurs, have a high index of suspicion of ACS when gathering a history from the female patient. 5. Note that diabetics and the elderly are also high-risk groups that may present with atypical findings. 	
65	<p>VIII. Cardiac Compromise and Acute Coronary Syndrome (ACS)—Other Causes of Cardiac Compromise</p> <p>A. Heart failure</p> <ul style="list-style-type: none"> 1. Pathophysiology <ul style="list-style-type: none"> a. Occurs when the heart no longer has the ability to adequately eject blood out of the ventricle b. Caused by heart attack, valve disorder, hypertension, pulmonary embolism, and certain drugs c. Can be left ventricular failure or right ventricular failure <ul style="list-style-type: none"> i. Left ventricular failure causes reduced blood flow to the arteries and perfusion to the cells and causes increased blood pressure in the left atrium which ultimately leads to pulmonary edema. ii. Right ventricular failure causes blood to back up into the venous system and may be caused the left ventricular failure, hypertension, or chronic obstructive pulmonary disease. iii. See Table 17-1. d. Cardiogenic shock occurs when the left ventricle or right ventricle fails to pump out enough blood to meet the demands of the body and includes a drop in systolic blood pressure, diminished or absent peripheral pulse amplitude, altered mental status, changes in the heart rate, poor urinary output, respiratory distress, inspiratory rales, and possible pulmonary edema. e. Congestive heart failure (CHF) is a medical diagnosis that refers to the condition in which there is a build-up of fluid in the body resulting from the pump failure of the heart and commonly leads to pulmonary edema and edema in other areas of the body (liver, abdomen). 	<p>Knowledge Application</p> <p>Given several different scenarios, students should be able to recognize cardiac compromise and develop a treatment plan for specific patients.</p>

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	<p>2. Assessment</p> <ul style="list-style-type: none"> a. Marked or severe dyspnea b. Tachycardia c. Difficulty breathing when supine d. Suddenly waking at night with dyspnea e. Fatigue on any type of exertion f. Anxiety g. Tachypnea h. Diaphoresis i. Upright position with legs, feet, arms, and hands dangling j. Cool, clammy, and pale skin k. Chest discomfort l. Cyanosis m. Agitation and restlessness due to hypoxia n. Edema to the hands, ankles, and feet o. Crackles and possibly wheezes on auscultation p. Decreased SpO₂ reading q. Signs and symptoms of pulmonary edema r. Blood pressure may be normal, elevated, or low s. Distended neck veins—jugular venous distention (JVD) t. Distended and soft spongy abdomen <p>3. Emergency medical care</p> <ul style="list-style-type: none"> a. Basically the same as for patient with acute myocardial infarction b. Continuously reassess the patient and be prepared for respiratory failure and cardiac arrest. <p>B. Hypertensive emergencies</p> <p>1. Pathophysiology</p> <ul style="list-style-type: none"> a. Severe, accelerated hypertension episode with a systolic pressure greater than 160 mmHg, and a diastolic blood pressure greater than 94 mmHg b. Hypertensive emergencies are rare. c. Primary hypertension is characterized by a hypertensive state in which no specific cause for the hypertension has been identified (idiopathic). d. Secondary hypertension is said to occur when a patient is hypertensive from some other underlying disease process (e.g., renal disease, thyroid disorder). <p>2. Assessment</p>	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on CDC hypertension data.</p>

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	<ul style="list-style-type: none"> a. Remember that if the patient has the signs and symptoms listed next, with a blood pressure consistent with his normal blood pressure, treat the underlying cause. If the patient's blood pressure is significantly higher than his normal blood pressure, consider the findings to be related to hypertension. b. Signs and symptoms of a hypertensive emergency <ul style="list-style-type: none"> i. Strong, bounding pulse ii. Warm, dry, or moist skin iii. Severe headache iv. Ringing in the ears v. Nausea and/or vomiting vi. Elevated blood pressure vii. Respiratory distress viii. Chest pain ix. Seizures x. Focal neural deficits xi. Indications of organ dysfunction xii. Possible nose bleed 3. Emergency medical care <ul style="list-style-type: none"> i. Support lost functions related to airway, breathing, or circulation. ii. If the patient is breathing inadequately, provide positive pressure ventilation with supplemental oxygen. iii. Place patient in a position of comfort (semi-Fowler's if no airway concerns.) iv. Consider contacting ALS for back-up C. Cardiac arrest <ul style="list-style-type: none"> 1. Worst manifestation of cardiac compromise 2. Occurs when heart, for any variety of reasons, is not pumping effectively or at all, and no pulses can be felt 	<p>Discussion Question What are indications of a hypertensive emergency?</p>
15	<p>IX. Nitroglycerin</p> <ul style="list-style-type: none"> A. A potent vasodilator that works in seconds to relax the muscles of the blood vessel walls, increasing the blood flow and oxygen supply to the heart muscle and decreasing the workload of the heart B. Normally can be found in a sublingual tablet or a sublingual spray C. Obtain authorization from medical direction before administering nitroglycerin to a patient with a prescription. 	<p>Teaching Tip Cover your specific protocols for administering nitroglycerin.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • How does nitroglycerin benefit the patient with ACS?

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	<p>D. Contraindications for nitroglycerin</p> <ol style="list-style-type: none"> 1. Patient with a systolic blood pressure below 90 mmHg 2. Patient with a blood pressure no more than 30 mmHg lower than the baseline systolic blood pressure 3. Patient with extreme bradycardia or tachycardia 4. Patient who has taken tadalafil, vardenafil, or sildenafil within the last 24 hours <p>E. Have the patient lie or sit down prior to administration.</p> <p>F. If the patient experiences no relief after one dose, another may be administered after three to five minutes if authorized by medical direction, to a maximum of three doses (including any taken before your arrival).</p> <p>G. Ask patient for “fresh” supply of nitroglycerin.</p>	<ul style="list-style-type: none"> • What are contraindications for administering nitroglycerin? <p>Class Activity Have pairs of students role play instructing patients to take nitroglycerin, including an explanation of its actions and side effects.</p> <p>Knowledge Application Give several patient descriptions and have students determine whether or not it would be appropriate to assist the patient in taking nitroglycerin.</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • Why can nitroglycerin cause a headache? • How is lowering the blood pressure too much detrimental to the patient?
8	<p>X. Age-Related Variations: Pediatrics and Geriatrics—Pediatric Considerations</p> <p>A. A pediatric patient is more likely to experience a cardiac disturbance from some congenital heart condition than a myocardial infarction or ischemic episode. In these cases, contact medical direction immediately and support any lost function to the patient’s airway, breathing, or circulation.</p> <p>B. Cardiac arrest may be caused by airway occlusion or ventilatory insufficiency.</p> <p>C. Remain vigilant about establishing and maintaining an airway in a pediatric to prevent cardiac arrest.</p>	<p>Discussion Question What are the most common causes of cardiac problems in children?</p> <p>Knowledge Application Given several scenarios involving atypical ACS presentations, students should recognize the potential for ACS.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on congenital heart defects.</p> <p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency</i></p>

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		Care, 9 th edition to access an animation reviewing congenital heart defects.
7	<p>XI. Age-Related Variations: Pediatrics and Geriatrics—Geriatric Considerations</p> <p>A. Geriatric patients will represent the highest number of patients you treat who are experiencing some form of acute coronary syndrome.</p> <p>B. Review Table 17-2.</p>	<p>Discussion Question</p> <p>How can an elderly patient’s medications or medical history affect the presentation and management of ACS?</p>
50	<p>XII. Assessment and Care: General Guidelines—Assessment-Based Approach: Cardiac Compromise and Acute Coronary Syndrome</p> <p>A. Remember that any adult patient with chest pain or chest discomfort should be treated as a cardiac emergency until proven otherwise.</p> <p>B. Scene size-up—Make sure scene is safe.</p> <p>C. Primary assessment</p> <ol style="list-style-type: none"> 1. Form a general impression of the patient and his mental status. 2. Encountering an unresponsive patient with no respiration and no pulse <ol style="list-style-type: none"> a. For infants, begin chest compressions and artificial ventilations (CPR). b. For children between the ages of one and eight, if the cardiac arrest was not witnessed, begin CPR immediately for about two minutes (five cycles). Then apply the AED (with dose attenuating system if possible). c. For patient eight years or older, apply two minutes of CPR (five cycles) followed by AED application if the time of arrest has been longer than four to five minutes. If the time of arrest has been shorter than four minutes, apply the AED as soon as it is available. 3. Encountering a responsive patient <ol style="list-style-type: none"> a. Ensure adequate airway, breathing, oxygenation, and circulation. b. Note the patient’s skin color, temperature, and condition. c. Note the type, location, and intensity of any pain and presence of other signs and symptoms related to acute coronary syndrome. d. Apply oxygen at 15 lpm via a nonrebreather mask if necessary. e. Make a decision on whether early transport is needed and contact ALS as appropriate. <p>D. Secondary assessment</p> <ol style="list-style-type: none"> 1. History <ol style="list-style-type: none"> a. Gather history from family or bystanders if the patient has an altered 	<p>Discussion Question</p> <p>What should you look for in the primary assessment?</p> <p>Teaching Tip</p> <p>Role play the assessment and management of a patient with ACS or cardiac compromise.</p> <p>Knowledge Application</p> <p>Give students ample opportunity to practice assessment and management of patients with ACS and cardiac compromise.</p>

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	<p>mental status and is unable to answer questions.</p> <ul style="list-style-type: none"> b. Onset: What were you doing when the chest discomfort started? What triggered the discomfort? What the onset sudden or gradual? c. Provocation or palliation: What makes the chest discomfort worse? What makes the chest discomfort better? d. Quality: Describe the chest discomfort. Is it a dull, aching, pressure-type discomfort? Is it pressure, squeezing, crushing, or burning? Is it sharp or stabbing? (Levine's sign) e. Radiation: Does the discomfort radiate, that is, does it travel to any other part of the body? Do you feel it anywhere else in the body? f. Severity: On a one to ten scale, with ten being the worst, describe the discomfort. g. Time: When did the chest discomfort start? How long have you had the discomfort? Has the discomfort been constant or does it come and go (intermittent)? <p>2. Fibrinolytic therapy and the EMT's role</p> <ul style="list-style-type: none"> a. Gather information to help the hospital determine whether the patient is a candidate for fibrinolytic therapy. b. Fibrinolytics are a type of drug that, upon administration, dissolve the newly formed clot that is occluding the coronary artery and causing the heart attack. c. The drug can help resume distal perfusion and minimize or inhibit myocardial damage. d. EMTs should have a fibrinolytic check list to document the patient's history and present it to the emergency department staff as soon as possible. e. Absolute contraindications <ul style="list-style-type: none"> i. History of prior intracranial hemorrhage ii. Known diagnosis of a cerebral vascular lesion iii. Diagnosis of a malignant intracranial neoplasm iv. Suspected aortic dissection v. Active bleeding (excluding menstrual cycle) vi. Bleeding disorders vii. Closed head trauma or facial trauma within the past three months viii. Ischemic stroke within the past three months (except acute ischemic stroke within the past three hours) f. Relative contraindications 	<p>Discussion Question</p> <p>What are key questions in the history of a patient with possible ACS or cardiac compromise?</p>

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	<ul style="list-style-type: none"> i. History of chronic, severe, or poorly controlled hypertension ii. Uncontrolled systolic hypertension (> 180 mmHg) on presentation iii. Uncontrolled diastolic hypertension (>110 mmHg) on presentation iv. History of intracranial pathology not covered in absolute contraindications v. Traumatic or prolonged CPR (> ten minutes) vi. Major surgery (< three weeks) vii. Internal bleeding within last two to four weeks viii. Noncompressible vascular punctures ix. For streptokinase/anistreplase: prior exposure (> five days ago) or prior documented allergic reaction to these agents x. Pregnancy xi. Active peptic ulcer disease xii. Current use of anticoagulants g. Treat the following patients as cardiac compromise and acute coronary syndrome patients and transport immediately. <ul style="list-style-type: none"> i. A patient who has a history of angina who is having chest discomfort at rest that lasts longer than 20 minutes ii. Recent onset of angina that progressively worsens iii. Nocturnal angina iv. Angina unrelieved by rest or three nitroglycerin tablets over ten minutes v. Chest discomfort that lasts greater than five to ten minutes after rest h. Remember that some patients may have atypical presentations or “silent” heart attacks. 3. Physical exam and baseline vital signs <ul style="list-style-type: none"> a. Pupils—Sluggish or dilated pupils may suggest hypoxia and poor perfusion. b. Oral cavity—Cyanotic mucous membranes indicate hypoxia. c. Neck—Congestive heart failure or cardiac tamponade may produce jugular vein distention. d. Chest—Auscultate for abnormal breath sounds, especially crackles, which may indicate fluid in the alveoli from left ventricular heart failure. e. Lower and upper extremities—Assess for peripheral edema, 	<p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on ventricular fibrillation.</p>

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	<p>suggesting heart failure, and peripheral cyanosis, usually indicating vessel disease.</p> <p>f. Posterior body—Presacral edema to the lower back would be another indicator of heart failure that may be more prominent in the patient who is sedentary and commonly in a supine or lying position.</p> <p>g. Obtain patient's vital signs.</p> <p>4. Signs and symptoms</p> <p>a. Chest discomfort or pain that radiates to any of the following areas: chest, neck, jaw, arm, or back; epigastric pain</p> <p>b. Sudden onset of sweating</p> <p>c. Cool, pale skin</p> <p>d. Difficulty in breathing</p> <p>e. Lightheadedness or dizziness</p> <p>f. Anxiety or irritability</p> <p>g. Feelings of impending doom</p> <p>h. Abnormal or irregular pulse rate</p> <p>i. Abnormal blood pressure</p> <p>j. Nausea and/or vomiting</p> <p>E. Emergency medical care</p> <p>1. Do not take the time to diagnose the type of cardiac emergency.</p> <p>2. Administer oxygen if breathing is adequate or provide positive pressure ventilation with supplemental oxygen if breathing is inadequate.</p> <p>3. Decrease patient's anxiety by providing calm reassurance and placing him in a position of comfort (often sitting up).</p> <p>4. Assist the patient who has prescribed nitroglycerin.</p> <p>5. If local protocol permits and the patient does not have a known aspirin allergy, administer 160–235 mg of nonenteric aspirin.</p> <p>6. Call for ALS backup; initiate early transport.</p> <p>F. Reassessment</p> <p>1. Be ready for a patient with chest pain/discomfort or cardiac compromise to deteriorate into cardiac arrest.</p> <p>2. Closely reassess breathing and pulse as you perform reassessment during transport.</p>	<p>Teaching Tip Emphasize that patients do not need to have all signs and symptoms of ACS to be experiencing ACS.</p> <p>Video Clips Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access videos on dysrhythmias and AEDs.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the key treatments for patients with ACS? • How may CPAP benefit the patient with pulmonary edema? • Why is oxygen an important treatment for patients with cardiac compromise? <p>Critical Thinking Discussion Why is early administration of aspirin an important treatment in ACS?</p>
10	<p>XIII. Assessment and Care: General Guidelines—Summary: Assessment and Care</p>	<p>Knowledge Application Given a number of scenarios, students</p>

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	<p>A. Review assessment findings that may be associated with cardiac compromise and emergency care for cardiac compromise.</p> <p>B. See Figures 17-20a and b and 17-21.</p>	<p>should be able to recognize ACS and cardiac compromise and intervene appropriately.</p>
<p style="text-align: center;">10</p>	<p>XIV. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 17 Summary. 2. Complete Chapter 17 In Review questions. 3. Complete Chapter 17 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 17 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why did the EMT partner leave to retrieve the stretcher rather than assisting with the assessment and treatment of the patient? • What is significant in Mr. Antak's history? • Why was Mr. Antak defibrillated prior to performing CPR? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 18

Altered Mental Status, Stroke, and Headache

155–170 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency care for a patient suffering from an altered mental status, stroke, or headache.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What is your general impression of the patient? • What questions should you ask about the patient to find out more about what is going on?
20	<p>II. Altered Mental Status—Assessment-Based Approach: Altered Mental Status</p> <p>A. A patient must have an intact reticular activating system and at least one cerebral hemisphere to remain awake or conscious.</p> <p>B. The reticular activating system (RAS) is not an actual structure but a network of nerve cells in the brainstem that constantly transmit environmental and sensory stimuli to and from the cerebrum.</p> <p>C. An altered mental status is a significant indication of injury or illness in a patient.</p> <p>D. An unconscious state where the patient does not respond to painful stimuli is referred to as coma.</p> <p>E. Structural causes of an altered mental status</p> <ol style="list-style-type: none"> 1. Brain tumor 2. Hemorrhage in the cranium but above the brain 3. Hemorrhage in the brain tissue 4. Direct brain tissue damage from trauma to the brain 5. Degenerative disease of the brain <p>F. Toxic-metabolic causes of altered mental status</p> <ol style="list-style-type: none"> 1. Severe hypoxia or anoxia 2. Abnormal blood glucose conditions 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What is altered mental status? • What are some causes of AMS? • What are some causes of AMS that EMTs can treat? <p>Teaching Tip Emphasize detecting and correcting causes of AMS, such as hypoxia and hypoglycemia.</p>

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	<ul style="list-style-type: none"> 3. Liver failure 4. Kidney failure 5. Poisoning (e.g., carbon monoxide, cyanide) G. Other causes of altered mental status <ul style="list-style-type: none"> 1. Shock 2. Drugs that depress the central nervous system 3. Post seizure 4. Infection 5. Cardiac rhythm disturbance 6. Stroke 	
25	<p>III. Altered Mental Status—Assessment-Based Approach: Altered Mental Status</p> <p>A. Scene size-up</p> <ul style="list-style-type: none"> 1. Determine the cause of the patient’s altered mental status—mechanism of injury or medical illness. 2. Note items at the scene such as the patient’s medications. Keep medications with the patient. 3. If more than one patient at the scene is noted to have an altered mental status, suspect some type of hazardous gas or poison. <p>B. Primary assessment</p> <ul style="list-style-type: none"> 1. Stabilize the spine if you suspect injury. 2. Assess the patient’s airway and breathing. 3. Apply high-flow, high-concentration oxygen therapy. <p>C. Secondary assessment</p> <ul style="list-style-type: none"> 1. The order of the secondary assessment is determined by whether the patient is responsive or unresponsive. 2. Take baseline vital signs (including blood glucose if possible). 3. Gather patient history. <ul style="list-style-type: none"> a. What are the signs and symptoms the patient was complaining of prior to the alteration in the mental status? b. Did the signs and symptoms seem to get progressively worse or better? c. Does the patient have any known allergies? d. What medications, prescription and nonprescription, is the patient taking? 	<p>Discussion Question Why is the scene size-up especially useful in assessing the patient with AMS?</p> <p>Critical Thinking Discussion What are some clues at the scene of a patient with AMS that you would specifically search for?</p> <p>Knowledge Application Given a scenario involving a patient with AMS, students should be able to develop a relevant line of questioning about the problem.</p>

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	<ul style="list-style-type: none"> e. What is the patient's past medical history? When was the last time he has seen a doctor for his medical condition? f. When did the patient last have something to eat or drink? What did he eat or drink? Did he take any drugs or ingest any alcohol? g. What was the patient doing prior to the onset of the altered mental status? h. Was the onset of signs and symptoms gradual or sudden? i. Did the patient suffer from seizure, severe headache, or confusion prior to the alteration in mental status? j. How long has the patient been sick or suffering from these signs and symptoms? When was the patient last well? 4. Provide a physical examination. <ul style="list-style-type: none"> a. Head b. Pupils c. Mouth and oral mucosa d. Chest e. Breath sounds f. Abdomen g. Lower and upper extremities h. Lower extremities i. Posterior body 5. Signs and symptoms of altered mental status commonly associated with trauma <ul style="list-style-type: none"> a. Obvious signs of trauma (e.g., deformity, contusion) b. Abnormal respiratory pattern c. Increased or decreased heart rate d. Unequal pupils e. High or low blood pressure f. Discoloration around the eyes g. Discoloration behind the ears h. Pale, cool, moist skin i. Flexion 6. Signs and symptoms of altered mental status commonly associated with a nontraumatic or medical condition <ul style="list-style-type: none"> a. Abnormal respiratory pattern b. Dry or moist skin c. Cool or hot skin d. Pinpoint, midsize, dilated, or unequal pupils 	

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	<ul style="list-style-type: none"> e. Stiff neck f. Lacerations to the tongue indicating seizure activity g. High systolic blood pressure and low heart rate h. Loss of bowel or bladder control i. Abnormally high or abnormally low blood glucose reading <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Maintain manual spinal stabilization. 2. Maintain a patent airway. 3. Suction any secretions, vomitus, or blood. 4. Maintain oxygen therapy. 5. Be prepared to assist ventilation. 6. Position the patient. 7. Transport. <p>E. Reassessment</p> <ol style="list-style-type: none"> 1. Continuously monitor for changes in the patient's mental status airway, breathing, and circulation. 2. Repeat the reassessment every five minutes. 	
5	<p>IV. Stroke—Neurological Deficit Resulting from Stroke</p> <p>A. A patient experiences a neurologic deficit when the patient loses some or all of the ability to be alert and aware of his surroundings, speak, feel sensations, and move.</p> <p>B. A neurological deficit should direct you to the possibility of a condition affecting the patient's central nervous system.</p> <p>C. A nontraumatic brain injury, or stroke, is a medical injury to the brain that is not related to trauma.</p>	
5	<p>V. Stroke—Acute Stroke</p> <p>A. One of the most significant factors that makes a difference in the care and prognosis of the patient is early recognition of the stroke.</p> <p>B. Drugs are now available for certain stroke patients that may reduce or even reverse the consequence of the stroke by breaking up the clot causing the obstruction; however, they must be administered within three hours from the first sign or symptom of the onset of the stroke.</p> <p>C. The patient, bystander, or EMT must immediately recognize the signs and symptoms of stroke, and the EMT must provide immediate care and transport.</p>	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on American Stroke Association's information about strokes.</p>

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	<p>D. 7 Ds for stroke care</p> <ol style="list-style-type: none"> 1. Detection 2. Dispatch 3. Delivery 4. Door 5. Data 6. Decision 7. Drug 	
5	<p>VI. Stroke—Pathophysiology of Stroke</p> <p>A. A stroke is due to an inadequate amount of blood being delivered to a portion of the brain caused by a blood clot obstructing a blood vessel in the brain.</p> <p>B. Atherosclerosis is usually a contributing factor to the formation of the clots and narrowing of the cerebral arteries.</p>	<p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on information about strokes and stroke prevention.</p>
10	<p>VII. Stroke—Types of Stroke</p> <p>A. Ischemic strokes</p> <ol style="list-style-type: none"> 1. An ischemic stroke occurs when the cerebral artery is blocked by a clot or other foreign matter. 2. Thrombosis is the process by which a clot (thrombus) develops at the site of occlusion and blocks the flow of blood through the artery to the brain. 3. A cerebral embolism occurs when a clot that travels from another area of the body (embolus) lodges in a cerebral artery and occludes it. <p>B. Hemorrhagic strokes</p> <ol style="list-style-type: none"> 1. A hemorrhagic stroke results from the rupture of an artery that that causes bleeding within the brain (intracerebral) or in the space around the outer surface of the brain (subarachnoid space). 2. People with hypertension are likely candidates for this type of stroke. 3. Signs and symptoms usually occur very suddenly (headache). <p>C. Manage immediate life threats and gather as much history and information as possible in the physical exam to help the emergency department staff determine the type of stroke it is and provide effective care to the patient (e.g., The ED can only give the fibrinolytic drug to a patient suffering an ischemic stroke).</p>	<p>Critical Thinking Discussion</p> <p>Is it necessary to differentiate between an ischemic and a hemorrhagic stroke in the prehospital setting? Why or why not?</p>

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 These objectives, which form the basis of each chapter, were developed from the new Education Standards and Instructional Guidelines.

Minutes	Content Outline	Master Teaching Notes
10	<p>VIII. Stroke—Stroke or Transient Ischemic Attack</p> <p>A. Strokes most often affect the elderly who have a history of atherosclerosis, heart disease, or hypertension.</p> <p>B. The signs and symptoms of stroke are associated with the specific area of the brain that has been affected by the disruption of blood flow.</p> <p>C. Common signs</p> <ol style="list-style-type: none"> 1. Paralysis (monoplegia or hemiplegia) 2. Weakness in extremities 3. Facial droop 4. Alterations in mental status 5. Dysphasia 6. Aphasia 7. Fluent aphasia 8. Blurred vision or loss of vision <p>D. Transient ischemic attack (TIA)</p> <ol style="list-style-type: none"> 1. The key difference between a stroke and a TIA is that the signs and symptoms of a TIA typically disappear within ten to 15 minutes but almost always within one hour of the onset of the signs and symptoms. 2. The TIA always resolves within 24 hours without causing any permanent neurologic disability. 3. TIAs are important to recognize and report since almost a third of those who suffer a TIA will eventually have a stroke. 	<p>Discussion Question What are common signs and symptoms of stroke?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on information about TIAs.</p>
60	<p>IX. Stroke—Assessment-Based Approach: Stroke and Transient Ischemic Attack</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Try to determine whether the neurological deficit is due to trauma or to a medical condition. 2. Look for evidence of spine injury, alcohol, or drugs. 3. Note where the patient is found and how he is dressed. <p>B. Primary assessment</p> <ol style="list-style-type: none"> 1. Assess the airway and suction any vomitus and secretions. 2. Place the patient in a lateral recumbent position if spine injury is not suspected. 3. Provide manual in-line stabilization if spine injury is suspected. 4. Assess the patient's breathing and insert an oropharyngeal or 	<p>Teaching Tip Role play the assessment of a patient complaining of stroke symptoms.</p>

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Minutes	Content Outline	Master Teaching Notes
	<p>nasopharyngeal airway if needed.</p> <ol style="list-style-type: none"> 5. Check more than one extremity for patient responsiveness. <p>C. Secondary assessment</p> <ol style="list-style-type: none"> 1. The order of the secondary assessment depends on whether the patient is responsive or unresponsive. 2. The physical exam will be a rapid head-to-toe assessment. <ol style="list-style-type: none"> a. Check for head trauma. b. Inspect the face. c. Listen to the patient's speech. d. Note the patient's ability to obey your commands. e. Assess the patient's extremities for sensory and motor function. f. Use a validated stroke screening evaluation tool. 3. Cincinnati Prehospital Stroke Scale <ol style="list-style-type: none"> a. Facial droop by having the patient show his teeth or make a smile b. Arm drift by having the patient close his eyes and hold both arms straight out in front of him for ten seconds c. Abnormal speech pattern and muscle paralysis by having the patient say, "You can't teach an old dog new tricks." 4. Los Angeles Prehospital Stroke Screen (LAPSS)—Takes into consideration other possible causes of altered mental status <ol style="list-style-type: none"> a. Age greater than 45 years b. History of seizures or epilepsy c. Duration of symptoms d. Wheelchair or bedridden status of patient e. Blood glucose level f. Asymmetry of strength by testing facial smile or grimace, grip, and arm strength 5. Findings suggestive of a stroke <ol style="list-style-type: none"> a. Facial droop on one side of the face when the patient is asked to smile or show his teeth. b. One arm does not move or one arm drifts downward when the patient's arms are extended outward for ten seconds with his eyes closed. c. The patient slurs his words, uses wrong words, or is unable to speak when asked to repeat the phrase, "You can't teach an old dog new tricks." d. Weak or no grip on one side of the body when asked to squeeze your fingers. 	<p>Knowledge Application</p> <p>Given several different scenarios, students should be able use either the Cincinnati Prehospital Stroke Scale or the Los Angeles Prehospital Stroke Screen.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> e. Pay attention to the patient’s blood pressure when taking the vital signs and rule out hypoglycemia, if possible. f. Look for medical alert tags and medications. 6. Ask the following questions during the history. <ul style="list-style-type: none"> a. When did the symptoms begin? b. Is there any recent history of trauma to the head? c. Does the patient have a history of previous stroke? d. Was there any seizure activity noted prior to your arrival? e. What was the patient doing at the time of onset of the signs and symptoms? f. Does the patient have a history of diabetes? g. Has the patient complained of a headache? A stiff neck? h. Has the patient complained of dizziness, nausea, vomiting, or weakness? 7. Other signs and symptoms <ul style="list-style-type: none"> a. Altered mental status (dizziness or sudden confusion to complete unresponsiveness) b. Sudden onset of paralysis (hemiplegia) or weakness (hemiparesis) c. Numbness or loss of sensation to one side of the body d. Speech disturbances e. Loss of control of the bladder or bowel f. Unequal pupils g. Deterioration or loss of vision h. Eyes turned away from side of body that is paralyzed. i. Nausea and vomiting j. Sudden onset of severe headache k. Seizure activity l. Stiff neck m. Sensory or receptive aphasia n. Expressive or motor aphasia o. Incoordination of the extremities, usually on one side p. Poor balance, clumsiness, or difficulty in walking q. Hearing loss to one side r. Light or sound sensitivity s. Vertigo t. Dizziness D. Emergency medical care <ul style="list-style-type: none"> 1. Maintain a patent airway. 	<p>Discussion Question What are key components of the history in a patient who may be having a stroke?</p> <p>Class Activity Have pairs of students assist each other in immobilizing their dominant arm and have them try to take notes in class and go on break with their upper extremity immobilized to help students appreciate the frustration of a stroke patient with impaired motor function.</p> <p>Critical Thinking Discussion What do you think is the experience of a stroke patient, both immediately and over time?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 2. Suction secretions and vomitus. 3. Be prepared to assist ventilation. 4. Maintain oxygen therapy. 5. Position the patient. 6. Check the blood glucose level, if protocol permits. 7. Protect any paralyzed extremities. 8. Rapid transport. <p>E. Reassessment</p> <ol style="list-style-type: none"> 1. Perform a reassessment every five minutes. 2. Pay special attention to the status of the airway, breathing, circulation, and mental status. 3. Repeat and record vital signs. 	<p>Discussion Question What are important considerations in the management of a patient who may be having a stroke?</p>
5	<p>X. Stroke—Summary: Assessment and Care</p> <p>A. Review assessment findings that may be associated with stroke and emergency care for a patient suspected of having suffered a stroke.</p> <p>B. Review Figures 18-10a and b and Figure 18-11.</p>	
5	<p>XI. Headache—Types of Headache</p> <p>A. Vascular headaches (migraines)</p> <ol style="list-style-type: none"> 1. Result of dilation or distention of vessels or inflammation within the cranium 2. Often described as throbbing and may be generalized or localized to one side of the head <p>B. Cluster headaches</p> <ol style="list-style-type: none"> 1. Believed to have vascular origin 2. Pain found on only one side of head or face in the temporal region or around the eye and is excruciating <p>C. Tension headaches</p> <ol style="list-style-type: none"> 1. Thought to be caused by contraction of the muscles of the neck and scalp 2. Pain usually described as “tight” or “vise-like” 3. Common in children, adolescents, and adults <p>D. Organic, traction, or inflammatory headaches—Result of tumors, infection, stroke, or inflammatory disorders within the cranium</p>	<p>Teaching Tip Ask students who are willing to share their experience of headaches, particularly if a student in class has a history of migraine headaches. It is difficult for a person who has not experienced a migraine to appreciate the discomfort associated with the condition.</p> <p>Discussion Question What are some of the causes of headaches?</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on headache information and American Brain Tumor Association</p>

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Minutes	Content Outline	Master Teaching Notes
		information.
10	<p>XII. Headache—Assessment</p> <ul style="list-style-type: none"> A. Look for clues of toxic exposure. B. Assess the airway, ventilation, and oxygenation status of the patient. C. Apply oxygen based on the SpO₂ reading. D. Assess the pulse and perfusion status. E. Gather a history and conduct a secondary assessment looking for underlying causes. F. Assess the blood glucose level, if permitted. G. Suspect a serious underlying condition if headache is associated with any of the following. <ul style="list-style-type: none"> 1. Altered mental status 2. Motor or sensory deficit 3. Behavior change 4. Seizure 5. Headache unlike anything the patient has experienced 6. Worsening pain with coughing, sneezing, or bending over 7. Fever or stiff neck 8. Change in the quality of a chronic headache 	<p>Discussion Question What are some important questions to ask of the patient experiencing a headache?</p> <p>Class Activity Have pairs of students role play obtaining the history from a patient with a complaint of headache.</p> <p>Knowledge Application Given several patient descriptions of patients with a complaint of headache, students should be able to develop a relevant line of questioning.</p>
5	<p>XIII. Headache—Emergency Medical Care</p> <ul style="list-style-type: none"> A. Establish and maintain an adequate airway. B. Be prepared to suction C. Assess and maintain adequate ventilation. D. Administer oxygen. E. Place the patient in a position of comfort. F. Transport to a medical facility. 	<p>Critical Thinking Discussion Why is it important to reassess the patient complaining of a headache?</p>
10	<p>XIV. Follow-Up</p> <ul style="list-style-type: none"> A. Answer student questions. B. Case Study Follow-Up <ul style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why is the immediate application of oxygen an important aspect of Mrs. Stein's treatment? • What is the significance to Mrs. Steins' treatment and recovery of the inability to pinpoint the exact time the symptoms began?

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Minutes	Content Outline	Master Teaching Notes
	<p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 18 Summary. 2. Complete Chapter 18 In Review questions. 3. Complete Chapter 18 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 18 quiz 	<p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 19

Seizures and Syncope

75–90 minutes

MASTER TEACHING NOTES

- Case Study Discussion
- Teaching Tips
- Discussion Questions
- Class Activities
- Media Links
- Knowledge Application
- Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn special considerations of assessment and emergency care for a patient experiencing a seizure or syncope.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • Given the length of the seizure, what is your level of concern? • What are some possible causes of seizures that you should consider?
10	<p>II. Seizure—Pathophysiology of Seizures</p> <p>A. A seizure is a sudden and temporary alteration in brain function caused by massive, continuing electrical discharges in a group of nerve cells in the brain.</p> <p>B. Seizures produce changes in mental activity and behavior ranging from brief trance-like periods of inattention to unresponsiveness and convulsions.</p> <p>C. Seizures are a sign of an underlying defect, injury, or disease.</p> <p>D. Epilepsy is a chronic brain disorder characterized by recurrent seizures.</p> <p>E. Seizures of various types may be mistaken for other conditions.</p> <p>F. Seizures are categorized as either primary or secondary.</p> <ol style="list-style-type: none"> 1. Primary seizures in adults are usually due to a genetic or unknown cause. <ol style="list-style-type: none"> a. Generalized seizures involve both hemispheres of the brain and the reticular activating system, often resulting in convulsions and loss of consciousness. b. Partial seizures are typically related to abnormal activity in just one cerebral hemisphere and are either simple (remain conscious) or complex (altered mental status or unresponsiveness). 2. Secondary or reactive seizures do not result from a genetic cause but occur as the result of an insult to the body (e.g., fever, hypoxia, drug intoxication, eclampsia). <ol style="list-style-type: none"> a. This type of seizure is often generalized in nature. 	<p>Video Clip</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on seizures and epilepsy.</p> <p>Discussion Question</p> <p>Besides epilepsy, what are some causes of seizures?</p> <p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on status epilepticus.</p>

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	<ul style="list-style-type: none"> b. This type of seizure is extremely dangerous and can result in death. G. A patient who suffers generalized motor seizures that last more than five minutes or seizures that occur consecutively without a period of responsiveness between them is considered to be in status epilepticus. 	<p>Critical Thinking Discussion What are the consequences of prolonged seizure activity?</p>
20	<p>III. Seizure—Types of Seizures</p> <ul style="list-style-type: none"> A. Generalized tonic-clonic (grand mal) seizure <ul style="list-style-type: none"> 1. Begins with abnormal electrical activity low in the cerebral cortex that spreads upward, affecting both cerebral hemispheres, and downward, affecting the reticular activating system 2. Five stages <ul style="list-style-type: none"> a. Aura—Warning b. Loss of consciousness c. Tonic phase—Muscle rigidity d. Hypertonic phase—Extreme muscle rigidity and hyperextension e. Clonic phase—Convulsion f. Postictal state—Recovery 3. Emergency medical care <ul style="list-style-type: none"> a. If patient is in postictal state, provide reassurance and conduct assessment. b. If patient refuses transport, follow local protocol. c. If patient is in status epilepticus, establish and maintain an airway, ventilation, oxygenation, and circulation. B. Simple partial seizure <ul style="list-style-type: none"> 1. Also known as focal motor seizure or Jacksonian motor seizure 2. Involves only one cerebral hemisphere 3. Produces jerky muscle activity in one area of the body but may spread to another area or progress to a generalized tonic-clonic seizure 4. Patient remains awake and aware. 5. Document where seizure activity began and how it progressed. 6. Emergency medical care—Contact medical direction or follow local protocol if patient refuses care. C. Complex partial seizure <ul style="list-style-type: none"> 1. Also known as psychomotor or temporal lobe seizure 2. Involves only one cerebral hemisphere 3. Patient will remain awake but will be unaware of his surroundings. 4. Lasts one to two minutes and may include blank stare followed by 	<p>Video Clips Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access videos on absence seizures, partial seizures, and tonic-clonic seizures.</p>

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	<p>random activities (e.g., chewing, lip smacking, rolling fingers)</p> <ol style="list-style-type: none"> 5. Post-seizure confusion may last longer than a few minutes. 6. Emergency medical care—Stay with the person until he is completely aware of his surroundings, and follow local protocol if he refuses transport. <p>D. Absence (petit mal) seizure</p> <ol style="list-style-type: none"> 1. Mostly common in children 2. Characterized by blank stare, beginning and ending abruptly, and lasting only a few seconds 3. No emergency care is necessary; however, if it is a first-time observation, recommend medical evaluation. <p>E. Febrile seizure</p> <ol style="list-style-type: none"> 1. Caused by high fever, often in children six months to six years of age 2. Most often do not need emergency care 	
20	<p>IV. Seizure—Assessment-Based Approach to Seizure Activity</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Look for mechanism of injury or prescription medications that may indicate history. 2. Always begin with the assumption that the seizure patient needs emergency care. 3. Follow proper patient refusal procedure if necessary. 4. If patient is still seizing upon arrival, be sure patient receives proper care (e.g., guide movements rather than restrain) <p>B. Primary assessment</p> <ol style="list-style-type: none"> 1. Form a general impression of the patient. 2. For the patient in a postictal state who is talking without distress, continue with the secondary assessment and realize the patient may not require emergency care. 3. For the patient who is not responsive, actively seizing, or in status epilepticus <ol style="list-style-type: none"> a. Open the airway with a jaw-thrust or head-tilt, chin-lift maneuver. b. Suction and insert nasopharyngeal airway as necessary. c. Begin positive pressure ventilation if the patient is severely cyanotic, the seizure has lasted for greater than five minutes, or the breathing does not immediately become adequate following the episode. d. Note the skin temperature and color. e. Ensure the presence of a pulse if the patient is unresponsive. 	<p>Teaching Tip Emphasize the need to balance a patient's rights and autonomy with concern for his medical condition. Try to gain the cooperation of the patient who does not wish to be transported.</p> <p>Class Activity Provide students with ample opportunity to practice assessment and management of patients with seizures.</p> <p>Discussion Question What causes hypoxia in the patient having a tonic-clonic seizure?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> f. Initiate CPR and apply the AED if the patient is pulseless. g. Determine if patient is transport priority (e.g., evidence of head trauma, pregnant patient). <p>C. Secondary assessment</p> <ul style="list-style-type: none"> 1. If patient is transport priority, conduct secondary assessment en route to the hospital. 2. Assess the head for injury and extremities for paralysis or injury. 3. Assess and record the baseline vital signs. 4. Apply a pulse oximeter. 5. Assess the blood glucose level if protocol permits. 6. Gather a history from the responsive patient, relatives, and bystanders (e.g., when the seizure started; how long it lasted; description of activity during seizure). 7. Be aware that seizures can be mistaken for other disorders. 8. Signs and symptoms of a seizure <ul style="list-style-type: none"> b. Convulsions c. Rigid muscular contraction or muscle spasm d. Bitten tongue e. Excessive saliva f. Urinary or bowel incontinence g. Chewing movement, smacking lips, wringing hands or some other repetitive activity h. Localized twitching of muscles i. Visual hallucinations j. Olfactory hallucination <p>D. Emergency medical care</p> <ul style="list-style-type: none"> 1. Position the patient. 2. Maintain a patent airway. 3. Suction. 4. Assist ventilation if necessary. 5. Prevent injury to the patient. 6. Maintain oxygen therapy. 7. Transport. <p>E. Reassessment</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some indications that a patient having, or who has had, a seizure, is a high priority for transport? • What should you be looking for in the secondary assessment of a patient who has had a seizure? <p>Knowledge Application</p> <p>Given several scenarios of patients who have had, or who are having, a seizure, students should be able to identify the appropriate priority for transport.</p>

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Minutes	Content Outline	Master Teaching Notes
10	<p>V. Seizure—Summary: Assessment and Care for Seizures</p> <p>A. Review assessment findings and emergency care for seizures.</p> <p>B. See Figures 19-5 and 19-6.</p>	
15	<p>VI. Syncope</p> <p>A. Syncope, or fainting, is a sudden and temporary loss of consciousness.</p> <p>B. It occurs when, for some reason, there is a temporary lack of blood flow to the brain, and the brain is deprived of oxygen for a brief period.</p> <p>C. Common cause is the overwhelming influence of the parasympathetic nervous system that causes blood vessels to dilate throughout the body.</p> <p>D. Type of faint in which patient is in a standing or seated position, allowing blood to pool in the lower extremities, is called a vasovagal faint.</p> <p>E. Difference between a seizure and a syncope</p> <ol style="list-style-type: none"> 1. Episode usually begins in a standing position. 2. Patient remembers feeling faint or lightheaded. 3. Patient becomes responsive almost immediately after becoming supine. 4. Skin is usually pale and moist. <p>F. Place the patient in a supine position and conduct primary and secondary assessments. (Be alert to possible spinal cord injury from fall).</p> <p>G. Patient may refuse transport; follow local protocol in this situation.</p> <p>H. Remember that syncope could be a sign of a serious illness or injury (especially in older patients).</p>	<p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on syncope.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some causes of syncope? • What signs and symptoms might be reported just prior to a syncopal episode? <p>Critical Thinking Discussion</p> <p>What kinds of medications might make a patient prone to syncope?</p> <p>Class Activity</p> <p>Provide students with opportunities to practice assessment and management of patients with a complaint of syncope.</p>
10	<p>VII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p>	<p>Case Study Follow-Up Discussion</p> <p>Would you feel comfortable with Carmen’s refusal of treatment? Why or why not?</p> <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 1. Review Chapter 19 Summary. 2. Complete Chapter 19 In Review questions. 3. Complete Chapter 19 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 19 quiz 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 20

Acute Diabetic Emergencies

120–130 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency care for a patient suffering from an acute diabetic emergency.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What types of problems might cause a sudden change in Mr. Bennet's behavior? • If Mr. Bennet is unable to give you a medical history, how can you find out additional information about him?
5	<p>II. Understanding Diabetes Mellitus—Glucose (Sugar)</p> <ol style="list-style-type: none"> A. Major source of fuel for the cells B. Significantly affects brain cells C. Tendency to attract water when glucose molecule moves D. Excess spills off into the urine 	<p>Discussion Question</p> <p>What happens to the glucose that is not immediately needed by our cells for energy?</p> <p>Class Activity</p> <p>To illustrate the breakdown of starches into simple sugars, pass out saltine crackers. Ask students to begin to chew the crackers but not to swallow right away. Enzymes in saliva begin to break down the starches, and the cracker takes on a sweet taste after it is held in the mouth for a short period of time.</p>
5	<p>III. Understanding Diabetes Mellitus—Hormones that Control Blood Glucose Levels</p> <p>A. Insulin</p> <ol style="list-style-type: none"> 1. Increases the movement of glucose out of the blood and into cells 2. Causes the liver to take up the glucose out of the blood and convert it into glycogen 	<p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on insulin resistance.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 3. Decreases the blood glucose level and facilitates the movement of the glucose into the cells and the liver 4. Not needed in order for glucose to cross into the brain <p>B. Glucagon</p> <ol style="list-style-type: none"> 1. Converts glycogen stored in the liver back into glucose and releases it into the blood (opposite of insulin) 2. Converts other, noncarbohydrate substances into glucose 3. Increases and maintains the blood glucose level, converting glycogen and other substances into glucose <p>C. Other hormones (epinephrine)</p> <ol style="list-style-type: none"> 1. Released by the adrenal glands when the blood glucose level is decreasing to a dangerously low level 2. Stops the secretion of insulin and promotes the release of stored glucose from the liver as well as the conversion of other substances in to glucose 	<p>Knowledge Application Ask students to explain what happens to glucose and hormone levels in response to eating and fasting.</p>
5	<p>IV. Understanding Diabetes Mellitus—Normal Metabolism and Glucose Regulation</p> <ol style="list-style-type: none"> A. Blood glucose level increases within hour after first meal. B. Insulin, released from the pancreas, increases movement of glucose into cells. C. As body cells, the liver, and the brain take up the glucose, the blood glucose level lowers. D. Pancreas secretes glucagon as the blood glucose level drops. E. Liver converts glycogen back to glucose and releases into blood stream. F. Glucose in blood stream maintains normal range until next meal. 	<p>Teaching Tip Use the analogy of a thermostat’s role in regulating heat to explain the pancreas’ role in regulating blood glucose levels.</p> <p>Discussion Question How is the blood glucose level normally regulated?</p>
5	<p>V. Understanding Diabetes Mellitus—Checking the Blood Glucose Level</p> <ol style="list-style-type: none"> A. Glucose meters can determine blood glucose, or sugar, level (BGL). <ol style="list-style-type: none"> 1. Normal blood glucose level is 80–120 mg/dL. 2. Normal level following a meal is 120–140 mg/dL. 3. Determine when the patient last had something to drink or eat. 4. Average BGL in a diabetic patient is 200 mg/dL. 5. Hypoglycemia is a BGL of 60 mg/dL or less with signs or symptoms OR 50 mg/dL with or without signs and symptoms. 6. Hyperglycemia is a persistent BGL greater than 120 mg/dL. 	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on how to use a blood glucose meter.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • At what point is a patient considered hypoglycemic? • At what point is a patient considered

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	<ul style="list-style-type: none"> B. Use glucose meters in conjunction with information collected in history and signs in physical examination. C. Determine whether medical direction or local protocol allow you to test the patient's BGL. D. Test the BGL prior to administration of any oral glucose or sugar-containing solution. E. Ensure that you have a glucose meter, glucose meter test strips, a lancet, a lancet device (optional), and alcohol swabs. F. Follow the steps listed in Table 20-1. 	<p>hyperglycemic?</p>
10	<p>VI. Understanding Diabetes Mellitus—Diabetes Mellitus (DM)</p> <ul style="list-style-type: none"> A. Disturbance in metabolism of carbohydrates, fats, and proteins <ul style="list-style-type: none"> 1. Lack of insulin being secreted by pancreas 2. Inability of the cell receptors to recognize the insulin and allow glucose to enter at a normal rate 3. Brain has more glucose than it needs since it does not require insulin while the body cells are starving for glucose. B. Common signs and symptoms <ul style="list-style-type: none"> 1. Elevated blood glucose level (hyperglycemia) 2. Polydipsia: frequent thirst 3. Polyuria: frequent urination 4. Polyphagia: frequent hunger 5. Prone to a wide variety of diseases and disorders involving blood vessels C. Types <ul style="list-style-type: none"> 1. Type I diabetes <ul style="list-style-type: none"> a. Also called insulin-dependent diabetes mellitus (IDDM) b. Pancreas does not secrete insulin. c. Peak age is 10–14 years. d. Patient may suffer from diabetic ketoacidosis (DKA) or hypoglycemia. 2. Type II diabetes <ul style="list-style-type: none"> a. Also called non-insulin dependent mellitus b. Typically overweight and middle-aged or older patients c. May suffer from hyperglycemic hypersmolar nonketotic syndrome (HHNS) d. More common than Type I diabetes 	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on diabetes.</p> <p>Critical Thinking Discussion What causes the three “Ps” of untreated diabetes mellitus?</p> <p>Discussion Question What are the similarities and differences between Type I and Type II diabetes?</p>

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Minutes	Content Outline	Master Teaching Notes
15	<p>VII. Acute Diabetic Emergencies—Hypoglycemia</p> <ul style="list-style-type: none"> A. Patient suffers from low blood glucose level. B. More common in Type I IDDM patients C. Most dangerous acute complication of diabetes mellitus; can result in brain cell death D. Pathophysiology of hypoglycemia <ul style="list-style-type: none"> 1. Noted as blood sugar less than 60 mg/dL with signs and symptoms of hypoglycemia or less than 50 mg/dL with or without signs and symptoms 2. Patient takes insulin but with excessive results for one of the following reasons. <ul style="list-style-type: none"> a. Patient takes insulin and does not eat a meal. b. Patient takes insulin, eats a meal, but drastically increases activity beyond normal. c. Patient takes too much insulin (either takes too much at one time or forgets and takes another dose). E. Assessment findings in hypoglycemia (also referred to as “insulin shock”) <ul style="list-style-type: none"> 1. Signs and symptoms caused by epinephrine release <ul style="list-style-type: none"> a. Diaphoresis b. Tremors c. Weakness d. Hunger e. Tachycardia f. Dizziness g. Pale, cool, clammy skin h. Warm sensation 2. Signs and symptoms caused by brain cell dysfunction <ul style="list-style-type: none"> a. Confusion b. Drowsiness c. Disorientation d. Unresponsiveness (coma) e. Seizures f. Stroke-like symptoms 3. Misinterpretation of signs and symptoms can be deadly (Look for a medical bracelet.) F. Hypoglycemia unawareness: Signs and symptoms may change over time, causing the person to become unaware of the drop in glucose level and suddenly experiencing hypoglycemia. G. Emergency medical care for hypoglycemia 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource with a NIH interactive X-plain tutorial about hypoglycemia.</p> <p>Discussion Question What are the likely events leading to an episode of hypoglycemia?</p> <p>Class Activity Draw a grid on the white board with Hypoglycemia and Hyperglycemia as column headings. Label rows Signs, Symptoms, History, and Management. Have students fill in the grid. Review the grid, emphasizing key points and filling in any gaps.</p> <p>Critical Thinking Discussion Why do patients with hypoglycemia often present with bizarre or aggressive behavior?</p>

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	<ol style="list-style-type: none"> 1. It is important that the patient is given sugar to increase the blood glucose level as quickly as possible to prevent the brain cells from dying. 2. Unresponsive patient, patient unable to swallow, or patient unable to obey your commands <ol style="list-style-type: none"> a. Establish open airway. b. Provide oxygen via a nonrebreather mask at 15 lpm if breathing is adequate. c. Provide positive pressure ventilation if breathing is inadequate. d. Contact advanced life support. e. Assess the blood glucose level. 3. Responsive patient, patient able to swallow, or patient able to obey your commands <ol style="list-style-type: none"> a. Ensure airway is patent. b. Assess the blood glucose level if your protocol permits. c. Administer one tube of oral glucose. 4. Continuously reassess patient's condition 	<p>Discussion Question What are the management priorities for patients with hypoglycemia?</p>
5	<p>VIII. Acute Diabetic Emergencies—Oral Glucose</p> <ol style="list-style-type: none"> A. Heavy sugar gel that raises the amount of glucose circulating in the blood and increases the amount of glucose available to the brain B. Criteria for administration <ol style="list-style-type: none"> 1. Altered mental status 2. History of diabetes controlled by medication or blood glucose reading less than 60 mg/dL 3. Ability to swallow C. If patient does not meet all three criteria, provide emergency care as if for a patient with altered mental status and an unknown history. 	<p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation about the use of oral glucose.</p> <p>Teaching Tip Pass around tubes of oral glucose for students to see and handle.</p>
5	<p>IX. Acute Diabetic Emergencies—Hyperglycemia</p> <ol style="list-style-type: none"> A. Condition where diabetic patient is suffering from a lack of insulin and a high blood glucose level B. Patients may suffer diabetic ketoacidosis (DKA) or hyperglycemic hyperosmolar nonketotic syndrome (HHNS) from being hyperglycemic. 	
20	<p>X. Acute Diabetic Emergencies—Hyperglycemic Condition: Diabetic Ketoacidosis (DKA)</p>	

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	<p>A. Pathophysiology of DKA</p> <ol style="list-style-type: none"> 1. Most common in Type I diabetic 2. Brain has an excess amount of glucose, and the other cells in the body are starving for glucose because of an inadequate amount of insulin. 3. Effects include dehydration, acidosis, and cardiac disturbances. 4. Causes <ol style="list-style-type: none"> a. Infection that has upset the insulin and glucose balance b. Inadequate dose of insulin c. Medications such as Thiazide, Dilantin, or steroids. d. Types of stress such as surgery, trauma, pregnancy, or heart attack e. Change in diet <p>B. Assessment findings in DKA</p> <ol style="list-style-type: none"> 1. Polyuria 2. Polyphagia 3. Polydipsia 4. Nausea and vomiting 5. Poor skin turgor 6. Tachycardia 7. Rapid deep respirations (Kussmaul's respirations) 8. Fruity or acetone odor on the breath (from ketone buildup) 9. Positive orthostatic tilt test 10. Blood glucose level greater than 350 mg/dL 11. Muscle cramps 12. Abdominal pain 13. Warm, dry, flushed skin 14. Altered mental status 15. Coma <p>C. Emergency medical care for DKA</p> <ol style="list-style-type: none"> 1. Establish and maintain a patent airway. 2. Provide oxygen via a nonrebreather at 15 lpm if the breathing is adequate. 3. If the breathing is inadequate, provide positive pressure ventilation with oxygen connected to the ventilation device. 4. If protocol permits, determine the blood glucose level. 5. If you are unsure about the condition, administer oral glucose if the patient is able to swallow since hypoglycemia could cause brain cell death. 6. Contact medical direction for further orders. 	<p>Discussion Question What are the management priorities for patients with hyperglycemia?</p>

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Minutes	Content Outline	Master Teaching Notes
15	<p>XI. Acute Diabetic Emergencies—Hyperglycemic Condition: Hyperglycemic Hyperosmolar Nonketotic Syndrome (HHNS)</p> <p>A. Pathophysiology of HHNS</p> <ol style="list-style-type: none"> 1. Most common in Type II diabetic 2. Condition that causes the blood glucose level to increase dramatically (600–1,200 mg/dL) 3. Glucose draws large amounts of water into the urine 4. Less fat burned for energy than in DKA (meaning lesser production of ketones) 5. May be first indication that patient has diabetic condition 6. Possible causes <ol style="list-style-type: none"> a. Diabetic condition b. Trauma c. Burns d. Dialysis e. Drugs f. Heart attack g. Stroke h. Infection i. Head injuries <p>B. Assessment findings in HHNS</p> <ol style="list-style-type: none"> 1. Tachycardia 2. Fever 3. Positive orthostatic tilt test 4. Dehydration 5. Polydipsia 6. Dizziness 7. Poor skin turgor 8. Altered mental status 9. Confusion 10. Weakness 11. Dry oral mucosa 12. Dry, warm skin 13. Polyuria 14. Nausea and vomiting <p>C. Emergency medical care for HHNS</p> <ol style="list-style-type: none"> 1. Emergency care is the same as for DKA. 	<p>Discussion Question How are DKA and HHNS distinguished from one another?</p> <p>Critical Thinking Discussion Why is the blood glucose level typically higher in HHNS than in DKA?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on Hyperglycemic Hyperosmolar Nonketotic Syndrome.</p> <p>Knowledge Application Given several different scenarios, students should be able to identify patients with hypoglycemia and hyperglycemia.</p>

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	<ol style="list-style-type: none"> 2. When in doubt or protocol does not permit you to distinguish between hypoglycemia, DKA, or HHNS, treat the patient as if he is hypoglycemic to prevent brain death or even the patient's death. 	
5	<p>XII. Assessment-Based Approach: Altered Mental Status in a Diabetic Emergency—Scene Size-Up and Primary Assessment</p> <ol style="list-style-type: none"> A. Assess the patient in the same manner as an altered mental status patient with no known history of diabetes mellitus B. Err on the side of caution by administering oral glucose if you are unable to assess the patient with a glucose meter C. Scene size-up and primary assessment <ol style="list-style-type: none"> 1. Look for clues gathered during the scene size-up and primary assessment that may lead you to suspect that the patient may be diabetic (e.g., prescription medications). 2. Look for medical alert tags or other medical identification. 	
10	<p>XIII. Assessment-Based Approach: Altered Mental Status in a Diabetic Emergency—History and Secondary Assessment</p> <ol style="list-style-type: none"> A. Secondary assessment <ol style="list-style-type: none"> 1. Ask SAMPLE history questions 2. Medications often taken by diabetics <ol style="list-style-type: none"> a. Insulin (Humlin®, Novolin®, Iletin®, Semilente®) b. Actos® c. Diabinese®, Glucamide® d. Orinase® e. Micronase®, Diabeta® f. Tolinase® g. Glucotrol® h. Humalog® i. Glucophage® j. Glynase® k. Exenatide (Byetta®) l. Exubra® 3. Important questions <ol style="list-style-type: none"> a. Did the patient take his medication the day of the episode? b. Did the patient eat (or skip any) regular meals on that day? c. Did the patient vomit after eating a meal on that day? d. Did the patient do any unusual exercise or physical activity on that 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some medications that would indicate to you that your patient is a diabetic? • What are some key characteristics to help differentiate between hypoglycemia and hyperglycemia? <p>Knowledge Application</p> <p>Given several descriptions of patients with altered mental status, students should be able to obtain a relevant history to</p>

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	<p>day?</p> <ul style="list-style-type: none"> e. Was the onset of altered mental status gradual or fast? f. How long has the patient had the signs and symptoms? g. Are there any other signs or symptoms associated with the altered mental status? h. Is there any evidence of injury that might be the cause of the altered mental status? i. Was there any period in which the patient regained a normal mental status and then deteriorated again? j. Did the patient suffer a seizure? k. Does the patient appear to have a fever or other signs of infection? <p>B. Signs and symptoms</p> <ul style="list-style-type: none"> 1. Rapid onset of an altered mental status after missing or vomiting a meal, unusual exercise, or physical work 2. Intoxicated appearance 3. Tachycardia 4. Cool, moist skin 5. Hunger 6. Seizure activity 7. Uncharacteristic or bizarre behavior, combativeness 8. Anxiousness or restlessness 9. Bruising at insulin injection sites on the abdomen 10. Stroke symptoms (in elderly patient) 11. Blood glucose reading of < 60 mg/dL 	<p>determine if the patient is more likely suffering from hypoglycemia or hyperglycemia.</p> <p>Class Activity Have pairs of students role play assessing and instructing each other as if they were assessing a patient to see if they can swallow and follow commands in order to receive oral glucose.</p>
5	<p>XIV. Assessment-Based Approach: Altered Mental Status in a Diabetic Emergency—Emergency Medical Care</p> <ul style="list-style-type: none"> A. Establish and maintain an open airway. B. Determine if the patient is alert enough to swallow. C. Administer oral glucose. D. Transport. 	<p>Critical Thinking Discussion Why is it important to err on the side of giving glucose if in doubt about a patient's blood glucose level?</p>
5	<p>XV. Assessment-Based Approach: Altered Mental Status in a Diabetic Emergency—Reassessment</p> <ul style="list-style-type: none"> A. Reassess the patient to determine if the oral glucose has had any effect. B. If local protocol permits, retest the blood glucose level. 	

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	<p>C. If the patient's BGL is increasing and mental status is improving, the patient is likely suffering from a low blood glucose level.</p> <p>D. If otherwise, the patient may be suffering from another condition in addition to the low blood glucose level.</p> <p>E. Communicate and record any changes in the patient's condition.</p>	
5	<p>XVI. Assessment-Based Approach: Altered Mental Status in a Diabetic Emergency—Summary: Assessment and Care</p> <p>A. Review assessment findings that may be associated with diabetic emergencies and emergency care for diabetic emergencies.</p> <p>B. See Figures 20-10a and b and 20-11 and Table 20-2.</p>	
5	<p>XVII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 20 Summary. 2. Complete Chapter 20 In Review questions. 3. Complete Chapter 20 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 20 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why is it important to check the refrigerator for medications? • Why was Mr. Bennet placed on his left side after receiving oral glucose? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 21

Anaphylactic Reactions

50–65 minutes

MASTER TEACHING NOTES

- Case Study Discussion
- Teaching Tips
- Discussion Questions
- Class Activities
- Media Links
- Knowledge Application
- Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency care for patients suffering from allergic reaction.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What is your general impression of the patient? • What is the first action you should take?
15	<p>II. Anaphylactic Reaction—Pathophysiology of Anaphylactic Reaction</p> <p>A. The immune system is a defense mechanism to fight off invasion by foreign substances.</p> <p>B. Antigens are foreign substances that are recognized by the cells of the immune system and eventually destroyed.</p> <p>C. When an antigen enters the body, it sets off an immune response, and the immune system produces antibodies, proteins that search for the antigen, combine with it, and help to destroy it.</p> <p>D. If an allergen, a type of antigen, enters the body, it can cause an abnormal response by the immune system known as an allergic reaction.</p> <p>E. An allergic reaction is a misdirected and excessive response by the immune system to an allergen. The response can be local or systemic.</p> <p>F. A life-threatening allergic reaction is known as an anaphylactic reaction (also anaphylaxis or anaphylactic shock).</p> <ol style="list-style-type: none"> 1. Swelling in the upper and lower airways can cause breathing difficulties and hypoxia. 2. Dilated blood vessels and capillaries can decrease blood pressure and cause shock. <p>G. Sensitization</p> <ol style="list-style-type: none"> 1. An allergic reaction usually does not occur the first time the body is exposed to and produces antibodies against a particular antigen. 2. Hypersensitivity can develop upon first exposure, meaning if the person 	<p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the immune system and allergic reactions.</p> <p>Discussion Question</p> <p>What is the relationship between an allergic reaction and anaphylaxis?</p> <p>Video Clip</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on allergic rhinitis.</p>

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	<p>is again exposed to the antigen, an allergic reaction will occur.</p> <ol style="list-style-type: none"> 3. The process of developing hypersensitivity on first exposure to an antigen is known as sensitization and primes the patient for a possible anaphylactic reaction. 4. During sensitization, antibodies attach to mast cells and basophils. When the antigen is reintroduced into the body, the cell membranes break down and release chemical mediators (such as histamine) that cause the signs and symptoms of anaphylaxis. 5. Life-threatening responses from the chemical mediators include bronchoconstriction, increase in capillary permeability, and vasodilation. <p>H. Anaphylactoid reaction</p> <ol style="list-style-type: none"> 1. Sometimes mast cells and basophils can release chemical mediators the first time the antigen is introduced into the body without the patient ever being sensitized. This is referred to as an anaphylactoid reaction. 2. Signs, symptoms, and treatment are exactly the same as for anaphylactic reaction. 3. See Table 21-1 for substances that commonly cause anaphylactoid reactions. <p>I. Causes of anaphylactic reaction</p> <ol style="list-style-type: none"> 1. Some causes of anaphylactic reaction are idiopathic (cannot be identified). 2. How antigens enter the body <ol style="list-style-type: none"> a. Injection b. Ingestion c. Inhalation d. Contact (absorption) 3. Common causes of anaphylactic reaction <ol style="list-style-type: none"> a. Venom b. Foods c. Pollen d. Medications (penicillin) e. Other substances (glue) f. Exercise g. Latex 	<p>Critical Thinking Discussion How does the body's response to an allergen result in signs and symptoms of anaphylaxis?</p> <p>Discussion Question What are some common causes of anaphylaxis?</p> <p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on anaphylactic reaction.</p>

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20	<p>III. Anaphylactic Reaction—Assessment-Based Approach to Anaphylactic Reaction</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Be certain your own safety is not in jeopardy (especially if anaphylactic reaction is the result of a bite or sting). 2. Look for clues at the scene such as medications. <p>B. Primary assessment</p> <ol style="list-style-type: none"> 1. Patient may complain of not feeling well or malaise, generalized feeling of weakness or discomfort. 2. Closely assess the airway for signs of obstruction (stidor or crowing sounds). 3. Positive pressure ventilation may be necessary to force the air past the swollen upper airway. 4. If breathing is adequate, place the patient on a nonrebreather mask with an oxygen flow of 15 lpm. 5. Management of the airway may require endotracheal intubation, placement of a tube in the trachea to facilitate breathing. In most jurisdictions, this is performed by ALS. 6. Common signs of allergic reaction <ol style="list-style-type: none"> a. Rapid and weak pulse (fluid loss) b. Warm, flushed skin (vasodilation) c. Hives (capillary permeability and leaking in the epidermis) d. Edema (capillary permeability and leaking in the dermis) 7. Patient with an anaphylactic reaction is considered priority; consider calling ALS. 8. Determine if the patient has an epinephrine auto-injector and locate it immediately. <p>C. Secondary assessment</p> <ol style="list-style-type: none"> 1. If the patient is experiencing a severe reaction, conduct the secondary assessment en route to the hospital. 2. History <ol style="list-style-type: none"> a. Use the OPQRST line of questioning, with emphasis on the onset of the reaction. b. The faster the onset of signs and symptoms of an anaphylactic reaction, the more severe and prolonged the reaction will probably be. c. Take the patient's SAMPLE history. 	<p>Class Activity</p> <p>Provide ample opportunity for students to practice skills.</p>

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	<p>3. Signs and symptoms</p> <ul style="list-style-type: none"> a. Skin <ul style="list-style-type: none"> i. Warm, tingling feeling in face, mouth, chest, feet, and hands ii. Intense itching iii. Hives iv. Flushed or red skin v. Swelling to the face, lips, neck, hands, feet, and tongue b. Respiratory system <ul style="list-style-type: none"> i. "Lump in the throat" ii. Tightness in the chest iii. High-pitched cough iv. Tachypnea v. Labored breathing vi. Noisy breathing vii. Impaired ability to talk or hoarseness viii. Excessive amounts of coughed-up mucus ix. Partially or completely occluded airway x. Difficulty in breathing c. Cardiovascular system <ul style="list-style-type: none"> i. Tachycardia ii. Hypotension iii. Irregular pulse iv. Absent radial pulse d. Central nervous system <ul style="list-style-type: none"> i. Increased anxiety ii. Lightheadedness iii. Unresponsiveness iv. Disorientation v. Restlessness vi. Seizures vii. Headache e. Gastrointestinal system <ul style="list-style-type: none"> i. Nausea/vomiting ii. Abdominal cramping iii. Diarrhea iv. Difficulty in swallowing v. Loss of bowel control f. Genitourinary system 	<p>Discussion Question What are signs and symptoms of anaphylaxis?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on urticaria.</p>

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	<ul style="list-style-type: none"> i. Urgent need to urinate ii. Cramping of the uterus g. Generalized signs and symptoms <ul style="list-style-type: none"> i. Itchy, watery eyes ii. Runny or stuffy nose iii. Sense of impending doom iv. Complaints of “not feeling well” v. General weakness or discomfort vi. Physical exam vii. Baseline vital signs h. Two key categories of signs and symptoms <ul style="list-style-type: none"> i. Airway and respiratory compromise—Airway occlusion; respiratory distress or respiratory failure with possible wheezing or stridor ii. Shock (hypoperfusion—Absent or weak pulses; rapid heartbeat; decreased blood pressure; deteriorating mental status) 4. Physical exam <ul style="list-style-type: none"> a. Focus the physical exam on the patient’s complains involving the airway, breathing, and circulation. b. The EMT’s major concerns are a compromised airway, inadequate breathing, and shock (hypoperfusion). c. Check the face for swelling and extremities for bites, stings, or injection marks. d. Check pulses and skin temperature, color, and condition for indications of shock. 5. Baseline vital signs—Pay particular attention to the breathing, pulse, and blood pressure. 6. Remember that what appears to be a mild allergic reaction can progress to a severe, life-threatening reaction within minutes. Do not mistake anaphylaxis for other conditions with similar signs and symptoms. D. Emergency medical care <ul style="list-style-type: none"> 1. Distinguish between a mild and a moderate-to-severe reaction. 2. The mild reaction typically does not require aggressive intervention or administration of medication. Maintain an open airway, provide oxygen, and transport as soon as possible. 3. Emergency care for a moderate to severe reaction. <ul style="list-style-type: none"> a. Maintain a patent airway. b. Suction any secretions. 	

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	<ul style="list-style-type: none"> c. Maintain oxygen therapy. d. Be prepared to assist ventilation. e. Administer epinephrine by a prescribed auto-injector (on-line or off-line order). f. Consider calling for advanced life support. g. Initiate early transport. <p>E. Reassessment</p> <ol style="list-style-type: none"> 1. Patient with a mild reaction should be constantly monitored for indications that the reaction is worsening and that further intervention may be needed. 2. Patient with moderate-to-severe reaction who has received an epinephrine injection should be reassessed to determine if the injection has been effective (after two minutes). 3. Closely reassess the airway, breathing, and circulation status and looks for signs of deterioration. 	<p>Discussion Question What are the treatment priorities for patients with anaphylaxis?</p>
5	<p>IV. Anaphylactic Reaction—Summary: Assessment and Care</p> <ul style="list-style-type: none"> A. Review assessment findings that may be associated with allergic reaction and emergency care for allergic reaction. B. See Figures 21-3 and 21-4. 	<p>Knowledge Application Given a scenario involving exposure to an allergen, students should be able to determine treatment priorities for the patient.</p>
15	<p>V. Anaphylactic Reaction—Epinephrine Auto-Injector</p> <ul style="list-style-type: none"> A. Epinephrine is the drug of choice for the emergency treatment of moderate-to-severe allergic reactions. B. Epinephrine's alpha₁ and alpha₂ properties cause vasoconstriction and tighten the capillaries, reversing the increased capillary permeability experienced by the anaphylactic patient. C. The beta₂ properties cause bronchodilation, reversing the bronchoconstriction. D. The beta₁ properties are responsible for side effects from administration. E. Epinephrine also reduces the effects of antihistamine. F. Body's response to epinephrine is rapid; however, it only lasts ten to 20 minute. G. Epinephrine comes packaged in a disposable delivery system for self-administration (EpiPen® and Twinject®) <ol style="list-style-type: none"> 1. Autoinjectors with spring-loaded, concealed needle designed to deliver a precise dose of epinephrine 	<p>Teaching Tip Pass around examples of epinephrine auto-injectors for students to see and handle.</p> <p>Critical Thinking Discussion What are the actions of epinephrine that are beneficial to the patient with anaphylaxis?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the epinephrine auto-injector and anaphylaxis.</p>

Chapter 21 objectives can be found in an accompanying folder.
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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 2. Twinject® is unique because it carries two doses of epinephrine. 3. Both epinephrine auto-injectors carry a 0.3 mg dose for patients 66 pounds or greater and 0.15 mg for infants and children up to 66 pounds. 4. Activated by pressing it against the patient’s thigh (lateral portion, midway between the hip and knee preferred); second dose of Twinject® requires additional steps 5. Preferable to move clothing from the injection site but not necessary. 	<p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on allergic reactions and epinephrine.</p>
5	<p>VI. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 21 Summary. 2. Complete Chapter 21 In Review questions. 3. Complete Chapter 21 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 21 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why is the immediate application of oxygen an important aspect of Mrs. Stein’s treatment? • What is the significance to Mrs. Steins’ treatment and recovery of the inability to pinpoint the exact time the symptoms began? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 22

Toxicologic Emergencies

220–250 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency care for patients suffering from various types of poisonings.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What is your level of concern for this patient? • What information should you obtain to relay to the Poison Control Center and emergency department staff?
15	<p>II. Poisons and Poisonings—Poisons and Routes of Exposure</p> <p>A. Poison is any substance that impairs health or causes death by its chemical action when it enters the body or comes into contact with the skin.</p> <p>B. Toxicology is the study of toxins, antidotes, and the effects of toxins on the body.</p> <p>C. A toxin is a drug or substance that is poisonous to a human and will cause certain adverse effects that may ultimately lead to death.</p> <p>D. Certain toxins may not be poisonous when used properly.</p> <p>E. <i>Overdose</i> is commonly used to describe a poisoning in which the patient has been exposed to an excessive dose of a drug.</p> <p>F. Substance abuse, which can be a form of poisoning, is the inappropriate use of a substance or medication.</p> <p>G. Four routes of exposure</p> <ol style="list-style-type: none"> 1. Ingestion (most common)—Drug or substance can be swallowed with absorption occurring through the gastrointestinal tract. 2. Inhalation (early signs and symptoms)—Breathing a poison, typically a gas, vapor, fume, or aerosol, into the lungs allows for rapid absorption into the body. 3. Injection (local and/or systemic reaction)—A poison can be injected under the skin, into the muscle, or directly into a blood vessel, and may result from drug use or insects that bite or sting (hymenoptera). 4. Absorption (local and/or systemic reaction)—A poisonous substance can 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What is a poison? • What are the four routes by which poisons can enter the body? • How does the route of exposure to a poison affect the onset of its effects on the body? <p>Class Activity</p> <p>Assign groups of students one of the common household toxins you have brought in. Have each group research the ingredients of the substance and prepare a short presentation on the toxic effects of the substance and/or its component ingredients.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Have students list examples of toxic substances that they might find in their homes.

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	<p>enter the body when it comes in contact with the skin or mucous membranes.</p> <p>H. Signs and symptoms depend on the specific poison and the route of entry.</p>	<ul style="list-style-type: none"> • Ask students to give examples of poisons that can enter the body by each of the four routes of exposure. • Pass around common toxic household items you have collected for this purpose to illustrate the range of toxic substances available in our everyday environment. <p>Knowledge Application Given a scenario involving exposure to a poison, students should be able to determine the route of exposure.</p>
10	<p>III. Poisons and Poisonings—Managing the Poisoning Patient</p> <p>A. Majority of emergency care will be supportive.</p> <p>B. Establish and maintain a patent airway and determine whether the breathing is adequate or inadequate.</p> <p>C. Provide positive pressure ventilation for inadequate breathing or a nonrebreather mask for adequate breathing.</p> <p>D. Assess the circulation.</p> <p>E. Continue to reassess the patient, and keep in mind that these patients can deteriorate quickly.</p> <p>F. Pay close attention to the airway as a patient may aspirate vomitus into the lungs.</p>	<p>Discussion Question What are the treatment priorities for patients with poisoning?</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some ways that unintentional poisonings can be prevented? • What is the EMT's role in providing education to prevent poisoning?
5	<p>IV. Poisons and Poisonings—Antidotes</p> <p>A. Substance that will neutralize the effects of the poison or toxic substance</p> <p>B. True antidotes are available for only a small number of poisons.</p> <p>C. Treatment is generally geared toward limiting or preventing absorption of the poison and managing signs and symptoms.</p> <p>D. ALS unit may have medications that reverse the effects of certain drugs that may have been injected, inhaled, or absorbed.</p>	<p>Discussion Question What role do specific antidotes play in the management of poisoned patients?</p>

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Minutes	Content Outline	Master Teaching Notes
	<p>unwilling or unable to communicate. (Exercise caution in trusting history gained from a patient who took an intentional overdose.)</p> <ol style="list-style-type: none"> b. Was any substance ingested? c. Was any alcohol ingested with the substance? d. When did the patient ingest the poison, or when was the patient exposed to the poison? e. Over what time period was the substance ingested? f. How much of the substance was taken? g. Has anyone attempted to treat the poisoning? h. Does the patient have a psychiatric history that may suggest a possible suicide attempt? i. Does the patient have an underlying medical illness, allergy, chronic drug use, or addiction? j. How much does the patient weigh? k. What medications are available in the house? <ol style="list-style-type: none"> 2. Conduct a physical exam of the areas in which the patient has a complaint, sign, or symptom, and of body systems that might be affected in the poisoning (or a complete secondary assessment for unresponsive patient). 3. Record the vital signs. (Remember that they have a limited role in establishing the degree of distress for poisoning). 4. Common signs and symptoms (Keep in mind a seriously poisoned person may have few or no signs or symptoms). <ol style="list-style-type: none"> a. History of ingestion b. Swelling of mucosal membranes in the mouth c. Nausea d. Vomiting e. Diarrhea f. Altered mental status g. Abdominal pain, tenderness, distention, and/or cramps h. Burns or stains around the mouth, or pain in the mouth or throat i. Unusual breath or body odors j. Respiratory distress k. Altered heart rate l. Altered blood pressure m. Dilated or constricted pupils n. Warm and dry or cool and moist skin <p>G. Emergency medical care</p>	<p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are the critical facts to determine when collecting the history of a patient who has ingested a poison? • How is each of these things important in the patient's treatment? <p>Discussion Question What are some indications that a patient may have ingested a poison?</p> <p>Knowledge Application Given several different scenarios, students should be able to assess and manage patients with poisoning by ingestion.</p>

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	<ol style="list-style-type: none"> 1. Maintain the airway (suction, lateral recumbent position). 2. Provide oxygen or assist ventilations. 3. Prevent further injury. (Do not flush the mouth of an unresponsive patient as he may aspirate the fluid.) 4. During transport, consult medical direction, or, if your protocols mandate, contact the poison control center. 5. Bring suspected poisons to the receiving facility. <p>H. Reassessment</p> <ol style="list-style-type: none"> 1. Reassess mental status, airway, and breathing. 2. For an unstable patient, reassess every five minutes and stay in contact with receiving hospital. 	<p>Discussion Question What are the key management priorities in patients who have ingested poisons?</p>
5	<p>VI. Ingested Poisons—Activated Charcoal</p> <ol style="list-style-type: none"> A. It is rarely used in the emergency medical care of ingested poisonings because no evidence suggests a better patient outcome. B. In cases of specific medication ingestion that cause a delayed emptying effect (opioids), medical direction may order the administration of activated charcoal. C. It is extremely porous and therefore absorbs many times its weight in contaminants. D. It should be administered within one hour of the ingestion and only in every specific cases approved by medical direction. E. Examples include SuperChar, InstaChar, Actidose, and Liqui-Char. F. It should not be administered to patients with altered mental status, to patients who have swallowed acids or alkalis, or to patients who are unable to swallow. G. Use activated charcoal that has been premixed with water. 	<p>Discussion Question What is the role of activated charcoal in treating patients with poisoning by ingestion?</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Pass around bottles of activated charcoal for students to examine.\ • Emphasize the ability of activated charcoal to adsorb substances by describing its use in water filters and shoe insoles (Odor Eaters®). <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource for the American Association of Poison Control Centers.</p>
15	<p>VII. Inhaled Poisons—Assessment-Based Approach: Inhaled Poisons</p> <ol style="list-style-type: none"> A. Body absorbs inhaled poisons rapidly, and the longer the exposure without treatment, the poorer the prognosis. 	

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Minutes	Content Outline	Master Teaching Notes
	<p>B. Common inhaled poisons</p> <ol style="list-style-type: none"> 1. Carbon monoxide 2. Carbon dioxide from industrial sites, sewers, and wells 3. Chlorine gas 4. Fumes from liquid chemicals and sprays 5. Ammonia 6. Sulfur dioxide 7. Anesthetic gases 8. Solvents used in dry cleaning, degreasing agents, or fire extinguishers 9. Industrial gases 10. Incomplete combustion of natural gas 11. Hydrogen sulfide <p>C. Patient who inhale paints and propellants are commonly referred to as “huffers”.</p> <p>D. Commonly abused inhaled poisons</p> <ol style="list-style-type: none"> 1. Paints 2. Freon 3. Gas propellants 4. Glue 5. Nitrous oxide 6. Amyl nitrate 7. Butyl nitrate <p>E. Scene size-up</p> <ol style="list-style-type: none"> 1. Ensure your safety and the safety of bystanders and care givers. Remember that some gases are colorless and odorless. 2. Be sure you are wearing a self-contained breathing apparatus before entering the scene if toxic fumes may be present. 3. Call for assistance if you are not properly equipped or trained for hazardous materials rescue. 4. Once the scene is safe, determine the number of patients and call for additional ambulances if necessary. <p>F. Primary assessment</p> <ol style="list-style-type: none"> 1. Closely assess and manage the patient’s airway and ventilation status. 2. Insert an oropharyngeal or nasopharyngeal airway, if warranted. 3. Closely assess the breathing status and apply a nonrebreather mask at 15 lpm or provide positive pressure ventilation with supplemental oxygen as necessary. 4. Assess the patient’s circulatory status. 	<p>Discussion Question What are some common inhaled poisons?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on carbon monoxide.</p> <p>Teaching Tip Ask students what some sources of inhaled poisons are in the community.</p> <p>Critical Thinking Discussion Why is the scene size-up especially critical when dealing with inhaled toxins?</p> <p>Knowledge Application Given several patient descriptions, students should be able to assess and manage patients with inhaled poisonings, with special emphasis on scene safety.</p>

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	<p>G. Secondary assessment</p> <ol style="list-style-type: none"> 1. Ask either the patient or bystanders about what was inhaled, when and how long it was inhaled, and what treatments might have been attempted. <ol style="list-style-type: none"> a. Does the patient have a history that suggests a possible suicide attempt? b. Did the exposure occur in an open or a confined space? c. How long was the patient exposed? 2. Remember that patients trapped in a fire are typically exposed to large amounts of toxic substances. 3. Perform a focused assessment of the areas in which the patient has a complaint, sign, or symptom. If the patient is unresponsive, perform a complete physical exam. 4. Obtain and record the patient's vital signs. 5. Signs and symptoms of inhaled poisoning <ol style="list-style-type: none"> a. A history of inhalation of a toxic substance b. Difficulty breathing or shortness of breath c. Chest pain or tightness; a burning sensation in the chest or throat d. Cough, stridor, wheezing, or crackles e. Hoarseness f. Copious secretions g. Oral or pharyngeal burns h. Dizziness i. Headache, often severe j. Confusion k. Seizures l. Altered mental status, possible unresponsiveness m. Cyanosis n. Respiratory rate faster or slower than normal o. Nausea/vomiting p. Paint or other materials on face or lips 6. Signs of respiratory tract burns <ol style="list-style-type: none"> a. Signed nasal hairs b. Soot in the sputum c. Soot in the throat <p>H. Emergency medical care</p> <ol style="list-style-type: none"> 1. Quickly get the patient out of the toxic environment. 2. Place the patient in a supine position or position of comfort. 	<p>Discussion Question What are some indications that there is an inhaled poisoning?</p>

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	<ol style="list-style-type: none"> 3. Ensure an open airway. 4. Start positive pressure ventilation with supplemental oxygen immediately. 5. Administer oxygen via nonrebreather mask. 6. Bring all containers, bottles, labels, or other clues about the poisoning agent to the receiving facility. <p>I. Reassessment</p> <ol style="list-style-type: none"> 1. Pay particular attention to the patient's airway and breathing. 2. Reassess vital signs and treat any respiratory compromise. 	
10	<p>VIII. Injected Poisons—Assessment-Based Approach: Injected Poisons</p> <p>A. With bites and stings, the first signs and symptoms are at the site of the injection, followed by a delayed systemic reaction.</p> <p>B. Anaphylactic shock may occur following the allergic reaction to an insect bite or sting.</p> <p>C. Scene size-up—Look for clues such as drug paraphernalia or insects.</p> <p>D. Primary assessment</p> <ol style="list-style-type: none"> 1. Assess the patient's airway and breathing and insert a mechanical airway device if necessary. 2. Administer oxygen as appropriate if breathing is adequate, or begin positive pressure ventilations with supplemental oxygen if breathing is inadequate. 3. Assess the patient's mental status, look for indications of an allergic reaction, and determine the priority for transport. <p>E. Secondary assessment</p> <ol style="list-style-type: none"> 1. Questions to ask the patient or bystander <ol style="list-style-type: none"> a. Does the patient have a history of drug use? b. Does the patient have a history of allergic reaction to bites and stings? c. What was the time lapse between the injection and onset of signs and symptoms? d. What type of animal or insect was the patient bitten by? 2. Perform a physical assessment and obtain and record the patient's vital signs. 3. Signs and symptoms of toxic injection <ol style="list-style-type: none"> a. Weakness/lethargy b. Dizziness c. Chills 	<p>Teaching Tip Discuss any particular injected poisons of concern in your area, such as marine animals, insects, or areas in which intravenous drug abuse is common.</p> <p>Discussion Question What are some common injected poisons?</p>

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	<ul style="list-style-type: none"> d. Fever e. Nausea/vomiting f. Euphoria g. High or low blood pressure h. Pupillary changes i. Needle tracks j. Pain at the site of injection k. Trouble breathing l. Abnormal skin vitals m. Possible paralysis n. Swelling and redness at the site of injection <p>F. Emergency medical care</p> <ol style="list-style-type: none"> 1. Maintain the patient's airway. 2. Begin positive pressure ventilation with supplemental oxygen if the patient's respirations are inadequate, or administer oxygen if necessary if the patient's respirations are adequate. 3. Be alert for vomiting. 4. In the case of a bite or sting, protect yourself from injury and protect the patient from repeated injection. 5. Bring all containers, bottles, labels, or other evidence of poisonous substances to the receiving facility. If the patient was bitten or stung, try to identify the insect, reptile, or animal that caused the injury (without endangering yourself). <p>G. Reassessment</p> <ol style="list-style-type: none"> 1. Provide reassessment with particular attention to the airway and breathing. 2. Monitor the patient for possible development of anaphylactic reaction. 	<p>Knowledge Application</p> <p>Given several patient descriptions, students should be able to assess and manage patients with injected poisonings, with special emphasis on scene safety.</p>
8	<p>IX. Absorbed Poisons—Assessment-Based Approach: Absorbed Poisons</p> <p>A. Absorbed poisons generally cause burns, lesions, and inflammation.</p> <p>B. Scene size-up</p> <ol style="list-style-type: none"> 1. Make note of any open containers of chemicals or poisonous plants in the environment. 2. Wear gloves and other protective gear as needed. 3. Call for additional help if more than one patient is injured. 4. Remove patients from dangerous area as soon as possible. 	<p>Discussion Question</p> <p>What are some common sources of absorbed poisons?</p>

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Minutes	Content Outline	Master Teaching Notes
	<p>C. Primary assessment</p> <ol style="list-style-type: none"> 1. Assess the patient's airway and breathing. 2. Inspect the patient for any poison that may still be on the person's body or clothes. <p>D. Secondary assessment</p> <ol style="list-style-type: none"> 1. Get a history from the patient or bystanders. 2. Perform a physical exam and obtain and record the patient's vital signs. 3. Signs and symptoms of an absorbed poison <ol style="list-style-type: none"> a. A history of exposure to a poisonous substance b. Traces of liquid or powder on the patient's skin c. Burns d. Itching and/or irritation e. Redness f. Swelling 4. Signs and symptoms of contact with a poisonous plant <ol style="list-style-type: none"> a. Fluid-filled, oozing blisters b. Itching and burning c. Swelling d. Possible pain e. Rash <p>E. Emergency medical care</p> <ol style="list-style-type: none"> 1. Protecting your hands with gloves, move the patient from the source of the poison and remove the patient's contaminated clothing and jewelry. 2. Carefully monitor the airway and respiratory status. 3. Begin positive pressure ventilation with supplemental oxygen if the patient's respirations are inadequate, or administer oxygen if necessary if breathing is adequate. 4. Brush any dry chemicals or solid toxins from the patient's skin, taking care not to abrade the skin or spread the contamination. 5. If the poison is liquid, irrigate all parts of the body with clean water for at least 20 minutes. 6. Irrigate the affected eye with clean water for at least 20 minutes. <p>F. Reassessment—Pay particular attention to the status of the patient's airway and breathing.</p>	<p>Discussion Question What are some indications that a patient may have been exposed to an absorbed poison?</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some conditions that might make it easier for poisons to be absorbed through the skin? • Why is it important to brush away solid or dry chemicals before irrigating the area with water? <p>Knowledge Application Given several patient descriptions, students should be able to assess and manage patients with absorbed poisonings.</p> <p>Teaching Tip Explain local procedures and equipment for irrigating the eyes.</p>
2	<p>X. Absorbed Poisons—Summary: Assessment and Care</p> <ol style="list-style-type: none"> A. Review assessment findings and care for poisoning emergencies. B. Review Figures 22-10 and 22-11. 	

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Minutes	Content Outline	Master Teaching Notes
6	<p>XI. Specific Types of Poisoning—Food Poisoning</p> <ul style="list-style-type: none"> A. Ingestion of food that contains bacteria or toxins B. Most rapidly increasing sources of food poisoning is seafood (ciguatera) C. Foods most commonly associated with poisoning <ul style="list-style-type: none"> 1. Eggs 2. Chicken 3. Ready-to-eat foods (cheese, processed meat) 4. Untreated water or unpasteurized milk 5. Fish D. Types of foodborne illnesses <ul style="list-style-type: none"> 1. Salmonella 2. Campylobacter 3. Escherichia coli (E. coli) 4. Staphylococcus aureus E. Signs and symptoms <ul style="list-style-type: none"> 1. Vary greatly and difficult to detect 2. Abdominal cramping 3. Nausea and vomiting 4. Gas 5. Diarrhea, 6. Loud or frequent bowel sounds 7. Severe findings include increased temperature, blood disorders, muscle cramping or muscle paralysis, and passing blood in the stool. F. Emergency medical care <ul style="list-style-type: none"> 1. Follow the general guidelines for any ingested poison. 2. Do not give the patient anything by mouth. 3. Transport as soon as possible. 	<p>Discussion Question What are some common types of food poisoning?</p> <p>Critical Thinking Discussion What can you do to make foods safer for ingestion?</p>
5	<p>XII. Specific Types of Poisoning—Carbon Monoxide Poisoning</p> <ul style="list-style-type: none"> A. Leading cause of death among people who inhale smoke from fires B. Causes a life-threatening lack of oxygen C. Primary sources of carbon monoxide are home-heating devices and automobile exhaust fumes. D. Common signs and symptoms <ul style="list-style-type: none"> 1. Headache 2. Tachypnea 3. Nausea and vomiting 4. Altered mental status 	<p>Critical Thinking Discussion What are some settings in which carbon monoxide poisoning could occur?</p> <p>Discussion Question What are some clues to carbon monoxide exposure?</p>

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	<ul style="list-style-type: none"> 5. High pulse oximeter reading 6. Signs may easily be mistaken for something else. E. Emergency medical care <ul style="list-style-type: none"> 1. Evacuate everyone from the enclosed space. 2. Transport a carbon monoxide patient immediately with a tight-fitting nonrebreather mask at 15 lpm, even if the patient seems to have recovered. 3. Do not rely on the pulse oximeter. 	
6	<p>XIII. Specific Types of Poisoning—Cyanide</p> <ul style="list-style-type: none"> A. Found in a variety of forms and enters the body through a variety of routes B. Found in many household products and as a byproduct of incomplete combustion of many plastic, silk, and synthetic carpets C. Causes severe hypoxia at the cellular level D. Early signs and symptoms <ul style="list-style-type: none"> 1. Headache 2. Confusion 3. Agitation or combative behavior 4. Burning sensation in the mouth or throat 5. Dyspnea 6. Hypertension 7. Bradycardia or tachycardia 8. Smell of bitter almonds E. Late signs and symptoms or those seen in large-dose poisoning <ul style="list-style-type: none"> 1. Seizures 2. Coma 3. Hypotension 4. Pulmonary edema 5. Cardiac dysrhythmias 6. Acidosis F. Emergency medical care <ul style="list-style-type: none"> 1. Be sure to wear appropriate personal protective equipment. 2. Remove the patient from the toxic environment. 3. Remove any contaminated clothing and rapidly decontaminate the patient. 4. Open and maintain a patent airway. 5. Assess the breathing status, and provide oxygen or positive pressure ventilation as appropriate. 	<p>Class Activity</p> <p>Have students look through their homes for poisons and make a list of them to bring to the next class. Ask students if they feel these poisons were stored safely or if they will take measures to improve safety in their homes.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 6. Consider contacting ALS for administration of a cyanide antidote. 7. Rapidly transport the patient. 	
6	<p>XIV. Specific Types of Poisoning—Acids and Alkalis</p> <p>A. Acids</p> <ol style="list-style-type: none"> 1. Extremely low pH 2. Burn on contact and cause immediate and severe pain 3. Majority of the chemical burn occurs in the stomach 4. Burns for only about one to two minutes, limiting the damage <p>B. Alkalis</p> <ol style="list-style-type: none"> 1. Burns on contact but it takes longer to recognize the burning sensation 2. Burns deeper by continuing to burn through tissue 3. Likely adheres to oropharynx and esophagus 4. Burns for minutes to hours <p>C. Signs and symptoms of caustic poisoning</p> <ol style="list-style-type: none"> 1. Burns to the mouth, lips, and around the face 2. Dysphagia 3. Pain to the lips, mouth, and throat 4. Abdominal pain 5. Hoarseness or dysphasia 6. Stridor 7. Dyspnea 8. Evidence of shock from perforation of stomach or esophagus <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Ensure that all rescuers are wearing the necessary personal protective equipment. 2. Remove any contaminated clothing and rapidly decontaminate the patient. Flush the contaminated areas with large amounts of water. 3. Open and maintain a patent airway. Insert an oropharyngeal or nasopharyngeal airway if necessary, and be prepared to contact ALS for more advanced airway care. 4. Assess the breathing status, and provide oxygen or positive pressure ventilation as appropriate. 5. Rapidly transport the patient. 	<p>Discussion Question What are the effects of exposure to acids and alkalis?</p>
6	<p>XV. Specific Types of Poisoning—Hydrocarbons</p> <p>A. Substances that are produced from crude oil, coal, or plant sources and</p>	

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Minutes	Content Outline	Master Teaching Notes
	<p>found in common household products</p> <ul style="list-style-type: none"> B. The lower the viscosity, the greater the risk of aspiration and the greater the potential side effects. C. May occur by ingestion, inhalation, or absorption D. Signs and symptoms of hydrocarbon poisoning—If patient is not exhibiting signs or symptoms upon your arrival, it is likely the patient will not suffer a serious consequence of exposure. <ul style="list-style-type: none"> 1. Coughing, choking, crying 2. Burns to mouth or contact area 3. Stridor 4. Dyspnea 5. Wheezing 6. Tachypnea 7. Cyanosis 8. Abdominal pain 9. Nausea and vomiting 10. Belching 11. Fever 12. Seizures 13. Coma 14. Altered mental status 15. Headache, dizziness, and dulled reflexes 16. Slurred speech 17. Cardiac dysrhythmia E. Emergency medical care <ul style="list-style-type: none"> 1. Be sure to use the necessary personal protective equipment. 2. Remove the patient from the environment. 3. Remove all contaminated clothing and decontaminate the patient. 4. Open and maintain a patent airway. 5. Assess the breathing status, and provide oxygen or positive pressure ventilation as appropriate. 6. Rapidly transport the patient. 	<p>Discussion Question What are some examples of hydrocarbons?</p>
5	<p>XVI. Specific Types of Poisoning—Methanol (Wood Alcohol)</p> <ul style="list-style-type: none"> A. Poisonous form of alcohol found in common products such as gasoline and paint (Patients may ingest methanol in an attempt to “get drunk”.) B. May occur from ingestion, inhalation, or absorption 	

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Minutes	Content Outline	Master Teaching Notes
	<p>C. Signs and symptoms—Occurring 40 minutes to 72 hours after ingestion</p> <ol style="list-style-type: none"> 1. Altered mental status 2. Seizures 3. Nausea and vomiting 4. Abdominal pain 5. Blurred vision 6. Dilated pupils that are sluggish to respond to light 7. Seeing spots 8. Blindness 9. Dyspnea 10. Tachypnea <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Care is primarily supportive until patient can get to hospital to receive ethanol alcohol or the antidote fomapizole. 2. Open and maintain a patent airway. 3. Assess the breathing status, and provide oxygen or positive pressure ventilation as appropriate. 4. Rapidly transport the patient. 	
5	<p>XVII. Specific Types of Poisoning—Isopropanol</p> <p>A. Most common form is rubbing alcohol</p> <p>B. Most commonly ingested (either accidentally or intentionally)</p> <p>C. Signs and symptoms of isopropanol poisoning—Usually occurs within 30 minutes following ingestion</p> <ol style="list-style-type: none"> 1. Respiratory depression 2. Altered mental status 3. Slow respirations, shallow tidal volume 4. Abdominal pain 5. Bloody vomitus 6. Signs of shock <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Open and maintain a patent airway. 2. Assess the breathing status, and provide oxygen or positive pressure ventilation as appropriate. 3. Rapidly transport the patient. 	
	<p>XVIII. Specific Types of Poisoning—Ethylene Glycol</p>	

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6	<ul style="list-style-type: none"> A. Commonly found in detergents and coolants B. Usually colorful and has a sweet taste (Alcoholic patients or teenagers may intentionally drink it.) C. First stage signs and symptoms: Neurological—Occurs 30 minutes to 12 hours after ingestion <ul style="list-style-type: none"> 1. Uncoordinated movements 2. Slurred speech 3. Altered mental status 4. Nausea and vomiting 5. Seizures 6. Hallucinations D. Second stage signs and symptoms: Cardiopulmonary—Occurs 12 to 24 hours after ingestion <ul style="list-style-type: none"> 1. Tachypnea 2. Crackles upon auscultation (pulmonary edema) 3. Cyanosis 4. Dyspnea 5. Respiratory distress 6. Heart failure E. Third stage signs and symptoms: Renal—Occurs 24 to 72 hours after ingestion <ul style="list-style-type: none"> 1. Production of very little urine or no urine 2. Bloody urine 3. Pain to the flanks F. Emergency medical care <ul style="list-style-type: none"> 1. Care is primarily supportive; be prepared for seizures and respiratory arrest. 2. Open and maintain a patent airway. 3. Assess the breathing status, and provide oxygen or positive pressure ventilation as appropriate. 4. Rapidly transport the patient. 	<p>Discussion Question What signs and symptoms would you look for in ethylene glycol ingestion?</p> <p>Knowledge Application Given several scenarios, students will recognize the problems associated with exposure to specific poisons.</p>
5	<p>XIX. Specific Types of Poisoning—Poisonous Plants</p> <ul style="list-style-type: none"> A. Poison ivy <ul style="list-style-type: none"> 1. Usually grows in the form of a trailing vine but can also be a bush 2. Poisonous element, urushiol, can travel on animal fur, tools, clothing, and even in smoke. B. Poison sumac—Tall shrub or slender tree, usually growing along swamps 	<p>Teaching Tip Show pictures of poisonous plants common to the local area to help students learn to identify them.</p>

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	<p>and ponds in wooded areas</p> <p>C. Poison oak resembles poison ivy except for rounded, lobed leaflets instead of jagged leaflets.</p> <p>D. Other plants include stinging nettle, crown of thorns, buttercup, May apple, marsh marigold, candelabra cactus, brown-eyed Susan, Shasta daisy, and chrysanthemum.</p> <p>E. Emergency treatment</p> <ol style="list-style-type: none"> 1. Scene safety, personal protective measures, and decontamination 2. Ensure airway, breathing, and circulatory status. 3. Mainly supportive care 	
5	<p>XX. Poison Control Centers</p> <p>A. Assist in the treatment of poison victims by helping you set priorities and formulate an effective treatment plan</p> <p>B. Provide information about any available antidote that may be appropriate</p> <p>C. Toll-free calls and staffed 24 hours a day by experienced professionals and connected to network of nationwide consultants.</p> <p>D. Provide follow-up telephone calls, monitoring the patient's progress and making treatment suggestions until the patient is either hospitalized or no longer has the symptom</p> <p>E. When calling poison control center</p> <ol style="list-style-type: none"> 1. Be prepared to provide the center with details about the patient's age, weight, and condition. 2. Be sure to discuss with medical direction any treatment recommended by poison control before administering it, and follow local protocol. 	<p>Discussion Question What is the role of poison control centers?</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Provide students with the local poison control center telephone number. • Have a guest speaker from the poison control center speak to the class.
25	<p>XXI. Drug and Alcohol Emergencies—Assessment-Based Approach: Drug and Alcohol Emergencies</p> <p>A. Drug abuse is defined as the self-administration of drugs (or of a single drug) in a manner that is not in accord with approved medical or social patterns.</p> <p>B. A drug or alcohol overdose is an emergency that involves poisoning by drugs or alcohol.</p> <p>C. Withdrawal is a period of abstinence from the drug or alcohol to which his body has become accustomed and can be as serious an emergency as an overdose.</p> <p>D. Drug overdose may be the result of habitual use, miscalculation, confusion, drug interaction, or attempted suicide.</p> <p>E. Even though medical problems depend on the type of drug taken, remember</p>	<p>Teaching Tip Discuss any drugs of abuse that are common in your community.</p> <p>Discussion Question What are some risk factors for drug overdose?</p>

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	<ol style="list-style-type: none"> 6. Signs and symptoms can vary widely, depending on the drug. Remember that many times the patient abuses more than one substance or drug. 7. CNS stimulants (excite central nervous system)—Excitability, elevated mood, agitation, apprehension, uncooperativeness, tachycardia, tachypnea, dilated pupils, dry mouth, sweating, increased blood pressure, loss of appetite, lack of sleep 8. CNS depressants (depress central nervous system)—Euphoria, drowsiness, sleepiness, decreased breathing rates and volumes, bradycardia, hypotension dilated pupils that are sluggish to respond to light 9. Narcotics (CNS depressant derived from opiates or opioids)—Bradycardia, hypotension, inadequate breathing rates and volume, cool, clammy skin, lethargy, constricted pupils, and nausea. 10. Hallucinogens—Motor disturbances, paranoia, anxiety, visual or auditory hallucinations, tachycardia, dilated pupils, flushed face, and poor perception of time and distance. 11. Volatile inhalants—Excitement, euphoria, drunkenness, aggressiveness, depression, headache, drowsiness, nausea, swollen mucous membranes of the nose and mouth, glazed eyes, slurred speech, hallucinations, incoordination, erratic pulse and blood pressure, and seizures. <ol style="list-style-type: none"> I. Emergency medical care <ol style="list-style-type: none"> 1. Establish and maintain an airway. 2. Administer oxygen. 3. Position the patient. 4. Maintain the body temperature. 5. If you local protocol permits, assess the blood glucose level. 6. Restrain the patient only if necessary. J. Reassessment <ol style="list-style-type: none"> 1. Be aware that the patient's condition can change rapidly. 2. Conduct reassessment every five minutes, or every 15 minutes if the patient is stable. 	<p>Discussion Question What are indications that a patient may have used a CNS stimulant?</p> <p>Discussion Question What signs and symptoms would you expect to see in a narcotic overdose?</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the priorities of management for patients with drug or alcohol emergencies? • What guidelines should be followed if a patient must be physically restrained?
5	<p>XXII. Drug and Alcohol Emergencies—Summary: Assessment and Care</p> <ol style="list-style-type: none"> A. Review assessment findings that may be associated with drug or alcohol emergencies and emergency care for these emergencies. B. Review Figures 22-15 and 22-16. 	

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Minutes	Content Outline	Master Teaching Notes
10	<p>XXIII. Drug and Alcohol Emergencies—Managing a Violent Drug or Alcohol Abuse Patient</p> <p>A. The violent behavior of the drug or alcohol abuse patients presents special safety concerns for EMS crew, the patient, and bystanders.</p> <p>B. Talk-down technique</p> <ol style="list-style-type: none"> 1. Make the patient feel welcome. 2. Identify yourself clearly. 3. Reassure the patient that his condition is caused by the drug and will not last forever. 4. Help the patient verbalize what is happening to him. 5. Reiterate simple and concrete statements. 6. Forewarn the patient about what will happen as the drug begins to wear off. 7. Once the patient has been calmed, transport. <p>C. Never use the talk-down technique for patients whom you know have used the hallucinogen PCP because it may further agitate them.</p>	<p>Class Activity Have students role play the talk-down technique.</p> <p>Knowledge Application Given several scenarios, students should be able to manage a patient who has a drug or alcohol emergency.</p> <p>Critical Thinking Discussion How can the talk-down technique be helpful for patients experiencing a “bad trip” after using marijuana or a hallucinogen?</p>
5	<p>XXIV. Specific Substance Abuse Considerations—Drug Withdrawal</p> <p>A. A habitual drug user may develop a tolerance to a drug, in which larger doses are required to produce the same desired effects.</p> <p>B. Building a tolerance can lead to physical or psychological dependence, in which the patient experiences a strong need to use the drug repeatedly.</p> <p>C. While a psychologically dependent drug patient has no physiological consequences of drug withdrawal, a physically dependent drug user undergoes physiological changes within the body that require the drug to be present in his system to prevent drug withdrawal consequences from occurring.</p> <p>D. Signs and symptoms of drug withdrawal (48 to 72 hours after person stops taking the drug)</p> <ol style="list-style-type: none"> 1. Anxiety and agitation 2. Confusion 3. Tremors 4. Profuse sweating 5. Elevated heart rate and blood pressure 6. Hallucinations (visual and auditory) 7. Feeling as if there are things on the body that are not there 8. Nausea 9. Abdominal cramping 	<p>Discussion Question What are the stages of alcohol withdrawal?</p>

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	<p>E. Drug withdrawal may cause seizures or deterioration in the patient’s mental status, resulting in a blocked airway, inadequate breathing, or poor circulation.</p>	
<p style="text-align: center;">5</p>	<p>XXV. Specific Substance Abuse Considerations—The Alcoholic Syndrome</p> <p>A. Alcohol emergencies are related to the alcoholic syndrome, consisting of problem drinking and true addiction.</p> <p>B. Alcoholics may abuse alcohol in many forms and often have underlying psychiatric disorders.</p> <p>C. Be aware that the signs and symptoms of disorders or injuries unrelated to alcohol can easily be confused with signs and symptoms of intoxication.</p> <p>D. Alcoholics are prone to injuries and medical conditions brought about by or related to their alcoholism.</p> <p>E. Wernicke-Korsakoff syndrome is a chronic brain syndrome resulting from the toxic effect of alcohol on the central nervous system combined with malnutrition.</p> <p>F. Alcoholics are more prone to the following illnesses.</p> <ol style="list-style-type: none"> 1. Hypertension 2. Altered mental status due to liver malfunction 3. Cirrhosis of the liver 4. Liver failure 5. Pancreatitis 6. Cardiomyopathy or heart muscle disease 7. Peritonitis 8. Chronic gastric ulcer 9. Suppression of the bone marrow’s ability to produce red and white blood cells and platelets 10. Upper gastrointestinal hemorrhage 11. Seizures 12. Subdural hematoma 13. Fractures of the ribs and extremities due to repeated falls 14. Hypoglycemia 15. Pruritus 	
<p style="text-align: center;">10</p>	<p>XXVI. Specific Substance Abuse Considerations—The Withdrawal Syndrome</p> <p>A. Withdrawal syndrome occurs after a period of abstinence from the drug or</p>	

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	<p>alcohol to which the person's body has become accustomed. It can occur even if the abuser still takes in the alcohol or drug, just in a lesser amount.</p> <p>B. The more the alcoholic was drinking, the more severe the syndrome will be.</p> <p>C. Signs and symptoms of alcohol withdrawal</p> <ol style="list-style-type: none"> 1. Insomnia 2. Muscular weakness 3. Fever 4. Seizures or tremors 5. Disorientation, confusion, and thought-process disorders 6. Transient visual, tactile, or auditory hallucinations 7. Anorexia 8. Nausea and vomiting 9. Hyperthermia 10. Sweating 11. Rapid heartbeat <p>D. Four general stages of alcohol withdrawal</p> <ol style="list-style-type: none"> 1. Stage 1—Occurs within eight hours and is characterized by nausea, insomnia, sweating, and tremors. 2. Stage 2—Occurs within eight to 72 hours and is characterized by a worsening of Stage 1 symptoms plus hallucinations. 3. Stage 3—Occurs as early as 48 hours following the last alcoholic beverage and is characterized by major seizures 4. Stage 4—Characterized by delirium tremens or DTs <p>E. Delirium Tremens</p> <ol style="list-style-type: none"> 1. Life-threatening condition occurring one to fourteen days after the patient's last drink 2. Can last between one and three days 3. Signs and symptoms <ol style="list-style-type: none"> a. Severe confusion b. Loss of memory c. Tremors d. Restlessness and irritability e. Extremely high fever f. Dilated pupils g. Profuse sweating h. Insomnia i. Elevated blood pressure j. Tachycardia 	

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	<ul style="list-style-type: none"> k. Nausea and vomiting l. Diarrhea m. Hallucinations 4. Approximately a third of all those who have seizures in early withdrawal will progress to DTs if left untreated or if treated inadequately. 5. Treatment goals include psychological and physical support. 	
10	<p>XXVII. Specific Substance Abuse Considerations—PCP, Cocaine, Amphetamines, and Methamphetamines</p> <ul style="list-style-type: none"> A. PCP (phencyclidine) <ul style="list-style-type: none"> 1. One of the most dangerous hallucinogens 2. Cheap, easy to make, and produces horrible psychological effects 3. Stored in body fat and can suddenly be released if a person loses weight, even if the drug has not been recently taken B. Cocaine <ul style="list-style-type: none"> 1. Inhaled through the nose, injected into the veins, and injected into the muscles, or smoked (crack) 2. Highly addictive and overdose can be fatal C. Amphetamines and methamphetamines <ul style="list-style-type: none"> 1. Abused in a number of forms (tablets, capsules, powders, in paper, gelatin) 2. Stimulate the central nervous system, excite the cardiovascular system, and produce hallucinations 3. Result in hypertension, hyperthermia, and increased muscle tone D. Signs and symptoms of PCP, cocaine, amphetamines, or methamphetamines <ul style="list-style-type: none"> 1. Extreme agitation or excitation 2. Involuntary horizontal and vertical eye movement 3. Unresponsiveness to pain 4. Severe muscular rigidity 5. Excessive bronchial and oral secretions 6. Hypertension 7. Hyperthermia 8. Decreased urinary output 9. Seizures 10. Respiratory depression or arrest 11. Vivid visual or auditory hallucinations 	<p>Discussion Question What are some of the names by which PCP can be recognized?</p> <p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on cocaine dependence.</p> <p>Discussion Question What are some of the signs and symptoms of PCP, cocaine, amphetamine, and methamphetamine use?</p>

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	<ul style="list-style-type: none"> 12. Sensation of bugs or ants crawling under the skin 13. Myocardial infarction, cardiac dysrhythmias, sudden death 14. Aortic dissection 15. Chest pain not related to MI or dissection 16. Stroke or intracranial hemorrhage 17. Severe headache, unrelated 18. Respiratory problems 19. Neurological problems 20. Psychiatric problems E. Emergency medical care <ul style="list-style-type: none"> 1. Be sure to take Standard Precautions to avoid infectious diseases. 2. Treat as you would any other drug emergencies with the following exceptions. 3. First priority is to protect yourself and your crew since the patient may be combative and require restraint. 4. Keep the patient in a quiet, nonstimulating environment. 5. Administer emergency medical care for those injuries requiring attention before continuing with psychological care. 6. Monitor vital signs regularly and transport the patient as quickly as possible. 	<p>Critical Thinking Discussion How should you respond to a patient who is experiencing hallucinations?</p>
5	<p>XXVIII. Specific Substance Abuse Considerations—Medication Overdose</p> <ul style="list-style-type: none"> A. Overdose may be intentional or accidental. B. Medication commonly involved in overdose <ul style="list-style-type: none"> 1. Cardiac medications such as calcium channel blockers, beta blockers, cardioactive steroids, ACE inhibitors, and antidysrhythmics 2. Psychiatric medications such as benzodiazepines, tricyclic antidepressants (TCAs), selective serotonin reuptake inhibitors (SSRIs), monoamine oxidase inhibitors (MAOIs) and lithium 3. Over-the-counter pain relief drugs such as acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), and aspirin 4. Antihistamines 5. Herbal remedies 6. Dietary supplements C. Signs and symptoms of medical overdose vary depending on the substance ingested. D. Emergency care for medication overdose focuses on establishing and maintaining an adequate airway, ventilation, and oxygenation. 	<p>Discussion Question What types of cardiac medications are commonly implicated in overdoses?</p>

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	E. Transport and continuously reassess the patient for changes in his condition.	
5	<p>XXIX. Specific Substance Abuse Considerations—Huffing</p> <p>A. Many of the chemicals accumulate in the regions of the brain responsible for feelings of pleasure and reward. They also migrate to other regions where they can cause abnormal muscle coordination and alterations in mental status.</p> <p>B. Substances can also lead to hypoxia or impaired gas exchange.</p> <p>C. Poisons commonly used by “huffers”</p> <ol style="list-style-type: none"> 1. Chemicals that contain toluene 2. Paints 3. Freon 4. Gas propellants 5. Glue <p>D. Look for paint or other material on the lips or around the nose of the patient during the physical exam.</p> <p>E. Treatment is geared toward removing the patient from the exposure, assessing and treating any loss of vital function caused by the drug (such as airway, breathing, or circulatory deficits), and providing rapid transport to the emergency department.</p>	<p>Discussion Question</p> <p>What is huffing?</p>
10	<p>XXX. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 22 Summary. 2. Complete Chapter 22 In Review questions. 3. Complete Chapter 22 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 22 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What is the cause of swelling of the oral mucosa? What is the significance of the swelling? • If Sophie had continued to resist administration of oxygen, how would you handle the situation? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical

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		<p>Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter.</p> <ul style="list-style-type: none">• The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 23

Abdominal, Gynecologic, Genitourinary, and Renal Emergencies

120–150 minutes

MASTER TEACHING NOTES

- Case Study Discussion
- Teaching Tips
- Discussion Questions
- Class Activities
- Media Links
- Knowledge Application
- Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency medical care for abdominal, gynecologic, genitourinary, and renal emergencies.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What are some possible causes for Parker's fever and abdominal pain? • What questions will give you important information about Parker's condition?
5	<p>II. Acute Abdomen—Abdominal Structures and Functions</p> <p>A. Acute abdomen or acute abdominal stress is a common condition.</p> <p>B. Abdominal cavity is located below the diaphragm and extends to the top of the pelvis.</p> <p>C. The abdominal cavity is lined with the peritoneum</p> <ol style="list-style-type: none"> 1. Visceral peritoneum is the innermost layer and is in contact with the abdominal organs. 2. Parietal peritoneum is the outer layer. <p>D. Organs enclosed by the visceral peritoneum (stomach, spleen, liver, gallbladder, pancreas, small intestine, and part of the large intestine) are termed intraperitoneal.</p> <p>E. Organs located behind the peritoneal space (kidneys, ureters, pancreas, and abdominal aorta) are located in the retroperitoneal space.</p> <p>F. Abdominal quadrants and regions</p> <ol style="list-style-type: none"> 1. Abdominal quadrants—Use the umbilicus to divide the abdomen into quarters. <ol style="list-style-type: none"> a. Left upper quadrant (LUQ) b. Right upper quadrant (RUQ) c. Right lower quadrant (RLQ) 	

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	<ul style="list-style-type: none"> d. Left lower quadrant (LLQ) 2. Nine regions <ul style="list-style-type: none"> a. Right hypochondriac b. Epigastric c. Left hypochondriac d. Right lumbar e. Umbilical f. Left lumbar g. Right iliac h. Hypogastric i. Left iliac G. Types of abdominal structures <ul style="list-style-type: none"> 1. Hollow organs contain some type of substance that may leak out into the abdominal cavity if the organ is perforated or injured. 2. Solid organs are very vascular, and a rupture or injury to a solid organ could lead to bleeding or severe shock. 3. Vascular structures are the large blood vessels found in the abdominal cavity, and rupture could lead to major bleeding, rapid blood loss, and death. 	<p>Teaching Tip Draw the nine abdominal regions on the white board. Have students come up and write the names of the organs in their respective regions.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • In what quadrant or region of the abdomen is the appendix located? • What is the location of the kidneys? • What are examples of solid organs in the abdominal cavity?
5	<p>III. Acute Abdomen—Abdominal Pain</p> <p>A. Pathophysiology of abdominal pain—Results from mechanical forces (stretching), inflammation, or ischemia (organ and tissue hypoxia)</p> <ul style="list-style-type: none"> 1. If organ is torn, pain results from blood irritating the peritoneum. 2. Rapid distention of an organ causes pain. 3. Stretching of the peritoneum causes pain. 4. Pain from stretching a solid organ is usually a steady pain. 5. Inflammation may cause a crampy type of pain. 6. Pain associated with ischemia worsens as the organ becomes more hypoxic. <p>B. Types of abdominal pain</p> <ul style="list-style-type: none"> 1. Visceral pain occurs when the organ itself is involved; pain is usually less severe, poorly localized, dull or aching, and constant or intermittent. 2. Parietal pain (somatic pain) is associated with irritation of the peritoneal lining; pain is more severe, localized, and typically constant. 3. Referred pain is actually visceral pain that is felt elsewhere in the body; pain is usually poorly localized but is felt consistently in the part of the 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on information about abdominal pain.</p> <p>Discussion Question How is visceral abdominal pain different from somatic pain?</p> <p>Critical Thinking Discussion How could a problem elsewhere in the body, such as pneumonia, cause abdominal pain?</p>

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	<ul style="list-style-type: none"> 2. May be caused by ingestion of alcohol, gallstones, or infection 3. Common signs and symptoms <ul style="list-style-type: none"> a. Abdominal pain (can be severe and radiate from the umbilicus to the back and shoulders) b. Nausea and vomiting c. Abdominal tenderness and distention d. Mild jaundice (depending on cause) e. Fever, rapid pulse, signs of shock (extreme cases) D. Cholecystitis <ul style="list-style-type: none"> 1. Inflammation of the gallbladder and commonly associated with gallstones 2. More common in women and frequently occurs between the ages of 30 and 50 3. Common signs and symptoms <ul style="list-style-type: none"> a. Sudden onset of abdominal pain located from the middle of upper quadrants to RUQ areas b. Tenderness upon palpation of the RUQ c. Belching or heartburn d. Nausea and vomiting (contents may be greenish) E. Gastrointestinal bleeding <ul style="list-style-type: none"> 1. Bleeding that can occur anywhere within the gastrointestinal tract and can be attributed to numerous causes 2. Usually classified as upper or lower 3. Common signs and symptoms <ul style="list-style-type: none"> a. Abdominal pain or tenderness b. Hematemesis c. Hematochezia d. Melena e. Altered, mental status, weakness, or syncope f. Tachycardia g. Signs of shock F. Esophageal varices <ul style="list-style-type: none"> 1. Bulging, engorgement, or weakening of the blood vessel in the lining of the lower part of the esophagus 2. Common to heavy alcohol drinkers or patients with liver disease 3. Caused by increased pressure in the venous blood supply system of the liver, stomach, and esophagus 4. Common signs and symptoms 	<p>Discussion Question What are causes of gastrointestinal bleeding?</p> <p>Critical Thinking Discussion What are some reasons gastrointestinal bleeding may not be diagnosed and treated promptly?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> a. Large amounts of bright red hematemesis b. Absence of pain or tenderness in abdomen c. Rapid pulse d. Breathing difficulty e. Pale, cool, clammy skin f. Other signs and symptoms of shock g. Jaundice G. Gastroenteritis <ul style="list-style-type: none"> 1. Inflammation of the stomach and small intestines and commonly associated with abdominopelvic pain 2. Condition can be chronic or acute 3. Common signs and symptoms <ul style="list-style-type: none"> a. Abdominal pain or cramping b. Nausea, vomiting, and diarrhea c. Abdominal tenderness d. Fever and dehydration e. Signs and symptoms of shock and hemorrhage (severe cases) H. Ulcers <ul style="list-style-type: none"> 1. Open wounds or sore within the digestive tract 2. Breakdown of the lining that normally protects the intestine from the digestive fluids contained in the tract. 3. Signs and symptoms <ul style="list-style-type: none"> a. Sudden onset of abdominal pain normally in the LUQ and epigastric area b. Nausea and vomiting c. Hematemesis, hematochezia, or melena or coffee-ground emesis in some cases d. Signs or symptoms of shock (in cases of massive bleeding) e. Peritonitis I. Intestinal obstruction <ul style="list-style-type: none"> 1. Blockage that interrupts the normal flow the of intestinal contents 2. Can occur in both the small and large intestines and be either partial or complete 3. Common signs and symptoms <ul style="list-style-type: none"> a. Abdominal pain, moderate to severe, depending on location of obstruction (crampy or colicky) b. Nausea and vomiting c. Constipation 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on gastroenteritis and dehydration.</p>

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	<ul style="list-style-type: none"> d. Abdominal distension and tenderness e. Abnormally prominent, high-pitched bowel sounds with auscultation in early stages <p>J. Hernia</p> <ul style="list-style-type: none"> 1. Protrusion or thrusting forward of a portion of the intestine through an opening or weakness in the abdominal wall 2. Associated with increased pressure in the abdominal cavity during heaving lifting or straining 3. Common signs and symptoms <ul style="list-style-type: none"> a. Sudden onset of abdominal pain (usually after heavy lifting or straining) b. Fever c. Rapid pulse d. Tender mass at point of hernia e. Others similar to intestinal obstruction <p>K. Abdominal aortic aneurysm</p> <ul style="list-style-type: none"> 1. Weakened, ballooned, and enlarged area of the wall of the abdominal aorta 2. May eventually rupture and is one of the most lethal causes of abdominal pain 3. Common signs and symptoms <ul style="list-style-type: none"> a. Gradual onset of lower lumbar, groin, and abdominal pain b. Rupture associated with sudden onset of severe, constant abdominal pain c. Testicular pain in the male patient d. Possible nausea and vomiting e. Mottled or spotty abdominal skin f. Pale, cool, clammy, and possibly cyanotic skin in legs g. Absent or decreased femoral or pedal pulses h. Pulsating abdominal mass (felt if abdomen is soft) or rigid and tender abdomen (if aneurysm has burst) i. Cyanotic, cold, or mottled skin below waistline (if aortic aneurysm is starting to rupture) <p>L. Vomiting/diarrhea/constipation</p> <ul style="list-style-type: none"> 1. Symptoms of many of the conditions previously discussed 2. EMT should be concerned if condition has persisted for hours (vomiting) or days (diarrhea), and the patient has become dehydrated. 	

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25	<p>V. Acute Abdomen—Assessment-Based Approach: Acute Abdomen</p> <p>A. It is not important that you try to isolate the exact cause of abdominal pain or distress in the prehospital setting, but rather that you simply correctly assess and identify that the patient is suffering abdominal pain and provide suitable emergency care based on the symptom.</p> <p>B. Scene size-up</p> <ol style="list-style-type: none"> 1. Check for scene safety and take Standard Precautions. 2. Look for mechanism of injury 3. Use all of your senses to size-up the scene. <p>C. Primary assessment</p> <ol style="list-style-type: none"> 1. Stabilize spine injury if suspected. 2. Person with an acute abdomen generally appears very ill and assumes a guarded position with his knees drawn up and his hands clenched over his abdomen. 3. Ensure the patient has a patent airway with adequate breathing. 4. Apply high-flow, high-concentration oxygen therapy and assist the patient's ventilations if they are inadequate. 5. Assess circulation. 6. Look for signs of shock. 7. Consider the patient a priority for transport if he meets any of the following criteria. <ol style="list-style-type: none"> a. Poor, general appearance b. Unresponsive c. Responsive, not following commands d. Shock e. Severe pain <p>D. Secondary assessment</p> <ol style="list-style-type: none"> 1. If patient is responsive, conduct history before the physical exam; if patient is unresponsive, conduct history after physical exam and vitals, gathering information from family or bystanders. 2. Important questions to ask during the history <ol style="list-style-type: none"> a. Ask the OPQRST questions to get the full description of the pain. b. Does the patient have any known allergies to medications, food, or other substances? c. Is the patient currently taking any medications? d. Does the patient have any pertinent past medical history? e. When was the last time the patient had anything to eat or drink? f. Has the patient's appetite changed? 	<p>Discussion Question What are the management priorities for patients with acute abdominal pain?</p> <p>Class Activities</p> <ul style="list-style-type: none"> • Divide students into small groups. Provide individual students in each group with an index card listing a cause of abdominopelvic pain. Instruct students not to share the information on the cards with their classmates. Ideally, each student will have a card, but at least one student in each group must have a card. Students will spend time

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	<ul style="list-style-type: none"> g. Has the patient been nauseated? h. Did the patient vomit, and if so, what was the color and appearance? i. What was the color of the patient's last stools? j. Has the patient had difficulty urinating? k. Was the patient doing anything prior to the onset that led to the abdominal pain or distress? 3. Focus on the abdomen during the physical exam but still assesses the rest of the body for signs and symptoms. 4. General guidelines for the physical exam <ul style="list-style-type: none"> a. Determine if the patient is restless or quiet and whether pain is increased upon movement. b. Inspect the abdomen to determine if it is distended. Ask the patient whether that is normal or not. c. Gently palpate the abdomen using the quadrants as landmarks. Remember to start with the least painful area first. d. Assess if the abdomen feels soft or rigid (involuntary guarding/rigidity versus voluntary guarding). e. Assess if the abdomen is tender or nontender when touched. f. When palpating the abdomen, note any masses that may be present and if they are pulsating. g. Ask the patient if he has any pain on other body areas. h. Document the quadrant in which any pain is located. 5. Obtain and document the patient's baseline vital signs. 6. Signs and symptoms <ul style="list-style-type: none"> a. Pain or tenderness b. Anxiety and fear c. Guarded position or other comfortable position d. Rapid and shallow breathing e. Rapid pulse f. Blood pressure changes g. Nausea, vomiting, and/or diarrhea h. Rigid abdomen or guarding i. Distended abdomen j. Fever or chills k. Belching or flatulence l. Changes in bowel habits or urination m. Other signs and symptoms associated with shock n. Signs of internal bleeding 	<p>researching the presentation of their condition and will develop a complaint and history to be elicited by the other students in their group. The other students must obtain a history to determine their classmate's condition. Students will then discuss how well the complaints and history matched the condition.</p> <ul style="list-style-type: none"> • Provide ample opportunity for students to practice skills.

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	<ul style="list-style-type: none"> 7. Do not waste time with extensive exams or palpation prior to initiating transport. Excessive palpation can worsen the pain and aggravate the cause. E. Emergency medical care <ul style="list-style-type: none"> 1. Keep the airway patent. 2. Place the patient in the position of comfort. 3. If breathing is adequate, administer oxygen based on the SpO₂ reading and patient signs and symptoms. 4. Never give anything by mouth. 5. Calm and reassure the patient. 6. If signs and symptoms of hypoperfusion are present, treat for shock. 7. Initiate a quick and efficient transport. F. Reassessment <ul style="list-style-type: none"> 1. Reassess during transport. 2. Document and record vital signs and communicate to receiving facility. 	<p>Knowledge Application Given a series of scenarios of patients complaining of abdominal pain, students should be able to develop an index of suspicion for the cause and provide appropriate management for the patient.</p>
5	<p>VI. Gynecologic Emergencies—Female Reproductive Structures and Function</p> <ul style="list-style-type: none"> A. Gynecology is the branch of medicine that studies health of the female patient and her reproductive system. B. External genitalia (vulva) <ul style="list-style-type: none"> 1. Consists of vascular tissues called the perineum, mons pubis, labia, and the clitoris 2. Provides accessory functions to the internal organs that are used primarily for reproduction C. Internal organs <ul style="list-style-type: none"> 1. Includes the vagina, uterus, ovaries, and fallopian tubes 2. Vagina functions as the birth canal during childbirth, receives the penis during sexual intercourse, and serves as a passageway for menstrual flow. 3. Ovaries are the primary sex glands located on each side of the uterus. 4. Fallopian tubes extend from near each of the ovaries to the uterus. 5. Uterus is the pear-shaped muscular organ which provides an appropriate site for egg implantation and fetal development during pregnancy. The endometrium lines the uterus and is sloughed off during menses. 	

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15	<p>VII. Gynecologic Emergencies—Gynecological Conditions</p> <p>A. Sexual assault</p> <ol style="list-style-type: none"> 1. Act of violence and a crime that is defined differently by each state (most include sexual intercourse or other sexual activities that are performed without consent) 2. Make sure you follow your local protocols when dealing with a sexual assault patient. 3. Physical effects of rape or sexual assault <ol style="list-style-type: none"> a. Traumatic injuries from beatings, chokings, and penetrations b. Swelling, bleeding, and pain around the genital or rectal area c. Sexual transmitted diseases d. Possible pregnancy 4. Psychological effects of rape or sexual assault <ol style="list-style-type: none"> a. Severe anxiety, depression, or fear b. Inappropriate feelings of guilt c. Flashbacks or nightmares d. Emotional withdrawal, numbness, or irritability 5. Guidelines for when sexual assault has occurred <ol style="list-style-type: none"> a. Address both the physical and emotional needs of the patient. b. Always maintain patient confidentiality. c. Do not allow the patient to change clothes, bathe, comb, or clean any part of the body. If the clothing was changed, collect it, bag it separately, and take it with you. d. Do not cut through any holes or tears in the patient's clothing. Handle the clothing as little as possible. e. Do not touch or change anything at the crime scene unless it impedes emergency medical care. f. Do not clean wounds, if possible. Treat wounds as you would other soft-tissue injuries. g. Do not examine the genital area unless there is a life-threatening hemorrhage. Minor bleeding can be absorbed by a pad. Make sure all bloody articles are collected and transported with the patient. h. Document all findings objectively and accurately. <p>B. Vaginal bleeding (nontraumatic)</p> <ol style="list-style-type: none"> 1. May be caused by cancerous lesions, pelvic inflammatory disease, hormonal imbalances, spontaneous abortion, or labor. 2. EMT should not assume bleeding is occurring from menses; however, for girls about the age of ten, menses could be the cause of bleeding. 	<p>Teaching Tip Consider having a sexual assault nurse examiner lecture on management of patients who have been sexually assaulted.</p> <p>Discussion Question What are some special considerations in management of the patient who has been sexually assaulted?</p> <p>Discussion Question What are some gynecological conditions that can lead to life threatening emergencies?</p>

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	<ul style="list-style-type: none"> 3. Common signs and symptoms of a spontaneous abortion <ul style="list-style-type: none"> a. Lower abdominal or pelvic pain b. Abdominal tenderness c. Vaginal bleeding d. Rapid pulse e. Signs and symptoms of shock C. Menstrual pain <ul style="list-style-type: none"> 1. Dysmenorrhea is strong uterine cramps that cause severe pain during menstruation and could be caused by hormonal imbalances. 2. Mittelschmerz is abdominopelvic pain in the middle of the menstrual cycle and occurs when the small amount of bleeding associated with the release of a mature ovum irritates the peritoneum. D. Ovarian cyst <ul style="list-style-type: none"> 1. Fluid-filled sac that forms inside or on an ovary 2. Common signs and symptoms of an ovarian cyst <ul style="list-style-type: none"> a. Unilateral abdominopelvic pain that may radiate to the back b. Abdominal tenderness c. Vaginal bleeding that may be irregular or abnormal d. Pain during sexual intercourse or bowel movements E. Endometritis <ul style="list-style-type: none"> 1. Inflammation of the endometrium 2. Caused by infection 3. Common signs and symptoms of endometritis 4. Abdominopelvic pain or tenderness 5. Fever 6. Abdominal distention 7. Vaginal bleeding or discharge 8. Discomfort during a bowel movement F. Endometriosis <ul style="list-style-type: none"> 1. Condition in which endometrial tissue grow outside the uterus 2. Common signs and symptoms of endometriosis <ul style="list-style-type: none"> a. Abdominopelvic pain or tenderness that may be dull or cramping b. Dysmenorrhea c. Vaginal bleeding d. Pain during sexual intercourse or a bowel movement G. Pelvic inflammatory disease <ul style="list-style-type: none"> 1. Infection of the female reproductive tract caused by bacteria, fungi, or viruses 	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on premenstrual syndrome.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on menstruation and menstrual problems.</p>

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	<ul style="list-style-type: none"> 2. Common signs and symptoms of pelvic inflammatory disease <ul style="list-style-type: none"> a. Abdominopelvic pain or tenderness b. Vaginal discharge with an abnormal color, consistency, or odor c. Fever and chills d. Anorexia e. Nausea or vomiting f. Irregular vaginal bleeding or cramping g. Pain during sexual intercourse H. Sexually transmitted disease <ul style="list-style-type: none"> 1. Infectious diseases transmitted through sexual contact and caused by bacteria, viruses, parasites or fungi. 2. Common signs and symptoms of sexually transmitted diseases <ul style="list-style-type: none"> a. Abdominopelvic pain or tenderness b. Vaginal discharge with an abnormal color, consistency, or odor c. Fever and chills d. Nausea or vomiting e. Irregular vaginal bleeding or cramping f. Pain during sexual intercourse or urination g. Genital itching, redness, or swelling h. Lesions or ulcers 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on STDs.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on gonorrhea.</p>
10	<p>VIII. Gynecologic Emergencies—Assessment-Based Approach: Gynecological Emergencies</p> <ul style="list-style-type: none"> A. Scene size-up <ul style="list-style-type: none"> 1. Ensure the scene is safe, and take Standard Precautions. 2. Determine if the patient has been injured or is suffering a medical illness. 3. Call the proper authorities if the call appears to be a crime scene. B. Primary assessment <ul style="list-style-type: none"> 1. Form a general impression of the patient. 2. Stabilize the spine, if necessary. 3. Ensure your patient has a patent airway. 4. Assess breathing and either administer oxygen or provide bag-valve-mask ventilations with supplemental oxygen as appropriate. 5. Assess circulation and look for signs of shock. 6. If major bleeding is coming from the vagina, attempt to control bleeding by placing a pad over the external genitalia to absorb the blood flow. 7. Consider the patient a priority for transport if she meets any of the following criteria. 	

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	<ul style="list-style-type: none"> a. Poor general appearance b. Unresponsive c. Responsive, not following commands d. Severe pain e. Shock (hypoperfusion) <p>C. Secondary assessment</p> <ul style="list-style-type: none"> 1. Protect the patient's privacy and modesty. 2. Be patient, compassionate, and professional when asking the following questions. <ul style="list-style-type: none"> a. What are the signs and symptoms the patient is complaining of? b. Did the signs and symptoms seem to get progressively worse or better? c. How long has the patient been sick or suffering from these signs and symptoms? d. Was the onset of signs and symptoms gradual or sudden? e. What was the patient doing prior to the onset of the complaint? f. Does the patient have any known allergies to medications, food, or other substances? g. When did the patient last have something to eat or drink? What did she eat or drink? h. What medications is the patient taking? Is she taking birth control pills or other contraceptives? i. What is the patient's past medical history? When was the last time she has seen a doctor for her medical condition? j. When was the patient's last menstrual period? Is her cycle regular? k. Does the patient have any vaginal bleeding? l. Is there a possibility that she is pregnant? Has she been pregnant before? m. Does she have any vaginal discharge? n. Has the patient had any nausea or vomiting? o. Does the patient have any pain associated with urination, defecation, or sexual intercourse? 3. Common signs and symptoms of gynecological emergency <ul style="list-style-type: none"> a. Abdominopelvic pain or tenderness b. Irregular vaginal bleeding or cramping c. Vaginal discharge with an abnormal color, consistency, or odor d. Nausea and vomiting e. Fever or chills 	<p>Discussion Question What are key questions to ask when obtaining the history of a patient with a gynecological complaint?</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • How can you lessen the embarrassment or self-consciousness of a patient with a gynecological complaint? • How can you increase your own comfort level in dealing with patients with gynecological complaints? <p>Knowledge Application Given several different scenarios, students should be able to obtain a relevant history from the patient with a gynecological complaint.</p>

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	<ul style="list-style-type: none"> f. Syncope g. Vaginal pain h. Genital itching, redness, or swelling i. Signs of shock 4. Physical exam <ul style="list-style-type: none"> a. Still assess the rest of the body for signs and symptoms b. Perform the physical examination of the abdomen carefully and gently. c. Palpate the least painful quadrant first and the most painful quadrant last. d. Document the number of pads a patient saturates if she is bleeding, and record the baseline vital signs. D. Emergency medical care <ul style="list-style-type: none"> 1. Do not try to isolate the exact cause of abdominopelvic pain or vaginal bleeding in the prehospital setting. Provide suitable emergency medical care based on the signs and symptoms. 2. Maintain manual spine stabilization. 3. Keep the airway patent. 4. If breathing is adequate, administer oxygen based on the SpO₂ reading and patient signs and symptoms. 5. Control any major vaginal bleeding if present. 6. Place the patient in a position of comfort if no trauma is suspected. 7. Calm and reassure the patient. 8. Initiate a quick and efficient transport. E. Reassessment <ul style="list-style-type: none"> 1. Reassess the patient and record vital signs every five minutes. 2. Report your findings to the receiving facility. 	
5	<p>IX. Genitourinary/Renal Emergencies—Genitourinary/Renal Structures and Functions</p> <ul style="list-style-type: none"> A. Urology is the branch of medicine that studies the urinary system in females and the genitourinary system in males. B. Organs of the female reproductive system are separate from those in the urinary system; however, in males, some of the structures are shared (genitourinary system). C. The urinary system is composed of the kidney's ureters, urinary bladder, and urethra. The system produces, stores, and eliminates urine from the body. 	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on erectile dysfunction.</p>

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	<p>D. The organs of the male reproductive system include the testes, epididymis, vas deferens, prostate gland, and penis.</p>	<p>Discussion Question What are the functions of the kidneys?</p>
<p>15</p>	<p>X. Genitourinary/Renal Emergencies—Genitourinary/Renal Conditions</p> <p>A. Urinary tract infection</p> <ol style="list-style-type: none"> 1. Affect the urethra, bladder, ureters, kidneys, and prostate (in men) 2. Most frequently caused by bacteria entering the urethra 3. Common signs and symptoms of urinary tract infections <ol style="list-style-type: none"> a. Abdominopelvic pain or tenderness b. Blood in the urine (hematuria) c. Urine with cloudiness or a foul or strong odor d. Pain or burning with urination or sexual intercourse e. Frequent or urgent need to urinate f. Genital or flank pain g. Fever or chills h. Nausea or vomiting i. Altered mental status <p>B. Kidney stones (renal calculi)</p> <ol style="list-style-type: none"> 1. Crystals of substances like calcium, uric acid, struvite, and cystine that are formed from metabolic abnormalities 2. Common signs and symptoms of kidney stones <ol style="list-style-type: none"> a. Abdominopelvic pain or tenderness b. Flank or back pain that is colicky and severe c. Groin pain d. Abnormal urine color e. Pain with urination f. Frequent or urgent need to urinate g. Nausea or vomiting <p>C. Kidney failure (renal failure)</p> <ol style="list-style-type: none"> 1. Occurs when the kidneys fail to function adequately and are not able to filter the wastes and maintain homeostasis 2. Acute renal failure (ARF) normally occurs over a period of days and often results from a significant decrease in urine elimination (cardiac failure, surgery, shock, sepsis, urinary tract infection). 3. Chronic renal failure (CRF) occurs over a period of years, and the symptoms range from mild at first to severe kidney failure (diabetes, hypertension). This condition is permanent and life threatening. 4. Complications from kidney failure 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on genitourinary problems.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the signs and symptoms of a urinary tract infection? • What are some risk factors for kidney stones? <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the urinary tract and kidney stones.</p> <p>Video Clips Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access videos on different types of kidney stones and renal failure.</p> <p>Discussion Question How are acute and chronic renal failure different?</p>

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	<ul style="list-style-type: none"> a. Pulmonary edema b. Cardiac tamponade or pericarditis c. Electrolyte and other metabolic abnormalities d. Cardiac dysrhythmias e. Congestive heart failure f. Hypertension g. Infections h. Hemorrhage i. Liver failure j. Altered mental status k. Seizures l. Uremia <p>5. Common signs and symptoms of kidney failure</p> <ul style="list-style-type: none"> a. Abdominopelvic or flank pain b. Blood in the urine c. Altered mental status d. Edema of the feet, ankles, and legs e. Decreased urine output or cessation of urination f. Blood in the urine or stools g. Hypertension h. Swelling or easy bruising i. Anorexia j. Hypertension k. Swelling l. Tachycardia <p>D. Dialysis</p> <ul style="list-style-type: none"> 1. Artificial process used to remove water and waste substances from the blood when the kidneys fail to function properly 2. Blood containing waste products passes on one side of the membrane while a dialysate passes on the other side. Water and waste products travel into the dialysate. 3. Hemodialysis involves a dialysis machine that contains the dialysate and is connected to an access site on the patient. 4. Peritoneal dialysis involves a dialysate that is run through a tube into the patient's abdomen, and the peritoneal membrane functions as the semipermeable membrane. 5. Risks and life-threatening complications of dialysis <ul style="list-style-type: none"> a. Hypotension 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on dialysis from the National Kidney Foundation.</p> <p>Discussion Question What are some complications of dialysis?</p>

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	<ul style="list-style-type: none"> b. Muscle cramps c. Peritonitis d. Nausea and vomiting e. Hemorrhage f. Infection at the access site g. Irregular pulse or cardiac arrest h. Difficulty breathing 6. Dialysis emergency management <ul style="list-style-type: none"> a. Maintain the airway, breathing, and circulation. b. Support ventilation as needed. c. Provide high-flow, high-concentration oxygen. d. Stop any bleeding from the shunt or access site as needed. e. Position the patient. If the patient has signs of shock, place him in a supine position. If the patient has pulmonary edema, place him upright. E. Urinary catheters <ul style="list-style-type: none"> 1. Foley or indwelling catheters (most common) have a balloon that is inserted into the urinary bladder via the urethra and allows urine to drain from the bladder into a bag. 2. Suprapubic catheters work in a similar way, but instead of being inserted through the urethra, they are placed into the urinary bladder directly through the patient's abdominal wall. 3. Urinary catheter management <ul style="list-style-type: none"> a. Note any swelling, redness, pain, unusual odor or color, or bleeding around the site. b. Drain the bag before moving and transporting the patient (record amount of urine). c. Be sure there are no kinks in the device, transfer the patient to the cot or bed, and lower the bag so urine can freely flow into it. 	<p>Critical Thinking Discussion How would a dialysis patient be affected by missing dialysis appointments?</p> <p>Teaching Tip Pass around an example of urinary catheter kit to allow students to examine it.</p> <p>Critical Thinking Discussion Why are women and patients with a urinary catheter at increased risk of UTIs?</p>
10	<p>XI. Genitourinary/Renal Emergencies—Assessment-Based Approach: Genitourinary/Renal Emergencies</p> <ul style="list-style-type: none"> A. Scene size-up <ul style="list-style-type: none"> 1. Ensure the scene is safe and take Standard Precautions. 2. Determine if the patient has been injured (mechanism of injury) or is suffering a medical illness. B. Primary assessment 	

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 1. Form a general impression of the patient. 2. Stabilize the spine if necessary. 3. Ensure a patent airway. 4. Assess the patient's breathing and apply oxygen or bag-valve-mask ventilations as appropriate. 5. Assess circulation and look for signs of shock. 6. Identify and control any major bleeding. 7. Consider the patient a priority for transport for any of the following reasons. <ol style="list-style-type: none"> 8. Poor general appearance 9. Unresponsive 10. Responsive, not following commands 11. Severe pain 12. Shock C. Secondary assessment <ol style="list-style-type: none"> 1. Protect the patient's privacy and modesty. 2. Be patient, compassionate, and professional when communicating and asking the following questions. <ol style="list-style-type: none"> a. What are the signs and symptoms the patient is complaining of? b. Did the signs and symptoms seem to get progressively worse or better? c. How long has the patient been sick or suffering from these signs and symptoms? d. Was the onset of signs and symptoms gradual or sudden? e. What was the patient doing prior to the onset of the complaint? f. Does the patient have any known allergies to medications, food, or other substances? g. When did the patient last have something to eat or drink? What did he eat or drink? h. What medications, prescription and nonprescription, is the patient taking? i. What is the patient's past medical history? When was the last time he has seen a doctor for his medical condition? Has he had any surgeries? j. When was the patient's last menstrual period? Is her cycle regular? Does she have any vaginal bleeding or discharge? Could she be pregnant? k. Is there any genital pain or discharge? If so, what is the color, 	

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	<p>consistency, and odor like? Is there a change in urine? If so, what is the color and odor like?</p> <ul style="list-style-type: none"> l. Does the patient receive dialysis? If so, when was the last treatment received? When is the next treatment due? m. Does the patient have any abdominopelvic or flank pain? n. Has the patient had any nausea or vomiting? If so, when and how much? o. Does the patient have any pain associated with urination, defecation, or sexual intercourse? <p>3. Signs and symptoms</p> <ul style="list-style-type: none"> a. Urine with an abnormal color, consistency, or odor b. Abdominopelvic pain or tenderness c. Nausea and vomiting d. Fever or chills e. Syncope or altered mental status f. Pain or burning during sexual intercourse, urination, or during a bowel movement g. Flank, groin, or back pain h. Frequent or urgent need to urinate or decreased urine output i. Blood in the urine (hematuria) j. Edema of the feet, ankles, and legs k. Hypertension l. Anorexia m. Tachycardia n. Signs of shock <p>4. Physical exam</p> <ul style="list-style-type: none"> a. Will primarily focus on the genitourinary or renal complaint (abdominopelvic area) but should also include other related body systems b. Examine the abdomen carefully, palpating the most painful quadrant last. c. Obtain and document the patient's vital signs. d. Pay attention to blood pressure and heart rate, and look for signs of shock. <p>D. Emergency medical care</p> <ul style="list-style-type: none"> 1. It is not important that you isolate the exact cause of abdominopelvic pain or a genitourinary or renal condition in the prehospital setting. 2. Maintain manual spine stabilization if necessary. 	<p>Knowledge Application</p> <p>Give several descriptions of patients with genitourinary/renal complaints, students should be able to collect a relevant history and perform a physical examination.</p>

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	<ol style="list-style-type: none"> 3. Keep the airway patent. 4. If breathing is adequate, administer oxygen based on the SpO₂ reading and patient signs and symptoms. 5. Control any major bleeding if present; recheck the access site for bleeding in a dialysis patient. 6. Place the patient in a position of comfort if no trauma is suspected. 7. Calm and reassure the patient. 8. Initiate a quick and efficient transport. <p>E. Reassessment</p> <ol style="list-style-type: none"> 1. Continuously monitor the patient for changes in patient’s mental status, airway, breathing, or circulation. 2. Repeat assessment every five minutes for patient with altered mental status or signs of shock. 3. Record findings and communicate them to the receiving facility. 	
10	<p>XII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 23 Summary. 2. Complete Chapter 23 In Review questions. 3. Complete Chapter 23 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 23 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What are some possible explanations for Parker’s increased respiratory rate? • If Parker’s mother had waited longer to call EMS, how do you anticipate his presentation might have been different? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important

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		information in each chapter. This can be found under mykit at www.bradybooks.com .

Detailed Lesson Plan

Chapter 24

Environmental Emergencies

200–220 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn considerations for assessing and managing patients who have suffered from environmental emergencies including exposure to heat and cold as well as bites, stings, and altitude sickness.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What is the significance of the patient's lack of shivering? • What are your priorities in the management of this patient?
30	<p>II. Heat and Cold Emergencies—Regulation of Temperature</p> <p>A. Hypothalamus monitors and controls the hypothalamus in the brain (98.6 degrees Fahrenheit or 37 degrees Celsius).</p> <ol style="list-style-type: none"> 1. Thermoregulatory center in the hypothalamus receives input from central thermoreceptors and peripheral thermoreceptors. 2. Thermoreceptors are responsible for sending nerve impulses to the hypothalamus indicating the temperature of the body. <ol style="list-style-type: none"> a. Central thermoreceptors measure the core body temperature by monitoring the temperature of the blood. b. Peripheral thermoreceptors monitor the body temperature found in the skin and extremities. <p>B. Thermal gradient operates by warmer temperatures moving toward cooler temperatures.</p> <p>C. Body must maintain optimum body temperature for cells to function normally; the amount of heat lost by the body must equal the amount of heat gained by the body.</p> <p>D. Body produces heat through processes of metabolism (digestion of food) and shivering (skeletal muscle movement).</p> <p>E. Body conserves heat by constricting blood vessels (vasoconstriction), sending warm blood from the surface of the skin to internal organs,</p>	<p>Discussion Question</p> <p>How does the basic process of thermoregulation work?</p>

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	<p>piloerection, allowing little or no perspiration, and decreasing the surface area (folding arms, more clothing).</p> <p>F. Organs responsible for cooling</p> <ol style="list-style-type: none"> 1. Skin—Increasing flow of warm blood near skin to dissipate excess heat; sweat 2. Cardiovascular system—Elevating heart rate and increasing the strength of contractions so more blood moves to surface 3. Respiratory system—Eliminating heat through evaporation during exhalation <p>G. When heat lost exceeds heat gained (core temperature decreases)</p> <ol style="list-style-type: none"> 1. Hypothermia (or low body temperature; below 95 degrees Fahrenheit) 2. Radiation <ol style="list-style-type: none"> a. Transfer of heat from the surface of one object to the surface of another without physical contact b. From head, hands, and feet c. 55 to 65 percent of heat loss (under normal environmental conditions) 3. Convection <ol style="list-style-type: none"> a. Cold air molecules in immediate contact with the skin are warmed. b. Heated air molecules move away and cooler ones take their place. c. Concept of wind chill—Amount of heat lost in an hour from square meter of exposed skin surface with a normal temperature of 91.4 degrees Fahrenheit 4. Conduction <ol style="list-style-type: none"> a. Body heat is lost through direct contact. b. Method of heat loss in water chill—Water and wet clothing conduct heat away from the body at a much higher rate than air and dry clothing. c. Convection and conduction account for about 15 percent heat loss. 5. Evaporation <ol style="list-style-type: none"> a. Process in which a liquid or solid changes to a vapor b. Relative humidity affects heat loss. c. 20 to 30 percent of heat loss under normal conditions 6. Respiration <ol style="list-style-type: none"> a. Person breathes in cold air from the atmosphere and breathes out air that has been warmed and humidified. b. Heat is carried away with exhalation. c. 10 to 20 percent of heat loss under normal circumstances 	<p>Discussion Question What are examples of heat loss through radiation, convection, conduction, and evaporation?</p> <p>Critical Thinking Discussion What medications or illnesses could interfere with heat loss or heat production?</p> <p>Knowledge Application Given a series of scenarios, students should be able to identify whether patients are gaining or losing heat and by what mechanism(s).</p> <p>Critical Thinking Discussion Why is hyperthermia more common when high humidity and low air movement accompany high ambient temperatures?</p>

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	<p>H. When heat gained exceeds heat lost (core temperature increases)</p> <ol style="list-style-type: none"> 1. Hyperthermia, or high body temperature, occurs when heat gained exceeds heat lost. 2. Body may produce more heat than is needed or may fail to cool the body when needed. 3. Hyperthermia is most common in situations where the air temperature is high, the humidity is high, and there is little or no breeze. 	<p>Discussion Question What changes in the appearance of a patient's skin would tell you the patient's body is trying to cool itself?</p>
2	<p>III. Exposure to Cold—Generalized Hypothermia</p> <ol style="list-style-type: none"> A. Results from an increase in the body's heat loss, a decrease in the body's heat production, or both B. Most life-threatening cold injury because it affects the entire body (mortality as high as 87 percent) C. Can have sudden or gradual onset 	<p>Teaching Tip Consider having a wilderness medicine expert lecture on hypothermia and local cold injuries.</p>
5	<p>IV. Exposure to Cold—Pathophysiology of Generalized Hypothermia</p> <ol style="list-style-type: none"> A. Predisposing factors <ol style="list-style-type: none"> 1. Ambient temperature, wind chill, and moisture 2. Age 3. Medical conditions 4. Alcohol, drugs, and poisons 5. Duration of exposure 6. Clothing 7. Activity level B. Stages of hypothermia <ol style="list-style-type: none"> 1. Can occur with little warning and can progress rapidly 2. Initial reactions to cold exposure are increases in the basal metabolic rate, muscular shivering, and "goosebumps". 3. As the core temperature drops, body's thermal-regulating mechanism and perception become confused. 4. See Figure 24-5. C. Immersion hypothermia <ol style="list-style-type: none"> 1. Occurs as a result of the lowering of the body temperature from immersion in cool or cold water 2. Should be considered in all cases of accidental immersion 3. Body temperature drops 25 to 30 times faster in water than in air of the same temperature. 4. Get the patient out of the water as rapidly as possible and then out of his 	<p>Discussion Question What are some risk factors for generalized hypothermia?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on hypothermia.</p> <p>Teaching Tip Have students consider the difference in comfort level between being exposed to 70 degree Fahrenheit air and 70 degree Fahrenheit water to illustrate the increased rate of heat loss in water.</p>

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	<p>wet clothes and into a warm environment.</p> <p>D. Urban hypothermia</p> <ol style="list-style-type: none"> 1. Occurs in those individuals who have a predisposition, disability, illness, or medication usage that renders them more susceptible to hypothermia (e.g. very young or old) 2. External category includes patients who are subject to hypothermia because they do not have the access to a warm environment during the cold months. 3. Internal category includes patients (typically the elderly) who are subject to colder temperatures in winter months when they attempt to minimize heating bills to save money. 4. Remember that a patient can be hypothermic even on a warm day if he is in an air-conditioned environment with decreased tissue insulation and the inability to move from a cold surface. <p>E. Myxedema coma</p> <ol style="list-style-type: none"> 1. Hypothyroidism may make a person more susceptible to hypothermia. 2. Hypothyroidism is a clinical syndrome characterized by an absence or severe deficiency of a hormone secreted by the thyroid. 3. Myxedema coma is a complication that occurs late in the progression of hypothyroidism and can be fatal (core temperature 75–90 degrees Fahrenheit, seizures, slow reflexes, respiratory depression). <ol style="list-style-type: none"> a. Precipitating factors include exposure to cold temperatures, recent illness or infection, trauma, and use of drugs that depress the central nervous syndrome. b. Support lost functions of airway, breathing, and circulation. c. Contact medical direction regarding rewarming techniques. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on myxedema coma.</p>
2	<p>V. Exposure to Cold—Local Cold Injury</p> <ol style="list-style-type: none"> A. Condition commonly called “frostbite” results from the freezing of body tissue B. Requires much colder temperatures than does generalized hypothermia C. Often accompanies generalized hypothermia (Generalized hypothermia takes precedence for emergency care.) 	
5	<p>VI. Exposure to Cold—Pathophysiology of Local Cold Injury</p> <ol style="list-style-type: none"> A. Ice crystals form between the cells of the skin and then expand as they extract fluid from the cells. B. Circulation is obstructed. C. Injuries tend to occur on the hands, feet, ears, nose, and cheeks. 	

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	<p>D. Predisposing factors</p> <ol style="list-style-type: none"> 1. Any kind of trauma 2. Extremes of age 3. Tight or tightly laced footwear 4. Use of alcohol during exposure to cold 5. Wet clothing 6. High altitudes 7. Loss of blood 8. Arteriosclerosis <p>E. Stages of local cold injury</p> <ol style="list-style-type: none"> 1. Early or superficial cold injury <ol style="list-style-type: none"> a. Usually involves tips of ears, nose, cheekbones, tips of the toes or fingers, and chin b. Patient is usually unaware of the injury. c. Patient will lose feeling and sensation in the affected area. d. Skin may begin to turn waxy gray or yellow. e. Skin remains soft but cold to the touch. f. If affected area is rewarmed, patient will usually report a tingling sensation as the area thaws. 2. Late or deep cold injury <ol style="list-style-type: none"> a. Involves skin and tissue beneath it b. Skin is white and waxy in appearance. c. Palpation reveals a firm to completely solid, frozen feeling. d. May involve whole hand or foot e. Swelling and blisters may be present. f. As area thaws, it may become blotchy or mottled. g. Deep cold tissue injury is an extreme emergency and can result in permanent tissue loss. 	<p>Discussion Question How is early (superficial) local cold injury differentiated from late (deep) local cold injury?</p>
25	<p>VII. Exposure to Cold—Assessment-Based Approach: Cold-Related Emergency</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Ensure your safety and the safety of your partner. 2. Remember that cold temperatures and high winds pose hazards for EMT crews. 3. Be prepared for cold exposure (layered clothing). 4. Cold weather conditions may exacerbate unstable environments. 	<p>Discussion Question What are some special considerations in scene safety in conditions that could lead to hypothermia?</p> <p>Critical Thinking Discussion How can you protect yourself from local</p>

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	<p>5. Look for signs indicating how the patient interacted with the environment.</p> <ol style="list-style-type: none"> a. Is the patient protected from the cold environment? b. Is the ambient temperature cool or cold? c. Does the scene indicate the possibility for urban hypothermia, even though the nature of the call was something different? d. Is the wind blowing? e. Does it appear that the patient has been outside for a prolonged period of time? f. Is there any evidence that the patient's clothing is wet? g. Is the patient properly dressed for the environment? h. What is the temperature inside a residence? i. Is there any evidence that a patient has ingested alcohol or has been using drugs? j. Does the patient have any injury that may interfere with normal thermoregulation such as a spine injury or head injury? <p>B. Primary assessment</p> <ol style="list-style-type: none"> 1. Gather a general impression of the patient. 2. Closely assess the airway; perform a manual maneuver if necessary. 3. Decrease in carbon dioxide production as the body core temperature decreases may cause the respiratory rate and tidal volume to decrease and eventually become ineffective. 4. Administer oxygen, warmed and humidified if possible, by a nonrebreather mask at 15 lpm if breathing is adequate. 5. If breathing is inadequate, provide positive pressure ventilation with supplemental oxygen. 6. Consider use of airway adjunct if necessary for establishing and maintaining the airway. 7. Check carotid and radial pulses very carefully, and begin chest compressions if pulse is absent. 8. Skin may appear red in early hypothermia but will change to pale, then cyanotic, then gray as the condition worsens. 9. Immediately remove the patient from the cold environment, remove any wet clothing, dry the patient thoroughly, and wrap the patient in warm blankets. 10. Patient is a priority for transport. <p>C. Secondary assessment</p> <ol style="list-style-type: none"> 1. Should be conducted in the back of the warmed ambulance 	<p>cold injury?</p> <p>Discussion Question What are the assessment findings that would lead you to suspect a patient is hypothermic?</p>

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	<ol style="list-style-type: none"> 2. Gather a history if the patient is responsive (complaints, medications, preexisting diseases or significant medical conditions, last intake of food, actions before incident, and time out in the cold). 3. If a mechanism of injury consistent with trauma is suspected or patient complains of pain to several areas, perform a physical exam (evidence of trauma, burns, and so on.) <ol style="list-style-type: none"> a. Feel with your hand the warmth of the abdomen to get an idea of how cold the patient actually is. b. Be alert for signs of local cold injuries when assessing the extremities (decrease in sensation, lack of coordination, difficulty in movement). c. Baseline vital signs may reveal decreasing blood pressure, heart rate, and respirations as the temperature decreases and hypothermia worsens. d. If patient is unresponsive, perform a physical exam and gather history from family or bystanders. 4. Signs and symptoms of generalized hypothermia (Use a medical grade thermometer to take a thermometer reading as well as consider presenting signs and symptoms.) <ol style="list-style-type: none"> a. Decreasing mental status correlating with the degree of hypothermia (e.g., amnesia, mood changes, impaired judgment, dizziness) b. Decreasing motor and sensory function correlating with the degree of hypothermia (e.g., joint and/or muscle stiffness, lack of coordination, reduced sensation or loss, uncontrollable fits of shivering) c. Changing vital signs (e.g., respiratory changes, changes in pulse, changes in skin color, slowly responding pupils, low to absent blood pressure) 5. Signs and symptoms for local cold injury—Can be difficult to assess <ol style="list-style-type: none"> a. Early or superficial cold injury <ol style="list-style-type: none"> i. Blanching of the skin (normal color does not return after blanching) ii. Loss of feeling and sensation in the injured area iii. Continued softness of the skin in the injured areas and in the tissue just beneath it iv. Tingling sensation during any rewarming b. Late or deep local cold injury <ol style="list-style-type: none"> i. White, waxy skin 	<p>Class Activity Divide the class into groups of four to six students. Assign each group a hypothermia scenario with different circumstances (stage of hypothermia, type of hypothermia, distance from the hospital, and so on). Have each group work through their scenario on their own first, and then have them explain their decision-making process to the rest of the class.</p>

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	<ul style="list-style-type: none"> ii. Firm-to-frozen feeling when the skin is palpated iii. Swelling iv. Blisters v. Areas of purple and blanching or mottled and cyanotic if skin is partially or wholly thawed <p>D. Emergency medical care for generalized hypothermia</p> <ul style="list-style-type: none"> 1. General principles <ul style="list-style-type: none"> a. Preventing further heat loss b. Rewarming the patient as quickly and safely as possible c. Staying alert for complications 2. Steps for emergency care <ul style="list-style-type: none"> a. Top priority is to remove the patient from the cold environment and prevent further heat loss. (Insulate from ground up; insulate the head). b. Handle the patient gently. (Rough handling can cause cardiac dysrhythmia.) c. Administer oxygen via nonrebreather mask at 15 lpm (warm, humidified oxygen, if possible). d. If patient goes into cardiac arrest from ventricular fibrillation or pulseless ventricular tachycardia, provide one defibrillatory shock if the AED is immediately available or if it has been at least four to five minutes since the patient has arrested. e. Provide five cycles of 30:2 compressions/ventilations (roughly two minutes) prior to rhythm analysis. f. If you cannot detect a pulse or respiration, but an unresponsive patient shows any signs of movement at all, assume there is some cardiac activity and do not start defibrillation or CPR. g. If the patient is alert and responding appropriately, actively rewarm him. <ul style="list-style-type: none"> i. Follow medical direction and your local protocol. ii. Active rewarming is a technique of aggressively applying heat to warm the patient's body and includes wrapping the patient in warm blankets, placing heat packs or hot water bottles in the groin, armpits, and on the chest, and turning up the heat in the patient compartment of the ambulance. iii. Heat should be added gradually; never immerse a patient in a tub of hot water or in a hot shower. h. If the patient is unresponsive or is not responding appropriately, do 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How are passive warming techniques different from active warming techniques? • How do you determine whether a patient should be passively or actively rewarmed?

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	<p>not actively rewarm; use only passive rewarming.</p> <ul style="list-style-type: none"> i. Passive rewarming is taking measures to prevent further heat loss and giving the patient's body the optimum chance to rewarm itself. ii. All hypothermic patients should receive passive rewarming. <ul style="list-style-type: none"> i. Do not allow the patient to eat or drink stimulants. j. Never rub or massage the patient's arms or legs. k. Transport as quickly as possible <p>E. Emergency medical care for immersion hypothermia</p> <ol style="list-style-type: none"> 1. Instruct the patient to make the least effort needed to stay afloat until you reach him. 2. Lift the patient from the water in a horizontal or supine position to prevent vascular collapse. 3. Remove the patient's wet clothing carefully and gently. 4. Continue treatment as you would for a patient with generalized hypothermia. <p>F. Emergency medical care for local cold injury</p> <ol style="list-style-type: none"> 1. Remove the patient immediately from the cold environment, if possible. 2. Never initiate thawing procedures if there is any danger of refreezing. 3. Administer oxygen at 15 lpm by nonrebreather mask if not already done. 4. Prevent further cold injury to the injured part. <ul style="list-style-type: none"> a. Early or superficial injury <ul style="list-style-type: none"> i. Carefully remove any jewelry or wet or restrictive clothing to prevent causing further injury. Leave in place any clothing frozen to the skin. ii. Immobilize the affected extremity to prevent movement and elevate. iii. Cover the affected skin with dressing or dry clothing to prevent friction or pressure. iv. Never rub or massage the affected skin. v. Never reexpose the injured skin to the cold. b. Late or deep injury <ul style="list-style-type: none"> i. Carefully remove any jewelry or wet or restrictive clothing to prevent causing further injury. Leave in place any clothing frozen to the skin. ii. Cover the affected skin with dressings or dry clothing to prevent friction. Avoid pressure. iii. Do not break any blisters or treat them with salve or ointment. 	

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	<ul style="list-style-type: none"> iv. Do not rub or massage the affected skin. v. Never apply heat or rewarm the skin. vi. Do not allow the patient to walk on an injured extremity. <p>5. Rewarm frozen tissue rapidly after contacting medical direction; follow local protocol.</p> <ul style="list-style-type: none"> a. Immerse the affected tissue in a warm-water bath (ideally 104 degrees Fahrenheit). b. Monitor the water to make sure it stays at an even temperature. c. Continuously stir the water to keep heat evenly distributed and constant about the frozen extremity. d. Keep the tissue in warm water until it is soft and color and sensation return to it. e. Following the thawing process, dress the area with dry sterile dressings. f. Elevate the affected extremity. g. Protect against refreezing of the warmed part. h. Transport as soon as possible. All patients with frozen tissue require hospitalization. <p>G. Reassessment</p> <ul style="list-style-type: none"> 1. Carefully reassess the patient's mental status. 2. Closely monitor the airway, breathing, and circulation. 3. Patient may begin to feel sensations and pain if being rewarmed. 4. Repeat and record vital signs every five minutes. 5. Keep the patient warm and try not to reexpose him to the cold. 	<p>Knowledge Application Given several different scenarios, students should be able to assess and manage patients with generalized hypothermia and local cold injuries.</p>
5	<p>VIII. Exposure to Cold—Summary: Assessment and Care—Cold Emergency</p> <ul style="list-style-type: none"> A. Review assessment findings that may be associated with a cold emergency and emergency care for a cold emergency. B. Review Figures 24-13 and 24-14. 	
5	<p>IX. Exposure to Heat—Hyperthermia</p> <ul style="list-style-type: none"> A. Heat-related emergencies (hyperthermia) are brought on by an increase in the body's heat production or by an inability to eliminate the heat produced. B. Most emergencies occur in the early summer season before people have acclimated themselves to the season's higher temperatures. 	
10	<p>X. Exposure to Heat—Pathophysiology of Heat-Related Emergencies</p> <ul style="list-style-type: none"> A. Heat cramps 	<p>Class Activity Before lecturing on this topic, assign</p>

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	<ol style="list-style-type: none"> 1. Least serious form of heat-related injury 2. Muscle spasms or cramps (heat cramps) 3. Affects large flexor muscle groups of the body first (abdominal muscles, gluteus muscles, and hamstrings) <p>B. Heat exhaustion</p> <ol style="list-style-type: none"> 1. Disturbance of the body's blood flow, resulting in mild state of shock 2. Large quantities of salt and water are lost due to prolonged and profuse sweating, leading to diminished blood circulation. 3. Patient's skin will be normal-to-cool in temperature, either pale or ashen gray in color, and sweaty. 4. Occurs when the body has maximized the heat-dissipating mechanisms to a point where other body systems are starting to dysfunction <p>C. Heatstroke</p> <ol style="list-style-type: none"> 1. Life-threatening medical emergency 2. Occurs when the body's heat-regulating mechanisms break down and become unable to cool the body sufficiently 3. Body becomes overheated, body temperature rises, and sweating ceases. 4. Brain cells are damaged. 5. Patients are commonly unresponsive; skin is hot and red. 6. Patient does not have to first suffer from heat cramps or heat exhaustion to suffer heatstroke. 7. Nonexertional heatstroke (NEHS) typically occurs to elderly patients with sedentary lifestyles, those who are chronically ill, those who are on medications inhibiting temperature-sensing ability, or those who live in regions of the country that rarely experience heat waves. 8. Exertional heatstroke (EHS) commonly occurs in younger individuals who are engaged in strenuous physical exertion in a very hot environment for prolonged periods. <p>D. Predisposing factors</p> <ol style="list-style-type: none"> 1. Climate 2. Exercise and strenuous activity 3. Age 4. Preexisting illnesses (e.g., heart disease, kidney disease, cerebrovascular disease, Parkinson's disease, thyroid gland disorder, skin diseases, dehydration, fatigue, obesity, mental retardation) 5. Certain drugs and medications (e.g., alcohol, cocaine, hallucinogens, barbiturates) 	<p>different groups of students each of the heat-related emergencies. Give the groups 20 minutes to research their topic and prepare to report back to the class. Be prepared to correct misconceptions and fill in any gaps in information.</p> <p>Discussion Question What physical findings are associated with heat cramps?</p> <p>Discussion Question What are some factors that predispose someone to heat-related emergencies?</p> <p>Critical Thinking Discussion What is the mechanism (or mechanisms) by which cardiovascular disease predisposes a patient to heat-related emergencies?</p>

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Minutes	Content Outline	Master Teaching Notes
	6. Lack of acclimation	
25	<p>XI. Exposure to Heat—Assessment-Based Approach: Heat-Related Emergency</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Scan the scene for evidence of a heat-related emergency (e.g., ambient temperature and humidity, exercise and activity, person’s clothing, infants and children in closed structures, medications or drugs.) 2. Recognize your own limits and protect yourself from overexposure to the heat. <p>B. Primary assessment</p> <ol style="list-style-type: none"> 1. Determine if patient is dressed appropriately for the hot environment. 2. Assess mental status. 3. Assess the airway and breathing; provide oxygen or positive pressure ventilation as appropriate. 4. Assess pulse (radial pulse may be weak and rapid or absent due to dehydration). 5. The patient with an altered mental status who has hot skin should be considered a priority patient. <p>C. Secondary assessment</p> <ol style="list-style-type: none"> 1. Move the patient to a cool environment as quickly as possible. 2. If patient is responsive, gather a history (OPQRST). 3. Conduct a physical exam (targeting areas of complaint from the history). 4. Take baseline vital signs. (Hot skin is alarming.) 5. If patient is unresponsive, conduct a physical exam, take baseline vital signs, and then gather the history from family or bystanders. 6. Signs and symptoms of generalized hyperthermia <ol style="list-style-type: none"> a. Elevated core temperature b. Muscle cramps c. Weakness or faintness d. Rapid pulse that is usually strong at first but becomes weak e. Initial deep, rapid breathing that becomes shallow and weak as damage progresses f. Headache g. Seizures h. Loss of appetite, nausea, or vomiting i. Altered mental status, possibly unresponsiveness j. Moist and pale skin with normal-to-cool temperature or hot and 	<p>Knowledge Application</p> <p>Given several descriptions of patients with heat-related emergencies, students should be able to collect a relevant history and perform a physical examination.</p>

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	<p style="text-align: center;">either dry or moist</p> <p>D. Emergency medical care for a heat emergency patient with moist, pale, normal-to-cool skin</p> <ol style="list-style-type: none"> 1. Move the patient to a cool place. 2. Administer oxygen at 15 lpm via a nonrebreather mask. Provide positive pressure ventilation if needed. 3. Remove as much of the patient's clothing as you can; loosen what you cannot remove. 4. Cool the patient by applying cold, wet compresses and/or by misting the patient with water and then fanning lightly. 5. Place the patient in a supine position. 6. If the patient is fully responsive and is not nauseated, have him drink cool water. 7. If the patient is unresponsive or has an altered mental status or is vomiting, do NOT give fluids. 8. When to transport a patient with moist, pale, and normal-to-cool skin <ol style="list-style-type: none"> a. Unresponsive or has altered mental status b. Vomiting or is nauseated and will not drink fluids c. History of medical problems d. Core temperature above 101 degrees Fahrenheit e. Continuously rising temperature f. Does not respond to emergency care <p>E. Emergency medical care for a heat emergency patient with hot skin that is moist or dry (dire medical emergency)</p> <ol style="list-style-type: none"> 1. Remove the patient from the source of heat and place him in a cool environment. 2. Remove as much of the patient's clothing as is possible or reasonable. 3. Administer oxygen at 15 lpm via a nonrebreather mask. 4. Immediately begin to cool the patient. 5. Pour tepid water over the patient's body. Avoid use of cold water. 6. Place cold packs in the patient's groin, at each side of the neck, in the armpits, and behind each knee to cool the large surface blood vessels. 7. Fan the patient aggressively or direct an electric fan at the patient. 8. Keep the patient's skin wet to promote cooling through evaporation. 9. Be prepared to manage seizures or prevent the aspiration of vomitus. 10. Always transport a hyperthermic patient with hot skin that is moist or dry. <p>F. Emergency medical care for heat cramps</p> <ol style="list-style-type: none"> 1. Remove the patient from the source of heat to a cool environment. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • Under what circumstances could you consider giving oral fluids to a patient with a heat-related emergency? • What are the management priorities for a patient with heatstroke?

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	<ol style="list-style-type: none"> 2. Consult medical direction before giving the patient sips of low-concentration salt water at the rate of half a glassful every 15 minutes (Gatorade). 3. Apply moist towels to the patient's forehead and over the cramping muscles. 4. Explain to the patient what happened so he can avoid a recurrence of the problem. <p>G. Reassessment</p> <ol style="list-style-type: none"> 1. Reevaluate mental status, airway, breathing, circulation, vital signs, and treatment. 2. Be prepared to establish an airway or provide positive pressure ventilation if breathing becomes inadequate. 3. Assess pulse with mental status to determine if the patient is improving or deteriorating. 4. Reassess, record, and report vital signs every five minutes. 	
5	<p>XII. Exposure to Heat—Summary: Assessment and Care—Heat Emergency</p> <ol style="list-style-type: none"> A. Review assessment findings that may be associated with a heat emergency and appropriate management for heat-related emergencies. B. Review Figures 24-20a and b and Figure 24-21. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on heat-related conditions.</p>
5	<p>XIII. Bites and Stings—Snakebite</p> <ol style="list-style-type: none"> A. Bites from nonpoisonous snakes are generally treated as minor wounds. B. Poisonous snakes include coral snakes and pit vipers (rattlesnakes, copperheads, and water moccasins), and bites from these snakes are considered an emergency. C. Characteristics of poisonous snakes <ol style="list-style-type: none"> 1. Large fangs (with the exception of the coral snake which leaves a semicircular pattern with its teeth) 2. Elliptical pupils or vertical slits, much like those of a cat 3. A pit between the eye and the mouth 4. A variety of different-shaped blotches on the backgrounds of pink, yellow, olive, tan, gray, or brown skin (Coral snake is ringed with red, yellow, and black.) D. Signs and symptoms <ol style="list-style-type: none"> 1. Pit viper bite signs and symptoms generally occur immediately, whereas those of a coral snake bite are usually delayed by at least one hour or as 	<p>Class Activity Assign students to research the specific effects of a poisonous snake, insect, or marine animal indigenous to your area and write a brief report on it as homework.</p> <p>Discussion Question How are pit vipers distinguished from other snakes?</p> <p>Teaching Tip If available, show preserved specimens of snakes, insects, or marine animals indigenous to your area.</p>

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	<p>many as eight hours.</p> <ol style="list-style-type: none"> 2. Other factors that determine the severity of a snakebite <ol style="list-style-type: none"> a. Location of the bite since fatty tissue absorbs the venom more slowly than muscle tissue b. Whether pathogens are present in the venom c. The patient's size and weight d. The patient's general health and condition e. How much physical activity the patient engaged in immediately following the bite since physical activity will spread the venom E. The emergency medical care for a snakebite is the same as general emergency medical care for bites and stings. 	<p>Discussion Question What are the general guidelines for treating snakebites?</p>
5	<p>XIV. Bites and Stings—Insect Bites and Stings</p> <ol style="list-style-type: none"> A. Generally, medical help is necessary only if the itching lasts longer than two days, signs of infection or an allergic reaction develop, or the insect is poisonous. B. Redness, tenderness, and swelling at or around the sting site, even if severe, in the absence of other symptoms is considered to be a local reaction (treated successfully with cold compresses). C. Allergic reactions may cause anaphylactic shock. D. Black widow spider <ol style="list-style-type: none"> 1. Characterized by a shiny black body, thin legs, and a crimson red marking on its abdomen, usually in the shape of an hourglass or two triangles. 2. Those at highest risk for developing severe reactions to the bites are children under the age of 16, people over the age of 60, people with chronic illness, and anyone with hypertension. 3. Signs and symptoms <ol style="list-style-type: none"> a. Pinprick sensation at the bite site, becoming a dull ache within about 30 minutes b. Severe muscle spasms, especially in the shoulder, back, chest, and abdomen c. Rigid, boardlike abdomen d. Dizziness, nausea, vomiting, and respiratory distress (severe cases) 4. Emergency care—Provide general wound care and transport. E. Brown recluse spider <ol style="list-style-type: none"> 1. Can range in color from yellow to dark chocolate brown and have brown, 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on allergic reactions to stings.</p> <p>Discussion Question How are the effects of a black widow spider different from those of the brown recluse spider?</p>

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	<p>violin-shaped marking on the upper back</p> <ol style="list-style-type: none"> 2. Bite is a serious medical condition and often requires surgery. 3. Several hours after bite, the site becomes bluish surrounded by a white periphery, than a red halo or “bull’s eye” pattern. 4. Within seven to ten days, the bite becomes a large ulcer. <p>F. Scorpion</p> <ol style="list-style-type: none"> 1. Only the sting of one type of scorpion in the United States is fatal. 2. Signs and symptoms depend on the amount of venom injected. <ol style="list-style-type: none"> a. Sharp pain at the injection site b. Drooling c. Poor coordination d. Incontinence e. Seizures <p>G. Fire ant</p> <ol style="list-style-type: none"> 1. Circular pattern of bites that cause intense, fiery, burning pain 2. Produces painful vesicles filled with fluid 3. Causes large local reaction that affects the entire extremity <p>H. Tick</p> <ol style="list-style-type: none"> 1. Carries tick fever, Rocky Mountain spotted fever, Lyme disease, and other bacterial diseases 2. Emergency care <ol style="list-style-type: none"> a. Promptly remove the tick using tweezers to grasp the tick as close as possible to the point where it is attached to the skin. b. Pull firmly and steadily. (Do not twist, jerk, or squash the tick.) c. Wash the bite area thoroughly with soap and water and apply an antiseptic. 	
15	<p>XV. Bites and Stings—Assessment-Based Approach: Bites and Stings</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Protect yourself and your partner from bites or stings. 2. Once the scene is safe, look around the scene for evidence of what may have bitten or stung the patient. <p>B. Primary assessment</p> <ol style="list-style-type: none"> 1. Gather a general impression of the patient and his mental status. 2. Assess the airway and breathing. 3. Remember that some patients may have an allergic reaction to bites and stings that can lead to anaphylactic shock. <p>C. Secondary assessment</p>	<p>Knowledge Application</p> <p>Given several descriptions of patients with bites or stings, students should be able to collect a relevant history and perform a physical examination.</p>

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	<ol style="list-style-type: none"> 1. Signs and symptoms of anaphylactic shock <ol style="list-style-type: none"> a. Hives b. Flushing c. Upper airway obstruction d. Faintness e. Dizziness f. Generalized itching g. Generalized swelling, including eyelids, lips, tongue h. Difficulty swallowing i. Shortness of breath, wheezing, or stridor j. Labored breathing k. Abdominal cramps l. Confusion m. Loss of responsiveness n. Convulsions o. Hypotension (low blood pressure) 2. Signs and symptoms of a bite or sting (general) <ol style="list-style-type: none"> a. History of a spider or snake bite or a sting from an insect, scorpion, or marine animal b. Pain that is often immediate and severe or burning; within several hours the area may become numb. c. Redness or other discoloration around the bite d. Swelling around the bite, sometimes gradually spreading e. Weakness or faintness f. Dizziness g. Chills h. Fever i. Nausea or vomiting j. Bite marks k. Stinger D. Emergency medical care for anaphylactic shock <ol style="list-style-type: none"> 1. Maintain a patent airway. 2. Administer oxygen and support breathing. 3. Administer epinephrine by a prescribed auto-injector with permission from medical direction for patients with airway obstruction, wheezing, hypotension, or prior anaphylaxis. 4. Call for advanced life support. 5. Initiate early transport. 	

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	<p>E. Emergency medical care for a bite or sting</p> <ol style="list-style-type: none"> 1. If the stinger is still present, remove it by gently scraping against it with the edge of a credit card or similar item. 2. Wash the area around the bite or sting gently with a mild agent or strong soap solution. 3. Remove any jewelry or other constricting objects as soon as possible. 4. Lower the injection site below the level of the heart. 5. Apply a cold pack to an insect bite or sting to relieve pain and swelling (but not to snakebites or injuries inflicted by marine animals). 6. Some experts advise the use of a constricting band in the treatment of a snakebite, proximal to the bite. Consult medical direction. 7. Observe the patient carefully for the signs and symptoms of an allergic reaction. 8. Keep the patient calm, limit his physical activity, and keep him warm. 9. Transport as soon as possible. <p>F. Reassessment</p> <ol style="list-style-type: none"> 1. Monitor the patient's airway, breathing, and circulation carefully. 2. Look for signs and symptoms of anaphylactic shock. 	<p>Critical Thinking Discussion Why is ice to be avoided in the treatment of a patient with a snakebite?</p>
5	<p>XVI. Bites and Stings—Marine Life Bites and Stings</p> <ol style="list-style-type: none"> A. Venom of marine life may cause more extensive tissue damage than that of land animals. B. Venoms of aquatic organisms are destroyed by heat; so heat should be applied to marine bites and stings. C. Try to identify the animal because some very effective antivenins are available. D. Emergency medical care for marine life poisoning <ol style="list-style-type: none"> 1. Treated similarly to soft-tissue injuries. 2. Use forceps to remove any material that sticks to the sting site on the surface of the flesh; then irrigate the wound with water. 3. Do not attempt to remove spines that are embedded in joints or that are deeply embedded in skin. 4. If the patient was stung by a jellyfish, coral, hydra, or anemone, carefully remove dried tentacles and pour vinegar on the affected area to denature the toxin. Sprinkle the area with meat tenderizer if available. 5. Apply heat or soak the affected area in hot water for at least 30 minutes or throughout transport. 	<p>Discussion Question Why is the application of heat used in the management of marine animal bites and stings?</p>

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Minutes	Content Outline	Master Teaching Notes
10	<p>XVII. Lightning Strike Injuries—Pathophysiology of a Lightning Strike Injury</p> <p>A. Lightning injuries are not typically major burn injuries because of the extremely short contact time (even though the temperature is 15,000–60,000 degrees Fahrenheit).</p> <p>B. The rapid explosion and implosion of air associated with thunder may propel the patient, leading to blunt trauma.</p> <p>C. Rapid change in air pressure can cause pressure changes in the body’s air-containing cavities, leading to damage and possible rupture.</p> <p>D. Lightning strike patient is a medical patient and a trauma patient.</p> <p>E. Four major lightning strike mechanisms</p> <ol style="list-style-type: none"> 1. Direct strike (highest rate of injury and death)—Lightning bold makes direct contact with the patient. 2. Contact strike—Lightning strikes an object the patient is in contact with 3. Splash or side flash strike—Lightning strikes an object and jumps to a nearby person 4. Ground current or step voltage strike—Lightning current energizes the ground. <p>F. In a lightning strike, the heart is depolarized by the massive discharge of energy through the body which leads to primary cardiac arrest.</p> <p>G. In a lightning strike, the medulla, which houses the respiratory center, is shut down and the patient stops breathing.</p> <p>H. Often the heart will begin to beat spontaneously on its own without any intervention; however, the inspiratory centers in the medulla of the brain remain dormant for a much longer time, and deoxygenated blood begins to circulate throughout the body.</p> <p>I. The heart becomes hypoxic and acidotic, which may lead to a secondary cardiac arrest.</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • Why is a lightning strike considered a medical injury first, with the possibility of traumatic injury? • What are the different ways in which a patient can be exposed to the energy of a lightning strike? • What are the mechanisms of cardiac and respiratory arrest in the patient who has been struck by lightning?
10	<p>XVIII. Lightning Strike Injuries—Assessment of the Lightning Strike Patient</p> <p>A. Signs and symptoms—Nervous system</p> <ol style="list-style-type: none"> 1. Altered mental status 2. Retrograde amnesia 3. Anterograde amnesia 4. Weakness 5. Pain, tingling, and numbness 6. Pale, cool, and clammy skin 	<p>Critical Thinking Discussion</p> <p>Why might a lightning strike patient have retrograde or anterograde amnesia?</p>

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	<ul style="list-style-type: none"> 7. Temporary paralysis 8. Dizziness 9. Loss of pupillary function 10. Seizures 11. Vertigo B. Signs and symptoms—Cardiac System <ul style="list-style-type: none"> 1. Asystole or ventricular fibrillation 2. Irregular pulse C. Signs and symptoms—Respiratory system: apnea D. Signs and symptoms—Skin <ul style="list-style-type: none"> 1. Burns 2. Linear burns 3. Feathering 4. Punctuate burns 5. Thermal burns E. Signs and symptoms—Musculoskeletal <ul style="list-style-type: none"> 1. Discolorations 2. Fractures F. Signs and symptoms—Ophthalmic <ul style="list-style-type: none"> 1. Unequal pupils 2. Drooping eyelid G. Signs and symptoms—Otologic <ul style="list-style-type: none"> 1. Ruptured tympanic membrane 2. Tinnitus 3. Deafness 	<p style="text-align: center;">Critical Thinking Discussion</p> <p>How does a lightning strike cause rupture of the tympanic membranes?</p>
10	<p>XIX. Lightning Strike Injuries—Emergency Care for the Lightning Strike Patient</p> <ul style="list-style-type: none"> A. Ensure the scene is safe; do not become a lightning strike patient yourself. B. If the patient's clothes are on fire, put out the fire. C. Establish manual in-line stabilization. D. Establish an airway if the patient has an altered mental status. E. If patient is in cardiac arrest, immediately begin CPR, attach the AED, and follow the prompts. Provide aggressive ventilation with high-flow, high-concentration oxygen. F. If the patient has a pulse but is not breathing or not breathing adequately, begin aggressive positive pressure ventilation at ten to 12 per minute. Supply high-flow, high-concentration oxygen. 	<p>Discussion Question</p> <p>What are the management priorities for a patient with a lightning strike?</p> <p>Knowledge Application</p> <p>Given a scenario of a lightning strike, students should be able to perform a scene survey, assess, and manage the patient.</p>

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	<p>G. Completely immobilize the patient to a backboard.</p> <p>H. Transport while continuously monitoring the patient's condition.</p>	
10	<p>XX. High Altitude Sickness—Acute Mountain Sickness</p> <p>A. Oxygen is less available at higher altitudes.</p> <p>B. High altitude is above 5,000 feet.</p> <p>C. An altitude above 8,000 feet is where serious illness may present.</p> <p>D. Signs and symptoms of altitude illness</p> <ol style="list-style-type: none"> 1. General ill feeling 2. Loss of appetite 3. Headache 4. Disturbance in sleep 5. Respiratory distress upon exertion <p>E. Can be prevented by ascending gradually, allowing the body time to acclimate, limiting exertion, descending to a lower altitude to sleep, eating a high-carbohydrate diet, and possibly taking acetazolamide or nifedipine.</p> <p>F. Acute mountain sickness (AMS) typically occurs in people who rapidly ascend to 6,600 feet or greater.</p> <p>G. Signs and symptoms of AMS (6 to 24 hours after ascent)</p> <ol style="list-style-type: none"> 1. Weakness 2. Nausea 3. Headache 4. Shortness of breath 5. Lightheadedness 6. Loss of appetite 7. Fatigue 8. Difficulty sleeping <p>H. Severe signs and symptoms of AMS</p> <ol style="list-style-type: none"> 1. Severe weakness 2. Decreased urine output 3. Vomiting 4. Increased shortness of breath 5. Altered mental status <p>I. Emergency medical care</p> <ol style="list-style-type: none"> 1. Primary treatment is to stop the ascent and consider moving the patient to a lower altitude. 2. Administer supplemental oxygen. 	<p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on high altitudes and altitude related illnesses.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • How can high altitude sickness be prevented? • What are the signs and symptoms of AMS? <p>Discussion Question</p> <p>What are the management priorities for a patient with high altitude sickness?</p>
	<p>XXI. High Altitude Sickness—High Altitude Pulmonary Edema (HAPE)</p>	<p>Discussion Question</p>

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10	<p>A. Condition affecting the lungs and gas exchange</p> <p>B. Fluid collects in and around the alveoli</p> <p>C. Condition can occur above 8,000; more commonly occurs above 14,500 feet.</p> <p>D. Signs and symptoms</p> <ol style="list-style-type: none"> 1. Shortness of breath at rest 2. Cough 3. Fatigue 4. Headache 5. Loss of appetite 6. Tachypnea 7. Tachycardia 8. Cyanosis 9. Crackles or wheezing 10. Weakness <p>E. Emergency medical care</p> <ol style="list-style-type: none"> 1. Move the patient to a lower altitude and administer oxygen. 2. May take 36–72 hours to resolve with oxygen therapy alone 	How do HAPE and HACE occur?
10	<p>XXII. High Altitude Cerebral Edema (HACE)</p> <p>A. Occurs from the collection of an excessive amount of fluid in the brain tissue</p> <p>B. Increases the pressure within the skull and puts pressure on the brain</p> <p>C. Most cases occur at altitudes above 12,000 feet (some reported at 8,200 feet).</p> <p>D. Signs and symptoms</p> <ol style="list-style-type: none"> 1. Severe headache 2. Uncoordination 3. Nausea and vomiting 4. Altered mental status 5. Seizures 6. Coma <p>E. Emergency medical care</p> <ol style="list-style-type: none"> 1. Immediately move the patient to a lower altitude and administer oxygen. 2. Severe cases may require positive pressure ventilation with supplemental oxygen. 	<p>Knowledge Application</p> <p>Given several descriptions of patients with high altitude disorders, students should be able to identify the problem and develop a treatment plan.</p> <p>Critical Thinking Discussion</p> <p>How do people who live at higher altitudes adjust physiologically to living with lower atmospheric pressure environments?</p>
5	<p>XXIII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p>	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What are some possible explanations

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	<ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 24 Summary. 2. Complete Chapter 24 In Review questions. 3. Complete Chapter 24 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 24 quiz 	<p>for Mrs. Rector's disorientation?</p> <ul style="list-style-type: none"> • Why is it important to prevent Mrs. Rector from moving her cold-injured feet? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 25

Submersion Incidents: Drowning and Diving Emergencies

100–120 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn special considerations of assessment and care for patient in water-related emergencies.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What types of problems can you identify from the description of the incident? • What are your priorities in the management of this patient?
5	<p>II. Water-Related Emergencies—Definitions</p> <p>A. Common sense precautions</p> <ol style="list-style-type: none"> 1. All pools should be fenced. 2. Children should be under constant supervision if they are in the area of a lake, pool, pond, or container of water of any significant size. 3. Water activities and alcohol do not mix. 4. Life preservers or personal flotation devices (life jackets) must always be worn when boating. 5. Avoid diving into shallow or unexplored bodies of water. 6. Those with seizure disorders must be especially careful when in or around bodies of water. <p>B. Drowning is now the only recommended term to be used to describe a submersion event (as opposed to near-drowning).</p> <p>C. Drowning is an incident in which someone is submersed or immersed in a liquid that results in a primary respiratory impairment.</p>	

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Minutes	Content Outline	Master Teaching Notes
5	<p>III. Water-Related Emergencies—Incidence of Drowning</p> <p>A. Approximately 4,500 drowning deaths per year in the United States (40 percent are children less than five years of age)</p> <p>B. Approximately 85 percent of drownings are in males</p> <p>C. Most common location of drowning is the bathtub for a child less than one and a swimming pool for a child between one and five.</p> <p>D. Adolescents and young adults most often drown in ponds, lakes, rivers, and oceans.</p> <p>E. For an adult patient, consider the following conditions that may have led to the submersion.</p> <ol style="list-style-type: none"> 1. Hypoglycemia 2. Myocardial infarction from exertion 3. Cardiac dysrhythmia 4. Syncope 5. Seizure 6. Depression or a suicide attempt 7. Anxiety or a panic disorder 8. Arthritis, Parkinson’s, or other neuromuscular disorder that leads to poor body control 9. Exhaustion 10. Hypothermia 11. Alcohol or drug use 12. Trauma (especially to the head or spine) <p>F. Water sports (especially when mixed with alcohol or drugs) can also pose a hazard of submersion or drowning.</p>	<p>Teaching Tip Describe local bodies of water where drowning is a public health concern.</p> <p>Discussion Question Why are adolescent males more prone to water-related emergencies?</p> <p>Class Activity Assign a type of body of water (river, home swimming pool, public swimming pool, and so on) to each of several groups of students. Ask each group to come up with a drowning prevention plan.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip on drowning.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the CDC’s water injuries facts sheet.</p>
5	<p>IV. Water-Related Emergencies—Prognostic Predictors</p> <p>A. Quick rescue of the submerged patient from the water and early resuscitation are the most critical factors associated with better outcomes.</p> <p>B. Best chance of survival is in a patient who has two or fewer characteristics on the following list of Orlowski predictors.</p> <ol style="list-style-type: none"> 1. Three years of age or older 2. Submersed for greater than five minutes 3. Resuscitation that began more than ten minutes after rescue 4. Comatose patient upon delivery to emergency department 5. Acidic arterial blood (pH less than 7.10) 	<p>Critical Thinking Discussion If you were to design a research project on improving survival from drowning, how would you go about it?</p>

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Minutes	Content Outline	Master Teaching Notes
	<p>C. Moderate body core hypothermia associated with submersion is thought to provide a protective mechanism that reduces brain and other organ damage in children.</p>	
5	<p>V. Water-Related Emergencies—Pathophysiology of Drowning</p> <p>A. The most significant consequence of a drowning is the lack of ventilation while submerged, which leads to severe and prolonged hypoxia and the accumulation of carbon dioxide in the blood, which leads to severe acid build-up.</p> <p>B. The combined hypoxia and acidosis may lead to severe brain injury and cardiac arrest.</p> <p>C. The severe hypoxia associated with the initial drowning event (primary injury) could produce prolonged effects that continue to damage tissues and organs and create an ongoing hypoxia (secondary injury).</p> <p>D. Approximately ten to 15 percent of drowning victims are prevented from aspirating water into their lungs during submersion by the spasm and tight closing of the larynx that lasts until all inspiratory efforts have ceased (dry drowning).</p> <p>E. Abdominal thrusts are not helpful or necessary during the resuscitation of a drowning victim.</p> <p>F. Surfactant is a substance that maintains surface tension in the alveoli to keep them from collapsing. If surfactant is washed out, the alveoli tend to collapse (atelectasis).</p> <ol style="list-style-type: none"> 1. Collapse creates ventilation problems and leads to pulmonary edema. 2. Collapse interferes with gas exchange and leads to acute respiratory distress syndrome (ARDS). <p>G. Hypothermia is another problem that may be encountered in a drowning patient as a result of extremely cold water (< 41 degrees Fahrenheit or < 5 degrees Celsius).</p> <p>H. Hypovolemia (loss of fluid volume within the vascular system) can occur during and after the initial resuscitation period from an increase in capillary permeability, producing hypotension.</p> <p>I. Important signs, symptoms, or factors to consider in determining the seriousness of a drowning event are as follows.</p> <ol style="list-style-type: none"> 1. Persistent cough 2. Dyspnea or apnea 3. Altered mental status or loss of consciousness at some point during the 	<p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on submersions and drowning.</p> <p>Discussion Question Is a patient's outcome affected by whether it is a dry or wet drowning?</p> <p>Critical Thinking Discussion How does surfactant work to keep the lungs open?</p>

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Minutes	Content Outline	Master Teaching Notes
	submersion 4. Vomiting 5. Drug or alcohol use 6. Pertinent past medical history 7. Hypothermia 8. Duration of cardiac or respiratory arrest 9. Age of the patient 10. Preexisting disease or conditions	
2	VI. Water-Related Emergencies—Diving Emergencies A. Patients who dive into water from a diving board, shore, poolside, boat, or dock often sustain injuries to the head and spine and fractures of the arms, legs, and ribs. B. You should always assume that a diver has sustained neck and spine injuries, even if the diver is still responsive or as left the water. C. If the patient is still in the water, provide the care as described for a submersion patient.	
5	VII. Water-Related Emergencies—Safety Measures in Water-Related Emergencies A. Certain deep-water accidents require specialized equipment to correct medical complications. B. Unless a water emergency occurs in open, shallow water that has a stable, uniform bottom, never go out into the water to attempt a rescue unless you meet all of the following criteria. <ol style="list-style-type: none"> 1. You are a good swimmer, <i>and</i> . . . 2. You are specially trained in water rescue techniques, <i>and</i> . . . 3. You are wearing a personal flotation device, <i>and</i> . . . 4. You are accompanied by other rescuers. C. If the patient is responsive and close to shore, use the <i>reach, throw, row, go</i> strategy. D. If the patient is responsive but too far away to grasp an object you are holding, another way of reaching him is to throw something (rope tied to a floating object). E. If the patient is unresponsive or out of reach with a line, you will need to either row to him in a boat or go to him by wading out or swimming or using a float board.	Discussion Question Under what conditions should you attempt to rescue a patient still in the water?

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	F. Follow the guidelines listed above so that you do not become a patient or fatality.	
5	<p>VIII. Water-Related Emergencies—Possible Spine Injury</p> <p>A. Cases to suspect spine injury in a patient</p> <ol style="list-style-type: none"> 1. Involved in a diving accident 2. Struck by a boat, water skier, surfboard, or other object 3. Had been diving 4. Had used a waterslide 5. Suspected of being intoxicated 6. Has evidence of traumatic injury <p>B. Support the patient's back, and stabilize the head and neck.</p> <p>C. Stabilize the patient properly (preferably with backboard or other rigid support) before removing him from the water.</p>	<p>Discussion Question</p> <p>What is the relationship between drowning and spinal injury?</p>
3	<p>IX. Water-Related Emergencies—Resuscitation</p> <p>A. In water below 70 degrees Fahrenheit or 21 degrees Celsius, the mammalian diving reflex may drastically slow down metabolism and make the patient more likely to be resuscitated, even after prolonged submersion.</p> <p>B. The diving reflex is more pronounced and cooling is more rapid in the young.</p> <p>C. Attempt resuscitation on any pulseless, nonbreathing patient who has been submerged in cold water. (Hypothermic patients are not pronounced dead until after both rewarming and resuscitation have been performed).</p> <p>D. Some experts advise providing resuscitation to every drowning patient, regardless of water temperature or time in the water.</p>	<p>Discussion Question</p> <p>What is the relationship between hypothermia and survival from drowning?</p> <p>Class Activity</p> <p>Have students research and report on the most recent evidence regarding the mammalian diving reflex.</p>
20	<p>X. Water-Related Emergencies—Assessment-Based Approach: Drowning and Water-Related Emergencies</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Ensure your own safety and that of your partner. 2. Consider wearing a PDF anytime you are within ten feet of the water's edge. 3. Take Standard Precautions and note any mechanism of injury. 4. Survey the scene to determine the number of patients. 5. Decide if you will need any additional assistance or special teams. <p>B. Primary assessment</p> <ol style="list-style-type: none"> 1. Form a general impression of the patient. 2. Assess the level of responsiveness and document it. 	

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	<ul style="list-style-type: none"> 3. Assess the airway, keeping in mind the potential for spine injury, and suction or insert oral or nasal airway as necessary. 4. Check the breathing, administering oxygen via a nonrebreather mask if breathing is adequate or providing positive pressure ventilation with supplemental oxygen if breathing is inadequate. 5. Check the circulation to make sure the patient has a pulse and no life-threatening external bleeding that needs to be controlled. Also assess for internal bleeding or hypoperfusion (shock). 6. Make a decision on the priority of transport. C. Secondary assessment <ul style="list-style-type: none"> 1. Perform a rapid secondary assessment if the patient has an altered mental status or is unresponsive. 2. Look for signs and symptoms of the following injuries or medical problems. <ul style="list-style-type: none"> a. Airway obstruction b. Absent or inadequate breathing c. Pulselessness (cardiac arrest) d. Spine injury or head injury e. Soft tissues injuries f. Musculoskeletal injuries g. External or internal bleeding h. Shock i. Hypothermia j. Alcohol or drug abuse k. Drowning or submersion 3. Categories of drowning victims <ul style="list-style-type: none"> a. Asymptomatic—Patient displays no signs or symptoms of the drowning event. b. Symptomatic <ul style="list-style-type: none"> i. Altered mental status ii. Altered vital signs iii. Respiratory distress or respiratory arrest iv. Dyspnea v. SpO₂ reading that is low vi. Persistent cough vii. Wheezing or crackles viii. Decreased body core temperature ix. Cool skin or cyanosis 	

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	<ul style="list-style-type: none"> x. Vomiting, diarrhea, or both xi. Anxiety c. Cardiac arrest—No pulses and apnea (asystole or ventricular tachycardia or fibrillation) d. Obviously dead—Rigor mortis and dependent lividity D. Emergency medical care—Drowning victim <ul style="list-style-type: none"> 1. Do not assume that a patient is dead even if he is unresponsive and without breathing or pulse and has been submerged for some time. 2. Remove the patient from the water as quickly and safely as you can. <ul style="list-style-type: none"> a. Stabilize the patient’s head and neck. b. If the patient is not breathing, begin rescue breathing. c. Keeping the head and neck in line with the spinal column, slide a long backboard under the patient; secure the torso and legs to the backboard. d. Apply a cervical spine immobilization collar and head immobilization device. e. Float the board to shore and lift the patient from the water. 3. If you do not suspect spine injury, place the patient on his left side so that water, vomitus, and secretions can drain. 4. Be prepared to suction. 5. If the patient is in respiratory arrest or is not breathing adequately, establish an airway and begin positive pressure ventilations with supplemental oxygen. 6. If the patient is pulseless and apneic and is older than one year of age, begin CPR and apply the AED according to protocol. Only deliver one shock if the patient is hypothermic. 7. With the patient on his side, apply pressure to the abdomen in cases of severe gastric distention only. 8. Manage any other medical or trauma conditions associated with the drowning event, such as soft-tissue injuries, seizure, or diabetic emergencies. 9. Transport the patient as quickly as possible, continuing resuscitative measures. 10. Always transport a drowning patient. E. Reassessment <ul style="list-style-type: none"> 1. Be alert for signs that the patient is deteriorating into respiratory or cardiac arrest. 2. Perform reassessment every five minutes if the patient is unstable and 	<p>Discussion Question What are the management priorities for drowning patients?</p> <p>Knowledge Application Given a series of scenarios, students should be able to assess and manage drowning patients.</p>

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	every 15 minutes if the patient is stable.	
5	XI. Water-Related Emergencies—Assessment and Care A. Review possible assessment findings and emergency care for a drowning emergency. B. See Figures 25-5 and 25-6.	
15	XII. Scuba- or Deep-Water Diving Emergencies—Basic Laws of Physics Related to Scuba- or Deep-Water Diving Emergencies A. The growing popularity of recreational and commercial diving has led to an increase in the incidence of diving incidents and emergencies. B. Due to many different types of bodies of water and accessibility to them through air travel, accidents involving diving may occur anywhere. C. Dysbarism is a medical condition that results from the effects on the body of changes in ambient pressure. This occurs when a person descends in water or ascends in altitude. D. Four laws of physics that play a major role in the conditions and emergencies experienced by divers <ol style="list-style-type: none"> 1. Boyle’s law—At a constant temperature, the volume of a gas is inversely related to the pressure. 2. Dalton’s law—The total pressure of a mixture of gases equals the sum of the partial pressures of the individual gases that make up the mixture. 3. Henry’s law—At a constant temperature, the amount of gas that dissolves in a liquid it is in contact with is proportionate to the pressure of the gas around it. 4. Charles’s law—All gases will expand equally upon being heated. 	Discussion Questions <ul style="list-style-type: none"> • What is meant by the partial pressure of a gas? • Use Boyle’s law to explain what happens when a diver holds his breath on ascent. Teaching Tip If teaching in cold weather, blow up a balloon at the beginning of class and place it outside. (If the weather is warm, put the balloon in a refrigerator). Have the class go outside on breaks and after class to observe what happens to the balloon to demonstrate Charles’s law.
30	XIII. Scuba- or Deep-Water Diving Emergencies—Decompression Sickness A. Pathophysiology <ol style="list-style-type: none"> 1. In decompression sickness, bubbles that form from the expansion of nitrogen in the blood and tissues act as emboli, cause obstruction in the circulation and compress or stretch the blood vessels and nerves, and may cause coagulation of the blood. 2. Predisposing factors of decompression sickness <ol style="list-style-type: none"> a. Flying or going to a high altitude too soon after a dive (12–24 hours) b. Failure to take the necessary safety stops while ascending from a 	Discussion Question How does decompression sickness occur?
		Critical Thinking Discussion How does flying immediately after deep water diving increase the risk for dysbarism?
		Weblinks

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	<p style="text-align: center;">dive</p> <ul style="list-style-type: none"> c. Inadequate surface intervals d. Inadequate decompression or passing the no-decompression limit e. Diving at depths for too long a period of time f. Repeated dives at depth on the same day g. Poor physical condition h. Obesity i. Age j. Dehydration k. Heart or lung diseases or conditions l. Preexisting musculoskeletal injury m. Fatigue n. Cold water o. Rough sea conditions p. Heated diving suits q. Heavy work <p>B. Categories of decompression sickness (“the bends”)</p> <ul style="list-style-type: none"> 1. Type I decompression sickness (mild) <ul style="list-style-type: none"> a. Pain (very common; dull, aching, throbbing pain in joints or tendons) b. Pruritus (itching) and burning sensation of the skin c. Skin rash (mottling or marbeling) d. Skin with orange-peel appearance (rare) e. Painless pitting edema (uncommon) 2. Type II decompression sickness (serious) <ul style="list-style-type: none"> a. Nervous system <ul style="list-style-type: none"> i. Low back pain that progresses into paresis, paralysis, numbness, or tingling, loss of sphincter control, and girdle pain to the lower abdomen ii. Headache, visual disturbances, dizziness, tunnel vision iii. Altered mental status iv. Nausea, vomiting, vertigo, tinnitus, partial deafness b. Respiratory system (“chokes”) <ul style="list-style-type: none"> i. Substernal burning sensation on inhalation ii. Nonproductive cough iii. Respiratory distress c. Circulatory system <ul style="list-style-type: none"> i. Signs of hypovolemic shock ii. Formation of a thrombus 	<p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resource on diving accidents and SCUBA diving emergencies.</p>

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	<ul style="list-style-type: none"> 3. Common signs and symptoms when performing an assessment on a patient with DCS <ul style="list-style-type: none"> a. Fatigue b. Signs and symptoms of shock c. Pupillary changes d. Pallor to the tongue e. Bloody sputum f. Nasal flaring, retraction of the chest, and accessory muscle use g. Tachypnea h. Crackles i. SpO₂ < 95 percent prior to oxygen administration j. Vomiting k. Urinary bladder distention l. Seizure m. Uncoordinated movement, weakness, motor and sensory deficits n. Joint pain, decreased range of motion o. Edema p. Cyanosis, pallor, itching 4. Questions to ask in the history of a suspected DCS patient <ul style="list-style-type: none"> a. Where did the patient dive (river, lake, ocean, cave)? b. What was the lowest depth and for what period of time? c. What were the other depths and for what periods of time? d. What was the rate of ascent from the various depths? e. What has the patient done since the dive? Did the patient fly on an airplane? f. What did the patient do the 72 hours prior to the dive? g. Did the patient do any type of work during the dive? h. What gases did the patient use during the dive? i. Were there any problems experienced by the diver? j. What physical condition was the patient in before, during, and after the dive? k. Was any first aid provided for the patient? C. Arterial gas embolism (AGE) <ul style="list-style-type: none"> 1. Blockage of blood vessels by an air bubble or clusters of air bubbles 2. Interferes with perfusion of body tissues with oxygen and nutrients 3. Results from air in the lungs rapidly expanding, rupturing the alveoli, damaging adjacent blood vessels, and leading to air bubbles in the blood stream 	

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	<p>4. Signs and symptoms (rapid onset)</p> <ol style="list-style-type: none"> a. Itchy, blotchy, or mottled skin b. Difficulty in breathing c. Dizziness d. Chest pain e. Severe, deep aching pain in the muscles, joint, and tendons f. Blurred or distorted vision g. Partial deafness, distortion of senses h. Nausea and vomiting i. Numbness or paralysis j. Weakness or numbness on one side of the body k. Staggering gait or lack of coordination l. Frothy blood in the nose and mouth m. Swelling and crepitus in the neck n. Loss or distortion of memory o. Coma p. Cardiac or respiratory arrest q. Behavioral changes (sometimes the only sign) <p>D. Barotrauma (“the squeeze”)</p> <ol style="list-style-type: none"> 1. Occurs during ascent or descent when air pressure in the body’s air cavities becomes too great 2. Signs and symptoms <ol style="list-style-type: none"> a. Mild to severe pain in the affected areas b. Clear or bloody discharge from the nose or ears c. Extreme dizziness d. Nausea e. Disorientation 3. Patients suffering from barotraumas must be cased for at a medical facility immediately to prevent permanent deafness, residual dizziness, or the inability to dive in the future. <p>E. Emergency medical care</p> <ol style="list-style-type: none"> 1. If you suspect spine injury, establish in-line spine stabilization. If you do not suspect spine injury, place the patient in a lateral recumbent position. 2. Administer oxygen via nonrebreather mask if breathing and/or tidal volume are adequate or positive pressure ventilation in breathing and/or tidal volume are inadequate. 3. Initiate CPR and apply the AED if needed. 	<p>Knowledge Application Given several scenarios involving dysbarism, students should be able to assess and manage patients.</p> <p>Critical Thinking Discussion Use gas laws to explain how a recompression (hyperbaric) chamber works.</p>

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Minutes	Content Outline	Master Teaching Notes
	4. Transport the patient immediately (possibly to recompression chamber).	
10	<p>XIV. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 25 Summary. 2. Complete Chapter 25 In Review questions. 3. Complete Chapter 25 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 25 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Could anything more have been done to prevent intoxicated individuals from swimming in the pool? • How do you think Robby's life will be changed as a result of this incident? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 26

Behavioral Emergencies

110–120 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn special considerations of assessment and emergency care for a patient who has attempted or is threatening suicide as well as for patients suffering other behavioral emergencies.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What additional resources should you consider? • Should you attempt to ask the patient to put down the knife, or should you retreat and wait for police to arrive?
10	<p>II. Behavioral Problems—Behavioral Change</p> <p>A. Behavior is the way a person acts or performs.</p> <p>B. A behavioral emergency is a situation in which a person exhibits behavior that is unacceptable or intolerable to the patient, the family, or the community.</p> <p>C. Common reasons for behavior change</p> <ol style="list-style-type: none"> 1. Low blood sugar in a diabetic 2. Hypoxia 3. Inadequate blood flow to the brain 4. Head trauma 5. Mind-altering substances 6. Psychogenic substances 7. Excessive cold or heat 8. Infections of the brain 9. Seizure disorder 10. Toxic ingestion or overdose 11. Drug or alcohol withdrawal <p>D. Determine a behavioral emergency.</p> <ol style="list-style-type: none"> 1. General appearance 2. Speech 3. Skin 	<p>Discussion Question</p> <p>What are some causes of behavioral emergencies?</p>

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	<ol style="list-style-type: none"> 4. Posture or gait 5. Orientation 6. Memory 7. Awareness 8. Body language 9. Perception 10. Mood 11. Judgment <p>E. Determine a physical emergency.</p> <ol style="list-style-type: none"> 1. Sudden onset of symptoms 2. Visual hallucinations 3. Memory loss or impairment 4. Dilated, constricted, or unequal pupils 5. Excessive salivation 6. Incontinence 7. Unusual breath odors 	<p>Discussion Question What are some particular things to pay attention to during your assessment of a patient with a behavioral emergency</p>
10	<p>III. Behavioral Problems—Psychiatric Problems</p> <p>A. Anxiety—A state of painful uneasiness about impending problems</p> <ol style="list-style-type: none"> 1. Agitation 2. Restlessness 3. Panic attacks <p>B. Phobia—An irrational fear of specific things, places, or situations</p> <ol style="list-style-type: none"> 1. Intense fear 2. Restlessness 3. Tremors 4. Tachycardia 5. Irregular heartbeat 6. Dyspnea 7. Sweating 8. Diarrhea <p>C. Depression—A condition characterized by sadness, worthlessness, and discouragement</p> <ol style="list-style-type: none"> 1. Sad appearance 2. Crying spells 3. Apathetic behavior 4. Appetite loss 5. Sleeplessness 	<p>Knowledge Application Given several descriptions of characteristics of common psychiatric disorders, students should be able to categorize the disorders.</p> <p>Discussion Question What are the most common types of psychiatric disorders?</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on panic attacks, panic</p>

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	<ul style="list-style-type: none"> 6. Fatigue 7. Severe restlessness D. Bipolar disorder—A condition that causes a patient to swing to opposite sides of the mood spectrum <ul style="list-style-type: none"> 1. Manic phase 2. Depressive state 3. Delusions 4. Hallucinations E. Paranoia—Exaggerated and unwarranted mistrust or suspiciousness <ul style="list-style-type: none"> 1. Hostile 2. Uncooperative 3. Excitable 4. Unpredictable F. Psychosis—A state of delusion where the patient is out of touch with reality <ul style="list-style-type: none"> 1. Characteristics <ul style="list-style-type: none"> a. Angry b. Belligerent c. Withdrawn 2. Causes <ul style="list-style-type: none"> a. Mind-altering drugs b. Intense stress c. Delusional disorders d. Schizophrenia G. Schizophrenia—A group of mental disorders in which patients suffer debilitating distortions of speech and thought <ul style="list-style-type: none"> 1. Bizarre delusions 2. Hallucinations 3. Social withdrawal 4. Lack of emotional expressiveness 	<p>disorders, and agoraphobia.</p> <p>Discussion Question What is schizophrenia?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on schizophrenia.</p>
10	<p>IV. Behavioral Problems—Violence</p> <ul style="list-style-type: none"> A. Suicide—A willful act designed to end one’s own life <ul style="list-style-type: none"> 1. Statistics <ul style="list-style-type: none"> a. Eighth leading cause of death in the U.S. among males b. Third leading cause of death among people between the ages of 15 and 24 years c. Most common methods <ul style="list-style-type: none"> i. Self-inflicted gunshot wound 	<p>Discussion Question What are some risk factors for suicide?</p>

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	<ul style="list-style-type: none"> ii. Hanging iii. Poisoning by ingestion iv. Carbon monoxide poisoning 2. Risk factors and potential signs <ul style="list-style-type: none"> a. History of depression or other mental disorders b. Previous suicidal attempts c. History of abuse d. Unwillingness to seek mental health care e. Feeling of being isolated f. Local epidemic of suicide g. History of impulse or aggressive behavior h. Inability to access mental health care i. Recent diagnosis of serious illness j. Recent loss of a loved one, job, money, or social loss k. Age between 15 and 24 years or over 40 years l. Alcohol or drug use m. Divorced or widowed n. Gives away personal belongings o. Psychosis with depression p. Homosexuality q. Major physical stress or long periods of sleep deprivation r. Suicide of same-sexed partner s. Expression of a plan for committing suicide t. Availability of the mechanism to carry out the suicide B. Agitated delirium—A mental state and physiological response also known as excited delirium <ul style="list-style-type: none"> 1. Characteristics <ul style="list-style-type: none"> a. Unusual strength and endurance b. Tolerance of pain c. Agitation d. Hostility e. Frenzied and bizarre behavior f. Hot and diaphoretic skin g. Unusual speech 2. Concerns <ul style="list-style-type: none"> a. It can be difficult to differentiate between excited delirium and violence. b. Without restraint, the patient is a potential danger. 	<p>Discussion Question What are indications that a patient may become violent?</p> <p>Critical Thinking Discussion What do you think the experience of a patient with a mental illness is like?</p>

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	<ul style="list-style-type: none"> c. Consider early contact with advanced life support for consideration of the use of a drug as a chemical restraint. C. Violence to others—A behavioral emergency patient that becomes assaultive or violent <ul style="list-style-type: none"> 1. Possible causes <ul style="list-style-type: none"> a. Patient mismanagement b. Psychosis c. Alcohol or drug intoxication d. Fear e. Panic f. Head injury 2. Early signs <ul style="list-style-type: none"> a. Nervous pacing b. Shouting c. Threatening d. Cursing e. Throwing objects f. Clenched teeth and/or fists 	
5	<p>V. Dealing With Behavioral Emergencies—Basic Principles</p> <ul style="list-style-type: none"> A. Every person has limitations. B. Each person has a right to his feelings. C. Each person has more ability to cope with crisis than he might think. D. Everyone feels some emotional disturbance when involved in a disaster or when injured. E. Emotional injury is just as real as physical injury. F. People who have been through a crisis do not just “get better.” G. Cultural differences have special meaning when you are called to intervene in behavioral emergencies. 	
10	<p>VI. Dealing With Behavioral Emergencies—Techniques for Treating Behavioral Emergency Patients</p> <ul style="list-style-type: none"> A. Approach the patient slowly and with a purpose. B. Engage in active listening. C. Be supportive and empathetic. D. Limit the interruptions in the interview. E. Respect the patient’s space. F. Limit physical touch until a rapport is established. 	<p>Discussion Question What are some useful techniques for communicating with the patient who has a behavioral emergency?</p>

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	<ul style="list-style-type: none"> G. Avoid any action the patient may interpret as threatening. H. Avoid any questions or statements the patient may construe as threatening. I. Speak in a calm, reassuring voice directly to the patient. J. Maintain a comfortable distance between yourself and the patient. K. Seek the patient's cooperation. L. Maintain good eye contact with the patient. M. Do not make any quick movements. N. Respond honestly to the patient's questions, but don't foster unrealistic expectations. O. Never threaten, challenge, belittle, or argue with disturbed patients. P. Always tell the truth; never lie to the patient. Q. Do not "play along" with visual or auditory disturbances. R. When you can, involve trusted family members or friends. S. Be prepared to spend time at the scene. T. Never leave the patient alone. U. Avoid the use of restraints. V. Do not force the patient to make decisions. W. Encourage the patient to participate in a motor activity, which helps reduce anxiety. X. If the patient has attracted a crowd, do what you can to disperse it. 	<p>Teaching Tip Use a mental health professional as a guest speaker for this content</p>
20	<p>VII. Dealing With Behavioral Emergencies—Assessment-Based Approach: Behavioral Emergencies</p> <ul style="list-style-type: none"> A. Scene size-up <ul style="list-style-type: none"> 1. Never enter a potentially violent situation without backup. 2. Be alert not to fall victim to a mechanism planned in a suicide. 3. Locate the patient visually before you enter the scene. 4. Always stay between the patient and an open door so you can exit quickly if necessary. 5. Never let your guard down or turn your back on the patient. 6. Discreetly move dangerous articles out of the way. 7. Never ignore or disregard a weapon. 8. Scan for items that may have contributed to the crisis. 9. Determine the number of patients in case there is more than one. B. Primary assessment <ul style="list-style-type: none"> 1. Gather a general impression of the patient. 2. Ask questions to assess mental status. 3. Watch the patient's appearance, level of activity, and speech patterns. 	<p>Discussion Question What are some specific scene safety considerations on a behavioral emergency call?</p> <p>Critical Thinking Discussion Why do so many people have trouble displaying empathy and respect toward patients with psychiatric illnesses?</p>

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	<ul style="list-style-type: none"> 4. Determine if the patient is oriented to time, person, and place. 5. Pay attention to the patient's airway and breathing. 6. If a patient has attempted suicide, make caring for his trauma your priority. C. Secondary assessment <ul style="list-style-type: none"> 1. Procedure <ul style="list-style-type: none"> a. Try to obtain a history. b. Pay attention to medications taken. c. Note the events leading to the emergency. d. Inform the patient of what you are doing. e. Ask questions in a calm, reassuring voice. f. Remain polite and show respect. g. Allow the patient to tell you what happened, in privacy if possible. h. Show that you are listening. i. Provide supportive, truthful information. 2. Evaluation <ul style="list-style-type: none"> a. Intellectual function b. Orientation c. Memory d. Concentration e. Judgment f. Thought content g. Language h. Mood 3. Suicidal patients <ul style="list-style-type: none"> a. Look for injuries or medical conditions related to the suicide attempt. b. Listen carefully. c. Accept all the patient's complaints and feelings. d. Do not trust "rapid recoveries." e. Be specific in your actions. f. Never show disgust or horror when you care for the patient. g. Do not try to deny that the suicide attempt occurred. h. Never try to shock a patient out of a suicidal act. 4. Violent patients <ul style="list-style-type: none"> a. Take a history. b. Look at the patient's posture. c. Listen to the patient. d. Monitor the patient's physical activity. 	<p>Video Clips Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access video clips presenting personal accounts of battles with anorexia and bulimia.</p>

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	<ul style="list-style-type: none"> e. Be firm and clear. f. Be prepared to use restraints but only if necessary. 5. Signs and symptoms <ul style="list-style-type: none"> a. Fear b. Anxiety c. Confusion d. Behavioral changes e. Anger f. Mania g. Depression h. Withdrawal i. Loss of contact with reality j. Sleeplessness k. Loss of appetite l. Loss of sex drive m. Constipation n. Crying o. Tension p. Irritability D. Emergency medical care <ul style="list-style-type: none"> 1. Your safety is of utmost importance. 2. Assess the patient for trauma or a medical condition. 3. Calm the patient, and stay with the patient. 4. Use restraints if it is necessary to protect yourself or others, or the patient from harming himself. 5. Transport the patient to a facility where he can get the physical and psychological treatment that is needed. 	<p>Discussion Question What are the priorities of care in the management of patients with behavioral emergencies?</p>
10	<p>VIII. Dealing With Behavioral Emergencies—Summary: Assessment and Care</p> <ul style="list-style-type: none"> A. Review assessment findings and emergency care for a behavioral emergency. B. Review Figure 26-3 and Figure 26-4. 	<p>Class Activity Break the class into groups of three or four. Each student will, in turn, play the role of the EMT, a patient with a behavioral emergency, and an observer who will give feedback to the student playing the EMT role. Students will use therapeutic interviewing techniques to manage a patient with a behavioral emergency and</p>

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		<p>will receive feedback on their skills from both the student observer and the patient. Reconvene the class and have students share what they learned.</p>
<p style="text-align: center;">15</p>	<p>IX. Dealing With Behavioral Emergencies—Restraining a Patient</p> <p>A. Restraint should be avoided unless the patient is a danger to himself and/or others.</p> <p>B. Restraints may require police authorization.</p> <p>C. If you are not authorized by state law to use restraints, wait for someone with the proper authority.</p> <p>D. Do not restrain a patient in a prone (face-down) position.</p> <ol style="list-style-type: none"> 1. This position may lead to inadequate breathing results in hypoxia and acidosis, which may cause cardiac arrest. 2. In this position, it is impossible to adequately assess the airway and the ventilatory status. <p>E. Restrain patients in a supine position or a lateral position if necessary.</p> <p>F. Restraints should be human restraints.</p> <ol style="list-style-type: none"> 1. Soft leather 2. Cloth 3. Cravats 4. Wide roller gauze <p>G. Procedure</p> <ol style="list-style-type: none"> 1. Gather enough people to overpower the patient rapidly. 2. Plan your activities before you attempt restraint. 3. Use only as much force as needed for restraint. 4. Estimate the range of motion of the patient's arms and legs. 5. Act quickly. 6. One rescuer should talk to the patient throughout the restraining process. 7. Approach the patient with at least four rescuers at the same time. 8. Secure the patient's limbs with equipment approved by medical direction. 9. Secure the patient to the stretcher in a supine position with multiple straps. 10. If the patient is spitting on rescuers, cover his face with a disposable surgical mask. 	<p>Discussion Question</p> <p>What guidelines and principles should you follow when restraining a patient?</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Inform students of local protocols regarding the use of restraints. • Show students an example of restraints that are considered acceptable in your community. <p>Critical Thinking Discussion</p> <p>Explain how the use of restraints can lead to patient death.</p> <p>Video Clip</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip reviewing the procedure for applying soft restraints.</p>

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	<p>11. Once you have applied restraints, do not remove them.</p> <p>12. Document reasons for restraints and technique used.</p>	
4	<p>X. Legal Considerations—Consent</p> <p>A. Consent is permission to treat.</p> <p>B. Informed consent means that the person who is to receive the treatment must understand what it involves.</p> <p>C. In most states, forcing a person to have treatment against his will is grounds for a charge of assault and battery.</p> <p>D. Anyone age 18 or over can give consent for his own care in most states.</p> <p>E. Emancipated patients, those under age 18 who are in the armed services or are married, pregnant, or a parent, can also give consent.</p> <p>F. For patients under age 18 who are not emancipated, consent to treat should come from a parent, guardian, or blood relative.</p> <p>G. For mentally incompetent patients, consent to treat should come from a parent, guardian, or blood relative.</p> <p>H. Implied consent is the belief that the person who could grant consent would if he were present or able to do so.</p>	<p>Discussion Question What is meant by <i>informed consent</i>?</p> <p>Knowledge Application Given several patient descriptions, students should be able to judge whether or not the patient meets criteria for implied consent.</p>
4	<p>XI. Legal Considerations—Refusal of Care</p> <p>A. Emotionally disturbed patients commonly refuse treatment.</p> <p>B. If the disturbed person is alert and oriented, he still must legally provide consent.</p> <p>C. A patient who is disoriented, in shock, mentally ill, or under the influence of drugs or alcohol may not be considered competent to refuse care.</p> <p>D. Document carefully and thoroughly all aspects of the encounter.</p> <p>E. Complete a refusal-of-care form, and have it signed and witnessed by a police officer.</p> <p>F. If a patient threatens to hurt himself or others and you can demonstrate reason to believe that the patient's threats are real, you can transport that patient without his consent.</p>	<p>Teaching Tip Discuss specific protocols for your area.</p> <p>Discussion Question Under what circumstances could you treat a patient with a behavioral emergency without his consent?</p>
4	<p>XII. Legal Considerations—Using Reasonable Force</p> <p>A. Reasonable force is the minimum amount of force required to keep the patient from injuring himself or others.</p> <p>B. In most areas, police authorization is necessary to use reasonable force in</p>	<p>Teaching Tip Demonstrate appropriate techniques for subduing and restraining a patient.</p>

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	<p>restraining or transporting a patient without consent.</p> <p>C. General considerations when using reasonable force</p> <ol style="list-style-type: none"> 1. The size and strength of the patient 2. The type of behavior exhibited by the patient 3. The mental state of the patient 4. The method of restraint <p>D. A patient who has become calm may suddenly revert to combativeness and aggression.</p>	
4	<p>XIII. Legal Considerations—Police and Medical Direction</p> <p>A. Involve your chain of command in any case where you might need to use reasonable force.</p> <p>B. Seek medical direction.</p> <p>C. Involve law enforcement personnel.</p> <ol style="list-style-type: none"> 1. Protection from injury 2. Credible witnesses 	<p>Critical Thinking Discussion</p> <p>How can you describe the behavior and mental status of a behavioral emergency patient objectively?</p>
4	<p>XIV. Legal Considerations—False Accusations</p> <p>A. Carefully and completely document everything that happens.</p> <p>B. Have witnesses.</p> <ol style="list-style-type: none"> 1. Involve other medical responders. 2. Use medical responders that are the same gender as the patient. 3. Involve third-party witnesses. 4. Carefully document your physical assessment. <p>C. Have witnesses sign a written report of the incident.</p>	<p>Discussion Question</p> <p>What are some ways to avoid liability when managing and transporting a patient with a behavioral emergency?</p>
10	<p>XV. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 26 Summary. 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Are there any reasons why you might expect a sudden deterioration in physical status in Maria or a patient like her? • What would you talk about with Maria during transport? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several</p>

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	<ol style="list-style-type: none"> 2. Complete Chapter 26 In Review questions. 3. Complete Chapter 26 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 26 quiz 	<p>minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan
Chapter 27
Trauma Overview: The Trauma Patient and
the Trauma System
100–120 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn special considerations in sizing up the mechanism of injury.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • How do speed and direction of impact affect the potential for patient injuries? • Other than injuries to the knees, are there other injuries that you should look for in this patient based on the type of impact?
8	<p>II. The Kinetics of Trauma—Mass and Velocity</p> <p>A. Mechanism of injury (MOI) refers to how a person was injured.</p> <p>B. Kinetics of trauma is the science of analyzing mechanisms of injury.</p> <p>C. Kinetic energy is the energy contained in a moving body.</p> <ol style="list-style-type: none"> 1. Kinetic energy is directly proportional to mass. 2. Kinetic energy is directly proportional to the square of velocity. <p>D. During scene size-up, get the best estimate you can of the speed the vehicle or vehicles were going at the time of collision.</p> <p>E. The kinetic energy of two moving bodies that collide will be combined.</p>	<p>Teaching Tip Use simple demonstrations with toy vehicles to explain the laws of motion.</p> <p>Knowledge Application Given several descriptions of mass and velocity, students should be able to calculate the kinetic energy exchanged in an impact.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on Newton's laws of motion.</p>
4	<p>III. The Kinetics of Trauma—Acceleration and Deceleration</p> <p>A. The motion of an object will not change unless a force acts upon it.</p> <ol style="list-style-type: none"> 1. Acceleration is an increase in speed. 2. Deceleration is a decrease in speed. <p>B. A faster acceleration or deceleration results in a greater force on the human</p>	<p>Teaching Tip Give several examples of changes of velocity and mass in the kinetic energy equation to demonstrate the effects of each.</p>

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	body.	<p>Discussion Question What are the effects of rates of acceleration or deceleration on force?</p>
4	<p>IV. The Kinetics of Trauma—Energy Changes Form and Direction</p> <p>A. If energy is transmitted to a body in a straight line, injury may not occur.</p> <p>B. If energy is interrupted, injury can occur.</p> <ol style="list-style-type: none"> 1. May be interrupted by a curve in a bone 2. May be interrupted by an organ between hard surfaces 3. May be interrupted by tissue pulled against a fixed point 	<p>Discussion Question How is mechanism of injury related to kinetics of trauma?</p>
4	<p>V. The Kinetics of Trauma—Impacts</p> <p>A. Types of Impacts</p> <ol style="list-style-type: none"> 1. Vehicle collision—The vehicle is suddenly stopped and gets bent out of shape. 2. Body collision—The patient comes to a quick stop on some part or parts of the inside. 3. Organ collision—The patient’s internal organs come to a quick stop. <p>B. Investigating kinetics</p> <ol style="list-style-type: none"> 1. A person in or on a moving vehicle who gets thrown has a much greater chance for injury than one who is restrained or remains within the vehicle. 2. The faster a vehicle is traveling, the greater the kinetic energy is, the greater the force, and the greater the potential for injury. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • Explain the three impacts that occur in a motor vehicle collision. What law of motion accounts for the three collisions? • How do mass and velocity each affect the amount of energy transferred to the human body? <p>Critical Thinking Discussion How do laws of physics explain why you might break a bone if you punched a brick wall with your fist, but why you would not be likely to break a bone if you struck a pillow with the same velocity?</p>
15	<p>VI. Mechanisms of Injury—Vehicle Collisions</p> <p>A. Situations that should have a high index of suspicion</p> <ol style="list-style-type: none"> 1. Death of another occupant of the vehicle 2. An unresponsive patient or patient with an altered mental status 3. Intrusion of greater than 12 inches for the occupant site or greater than 18 inches anywhere to the vehicle 4. Ejection from the motor vehicle <p>B. Classification of motor vehicle collisions</p> <ol style="list-style-type: none"> 1. Frontal impact 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What injuries are predicted in frontal motor vehicle collisions? • What are the variables that affect severity and patterns of injury in vehicle-pedestrian collisions?

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	<ul style="list-style-type: none"> a. Abdomen b. Chest c. Face, head, and neck 2. Rear-end impact <ul style="list-style-type: none"> a. Head b. Neck 3. Lateral impact <ul style="list-style-type: none"> a. Head and neck b. Chest and abdomen c. Pelvis 4. Rotational or rollover crash <ul style="list-style-type: none"> a. Multiple systems injury is common. b. Ejection is common. c. Crushing injuries to ejected occupants are common. 5. Vehicle-pedestrian collision <ul style="list-style-type: none"> a. The speed of the vehicle b. What part of the pedestrian's body was hit c. How far the pedestrian was thrown d. The surface the pedestrian landed on e. The body part that first struck the ground 6. Restraints—A cause of hidden injuries <ul style="list-style-type: none"> a. Air bags b. Seat belts 7. Considerations for infants and children <ul style="list-style-type: none"> a. Any parts of the body that are not restrained continue to move forward. b. Children should always be restrained in the back seat to avoid injury from air bag deployment. 8. Motorcycle collisions <ul style="list-style-type: none"> a. Head-on impact b. Angular impact c. Ejection d. "Laying the bike down" 	<p>Animations Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access animations on types of motor vehicle collisions and anticipated injuries related to mechanism of injury in vehicle collisions.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource providing safety information about protecting children in and from motor vehicle accidents.</p> <p>Class Activity Break the class into small groups. Give each group a photograph of a motor vehicle collision. Have the group analyze the photo and make a list of predicted injuries from the collision. Have each group present any findings to the class for further discussion and analysis.</p> <p>Critical Thinking Discussion You have a family member who refuses to wear a seatbelt because he states he is afraid that if he crashed into a body of water, he might not be able to get his seatbelt off and would drown. How can you convince your relative that it would be better to wear a seatbelt?</p>
10	<p>VII. Mechanisms of Injury—Falls</p> <ul style="list-style-type: none"> A. Severity factors <ul style="list-style-type: none"> 1. Distance 	<p>Discussion Question What factors affect the severity and pattern of injury produced in falls?</p>

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	<ul style="list-style-type: none"> 2. Surface 3. Body part impacted first 4. Objects that interrupt the fall B. Feet-first falls <ul style="list-style-type: none"> 1. Fractures of the heels and fractures or dislocations of the ankles are common. 2. The spine will absorb the force at every curve of the lumbar. 3. In falls of more than 20 feet, the internal organs are likely to be injured from deceleration forces. 4. A fracture of the wrist bones is common. 5. If the body is thrown backward, the most common injuries are to the head, back, and pelvis. C. Head-first falls <ul style="list-style-type: none"> 1. Injury begins with the arms and extends up to the shoulders. 2. The head may be forcibly hyperextended, hyperflexed, or compressed. 3. Extensive damage to the cervical spine can occur. 4. Chest, lower spine, and pelvic injuries are also common. 	<p>Knowledge Application Given several descriptions of mechanism of injury, students should be able to develop an index of suspicion for patterns and severity of injuries.</p>
10	<p>IX. Mechanisms of Injury—Penetrating Injuries</p> <ul style="list-style-type: none"> A. Low-velocity injuries <ul style="list-style-type: none"> 1. An object impaled in the body exerts damage to the immediate area of impact and its underlying structures. 2. The length of the object used provides valuable clues about the injury. B. Medium-and-high velocity injuries <ul style="list-style-type: none"> 1. Trajectory is the path or motion of a projectile during its travel. 2. Dissipation of energy is the way energy is transferred to the human body from the force acting upon it. <ul style="list-style-type: none"> a. Drag b. Profile c. Cavitation d. Fragmentation C. Gunshot wounds <ul style="list-style-type: none"> 1. Of fatal wounds, 90 percent involves the head, thorax, and abdomen. 2. Wounds also occur to the neck and extremities. <ul style="list-style-type: none"> a. Head <ul style="list-style-type: none"> i. A projectile entering the skull causes the brain tissue to be compressed. ii. A projectile entering the face threatens the airway. 	<p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation presenting information about entrance and exit wounds.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on gun violence.</p>

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	<ul style="list-style-type: none"> b. Chest <ul style="list-style-type: none"> i. Pneumothorax is a common result of injury to the chest and/or lung. ii. The outer covering of the heart may be able to seal itself off from low-velocity projectile wounds, but medium- and high-velocity projectiles are likely to cause significant wounds. iii. Suspect both thoracic and abdominal injury if the entrance wound is between the nipple line and the waist. c. Abdomen <ul style="list-style-type: none"> i. The abdomen is often secondarily injured when the chest is injured. ii. The majority of abdominal wounds are not rapidly fatal but need surgical repair. d. Extremities <ul style="list-style-type: none"> i. Bone injury from a projectile results in bony fragments becoming secondary missiles. ii. Muscle expands, resulting in capillary tears and swelling. iii. Vessels can be severed, ripped, buckled, and/or obstructed. 	
10	<p>X. Mechanisms of Injury—Blast Injuries</p> <ul style="list-style-type: none"> A. Primary phase injuries are due to the pressure wave of the blast. B. Secondary phase injuries are due to flying debris propelled by the force of the blast. C. Tertiary phase injuries occur when the patient is thrown away from the source of the blast. 	<p>Discussion Question What types of injuries are produced in each of the three phases of a blast?</p> <p>Teaching Tip Inform students of local trauma triage criteria based on mechanism of injury.</p>
5	<p>XI. The Multisystem Trauma Patient</p> <ul style="list-style-type: none"> A. A multisystem trauma patient has multiple injuries or involvement of more than one body system. B. Multiple organ injuries also are considered to be multisystem trauma. C. Multisystem trauma carries a high incidence of morbidity and mortality. 	<p>Discussion Question What is meant by <i>multisystem trauma</i>?</p>
5	<p>XII. The Golden Period</p> <ul style="list-style-type: none"> A. The “golden period” relates to the time during which a patient needs intervention in order to survive. B. The length of time indicated by the “golden period” depends on the patient injury. C. The EMT must assess, treat, and transport the injured patient as quickly as 	<p>Discussion Question Why is it difficult to assign an exact time to the golden period?</p>

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	<p>possible.</p> <p>D. The “platinum ten minutes” is the maximum time the EMS team should devote to on-scene activities with patient assessment, emergency care for life threats, and preparation for transport.</p> <p>E. If a patient is not severely injured, more time can be devoted to completing normal on-scene assessment and emergency care before transport.</p>	
10	<p>XIII. The Trauma System</p> <p>A. The trauma system was designed to provide immediate surgical intervention for patients with internal trauma.</p> <p>B. The trauma system requires significant resources and is expensive to maintain and operate.</p> <p>C. Common designation of trauma centers</p> <ol style="list-style-type: none"> 1. Level I—Regional Trauma Center 2. Level II—Area Trauma Center 3. Level III—Community Trauma Center 4. Level IV—Trauma Facility <p>D. It is crucial that EMS personnel triage patients accurately for transport to an appropriate trauma center.</p>	<p>Teaching Tip Discuss trauma centers available in your community.</p> <p>Discussion Question What are the capabilities of a Level I Trauma Center?</p> <p>Critical Thinking Discussion Why is a Level I Trauma Center not feasible for all communities?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on trauma scenarios.</p>
20	<p>XIV. Golden Principles of Out-Of-Hospital Trauma Care—Special Considerations in Trauma Care</p> <p>A. Principles of out-of-hospital trauma care</p> <ol style="list-style-type: none"> 1. Ensure at all times the safety of the EMS personnel, patients, and bystanders. 2. Quickly determine the need for additional resources at the scene. 3. Determine the mechanism of injury and kinematics involved in producing real or potential injuries. 4. Provide a primary assessment. 5. Establish and maintain spine stabilization for patients suspected of having a vertebral or spinal cord injury. 6. Establish and maintain a patent airway. 7. Establish and maintain adequate oxygenation in the patient with an 	

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	<p>adequate rate and adequate tidal volume.</p> <ol style="list-style-type: none"> 8. Provide positive pressure ventilation. 9. Control external hemorrhage with direct pressure. 10. Treat for shock. 11. Consider the application of the PASG. 12. Maintain manual spine stabilization until the patient is completely immobilized on a backboard. 13. Transport critically injured or multisystem trauma patients within ten minutes to the appropriate trauma facility. 14. Obtain a history from the patient, relatives, or bystanders. 15. Perform a secondary assessment. <p>B. Special considerations in the trauma patient</p> <ol style="list-style-type: none"> 1. Your personal safety is of utmost importance. 2. Airway management and adequate ventilation and oxygenation are key elements in managing the trauma patient. 3. Stop significant bleeding. 4. Assessment of the trauma patient is conducted in a sequence that promotes a systematic approach to the patient. 5. Rapid transport of the severely injured patient is essential to his survival. 6. A backboard can serve to secure suspected fractures in an unstable patient who requires rapid transport. 7. Do not develop tunnel vision and become focused on dramatic injuries or dramatic patients. 	<p>Critical Thinking Discussion What is the relationship between each of the golden principles and increased chances of survival for trauma patients?</p>
10	<p>XV. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 27 Summary. 2. Complete Chapter 27 In Review questions. 3. Complete Chapter 27 Critical Thinking. <p>D. Assessments</p>	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Under what circumstances would Mike have been a candidate for rapid extrication? • Explain the mechanism by which Mike may have sustained an injury to the cervical spine. <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p>

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	<ol style="list-style-type: none"> 1. Handouts 2. Chapter 27 quiz 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 28

Bleeding and Soft-Tissue Trauma

180–220 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about bleeding and shock.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What is your primary concern with this patient? • What organs may have been injured in the stabbing?
6	<p>II. External Bleeding—Severity</p> <p>A. Variables that determine the severity of blood loss</p> <ol style="list-style-type: none"> 1. Amount of blood loss 2. Rate of blood loss 3. Other injuries or existing conditions 4. Patient's existing medical problems 5. Patient's age <p>B. The severity of bleeding relative to the amount of blood loss is dependent on the patient.</p> <p>C. Uncontrolled bleeding or significant blood loss can lead to hemorrhagic shock and quite possibly to death.</p>	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Use some red soft drink, red food coloring, some old clothing, a large, clear container of water, and a syringe to demonstrate the difficulty in quantifying blood loss. • Without showing students how much liquid you have in the syringe, place some on an old t-shirt and have students try to estimate the amount of liquid involved. (In this case, a little can look like a lot.) <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some factors that can affect the severity of blood loss? • How much blood loss typically results in signs and symptoms of shock? • How can you estimate how much blood loss has occurred?

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		<p>Critical Thinking Discussion How is a 200 mL blood loss different in an average eight-year-old child than in a 20-year-old adult?</p>
6	<p>III. External Bleeding—Types of Bleeding</p> <p>A. Arterial bleeding—Bright red, spurting blood from a wound usually indicates a severed or damaged artery.</p> <ol style="list-style-type: none"> 1. Rich in oxygen 2. spurts with pulse 3. Can be more difficult to control than any other type of bleeding because of the higher pressure in the arteries 4. Decreases with patient’s blood pressure <p>B. Venous bleeding—Dark red blood that flows steadily from a wound usually indicates a severed or damaged vein.</p> <ol style="list-style-type: none"> 1. Depleted of oxygen 2. Steady flow <p>C. Capillary bleeding—Dark or intermediate color of red; slowly oozing blood usually indicates damaged capillaries.</p> <ol style="list-style-type: none"> 1. Easily controlled in most cases 2. Clots spontaneously 3. Can pose serious threat of infection 	<p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation labeling the bones of the skeletal system.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip on ways to control bleeding.</p>
10	<p>IV. External Bleeding—Methods of Controlling External Bleeding</p> <p>A. Direction pressure</p> <ol style="list-style-type: none"> 1. Place a sterile gauze pad or dressing over the injury site. 2. Applying fingertip pressure directly to the point of bleeding. 3. Remove dressings and apply direct pressure to the point of bleeding if necessary. 4. Apply direct pressure on either side of an impaled object. <p>B. Tourniquets</p> <ol style="list-style-type: none"> 1. Use a bandage or commercial device that is four inches wide. 2. Wrap the tourniquet around the extremity at a point just proximal to the bleeding. 3. Tighten the tourniquet until the hemorrhage ceases. 4. Secure the tightening rod or device. 5. Write the time of tourniquet application on tape and secure it to the tourniquet. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What is the approach to controlling external bleeding? • What principles must you follow when using a tourniquet to control bleeding? <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on tourniquets.</p>

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	<ul style="list-style-type: none"> 6. Never cover the tourniquet or site of bleeding. 7. Notify the receiving medical facility that a tourniquet has been applied. 8. Document the use of the tourniquet and the time it was applied in the prehospital care report. 9. In some cases, an inflated blood pressure cuff may be used as a tourniquet until bleeding stops C. Elevation <ul style="list-style-type: none"> 1. No evidence shows that elevation is an effective method to control or slow bleeding. 2. No evidence shows that elevation is harmful. 3. Elevation can only be considered if it is done in conjunction with direct pressure. D. Splints <ul style="list-style-type: none"> 1. Splinting the extremity may assist with control of bleeding associated with a possible fracture. 2. The application of a traction splint serves not only as a splint but also as a method of bleeding control. 3. Apply splints on scene to extremity fractures only if the patient is stable and there are no life threats. E. Topical hemostatic agents <ul style="list-style-type: none"> 1. Dressings that promote clotting <ul style="list-style-type: none"> a. Hemostatic dressing b. Chitosan dressing 2. Hemostatic agents poured onto the wound <ul style="list-style-type: none"> a. Celox and QuickClot b. TraumaDex 	<p>Discussion Question What are the roles of elevation, splinting, and topical hemostatic agents in controlling external bleeding?</p>
10	<p>V. External Bleeding—Assessment-Based Approach: External Bleeding</p> <ul style="list-style-type: none"> A. Scene size-up, primary assessment, and rapid secondary assessment <ul style="list-style-type: none"> 1. Begin preparing while en route. 2. Put on gloves and eye protection. 3. Make certain that the appropriate support agencies have been notified. 4. Make sure the scene is safe before you enter. 5. Note the number of patients at the scene. 6. Gather a general impression of the patient. 7. Ensure that the patient has a patent airway. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on bleeding.</p>

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	<ul style="list-style-type: none"> 8. Control any bleeding, but also be sure to continue with the primary assessment. 9. Perform the rapid secondary assessment in any patient who has suffered significant bleeding, who has an altered mental status, who presents with multiple injuries, or who has suffered a significant mechanism of injury. 10. Be sure to obtain a set of baseline vital signs. B. Emergency medical care <ul style="list-style-type: none"> 1. Take the necessary Standard Precautions. 2. Apply direct pressure. 3. Apply a tourniquet if direct pressure has failed. 4. Provide care for shock. 5. Immobilize injured extremities. C. Reassessment <ul style="list-style-type: none"> 1. Ensure that the bleeding is still under control. 2. Be alert for wounds that may suddenly begin to bleed again. 3. Repeat the primary assessment. 4. Obtain a set of vital signs every five minutes if the patient appears to be unstable. 5. Provide additional emergency care and assessment as necessary. 	
8	<p>VI. External Bleeding—Bleeding from the Nose, Ears, or Mouth</p> <ul style="list-style-type: none"> A. Possible causes <ul style="list-style-type: none"> 1. Skull injury 2. Facial trauma 3. Digital trauma 4. Sinusitis and other upper respiratory tract infections 5. Hypertension 6. Clotting disorders 7. Esophageal disease B. Epistaxis <ul style="list-style-type: none"> 1. Bleeding from the nose 2. May result from injury, disease, or the environment 3. Place the patient in a sitting position and have him lean forward. 4. Apply direct pressure by pinching the fleshy portion of the nostrils together. 5. Apply ice or a cold pack over the bridge of the nose 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on nosebleeds.</p>
	VII. Internal Bleeding—Severity	Discussion Question

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Minutes	Content Outline	Master Teaching Notes
15	<p>A. Severity depends on the patient’s overall condition, age, other medical conditions, and source of the internal bleeding.</p> <p>B. Common sources</p> <ol style="list-style-type: none"> 1. Injured or damaged internal organs 2. Fractured extremities <p>C. Hematoma is a contained collection of blood.</p> <p>D. Always suspect internal bleeding in cases of unexplained signs and symptoms of hemorrhagic shock.</p>	<p>What are some causes of internal bleeding?</p> <p>Critical Thinking Discussion How can fractures of the femur or pelvis result in so much blood loss?</p>
15	<p>IX. Internal Bleeding—Assessment-Based Approach: Internal Bleeding</p> <p>A. Scene size-up and primary assessment</p> <ol style="list-style-type: none"> 1. Look for and evaluate potential mechanisms of injury. 2. Look for any obvious external bleeding that is considered major. 3. If a major bleed is found, immediately control it with direct pressure. 4. Assess the patient’s mental status. 5. Assess the airway and ensure that it is patent. 6. Assess the pulses, skin, and capillary refill. <p>B. Secondary assessment</p> <ol style="list-style-type: none"> 1. If you suspect internal bleeding, proceed to a rapid secondary assessment. 2. If there is evidence of contusions, abrasions, deformity, impact marks, swelling, or other trauma, treat the patient for internal bleeding. 3. Signs and symptoms of internal bleeding <ol style="list-style-type: none"> a. Pain, tenderness, swelling, or discoloration of suspected site of injury b. Bleeding from the mouth, rectum, vagina, or other orifice c. Vomiting bright red blood or blood the color of dark coffee grounds d. Dark, tarry stools, or stools with bright red blood e. Tender, rigid, and/or distended abdomen 4. Signs and symptoms of internal bleeding that also indicate hemorrhagic shock <ol style="list-style-type: none"> a. Anxiety, restlessness, combativeness, or altered mental status b. Weakness, faintness, or dizziness c. Thirst d. Shallow, rapid breathing e. Rapid, thready pulse f. Pale, cool, clammy skin 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some signs and symptoms of internal bleeding? • What are the treatment priorities for patients with internal bleeding? <p>Knowledge Application Given several patient descriptions, students should be able to identify indications of internal bleeding and hemorrhagic shock.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> g. Delayed capillary refill h. Dropping blood pressure i. Narrow pulse pressure j. Dilated pupils that are sluggish in responding to light k. Nausea and vomiting <p>C. Emergency medical care</p> <ol style="list-style-type: none"> 1. Take Standard Precautions. 2. Maintain an open airway and adequate breathing. 3. Administer oxygen by a nonrebreather mask. 4. Control external bleeding with direct pressure. 5. Apply a tourniquet if direct pressure is unsuccessful. 6. Provide immediate transport to critical or unstable patients. 7. Provide care for shock. <p>D. Reassessment</p>	
5	<p>X. Factors That May Increase Bleeding</p> <p>A. Several factors may interfere with the clotting process.</p> <p>B. Factors</p> <ol style="list-style-type: none"> 1. Movement 2. Low body temperature 3. Medications 4. Intravenous fluids 5. Removal of dressings and bandages 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some ways to reduce movement of an injured area? • What are some medications that can interfere with blood clotting? <p>Critical Thinking Discussion For what types of medical problems would a patient take Coumadin (warfarin)?</p>
15	<p>XI. Hemorrhagic Shock—Assessment-Based Approach: Hemorrhagic Shock</p> <p>A. Scene size-up and primary assessment</p> <ol style="list-style-type: none"> 1. Take note of any potential mechanism of injury. 2. Seek law enforcement resources and reevaluate scene safety. 3. Assess the mental status, airway, breathing, and circulation. 4. Note any abnormalities or signs of shock. 5. Provide high-flow, high-concentration oxygen if breathing is adequate. 6. Provide positive pressure ventilation with supplemental oxygen if breathing is inadequate. <p>B. Secondary assessment</p> <ol style="list-style-type: none"> 1. Perform a rapid secondary assessment if necessary. 2. Assess for signs and symptoms of hemorrhagic shock. 	<p>Critical Thinking Discussion Why is thirst a sign of hemorrhagic shock?</p> <p>Discussion Question Why are restlessness, anxiety, and altered mental status indications of shock?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> 3. Signs and symptoms <ul style="list-style-type: none"> a. Mental status <ul style="list-style-type: none"> i. Restlessness ii. Anxiety iii. Altered mental status b. Peripheral perfusion and perfusion of the skin <ul style="list-style-type: none"> i. Pale, cool, clammy skin ii. Weak, thready, or absent peripheral pulses iii. Delayed capillary refill c. Vital signs <ul style="list-style-type: none"> i. Increased pulse rate (early sign), with weak and thready pulse (early sign) ii. Increased breathing rate iii. Decreased blood pressure (late sign) iv. Narrow pulse pressure d. Other signs and symptoms <ul style="list-style-type: none"> i. Dilated pupils ii. Marked thirst iii. Nausea and vomiting iv. Pallor with cyanosis to the lips C. Emergency medical care <ul style="list-style-type: none"> 1. Maintain Standard Precautions. 2. Maintain an open airway. 3. Control any external bleeding. 4. Apply and inflate the PASG if symptoms warrant. 5. Place the patient in a supine position. 6. Splint suspected bone or joint injuries. 7. Use a blanket to cover any patient suspected of suffering hemorrhagic shock. 8. Transport the patient immediately. D. Remainder of the assessment—Continue to assess the patient for changes in mental status and vital signs. 	<p>Critical Thinking Discussion What causes a narrow pulse pressure in hemorrhagic shock?</p> <p>Class Activity Provide students with ample opportunity to practice assessing and managing patients in shock in a supervised lab setting.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip presenting information about shock.</p>

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Minutes	Content Outline	Master Teaching Notes
15	<p>XII. Hemorrhagic Shock—Pneumatic Antishock Garment (PASG)</p> <p>A. Indications</p> <ol style="list-style-type: none"> 1. Suspected pelvic fracture with hypotension 2. Profound hypotension 3. Suspected intraperitoneal hemorrhage with hypotension 4. Suspected retroperitoneal hemorrhage with hypotension <p>B. Contraindications</p> <ol style="list-style-type: none"> 1. Penetrating thoracic trauma 2. Splinting of lower extremity fractures 3. Eviscerated abdominal organs 4. Impaled object in abdomen 5. Pregnancy 6. Cardiopulmonary arrest 	<p>Discussion Question What are the indications and contraindications for application of PASG?</p>

5	<p>XIII. Hemorrhagic Shock—Summary: Assessment and Care</p> <p>A. Review assessment findings and emergency care for bleeding and hemorrhagic shock.</p> <p>B. Review Figures 28-11 and 28-12.</p>	<p>Knowledge Application Given a variety of scenarios, students should be able to identify patients in shock and provide appropriate interventions.</p>
5	<p>XIV. Hemorrhagic Shock—Hemophilia</p> <p>A. Hemophilia is a congenital disease that prevents activation of the normal clotting mechanisms found in the blood.</p> <p>B. Bleeding in this patient is always considered to be significant.</p> <p>C. Transport to a medical facility immediately.</p>	<p>Discussion Question What is hemophilia?</p>
5	<p>XV. Soft-Tissue Trauma—The Skin</p> <p>A. One of the most durable and largest organs of the body</p> <p>B. Composed of three layers—the epidermis, the dermis, and a subcutaneous layer</p> <p>C. Protects the body</p> <p>D. Serves as a receptor organ</p> <p>E. Wounds</p> <ol style="list-style-type: none"> 1. Closed 2. Open 	<p>Discussion Question What are the roles of the skin?</p> <p>Critical Thinking Discussion What would be the consequences to the body if large areas of skin were damaged?</p>

	<ul style="list-style-type: none"> 3. Single 4. Multiple 	
2	<p>XVI. Closed Soft-Tissue Injuries—Contusions</p> <ul style="list-style-type: none"> A. Closed injury is a wound in which there is no break in the skin. B. A contusion is an injury to the tissue and blood vessels contained within the dermis. C. This injury will cause localized swelling and pain. D. Discoloration may occur due to blood leaking from damaged vessels. E. Black and blue is called ecchymosis. 	<p>Critical Thinking Discussion Why does the discoloration associated with a contusion change from red to blue/black to green to brown/yellow?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on contusions and ecchymoses.</p>
2	<p>XVII. Closed Soft-Tissue Injuries—Hematomas</p> <ul style="list-style-type: none"> A. A hematoma usually involves damage to a larger blood vessel and a larger amount of tissue than a contusion. B. It is characterized by a large lump with bluish discoloration. C. A hematoma the size of the patient’s fist can be equal to ten percent blood loss. 	
2	<p>XVIII. Closed Soft-Tissue Injuries—Crush Injuries</p> <ul style="list-style-type: none"> A. A crush injury is one in which force great enough to cause injury has been applied to the body. B. Severe blunt trauma or crushing force may result in internal bleeding and hemorrhagic shock. C. Internal organs may actually rupture. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on compartment syndrome.</p>
4	<p>XIX. Closed Soft-Tissue Injuries—Assessment-Based Approach: Closed Soft-Tissue Injuries</p> <ul style="list-style-type: none"> A. Scene size-up and primary assessment <ul style="list-style-type: none"> 1. Scan for the mechanism of injury. 2. Take all Standard Precautions. 3. Conduct a primary assessment. 4. Establish in-line stabilization of the cervical spine if you suspect a spine injury. 5. Assess the mental status. 6. Ensure an adequate airway. 7. Check for and treat obvious signs of severe bleeding and shock. 8. Administer oxygen if indicated. 9. Administer positive pressure ventilation with supplemental oxygen if 	<p>Knowledge Application Students should be able to apply the information in this section to assess and manage patients with soft-tissue injuries.</p>

	<p>breathing is inadequate.</p> <p>B. Secondary assessment</p> <ol style="list-style-type: none"> 1. Check for evidence of trauma. 2. Assess baseline vital signs. 3. Obtain a history. 4. Signs and symptoms <ol style="list-style-type: none"> a. Swelling, pain, and discoloration at the injury site b. Signs and symptoms of internal bleeding and hemorrhagic shock <p>C. Emergency medical care</p> <ol style="list-style-type: none"> 1. Take Standard Precautions. 2. Ensure an open airway and adequate breathing. 3. Treat for shock, if necessary. 4. Splint suspected fractures. <p>D. Reassessment</p> <ol style="list-style-type: none"> 1. Repeat the primary assessment. 2. Reassess and monitor vital signs. 3. Recheck all interventions. 	
4	<p>XX. Open Soft-Tissue Injuries—Abrasions</p> <p>A. An open injury is a wound in which the skin is broken.</p> <p>B. An abrasion is caused by scraping, rubbing, or shearing away of the epidermis.</p> <p>C. It often is extremely painful because of the presence of exposed nerve endings.</p> <p>D. Capillary bleeding can be controlled easily with direct pressure.</p> <p>E. Abrasions to large areas of body surface may be cause for concern due to the threat of contamination, infection, and the potential for underlying injuries.</p>	
4	<p>XXI. Open Soft-Tissue Injuries—Lacerations</p> <p>A. A laceration is a break in the skin of varying depth.</p> <ol style="list-style-type: none"> 1. Linear 2. Stellate <p>B. Lacerations may bleed more than other types of open soft-tissue injuries.</p>	<p>Video Clip</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip on decubitus ulcers.</p>
4	<p>XXII. Open Soft-Tissue Injuries—Avulsions</p> <p>A. A partial avulsion is a loose flap of skin and underlying soft tissue that has been torn loose.</p> <p>B. A total avulsion is a loose flap of skin and underlying soft tissue that has been pulled completely ripped off.</p> <p>C. Bleeding may be severe because of blood vessel injury.</p> <p>D. Healing will be prolonged, and scarring may be extensive.</p>	
4	<p>XXIII. Open Soft-Tissue Injuries—Amputations</p>	<p>Discussion Question</p>

	<ul style="list-style-type: none"> A. An amputation involves a disruption in the continuity of an extremity or other body part. B. Bleeding from amputations may be massive, but often very little bleeding occurs. C. Always consider shock in cases of amputation. 	Explain the management of partial and complete amputations and amputated parts.
4	<p>XXIV. Open Soft-Tissue Injuries—Penetrations/Punctures</p> <ul style="list-style-type: none"> A. A penetration/puncture injury generally is the result of a sharp, pointed object being pushed or driven into the soft tissues. B. The entry wound may appear very small and cause little bleeding. C. Injuries may be deep and cause severe internal bleeding. D. Severity factors <ul style="list-style-type: none"> 1. Location 2. Size of the object 3. Depth of the penetration 4. Forces involved 5. Structures in the path of the injury E. Always assess the patient for underlying internal injuries and hemorrhagic shock. 	<p>Discussion Question</p> <p>Why are impaled objects stabilized in place?</p>
2	<p>XXV. Open Soft-Tissue Injuries—Crush Injuries</p> <ul style="list-style-type: none"> A. Crush injuries may not appear to be serious. B. The only external sign may be an injury site that is painful, swollen, and deformed. C. External bleeding may be minimal or absent. D. Always suspect that there may be internal injury and severe internal bleeding in the presence of crush injuries. E. Patients may deteriorate rapidly into shock. 	
4	<p>XXVI. Open Soft-Tissue Injuries—Other Soft-Tissue Injuries</p> <ul style="list-style-type: none"> A. Bites <ul style="list-style-type: none"> 1. Complications <ul style="list-style-type: none"> a. Infection b. Cellulitis c. Septicemia d. Rabies e. Tetanus f. Hepatitis 2. The bite should be evaluated at a medical facility. 3. Always ensure scene safety first. 4. Arrange for someone to contain or isolate the animal. B. Clamping injuries <ul style="list-style-type: none"> 1. A body part is caught or strangled by some piece of machinery. 	<p>Discussion Question</p> <p>What are the preferred materials for managing an evisceration?</p>

2. The longer a part remains clamped, the more damage there may be.
3. Edema makes removal more difficult over time.
4. Apply a lubricant when possible.
5. Immediately transport the patient if the injury causes severe bleeding or shock.
6. Call for specialized personnel if needed to cut away parts of the clamping object.

4

XXVII. Open Soft-Tissue Injuries—Assessment-Based Approach: Open Soft-Tissue Injuries

- A. Scene size-up and primary assessment
 1. Make sure the scene is safe.
 2. Take notice of potential mechanisms of injury.
 3. Be prepared to stabilize the cervical spine.
 4. Get a general impression of the patient.
 5. Assess the patient’s mental status.
 6. Ensure an open airway.
 7. Provide oxygen by nonrebreather mask if necessary.
 8. Initiate positive pressure ventilation with supplemental oxygen if breathing is inadequate.
 9. Bring any severe bleeding under control with direct pressure.
- B. Secondary assessment
 1. Assess baseline vital signs.
 2. Obtain a history.
 3. Signs and symptoms
 - a. A break in the skin and external bleeding
 - b. Localized swelling
 - c. Pain
 - d. Discoloration at the injury site
 - e. Possible signs and symptoms of internal bleeding and hemorrhagic shock
- C. Emergency medical care
 1. Take Standard Precautions.
 2. Ensure an open airway and adequate breathing.
 3. Expose the wound.
 4. Control the bleeding with direct pressure.
 5. Prevent further contamination.
 6. Dress and bandage the wound.
 7. Keep the patient calm and quiet.
 8. Treat for hemorrhagic shock.

Discussion Questions

- Why are open chest wounds managed with an occlusive dressing sealed on three sides?
- Why is an open neck wound managed with an occlusive dressing?

	<ul style="list-style-type: none"> 9. Transport. D. Reassessment <ul style="list-style-type: none"> 1. Repeat the primary assessment. 2. Monitor vital signs. 3. Recheck interventions. E. Special considerations <ul style="list-style-type: none"> 1. Chest injuries 2. Abdominal injuries 3. Impaled objects 4. Amputations 5. Large open neck injuries 	
6	<p>XXVIII. Dressings and Bandages—Dressings</p> <ul style="list-style-type: none"> A. A dressing covers an open wound to aid in the control of bleeding and to prevent further damage or contamination. B. A dressing must be sterile. C. Common types <ul style="list-style-type: none"> 1. Gauze pad 2. Self-adhering dressing 3. Universal or multitrauma dressing 4. Occlusive dressing 	
6	<p>XXIX. Dressings and Bandages—Bandages</p> <ul style="list-style-type: none"> A. A bandage is used to secure a dressing in place. B. Common types <ul style="list-style-type: none"> 1. Self-adhering bandage 2. Gauze rolls 3. Triangular bandage 4. Air splint 	
6	<p>XXX. Dressings and Bandages—Pressure Dressings</p> <ul style="list-style-type: none"> A. A pressure dressing can be used to maintain control of bleeding. B. Application <ul style="list-style-type: none"> 1. Cover the wound with several sterile gauze dressings. 2. Apply direct pressure. 3. Bandage firmly. 4. If continued severe bleeding is indicated, remove the dressing and bandage and apply direct finger-tip pressure. 5. Once the bleeding is controlled, apply dressings and bandage over the wound again. 	

6	<p>XXXI. Dressings and Bandages—General Principles of Dressing and Bandaging</p> <p>A. Use the materials you have on hand.</p> <p>B. Adapt the methods as best you can.</p> <p>C. General guidelines</p> <ol style="list-style-type: none"> 1. Dressing materials should be as clean as possible. 2. Do not bandage a dressing in place until bleeding has stopped. 3. A dressing should adequately cover the entire wound. 4. If possible, remove all jewelry from the injured body part. 5. Do not bandage a wound too loosely. 6. Bandage wounds snugly but not too tightly. 7. If you are bandaging a small wound on an extremity, cover a larger area with the bandage. 8. Always place the body part to be bandaged in the position in which it is to remain. 9. Apply a tourniquet if bleeding is not controlled with direct pressure. 	<p>Teaching Tip</p> <p>Use simple moulage to simulate soft-tissue injuries for student lab practice in dressing and bandaging wounds.</p>
6	<p>XXXII. Dressings and Bandages—Summary: Assessment and Care</p> <p>A. Review possible assessment findings and emergency care for soft-tissue injuries.</p> <p>B. Review Figures 28-33 and 28-34.</p>	
10	<p>XXXIII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 28 Summary. 2. Complete Chapter 28 In Review questions. 3. Complete Chapter 28 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 28 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Do you agree with the EMTs' decision to forgo spinal immobilization? Why or why not? • Why is it important for the EMTs to seek feedback on their performance from the emergency department physician? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter.

		<ul style="list-style-type: none">• The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.
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Detailed Lesson Plan

Chapter 29

Burns

90–110 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

Chapter 29 objectives can be found in an accompanying folder.
 These objectives, which form the basis of each chapter, were developed from the new Education Standards and Instructional Guidelines.

Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency care for patients with burn injuries.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What are the patient management priorities in this situation? • Describe how you will proceed with this patient.
10	<p>II. The Skin: Structure and Function Review</p> <p>A. Structure</p> <ol style="list-style-type: none"> 1. The outermost layer, or epidermis, provides a watertight and resilient barrier from the external environment. 2. The second layer, or dermis, contains small capillary beds and the sensory structures of the skin. 3. The innermost layer or hypodermis (also known as the subcutaneous layer) is composed of fatty connective tissues and contains larger blood vessels. 4. The layers range in thickness from one cell to several layers of skin. <p>B. Functions</p> <ol style="list-style-type: none"> 1. Provides a physical barrier against the environment 2. Provides a barrier against infection 3. Provides protection from bacteria or other harmful agents 4. Insulates and protects underlying structures and bodily organs from injury 5. Aids in the regulation of body temperature 6. Provides for sensation transmission (hot, cold, pain, touch) 7. Aids in elimination of some bodily wastes 8. Contains fluids necessary to the function of organs and systems 	<p>Discussion Question</p> <p>What are the functions of the skin?</p> <p>Critical Thinking Discussion</p> <p>What complications should you anticipate when a patient sustains injury to a large area of skin?</p>

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Minutes	Content Outline	Master Teaching Notes
5	<p>III. Airway, Breathing, and Circulation</p> <p>A. Common causes of death in burn patients in prehospital setting</p> <ol style="list-style-type: none"> 1. Occluded airway 2. Toxic inhalation 3. Trauma other than the soft-tissue trauma of burn itself <p>B. EMT priorities</p> <ol style="list-style-type: none"> 1. Establish and maintain patient airway. 2. Establish and maintain adequate ventilation and oxygenation. 3. Ensure that any life-threatening bleeding has been controlled. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some of the toxins a burn patient may have inhaled? • Under what circumstances are burn patients prone to other types of trauma?
4	<p>IV. Effects of Burns on Body Systems—Circulatory System</p> <p>A. Extreme fluid loss can cause extreme fluid loss and increased stress on the heart.</p> <ol style="list-style-type: none"> 1. Creates edema (swelling) which compromises tissue perfusion 2. Causes burn shock after the first few hours <ol style="list-style-type: none"> a. Vascular bed damage allows fluid and protein molecules to leak. b. Leakage disturbs normal fluid balance of vascular system. c. Blood plasma begins to seep from all capillary beds. d. Fluid shifts from vessels into spaces surrounding cells. e. Total vascular volume becomes insufficient to meet the body's needs. f. Edema may cause the body to swell to double its normal size. <p>B. Leads to shock (hypoperfusion)</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How do severe burns affect the circulatory system? • How does burn shock develop? <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on burn facts.</p>
4	<p>V. Effects of Burns on Body Systems—Respiratory System</p> <p>A. Swelling of the face or throat may cause airway closure.</p> <p>B. Inhalation of superheated air may cause the lining of the larynx to swell and may cause fluid to accumulate in the lungs.</p> <p>C. Smoke and toxic gas inhalation may cause respiratory arrest, compromise, or poisoning.</p>	<p>Discussion Question What are the respiratory complications of burns?</p>
4	<p>VI. Effects of Burns on Body Systems—Renal System (Kidneys)</p> <p>A. Fluid loss from a burn can cause decreased blood flow to the kidneys.</p> <p>B. Decreases blood flow to the kidneys causes decrease in urinary output.</p> <p>C. Burn will cause wastes to form in the blood, which may result in kidney blockage.</p> <p>D. Kidneys may partially or wholly cease to function.</p>	<p>Discussion Question How do severe burns affect the renal system?</p>

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Minutes	Content Outline	Master Teaching Notes
4	<p>VII. Effects of Burns on Body Systems—Nervous and Musculoskeletal Systems</p> <p>A. Burn injuries</p> <ol style="list-style-type: none"> 1. Destroy nerve endings in the burn area 2. Cause loss of function to extremities or other body parts <p>B. Extremity burns</p> <ol style="list-style-type: none"> 1. Cause loss of function 2. Cause long-term muscle wasting 3. Cause joint dysfunction because of scarring 4. Indirectly cause fear and anxiety 	<p>Knowledge Application</p> <p>Given a series of scenarios, students should be able to predict burn-related complications to other body systems.</p>
4	<p>VIII. Effects of Burns on Body Systems—Gastrointestinal System</p> <p>A. Burn causes blood flow to decrease.</p> <p>B. Blood is rerouted from gastrointestinal system to the rest of the body.</p> <ol style="list-style-type: none"> 1. Causes nausea or vomiting in many patients with more than ten percent BSA 2. Can further upset normal chemical balances 3. May lead to ulcers 	
10	<p>IX. Assessment and Care of Burns—Classifying Burns by Depth</p> <p>A. Superficial burns (first-degree burns)</p> <ol style="list-style-type: none"> 1. Involve only the epidermis 2. Usually caused by a flash, hot liquid, or the sun 3. Skin will be red and dry. 4. May result in slight swelling 5. Usually very painful because pain receptors in dermis are still intact 6. Will take several days to heal; epidermis may peel but will not scar. <p>B. Partial thickness burns (second-degree burns)</p> <ol style="list-style-type: none"> 1. Involve epidermis and portions of dermis 2. Caused by contact with fire, hot liquids or objects, chemical substances, or the sun (thermal flame burns, severe scalding) 3. Plasma and tissue fluid collects between layers of skin and forms blisters 4. Very painful because pain receptors are intact 5. Two classifications: superficial and deep <ol style="list-style-type: none"> a. Superficial partial thickness <ol style="list-style-type: none"> i. Thin-walled blisters 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How would you recognize a partial thickness burn? • Why are patients with severe burns prone to hypothermia?

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> ii. Pink, moist skin iii. Soft, tender skin b. Deep partial thickness <ul style="list-style-type: none"> i. Thick-walled blisters that often rupture ii. Red and blanched white skin iii. Sense of pressure at burn site iv. Poor capillary refill to burn site v. Intense pain resulting from nerve-ending damage C. Full thickness burns (third-degree burns) <ul style="list-style-type: none"> 1. Involves all layers of skin 2. Caused by contact with extreme heat sources: hot liquids or solids, flame, chemicals, electricity (being trapped in confined space with flames; being exposed to high heat source or chemicals) 3. Skin becomes hard, dry, tough, leathery. 4. Skin may appear white and waxy to dark brown or black and charred. 5. Dead soft tissue is called an eschar. 6. Not very painful because nerve endings have been destroyed 7. Surrounding areas of partial thickness burns may be intensely painful. D. Fourth-degree burns (severe full thickness burns) <ul style="list-style-type: none"> 1. Extend completely through the epidermis and dermis deep into the tendons, ligaments, muscles, and so on 2. Usually associated with electrical injuries 3. Require extensive skin grafting to allow the burn site to heal 	<p>Teaching Tip Use the example of a cooked chicken breast or a fried egg to describe how a full thickness burn denatures the proteins of the tissues so that it cannot be “uncooked” and will require surgery and grafting.</p>
10	<p>X. Assessment and Care of Burns—Determining the Severity of Burn Injuries</p> <ul style="list-style-type: none"> A. Reasons to classify the severity of the burn injury <ul style="list-style-type: none"> 1. To provide optimal medical care 2. To make the best patient transport decision 3. To report accurately to the receiving facility B. Factors to consider <ul style="list-style-type: none"> 1. Burn injury location—Locations where injuries are considered critical <ul style="list-style-type: none"> a. Face, eyes, ears—Potential for respiratory compromises b. Hands and feet—Potential for loss of function c. Genital or groin region—Potential for loss of function, increased chance of infection d. Areas of major joint function (hips, shoulders)—Potential for loss of joint function 	<p>Knowledge Application Given a series of scenarios involving multiple patient variables, students should be able to determine the severity of burns and provide appropriate burn treatment.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on Kidshealth’s information about burns.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> e. Circumferential burns (those which encircle a body area)— Circulatory compromise and nerve damage 2. Age and preexisting medical conditions <ul style="list-style-type: none"> a. Age <ul style="list-style-type: none"> i. Children under five and adults over 55 have less tolerance for burn injuries. ii. Because of large skin surface ratio to body mass, children have the potential for greater fluid loss. iii. Infants have higher risk for shock (hypoperfusion), airway difficulties, and hypothermia. iv. You must consider the possibility of child abuse when a child has a burn injury. v. Older adults have a prolonged healing process and possible underlying medical conditions. b. Preexisting medical conditions that may increase the severity of a burn injury <ul style="list-style-type: none"> i. Respiratory illness or condition ii. Cardiovascular problem iii. Diabetes 3. Body surface area (BSA) percentage <ul style="list-style-type: none"> a. Rule of nines—Standard way to quickly determine BSA b. Regions representing nine percent BSA in adults <ul style="list-style-type: none"> i. Head and neck together ii. Each upper extremity iii. Chest iv. Abdomen v. Upper back vi. Lower back vii. Anterior of each lower extremity viii. Posterior of each lower extremity ix. Genital region = 1 percent BSA c. Regions and percentages of BSA for infants under age one <ul style="list-style-type: none"> i. Head and neck together—18 percent ii. Each upper extremity—9 percent iii. Chest and abdomen—18 percent iv. Upper and lower back—18 percent v. Each lower extremity—14 percent d. For children over age one—for each year beyond one, add 0.5 	

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Minutes	Content Outline	Master Teaching Notes
	<p style="text-align: center;">percent to each leg and subtract 1% for the head</p> <p>e. Rule of ones (rule of palms)—compare burn to surface area of palm of patient’s hand; X palm surface areas = X% BSA</p>	
10	<p>XI. Assessment and Care of Burns—Types of Burns</p> <p>A. Thermal burns</p> <ol style="list-style-type: none"> 1. Associated with heat applied to the body 2. Caused by flame, hot water (scalds), steam 3. Severity of burn is related to time of exposure to source, temperature of heat, and potential for inhalation injury. 4. Scalds in children may be sign of child abuse. <p>B. Inhalation burns</p> <ol style="list-style-type: none"> 1. Associated with high-temperature air or steam that is inhaled 2. Inhalation damages mucosa of upper airway 3. Resultant edema may restrict airflow and lead to airway obstruction 4. Possible inhalation of toxic gases (carbon monoxide, cyanide) <p>C. Chemical burns</p> <ol style="list-style-type: none"> 1. Produced by acids, alkalis, other heat-generating chemicals 2. Type of chemical, concentration, and duration of exposure determines severity of burn <p>D. Electrical burns</p> <ol style="list-style-type: none"> 1. Result from resistance of electrical current flow in the body 2. Primarily internal 3. May result in cardiac arrest 4. Rarely caused by lightning (see Chapter 24) <p>E. Radiation burns—caused by absorption of radiation into the body (see Chapters 43 and 45)</p>	<p>Discussion Question What are indications of airway burns and smoke inhalation?</p>
10	<p>XII. Assessment and Care of Burns—Causes of Burns</p> <p>A. Flame burn</p> <ol style="list-style-type: none"> 1. Contact with open flame 2. Clothing may ignite, causing further burn injury. 3. Synthetic fibers will melt, causing additional contact burn. <p>B. Contact burn</p> <ol style="list-style-type: none"> 1. Contact with hot object 2. Burn is localized to area of contact. <p>C. Scald</p> <ol style="list-style-type: none"> 1. Contact with hot liquid: more viscous liquid = more severe burn 2. Intentional scald usually involves entire extremity. 	<p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on household battery burns and fireworks.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> 3. Accidental scald shows patches of burns caused by splashing. D. Steam burn <ul style="list-style-type: none"> 1. Contact with hot steam 2. Often more severe than flame burns 3. Often result of industrial accident or contact with car radiator 4. Can cause thermal burns to distal airways in lungs E. Gas burn <ul style="list-style-type: none"> 1. May cause upper airway burns 2. May cause distal airway injury from byproducts of combustion F. Electrical burn <ul style="list-style-type: none"> 1. Caused by tissue resistance to electrical energy 2. Results in internal burns 3. May ignite clothing, resulting in flame burn G. Flash burn <ul style="list-style-type: none"> 1. Caused by flammable gas or liquid that ignites quickly 2. Areas of the body protected by clothing usually are not burned. 	
10	<p>XIII. Assessment and Care of Burns—Assessment-Based Approach:</p> <p>Burns</p> <ul style="list-style-type: none"> A. Scene size-up <ul style="list-style-type: none"> 1. Determine whether the scene is safe to enter. 2. If it is unsafe, wait for properly equipped and trained personnel to remove the victim. 3. Take appropriate Standard Precautions when entering the scene. B. Primary assessment <ul style="list-style-type: none"> 1. Stop the burning with water or saline. 2. Attempt to remove any smoldering clothing or jewelry. 3. Do not remove any clothing adhering to the patient; cut around it. 4. Evaluate patient’s airway, breathing, and mental status. 5. Provide oxygen or positive pressure ventilation if the patient is having difficulty breathing. 6. Determine whether the patient is a priority for transport. <ul style="list-style-type: none"> a. Is patient unresponsive with no gag reflex? b. Is patient responsive, but not following commands? c. Is there airway compromise or difficulty breathing? d. Are there signs of shock or uncontrolled bleeding? e. Is the patient in severe pain? C. Secondary assessment 	<p>Discussion Question What actions can you take to stop the burning?</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources with an interactive tutorial on burns from the National Library of Medicine and information about burn centers.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 1. Perform a physical exam. 2. Check for other injuries. 3. Take and record baseline vital signs. 4. Obtain history from patient or family and bystanders. 5. Watch for signs and symptoms of burn depth and inhalation injuries. <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Remove the patient from the source of the burn and stop the burning process. 2. Establish and maintain an airway and breathing. 3. Classify the severity of the burn and transport immediately if critical. 4. Cover the burned area with a dry sterile dressing. 5. Keep the patient warm and treat other injuries as needed. 6. Transport the patient to the appropriate facility. <p>E. Special considerations for dressing burns</p> <ol style="list-style-type: none"> 1. Avoid materials that shred or leave particles. 2. Never apply ointments, lotion, or antiseptics to burn injuries. 3. Never break or drain blisters. 4. If hands and/or toes are burned, remove all rings and jewelry and separate all digits. 5. If eyes are burned, do not attempt to open eyelids. <ol style="list-style-type: none"> a. If a thermal burn, apply sterile dressing to BOTH eyes. b. If a chemical burn, flush with water from medial to lateral side. <p>F. Reassessment</p> <ol style="list-style-type: none"> 1. Monitor vital signs and check interventions every five minutes for unstable patients and every 15 minutes for stable patients. 2. Continually evaluate the airway. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • Why should you avoid moist or wet dressings in burns (with the possible exception of burns of less than ten percent BSA)? • What actions can you take to prevent hypothermia in a patient with significant burns?
5	<p>XIV. Assessment and Care of Burns—Chemical Burns</p> <p>A. Protect yourself first.</p> <ol style="list-style-type: none"> 1. Never enter an unsafe scene. 2. Wear gloves and eye protection at a minimum. 3. If necessary, wear an impervious (fluid-proof) gown or suit. <p>B. Brush off dry chemicals before flushing with water.</p> <p>C. Ensure that the chemical may be diluted with water, then flush.</p> <ol style="list-style-type: none"> 1. Consult a hazardous materials guidebook. 2. Make sure fluid runs away from the injury. 3. Remove the patient's clothing and jewelry. 4. Continue to flush while en route to the hospital. 	

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Minutes	Content Outline	Master Teaching Notes
5	<p>XV. Assessment and Care of Burns—Electrical Burns</p> <p>A. Never try to remove a patient from an electrical burn source unless you are trained and equipped to do so.</p> <p>B. Never touch a patient still in contact with the electrical source.</p> <p>C. Administer oxygen by nonrebreather mask or positive pressure ventilation.</p> <ol style="list-style-type: none"> 1. 10–12 per minute for an adult patient 2. 12–20 per minute for an infant or child <p>D. Monitor the patient for cardiac arrest.</p> <p>E. Assess the patient for muscle tenderness, twitching, and any seizure activity.</p> <p>F. Always assess for an entrance and exit burn injury.</p> <p>G. Transport the patient as soon as possible.</p>	<p>Discussion Question</p> <p>Why should you consider external burns “the tip of the iceberg” when managing patients with electrical burns?</p>
5	<p>XVI. Assessment and Care of Burns—Summary: Assessment and Care</p> <p>A. Review possible assessment findings and emergency care for burn injuries.</p> <p>B. Review Figures 29-14 and 29-15.</p>	<p>Teaching Tip</p> <p>Stress the importance of burn prevention.</p> <p>Critical Thinking Discussion</p> <p>What are some ways in which EMTs can help prevent burn injuries in their own communities?</p> <p>Class Activity</p> <p>Give groups of students 15 to 20 minutes to develop ideas for a burn prevention program. Each group will report back to the class.</p>
10	<p>XVII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 29 Summary. 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What are the indications that the patient has an inhalation injury? • What do you predict this patient’s recovery will be like? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> 2. Complete Chapter 29 In Review questions. 3. Complete Chapter 29 Critical Thinking. D. Assessments <ul style="list-style-type: none"> 1. Handouts 2. Chapter 29 quiz 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan
Chapter 30
Musculoskeletal Trauma
120–130 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn to assess and treat a painful, swollen, or deformed extremity.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What are the patient management priorities in such a situation? • Describe how you will proceed with this patient.
10	<p>II. Musculoskeletal System Review—The Muscles</p> <p>A. Voluntary (skeletal) muscles are under control of a person's will.</p> <p>B. Voluntary muscles make possible all deliberate acts such as walking, chewing, and frowning.</p> <p>C. Most voluntary muscles are attached to the skeleton at one or both ends.</p> <p>D. Voluntary muscles form the major muscle mass of the body.</p> <p>E. Muscle tissue contracts when stimulated by a nerve impulse.</p> <p>F. Muscles give our bodies their distinctive shapes.</p> <p>G. Muscles can be injured in many ways.</p> <ol style="list-style-type: none"> 1. Broken fibers from overextension 2. Bruises 3. Crushing 4. Cuts 5. Tears 6. Painful swelling and weakness 	<p>Teaching Tip</p> <p>Since this section is review material, rely more heavily on questioning students rather than providing information.</p> <p>Knowledge Application</p> <p>Students should be able to use the information in this section to assess and describe musculoskeletal injuries.</p> <p>Discussion Question</p> <p>What happens to the shape of the muscles when they contract?</p>

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Minutes	Content Outline	Master Teaching Notes
5	<p>III. Musculoskeletal System Review—Tendons and Ligaments</p> <p>A. The “glue” that holds the body together</p> <p>B. Composed of specialized connective tissue</p> <ol style="list-style-type: none"> 1. Tendons connect muscle to bone. 2. Ligaments connect bone to bone. <p>C. Can be bruised, crushed, cut, or torn</p>	
5	<p>IV. Musculoskeletal System Review—Cartilage</p> <p>A. Extension of the bone</p> <p>B. Comprised of connective tissue</p> <p>C. Strong, smooth, flexible, compressible, slippery substance</p> <p>D. Found at the point of articulation of two bones</p> <p>E. Protects bones in motion from friction</p> <p>F. Acts as shock absorber between bone surfaces</p> <p>G. Leads to joint pain when injured</p>	<p>Discussion Question</p> <p>What is the function of cartilage?</p>
10	<p>V. Musculoskeletal System Review—The Skeletal System</p> <p>A. Upper extremity (shoulder girdle, arm, forearm, hand)</p> <ol style="list-style-type: none"> 1. Clavicle (collar bone) 2. Scapula (shoulder blade) 3. Humerus (upper arm bone) 4. Radius (lower arm bone) 5. Ulna (including the olecranon) (lower arm bone and elbow) 6. Carpal bones (wrist bones) 7. Metacarpals (hand bones) 8. Phalanges (finger bones) <p>B. Lower extremity (pelvis, thigh, leg, foot)</p> <ol style="list-style-type: none"> 1. Pelvis (including the ilium, ischium, and pubis) 2. Femur (thigh bone) 3. Patella (kneecap) 4. Tibia (lower leg bone) 5. Fibula (lower leg bone) 6. Calcaneus (heel bone) 7. Tarsals (ankle bones) 8. Metatarsals (foot bones) 9. Phalanges (toe bones) 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the components of the appendicular skeleton? • Where is the greater trochanter of the femur? <p>Class Activity</p> <p>Assign groups of students to prepare presentations to review the musculoskeletal system. Divide the following topics among the groups: Skeletal Muscle, Axial Skeleton, Shoulder Girdle and Upper Extremities, Pelvis and Lower Extremities, and Types of Joint Movements. Give students 20 minutes to prepare before reporting back to the class.</p>

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Minutes	Content Outline	Master Teaching Notes
15	<p>VI. Injuries to Bones and Joints—Types of Injuries</p> <p>A. Fracture</p> <ol style="list-style-type: none"> 1. A break in the continuity of a bone 2. Caused by direct force, indirect force, or twisting force 3. Open fracture—Associated with an open wound 4. Closed fracture—Skin is not broken. 5. Type can only be distinguished by X-ray. <ol style="list-style-type: none"> a. Hairline fracture—Small crack in bone, does not create instability b. Pathologic fracture—Result of degenerative disease such as osteoporosis 6. Can result in various complications <ol style="list-style-type: none"> a. Hemorrhage from the bone b. Instability of the extremity c. Surrounding tissue damage d. Infection (open fracture) e. Interruption of distal blood supply <p>B. Strain</p> <ol style="list-style-type: none"> 1. Injury to a muscle or tendon 2. Often due to overextension (overstretching) 3. Can be caused by extreme muscle stress or fatigue associated with overuse 4. No edema or discoloration 5. Pain or weakness with use of the muscle <p>C. Sprain</p> <ol style="list-style-type: none"> 1. Injury to a joint capsule 2. Damage to or tearing of the connective tissue 3. Usually involves ligaments 4. Usually occurs in shoulder, knee, or ankle 5. Immediate pain and tenderness, followed by inflammation and swelling <p>D. Dislocation</p> <ol style="list-style-type: none"> 1. Displacement of bone from normal position in joint 2. Caused by joint being forced beyond normal range of motion 3. Obvious deformity and swelling; pain and tenderness 4. May occur at shoulder, elbow, wrist, hand, hip, knee, ankle, or foot <p>E. General injury considerations</p> <ol style="list-style-type: none"> 1. Similar signs and symptoms: swelling, pain, or deformity 2. Usually associated with external forces (falls, vehicle collisions) 3. May occur through degenerative disease, particularly in elderly patients 	<p>Teaching Tip Obtain and show a variety of radiographs of orthopedic injuries.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • Which joints are most commonly dislocated? • Why should you consider dislocations significant injuries? <p>Knowledge Application Students should be able to recognize a painful, swollen, deformed extremity as well as other indications of musculoskeletal injury.</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on osteoporosis, fractures (including images), growth plate injuries, and additional fracture information from the <i>Journal of the American Medical Association</i>.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on joint injuries.</p>

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Minutes	Content Outline	Master Teaching Notes
	4. Force may cause injuries to surrounding soft tissues and other body areas	
3	VII. Injuries to Bones and Joints—Mechanism of Injury A. Direct force—Injury occurs at the point of impact. B. Indirect force—Force impacts on one end of a limb, causing injury some distance away from point of impact. C. Twisting force—One part of extremity remains stationary while the rest twists.	Discussion Questions <ul style="list-style-type: none"> • What is an example of direct force applied to a bone? • What is an example of indirect force applied to a bone? Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i> , 9 th edition to access a web resource on tennis elbow.
5	VIII. Injuries to Bones and Joints—Critical Fractures: The Femur and the Pelvis A. Femur <ol style="list-style-type: none"> 1. Symptoms <ol style="list-style-type: none"> a. Bone itself bleeds heavily—Up to 1.5 liters of blood b. Tension on thigh muscles is lost so thigh diameter increases, allowing more blood to be housed within thigh. 2. Goals of treatment <ol style="list-style-type: none"> a. Immobilize bone ends. b. Reduce bleeding. 3. Effect of traction splint <ol style="list-style-type: none"> a. Bone ends are realigned, preventing further injury and reducing pain. b. Diameter of thigh is decreased, allowing less blood to accumulate. B. Pelvis <ol style="list-style-type: none"> 1. Bone itself bleeds heavily—Up to two liters of blood 2. Application of Pneumatic Antishock Garment (PASG) will stabilize fracture and may help tamponade bleeding pelvis. 	
20	IX. Injuries to Bones and joints—Assessment-Based Approach: Bone or Joint Injuries	Class Activity Divide the class into small groups to

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	<p>A. Scene size-up and primary assessment</p> <ol style="list-style-type: none"> 1. Take appropriate Standard Precautions. 2. Consider the mechanism of injury. 3. Ask bystanders what caused the injury. 4. Try to imagine the forces to which the patient's body was subjected. 5. Check for obvious signs of severe hemorrhage. 6. Look for signs of shock and treat. 7. If the injury has caused a life-threatening condition, immobilize injured extremity and transport immediately following secondary assessment. <p>B. Secondary assessment</p> <ol style="list-style-type: none"> 1. If the patient has a life-threatening condition not directly related to the injury, initiate transport and immobilize injury en route if time and patient's condition permits. 2. If the patient is responsive and oriented, inspect and gently palpate bone or joint. 3. Be gentle and reassuring. 4. Check injury site for signs and symptoms of injury (deformity, contusions, tenderness, and so on). 5. Assess baseline vitals and obtain a history from the patient. 6. Evaluate the six "Ps." <ol style="list-style-type: none"> a. Pain b. Pallor c. Paralysis—May indicate nerve, muscle, tendon, or ligament damage d. Paresthesia (numbness, prickly feeling, or tingling)—May indicate nerve damage e. Pressure—May indicate damaged tissue or internal blood loss f. Pulse—Decrease to or absence of distal pulse may indicate arterial damage. <p>C. Emergency medical care</p> <ol style="list-style-type: none"> 1. If injury threatens patient's life, immobilize injured extremity during primary assessment or secondary assessment if the appropriate resources are available and it does not cause a delay in transport. 2. If the patient has other life-threatening conditions, initiate transport and immobilize injured extremity en route if time and patient's condition permits. 3. Immobilize the suspected fracture. <ol style="list-style-type: none"> a. Use proper Standard Precautions. b. Administer oxygen if needed. 	<p>practice assessment of musculoskeletal injuries.</p> <p>Critical Thinking Discussion How can you balance the need for immediate transport of a patient in shock with the need to immobilize major fractures to prevent further bleeding, tissue damage, and pain?</p>

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	<ul style="list-style-type: none"> c. Maintain in-line spine stabilization if spine injury is suspected. d. Splint bone and joint injuries. e. Apply cold packs to painful, swollen, or deformed extremity. f. Elevate the extremity (if spine injury is not suspected). g. Transport. <p>D. Reassessment</p> <ul style="list-style-type: none"> 1. Recheck patient's vital signs and interventions. 2. Make certain injured extremity is properly immobilized. 3. Make sure immobilization has not adversely affected patient's distal pulses, motor function, or sensation. 	
2	<p>X. Injuries to Bones and Joints—Summary: Assessment and Care</p> <ul style="list-style-type: none"> A. Review possible assessment findings and emergency care for musculoskeletal injuries. B. Review Figures 30-15 and 30-16. 	
5	<p>XI. Basics of Splinting—General Rules of Splinting</p> <ul style="list-style-type: none"> A. Before and after applying the splint, assess pulse, motor function, and sensation distal to the injury. B. Immobilize joints above and below a long bone injury. C. Remove or cut away clothing and jewelry around the injury site. D. Cover all wounds with sterile dressings and gently bandage before splinting. E. If there is severe deformity or the distal extremity is cyanotic (bluish) or lacks pulses, align injured limb with gentle manual traction before splinting. F. Never intentionally replace protruding bones or push them back below the skin. G. Pad each splint to prevent pressure and discomfort. H. Apply the splint before trying to move the patient. I. When in doubt, splint the injury. J. If the patient shows signs of shock, do not apply a splint first; align him in the normal anatomical position, treat for shock, and transport immediately. 	<p>Discussion Question What are the general rules of splinting?</p> <p>Knowledge Application Given a series of scenarios, students should be able to assess musculoskeletal injuries, assign injuries proper priority in the overall management of the patient, and demonstrate proper splinting techniques.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video about long bone injuries and splints.</p>
10	<p>XII. Basics of Splinting—Splinting Equipment</p> <ul style="list-style-type: none"> A. Rigid splints <ul style="list-style-type: none"> 1. Commercially manufactured 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Show examples of each type of splint as you talk about it.

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	<ol style="list-style-type: none"> 2. Made of wood, wood fiber, plastic, or cardboard 3. Designed to fit specific limbs, or can be molded to fit any appendage 4. May come with washable pads <p>B. Pressure (air or pneumatic) splints</p> <ol style="list-style-type: none"> 1. Soft and pliable before inflation; rigid once applied and inflated 2. Cannot be sized 3. May impair circulation 4. May interfere with ability to assess pulses 5. May lose or gain pressure with changes in temperature/altitude 6. Seek medical direction regarding use <p>C. Traction splints</p> <ol style="list-style-type: none"> 1. Provide a counterpull that alleviates pain, reduces blood loss, and minimizes further injury 2. Purpose is to immobilize bone ends, reduce diameter of thigh, and prevent further injury. 3. Many types available <p>D. Formable splints</p> <ol style="list-style-type: none"> 1. Rigid but made to be shaped to fit deformed extremity 2. Can be fixed in place with cravats or Velcro 3. Typically comprised of wire, aluminum, or other flexible metal <p>E. Vacuum splints</p> <ol style="list-style-type: none"> 1. Soft and pliable 2. Easily formed to deformed extremities 3. When air is sucked out, splint becomes extremely rigid. <p>F. Sling and swathe</p> <ol style="list-style-type: none"> 1. Provides stability to injured shoulder, elbow, or upper humerus 2. Sling supports arm; swathe holds arm against chest. 3. Minimizes pain and further injury <p>G. Spine board</p> <ol style="list-style-type: none"> 1. Considered a full body splint 2. Use in cases of critical injury to provide stability where extremity fractures cannot be splinted at scene. <p>H. Improvised splints</p> <ol style="list-style-type: none"> 1. Light in weight but firm and rigid 2. As wide as thickest part of fractured limb 3. Long enough to extend past joints and prevent movement 4. Padded well so inner surfaces are not in contact with skin 5. Possible materials include cane, cardboard, umbrella, pillow, and so on. 	<ul style="list-style-type: none"> • Provide students with adequate time to practice splinting under supervision. <p>Discussion Question What are some advantages and disadvantages of rigid splints?</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on the application of a Sager splint.</p> <p>Class Activity Have a contest to see which group of students can come up with the best improvised splint.</p>

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Minutes	Content Outline	Master Teaching Notes
5	XIII. Basics of Splinting—Hazards of Improper Splinting A. Compression of nerves, tissues, and blood vessels B. Delay in patient's transport C. Reduction of distal circulation D. Aggravation of bone or joint injury E. Aggravation or cause of damage to tissue, nerves, blood vessels, or muscles	
5	XIV. Basics of Splinting—Splinting Long Bone Injuries A. Look for exposed bone ends, joints locked in position, paresthesia (tingling), paralysis, and pallor. B. Assess the pulse and motor and sensory function below the injury site. C. If limb is severely deformed, cyanotic (bluish), or lacks distal pulses, align with gentle traction.	
5	XV. Basics of Splinting—Splinting Joint Injuries A. Look for paresthesia (tingling) or paralysis. B. Assess the pulse and motor and sensory function below the injury site. C. If distal extremity is cyanotic (bluish) or lacks distal pulses, align with gentle traction; stop if pain or crepitus increases.	
3	XVI. Basics of Splinting—Traction Splinting A. Use for fractured femur. B. Reduces diameter of thigh C. Decreases space in which bleeding can occur D. Do not use in the following instances. <ol style="list-style-type: none"> 1. Injury is within one to two inches of the knee or ankle. 2. Knee itself is injured. 3. Hip is injured. 4. Pelvis is injured. 5. There is partial amputation or avulsion with bone separation. 	Discussion Question What is the mechanism by which traction splinting works?
2	XVII. Basics of Splinting—Splinting Specific Injuries A. Special techniques may be applied to the splinting of suspected bone and joint injuries to specific sites. B. Review splinting techniques for the shoulder, upper arm, elbow, forearm,	

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Minutes	Content Outline	Master Teaching Notes
	wrist, hand, fingers, pelvis, hip, thigh, knee, lower leg, ankle, and foot in EMS Skills 30-07 and 30-08.	
5	<p>XVIII. Basics of Splinting—Pelvic Fracture</p> <p>A. Pneumatic Antishock Garment (PASG) can splint pelvis and decrease compartment size to reduce bleeding.</p> <p>B. Commercial pelvic splint is another method.</p> <p>C. Improvised pelvic wrap may be applied if necessary.</p> <ol style="list-style-type: none"> 1. Fold a sheet lengthwise to eight-inch width. 2. Slide it under the small of the back, then down under the pelvis until centered. Ends of the sheet must be of equal length on both sides of patient. 3. Cross tail ends over patient and twist until sheet is tightly secured around pelvis. 4. Tuck sheet ends under patient or tie into square knot. 5. Place patient on backboard or rigid device. 	
5	<p>XIX. Basics of Splinting—Compartment Syndrome</p> <p>A. May occur when fracture or injury to an extremity has occurred</p> <p>B. May occur in buttocks or abdomen</p> <p>C. Occurs when pressure in space around capillaries exceeds pressure needed to perfuse tissues; blood flow is cut off and cells become hypoxic.</p> <p>D. Usually develops over time as edema around injured area increases</p> <p>E. Commonly associated with fractures, bleeding from trauma, crush injuries, and high-energy trauma</p> <p>F. Signs and symptoms</p> <ol style="list-style-type: none"> 1. Severe pain or burning sensation 2. Decreased strength in extremity 3. Paralysis of extremity 4. Pain with movement 5. Extremity feeling hard to palpitation 6. Distal pulses, motor, and sensory function possibly normal <p>G. Treatment</p> <ol style="list-style-type: none"> 1. Immobilize and splint affected extremity. 2. Elevate extremity and apply cold pack or ice. 3. Transport the patient as soon as possible. 	<p>Discussion Question What is compartment syndrome?</p> <p>Critical Thinking Discussion What causes the pain and paresthesia associated with compartment syndrome?</p>
	XX. Follow-Up	Case Study Follow-Up Discussion

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Minutes	Content Outline	Master Teaching Notes
10	<p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 30 Summary. 2. Complete Chapter 30 In Review questions. 3. Complete Chapter 30 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 30 quiz 	<p>Do you agree with the choice of splints? Why or why not?</p> <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 31

Head Trauma

90–100 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and care for a patient suffering from a head injury.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What type of injury would present with a delayed onset of signs and symptoms such as this? • What are your immediate concerns for this patient?
5	<p>II. Anatomy of the Skull and Brain—The Skull</p> <p>A. Contains and protects the brain and upper portion of the spinal cord</p> <p>B. Cranial skull</p> <ol style="list-style-type: none"> 1. Made of plates of large, flat bones 2. Bones are fused together to form a helmet-like covering. <p>C. Facial bones</p> <ol style="list-style-type: none"> 1. 14 irregularly shaped bones 2. Cheek, nose, and jaw bones <p>D. Basilar skull (floor of the skull)</p> <ol style="list-style-type: none"> 1. Many separate pieces of bone 2. Weakest part of the skull 3. Spinal cord, nerves, and blood vessels perforate these bones 4. Many bony ridges that can cause injury to brain 	<p>Teaching Tip</p> <p>Pass around an anatomical model of the skull to illustrate the basilar skull—a set of structures that is often difficult for students to visualize.</p>
10	<p>III. Anatomy of the Skull and Brain—The Brain</p> <p>A. Cerebrospinal fluid</p> <ol style="list-style-type: none"> 1. Dense, serous substance surrounding brain 2. Protects brain and spinal cord against impact 3. Clear and colorless 4. Circulates through skull and spinal column 5. Is reabsorbed by circulatory system 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How can you describe the location of intracranial bleeding with respect to the meninges? • Why is swelling or bleeding within the brain quickly life threatening? • What are the functions of the brain

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	<p>6. Combats infection and cleanses brain and spinal cord</p> <p>7. Leakage through nose and ears is classic sign of basilar skull fracture</p> <p>B. The meninges (layers of tissue surrounding the brain)</p> <ol style="list-style-type: none"> 1. Dura mater <ol style="list-style-type: none"> a. Outermost layer b. Double layer of tough, fibrous tissue 2. Arachnoid <ol style="list-style-type: none"> a. Between dura mater and pia mater b. Separated from pia mater by subarachnoid space (lattice of fibrous, spongy tissue) 3. Pia mater <ol style="list-style-type: none"> a. Beneath arachnoid b. In contact with brain <p>C. Bleeding in the brain</p> <ol style="list-style-type: none"> 1. Epidural bleeding <ol style="list-style-type: none"> a. Occurs between dura mater and skull b. Usually involves brain's outermost arteries c. May have no permanent consequences if treated early 2. Subdural bleeding <ol style="list-style-type: none"> a. Occurs beneath dura b. Usually venous 3. Subarachnoid hemorrhage <ol style="list-style-type: none"> a. Occurs between arachnoid membrane and surface of brain b. Can be fatal within minutes <p>D. Parts of the brain</p> <ol style="list-style-type: none"> 1. Cerebrum <ol style="list-style-type: none"> a. Comprises three-fourths of brain's volume b. Divided into right and left hemispheres c. Each hemisphere divided into four lobes <ol style="list-style-type: none"> i. Frontal lobe (anterior) ii. Parietal lobe (middle) iii. Occipital lobe (posterior) iv. Temporal lobe (side) d. Responsible for most conscious and sensory functions, emotions, and personality e. Not attached to inside of skull 2. Cerebellum ("little brain") <ol style="list-style-type: none"> a. Found underneath cerebrum 	<p>stem?</p> <p>Knowledge Application</p> <ul style="list-style-type: none"> • Given a description of the location of bleeding within the cranium, students should be able to describe it using the correct terminology. • Given a description of a region of the brain, students should be able to describe the major functions of that area. <p>Class Activity</p> <p>Assign groups of students to research and present the anatomy and physiology of different parts of the brain.</p>

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	<ul style="list-style-type: none"> b. Controls muscle movement and coordination c. Predicts when to stop movement d. Coordinates reflexes that maintain posture and equilibrium 3. Brain stem <ul style="list-style-type: none"> a. Most primitive and best-protected part of brain b. Tethered to skull by nerves and vessels c. Controls most automatic functions of the body (cardiac, respiratory, vasomotor or blood pressure, and so on) d. Made up of pons, midbrain, and medulla or medulla oblongata <ul style="list-style-type: none"> i. Medulla physically connects the brain to the spinal cord. ii. All messages between brain and spinal cord pass through the medulla. 	
5	<p>IV. Head Injury—Scalp Injuries</p> <ul style="list-style-type: none"> A. The scalp may be contused, lacerated, abraded, or avulsed. B. Scalp injuries bleed heavily because of the rich supply of blood vessels. C. Underlying fascia (fibrous membrane) may be torn while the skin stays intact. D. Ruptured or depressed fascia can feel, on palpation, like a depressed skull fracture. E. If blood fills area between depressed skull fracture and scalp, skull will feel normal during palpation. 	
7	<p>V. Head Injury—Skull Injuries</p> <ul style="list-style-type: none"> A. Linear skull fracture <ul style="list-style-type: none"> 1. Resembles a line 2. No gross deformity 3. Can be diagnosed only through a radiograph B. Depressed skull fracture <ul style="list-style-type: none"> 1. Occurs when bone ends are pushed inward toward the brain 2. Depression can typically be palpated. 3. May pose harm if bone ends damage brain tissue C. Closed skull fracture—No open wound to scalp D. Open skull fracture <ul style="list-style-type: none"> 1. Open wound to scalp 2. Bacteria and other contaminants may infect brain through open wound 3. Cerebrospinal fluid may leak from open wound E. Basilar skull fracture 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What is a basilar skull fracture? • What are the signs and symptoms of a basilar skull fracture?

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	<ol style="list-style-type: none"> 1. Often begins as linear temporal fracture that extends downward and into the base of the skull 2. Often causes leakage of cerebrospinal fluid from ears, nose, or mouth 3. Patient often develops ecchymosis (bruise-type discoloration) around eyes and behind ears after several hours. 	
8	<p>VI. Head Injury—Brain Injuries</p> <ol style="list-style-type: none"> A. Injury to the skull can cause swelling of brain tissue or bleeding within the skull. B. Both conditions can cause increased pressure inside skull and decreased perfusion of the brain. C. Effects of pressure inside skull and decreased perfusion <ol style="list-style-type: none"> 1. Inadequate delivery of oxygen and glucose to brain tissues 2. Inadequate removal of carbon dioxide and other waste from brain tissues 	<p>Teaching Tip Take time to explain how increased intracranial pressure affects cerebral blood flow.</p> <p>Critical Thinking Discussion What happens to perfusion of the brain when brain tissue swells?</p>
25	<p>VII. Head Injury—Pathophysiology of Traumatic Brain Injury</p> <ol style="list-style-type: none"> A. Closed head injury <ol style="list-style-type: none"> 1. Scalp may be lacerated, but skull remains intact; no opening to the brain. 2. Brain injury may still be extensive. B. Open head injury <ol style="list-style-type: none"> 1. Involves break in skull and break in scalp 2. Involves direct local damage to tissue 3. Can also result in brain damage from infection, laceration, or puncture C. Diffused axonal injury (DAI) <ol style="list-style-type: none"> 1. Results from shearing, tearing, or stretching of nerve fibers 2. Interferes with communication and transmission of nerve impulses throughout the brain 3. Most common in auto crashes and pedestrians struck by autos 4. Categorized as mild (concussion), moderate, or severe (involves brain stem) D. Concussion (temporary loss of brain's ability to function) <ol style="list-style-type: none"> 1. Normally causes headache and some temporary disturbance in brain function 2. Presents with an altered mental status that progressively improves 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How do intracranial hematomas develop? • What conditions can lead to secondary brain injury? <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on traumatic brain injuries.</p>

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	<ul style="list-style-type: none"> 3. Loss of consciousness will only occur immediately after impact. 4. Signs include confusion, brief memory loss, irritability, combativeness, nausea and vomiting, and restlessness. E. Contusion (bruising and swelling of brain tissue) <ul style="list-style-type: none"> 1. Can accompany concussion 2. Causes bleeding into surrounding tissues 3. May cause increased intracranial pressure 4. Coup/contrecoup injury—Damage at and directly opposite the point of impact 5. Acceleration/deceleration injury—Head comes to a sudden stop but brain continues to move, resulting in bruising to brain. 6. Signs and symptoms <ul style="list-style-type: none"> i. All signs and symptoms of a concussion ii. Decreasing mental status or unresponsiveness iii. Paralysis iv. Unequal pupils v. Alteration of vital signs vi. Profound personality changes F. Subdural hematoma (collection of blood between dura mater and brain) <ul style="list-style-type: none"> 1. Due to low-pressure venous bleeding from veins torn during impact 2. Commonly associated with cerebral contusion 3. Formation of hematoma may cause pressure on the brain, resulting in cerebral injury. 4. Acute hematoma—Signs and symptoms begin almost immediately upon impact. 5. Occult hematoma—Signs and symptoms do not appear for days or weeks after impact. 6. Most common type of severe head injury; accounts for 33 percent of all severe head injuries 7. Those especially vulnerable to subdural hematoma <ul style="list-style-type: none"> a. Anyone over the age of 60 b. Anyone whose blood clots abnormally slowly (hemophiliacs, alcoholics, patients taking anticoagulant drugs) 8. Signs and symptoms <ul style="list-style-type: none"> a. Weakness or paralysis on one side of the body b. Deterioration in level of responsiveness c. Vomiting d. Dilation of one pupil 	

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	<ul style="list-style-type: none"> e. Abnormal respirations or apnea f. Possible increasing systolic blood pressure g. Decreasing pulse rate h. Headache i. Seizures j. Confusion k. Personality change (chronic subdural hematoma) <p>G. Epidural hematoma</p> <ul style="list-style-type: none"> 1. Arterial or venous bleeding pools between skull and dura 2. Bleeding is rapid, profuse, and severe and expands rapidly in a small space. 3. Rare; accounts for two percent of all severe head injuries 4. Extreme emergency 5. Most commonly results from low-velocity impact or from deceleration injury 6. Usually associated with a skull fracture, especially in temporal region 7. Signs and symptoms <ul style="list-style-type: none"> a. Loss of responsiveness; responsiveness returns (lucid interval) then rapidly deteriorates (occurs in only 20 percent of cases) b. Decreasing mental status (more common than above) c. Severe headache d. Fixed and dilated pupils e. Seizures f. Increasing systolic blood pressure and decreasing heart rate g. Vomiting h. Apnea or abnormal breathing pattern i. Systolic hypertension and bradycardia (Cushing's reflex) j. Posturing (withdrawal or flexion) 8. Needs immediate surgical repair; prognosis is generally good. <p>H. Laceration</p> <ul style="list-style-type: none"> 1. Often occurs when an object penetrates the skull 2. Permanent injury; almost always results in bleeding 3. Can cause massive disruption of nervous system <p>I. Brain herniation (compression of the brain)</p> <ul style="list-style-type: none"> 1. Hematoma puts pressure on the brain, resulting in compression and pushing of brain downward and through foramen magnum (opening in base of skull) 2. Compression of brain stem destroys vital functions (heartbeat, 	<p>Discussion Question What are the similarities and differences between subdural and epidural hematomas?</p> <p>Critical Thinking Discussion What is the explanation for Cushing's reflex?</p> <p>Discussion Question What are indications of herniation?</p>

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	<p>respiration, blood pressure).</p> <ol style="list-style-type: none"> 3. Signs and symptoms <ol style="list-style-type: none"> a. One dilated or sluggish pupil b. Weakness or paralysis c. Severe alteration in consciousness d. Abnormal posturing (nonpurposeful movement) e. Abnormal ventilation pattern f. Systolic hypertension and bradycardia (Cushing's reflex) 4. May consider controlled hyperventilation 	
25	<p>IX. Head Injury—Assessment-Based Approach: Head Injury</p> <ol style="list-style-type: none"> A. Scene size-up <ol style="list-style-type: none"> 1. Always be alert for signs of head injury in a scene size-up. 2. Unresponsiveness or altered mental status should always suggest the possibility of head injury. 3. Never assume that mental status changes in a trauma victim are due to drug or alcohol intoxication. B. Primary assessment <ol style="list-style-type: none"> 1. First step is manual in-line stabilization of the spine. 2. Establish an airway using a jaw-thrust maneuver. 3. Maintain airway and provide oxygen by nonrebreather mask. 4. Assess patient's mental status and keep in mind that it may change. 5. Assess and record patient's responsiveness accurately and in detail. <ol style="list-style-type: none"> a. Purposeful response—Patient tries to remove/move away from pain. b. Nonpurposeful response—Patient reacts inappropriately to pain. <ol style="list-style-type: none"> i. Flexion (decorticate) posturing (arms across chest, legs extended) indicates upper-level brain stem injury. ii. Extension (decerebrate) posturing (arms and legs extended, back sometimes arched) indicates lower-level brain stem injury. c. Unresponsive—Patient exhibits no response at all to verbal or painful stimuli. C. Secondary assessment <ol style="list-style-type: none"> 1. Physical exam <ol style="list-style-type: none"> a. Head—Using extreme care, palpate for deformities, depressions, lacerations, or penetrating objects. b. Eyes—Check pupils with a bright light for fixation or dilation; make sure eyes track normally; check for dark discoloration around eyes. c. Ears and nose—Check for leakage of blood or clear fluid; check for 	<p>Knowledge Application Given a variety of scenarios, students should be able to identify and properly manage patients with head injuries.</p> <p>Critical Thinking Discussion How can EMTs' actions help minimize secondary brain injury?</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on applying a cervical collar.</p> <p>Discussion Question What are flexion and extension posturing?</p>

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	<p>Battle's sign (purplish discoloration behind ear).</p> <p>d. Motor/sensory assessment—Check patient's ability to move fingers and toes; pinch extremities and check response.</p> <p>2. Baseline vital signs—Check and record every five minutes.</p> <p>a. Pulse—If fast, suspect hemorrhage or early onset of hypoxia; if slow, suspect pressure inside skull or severe hypoxia.</p> <p>b. Respiration—If definite signs of brain herniation exist, begin positive pressure ventilation at a rate of 20 ventilations per minute; if these signs are not present, ventilate at a rate of 10–12 per minute.</p> <p>3. History—Ask patient or bystanders:</p> <p>a. When and how did the incident occur?</p> <p>b. What is the patient's chief complaint?</p> <p>c. Have symptoms changed since the incident?</p> <p>d. Did the patient lose consciousness at any time?</p> <p>e. Was he moved after the incident?</p> <p>f. Is there any history of previous blows to the head? Can you provide any details?</p> <p>4. Signs and symptoms</p> <p>a. Altered mental status, from disorientation to unresponsiveness that doesn't improve, or that gets worse</p> <p>b. Irregular breathing pattern (severe)</p> <p>c. Cushing's reflex (increasing blood pressure and decreasing pulse) (severe)</p> <p>d. Obvious signs of injury—Contusions, lacerations, hematomas to scalp; deformity to skull</p> <p>e. Visible damage to skull</p> <p>f. Pain, tenderness, or swelling at injury site</p> <p>g. Blood or cerebrospinal fluid from ears or nose</p> <p>h. Discoloration around eyes in absence of trauma to eyes (very late)</p> <p>i. Absent motor or sensory function</p> <p>j. Nausea and/or vomiting</p> <p>k. Unequal pupil size with altered mental status</p> <p>l. Diplopia (double vision)</p> <p>m. Possible seizures</p> <p>n. Nonpurposeful response to painful stimuli</p> <p>o. Retrograde amnesia (no memory of what led up to incident)</p> <p>p. Anterograde amnesia (no memory of what happened after incident)</p> <p>D. Emergency medical care</p>	<p>Discussion Question What are some general signs and symptoms of brain injury?</p>

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	<ol style="list-style-type: none"> 1. Take Standard Precautions. 2. Take manual in-line spine stabilization. 3. Maintain a patient airway, adequate breathing, and oxygenation. <ol style="list-style-type: none"> a. Use a jaw-thrust to open airway. b. Remove any foreign bodies from the mouth; suction blood and mucus. c. Protect against aspiration by having suction available and by being prepared to roll secured patient to clear airway. d. If breathing is adequate, administer oxygen by nonrebreather mask at 15 lpm. e. If breathing is inadequate, administer positive pressure ventilation with supplemental oxygen at 10–12 per minute with SpO₂ reading at 95 percent or greater. f. Consider controlled hyperventilation if signs of brain herniation are present. 4. Monitor airway, breathing, pulse, and mental status for deterioration. 5. Control bleeding. <ol style="list-style-type: none"> a. Do not apply pressure to open or depressed skull injury. b. Dress and bandage open head wounds. c. Do not attempt to stop flow of blood or cerebrospinal fluid from ears or nose; cover loosely with sterile gauze dressing. d. For other wounds, use gentle, continuous direct pressure with sterile gauze only as needed to control bleeding. e. Never try to remove a penetrating object; immobilize in place and dress wound. 6. Provide emergency care for seizures. 7. Transport immediately. E. Reassessment <ol style="list-style-type: none"> 1. Recheck patient’s airway and mental status. 2. Repeat reassessment every five minutes. 	
5	<p>X. Head Injury—Summary: Assessment and Care</p> <ol style="list-style-type: none"> A. Review possible assessment findings and emergency care for head injuries. B. Review Figures 31-18 and 31-19. 	<p>Class Activity</p> <p>Give students 20 to 30 minutes to review the lecture and their textbooks. Divide the class into two teams. Read aloud the In Review questions from the text. The team to ring its bell first gets an opportunity to answer. If the students on the team are</p>

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		<p>correct, they get a point. If they are incorrect, the other team gets an opportunity to answer.</p>
10	<p>XI. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 31 Summary. 2. Complete Chapter 31 In Review questions. 3. Complete Chapter 31 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 31 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Based on Mike’s presentation, what type of injury do you suspect? • What factors do you believe made a difference in Mike’s good outcome? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 32

Spinal Column and Spinal Cord Trauma

90–100 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	I. Introduction A. During this lesson, students will learn special considerations of assessment and emergency care for a patient suffering from a possible spine injury. B. Case Study <ol style="list-style-type: none"> 1. Present Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	Case Study Discussion <ul style="list-style-type: none"> • What are the patient management priorities in this situation? • Based on the mechanism of injury, what injuries do you suspect?
5	II. Anatomy and Physiology of Spine Injury—The Nervous System A. Parts of the nervous system—Structural divisions <ol style="list-style-type: none"> 1. Central nervous system—Brain and spinal cord 2. Peripheral nervous system—Nerves outside the brain and spinal cord B. Parts of the nervous system—Functional divisions <ol style="list-style-type: none"> 1. Voluntary nervous system—Influences action of voluntary (skeletal) muscles 2. Autonomic nervous system—Influences activities of involuntary muscles and glands <ol style="list-style-type: none"> a. Sympathetic nervous system b. Parasympathetic nervous system 	Discussion Question What are the functions of the autonomic nervous system?
15	III. Anatomy and Physiology of Spine Injury—The Skeletal System A. The skull <ol style="list-style-type: none"> 1. Rests at the top of the spinal column 2. Contains the brain 3. Comprises cranium (brain case) and face B. The spinal (vertebral) column <ol style="list-style-type: none"> 1. Principal support system of the body <ol style="list-style-type: none"> a. Ribs originate from spinal column to form thoracic cavity. b. Rest of skeleton is indirectly attached to spine. 2. Made of 33 irregularly-shaped bones called vertebrae 	Discussion Question Describe the structure of the spinal column.

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	<ul style="list-style-type: none"> a. Body—Anterior aspect of vertebra b. Spinous process—Posterior aspect of vertebra c. Bound together by strong ligaments d. Arranged on either side of discs (fluid-filled pads of cartilage) that act as shock absorbers 3. Divided into five parts: <ul style="list-style-type: none"> a. Cervical spine <ul style="list-style-type: none"> i. Seven vertebrae that form the neck ii. Most mobile and delicate of the vertebrae, thus most vulnerable to spinal cord injury b. Thoracic spine—12 vertebrae that form the upper back c. Lumbar spine—Next five vertebrae that form the lower back d. Sacral spine (sacrum)—Five fused vertebrae that form rigid posterior of pelvis e. Coccyx (tailbone)—Four fused vertebrae that form lower end of spine C. Spinal cord <ul style="list-style-type: none"> 1. Exits brain through opening at base of skull 2. Surrounded by sheath of protective membranes (meninges) and cerebrospinal fluid 3. Wider at head/neck area; narrower in lower back 4. Source of origin of all nerves to trunk and extremities 5. Carries all messages from brain to rest of body 6. Three main types of tracts to test in injury assessment <ul style="list-style-type: none"> a. Motor tracts <ul style="list-style-type: none"> i. Carry impulses from spinal cord to muscles ii. Test by having the patient move on same side of body as tract b. Pain tracts <ul style="list-style-type: none"> i. Carry impulses from pain receptors from spinal cord to brain ii. Test by applying pain to patient on opposite side of body from tract c. Light touch tracts <ul style="list-style-type: none"> i. Carry light-touch impulses from spinal cord to brain ii. Test by touching patient lightly on same side of body as tract 	<p>Teaching Tip The use of graphics will enhance students' understanding of the anatomy and physiology of the spinal tracts.</p>

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5	<p>IV. Anatomy and Physiology of Spine Injury—Common Mechanisms of Spinal Injury</p> <p>A. Compression</p> <ol style="list-style-type: none"> 1. Weight of the body is driven against the head 2. Common in falls, diving accidents, motorcycle crashes 3. Usually results when a person impacts an object head first <p>B. Flexion</p> <ol style="list-style-type: none"> 1. Severe forward movement of head in which chin meets chest 2. Excessive forward curl of torso <p>C. Extension</p> <ol style="list-style-type: none"> 1. Severe backward movement of head in which neck is stretched 2. Excessive backward arch of torso <p>D. Rotation—Lateral movement of head or spine beyond normal rotation</p> <p>E. Lateral bending—Severe bending of body from side</p> <p>F. Distraction—Stretching and pulling apart of vertebrae and spinal cord (common in hangings)</p> <p>G. Penetration—Injury to cranium or spinal column from penetrating trauma such as gunshots or stabbings</p>	<p>Discussion Question Describe mechanisms that can lead to spinal column and spinal cord injuries.</p> <p>Critical Thinking Discussion What factors might increase a patient's chances of sustaining a spine injury?</p>
25	<p>V. Anatomy and Physiology of Spine Injury—Spinal Column Injury vs. Spinal Cord Injury</p> <p>A. Spinal column injury</p> <ol style="list-style-type: none"> 1. Bone injury (injury to one or more vertebrae) 2. Can be fracture or dislocation 3. Symptoms—Pain and tenderness <p>B. Spinal cord injury</p> <ol style="list-style-type: none"> 1. Nerve injury (damage to nervous tissue inside spinal column) 2. Symptoms—Loss of motor and/or sensory function <p>C. Complete spinal cord injury</p> <ol style="list-style-type: none"> 1. Spinal cord is transected (cut crossways) either physically or physiologically. 2. Results in total loss of motor and sensory function below level of injury <p>D. Spinal shock</p> <ol style="list-style-type: none"> 1. Temporary, concussion-like insult to spinal cord 2. Usually occurs high in cervical region 3. Results in loss of muscle tone, loss of light-touch sensation, and paralysis 4. Usually resolves within 24 hours after incident; sometimes within several 	<p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on spinal cord injuries, figures about spinal cord injuries, and spinal fractures.</p> <p>Discussion Question What is spinal shock? How is it related to neurogenic hypotension?</p>

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	<p>days</p> <ol style="list-style-type: none"> 5. Neurogenic hypotension from spinal shock <ol style="list-style-type: none"> a. Also called spinal-vascular shock or neurogenic shock b. Results from injury to spinal cord that interrupts nerve impulses to arteries c. Arteries relax and dilate, causing lowered blood pressure. d. Signs include red, dry skin and slow pulse (60–80 beats per minute). E. Incomplete spinal cord injury <ol style="list-style-type: none"> 1. Central cord syndrome <ol style="list-style-type: none"> a. Central portion of spinal cord is injured. b. Patient may have weakness or paralysis above injury site, but good function below it. 2. Anterior cord syndrome <ol style="list-style-type: none"> a. Sensory and motor tracts in anterior portion of cord are injured. b. Patient will have paralysis and inability to feel pain below site of injury but will still feel light touch. 3. Brown-Séquard syndrome <ol style="list-style-type: none"> a. Right or left half of spinal cord is injured. b. Patient will lose motor function and light-touch sensation on one side but lose pain sensation on the opposite side. 	<p>Critical Thinking Discussion Explain how and why the patient with spinal neurologic hypotension presents differently from the patient with hemorrhagic shock.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on central cord syndrome.</p> <p>Knowledge Application Students should be able to apply knowledge of spinal column and cord anatomy and physiology to the assessment of patients with suspected spine injury.</p>
25	<p>VI. Emergency Care for Suspected Spine Injury—Assessment-Based Approach: Spine Injury</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Likely mechanisms of spine injury <ol style="list-style-type: none"> a. Motorcycle crashes b. Motor vehicle crashes c. Pedestrian–vehicle collisions d. Falls e. Blunt trauma f. Penetrating trauma to head, neck, or torso g. Sporting injuries h. Hangings i. Diving or other water-related accidents j. Gunshot wounds to head, neck, chest, abdomen, back, or pelvis k. Electrical injuries 2. Clues to mechanism of injury—Dent in car windshield, presence of tree by unresponsive patient on ground, and so on 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • On what type of calls should you suspect spine injury? • At what point in your approach to a patient with a potential spine injury do you apply manual in-line stabilization of the cervical spine?

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	<p>B. Primary assessment</p> <ol style="list-style-type: none"> 1. Adopt a high index of suspicion of spine injury and initiate immediate in-line spinal stabilization. 2. Look for signs of altered mental status. 3. Be aware that the pain of other injuries may distract patient from feeling or mentioning pain to spinal column. 4. Open the airway using the jaw-thrust maneuver. 5. Categorize the patient as high or low priority for emergency care or transport. <p>C. Secondary assessment</p> <ol style="list-style-type: none"> 1. Physical exam <ol style="list-style-type: none"> a. Look for evidence of trauma to the head, posterior cervical region, anterior neck, chest, abdomen, back, and pelvis. b. Apply the cervical spine immobilization collar (CISC). c. Assess radial and pedal pulses. d. Assess motor function for upper and lower extremities with these commands. <ol style="list-style-type: none"> i. Flex your arms across your chest. ii. Extend your arms. iii. Spread your fingers out on both hands and don't let me squeeze them together. iv. Hold out both arms and don't let me push your hand down. v. Push downward against my hands with your feet. vi. Pull up against my hands with your feet. e. Assess sensory function for both pain (use jagged end of broken Q-Tip) and light touch (use cotton tip of Q-Tip). 2. Baseline vital signs—May reflect neurogenic hypotension if brain or spinal cord is damaged 3. History <ol style="list-style-type: none"> a. Does your back or neck hurt? b. Where does it hurt? c. Can you move your hands and feet? d. Do you have any pain or muscle spasms along your back or to the back of your neck? e. Do you have any numbness or tingling sensation in any of your arms or legs? f. Was the onset of pain associated with a fall or other injury? g. Did you move, or did someone move you, before our arrival? 	<p>Teaching Tip Discuss applicable local protocols related to spine immobilization.</p> <p>Critical Thinking Discussion If you must rely on bystanders to help you move a patient with a spine injury, which tasks should you delegate and which should you perform yourself?</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What patient factors may interfere with satisfactory assessment for indications of spine injury? • Explain the steps in the assessment of the upper and lower extremities for pulse and motor and sensory function. <p>Knowledge Application Given several scenarios, students should be able to identify and manage patients with possible spine injuries.</p> <p>Class Activity Have pairs of students practice neurological examination on patients with suspected spine injury.</p>

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	<ol style="list-style-type: none"> 7. Apply the cervical spine immobilization collar. 8. Immobilize the patient to a long backboard. 9. Once patient is immobilized, reassess, record, and document pulses and motor and sensory function in all extremities. 10. Transport to the hospital. <p>E. Reassessment</p> <ol style="list-style-type: none"> 1. Reassess the patient's condition every five minutes en route to the hospital. 2. Ensure that the airway is clear and breathing is adequate. 3. Reassess and record vital signs. 4. Look for signs of shock. 5. If the patient has further complaints, repeat those necessary parts of the physical exam. 6. Be aware of complaints of tingling, numbness, loss of sensation, or paralysis. 7. Reevaluate airway adjuncts, positive pressure ventilation devices, mask seal, oxygen therapy, splints, and immobilization devices. 8. Record findings in the prehospital report and communicate them to the emergency department. 	
5	<p>VII. Emergency Care for Suspected Spine Injury—Summary: Assessment and Care</p> <ol style="list-style-type: none"> A. Review possible assessment findings and emergency care for spine injuries. B. Review Figures 31-7 and 31-8. 	<p>Discussion Question What are the priorities of care in managing a patient with a suspected spine injury?</p>
25	<p>VIII. Guidelines for Immobilization—Tools</p> <ol style="list-style-type: none"> A. Cervical spine immobilization collars <ol style="list-style-type: none"> 1. Use whenever you suspect injury to the spine based on mechanism of injury, patient's history, or signs and symptoms. 2. Collar prevents the patient's head from moving in relation to the spine. 3. Collar reduces compression of cervical spine during movement and transport. 4. Use a collar of the proper size: if too small, it will not restrain the patient's head adequately; if too large, it may aggravate the injury. 5. Should be applied by two rescuers: one stabilizes the neck manually and the other applies the collar. 6. Collar should never obstruct the airway. B. Full body spine immobilization devices 	<p>Teaching Tip Demonstrate a variety of devices and techniques so that students will be able to adapt their approach to the situation.</p> <p>Knowledge Application Given a series of scenarios, students should be able to choose the best method of spine immobilization and perform it efficiently.</p> <p>Discussion Questions</p>

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	<ol style="list-style-type: none"> 1. Use a long backboard to immobilize patients found lying or standing. 2. Use padding, straps, and cravats with the long board. <p>C. Short spine immobilization devices</p> <ol style="list-style-type: none"> 1. Commercially-made vest-type device comes with straps for head, chest, and legs. 2. Rigid short spine board requires addition of straps, padding, tape, or cravats. 3. These devices require a significant amount of time to apply. 4. Use to immobilize noncritical sitting patients with suspected spine injuries. 5. Use only for immobilization while moving patient from sitting position; transfer patient immediately to a long board. <p>D. Other immobilization equipment</p> <ol style="list-style-type: none"> 1. Place backboard straps or cravats across the patient’s chest and under his armpits without interfering with his breathing; also across his pelvis and above his knees. 2. Fasten deceleration straps about the patient’s shoulders to help prevent his torso from sliding up the backboard. 	<ul style="list-style-type: none"> • What is the purpose of a cervical immobilization collar? • What are the considerations in determining placement of backboard straps? <p>Video Clips Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access videos on applying a cervical collar and when to use a long board.</p> <p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on cervical injuries and application of a cervical collar.</p>
25	<p>IX. Guidelines for Immobilization—Immobilization Techniques</p> <p>A. Immobilizing a supine or prone patient</p> <ol style="list-style-type: none"> 1. Ensure that all life-threatening situations have been managed. 2. Establish and maintain in-line manual spinal stabilization. 3. Apply cervical spine immobilization collar. 4. Log roll the patient onto the spine board (ideally done by at least four rescuers). 5. Slide the long board under the patient during the log roll. 6. Pad the spaces between the patient and the board. 7. Immobilize the patient’s torso to the board with straps. 8. Immobilize the patient’s head to the board. 9. Secure the patient’s legs to the board with straps. 10. Proceed with care as described under Emergency Medical Care. <p>B. Immobilizing a standing patient</p> <ol style="list-style-type: none"> 1. One EMT establishes in-line stabilization while another applies a cervical collar. 2. Position the long board behind the patient. 	<p>Discussion Question What are the steps for securing a supine patient to a long backboard?</p> <p>Class Activity Provide ample time and supervision for groups of students to practice spine immobilization skills.</p>

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	<ol style="list-style-type: none"> 3. Two EMTs should stand on either side of the patient, supporting him. 4. Each EMT places a leg behind the board, then slowly tips it backward and begins lowering it to the ground. 5. Once the board is level on the ground, one EMT maintains manual stabilization while others perform necessary assessment and care. 6. Proceed with care as described under Emergency Medical Care. <p>C. Immobilizing a seated patient</p> <ol style="list-style-type: none"> 1. Use manual in-line stabilization and apply a cervical collar. 2. Position the short spinal device behind the patient. 3. Secure the device to the patient's torso. 4. Pad behind the patient's head to align head and neck. 5. Secure the patient's head to the device. 6. Position a long backboard under or next to the patient's buttocks and rotate him until his back is in line with it. 7. Follow guidelines for immobilizing a patient to a long backboard. 8. Proceed with care as described under Emergency Medical Care. 9. Be aware of special considerations when using a short spinal device: <ol style="list-style-type: none"> a. Assess back, scapula, arms, and clavicles before you apply the board. b. Angle the board to fit, without jarring, between the arms of the rescuer who is stabilizing the patient's head. c. Push the spine board as far down into the seat as possible. d. Never place a chin cup or strap on the patient. e. Take care not to apply the first strap to the torso too tightly. f. Always tighten torso and leg straps before securing the patient's head. g. Never allow buckles to be placed midsternum where they might interfere with CPR. h. Never pad between the cervical collar and the board. i. Assess pulses and motor and sensory function before and after applying the device. <p>D. When rapid extrication before immobilization should be executed</p> <ol style="list-style-type: none"> 1. Scene is unsafe (such as a threat of fire or an explosion). 2. Patient's condition is so unstable you need to move and transport him immediately. 3. Patient blocks your access to a second, more seriously injured patient. 	<p>Discussion Question What are the indications for rapid extrication?</p>

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Minutes	Content Outline	Master Teaching Notes
20	<p>X. Special Considerations—Helmets</p> <p>A. Helmet removal</p> <ol style="list-style-type: none"> 1. Take the patient's eyeglasses off before attempting to remove the helmet. 2. One EMT should stabilize the helmet by placing hands on each side of it, with fingers on the patient's mandible (lower jaw). 3. A second EMT should loosen the chin strap. 4. Second EMT should place one hand anteriorly on the mandible and the angle of the jaw, and the other hand at the back of the head. 5. The first rescuer should pull the sides of the helmet apart, slip it gently halfway off the patient's head, then stop. 6. The second rescuer should slide his hand under the patient's head. 7. The first rescuer should finish removing the helmet. 8. The rescuers should then immobilize the patient. <p>B. Football injuries</p> <ol style="list-style-type: none"> 1. Removal of the face mask <ol style="list-style-type: none"> a. Face mask is attached to helmet by four plastic clips screwed into place. b. Use an ordinary garden pruning tool to cut all the plastic clips and lift the face mask off the helmet. 2. Immobilization of the player <ol style="list-style-type: none"> a. Immobilize the patient to a backboard, leaving helmet, chin straps, and shoulder pads in place. b. Football equipment may make it impossible to apply a cervical spine immobilization collar; if so, pad with towels or blanket rolls. c. Use a six-person lift to move the patient onto the backboard. d. Tape the helmet to the backboard, keeping the chin strap in place. e. Pad any gaps between the patient and the backboard. f. Remove the helmet only if it is a loose fit on the patient's head or if you cannot gain access to the airway; add padding behind the head. 	<p>Teaching Tip Bring in a selection of different types of helmets for students to examine and practice removing.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the considerations in deciding whether or not to remove a helmet from the patient with a potential spine injury? • What special equipment do you need to remove the face shield of a helmet? <p>Class Activity Provide ample opportunity for student skill practice under supervision.</p> <p>Knowledge Application Given a series of scenarios involving patients wearing helmets and pediatric patients with potential spine injury, students should be able to make appropriate decisions regarding helmet removal and immobilization.</p>
10	<p>XI. Special Considerations—Infants and Children</p> <ol style="list-style-type: none"> A. Use a long board that is appropriate for the child's size. B. Pad from the shoulders to the heels to maintain immobilization. C. Make sure the cervical collar fits properly; if it does not, substitute rolled towels taped to the backboard. D. Do not use a child car seat to stabilize the child for transport; transfer the 	<p>Teaching Tip Demonstrate pediatric-sized equipment as well as adult equipment.</p> <p>Discussion Question How do you modify immobilization</p>

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	child to a backboard.	techniques for children under eight years of age?
10	<p>XII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 32 Summary. 2. Complete Chapter 32 In Review questions. 3. Complete Chapter 32 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 32 quiz 	<p>Case Study Follow-Up Discussion How can Carrie’s ability to detect pain and move her feet be consistent with her inability to feel light touch?</p> <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 33

Eye, Face, and Neck Trauma

90–100 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn special considerations of assessment and emergency care for a patient suffering eye, face, and neck injuries.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • Are there any scene hazards that you need to address before approaching the patient? • Aside from the patient's complaint of eye pain and blindness, are there other injuries you should anticipate?
5	<p>II. Anatomy of the Eye, Face, and Neck—The Eye</p> <p>A. Globe (eyeball)—Sphere approximately one inch in diameter</p> <p>B. Sclera—Tough outer coat covering the globe (visible part is “white” of eye)</p> <p>C. Cornea—Clear front portion of the eye</p> <ol style="list-style-type: none"> 1. Window through which light enters the eye 2. Extremely sensitive and susceptible to injury 3. Superficial scratch can cause extreme pain, redness, and flow of tears. <p>D. Pupil—Dark center of eye; expands and contracts to control amount of light allowed through lens</p> <p>E. Iris—Colored portion of the eye</p> <p>F. Lens—Just behind pupil; focuses light on retina</p> <p>G. Retina—Back of the eye</p> <p>H. Conjunctiva—Lining of inner surface of eyelids and exposed portion of sclera</p> <p>I. Anterior chamber—Anterior to iris; filled with watery fluid called aqueous humor</p> <p>J. Aqueous humor—Watery fluid that fills anterior chamber</p> <p>K. Vitreous body—Behind the lens; filled with clear jelly called vitreous humor</p> <p>L. Vitreous humor—Clear jelly that fills the vitreous body</p> <p>M. Orbits (eye sockets)—Bony structures of skull that surround the eyes</p>	<p>Teaching Tip</p> <p>Use anatomical models to review the structures of the eye, face, and neck.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What is the pupil of the eye? • What is the orbit of the eye? <p>Class Activity</p> <p>Have each student, without opening the book, draw and label the anatomy of the eye. Then have groups of students compare and compile their drawings and come up with a revised, labeled drawing to turn in for review.</p>

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Minutes	Content Outline	Master Teaching Notes
5	<p>III. Anatomy of the Eye, Face, and Neck—The Face</p> <p>A. The face is comprised of 14 of the skull bones.</p> <ol style="list-style-type: none"> 1. 13 of the facial bones are immovable. <ol style="list-style-type: none"> a. Orbits of the eyes (eye sockets) b. Nasal bones c. Zygomatic bones (cheekbones) d. Maxillae (fused upper jaw bones) 2. The mandible (lower jaw) moves on hinged joints. <p>B. The face is extremely vascular (contains many blood vessels), so facial injuries may bleed profusely.</p> <p>C. Facial bones provide minimum protection for the airway.</p> <p>D. Facial bones allow points of attachment for muscles that control facial expression and manipulation of food.</p> <p>E. Compromise of facial structure can also cause closed or open brain injury.</p> <p>F. Mechanism that causes injury to the face is likely to have injured the spine as well.</p>	<p>Discussion Question What bones make up the face?</p>
5	<p>IV. Anatomy of the Eye, Face, and Neck—The Neck</p> <p>A. Body systems within the neck</p> <ol style="list-style-type: none"> 1. Cardiovascular—Carotid arteries and jugular veins 2. Musculoskeletal 3. Central nervous 4. Respiratory 5. Digestive 6. Endocrine <p>B. Major structures of the airway within the neck</p> <ol style="list-style-type: none"> 1. Trachea 2. Larynx <p>C. Major concerns with injuries to the neck</p> <ol style="list-style-type: none"> 1. Damages to structure of airway are serious life threats. 2. Any neck injury should automatically be assumed to have caused spine injury. 	<p>Discussion Question What structures are contained in the neck?</p> <p>Critical Thinking Discussion What would be the consequences of injury to the thyroid gland in the neck?</p>
15	<p>V. Eye, Face, and Neck Injuries—Assessment-Based Approach: Eye, Face, and Neck Injuries</p> <p>A. Scene size-up</p> <ol style="list-style-type: none"> 1. Think about forces behind injury as soon as you get the dispatcher's call. <ol style="list-style-type: none"> a. Motor vehicle crash (over 50 percent of all facial trauma cases) b. Assault 	<p>Discussion Question What are some causes of airway compromise in the patient with injuries to the eye, face, or neck?</p>

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	<ul style="list-style-type: none"> c. Sports-related injury 2. Be prepared to gather information from bystanders as patient is likely to be in great pain and emotionally distraught. 3. Protect your own safety; call for police backup if assault is involved. B. Primary assessment <ul style="list-style-type: none"> 1. Establish manual in-line stabilization of the head and neck on first contact. 2. Control major bleeding with direct pressure. 3. Open the airway using the jaw-thrust maneuver and suction vomitus and other substances as needed. 4. Consider advanced life support backup, if available. 5. If breathing is adequate, provide oxygen at 15 lpm by nonrebreather mask. 6. If breathing is inadequate, provide positive pressure ventilation with supplemental oxygen at 10–12 ventilations per minute. 7. Recognize which injuries are high priority for immediate patient transport. <ul style="list-style-type: none"> a. Chemical burns to the eye b. Impaled object in the eye c. Respiratory distress d. Severe injuries to the face or neck e. Major bleeding f. Airway compromise C. Secondary assessment <ul style="list-style-type: none"> 1. Inspect and gently palpate for signs of injury to eye sockets, cheekbones, nose, and jaw. 2. Use a small penlight to examine eyes. 3. Record vital signs. 4. If patient is bleeding severely, be prepared to treat shock. 5. Obtain a history. 6. Ask questions about the events leading up to the injury. D. Reassessment <ul style="list-style-type: none"> 1. Conduct a reassessment and check interventions. <ul style="list-style-type: none"> a. For unstable patient, reassess every five minutes. b. For stable patient, reassess every 15 minutes. 2. Monitor for deterioration of mental status, airway, or breathing. 	

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25	<p>VI. Specific Injuries Involving the Eye, Face, and Neck—Injuries to the Eye</p> <p>A. Assessment and care guidelines</p> <ol style="list-style-type: none"> 1. Use a small penlight to evaluate the following. <ol style="list-style-type: none"> a. Orbits for bruising, swelling, laceration, tenderness b. Lids for bruising, swelling, laceration c. Conjunctivae for redness, pulsing, foreign bodies d. Globes for redness, abnormal color, laceration e. Pupils for size, shape, equality, reactivity to light 2. Test whether the patient’s eyes can follow your finger normally as you move it up, down, left, and right. 3. Remember the following basic rules. <ol style="list-style-type: none"> a. Avoid unnecessary manipulation of an eye that is swollen shut. b. Do not try to force the eyelid open unless you have to wash out chemicals. c. Consult local protocol before irrigating. d. Do not put salve or medicine in an injured eye. e. Do not remove blood or blood clots from the eye. f. Have the patient lie down and keep quiet. g. Limit use of the uninjured eye. h. Give the patient nothing by mouth because hospital may use general anesthesia. i. Transport all patients with eye injuries for evaluation by a physician. j. Never apply direct pressure to an injured eye. 4. For foreign object in the eye <ol style="list-style-type: none"> a. Determine if patient or others made any attempt to remove object. b. Attempt to remove only if object is in the conjunctiva. c. Flush the eye with clean water. d. Pull down on lid while patient looks up, or pull up on lid while patient looks down; then remove object with sterile gauze or swab. e. Draw upper lid over lower lid, then back, allowing lower lashes to dislodge object. f. Grasp upper lashes to turn lid upward; remove object with sterile gauze or swab. g. Pull lower lid down and remove object with sterile gauze or swab. h. Do not attempt to remove object lodged in globe; bandage both eyes and transport patient as soon as possible. 	<p>Discussion Question What should you look for in the assessment of an injured eye?</p> <p>Class Activity To assess students’ ability to integrate the knowledge in this section, have groups of students write five to ten questions they predict would be on an exam covering this material. Have each group quiz the rest of the class.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on eye injuries, ways to prevent eye injuries, and first aid for eye injuries.</p>

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	<ul style="list-style-type: none"> 5. For injury to the orbits <ul style="list-style-type: none"> a. Establish and maintain spine stabilization if orbital fracture is suspected. b. Look for signs and symptoms of orbital fracture. <ul style="list-style-type: none"> i. Diplopia (double vision) ii. Marked decrease in vision iii. Loss of sensation above the eyebrow, over the cheek, or in the upper lip iv. Nasal discharge v. Tenderness to palpitation vi. Bony “step-off” (defect in smooth countour of bone) vii. Paralysis of upward gaze in the involved eye c. If the eyeball is uninjured, place cold packs over the injured eye and transport patient in a sitting position. d. If the eyeball is injured, do not use cold packs, and transport the patient in a supine position. 6. For lid injury (bruising, burn, laceration) <ul style="list-style-type: none"> a. Inspect the area around the lid for evidence of injury. b. Control bleeding with a light pressure from a dressing. c. Use no pressure if the eyeball itself is injured. d. Cover the lid with sterile gauze soaked in saline to keep wound from drying. e. Preserve any avulsed skin and transport for possible grafting. f. If eyeball is uninjured, cover injured lid with cold compress. g. Cover the uninjured eye with a bandage to decrease movement. h. Transport. 7. For injury to the globe <ul style="list-style-type: none"> a. Use caution; these injuries are best treated at the hospital. b. Apply patches lightly to both eyes. c. Do not apply patch if you suspect a ruptured eyeball. d. Avoid the use of cold packs. e. If you use an eye shield, be sure it puts no pressure on the injury. f. Keep the patient supine for transport. 8. For chemical burn to the eye <ul style="list-style-type: none"> a. Begin treatment immediately. b. Irrigate with clean water or sterile saline. c. Hold the eyelids open so all chemicals can be washed out. d. Continue to irrigate for at least 20 minutes (if alkalai is involved, for 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access information about orbital fractures.</p>

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	<p>at least an hour) until arrival at the hospital.</p> <ul style="list-style-type: none"> e. Use running water or continually pour from the inside corner. f. Take care not to contaminate the uninjured eye. g. You may have to force the lids open since the pain may be too great for the patient to open his eyes. h. Use no irrigants other than clean water or sterile saline. i. Never irrigate the eye with any chemical antidote (such as alcohol or sodium bicarbonate). j. Remove or flush out contact lenses; remove solid particles from eye surface with a swab. k. Place the patient on his side on a stretcher, with a basin or towels under his head, and continue irrigation throughout transport. l. Following irrigation, wash your hands thoroughly and clean under your nails with a nail brush. <p>9. For impaled object in the eye or extruded eyeball</p> <ul style="list-style-type: none"> a. Place the patient supine and immobilize head and spine. b. Encircle the eye and impaled object or extruded eyeball with a gauze dressing. c. Do not apply pressure; you can cut a hole in the dressing to accommodate the impaled object. d. Place a metal shield, crushed paper cup, or cone over the impaled object. e. Hold the cup and dressing in place with a bandage that covers both eyes; close the uninjured eye before bandaging. f. Give the patient nothing by mouth, never leave him alone, and constantly provide verbal reassurance. g. Transport immediately. <p>B. Summary: Emergency care—Eye injuries</p> <ol style="list-style-type: none"> 1. Review possible assessment findings and emergency care for eye injuries. 2. Review Figure 33-14. <p>C. Removing contact lenses</p> <ol style="list-style-type: none"> 1. When to remove <ul style="list-style-type: none"> a. If there has been a chemical burn to the eye b. If the patient is unresponsive and is wearing hard lenses c. If transport time is lengthy or will be delayed 2. When not to remove <ul style="list-style-type: none"> a. If the eyeball is injured (other than a chemical burn) 	<p>Discussion Question What is the care for an extruded eye?</p> <p>Knowledge Application Given a series of scenarios, students should be able to assess and manage a variety of patients with injuries of the eye, face, and neck.</p>

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	<ul style="list-style-type: none"> b. If transport time is short enough to allow emergency department personnel to remove the lens 3. Removing soft contact lenses <ul style="list-style-type: none"> a. Place several drops of saline on the lens, then lift off the eye by pinching lens between thumb and forefinger. b. Use the following procedure. <ul style="list-style-type: none"> i. With fingertip on lower lid, pull lid down. ii. Place index fingertip on lower edge of lens, then slide lens down to white of the eye. iii. Compress lens between thumb and index finger and remove from eye. iv. If lens has dehydrated on eye, run sterile saline across it, then slide off cornea and pinch to remove. v. Store removed lens in water or saline solution. 4. Removing hard contact lenses <ul style="list-style-type: none"> a. Separate the eyelids. b. Position the visible lens over the cornea by manipulating eyelids. c. Place your thumbs gently on the top and bottom eyelids and open them wide. d. Press the eyelids down and forward to the edge of the lens. e. Press the lower eyelid slightly harder and move it under the bottom edge of the lens. f. Moving the eyelids toward each other, slide the lens out between them. g. Alternatively, use a contact lens removal kit (commonly available on the ambulance). 	
25	<p>VII. Specific Injuries Involving the Eye, Face, and Neck—Injuries to the Face</p> <p>A. Assessment and care guidelines</p> <ul style="list-style-type: none"> 1. Provide emergency care as follows for any apparent facial injury. <ul style="list-style-type: none"> a. Establish and maintain in-line spine stabilization. b. Establishing and maintaining a patent airway <ul style="list-style-type: none"> i. Inspect mouth for small fragments of teeth, bits of bone, pieces of flesh, or foreign objects and remove them as thoroughly as possible. ii. If dentures are whole, leave them in place; if they are broken or loose, remove them and transport with the patient. 	<p>Discussion Question What are the primary complications of facial injury?</p> <p>Critical Thinking Discussion A patient received a glancing shotgun blast to the right side of the face, which was largely destroyed. He is alert and oriented, though extremely distraught. He has a large amount of bleeding from the wounds, but is able to manage his airway as long as he is</p>

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	<ul style="list-style-type: none"> iii. Open the airway using the jaw-thrust maneuver; if necessary, grasp the tongue to pull it forward. iv. Suction any blood, vomitus, secretions, or small debris from the mouth. v. Request advanced life support backup if needed to provide advanced airway management. c. Provide oxygen by nonrebreather mask at 15 lpm; if breathing is inadequate, begin positive pressure ventilation with supplemental oxygen at a rate of 10–12 per minute (adult patient) or 12–20 per minute (child or infant). d. Control severe bleeding. e. Cover any exposed nerves, tendons, or blood vessels with a moist, sterile dressing. f. Treat patient for shock and transport. 2. For an avulsed tooth <ul style="list-style-type: none"> a. If a tooth has been lost, try to find it; it may be reimplanted. b. Rinse the tooth with saline and transport in a cup of saline or wrapped in gauze that has been soaked in sterile saline. c. Never handle the tooth by the root. d. If you cannot find lost teeth, assume the patient has swallowed or aspirated them. e. Control bleeding from the tooth socket with a gauze pad. 3. For an injury to the mid-face, upper jaw, or lower jaw <ul style="list-style-type: none"> a. Look for the following signs and symptoms of fracture or other severe trauma. <ul style="list-style-type: none"> i. Numbness or pain ii. Distortion of facial features iii. Crepitation iv. Irregularities in the facial bones v. Severe bruising and swelling; black eyes vi. Distance between the eyes too wide; eyes not level vii. Bleeding from nose and mouth viii. Diplopia (when the orbit is fractured) ix. Limited jaw motion x. Palpable movement to the maxilla xi. Teeth not meeting normally xii. Hematoma under the tongue xiii. Mouth open or patient unable to open mouth 	<p>sitting up. Given the mechanism of injury, you are aware that there is some risk of cervical spine injury. How will you balance airway management with concern over the cervical spine?</p> <p>Discussion Question What are your concerns for a patient whose injury results in missing teeth?</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on maxillofacial injuries and jaw fractures.</p>

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	<ul style="list-style-type: none"> xiv. Saliva and blood flowing from the mouth xv. Drooling xvi. Painful or difficult speech xvii. Missing, loose, or uneven teeth xviii. Pain around the ears b. Establish and maintain spine stabilization and patent airway. c. Support breathing as necessary. d. Control life-threatening bleeding. e. Request advanced life support backup if needed and available. f. Assess for spine injury, skull and/or brain injury, eye injury, and facial burns. 4. If an object is impaled in the cheek <ul style="list-style-type: none"> a. Stabilize with bulky dressing and transport the patient. b. Remove if it has pierced through cheek into mouth or is loose and may fall into mouth. <ul style="list-style-type: none"> i. Pull or push object out of cheek in opposite direction to which it entered. ii. Pack dressing material between patient's teeth and the wound; tape dressing outside mouth to prevent patient from swallowing it. iii. Dress and bandage outside of the wound. iv. Consider requesting ALS backup. v. Suction mouth and throat frequently throughout transport. 5. If there is an injury to the nose <ul style="list-style-type: none"> a. Take special care to maintain open airway. b. Position the patient so blood does not drain into the oropharynx or pharynx. c. Never pack the injured nose; packing can create dangerous pressure if skull is fractured. d. Apply cold compress to reduce swelling, and transport. e. Do not try to remove a foreign object from the nose; reassure and calm the patient (usually a child) and transport. 6. If there is injury to the ear <ul style="list-style-type: none"> a. Save any avulsed ear parts, wrap in saline-soaked gauze and transport with patient. b. When dressing an injured ear, place dressing between ear and head. c. Do not probe into the ear. 	

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	<ul style="list-style-type: none"> d. Never pack the ear to stop blood flow from ear canal; place a loose, clean dressing across ear opening to absorb blood and fluids. e. Do not attempt to remove a foreign object from the ear; reassure the patient (usually a child) and parent, and transport to the hospital. <p>B. Summary: Emergency care—Facial injuries</p> <ul style="list-style-type: none"> 1. Review possible assessment findings and emergency care for facial injuries. 2. Review Figure 33-19. 	
10	<p>VIII. Specific Injuries Involving the Eye, Face, and Neck—Injuries to the Neck</p> <p>A. Common causes of neck injuries</p> <ul style="list-style-type: none"> 1. Hanging (accidental or intentional) 2. Impact with a steering wheel 3. Knife wounds 4. Gunshot wounds 5. Running or riding into a stretched wire or clothesline 6. Fractured larynx 7. Collapsed trachea 8. Cervical spine injury <p>B. Signs and symptoms</p> <ul style="list-style-type: none"> 1. Obvious swelling, bruising, or hematoma 2. Difficulty speaking 3. Change in or loss of voice 4. Subcutaneous emphysema in the neck 5. Airway obstruction that is not obviously due to other sources 6. Crepitation heard during speaking or breathing 7. Displacement of the trachea to one side (This is also a sign of chest injury.) <p>C. Treatment</p> <ul style="list-style-type: none"> 1. Use proper Standard Precautions. 2. Maintain in-line spine stabilization. 3. Establish a patient airway. 4. Provide high-flow, high-concentration oxygen or positive pressure ventilation. 5. Control severe bleeding. 6. Treat for shock. 7. Transport. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What is subcutaneous emphysema? How does it occur? • How can air embolism occur in the patient with an injury to a jugular vein?

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Minutes	Content Outline	Master Teaching Notes
	<p>D. Special considerations for treatment</p> <ol style="list-style-type: none"> 1. If jugular vein is lacerated, immediately apply an occlusive dressing. 2. If a major blood vessel of the neck is severed, follow the guidelines that were outlined in “Bleeding and Soft-Tissue Injuries.” 3. Never probe open wounds. 4. Never use circumferential bandages. <p>E. Summary: Emergency care—Neck injuries</p> <ol style="list-style-type: none"> 1. Review possible assessment findings and emergency care for facial injuries. 2. Review Figure 33-20. 	
10	<p>IX. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 33 Summary. 2. Complete Chapter 33 In Review questions. 3. Complete Chapter 33 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 33 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Why was plain water from the kitchen tap the best choice for irrigating Hector’s eyes? • How could Hector’s injury have been prevented? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 34

Chest Trauma

75–90 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

Chapter 34 objectives can be found in an accompanying folder.
 These objectives, which form the basis of each chapter, were developed from the new Education Standards and Instructional Guidelines.

Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency medical care for a patient suffering from chest trauma.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • How will you begin the process of determining the patient's problem? • What are the priorities for managing this call?
5	<p>II. The Chest—Anatomy of the Chest</p> <p>A. Thoracic cavity and pleural lining</p> <ol style="list-style-type: none"> 1. Visceral pleura—Innermost layer; in contact with lungs 2. Parietal pleura—Outermost layer; in contact with thoracic wall <p>B. Ribs—Bony cage around respiratory and circulatory organs</p> <p>C. Diaphragm—Separates thoracic and abdominal cavities</p> <p>D. Mediastinum</p> <p>E. Trachea—Conduit to the lungs</p> <p>F. Venae cavae—Veins that collect and return the blood to the heart</p> <p>G. Aorta—Artery carrying blood from the heart to the body</p> <p>H. Esophagus—Tubelike structure that connects pharynx to stomach</p> <p>I. Heart</p>	<p>Teaching Tip</p> <p>Use the anatomical models to review the structures of the chest.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What structures are in the mediastinum? • How is the contact between the pleural layers important to lung expansion and inhalation?
5	<p>III. The Chest—General Categories of Chest Injuries</p> <p>A. Open chest injury (penetrating chest wound)</p> <ol style="list-style-type: none"> 1. Causes <ol style="list-style-type: none"> a. Gunshot b. Knife c. Any hard, sharp object (screwdriver, ice pick, and so on) 2. Effects <ol style="list-style-type: none"> a. Bullet wound <ol style="list-style-type: none"> i. Tiny entrance wound 	<p>Teaching Tip</p> <p>Draw a grid on the white board with types of chest injuries at the top and rows for signs, symptoms, pathophysiology, and treatment at the left. Give students time to review the chapter material and notes. Then have students come to the board and fill in the grid. When the grid is complete, review it with the class, comparing and contrasting</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> ii. Extensive internal damager from ricochet iii. Exit wound, if bullet does not lodge itself in the body (larger than entrance wound) b. Injuries to heart—Ineffective pumping, severe blood loss c. Injuries to major vessels—Can result in immediate death d. Injuries to respiratory system <ul style="list-style-type: none"> i. Lungs rendered unable to inflate ii. Pneumothorax (air in the chest cavity) iii. Sucking chest wound B. Closed chest injury—Blunt trauma with no open wound <ul style="list-style-type: none"> 1. Injury to lungs, heart, great vessels, respiratory tract, diaphragm, esophagus 2. Flail segment (two or more adjacent ribs broken in two or more places) 	<p>the various injuries.</p>
30	<p>IV. The Chest—Specific Chest Injuries</p> <ul style="list-style-type: none"> A. Flail segment <ul style="list-style-type: none"> 1. Two or more adjacent ribs are fractured in two or more places. 2. This produces a freely moving section of the chest wall. 3. The flail segment displays paradoxical movement (movement in opposite direction from the rest of the chest wall) during breathing. 4. Paradoxical movement is created by pressure of inhalation and exhalation. 5. The underlying contusion to the lungs is more serious than the broken ribs because it reduces patient’s air intake and leads to hypoxia (oxygen deficiency). 6. To stabilize, splint and treat with positive pressure ventilation. B. Pulmonary contusion <ul style="list-style-type: none"> 1. Patient suffers from bleeding within the lung tissue. 2. Bleeding occurs in and around the alveoli and into the interstitial space between the alveoli and capillaries. 3. Pulmonary contusion leads to severe hypoxia and can lead to death. 4. Pulmonary contusion is often seen with a flail segment injury. 5. Other signs and symptoms include shortness of breath, cyanosis, and signs of blunt trauma to the chest. 6. Oxygenate by nonrebreather mask at 15 lpm if breathing is adequate or by positive pressure ventilation with supplemental oxygen if breathing is inadequate. C. Pneumothorax 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access information about rib fractures and flail chest.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • How does a flail segment interfere with ventilation? • How does pulmonary contusion interfere with gas exchange? <p>Critical Thinking Discussion What could the sudden compression of the chest do to the heart valves? What signs and symptoms might you find in association with these consequences?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access information about pulmonary contusions.</p>

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	<ol style="list-style-type: none"> 1. Air accumulates in the pleural cavity, causing lung collapse on the injured side of the chest. 2. Pneumothorax is usually due to either blunt or penetrating trauma. 3. Spontaneous pneumothorax <ol style="list-style-type: none"> a. Occurs with no trauma or other external cause b. Usually the result of a bleb (weak area on surface of lung) c. Bleb ruptures and allows air into thoracic cavity. d. Common among smokers and emphysema patients e. Signs and symptoms <ol style="list-style-type: none"> i. Dyspnea (shortness of breath) ii. Respiratory distress iii. Sharp chest pain iv. Absent breath sounds on one side D. Open pneumothorax (sucking chest wound) <ol style="list-style-type: none"> a. An open pneumothorax is the result of a blow from a penetrating object. b. Air may be heard escaping or entering through the wound. c. An open pneumothorax has the same signs and symptoms as a closed one, plus the presence of an open chest wound. d. Treat by immediately occluding, first with your gloved hand, then with an occlusive dressing. E. Tension pneumothorax <ol style="list-style-type: none"> 1. A tension pneumothorax is an immediately life-threatening condition. 2. A tension pneumothorax continues to trap air and thus collapses the injured lung. 3. The mediastinum begins to shift to the uninjured side. 4. The uninjured lung, heart, and large veins are compressed. 5. This results in poor cardiac output, ineffective ventilation, inadequate oxygenation, and severe hypoxia. 6. Signs and symptoms include rapid deterioration, severe respiratory distress, shock, and absent breath sounds on the injured side. 7. If these symptoms develop after you have treated for an open pneumothorax, lift the occlusive dressing to allow air to escape and transport immediately. F. Hemothorax <ol style="list-style-type: none"> 1. The thoracic cavity is filled with air. 2. The lung collapses as the blood continues to collect. 3. Blunt or penetrating trauma may cause a hemothorax. 	<p>Discussion Question What are the signs and symptoms of a pneumothorax?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access information about pneumothorax.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> 4. The injury may be open or closed. 5. Severe blood loss often results in severe shock, with signs of respiratory distress developing later. 6. The patient will often produce pink or red frothy sputum when coughing. 7. Treatment is the same as for pneumothorax and shock. G. Traumatic asphyxia <ul style="list-style-type: none"> 1. Severe and sudden compression of the thorax causes a rapid increase in pressure in the chest. 2. The sternum and ribs severely compress the heart and lungs. 3. This causes a backflow of blood from the right ventricle into the head, shoulders, and chest. 4. Signs and symptoms <ul style="list-style-type: none"> a. Bluish or purple discoloration of face, head, neck and shoulders b. Jugular vein distention c. Bloodshot eyes protruding from eye sockets d. Cyanotic and swollen tongue and lips e. Bleeding of the conjunctivae (area under lower eyelids) 5. Provide emergency care for chest wounds and treat for shock. H. Cardiac contusion <ul style="list-style-type: none"> 1. Occurs when the heart is violently compressed between the sternum and spinal column 2. An actual bruise may occur to the heart wall. 3. The heart wall may be ruptured. 4. The electrical conduction system of the heart may be disturbed. 5. The right ventricle is the most likely to be injured. 6. Signs and symptoms <ul style="list-style-type: none"> a. Chest pain or discomfort b. Evidence of blunt trauma to the chest (bruises, swelling, crepitation, deformity) c. Tachycardia (rapid heart rate) d. Irregular pulse 7. Transport promptly. I. Pericardial tamponade <ul style="list-style-type: none"> 1. Blunt or penetrating trauma (usually from a knife or similar object) may cause bleeding into the pericardial sac (tough fibrous sac that surrounds the heart). 2. Since the sac cannot expand much, the heart is compressed. 3. Cardiac output drops significantly, and blood backs up in the veins. 	<p>Discussion Question What is the pathophysiology of traumatic asphyxia?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access information about cardiac tamponade.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> 4. This condition is life threatening and requires prompt recognition and transport. 5. Signs and symptoms will worsen. <ul style="list-style-type: none"> a. Jugular vein distention b. Signs of shock (hypoperfusion) c. Tachycardia (can be extreme) d. Decreased blood pressure e. Narrow pulse pressure (less than 30 mmHg) f. Weak pulses (radial pulses will diminish or disappear) J. Rib injury <ul style="list-style-type: none"> 1. Broken ribs are not life threatening but can cause life-threatening damage to other structures and organs. 2. The ribs most commonly fractured are the third through the eighth; the most common fracture site is the lateral aspect of the chest. 3. The fracture may lacerate the intercostal artery or vein and cause internal bleeding. 4. Rib fractures are less common in children because their cartilage is more resilient than an adult's. 5. Signs and symptoms of rib fracture <ul style="list-style-type: none"> a. Severe pain with movement and breathing b. Crepitation c. Tenderness upon palpation d. Deformity of the chest wall e. Inability to breathe deeply f. Coughing g. Tachypnea (rapid breathing) 6. To treat a simple rib fracture <ul style="list-style-type: none"> a. Place the patient's arm over the injury site and apply a sling and swathe to hold it in place. b. Give the patient a pillow to hold over the injury to splint it manually. c. Do not completely wrap the chest or apply the swathe snugly. 	<p>Discussion Question What signs help you to distinguish between a tension pneumothorax and a pericardial tamponade?</p>
30	<p>V. The Chest—Assessment-Based Approach: Chest Trauma</p> <ul style="list-style-type: none"> A. Scene size-up <ul style="list-style-type: none"> 1. Do not enter the scene of a shooting or stabbing until the police tell you it is safe. 2. Take necessary Standard Precautions. 3. Wear gloves and eye protection. 	<p>Knowledge Application Given a variety of chest injury scenarios, students should be able to identify patient's injuries and provide both general supportive and injury-specific management.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> 4. Ask bystanders what happened. 5. Scan the scene for details that might reveal the mechanism of injury. <ul style="list-style-type: none"> a. Was the patient involved in a sports accident? b. Was there a fight? c. Is there any evidence that a shooting took place? d. Was the patient involved in an auto collision? e. Was the patient crushed between two objects, or was he run over? f. Was an explosion involved? B. Primary assessment <ul style="list-style-type: none"> 1. Form a general assessment of the patient's condition. <ul style="list-style-type: none"> a. Is he severely cyanotic? b. Is he in extreme respiratory distress? c. Is he breathing shallowly and rapidly? d. Is he holding his arms tightly against his chest? e. Does he appear to be in extreme pain? f. Are there any open wounds to his chest? g. Does his chest move unevenly when he breathes? 2. If you suspect a chest injury, expose and examine the patient's chest. 3. If you discover an open chest wound, immediately seal it with your gloved hand. 4. If there is paradoxical movement <ul style="list-style-type: none"> a. Immediately place your gloved hand over the flail segment to splint it in an inward position. b. Administer positive pressure ventilation. 5. Determine the patient's mental status. 6. Inspect the patient's airway for blood or other obstructions, and listen and feel for air movement. 7. Perform the jaw-thrust maneuver to open the patient's airway, if necessary. 8. Listen to the patient's speech pattern for indications of severe respiratory distress (gaspings for breath). 9. Administer oxygen with a nonrebreather mask at 15 lpm if patient is breathing adequately. 10. Immediately begin positive pressure ventilation with supplemental oxygen if the patient is not breathing adequately. 11. Any chest injury is a high priority for transport. 12. If you suspect a shooting or stabbing, log roll the patient to assess his posterior body for a second (entrance or exit) life-threatening wound. 	

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Minutes	Content Outline	Master Teaching Notes
	<p>C. Secondary assessment</p> <ol style="list-style-type: none"> 1. Inspect and palpate for other injuries (deformities, contusions, abrasions, punctures, and so on). 2. Assess the patient's breathing status; be sure that he is receiving enough oxygen or ventilation. 3. Assess the neck for subcutaneous emphysema, jugular vein distention, and tracheal deviation. 4. If you suspect a spine injury, apply a cervical spine immobilization collar. 5. Expose the patient's chest by cutting his clothing; inspect the chest thoroughly for any open wounds. 6. If you see signs of a flail segment, provide positive pressure ventilation. 7. Look for any signs that blunt force was applied to the chest. 8. Palpate the chest, checking for equal movement on both sides, paradoxical movement, swelling, and deformities. 9. Determine if the breath sounds are clear and equal, or decreased or absent on one or both sides. 10. Inspect the abdomen for excessive muscle movement during breathing. 11. Assess the baseline vital signs. 12. If the patient is responsive, obtain a history from him; if he is unresponsive, try to gather information from bystanders. 13. Be alert for the following signs and symptoms of major chest trauma. <ol style="list-style-type: none"> a. Cyanosis to the fingernails or fingertips, lips, or face b. Dyspnea (shortness of breath/difficulty breathing) c. Tachypnea (abnormally rapid breathing) or bradypnea (abnormally slow breathing) d. Contusions, lacerations, punctures, swelling, or other obvious signs of trauma e. Hemoptysis (coughing up blood or bloodstained sputum) f. Signs of shock g. Tracheal deviation h. Paradoxical movement of a segment of the chest wall i. Open wound that may or may not produce a sucking sound j. Subcutaneous emphysema k. Distended jugular veins l. Absent or decreased breathing sounds upon auscultation m. Pain at the injury site n. Failure of the chest to expand normally during inhalation o. Peripheral pulses that become extremely weak or absent during 	

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Minutes	Content Outline	Master Teaching Notes
	<p style="padding-left: 40px;">inhalation</p> <p style="padding-left: 20px;">p. Drop of 10 mmHg or more in systolic blood pressure during inhalation</p> <p>D. General emergency care—Chest trauma</p> <ol style="list-style-type: none"> 1. Maintain an open airway. 2. Continue oxygen therapy. 3. Reevaluate breathing status. 4. Completely immobilize the patient if you suspect spine injury. 5. Treat for shock if signs and symptoms are present. <p>E. Emergency medical care—Open chest wound</p> <ol style="list-style-type: none"> 1. Immediately seal the open wound with your gloved hand. 2. Apply an occlusive dressing (such as plastic wrap from an oxygen mask) to seal the wound. 3. Continually assess the patient's respiratory status. 4. Be alert for the signs and symptoms of complications. <ol style="list-style-type: none"> a. Difficultly breathing b. Tachypnea (abnormally rapid breathing) c. Severely decreased or absent breath sounds on the injured side d. Cyanosis e. Tachycardia (abnormally rapid heart rate) f. Decreasing blood pressure; narrowing pulse pressure g. Jugular vein distention (late sign) h. Tracheal deviation (late sign) i. Unequal movement of the chest wall j. Extreme anxiety and apprehension k. Increased resistance to positive pressure ventilation 5. If you observe complications, lift a corner of the occlusive dressing to allow air to escape for a few seconds; repeat as often as needed. <p>F. Emergency medical care—Flail segment</p> <ol style="list-style-type: none"> 1. Place your hand over the flail segment to splint it in an inward position. 2. If the patient is not breathing adequately, initiate positive pressure ventilation during primary assessment. 3. Alternatively, place bulky dressings, a pillow, or a towel over the unstable segment, or secure the patient's arm to his body, to stabilize the injury. <p>G. Reassessment</p> <ol style="list-style-type: none"> 1. Evaluate the effectiveness of your treatment. 2. Assess for further deterioration of the patient's condition. 	

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 3. At any sign of deterioration (increasing breathing difficulty, worsening cyanosis, and so on), repeat the rapid secondary assessment, looking for injuries that you missed. 4. Reassess and record vital signs. 	
10	<p>VI. The Chest—Summary: Assessment and Care—Chest Trauma</p> <ol style="list-style-type: none"> A. Review possible assessment findings and emergency care for chest injuries. B. Review Figures 34-17 and 34-18. 	
10	<p>VII. Follow-Up</p> <ol style="list-style-type: none"> A. Answer student questions. B. Case Study Follow-Up <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. C. Follow-Up Assignments <ol style="list-style-type: none"> 1. Review Chapter 34 Summary. 2. Complete Chapter 34 In Review questions. 3. Complete Chapter 34 Critical Thinking. D. Assessments <ol style="list-style-type: none"> 1. Handouts 2. Chapter 34 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What injury would best explain the patient’s presentation? • What is the explanation for the sudden resistance to ventilation? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 35

Abdominal and Genitourinary Trauma

50–60 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency medical care for patients suffering from abdominal and genitourinary injuries.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What questions would you ask about the mechanism of injury? • Based on what you know about the mechanism of injury, what injuries do you suspect?
5	<p>II. The Abdomen—Anatomy of the Abdominal Cavity</p> <p>A. Types of organs and vascular structures</p> <ol style="list-style-type: none"> 1. Hollow organs <ol style="list-style-type: none"> a. Stomach b. Gall bladder c. Urinary bladder d. Ureters e. Internal urethra f. Fallopian tubes g. Small intestine h. Large intestine 2. Solid organs <ol style="list-style-type: none"> a. Liver b. Spleen c. Pancreas d. Kidneys 3. Vascular structures <ol style="list-style-type: none"> a. Abdominal aorta b. Inferior vena cava <p>B. Additional structures</p> <ol style="list-style-type: none"> 1. Diaphragm 2. Abdominal wall 	<p>Teaching Tip</p> <p>Draw a grid representing the abdominal quadrants or regions on the white board. Call on students to identify the organs in each quadrant or region to fill in the grid.</p>

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Minutes	Content Outline	Master Teaching Notes
10	<p>III. The Abdomen—Abdominal Injuries</p> <ul style="list-style-type: none"> A. Blunt or penetrating trauma can cause an abdominal injury. B. Mechanisms of injury are similar to those of chest injury. C. Blunt trauma is especially lethal because of the large number of organs present. D. Open abdominal injuries result from penetrating trauma such as a gunshot or a stabbing by a knife or other hard, sharp object. E. In the case of a gunshot, always examine the patient for the exit wound. F. Open wounds are easier to see, but may be less dangerous than closed wounds. G. Always maintain suspicion of the existence of a closed abdominal injury. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What types of injuries should you suspect when faced with a gunshot wound to the abdomen? • From what abdominal organ injuries would you expect significant hemorrhage? <p>Critical Thinking Discussion Why can the early indications of blunt abdominal trauma be subtle?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on penetrating abdominal trauma.</p>
20	<p>IV. The Abdomen—Assessment-Based Approach: Abdominal Trauma</p> <ul style="list-style-type: none"> A. Scene size-up <ul style="list-style-type: none"> 1. Take necessary Standard Precautions. 2. Scan the scene for details that might reveal the mechanism of injury. 3. Ask police or bystanders what happened, particularly if anyone heard gunshots. 4. Attempt to determine the following in the case of a vehicle collision. <ul style="list-style-type: none"> a. Type of vehicle b. Approximate speed at which it was traveling c. Type of collision and point(s) of impact d. Whether the patient was driver, passenger, or pedestrian e. Where the patient was found and in what position f. Whether the patient was thrown from the vehicle g. Impact marks to the windshield, steering wheel, and dashboard h. Whether the patient was wearing a seat belt B. Primary assessment <ul style="list-style-type: none"> 1. Form a general assessment of the patient's condition. <ul style="list-style-type: none"> a. Is he lying still with knees flexed up toward the chest? b. Is he moaning and complaining of severe pain? 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What information about a weapon used to stab a patient would be helpful to hospital personnel? • What are the management priorities for patients with suspected abdominal trauma? <p>Knowledge Application Students should be able to identify patients with mechanisms of injury and assessment findings consistent with abdominal trauma.</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 2. If you suspect a spine injury, establish in-line spinal stabilization. 3. Ensure an open airway and adequate breathing. <ol style="list-style-type: none"> a. Inspect the airway for evidence of bloody vomitus and suction if necessary. b. If breathing is adequate, deliver oxygen by nonrebreather mask at 15 lpm. c. Administer positive pressure ventilation if necessary. 4. Assess the patient's circulation for signs of shock and abdominal injury. <ol style="list-style-type: none"> a. Weak or absent radial pulse b. Abnormally rapid heart rate c. Moist, pale, cool skin 5. If the above signs are present, patient is a priority for immediate transport. <p>C. Secondary assessment</p> <ol style="list-style-type: none"> 1. Consider the patient's complaints and the mechanism of injury. 2. Expose the entire body and perform a rapid secondary assessment: head, neck, and chest first. 3. If you suspect a spine injury, apply a cervical spine immobilization collar. 4. Inspect the abdomen for any open wounds; determine if it appears distended. 5. Inspect around the umbilicus (navel) and flanks for discoloration and bruising. 6. Look for bruising of the lower abdomen. 7. Inspect and provide emergency care for any abdominal evisceration. 8. Palpate the abdomen, noting tenderness, masses, or signs of pain. 9. Assess the extremities for injuries; check and compare the pulses. 10. Assess motor and sensory function. 11. Log roll the patient and inspect back and lumbar region for trauma; log roll him onto a backboard if you suspect a spine injury. 12. Assess baseline vital signs, especially for blood loss and shock. 13. If the patient is responsive, obtain a history from him; if he is unresponsive, try to gather information from bystanders. 14. Be alert for the following signs and symptoms of abdominal injury. <ol style="list-style-type: none"> a. Contusions, abrasions, lacerations, punctures, or other signs of blunt or penetrating trauma b. Pain that continues to get worse c. Tenderness on palpation to areas besides injury site d. Rigid abdominal muscles. 	<p>Discussion Question What is Kehr's sign?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> e. Patient who has drawn his legs up to his chest to reduce the pain f. Distended abdomen g. Discoloration around the umbilicus or to the flank (late sign) h. Rapid, shallow breathing i. Signs of hemorrhagic shock <ul style="list-style-type: none"> i. Decreasing blood pressure ii. Narrowing pulse pressure iii. Increasing heart rate iv. Increasing respiratory rate j. Nausea and vomiting (may contain blood). k. Abdominal cramping. l. Pain that radiates to either shoulder. m. Weakness. D. General emergency care—Abdominal trauma <ul style="list-style-type: none"> 1. Maintain an open airway and appropriate spine protection. 2. Continue oxygen therapy. 3. Reassess breathing status. 4. Treat for hemorrhagic shock if signs and symptoms are present. 5. Control any external bleeding. 6. Place the patient in a supine position with the knees flexed. 7. Stabilize any impaled objects. 8. Apply the pneumatic antishock garment (PASG) if indicated and allowed by local protocol. 9. Transport as quickly as possible. E. Emergency medical care—Abdominal evisceration <ul style="list-style-type: none"> 1. Expose the wound. 2. Position the patient on his back and flex the knees. 3. Prepare a clean, sterile dressing. 4. Cover the moist dressing with an occlusive dressing. 5. Administer high-flow, high-concentration oxygen. 6. Be prepared to treat for shock. F. Reassessment <ul style="list-style-type: none"> 1. Evaluate the effectiveness of your treatment. 2. Assess for further deterioration of the patient's condition. 3. At any sign of deterioration, repeat appropriate elements of the primary and secondary assessments. 4. Reassess vital signs, especially for indications of blood loss or shock. 	

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Minutes	Content Outline	Master Teaching Notes
5	<p>V. The Abdomen—Summary: Assessment and Care—Abdominal Trauma</p> <p>A. Review possible assessment findings and emergency care for abdominal trauma.</p> <p>B. Review Figures 35-3 and 35-4.</p>	<p>Critical Thinking Discussion</p> <p>How might technology allow EMTs to play a more specific role in the future in diagnosis of abdominal injuries?</p>
10	<p>VI. Genital Trauma</p> <p>A. Injuries to male genitalia</p> <ol style="list-style-type: none"> 1. Include lacerations, abrasions, avulsions, penetrations, amputations, contusions 2. Usually produce excruciating pain and cause patient great concern 3. Penis is very vascular (can bleed excessively). 4. Treat as a soft-tissue injury; apply direct pressure and cold compress to reduce pain and swelling. 5. Wrap any avulsed parts in sterile, moist dressing; place on ice; and transport with patient. 6. Apply oxygen by nonrebreather mask at 15 lpm. 7. Assess for signs and symptoms of shock and transport. <p>B. Injuries to female genitalia</p> <ol style="list-style-type: none"> 1. Include straddle injuries, sexual assault, blunt trauma, abortion attempts, lacerations following childbirth, and foreign bodies inserted into vagina 2. Usually produce excruciating pain and cause great concern to patient 3. Area is highly vascular. 4. Apply direct pressure to any bleeding; use moist compress. 5. Never pack or place dressings inside vagina. 6. Assess for shock. 7. Provide oxygen at 15 lpm by nonrebreather mask. 8. Transport. 	<p>Knowledge Application</p> <p>Given several scenarios, students should be able to identify and manage patients with injuries to the genitalia.</p> <p>Weblinks</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources about genital trauma and female genital cutting.</p>
10	<p>VII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What is the likely explanation for Mr. Young's flat neck veins? • How does pain in the upper left quadrant fit with Mr. Young's signs and symptoms of shock? <p>Class Activity</p>

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Minutes	Content Outline	Master Teaching Notes
	<p>would or would not change their answers.</p> <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 35 Summary. 2. Complete Chapter 35 In Review questions. 3. Complete Chapter 35 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 35 quiz 	<p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 36

Multisystem Trauma and Trauma in Special Patient Populations

120–140 minutes

MASTER TEACHING NOTES

- Case Study Discussion
- Teaching Tips
- Discussion Questions
- Class Activities
- Media Links
- Knowledge Application
- Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about special considerations an EMT should have when caring for specific trauma populations.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • Once you recognize that the patient is pregnant, what special considerations come to mind? • What are some common mechanisms of injury in pregnant patients?
30	<p>II. Multisystem Trauma—Golden Principles of Out-of-Hospital Multisystem Trauma Care</p> <p>A. Typically a patient is considered to have multisystem trauma when more than one major body system is involved.</p> <p>B. Multisystem trauma has a high incidence of morbidity and mortality.</p> <p>C. Patients with multisystem trauma are at a greater risk of developing shock.</p> <p>D. Golden principles</p> <ol style="list-style-type: none"> 1. Ensure safety of the rescue personnel and the patient. 2. Determine additional resources needed. 3. Understand kinematics (mechanism of injury). 4. Identify and manage life threats. 5. Manage the airway while maintaining cervical spine stabilization. 6. Support ventilation and oxygenation. 7. Control external hemorrhage and treat for shock. 8. Perform a secondary assessment and obtain a medical history. 9. Splint musculoskeletal injuries and maintain spine immobilization. (Splint en route for the unstable patient.) 10. Make transport decisions (rapid extrication, rapid export, and so on). Remember that on-scene time is part of the platinum ten minutes and the golden period between injury and definitive care at the hospital. 	<p>Animation</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on multisystem injuries in front-end collisions.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What is the relationship between multisystem trauma and shock? • Under what circumstances should you request ALS or air medical support when caring for a multisystem trauma patient? • What are the priorities when managing a multisystem trauma patient? • Why is it important to perform a secondary assessment and obtain a medical history from a trauma patient? <p>Knowledge Application</p>

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Minutes	Content Outline	Master Teaching Notes
		<p>Students should be able to apply the principles of managing multisystem trauma patients to a variety of lab scenarios.</p> <p>Class Activity Have groups of students prepare multisystem trauma scenarios to demonstrate their understanding of the effects of multisystem trauma. Review the scenarios for accuracy during a break, and use the scenarios for lab practice.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Allow ample opportunity for students to apply the principles in lab scenarios. • If weather and resources allow, have students practice outdoors. <p>Critical Thinking Discussion How can you develop the level of skill and efficiency needed to care for critically injured multisystem trauma patients?</p>
15	<p>III. Trauma in Special Patient Populations—Trauma in Pregnant Patients</p> <p>A. Trauma is the leading cause of death for pregnant women, and all women who have suffered an injury should be evaluated by a physician in the emergency room.</p> <p>B. Anatomical and physiological considerations in the pregnant trauma patient</p> <ol style="list-style-type: none"> 1. Total blood volume increases by 50 percent (shock). 2. Mother’s heart rate in third trimester increases by 10–15 bpm. 3. Uterus becomes more vascular. 4. Diaphragm elevates (tension pneumothorax). 5. Gastric motility increases (vomiting and aspiration). 6. Uterus grows and rises out of pelvis. 7. Renal blood flow increases. 8. Pelvic joints loosen and center of gravity changes (accidents and falls). 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are common causes of injury in pregnant patients? • How does the anatomy and physiology of pregnancy affect the response to injuries?

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	<p>9. Fetal size in the third trimester can affect the patient's venous return.</p> <p>C. Assessment considerations in the pregnant trauma patient</p> <ol style="list-style-type: none"> 1. More severe the injury to the mother, the greater the chances of fetal injury. 2. Most common problem caused by maternal trauma is uterine contractions that may progress into labor. 3. Types of problems from traumatic injury <ol style="list-style-type: none"> a. Abruptio placentae—Separation of the placenta from the uterine wall b. Penetrating trauma—Stab wounds to the uterus provide 93 percent morbidity to the fetus. c. Motor vehicle crashes—Large percentage of maternal and traumatic injuries d. Fetal distress from hypoxia or hypovolemic shock 4. A pulseless woman in the third trimester should be transported to the nearest appropriate medical facility for attempted resuscitation of the mother and fetus unless instructed otherwise by medical direction. <p>D. Management considerations for the pregnant trauma patient</p> <ol style="list-style-type: none"> 1. Most of the emergency care for a pregnant patient is the same as for nonpregnant trauma patients and obstetric emergencies with a few exceptions. 2. During full spine immobilization, be sure to tilt the long spineboard to the left if the patient is in her third trimester or obviously pregnant. 3. Assess the patient's breathing. Administer oxygen by nonrebreather mask if breathing is adequate or bag-valve mask if breathing is inadequate. 4. Assess the patient's circulation and check for major bleeding. Absorb blood flow from vaginal bleeding with a pad but do not pack the vagina. 5. Perform a visual exam at the vaginal opening to assess for crowning or bleeding. 6. Consider ALS intercept or air medical transport for major traumas involving pregnant patients. 7. Best method to care for the fetus is by anticipating injuries and shock and aggressively managing the mother. 	

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Minutes	Content Outline	Master Teaching Notes
15	<p>IV. Trauma in Special Patient Populations—Trauma in Pediatric Patients</p> <p>A. Half of all deaths in children ages one to 14 are the result of trauma. (Motor vehicle collision accounts for the majority of traumatic injuries.)</p> <p>B. Findings that should prompt you to suspect abuse</p> <ol style="list-style-type: none"> 1. Bruises or burns in unusual shapes and locations 2. Injury that doesn't seem to correlate with the cause provided 3. More injuries than usual for a child that same age 4. Multiple injuries in various healing stages <p>C. Shaken-baby syndrome is one of many causes of brain injury.</p> <p>D. Trauma involving a pediatric patient can be very stressful for the EMT, patient's family, and bystanders.</p> <p>E. Anatomical and physiological considerations in the pediatric trauma patient</p> <ol style="list-style-type: none"> 1. Traumatic forces are more widely distributed (multisystem trauma). 2. Child's body surface area is greater than an adult's (loses heat faster). 3. Pediatric patients have heavy heads and weak neck muscles (head and spine injuries). 4. Internal organ placement makes the child more susceptible to injuries to the spleen and liver. 5. Infants and children have greater chest wall flexibility. 6. Trauma to growth plates can impact the bones' normal growth. 7. Children fatigue faster than adults. <p>F. Assessment considerations in the pediatric trauma patient</p> <ol style="list-style-type: none"> 1. Pediatric Assessment Triangle can help you form a general impression. 2. Appearance—Refers to the child's overall mental status, body position, and muscle tone 3. Work of breathing—Visual effort of breathing and any audible sounds associated with the patient's respiration 4. Circulation—Patient's skin color 5. Ensure patient airway, adequate ventilation, oxygenation, and circulation. 6. Subtle changes in the pediatric trauma patient's heart rate, blood pressure, or perfusion status may indicate cardiorespiratory failure. <ol style="list-style-type: none"> a. Assess brachial pulse in an infant. b. Blood pressure readings are unreliable in children three years of age or less. c. Rely on other signs and symptoms such as skin color, temperature, 	<p>Discussion Question What are the differences in pediatric patients that account for their greater severity of injuries as compared to adults exposed to similar forces?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on pediatric trauma considerations.</p>

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	<p style="text-align: center;">condition, mental status, and capillary refill.</p> <p>G. Management considerations for the pediatric trauma patient</p> <ol style="list-style-type: none"> 1. Most of the management for a pediatric patient is the same as for adults with a few exceptions. 2. During spine immobilization, pad beneath the child who is less than eight years of age from the shoulders to the hips to prevent flexion of the neck. 3. Open the airway and assess for any possible obstructions. 4. Assess the breathing rate and tidal volume. 5. Administer high-flow, high-concentration oxygen and monitor the saturation via the SpO₂ monitor. 6. Assess the circulation and control any external bleeding by direct pressure. 7. Manage hypovolemia and shock as you would for an adult. 8. Prevent hypothermia. 9. Transport to an appropriate facility. 10. Continually reassess the pediatric trauma patient. 	<p>Teaching Tip Arrange a tour of a pediatric emergency department or, if this is not possible, consider a tour of the area of the ED in which pediatric patients are treated.</p>
15	<p>V. Trauma in Special Patient Populations—Trauma in Geriatric Patients</p> <p>A. Falls are the most common cause of injury in the elderly (often a result of a medical condition). Second most common is motor vehicle collisions.</p> <p>B. Most common injury is fracture.</p> <p>C. Anatomical and physiological considerations in the geriatric trauma patient</p> <ol style="list-style-type: none"> 1. Circulation changes can lead to the inability to maintain vital signs during hemorrhage. 2. Shrinking brain can lead to a higher risk of cerebral bleeding following head trauma. 3. Skeletal changes cause curvature of the upper spine. 4. Osteoporosis places the elderly patient at increased risk for fractures and other injuries. 5. Other changes include decreased muscle size in the abdomen and thinner skin. <p>D. Assessment considerations in the geriatric trauma patient</p> <ol style="list-style-type: none"> 1. A decreased ability to respond to trauma, preexisting medical conditions, and multiple medications all affect patient assessment and outcome. 2. Suspect a head injury for a patient with altered mental status. 3. Be mindful that the patient may wear dentures. 	<p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on falls in nursing homes and geriatric traumas.</p> <p>Discussion Question What are some things that affect the elderly patient's ability to compensate from hemorrhage?</p> <p>Teaching Tip Arrange with an extended care facility to have students assess elderly patients under nursing supervision.</p>

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	<ul style="list-style-type: none"> 4. Be prepared to suction and monitor the patient's oxygenation using pulse oximetry. 5. Patient's who were hypertensive prior to an injury may have normal blood pressure in shock. E. Management considerations for the geriatric trauma patient <ul style="list-style-type: none"> 1. Management is very similar to that provided to other adults with a few exceptions. 2. During spine immobilization, add padding around the spaces in the back if necessary. 3. Open and maintain a clear airway; remember to suction. 4. Provide and support ventilation as needed. 5. Prevent hypothermia. 6. Splint fractures. Remember that traction splints are not used to treat hip fractures. 7. Rapidly transport to the closest appropriate facility. 	
15	<p>VI. Trauma in Special Patient Populations—Trauma in Cognitively Impaired Patients</p> <ul style="list-style-type: none"> A. It can be difficult to recognize patients with cognitive impairment when you begin your assessment. B. Always maintain a high index of suspicion that your patient may have suffered a traumatic head injury. C. Anatomical and physiological considerations in the cognitively impaired trauma patient—Considerations depend on the underlying cause of the individual's impairment. D. Assessment considerations in the cognitively impaired trauma patient <ul style="list-style-type: none"> 1. Patients with cognitive impairments are not good at recalling or relating their past medical history or events of the trauma. Address them with respect and approach them as you would any other patient; however, you may need to rely on others to provide information. 2. The traumatic event may make it even more difficult for the patient to communicate and cooperate with you. 3. Remember that the patient's pain perception may be altered. 4. The trauma assessment will provide the most pertinent information about your patient. 5. Always maintain a high level of suspicion that your patient's presenting 	<p>Discussion Question What are some guidelines to follow when dealing with the cognitively impaired trauma patient?</p>

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Minutes	Content Outline	Master Teaching Notes
	<p>signs and symptoms have resulted from trauma.</p> <p>E. Management considerations for the cognitively impaired trauma patient</p> <ol style="list-style-type: none"> 1. Involve the patient’s care givers in emergency treatment. 2. Err on the side of caution and do what is in the best interest of the patient. Manage them as if they have a head injury. 	<p>Knowledge Application</p> <p>Students should be able to apply the information in this section to scenarios involving assessment and management of pregnant, pediatric, geriatric, and cognitively impaired patients.</p>
5	<p>VII. Assessment-Based Approach: Multisystem Trauma and Trauma in Special Patient Populations—Scene Size-Up</p> <ol style="list-style-type: none"> A. Ensure the scene is safe for you and others. B. Look for a possible mechanism of injury and maintain a high index of suspicion that more than one major body system may be affected in your patient. C. Identify if your patient belongs to any special populations and use your knowledge about that population throughout your assessment. D. Remember that unresponsiveness or altered mental status should always suggest the possibility of head injury. 	
5	<p>VIII. Assessment-Based Approach: Multisystem Trauma and Trauma in Special Patient Populations—Primary Assessment</p> <ol style="list-style-type: none"> A. Suspect a cervical spine injury and maintain manual in-line spine stabilization. B. Assess your patient’s mental status using the AVPU mnemonic. You may also use Glasgow Coma Scale and the Pediatric Assessment Triangle. C. Establish an airway while holding in-line spine stabilization and ensure the airway is free from obstructions. D. Maintain the patient’s airway and assess the breathing rate and quality. Provide oxygen via nonrebreather mask if breathing is adequate or provide positive pressure ventilation with supplemental oxygen if breathing is inadequate. E. Assess the patient’s circulatory status and check the pulse as appropriate for the special population (e.g. brachial pulse in infants) 	<p>Video Clip</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on immobilization considerations for pediatric patients.</p> <p>Animation</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on differences between pediatric and adult trauma patients.</p>
10	<p>IX. Assessment-Based Approach: Multisystem Trauma and Trauma in Special Patient Populations—Secondary Assessment</p> <ol style="list-style-type: none"> A. Physical exam <ol style="list-style-type: none"> 1. Perform a rapid physical exam, and keep in mind that multiple systems may be affected. 	

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Minutes	Content Outline	Master Teaching Notes
	<p>2. Remember that if your patient is pregnant, you have two patients to consider.</p> <p>B. Vital signs</p> <ol style="list-style-type: none"> 1. Check and record vital signs every five minutes. 2. Normal vital signs are based on the patient's age. 3. Remember that in the pregnant woman and elderly patient, you may have what appears to be normal vital signs even though the patient is in shock. 4. The slightest changes in a pediatric trauma patient's vital signs may indicate impending cardiorespiratory failure. <p>C. History</p> <ol style="list-style-type: none"> 1. You may need to obtain information from others at the scene for children, those with cognitive impairments, or those with an altered mental status. 2. Questions to ask <ol style="list-style-type: none"> a. When and how did the incident occur? b. What is the patient's chief complaint? c. Does the patient have any signs or symptoms associated with the trauma? d. Is the patient pregnant? How far along is she? Is there any vaginal bleeding or crowning? e. How old is the patient? f. Does the patient take any medications? Is the patient allergic to anything? g. What is the patient's medical history? Is there a history of previous trauma or cognitive impairment? <p>D. Signs and symptoms—Will vary based on the patient and the trauma</p>	<p>Critical Thinking Discussion How do the psychosocial developmental stages of children of various ages affect their responses to trauma and to treatment by health care providers?</p>
5	<p>X. Assessment-Based Approach: Multisystem Trauma and Trauma in Special Patient Populations—Emergency Medical Care</p> <ol style="list-style-type: none"> A. Take Standard Precautions. B. Establish and maintain inline spine stabilization. Review relevant positioning discussed earlier for a pregnant patient, a child less than eight years of age, and an elderly patient. C. Maintain a patient airway, and adequate breathing and oxygenation. Maintain the SpO₂ at 100% if the patient is pregnant. D. Monitor the airway, breathing, pulse, and mental status for deterioration. E. Control bleeding. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the priorities of care for multisystem trauma patients? • How is the management of pediatric trauma patients different from that of adults? • What are some special considerations in management of geriatric trauma patients?

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Minutes	Content Outline	Master Teaching Notes
	<p>F. Treat for shock. G. Identify any other injuries and treat them appropriately. H. Transport immediately. Be sure to notify the receiving facility and consider the use of ALS intercept. Follow local protocol.</p>	
5	<p>XI. Assessment-Based Approach: Multisystem Trauma and Trauma in Special Patient Populations—Reassessment A. Reassess during transport. B. Pay close attention to the mental status, airway, breathing, and circulation of these patients. C. Repeat the vital signs every five minutes.</p>	<p>Knowledge Application Given a series of scenarios, students should be able to assess and manage a variety of patients from special populations.</p>
10	<p>XII. Follow-Up A. Answer student questions. B. Case Study Follow-Up 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. C. Follow-Up Assignments 1. Review Chapter 36 Summary. 2. Complete Chapter 36 In Review questions. 3. Complete Chapter 36 Critical Thinking. D. Assessments 1. Handouts 2. Chapter 36 quiz</p>	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What are some possible injuries causing Mrs. Miller’s signs of shock? • What are your concerns for the fetus? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 37

Obstetrics and Care of the Newborn

235–280 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn how to recognize and provide emergency medical care for obstetric and gynecological emergencies.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • How will you know if the patient is correct about her impression that delivery is imminent? • What equipment will you need immediately if delivery is imminent?
15	<p>II. Anatomy and Physiology of the Obstetric Patient—Anatomy of Pregnancy</p> <p>A. Ovaries are the female gonads or sex glands, and they are responsible for secreting the hormones estrogen and progesterone and for development and release of the mature egg (ovum) necessary for reproduction.</p> <p>B. Fallopian tubes are thin, flexible tubelike structures that extend from the uterus to the ovaries; ovum is transported down the fallopian tube and into the uterus by peristalsis.</p> <p>C. Uterus is the pear-shaped organ (fundus, corpus or body, and cervix) that contains the developing fetus and produces contractions during labor and delivery; uterine wall is made up of the endometrium, myometrium, and perimetrium.</p> <p>D. Cervix connects with the vagina and contains a protective plug of mucus that is discharged at the beginning of labor (bloody show).</p> <p>E. Placenta is a disk-shaped inner lining of the uterus that begins to develop after the ovum is fertilized and attaches itself to the uterine wall; sole organ through which the fetus receives oxygen and nourishment and separates after delivery (afterbirth).</p> <p>F. Umbilical cord attaches the fetus to the placenta; contains one vein, two arteries, and a protective substance called Wharton's jelly.</p> <p>G. Amniotic sac is filled with the amniotic fluid in which the infant floats;</p>	<p>Discussion Question</p> <p>From outermost to innermost, what are the layers of the uterus?</p>

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	<p>rupturing of the “bag of waters” is one of the first indications that labor is starting.</p> <p>H. The lower part of the birth canal is the vagina.</p>	
5	<p>III. Anatomy and Physiology of the Obstetric Patient—Menstrual Cycle</p> <p>A. Controlled by the hormones estrogen and progesterone</p> <p>B. Cycle lasts 24 to 35 days with an average of 28 days.</p> <p>C. First day of the menstrual cycle begins with menstruation—sloughing of the endometrial tissues.</p> <p>D. After three to five days, estrogen levels increase and once again prepare the endometrium for implantation of a fertilized ovum.</p> <p>E. On the 14th day of the cycle, ovulation occurs and the mature ovum is released from the ovary.</p> <p>F. Ovum descends through the fallopian tube within the next five to seven days.</p> <p>G. If the ovum is not fertilized, it is discharged with the outer layer of endometrial tissue (approximately 14 days after ovulation).</p>	<p>Teaching Tip Ask students to take turns, each listing one of the sequential events or benchmarks from ovulation to delivery.</p> <p>Discussion Question At what point in the menstrual cycle does ovulation occur?</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • How do multiple-gestation pregnancies occur? • How might hormonal contraceptives affect the reproductive tract to prevent pregnancy?
5	<p>IV. Anatomy and Physiology of the Obstetric Patient—Prenatal Period</p> <p>A. Ovulation is the release of the mature ovum from the ovary.</p> <p>B. Fertilized egg implants in the wall of the uterus and pregnancy begins.</p> <p>C. Approximately three weeks after implantation of the fertilized egg, the placenta develops.</p> <p>D. The preembryonic stage is the first 14 days after conception.</p> <p>E. The embryonic stage is from day 15 to eight weeks.</p> <p>F. The fetal stage begins at eight weeks and ends with delivery of the baby (neonate).</p> <p>G. Gestational age refers to the age of the fetus in weeks from the time of fertilization of the ovum through delivery.</p> <p>H. Fully term pregnancy lasts approximately 280 days from the first day of the last normal menstrual cycle.</p> <p>I. Each three-month period is referred to as a trimester. (Most emergencies occur in the first or third trimester).</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • At what point does the placenta develop? In which portion of the uterus is it normally located? • How is gestational age measured?

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15	<p>V. Anatomy and Physiology of the Obstetric Patient—Physiologic Changes in Pregnancy</p> <p>A. Reproductive system</p> <ol style="list-style-type: none"> 1. Uterus grows to weight more than two pounds and holds 5,000 mL by the end of pregnancy. 2. Uterus is extremely vascular and contains about one-sixth of the total blood volume of the mother. 3. Mucous plug forms in the opening to the cervix. 4. Breasts enlarge and become more nodular in preparation for milk production. <p>B. Respiratory system</p> <ol style="list-style-type: none"> 1. Oxygen demand of the mother increases. 2. Respiratory tract resistance decreases. 3. Tidal volume increases by 40 percent. 4. Respiratory rate increases slightly. 5. Oxygen consumption increases by 20 percent. <p>C. Cardiovascular system</p> <ol style="list-style-type: none"> 1. Cardiac output increases. 2. Maternal blood increases by 45 percent. 3. Maternal heart rate increases by 10 to 15 bpm. 4. Blood pressure decreases slightly during the first and second trimester. <p>D. Gastrointestinal system</p> <ol style="list-style-type: none"> 1. Nausea and vomiting commonly occur during the first trimester. 2. Bloating and constipation may occur. <p>E. Urinary system</p> <ol style="list-style-type: none"> 1. Renal blood flow increases. 2. Glomerular filtration increases by approximately 50 percent. 3. Urinary bladder is displaced superiorly and anteriorly. 4. Urinary frequency increases during first and third trimester. <p>F. Musculoskeletal system</p> <ol style="list-style-type: none"> 1. Pelvic joints loosen as a result of hormone changes. 2. Mother may experience back pain from compensating for the center of gravity. 	<p>Discussion Question What are some of the physiological changes of pregnancy?</p> <p>Knowledge Application Students should be able to apply knowledge of the anatomy and physiology of the female reproductive system to the assessment and management of obstetric patients.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on pregnancy, labor, and delivery.</p>

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20	<p>VI. Antepartum (Predelivery) Emergencies—Antepartum Conditions Causing Hemorrhage</p> <ul style="list-style-type: none"> A. Antepartum emergencies are those that occur in the pregnant patient prior to the onset of labor. B. Hemorrhage is one of the leading causes of death in the pregnant patient. C. Patient may or may not have vaginal bleeding, depending on whether or not the margins of the placenta are intact or if the fetus is engaged low in the pelvis. D. Spontaneous abortion <ul style="list-style-type: none"> 1. Pathophysiology <ul style="list-style-type: none"> a. Delivery of the fetus and placenta before the fetus is viable (usually after the 20th week) b. Cause may be genetic (50 percent of cases), uterine abnormality, infection, drugs, or maternal disease c. Patient history is extremely important; do not mistake spontaneous abortion for heaving period. d. Spontaneous abortion is different from elective abortion. 2. Assessment <ul style="list-style-type: none"> a. Cramp-like lower abdominal pain similar to labor b. Moderate-to-severe vaginal bleeding, bright or dark red c. Passing of tissue or blood clots 3. Emergency medical care <ul style="list-style-type: none"> a. Follow general guidelines for emergency medical care for antepartum emergencies (described later). b. Ask when patient’s last menstrual period began. c. Provide emotional support to the mother and members of her family throughout treatment and transport. E. Placenta previa <ul style="list-style-type: none"> 1. Pathophysiology <ul style="list-style-type: none"> a. Associated with abnormal implantation of the placenta over or near the opening of the cervix b. Placenta is prematurely torn away from the lower portion of the uterine wall and results in bleeding. c. Total—Placenta completely covers the os and blocks the birth canal, preventing delivery of the baby. d. Partial—Placenta covers the os of the cervix partially and may obstruct delivery of the baby. 	<p>Teaching Tip Arrange for an OB nurse to guest speak on these emergencies.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on vaginal bleeding during pregnancy.</p>

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	<ul style="list-style-type: none"> e. Marginal—Placenta is implanted near the neck of the cervix and may tear when the cervix effaces and dilates. f. Predisposing factors <ul style="list-style-type: none"> i. Multiparity ii. Rapid succession of pregnancies iii. Greater than 35 years of age iv. Previous placenta previa v. History of early vaginal bleeding vi. Bleeding immediately after intercourse 2. Assessment <ul style="list-style-type: none"> a. Third-trimester vaginal bleeding that is painless b. Look for signs of hypovolemic shock. 3. Emergency medical care <ul style="list-style-type: none"> a. Follow general guidelines for emergency medical care for antepartum emergencies (described later). b. Administer oxygen via a nonrebreather mask at 15 lpm. c. Treat for shock, and transport immediately. F. Abruptio placentae <ul style="list-style-type: none"> 1. Pathophysiology <ul style="list-style-type: none"> a. When small arteries located in the lining between the placenta and uterus are prone to rupture, accumulating blood begins to tear and separate the placenta from the uterine wall. b. Causes poor gas, nutrient, and waste exchange between the fetus and placenta and can cause severe maternal blood loss c. Complete—Placenta completely separates from the uterine wall (100 percent fetal mortality rate). d. Partial—Placenta is partially torn from the uterine wall (30 to 60 percent fetal mortality rate). e. Predisposing factors <ul style="list-style-type: none"> i. Hypertension ii. Use of cocaine or other vasoactive drugs iii. Preeclampsia iv. Multiparity v. Previous abortion vi. Smoking vii. Short umbilical cord viii. Premature rupture of the amniotic sac ix. Diabetes mellitus 	<p>Discussion Question How are placenta previa and abruptio placenta different?</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • Why is maternal cocaine use a risk factor for abruptio placenta? • What are some other potential risks of maternal substance abuse?

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	<ul style="list-style-type: none"> 2. Assessment—Signs and symptoms <ul style="list-style-type: none"> a. Vaginal bleeding with constant abdominal pain b. Mild, sharp, or acute abdominal pain due to muscle spasm of the uterus c. Lower back pain d. Uterine contractions e. Tender abdomen (upon palpation) f. Dark or bright red bleeding g. Hypovolemic shock (Remember that more than 2,500 mL of blood can be concealed in the uterus). 3. Emergency care <ul style="list-style-type: none"> a. Treatment is same as for placenta previa. b. Administer oxygen, treat for shock, and provide immediate transport. G. Ruptured uterus <ul style="list-style-type: none"> 1. Pathophysiology <ul style="list-style-type: none"> a. Spontaneous or traumatic rupture of the uterine wall, releasing the fetus into the abdominal cavity b. Mortality to the mother is 5–20 percent; infant mortality is over 50 percent. c. Ruptured uterus requires immediate surgery. 2. Assessment <ul style="list-style-type: none"> a. History of previous uterine rupture b. History or findings of abdominal trauma c. History of a large fetus d. Having borne more than two children e. History of prolonged and difficult labor f. History of prior Caesarean section or uterine surgery g. Tearing or shearing sensation in the abdomen h. Constant and severe abdominal pain i. Nausea j. Signs and symptoms of shock k. Vaginal bleeding (typically minor) l. Cessation of noticeable uterine contractions m. Ability to palpate the infant in the abdominal cavity 3. Emergency medical care <ul style="list-style-type: none"> a. Follow general guidelines for emergency medical care for antepartum emergencies (described later). b. Administer oxygen at 15 lpm by nonrebreather mask. 	<p>Discussion Question What are some risk factors for uterine rupture?</p>

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	<ul style="list-style-type: none"> c. Provide immediate transport. H. Ectopic pregnancy <ul style="list-style-type: none"> 1. Pathophysiology <ul style="list-style-type: none"> a. Egg is implanted outside the uterus in either the fallopian tub, on the abdominal peritoneal covering, on the outside wall of the uterus, on the ovary, or on the cervix. b. Tissue ultimately ruptures (third leading cause of maternal death). c. Predisposing factors <ul style="list-style-type: none"> i. Previous ectopic pregnancies ii. Pelvis inflammatory disease (PID) iii. Adhesions from surgery iv. Tubal surgery 2. Assessment <ul style="list-style-type: none"> a. Dull aching-type pain that is poorly localized and then becomes sudden b. Shoulder pain c. Vaginal bleeding (heaving, light, or absent) d. Lower abdominal pain e. Tender, bloated abdomen f. Palpable mass in the abdomen (rare) g. Weakness or dizziness when sitting or standing h. Decreased blood pressure i. Increased pulse rate j. Signs of shock (hypoperfusion) k. Discoloration around the navel l. Urge to defecate 3. Emergency medical care <ul style="list-style-type: none"> a. Follow general guidelines for emergency medical care for antepartum emergencies (described later). b. Treat the patient for shock. c. Administer oxygen at 15 lpm by nonrebreather mask. d. Constantly reassess vital signs. e. Provide immediate transport. 	<p>Discussion Question What is an ectopic pregnancy?</p>
15	<p>VII. Antepartum (Predelivery) Emergencies—Antepartum Seizures and Blood Pressure Disturbances</p> <p>A. Seizures during pregnancy</p>	

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	<ol style="list-style-type: none"> 1. Can be life-threatening to mother and fetus 2. Provide emergency medical care the same as for any seizure patient. 3. Protect the pregnant patient from injuring herself. 4. Transport the patient in a calm and quiet manner, and place her on her side. 5. Seizures may be associated with eclampsia. <p>B. Preeclampsia (toxemia)/eclampsia</p> <ol style="list-style-type: none"> 1. Pathophysiology <ol style="list-style-type: none"> a. Most frequently occurs in the last trimester and affects women in their 20s who are pregnant for the first time b. Eclampsia is a more severe form of preeclampsia and can include coma or seizures (causing the placenta to separate from the uterine wall). 2. Assessment <ol style="list-style-type: none"> a. History of hypertension, diabetes, kidney disease, liver disease, or heart disease b. No previous pregnancies c. History of poor nutrition d. Sudden weight gain (two pounds a week or more) e. Altered mental status f. Abdominal pain g. Blurred vision or spots before the eyes h. Excessive swelling of the face, fingers, legs, or feet i. Decreased urine output j. Severe, persistent headache k. Elevated blood pressure—Pregnancy induced hypertension (PIH) is defined as a blood pressure in a pregnant woman that is great than 140/90 mmHg on two or more occasions at six hours apart; or a systolic blood pressure of greater than 30 mmHg and a diastolic blood pressure greater than 15 mmHg from blood pressure prior to pregnancy. 3. Emergency medical care <ol style="list-style-type: none"> a. Follow general guidelines for emergency medical care for antepartum emergencies (described later). b. Administer oxygen at 15 lpm by nonrebreather mask, and keep suction close at hand. c. If seizure begins, you may need to provide positive pressure ventilation. 	<p>Discussion Question What are preeclampsia and eclampsia?</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on preeclampsia.</p>

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	<p>C. Supine hypotensive syndrome</p> <ol style="list-style-type: none"> 1. Pathophysiology <ol style="list-style-type: none"> a. Typically a third trimester complication that occurs when the weight of the fetus compresses the inferior vena cava when the patient is in a supine position b. Reduces blood flow to the right atrium (decreasing the preload and ultimately reducing the systolic blood pressure and perfusion). 2. Assessment <ol style="list-style-type: none"> a. Patient commonly complains of dizziness or lightheadedness in a supine position. b. Patient may experience a decrease in blood pressure, tachycardia, and pale, cool, clammy skin. c. Assess the patient for blood loss. 3. Emergency medical care <ol style="list-style-type: none"> a. Keep patient in a sitting position, lying on her left side, or supine with the right hip elevated. b. Placing the patient on either side is actually enough to relieve the pressure and reverse supine hypotensive syndrome. 	
20	<p>VIII. Antepartum (Predelivery) Emergencies—Assessment-Based Approach: Antepartum (Predelivery) Emergency</p> <ol style="list-style-type: none"> A. Scene size-up <ol style="list-style-type: none"> 1. Information from dispatch may indicate an obstetric emergency (emergency having to do with pregnancy or childbirth). 2. Remember that any woman of childbearing age could potentially be experiencing an obstetric emergency. 3. Ensure scene safety and take Standard Precautions. B. Primary assessment <ol style="list-style-type: none"> 1. Assess mental status, airway, breathing, and circulation of the patient. 2. Use the same assessment and treatment techniques as for a patient who is not pregnant. C. Secondary assessment <ol style="list-style-type: none"> 1. Use SAMPLE questions including OPQRST mnemonic to gather a quick history. 2. Include the following questions as appropriate. (Patients may not know they are pregnant). <ol style="list-style-type: none"> a. Have you ever been pregnancy before (number, live births, vaginal or Caesarean, complications)? 	<p>Discussion Question What specific questions should you ask when obtaining the history of a patient with an antepartum emergency?</p>

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	<ul style="list-style-type: none"> i. Gravida refers to pregnancy (Roman numeral added to the end indicates the number of pregnancies). ii. Primigravida is a woman in her first pregnancy. iii. Para refers to a woman who has given birth (Roman numeral added to the end indicates the number of births.) iv. Primipara is a mother who has given birth for the first time. b. Are you experiencing any pain or discomfort (quality, intensity, onset, duration, frequency)? c. When was your last menstrual period (date, volume, color, regularity)? d. Have you missed a menstrual period (change of pregnancy, early signs of pregnancy)? e. Have you had any unusual vaginal discharge (color, odor, quantity)? f. When (if patient knows she is pregnant) is your due date (prenatal care, number of pregnancies, number of children, complications)? <p>3. Examine the abdominal regions.</p> <p>4. Obtain a set of baseline vital signs.</p> <p>5. Signs and symptoms of an antepartum emergency</p> <ul style="list-style-type: none"> a. Abdominal pain, nausea, vomiting b. Vaginal bleeding, passage of tissue c. Weakness, dizziness d. Altered mental status e. Seizures f. Excessive swelling of the face and/or extremities g. Abdominal trauma h. Shock (Pregnancy may mask early signs and symptoms.) i. Elevated blood pressure <p>D. Emergency medical care</p> <ul style="list-style-type: none"> 1. Any pregnant patient experiencing abnormality (pain, discomfort, bleeding) needs to be seen by a physician. 2. Take precautions against supine hypotensive syndrome. 3. Watch for lower-than-expected blood pressure readings and be alert to syncope. 4. Ensure adequate airway, breathing, oxygenation, and circulation. (Provide oxygen via nonrebreather mask or positive pressure ventilation if necessary.) 5. Care for bleeding from the vagina—Place a sanitary pad over the vaginal opening but do not pack the vagina. (Keep all blood-soaked 	<p>Class Activity Hand out index cards to pairs or small groups of students. One student in the group will play the role of patient (or family member of a patient) with the disorder listed on the card. Another student will play the role of the EMT obtaining a history. Each student will have to know enough about the disorder to play his role. Additional students in the group can observe and give feedback while waiting their turn to role play. Provide several cards to each group.</p> <p>Discussion Question What are signs and symptoms associated with antepartum emergencies?</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the priorities of management for patients with antepartum emergencies? • What steps should you take to reduce the risk of seizures in patients with preeclampsia/ eclampsia?

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	<p>pads and transport to the hospital.)</p> <ol style="list-style-type: none"> 6. Provide emergency medical care as you would for the nonpregnant patient based on any other signs and symptoms. 7. Transport the patient on her left side. 8. If a pregnant patient dies in or as a result of an accident, CPR started immediately or within the first few minutes may save the life of the infant. If you do begin, it must be continued until the infant is surgically delivered at the hospital. <p>E. Reassessment</p> <ol style="list-style-type: none"> 1. Perform a reassessment and check any interventions. 2. Be attentive for and treat any signs of developing shock. 3. Repeat reassessment every 15 minutes if stable or every five minutes if unstable. 	<p>Knowledge Application</p> <p>Students should be able to apply the knowledge in this section to scenarios involving assessment and management of patients with antepartum emergencies.</p>
5	<p>IX. Antepartum (Predelivery) Emergencies—Summary: Assessment and Care—Antepartum (Predelivery Emergency)</p> <ol style="list-style-type: none"> A. Review possible assessment findings and emergency care for an antepartum obstetric emergency. B. See Figures 37-6 and 37-7. 	
30	<p>X. Labor and Normal Delivery—Labor</p> <ol style="list-style-type: none"> A. Term used to describe the process of birth B. Fetus normally moves into a head-down position. C. First stage: dilation <ol style="list-style-type: none"> 1. From beginning of true labor (contractions) to complete cervical dilation 2. Infant’s head progresses from the body of the uterus to the birth canal. 3. Cervix gradually dilates (stretches) and effaces (thins). 4. Contractions get stronger and closer together. 5. Appearance of the plug of mucus may occur. 6. Amniotic sac may rupture. 7. Dilation stage ends when contractions are at regular three to four minute intervals, last at least 60 second each, and feel very intense. 8. Braxton-hicks contractions are painless, short-duration, irregular contractions, and are often referred to as “false labor.” D. Second stage: expulsion <ol style="list-style-type: none"> 1. Begins with complete cervical dilation and ends with the delivery of the baby 2. Infant moves through the vagina and is born. 3. Contractions are close together—two to three minutes apart—and last 	<p>Video Clips</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access videos on childbirth and the first stage of labor.</p>

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	<p>longer—60 to 90 seconds each.</p> <ol style="list-style-type: none"> 4. Mother experiences considerable pressure in her rectum and an uncontrollable urge to push down. 5. Perineum, area of skin between the vagina and the anus, bulges significantly. 6. The infant's head appears at the opening of the birth canal (crowning). <p>E. Third stage: placental</p> <ol style="list-style-type: none"> 1. Begins following the delivery of the baby and ends with the expulsion of the placenta. 2. Placenta separates from the uterine wall and is expelled from the uterus. 3. Mother will continue to have contractions until the placenta is expelled. 4. Signs delivery of the placenta is imminent <ol style="list-style-type: none"> a. Sudden increase in bleeding from the vagina b. Uterus becomes smaller in size. c. Umbilical cord begins to lengthen. d. Mother has an urge to push. e. Never tug or pull on the umbilical cord in an attempt to facilitate delivery of the placenta. 	
30	<p>XI. Labor and Normal Delivery—Assessment-Based Approach: Active Labor and Normal Delivery</p> <p>A. Scene size up, primary assessment, and secondary assessment</p> <ol style="list-style-type: none"> 1. Essentially the same as you would provide in an antepartum emergency 2. If you determine that the patient is in active labor, assessment and treatment goals should focus on assisting the mother with delivery and providing initial care to the neonate. 3. It is best to transport a mother in labor so that delivery can take place at the hospital; however, if delivery is imminent, prepare to assist in delivery at the scene. 4. Questions to determine whether to transport or commit to delivery <ol style="list-style-type: none"> a. How many times has the patient been pregnant? b. Is this the patient's first delivery? How many deliveries has she experienced? c. How long has the patient been pregnant? d. Has there been any bleeding or discharge? e. Are there any contractions or pain present? f. What is the frequency and duration of contractions? g. Is crowning occurring with contractions? 	<p>Knowledge Application</p> <p>Students should be able to demonstrate the steps necessary to assist with a normal field delivery.</p>

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	<p>h. Does the patient feel the need to push?</p> <p>i. Does the patient feel as if she is having a bowel movement with increasing pressure in the vaginal area?</p> <p>j. Is the abdomen hard upon palpation?</p> <p>5. Signs and symptoms that delivery can be expected within a few minutes</p> <p>a. Crowning has occurred.</p> <p>b. Contractions are two minutes apart or closer, are intense, and last from 60 to 90 seconds.</p> <p>c. The patient feels the infant's head moving down the birth canal (urge to defecate).</p> <p>d. Patient has a strong urge to push.</p> <p>e. Patient's abdomen is very hard.</p> <p>6. If birth is imminent with crowning, contact medical direction for a decision to commit to delivery on site. (If delivery does not occur within ten minutes, contact medical direction for permission to transport).</p> <p>7. Assisting in delivery of infant</p> <p>a. Take all appropriate Standard Precautions.</p> <p>b. Do not touch the patient's vaginal area except during delivery and in the presence of your partner.</p> <p>c. Do not allow the patient to use the bathroom.</p> <p>d. Do not hold the mother's legs together.</p> <p>e. Use a sterile obstetrics (OB) kit.</p> <p>f. Ensure mother's comfort, modesty, and piece of mind.</p> <p>g. Recognize your own limitations, and call medical direction for help if necessary.</p> <p>B. Emergency medical care</p> <p>1. Position the patient (firm surface with her knees drawn up and spread apart).</p> <p>2. Create a sterile field around the vaginal opening if time permits.</p> <p>3. Monitor the patient for vomiting.</p> <p>4. Continually assess for crowning.</p> <p>5. Place your gloved fingers on the body part of the infant's skull when he crowns.</p> <p>6. Tear the amniotic sac if it is not already ruptured.</p> <p>7. Determine the position of the umbilical cord. (Cord around the infant's neck is referred to as nuchal cord).</p> <p>8. Suction fluids from the infant's airway.</p> <p>9. As the torso and full body are expelled, support the newborn with both</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the indications that delivery is imminent? • How should you prepare for a field delivery? • What steps must you take to assist with the delivery? <p>Teaching Tips</p> <ul style="list-style-type: none"> • Use an OB mannequin to allow students ample practice assisting with a normal delivery. • Ensure that students have adequate opportunities to examine and handle all contents of an OB kit.

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	<p>hands.</p> <ol style="list-style-type: none"> 10. Grasp the feet as they are born. 11. Clean the newborn's mouth and nose. 12. Dry, wrap, warm, and position the infant. 13. Assign your partner to monitor and complete initial care of the newborn. 14. Clamp, tie, and cut the umbilical cord as pulsations cease. 15. Observe for delivery of the placenta. 16. Transport the delivered placenta. 17. Place one or two sanitary pads over the vaginal opening. 18. Record the time of delivery and transport the mother, infant, and placenta to the hospital. 19. If blood loss appears to be excessive, provide oxygen to the mother and massage the uterus. <ol style="list-style-type: none"> a. Place the medial edge of one hand (fingers extended) horizontally across the abdomen, just above the symphysis pubis. b. Cup your other hand around the uterus. c. Allows the infant to suckle on the mother's breast. 20. If bleeding continues to appear to be excessive, check your massage technique, continue massage, and transport immediately. <p>C. Reassessment</p> <ol style="list-style-type: none"> 1. If mother appears to be suffering shock, treat and transport immediately. 2. You can initiate uterine massage during transport. 	<p>Discussion Question What steps must you take to manage excessive postpartum hemorrhage?</p>
5	<p>XII. Abnormal Delivery—Assessment-Based Approach: Active Labor with Abnormal Delivery</p> <p>A. Scene size-up, primary assessment, and secondary assessment</p> <ol style="list-style-type: none"> 1. Perform as you would for a patient who is experiencing a normal delivery. 2. Signs and symptoms of an abnormal delivery emergency <ol style="list-style-type: none"> a. Any fetal presentation other than the normal crowning of the fetus head b. Abnormal color or smell of the amniotic fluid c. Labor before 38 weeks of pregnancy d. Recurrence of contractions after the first infant is born (indicating multiple births) <p>B. Emergency medical care and reassessment</p> <ol style="list-style-type: none"> 1. Emergency medical care of the mother and newborn is similar to that of a normal delivery. 	<p>Discussion Question What signs should alert you to an abnormal delivery?</p> <p>Teaching Tip Use an OB mannequin to allow students ample practice assisting with abnormal delivery situations. Simulate meconium with a small amount of pureed spinach baby food placed in water.</p>

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	<ol style="list-style-type: none"> 2. Place emphasis on immediate transport, administration of high-flow, high-concentration oxygen, and continuous monitoring of vital signs during the reassessment. 	
<p style="text-align: center;">30</p>	<p>XIII. Abnormal Delivery—Intrapartum Emergencies</p> <ol style="list-style-type: none"> A. Intrapartum emergency is one that occurs during the period from the onset of labor to the actual delivery of the neonate; delivery is often not possible. B. Prolapsed cord <ol style="list-style-type: none"> 1. After amniotic sac ruptures, umbilical cord rather than the head is the first part presenting at the vaginal opening. 2. Infant's supply of oxygenated blood can be cut off. 3. Predisposing factors include prematurity, multiple births, and premature rupture of the amniotic sac. 4. Emergency medical care <ol style="list-style-type: none"> a. Instruct the patient not to push to avoid additional compression of the umbilical cord; coach the patient during contractions. b. Position the patient on the stretcher in a "knee-chest" position with the stretcher in a Trendelenburg position. c. Insert a sterile, gloved hand into the vagina, and gently push the presenting part of the fetus, head or buttocks, up, back, or away from the pulsating cord. d. Cover the umbilical cord with a sterile dressing moistened with a sterile saline solution. e. Transport the patient rapidly while maintaining pressure on the head or buttocks to keep pressure off of the cord. Monitor pulsations in the cord. C. Breech birth <ol style="list-style-type: none"> 1. One in which the fetal buttocks or lower extremities are low in the uterus and are first to be delivered 2. Transport immediately upon recognition of a breech presentation, if possible. 3. Administer oxygen to the mother, and keep the mother in a supine head-down position with pelvis elevated. 4. If delivery is unavoidable <ol style="list-style-type: none"> a. Position the mother with her buttocks at the edge of a firm surface or bed. b. Have her hold her legs in a flexed position. 	<p>Discussion Question How should you manage a prolapsed umbilical cord?</p>

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	<ul style="list-style-type: none"> c. As the infant delivers, do not pull on the legs but support them. d. Allow the entire body to be delivered as you simply support it. e. If head cannot be delivered, insert your index and middle gloved fingers into the vagina, forming a “V” along the vaginal wall with the baby’s nose and mouth between the fingers. Immediately transport while maintaining this position. <p>D. Limb presentation</p> <ul style="list-style-type: none"> 1. When one arm or one leg is the first to protrude from the birth canal 2. Transport immediately because a cesarean section will be required. 3. Administer oxygen to the mother. 4. Place the mother in a knee-chest position with her pelvis elevated. 5. Never pull on the infant by his arm or leg. <p>E. Multiple births</p> <ul style="list-style-type: none"> 1. Infants may have their own placenta or share a placenta. 2. Indications of a multiple birth <ul style="list-style-type: none"> a. Abdomen is still very large after one infant is delivered. b. Uterine contractions continue to be extremely strong after delivering the first infant. c. Uterine contractions begin again about ten minutes after one infant has been delivered. d. Infant’s size is small in proportion to the size of the mother’s abdomen. 3. Follow general guidelines for emergency medical care in a normal delivery with the following exceptions. <ul style="list-style-type: none"> a. Be prepared to care for more than one infant. b. Call for assistance. c. If the second infant is breech, handle the delivery as you would for a single infant. d. Expect and manage hemorrhage following the second birth. e. If second infant has not delivered within ten minutes of the first, transport the mother and first infant to the hospital for delivery of the second infant. f. Be prepared to provide additional resuscitation. <p>F. Meconium</p> <ul style="list-style-type: none"> 1. Fetus may undergo significant distress and pass a bowel movement in the amniotic fluid (meconium staining). 2. If meconium is present, suction the infant’s mouth and nose as soon as the head emerges from the birth canal. (Do not stimulate infant before 	<p>Discussion Question What should you do if there is a limb presentation?</p>

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	<p>you suction mouth and nose.)</p> <ol style="list-style-type: none">3. Transport the infant as soon as possible, maintaining the airway and supporting ventilation. <p>G. Premature birth</p> <ol style="list-style-type: none">1. Infant weighing less than five pounds or an infant born before the 38th week of development2. Appearance of a premature infant is different (thinner, smaller, reddened and wrinkled skin, single crease across the sole of the foot, fuzzy scalp hair, and underdeveloped external ear cartilage).3. Emergency medical care<ol style="list-style-type: none">a. Dry the infant thoroughly and cover his head.b. Use gentle suction with a bulb syringe to keep the infant's nose and mouth clear of fluid.c. Prevent bleeding from the umbilical cord. A premature infant cannot tolerate losing even the smallest amount of blood.d. Administer supplemental oxygen by blowing oxygen in the infant's face (approximately one inch above the infant's nose and mouth).e. Protect baby from infection, and do not let anyone breathe into the infant's face.f. Wrap the infant securely to keep him warm, and heat the vehicle during transport. <p>H. Post-term pregnancy</p> <ol style="list-style-type: none">1. Pregnancy in which the gestation of the fetus extends beyond 42 weeks2. Postmaturity syndrome is a deterioration of conditions necessary to support the well-being of the fetus (decline in oxygenation and nutrient delivery). <p>I. Precipitous delivery</p> <ol style="list-style-type: none">1. Delivery in which the birth of the fetus occurs after less than three hours of labor2. Most often seen in patients who have delivered several children3. Increased risk of trauma to the fetus, trauma to the mother, and tearing of the umbilical cord <p>J. Shoulder dystocia</p> <ol style="list-style-type: none">1. When fetal shoulders are larger than the fetal head2. Head delivers but then retracts back into the vagina ("turtle sign").3. Do not pull the head of the fetus in an attempt to deliver; transport immediately.4. Have the mother pant, and place the mother on her back with her knees	

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	<p style="text-align: center;">drawn up as close to her chest as possible (McRobert’s position).</p> <p>K. Preterm labor</p> <ol style="list-style-type: none"> 1. Occurs after the 20th week but prior to the 37th week of gestation 2. Refers specifically to the onset of labor and does not always lead to the birth of the baby 3. Do not allow the mother to push, place the patient on oxygen, and consider calling advanced life support. <p>L. Premature rupture of membranes</p> <ol style="list-style-type: none"> 1. Spontaneous premature rupture of the amniotic sac prior to the onset of true labor and before the end of the 37th week gestation 2. Increased risk of infection of the uterus and its contents 3. Premature rupture may lead to inadequate lubrication of the vaginal canal at the time of birth. 	<p>Discussion Question What is preterm labor?</p>
5	<p>XIV. Abnormal Delivery—Summary: Assessment and Care—Active Labor and Abnormal Delivery</p> <p>A. Review possible assessment findings and emergency care for an obstetric emergency associated with active labor and delivery.</p> <p>B. Review Figures 37-17 and 37-18.</p>	<p>Knowledge Application Students should be able to demonstrate management of a variety of abnormal delivery situations.</p>
5	<p>XV. Abnormal Delivery—Postpartum Complications</p> <p>A. Postpartum refers to the period following delivery and complications involve only the mother.</p> <p>B. Postpartum hemorrhage</p> <ol style="list-style-type: none"> 1. Defined as the loss of greater than 500 mL of blood following delivery 2. Most common cause is failure of the uterus to regain its muscle tone. 3. Most common in multigravida patients following multiple births or delivery of a large baby 4. Provide oxygen therapy, fundal massage, and immediate transport. <p>C. Embolism</p> <ol style="list-style-type: none"> 1. Pregnant or postpartum patient is at greater risk because of her increased blood flow volume and coagulation properties of the blood. 2. Signs and symptoms of pulmonary embolism include shortness of breath; syncope; tachycardia; sharp chest pain; hypotension; cyanosis; and pale, cool, and clammy skin. 3. Maximize oxygenation via a nonrebreather mask or positive pressure ventilation. 	

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25	<p>XVI. Care of the Newborn—Assessment-Based Approach: Care of the Newborn</p> <p>A. Immediately dry the infant, cover the head, wrap the newborn in a blanket, suction the infant’s mouth and nose repeatedly, and position the newborn on his back or side with the neck slightly extended in a sniffing position.</p> <p>B. Assessment</p> <ol style="list-style-type: none"> 1. Determine APGAR score at 60 seconds and four minutes (one minute and five minute score). <ol style="list-style-type: none"> a. Appearance (cyanotic or pale = 0; pink core = 1; pink = 2) b. Pulse (no pulse = 0; heart rate under 100 = 1; heart rate over 100 = 2) c. Grimace (limp = 0; some flexion without adequate movement = 1; actively moving around = 2) d. Respiration (no respiratory effort = 0; slow or irregular breathing effort = 1; good respirations and strong cry = 2) 2. APGAR score <ol style="list-style-type: none"> a. 7 – 10 points—Newborn should be active and vigorous; provide routine care. b. 4 – 6 points—Newborn is moderately depressed; provide stimulation and oxygen. c. 0 – 3 points—Newborn is severely depressed. Provide extensive care including oxygen with bag-valve-mask ventilations and CPR. 3. Stimulate respirations by gently flicking the soles of the feet or by rubbing the back in a circular motion with three fingers. 4. Signs of severely depressed newborn <ol style="list-style-type: none"> a. Respiratory rate over 60 per minute b. Diminished breath sounds c. Heart rate over 180 per minute or under 100 per minute d. Obvious signs of trauma from the delivery process e. Poor or absent skeletal muscle tone f. Respiratory arrest, or severe arrest g. Heavy meconium staining of amniotic fluid h. Weak pulses i. Cyanotic body j. Poor peripheral perfusion k. Lack of or poor response to stimulation l. Apgar score under four 	<p>Teaching Tip Allow students ample opportunity to practice neonatal care and resuscitation.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on APGAR.</p> <p>Discussion Question How can you use the APGAR score to assess newborns?</p> <p>Discussion Question What are indications that a newborn requires resuscitation?</p> <p>Critical Thinking Discussion Why are airway management, oxygenation, and ventilation the most commonly needed interventions in neonatal resuscitation?</p>

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	<p>C. Emergency medical care</p> <ol style="list-style-type: none"> 1. The establishment and maintenance of an adequate airway, ventilation, and oxygenation is cornerstone treatment for any newborn infant. 2. If infant has bluish discoloration but has spontaneous breathing and an adequate heart rate, provide blow-by oxygen (one inch from the nose and mouth at five lpm or greater). 3. Provide ventilations by bag-valve mask with supplemental oxygen at the rate of 40–60 per minute if the newborn displays any of the following. 4. Infant’s breathing is shallow, slow, gasping, or absent following brief stimulation. 5. Infant’s heart rate is less than 100 beats per minute. 6. Infant’s core body remains cyanotic (blue) despite provision of blow-by oxygen. 7. Reassess after 30 seconds of ventilation; insert gastric tube if infant’s stomach becomes distended or impedes ventilation. 8. If infant’s heart rate drops to less than 60 beats per minute, continue ventilation and begin chest compressions. 	<p>Discussion Question What are the steps of neonatal resuscitation?</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on newborn resuscitation.</p> <p>Knowledge Application Students should be able to demonstrate assessment and care of normal newborns and newborns in need of resuscitation.</p>
5	<p>XVII. Care of the Newborn—Summary: Care of the Newborn</p> <ol style="list-style-type: none"> A. Review emergency care for the newborn. B. Review Figures 37-22 and 37-23. 	
10	<p>XVIII. Follow-Up</p> <ol style="list-style-type: none"> A. Answer student questions. B. Case Study Follow-Up <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. C. Follow-Up Assignments <ol style="list-style-type: none"> 1. Review Chapter 37 Summary. 2. Complete Chapter 37 In Review questions. 3. Complete Chapter 37 Critical Thinking. D. Assessments <ol style="list-style-type: none"> 1. Handouts 2. Chapter 37 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What is the procedure for clamping and cutting the umbilical cord? • Is it normal for a newborn to have an APGAR score of seven? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition.

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		<p>Advise students to review the questions again as they study the chapter.</p> <ul style="list-style-type: none"> • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 38 Pediatrics

385–430 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about special assessment and emergency care considerations when dealing with pediatric patients.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What are common causes of respiratory and cardiac arrest in infants? • How can you put aside your emotions to focus on providing the best assessment and management possible for this patient? • What are the needs of the parents at this time?
15	<p>II. Dealing with Caregivers</p> <ol style="list-style-type: none"> A. Listen carefully and remain nonjudgmental. B. Let caregivers verbalize their emotions. C. Calm, supportive interaction with the child’s family is in the child’s best interest. D. Let caregivers see that you are competent, calm, and confident. E. Keep the caregiver informed about what you are doing and the condition of the child. F. Use jargon only if appropriate. G. Do not give false reassurances. H. Remember that caregivers are often experts on their child’s normal behavior or characteristics. I. Enlist the parent’s help in treating the child, if appropriate. 	<p>Teaching Tip</p> <p>Solicit student volunteers, if they are willing, to discuss feelings they have had when their child was sick or injured. If appropriate, share your own experiences.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • How are caregivers of sick or injured children likely to react? • What do the caregivers of sick or injured children need from the EMTs caring for their children? <p>Knowledge Application</p> <p>Students should be able to apply the principles of interacting with caregivers to their care of sick and injured pediatric patients.</p>

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		<p>Critical Thinking Discussion Why might caregivers feel guilty when a child is sick or injured?</p>
25	<p>III. Dealing with the Child—Developmental Characteristics</p> <p>A. Pain can be difficult to assess in all of the following age groups.</p> <p>B. Neonates (newborn to one month of age)</p> <ol style="list-style-type: none"> 1. The first four weeks of life are very different as far as growth and development are concerned. 2. Birth defects and unintentional injuries are common causes of emergencies in this group. <p>C. Infants (one month to one years of age)</p> <ol style="list-style-type: none"> 1. May cry if separated from caregiver (“stranger anxiety”) 2. Complete scene size-up and primary assessment as thoroughly as possible while you view the infant from across the room. 3. Allow a familiar person to hold the baby while you complete your examination unless the infant is critically injured or ill. 4. Start with the feet or the trunk and end with the head if the infant is not critically ill or injured. <p>D. Toddlers (one year to three years of age)</p> <ol style="list-style-type: none"> 1. They do not like to be touched, so limit your touch to necessary assessment and management needs. 2. They do not like to be separated from their caregiver. 3. They do not like having their clothing removed (only as necessary and enlist the help of caregiver). 4. They do not like having an oxygen mask over their face. 5. They do not like needles, they fear pain, and they may actually believe the injury or illness they have is punishment. 6. Remain calm, speak soothingly, and try to distract the child with a favorite toy. 7. Complete essential parts of the physical assessment first (use to-to head approach). 8. Reduce the number of ways you assess the anxious child (e.g., touch but don’t look). <p>E. Preschoolers (three to six years of age)</p> <ol style="list-style-type: none"> 1. Concrete thinkers and interpret literally 2. Vivid imaginations and able to dramatize events 	<p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web a resource on child behavior disorders and the Maternal and Child Health Bureau site.</p> <p>Discussion Question What is the best way to approach assessment in a preschool-age child?</p>

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	<ul style="list-style-type: none"> 3. May view injury as punishment 4. Aware of and fear death, pain, blood, and permanent injuries 5. Explain procedures slowly and in simple terms. 6. Allow the child to see your equipment in full view and touch it 7. Have caregiver present and holding child if child is not critically ill or injured. 8. Set a few ground rules (e.g. Biting and kicking are not okay.) F. School-age children (six to 12 years of age) <ul style="list-style-type: none"> 1. Cooperative, even curious 2. Understand that you are there to help them 3. Concerned about death and disability 4. Modesty and body image are very important. 5. Illness or injury may cause child to regress emotionally. 6. Honesty is very important to school-age children. 7. Treat them with respect and make them partners in their care. 8. Explain their physical injuries. G. Adolescents (12 to 18 years of age) <ul style="list-style-type: none"> 1. Use concrete thinking but are developing their abstract thinking skills 2. Generally believe that nothing bad can happen to them 3. Still fear the possibility of disability and disfigurement 4. Preoccupied by their bodies and concerned about modesty 5. Capable of hysterical reaction or “mass hysteria” 6. Use a relaxed approach when performing a history or secondary assessment. 7. If the adolescent trusts you, you will be more likely to get truthful information. 8. Have same-sex provider conduct examinations of the genital area, if necessary. 	<p>Critical Thinking Discussion How is the concrete thinking of children different from the more abstract thinking of adults? What are the implications for communicating with children?</p> <p>Discussion Question What are the concerns of adolescents regarding illness and injury?</p>
25	<p>IV. Dealing with the Child—Anatomical and Physiologic Differences</p> <p>A. Airway</p> <ul style="list-style-type: none"> 1. Infants have proportionally larger tongues than adults as compared to the size of the mouth. 2. The diameter of a newborn’s trachea is only about four to five mm, or about one-third of the diameter of a dime, or the size of a straw. 3. The pediatric trachea is much more pliable than the adult trachea because children’s tracheal rings are underdeveloped. 4. Pressure on the soft tissue under the chin can easily cause the tongue 	<p>Teaching Tip Draw a grid on the white board to compare and contrast the characteristics of adults and children.</p>

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	<p>to be displaced, leading to airway obstruction.</p> <ol style="list-style-type: none"> 5. Newborns and infants are obligate nose breathers. 6. The smallest area of the upper airway is at the level of the cricoid cartilage. 7. The epiglottis is much higher in the airway than in an adult. <p>B. Head</p> <ol style="list-style-type: none"> 1. Children’s heads are proportionally larger than adults’. (Padding necessary for immobilization). 2. Infants younger than six or seven months old typically cannot fully support their own heads. 3. Infants have a “soft spot” on their head from incomplete closure of the skeletal plates that make up the skull (fontanelles). <p>C. Chest and lungs</p> <ol style="list-style-type: none"> 1. The child’s ribs are much more pliable than the adult’s (lungs more prone to collapse). 2. The child’s ribs are more horizontal than they are rounded (relies more on diaphragm). 3. Lung tissue is much more fragile. 4. The chest will move minimally with respiration in the healthy child. It is normal for the abdomen to rise with inhalation and the abdomen to fall with exhalation. 5. The chest muscles are underdeveloped and used more as accessory muscles. <p>D. Respiratory system</p> <ol style="list-style-type: none"> 1. The breathing is adequate once the respiratory rate reaches 60 breaths per minute or greater in children. 2. Infants and children less than five years of age will breathe at a rate two to three times faster than the adult patient. 3. Muscles of the diaphragm in the infant are more prone to fatigue. <p>E. Cardiovascular system</p> <ol style="list-style-type: none"> 1. The heart rate will increase in response to fear, fever, anxiety, activity, and hypovolemia. 2. In infants and children, bradycardia is a late response to hypoxia. In newborns, bradycardia is the initial response to hypoxia. 3. Infants and children have a smaller circulating blood volume than adults. 4. Hypotension will not usually develop in infants and children until greater than 30 percent of the blood volume has been lost. The onset of the hypotension is sudden once the compensation falls. 	<p>Discussion Question What are some characteristics of the pediatric head that must be considered in assessment and management?</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • Summarize the differences between adult and pediatric respiratory systems. • Why do infants and children tire so easily when they are in respiratory distress?

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	<p>5. Infants and young children have a limited ability to increase the strength of cardiac contraction.</p> <p>F. Abdomen</p> <ol style="list-style-type: none"> 1. The child’s abdominal musculature is less well developed than the adult’s. 2. Until the child reaches puberty, the liver and spleen are more exposed and less protected. <p>G. Extremities</p> <ol style="list-style-type: none"> 1. The bones of the extremities in a child will fracture more often by bending and splintering. 2. The infant and young child’s motor development occurs from the head to the toes. <p>H. Metabolic rate</p> <ol style="list-style-type: none"> 1. Infants and children have a much faster metabolic rate, even at rest. 2. Pediatric patients are at a significant risk for the development of acute hypoglycemia from poor glucose stores, inability to stimulate the release of glucose stores, increased metabolic rate, or known history of diabetes. <p>I. Skin and body surface area</p> <ol style="list-style-type: none"> 1. A child’s skin surface is large compared to his body mass. 2. The skin is thinner and much more delicate than in an adult. 	<p>Discussion Question What are some consequences of the undeveloped pediatric skeleton?</p> <p>Knowledge Application Students should be able to apply the knowledge in this section to scenarios involving assessment and management of pediatric patients.</p>
5	<p>V. Assessment-Based Approach to Pediatric Emergencies—Scene Size-Up</p> <ol style="list-style-type: none"> A. Take the necessary Standard Precautions. B. Determine if the scene is safe to enter (e.g., evidence of violence or hazardous substance). C. Determine if the pediatric patient is a medical or trauma patient, if there is only one patient, and if any additional resources are needed. 	
25	<p>VI. Assessment-Based Approach to Pediatric Emergencies—Primary Assessment</p> <ol style="list-style-type: none"> A. Quickly identify and manage immediate life threats. (Children can deteriorate very quickly.) B. Pediatric Assessment Triangle (PAT)—Primary assessment should begin “at the doorway”. <ol style="list-style-type: none"> 1. Integrated into general impression portion of the primary assessment for the pediatric patient 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Allow ample opportunity for students to practice pediatric assessment scenarios under supervision. • Arrange a tour of a pediatric emergency department or, if this is not possible, consider a tour of the area of the ED in which pediatric patients are treated.

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	<ul style="list-style-type: none">2. Consists of three sides: appearance, work of breathing, and circulation of skin3. Appearance (TICLS)<ul style="list-style-type: none">a. Toneb. Interactivity and irritabilityc. Consolabilityd. Look or gazee. Speech or cry4. Work of breathing (assessed before child begins to cry)<ul style="list-style-type: none">a. Abnormal soundsb. Abnormal posture or positionc. Retractionsd. Nasal flaringe. Head bobbing5. Circulation to skin<ul style="list-style-type: none">a. Pallorb. Mottlingc. Cyanosisd. Petechiae (pinpoint hemorrhages to the skin)6. Pediatric triangle application and interpretation—Form a general impression as to whether this is a “well” child versus a “sick” child.<ul style="list-style-type: none">a. Questions to ask<ul style="list-style-type: none">i. Does the patient display normal behavior for his age?ii. Does the patient move about spontaneously? Seem lethargic?iii. Does the patient appear attentive and recognize the parents or caregivers?iv. Does the patient maintain eye contact (appropriate for age)?v. Does the patient seem easily consoled by the parents or caregiver? Seem inconsolable?vi. Does the patient respond to parent or caregiver calling? Respond inappropriately? Not respond at all?b. Findings<ul style="list-style-type: none">i. Well baby is interactive with both the caregiver and the environment, is actively moving, has good color, and has a good, strong cry.ii. A sick baby will appear limp or flaccid, have a weak or absent cry, not interact with the environment or parents, possibly have poor skin color, and will not seem to notice your approach.	<p>Discussion Question Describe the pediatric assessment triangle.</p>

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	<ul style="list-style-type: none"> iii. Respiratory distress—Normal appearance, abnormal work of breathing, normal circulation to skin iv. Respiratory failure—Abnormal appearance, abnormal work of breathing, and normal or abnormal circulation to skin v. Compensated shock—Normal appearance, normal work of breathing, and abnormal circulation to skin vi. Decompensated shock—Abnormal appearance, normal work of breathing, and abnormal circulation to skin vii. Cardiopulmonary failure—Abnormal appearance, abnormal work of breathing, and abnormal circulation to skin <p>C. Assessing the level of consciousness (AVPU)—Use a variation of the adult AVPU scale.</p> <p>D. Airway assessment—Keep pediatric anatomical and physiologic differences in mind.</p> <p>E. Breathing assessment</p> <ul style="list-style-type: none"> 1. Assess respiratory rates over a minimum of 30 seconds but ideally over 60 seconds. 2. Any cessation in breathing for greater than ten seconds should be considered abnormal and require intervention. (True apnea is defined as cessation of breathing for 15 seconds or longer.) 3. Assess tidal volume, chest rise, and air movement. 4. If breathing is inadequate, begin positive pressure ventilation with supplemental oxygen. 5. Clues to the infant or child’s airway and respiratory status <ul style="list-style-type: none"> a. Rapid breathing (normal is 25–30 per minute in an infant; 15–30 per minute in a child)—Look for breathing through the mouth, flaring of the nostrils, retractions, use of accessory muscles, and cyanosis around the mouth. b. Noisy breathing—Listen along both midaxillary lines and assess for coughing, gagging, gasping (partial airway blockage); crackles (respiratory diseases); wheezing (narrowing of the lower airway or aspiration), and stridor (obstruction in the upper airway). c. Diminished breathing—Consider positive pressure ventilation if breath sounds are not obvious. <p>F. Circulatory assessment</p> <ul style="list-style-type: none"> a. In small children, obtain peripheral pulses at the brachial artery. b. In the older child, check the radial pulse. c. Obtain central pulses from either the femoral or carotid arteries. 	<p>Critical Thinking Discussion Why do pediatric patients tend to compensate well and then deteriorate suddenly?</p> <p>Discussion Question What are indications of respiratory distress in children?</p> <p>Discussion Question How is the assessment of circulation different in pediatric patients from in adults?</p>

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	<ul style="list-style-type: none"> d. If no pulse can be palpated, consider auscultating the heart with a stethoscope. e. Capillary refill time is typically quite an accurate measurement in children. (Assess closer to core in areas like kneecap or forearm; normal refill time is one to two seconds.) f. Other circulation assessment parameters <ul style="list-style-type: none"> i. Pulse rate and strength ii. Strength of peripheral versus central pulses iii. Warmth and color of the hands and feet iv. Urinary output v. Mental status G. Priority determination—Any patient with signs and symptoms of early respiratory distress, decompensated respiratory failure, respiratory arrest, or poor perfusion should be considered a priority patient. 	
10	<p>VII. Assessment-Based Approach to Pediatric Emergencies— Secondary Assessment</p> <ul style="list-style-type: none"> A. Follow guidelines listed early in “Dealing with the Child” as well as “The Ten Tips for Examining Infants and Children”, adapting them to the patient’s age and condition. B. For medical emergency, gather the history first and then perform the physical exam (including baseline vital signs). C. For trauma emergency, perform the physical exam and gather baseline vital signs before obtaining the history. D. History <ul style="list-style-type: none"> 1. Use OPQRST if pain is identified. 2. Gather history from the patient if possible and confirm with caregivers; if development age of patient does not allow, question family or bystanders. 3. Ask if all shots and immunizations are up to date. E. Physical exam <ul style="list-style-type: none"> 1. Follow toe-to-head or trunk-to-head approach (unless child is older or unresponsive). 2. If medical problem and patient is responsive, perform focused medical assessment; if trauma is suspected or patient is unresponsive or unable to communicate, perform a complete rapid secondary assessment. 	<p>Knowledge Application Given a series of scenarios, students should be able to assess pediatric patients.</p>

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	<p>approximately two-thirds of the systolic pressure.</p> <ol style="list-style-type: none"> 10. Hypotension indicating shock would be a systolic blood pressure less than 60 mmHg in a newborn, less than 70 mmHg in an infant, less than $70 + (2 \times \text{age in years})$ in a 1- to 10-year old child, and less than 90 mmHg in a child older than ten years. 11. To estimate the upper limit of a normal systolic blood pressure for a child between one and ten years of age, take $90 + (2 \times \text{years in age})$. 12. Children three years of age and older will obey your commands to move fingers, squeeze fingers, wiggle toes, or push up against your hands; make neurological exam into a game. 13. If child is crying, assess quality of cry; inspect presence of tears; assess color, temperature, and condition of skin; auscultate breath sounds; and inspect the face for symmetry. 	
5	<p>IX. Assessment-Based Approach to Pediatric Emergencies—Special Considerations for Assessing the Vital Signs</p> <ol style="list-style-type: none"> A. Pay more attention to general impression than vital signs. B. Respirations—Obtain the respiratory rate at regular intervals, based on techniques and normal ranges discussed earlier. C. Pulse—Use the radial pulse in a child, brachial pulse or femoral pulse in an infant, and auscultation of the apical pulse; compare central or core pulses with peripheral pulses (and/or core and peripheral skin temperatures). D. Skin—Check skin color, relative temperature, condition, and capillary refill. E. Pupils—Check for size, equality, and reactivity of pupils; note extraocular movements of the eyes. F. Blood pressure—Do not take blood pressure of a child under three. For child over three, use correctly sized cuff. 	<p>Discussion Question Why are vital signs not as useful in the assessment of pediatric patients as they are in adults?</p>
5	<p>X. Assessment-Based Approach to Pediatric Emergencies—Special Considerations for Taking a History</p> <ol style="list-style-type: none"> A. History should be sought from the parent or primary caregiver until the child reaches four years of age. B. Children will usually seek out the parent or caregiver for reassurance. C. If no life threats are present, try to gain the child's trust by allowing the child to become more familiar with you. D. Use a reassuring and calm voice when speaking to the child; include the child in the conversation with the parent or caregiver. E. Get down to the eye level of the child. F. Avoid rapid-fire yes and no questions. 	<p>Discussion Question What are some considerations in successfully obtaining a history from a pediatric patient?</p>

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	<ul style="list-style-type: none"> G. Avoid certain words that may increase the anxiety of the child (e.g., <i>cut, take, bleeding</i>). H. Keep the child with the parent during the reassessment. I. Perform the secondary assessment from the feet to the head. J. Do not explain things too far in advance. K. Let the child handle equipment as appropriate (e.g., stethoscope, penlight). 	
5	<p>XI. Assessment-Based Approach to Pediatric Emergencies—Reassessment</p> <ul style="list-style-type: none"> A. Continuously monitor for changes in the patient’s mental status, airway, breathing, and circulation status. B. Assess and record the vital signs and check interventions. C. Repeat the assessment at least every three to five minutes. D. Communicate your findings and treatment to the receiving medical facility. 	
10	<p>XII. Airway and Respiratory Problems in Pediatric Patients—Early Respiratory Distress</p> <ul style="list-style-type: none"> A. Failure to properly assess, establish, and maintain the airway, ventilatory, or oxygenation status will defeat any other subsequent treatment. B. While cardiovascular disease is the leading medical cause of cardiac arrest in the adult, the leading medical cause of cardiac arrest in the infant or child patient is failure of the respiratory system. C. Maintain a high index of suspicion regarding the patency of the airway and adequacy of respiratory function. D. The patient in early respiratory distress is still in serious trouble. The patient can progress from early (compensated) respiratory distress to decompensated respiratory failure and respiratory arrest in minutes. E. Patient’s respiratory rate and tidal volume are still adequate to meet his requirements. F. Signs of early respiratory distress <ul style="list-style-type: none"> 1. Increase in respiratory rate above the normal rate for the child’s age 2. Nasal flaring 3. Intercostal retraction on inspiration 4. Supraclavicular and subcostal retractions on inspiration 5. Neck muscle use 6. Audible breathing noises such as stridor, wheezing, or grunting 7. See-saw respirations 8. Alert or easily arousable child demonstrating behavior that reflects some energy reserve 	<p>Teaching Tip Create three columns on the white board: <i>Respiratory Distress, Respiratory Failure, and Respiratory Arrest</i>. List and discuss the features of each.</p> <p>Animation Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access an animation on respiratory distress in children.</p>

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	G. Provide oxygen and prompt transport to the hospital.	
5	<p>XIII. Airway and Respiratory Problems in Pediatric Patients—Decompensated Respiratory Failure</p> <p>A. Infant or child is failing to compensate for the impaired respiratory condition and is unable to maintain adequate breathing.</p> <p>B. Infant or child may require suctioning, repositioning, high-flow, high-concentration oxygen, delivery of nebulized therapies, and even ventilation with a bag-valve-mask device or other ventilation device; transport emergently.</p> <p>C. Signs and symptoms of decompensated respiratory failure</p> <ol style="list-style-type: none"> 1. Signs of early respiratory distress 2. Respiratory rate over 60 per minute 3. Cyanosis 4. Decreased muscle tone 5. Severe use of accessory muscles to aid in respirations 6. Poor peripheral perfusion 7. Altered mental status 8. Grunting 9. Head bobbing 	
5	<p>XIV. Airway and Respiratory Problems in Pediatric Patients—Respiratory Arrest</p> <p>A. Occurs when the compensatory mechanisms designed to maintain oxygenation of the blood have failed</p> <p>B. Signs of respiratory arrest</p> <ol style="list-style-type: none"> 1. Respiratory rate less than ten per minute 2. Irregular or gasping respirations 3. Limp muscle tone 4. Unresponsiveness 5. Slower than normal or absent heart rate 6. Weak or absent peripheral pulses 7. Hypotension in patients over three years of age <p>C. Treat aggressively with oxygenation and positive pressure ventilation and transport immediately to the hospital.</p>	<p>Discussion Question What are indications of respiratory arrest in children?</p> <p>Knowledge Application Given a series of scenarios, students should be able to assess and manage respiratory distress, respiratory failure, and respiratory arrest in pediatric patients.</p>
	XV. Airway and Respiratory Problems in Pediatric Patients—Airway	

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5	<p>Obstruction</p> <p>A. Keep a high index of suspicion for an obstructed airway in infants and children.</p> <p>B. In general, presentation and treatment of goals of a choking infant or child mirror those of an adult.</p> <p>C. Partial airway obstruction</p> <ol style="list-style-type: none"> 1. Patient may still be alert, pink, and with peripheral perfusion. 2. Skin may be normal or slightly pale with peripheral perfusion present. 3. Stridor may be present. 4. Retractions of intercostal, supraclavicular, and subcostal tissues 5. Possible crowing or other noisy respirations 6. Patient may be crying. 7. Forceful cough may still be present. 8. Allow the patient to assume a position of comfort, enlist the help of caregivers to administer oxygen, encourage the patient to cough, limit your exam, and transport immediately. <p>D. Complete airway obstruction</p> <ol style="list-style-type: none"> 1. No crying or talking 2. Ineffective or absent cough 3. Altered mental status, including loss of responsiveness 4. Cyanosis 5. Base treatment on foreign body airway obstruction procedures. 	<p>Discussion Question</p> <p>Why are pediatric patients prone to airway obstruction?</p>
5	<p>XVI. Airway and Respiratory Problems in Pediatric Patients—Signs and Symptoms</p> <p>A. Signs and symptoms of respiratory emergency require your immediate intervention.</p> <p>B. Know emergency medical care for both respiratory emergencies and foreign body airway obstruction.</p>	
10	<p>XVII. Airway and Respiratory Problems in Pediatric Patients—Emergency Medical Care—Respiratory Emergencies</p> <p>A. Establish and maintain a patent airway (avoid occluding the airway during maneuvers).</p> <p>B. Suction any secretions, vomitus, or blood (not longer than three to five seconds).</p> <p>C. If you need to assist ventilations, maintain a patent airway with an oropharyngeal or nasopharyngeal airway.</p>	<p>Teaching Tip</p> <p>Ensure adequate opportunity for students to practice pediatric airway management with feedback from instructors.</p>

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	<p>D. Initiate positive pressure ventilation (20–25 per minute with the correct size BVM).</p> <p>E. Maintain oxygen therapy (blow-by method if necessary).</p> <ol style="list-style-type: none"> 1. Oxygen at 15 lpm via a nonrebreather mask—Infants and children who have early signs of respiratory distress but still have adequate respiratory effort. 2. Bag-valve-mask ventilations with supplemental oxygen 3. Infant or child with respiratory distress and altered mental status 4. Infant or child with cyanosis present despite oxygen via a nonrebreather mask 5. Infant or child who displays respiratory distress with poor muscle tone 6. Infant or child who is in respiratory failure or respiratory distress <p>F. Position the patient (depending on whether patient is alert or unresponsive).</p> <p>G. Transport (preferably a children’s hospital or hospital with specialized pediatric practitioners).</p>	
20	<p>XVIII. Airway and Respiratory Problems in Pediatric Patients— Emergency Medical Care—Foreign Body Airway Obstruction</p> <p>A. If you notice a high resistance to airflow after initiating positive pressure ventilation (with no indication of illness) and continue to notice resistance after attempting to reposition the airway, assume the infant or child has an airway obstructed by a foreign body.</p> <p>B. Infant or child with a mild foreign body airway obstruction</p> <ol style="list-style-type: none"> 1. Allow the infant or child to continue to cough in an attempt to remove the obstruction on his own. 2. Do not perform any intervention in mild foreign body airway obstruction. 3. Constantly and closely monitor the infant or child. 4. Provide blow-by oxygen to the infant or oxygen by nonrebreather mask to the child. 5. Infant with a severe foreign body airway obstruction 6. Position the patient prone on your forearm in a head-down position, supporting the infant’s head with your hand and supporting your arm on your thigh. 7. Deliver five sharp back slaps between the shoulder blades. 8. Transfer the patient to a supine, head down position on your forearm, and deliver five chest thrusts using two fingertips positioned one finger-width beneath the nipple line. 9. Continue to repeat the steps en route until the obstruction is dislodged, 	<p>Discussion Question Why should you avoid manual maneuvers in pediatric patients with partial foreign body airway obstruction?</p>

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	<p>the infant becomes unresponsive, or you arrive at the medical facility. Consider ALS backup.</p> <p>C. Unresponsive infant with a foreign body airway obstruction</p> <ol style="list-style-type: none">1. Open the airway using a head-tilt, chin-lift maneuver.2. Open the mouth and look for the foreign body. If you see the foreign body in the oropharynx, attempt to remove it.3. Provide two ventilations over a one-second period.4. Using the same landmarks and techniques as for CPR, provide 30 chest compressions at a rate of 100 per minute.5. After the chest compressions, look in the mouth for the obstruction. If it can be seen in the oropharynx, attempt to remove it.6. Provide two ventilations followed by another set of 30 compressions.7. Continue this sequence until the foreign body is removed. Transport the patient without delay and connect oxygen to bag-valve-mask device.8. If the foreign body cannot be visualized and/or removed, continue chest compressions and attempted ventilations. <p>D. Child with a severe foreign body airway obstruction</p> <ol style="list-style-type: none">1. Assure the patient that you are there to help.2. Position yourself behind the child, and reach your arms around his abdomen.3. Locate the navel and place the thumb side of one clenched fist midway between the navel and the xiphoid process.4. Wrap the other hand over the clenched hand.5. Deliver five abdominal thrusts inward and upward.6. Continue to deliver sequential series of five abdominal thrusts until the object is dislodged, you arrive at the medical facility, or the patient becomes unresponsive. <p>E. Unresponsive child with a foreign body airway obstruction</p> <ol style="list-style-type: none">1. Open the airway, using a head-tilt, chin-lift maneuver.2. Open the mouth and look for a foreign body. If you see the foreign body in the oropharynx, attempt to remove it.3. Provide two ventilations over a one-second period.4. Using the same landmarks and techniques as for CPR, provide 30 chest compressions at a rate of 100 per minute.5. After the chest compressions, look in the mouth for the obstruction. If you can see it in the oropharynx, attempt to remove it.6. Provide two ventilations followed by another set of 30 compressions.7. Continue this sequence until the foreign body is removed.	

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	<ul style="list-style-type: none"> 8. Transport the patient without delay, and be sure to connect oxygen to the bag-valve-mask device. 9. If the foreign body cannot be visualized and/or removed, continue chest compressions and attempted ventilations. 	
5	<p>XIX. Specific Pediatric Respiratory and Cardiopulmonary Conditions— Croup</p> <ul style="list-style-type: none"> A. Common infection of the upper airway with slow onset of symptoms B. Common in children between six months and four years of age C. Infection causes swelling beneath the glottis and progressively narrows the airway. D. Child may be hoarse, cough with a harsh “seal bark,” and produce stridor with inhalation; may also show classic signs of respiratory distress. E. Emergency medical care <ul style="list-style-type: none"> 1. Apply humidified oxygen by a nonrebreather mask. 2. Keep the patient in a position of comfort, either propped up or in a caregiver’s arms. 3. Transport the patient to the hospital with as little disturbance as possible. 4. Be aware that cool night air may reduce the swelling in the airway, bringing relief. 	<p>Discussion Question What is croup? How does it cause airway obstruction?</p>
5	<p>XX. Specific Pediatric Respiratory and Cardiopulmonary Conditions— Epiglottitis</p> <ul style="list-style-type: none"> A. Caused by a bacterial infection that inflames and causes swelling of the epiglottis B. Can be life threatening if left untreated C. Usually rapid onset and is accompanied by temperature D. Signs and symptoms <ul style="list-style-type: none"> 1. Pain on swallowing 2. High fever and a “toxic” ill-appearing child 3. Drooling 4. Mouth breathing 5. Changes in voice quality and pain upon speaking 6. Patient’s insistence upon sitting up and leaning forward 7. Patient’s chin and neck thrust outward 8. Inspiratory stridor 9. Respiratory distress 10. Strikingly ill appearance E. Emergency medical care 	<p>Discussion Question How should you manage the patient with epiglottitis?</p> <p>Critical Thinking Discussion What is the role of childhood immunizations in preventing respiratory illnesses?</p>

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	<ol style="list-style-type: none"> 1. Do not place anything in the child’s mouth since this can increase swelling (not even suctioning equipment or fingers). 2. Allow the child to assume a position of comfort. 3. Provide oxygen at 15 lpm via a nonrebreather mask (or blow-by). 4. Provide bag-valve-mask ventilations with supplemental oxygen if airway is completely obstructed. 5. Consider ALS backup if it does not delay transport. 	
5	<p>XXI. Specific Pediatric Respiratory and Cardiopulmonary Conditions— Asthma</p> <p>A. Long-term inflammatory process that targets the lower airways (increased mucous production and acute narrowing of the airways)</p> <p>B. Common symptoms include shortness of breath, chest tightness, wheezing, and nonproductive “tight” coughing.</p> <p>C. Get the patient’s history from the caregivers by asking the following questions.</p> <ol style="list-style-type: none"> 1. How long has the child been wheezing? 2. How much fluid has he taken during this period? 3. Has he had a recent cold or other infection? 4. Has he had any medication for this attack? 5. Does he have any known allergies to drugs, foods, pollens, or other inhalants? 6. Has he ever been hospitalize for an acute asthmatic attack? <p>D. Secondary assessment</p> <ol style="list-style-type: none"> 1. Position—Child may be sitting in tripod position, exhausted and unable to move. Children under the age of 2 may show no agitation. 2. Mental status—Sleepiness and changes in metal status are progressively more serious signs of hypoxia, acidosis, and retention of carbon dioxide. 3. Vital signs—Pulse grows faster and weaker, blood pressure may fall, and patient may have bradycardia (ominous sign). 4. Skin color and condition—Check for dehydration and cyanosis. 5. Respirations—Auscultate the entire chest since localized wheezes suggest a foreign body obstruction whereas asthma causes generalized wheezes. <p>E. Emergency medical care</p> <ol style="list-style-type: none"> 1. Try to be as calm and reassuring as possible. 2. Apply humidified oxygen at 15 lpm by nonrebreather mask. Assist 	<p>Discussion Question What is the significance of asthma in the pediatric population?</p>

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	<ul style="list-style-type: none"> ventilations if breathing is not adequate. 3. Allow the child to assume a position of comfort. 4. If the child has a prescribed inhaler, follow the same emergency care procedures for administration of the medication via MDI as for adult. Be sure to consult medical direction. 5. Usually, you will need to transport the patient for further care. 	
5	<p>XXII. Specific Pediatric Respiratory and Cardiopulmonary Conditions—Bronchiolitis</p> <ul style="list-style-type: none"> A. Caused when the mucosal layer within the bronchioles in the lungs becomes inflamed by a viral infection B. Typically occurs in children less than two years of age C. Best known virus is RSV D. Symptoms include low-grade fever, tachycardia or tachypnea, shortness of breath, chest tightness, wheezing, and coughing. E. Emergency medical care <ul style="list-style-type: none"> 1. Apply humidified oxygen at 15 lpm by nonrebreather mask, and assist breathing as necessary. 2. Let the child assume a position of comfort or place him in a Fowler’s position with his neck slightly extended if this position is more comfortable. 3. Monitor the pulse rate and mental status while you transport the child to the hospital. 	<p>Discussion Question How would you recognize a child with bronchiolitis?</p>
5	<p>XXIII. Specific Pediatric Respiratory and Cardiopulmonary Conditions—Pneumonia</p> <ul style="list-style-type: none"> A. Viral pneumonia results from spread of infection along the airways resulting in airway obstruction. B. Bacterial infection causes cellular destruction and an inflammatory response in the airways, often leading to airway obstruction or even respiratory compromise. C. Common symptoms include shortness of breath, chest tightness, diminished breath sounds, and dry, hacking, productive-sounding cough. D. History <ul style="list-style-type: none"> 1. How long has the child been ill? 2. How much fluid has he taken during this period? 3. Has he had a recent cold or other infection, particularly one involving the respiratory tract? 4. Has he had any treatment for this current illness? 	

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	<ul style="list-style-type: none"> 5. Has he had a fever? E. Physical exam <ul style="list-style-type: none"> 1. Position—Child may lie on his side with his knees drawn up to his chest or put himself in tripod position. Child under the age of two often shows no agitation and may even lie on his back. 2. Mental status—Drowsiness and intermittent periods of restlessness are commonly associated with pneumonia. 3. Vital signs—Pulse grows faster and weaker, blood pressure may fall, and bradycardia may be present (ominous sign). 4. Skin color and condition—Pinch the skin to look for evidence of dehydration, and check for cyanosis. 5. Respirations—Mild to moderate exacerbation is characterized by diminished breath sounds and possibly wheezes and crackles. F. Emergency medical care <ul style="list-style-type: none"> 1. Apply humidified oxygen at 15 lpm by nonrebreather mask. Assist ventilations if breathing is not adequate. 2. Allow the child to assume a position of comfort. 3. Transport the patient for further care. 	
5	<p>XXIV. Specific Pediatric Respiratory and Cardiopulmonary Conditions—Congenital Heart Disease (CHD)</p> <ul style="list-style-type: none"> A. Responsible for more deaths in the first year of life than any other birth defects B. Symptoms <ul style="list-style-type: none"> 1. Inadequate pulmonary blood flow resulting in cyanosis and hypoxia 2. Excessive pulmonary blood flow resulting in congestive heart failure, hypoperfusion, and systemic shock 3. Respiratory distress with or without cyanosis or shock C. Diagnosing the defect is less important than recognizing the abnormality, initiating emergency care, and transporting rapidly. D. Emergency medical care <ul style="list-style-type: none"> 1. Ensure an open airway and provide oxygen at 15 lpm by nonrebreather mask. 2. Provide positive pressure ventilation via bag-valve-mask with supplemental oxygen connected to the ventilation device if breathing is inadequate. 3. Support the cardiovascular system as necessary, and consider ALS support. 	

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5	<p>XXV. Specific Pediatric Respiratory and Cardiopulmonary Conditions—Shock</p> <ul style="list-style-type: none"> A. Shock and cardiac arrest are rarely due to cardiac compromise alone but are usually the result of a sequential cardiorespiratory failure that begins with failure of another bodily organ system. B. Newborns have been known to go into shock from loss of body heat. C. Shock can be caused by medical problems, allergic reactions, poisoning, or cardiac events. D. Signs of shock <ul style="list-style-type: none"> 1. Rapid respiratory rate 2. Pale, cool, clammy skin 3. Mottling 4. Decreased mental status 5. Prolonged capillary refill 6. Weak or absent peripheral pulses E. Emergency medical care—Onset may be sudden; treat to correct any abnormalities that may compound the hypoperfusion state. <ul style="list-style-type: none"> 1. Ensure an open airway and provide oxygen at 15 lpm by nonrebreather mask. Call for ALS intercept if available. 2. Provide positive pressure ventilation via bag-valve mask with supplemental oxygen connected to the ventilation device. 3. Control any bleeding. 4. Place the patient in a supine position. 5. Keep the patient warm and as calm as possible. 6. Transport to the ED quickly. 	
5	<p>XXVI. Specific Pediatric Respiratory and Cardiopulmonary Conditions—Cardiac Arrest</p> <ul style="list-style-type: none"> A. Almost all cardiac arrests in children result from airway obstruction, respiratory distress leading to respiratory arrest, or shock. B. Signs of cardiac arrest C. Unresponsiveness D. Gasping or no respiratory sounds E. No audible heart sounds F. Chest is not moving. G. Pallor or cyanosis H. Absent pulse I. Emergency medical care 	<p>Class Activity Randomly hand out index cards prepared ahead of time (see the description in the Advance Preparation chart) to students. Students will explain the signs, symptoms, and management of the condition listed.</p>

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	<ol style="list-style-type: none"> 1. Provide positive pressure ventilation with supplemental oxygen. 2. Perform CPR effectively with minimal interruption. 3. Apply AED to child one year of age or older (AED may be applied to child less than a year). 4. If available, use dose-attenuating system and pediatric pads and cables for children under eight years of age. Employ only a single shock followed by CPR. 5. Call for ALS backup. 6. Transport rapidly. 	
5	<p>XXVII. Specific Pediatric Respiratory and Cardiopulmonary Conditions—Summary: Respiratory and Cardiopulmonary Emergencies</p> <ol style="list-style-type: none"> 1. Review possible assessment findings and emergency care for respiratory or cardiopulmonary emergencies in the infant or child. 2. Review figures 38-28 or 38-29. 	<p>Knowledge Application Given a series of scenarios, students should be able to assess pediatric patients with respiratory and cardiopulmonary problems.</p>
5	<p>XXVIII. Other Pediatric Medical Conditions and Emergencies—Seizures</p> <p>A. May be caused by any condition that would also produce seizures in an adult (e.g., head injury, drug overdose, low blood sugar)</p> <p>B. Children often have febrile seizures (risk is high up to age two).</p> <p>C. Assessment considerations</p> <ol style="list-style-type: none"> 1. “Generalized tonic-clonic” seizure may cause rigid arms and legs, arching back, jerking muscles, loss of bladder or bowel control, and so on. 2. EMS provider may have difficulty differentiating a syncopal episode from a seizure (seizure will not alter or cease in response to interventions). 3. Obtaining a good history during such a high stress situation may be difficult; however, try to determine duration of loss of consciousness and whether child has history of seizures. <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Ensure the airway is open. 2. Position the patient on his side (if no possibility of spine trauma). 3. Be prepared to suction. 4. Provide oxygen or ventilate as appropriate. 5. Transport. 6. Seizures lasting longer than five minutes or recur without a recovery period (status epilepticus) is a true medical emergency. 	<p>Discussion Question What are some causes of seizures in children?</p> <p>Class Activity Assign students a topic from this section for further research. Have students bring their research findings to the next class for discussion.</p>

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5	<p>XXIX. Other Pediatric Medical Conditions and Emergencies—Altered Mental Status</p> <p>A. Important to assess and treat any life threat to the airway, breathing, oxygenation, or circulation associated with the altered mental status.</p> <p>B. Assess blood glucose if protocol permits.</p> <p>C. Assessment considerations</p> <ol style="list-style-type: none"> 1. Use Pediatric Glasgow Coma Scale (PGCS). 2. Ask the child simple questions, and ask caregivers if response is typical or unusual. 3. Shout or inflict a pinch to assess the unresponsive infant or child. <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Ensure patency of the airway. 2. Be prepared to suction the airway. 3. Administer oxygen at 15 lpm or positive pressure ventilation with supplemental oxygen. 4. Expedite transport. 	
5	<p>XXX. Other Pediatric Medical Conditions and Emergencies—Drowning</p> <p>A. Main cause of death is not aspiration of the fluid but rather hypoxia that occurs secondary to glottic closure reflex “dry drowning.”</p> <p>B. Assessment considerations</p> <ol style="list-style-type: none"> 1. Be aware of trauma and/or hypothermia. 2. Be alert for secondary drowning syndrome. <p>C. Emergency medical care</p> <ol style="list-style-type: none"> 1. Be aware that mammalian dive reflex may slow blood perfusion and metabolism 2. Remove the patient from the water. 3. Assume that a spine injury has occurred and provide full immobilization. 4. Clear the airway and provide positive pressure ventilation via a bag-valve-mask with supplemental oxygen. 5. Check circulation. Provide CPR as needed. Attach the AED. 6. Maintain the treatment en route, and monitor the airway closely for regurgitation and aspiration. Have suction readily available. 	
5	<p>XXXI. Other Pediatric Medical Conditions and Emergencies—Fever</p> <p>A. Fevers of 104 to 105 degrees Fahrenheit are concerning.</p> <p>B. Assessment considerations</p> <ol style="list-style-type: none"> 1. Be concerned with how quickly the temperature rises (may cause febrile seizure). 	<p>Discussion Question What should the EMT do for the child with a fever?</p>

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	<ol style="list-style-type: none"> 2. Assess for dehydration. <p>C. Emergency medical care</p> <ol style="list-style-type: none"> 1. Lower body temperature based on local protocol. 2. Administer oxygen at 15 lpm via a nonrebreather mask. 3. Remove excess layers of clothing. 4. If cooling is done, perform it in a slow, controlled manner unless the child has a temperature over 106.9 degrees Fahrenheit. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on infant dehydration.</p>
5	<p>XXXII. Other Pediatric Medical Conditions and Emergencies—Meningitis</p> <p>A. Lining of the brain and spinal cord are infected by either bacteria or viruses.</p> <p>B. Fever in a child younger than three months should be considered meningitis until proven otherwise.</p> <p>C. Assessment considerations</p> <ol style="list-style-type: none"> 1. Signs and symptoms include recent ear or respiratory tract infection, high fever, lethargy, irritability, or vomiting. 2. Fontanelle may be bulging. 3. Movement may be painful. 4. Rash may be present. <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Wear mask, gloves, and possible a gown. 2. Complete the assessment rapidly and transport to the hospital. 3. If child is in shock, provide oxygen at 15 lpm by nonrebreather mask. 	<p>Discussion Question What are signs and symptoms of meningitis?</p> <p>Critical Thinking Discussion Why are pediatric patients susceptible to a variety of infectious illnesses?</p>
5	<p>XXXIII. Other Pediatric Medical Conditions and Emergencies—Gastrointestinal Disorders</p> <p>A. Cause diarrhea</p> <p>B. Leading cause of dehydration in young children</p> <p>C. Appendicitis is the inflammation of the vermiform appendix.</p> <p>D. Assessment considerations</p> <ol style="list-style-type: none"> 1. Appendicitis may present with diffuse, crampy pain around the umbilicus, nausea and vomiting, and sometimes a low-grade fever. 2. Once the appendix ruptures, the patient can become quite critically ill. <p>E. Emergency medical care</p> <ol style="list-style-type: none"> 1. When appendicitis is suspected, provide oxygen and place the patient in a position of comfort. 2. If patient is vomiting, place him on his side. 3. Transport without delay. 	<p>Discussion Question What are the concerns for a child with a gastrointestinal disorder?</p>
	<p>XXXIV. Other Pediatric Medical Conditions and Emergencies—</p>	

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Minutes	Content Outline	Master Teaching Notes
5	<p>Poisoning</p> <p>A. Assessment considerations</p> <ol style="list-style-type: none"> 1. Thorough secondary assessment is critical. 2. Gather as much information as possible about the type of overdose prior to transporting the patient to the hospital. <p>B. Emergency medical care</p> <ol style="list-style-type: none"> 1. Geared toward the effects of the poisoning on the patient 2. If patient is alert <ol style="list-style-type: none"> a. Contact medical direction or the local poison control center (follow local protocol and/or medical direction). b. Provide positive pressure ventilation by bag-valve mask if respiratory rate or tidal volume is inadequate. Administer oxygen if breathing is adequate. c. Transport any patient who was poisoned and monitor for any changes. 3. If patient is initially unresponsive or becomes unresponsive <ol style="list-style-type: none"> a. Establish and maintain an open airway. b. Provide oxygen at 15 lpm by nonrebreather mask if breathing is adequate, or positive pressure ventilation with supplemental oxygen if breathing is inadequate. c. Expedite transport. d. Perform a rapid secondary assessment to identify or rule out trauma as a cause of altered mental status. (Check blood glucose level if protocol permits.) 	
5	<p>XXXV. Other Pediatric Medical Conditions and Emergencies—Apparent Life-Threatening Events (ALTE)</p> <p>A. Defined as an “episode that is frightening to the observer and that is characterized by some combination of apnea, color change, marked change in muscle tone, choking, or gagging.”</p> <p>B. Assessment considerations—Symptoms</p> <ol style="list-style-type: none"> 1. Apnea 2. Skin color change 3. Changes in muscle tone 4. Unexplained choking or gagging <p>C. Emergency medical care—If infant is exhibiting any of the transient signs, immediately transport to a medical facility for further evaluation.</p>	<p>Discussion Question What are the characteristics of an ALTE?</p> <p>Knowledge Application Given a series of scenarios, students should be able to assess and manage pediatric medical emergencies.</p>
	XXXVI. Other Pediatric Medical Conditions and Emergencies—Sudden	

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Minutes	Content Outline	Master Teaching Notes
20	<p>Infant Death Syndrome</p> <p>A. Sudden and unexpected death of an infant in which an autopsy fails to identify the cause of death (peak incidence at two to four months)</p> <p>B. Etiology of SIDS remains unknown; almost always occurs while the baby is sleeping.</p> <p>C. Risk factors include sleeping in a prone position, sleeping on a soft surface, and secondhand smoke.</p> <p>D. Assessment considerations</p> <ol style="list-style-type: none"> 1. SIDS cannot be diagnosed in the field. 2. Obtain a brief history of the infant and observe the following. 3. Physical appearance of the infant 4. Position of the infant in the crib 5. Physical appearance of the crib 6. Presence of objects in the crib 7. Unusual or dangerous items in the room 8. Appearance of the room/house 9. Presence of medication 10. Circumstances concerning discovery of the unresponsive child 11. Time the infant was put to bed or fell asleep 12. Problems at birth 13. General health 14. Any recent illnesses 15. Date and result of last physical exam <p>E. Be careful not to convey by the wording of your questions or manner any suspicion that the parents or caretakers may be responsible for the child's condition.</p> <p>F. Emergency medical care</p> <ol style="list-style-type: none"> 1. Immediately try to resuscitate (aggressive resuscitation unless rigor mortis or dependent lividity). 2. Encourage the caregivers to talk and tell their story. 3. Do not provide false reassurances. 4. Transport the infant to the hospital. 5. Deliver the infant into the hands of the emergency department staff. <p>G. Aiding families in SIDS emergencies</p> <ol style="list-style-type: none"> 1. Caregiver reaction may vary from shock and disbelief to hysteria. 2. Offer to be of assistance to them (e.g., make a phone call or get coffee). 3. Don't neglect your own emotional turmoil. <p>H. Presence of parents during pediatric resuscitation</p>	<p>Teaching Tip Consider a guest speaker on SIDS.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video clip on SIDS.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • How should the EMT interact with the parents of an apparent SIDS infant? • What observations of the scene should you document in an infant death?

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	<ol style="list-style-type: none"> 1. Presence of parents during resuscitation is beneficial to both children and parents. 2. Studies found minimal negative effects on the success rates of clinicians who performed the interventions. 	
15	<p>XXXVII. Pediatric Trauma—Trauma and the Pediatric Anatomy</p> <ol style="list-style-type: none"> A. Trauma is the leading cause of death in children from ages one to 14 (car collision). B. Blunt trauma is the most common injury in children. C. Unrestrained children in cars will probably suffer head and neck injuries. Child passengers in the front seat may suffer face, neck, or chest injuries from the air bag. D. A restrained passenger will probably suffer abdominal and/or lumbar injuries from the stress applied by the seat belt during the accident. E. If the child was struck while riding a bike, he is likely to sustain head injuries, spine injuries, and abdominal injuries. F. If the young patient was struck by a car while walking, suspect all three elements of Waddell Triad: head injuries, chest/abdominal injuries, and lower extremity injuries. G. If patient was diving into water or fell from a height, suspect head and spine injuries. H. If the mechanism of injury involves burns, be aware that the burns may be more severe to the infant or child; inhalation of smoke, toxic fumes, or superheated air may also be more damaging than to an adult. I. Sports injuries typically involve injuries to the head and neck. J. Child abuse is another cause of trauma. K. Assessment considerations <ol style="list-style-type: none"> 1. Head <ol style="list-style-type: none"> a. Head injuries are common because of the relatively larger size of the child's head compared to the body. b. Common findings of head injury <ol style="list-style-type: none"> i. Nausea and vomiting; altered mental status ii. Respiratory arrest iii. Facial and scalp injuries iv. Be aware that shock is not typically one of the signs of a closed head injury 2. Chest—Young patient is more likely to sustain internal damage because the ribs do not protect the structures very well. 	<p>Discussion Question What are the most common causes of injury in children?</p> <p>Critical Thinking Discussion Why, despite the programs that have been implemented, does pediatric trauma continue at such an alarming rate?</p> <p>Discussion Question What anatomical differences affect injury patterns in children?</p>

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	<ul style="list-style-type: none"> 3. Abdomen—Abdominal muscles do not offer as much protection from blunt trauma; consider trauma to the abdomen a serious injury. 4. Extremities—Presentation of injuries to the extremities is same as for adult; use appropriately sized immobilization equipment. 5. Burns—Infants and children under the age of five suffer more severe consequences from burns than do older children and adults. L. Emergency medical care—pediatric trauma <ul style="list-style-type: none"> 1. Establish and maintain in-line spine stabilization and the airway, using a jaw thrust. 2. Suction as necessary. 3. Provide oxygen at 15 lpm by nonrebreather mask if ventilations are adequate, or initiate positive pressure ventilation with supplemental oxygen if breathing is inadequate. 4. Provide complete spine immobilization. 5. Transport (to hospital or trauma center). 	<p>Discussion Question What are the priorities of assessment and management of the pediatric trauma patient?</p> <p>Knowledge Application Given a series of scenarios, students should be able to assess and manage pediatric trauma patients.</p>
10	<p>XXXVIII. Pediatric Trauma—Infant and Child Car Seats in Trauma</p> <ul style="list-style-type: none"> A. Survey by the National Safekids Campaign found that more than half of all children are either buckled incorrectly into child safety seat or don't use restraints at all. B. Removing the infant or child from the car seat <ul style="list-style-type: none"> 1. Establish cervical spine stabilization manually while your partner cuts the restraining straps and lifts the front guard of the car seat. 2. Apply a cervical spine immobilization collar (appropriately sized) or similar device. 3. Position the entire car seat in the center of the backboard to which the patient will ultimately be secured. With a coordinated effort, tilt the care seat backward until resting on the backboard. 4. The EMT at the head calls for a coordinated movement of the patient, following the long axis of the body, sliding the patient out head first onto the backboard, maintaining in-line stabilization, and supporting the head, neck, and trunk. 5. If necessary, place a small, folded towel beneath the shoulders of the patient to prevent flexion of the head and neck. 6. While you maintain manual in-line spine stabilization, have your partner place rolled-up towels on both sides of the patient to help pad spaces prior to securing the patient with straps. 7. Secure the patient to the board using straps or wide tape. Position the 	<p>Teaching Tip Consider a demonstration by a certified child car seat technician.</p>

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	<p style="text-align: center;">securing straps across the chest, hips, and legs.</p> <p>8. Finish the immobilization by placing a cervical immobilization device (CID) or other such device on each side of the patient’s head. Secure the head to the backboard using tape across the forehead and cervical collar.</p> <p>C. Have caregiver close enough to provide emotional support to the child.</p>	
10	<p>XXXIX. Pediatric Trauma—Four-Point Immobilization of an Infant or Child</p> <p>A. Adult equipment can be modified to immobilize the child properly.</p> <p>B. One way to accommodate children and infants is to use a four-point safety harness.</p>	
10	<p>XL. Pediatric Trauma—Injury Prevention</p> <p>A. Unlike an accident, a childhood injury is understandable, predictable, and preventable.</p> <p>B. Injury prevention must be of paramount concern to EMS providers.</p> <p>C. Common injury prevention strategies include child safety seat education and inspections, fire safety programs, and community CPR training, among others.</p> <p>D. Identify and engage in injury prevention programs within your local jurisdiction.</p>	<p>Discussion Question What is the role of EMS in pediatric trauma prevention?</p> <p>Class Activity Have students use the website below and others to develop a child injury prevention program plan. http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem9f8c7d6359e0e9bbb30811060008a0c/.</p>
20	<p>XLI. Child Abuse and Neglect—Emergency Medical Care Guidelines for Child Abuse</p> <p>A. Abuse has been the only major cause of infant and child death to increase in the last 30 years.</p> <p>B. Physical abuse takes place when improper or excessive action is taken so as to injure or cause harm.</p> <p>C. Neglect is the provision of inadequate attention or respect to someone who has a claim to that attention.</p> <p>D. Caregiver or adult who abuses a child is often evasive, volunteers little information, gives contradictory information, or show outright hostility.</p> <p>E. General indicators of abuse and/or neglect</p> <ol style="list-style-type: none"> 1. Multiple abrasions, lacerations, incisions, bruises, broken bones 2. Multiple injuries or bruises in various stages of healing 3. Injuries on both the front and back or on both sides of the child’s body 	<p>Critical Thinking Discussion Why do you think the incidence of child abuse and child abuse deaths is increasing?</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on child maltreatment and shaken baby syndrome.</p>

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	<ol style="list-style-type: none"> 4. Unusual wounds 5. Fearful child 6. Injuries to the genitals 7. Injuries to the brain or spinal cord from violent shaking 8. Situations in which the injuries do not match the mechanism of injury described by the caregivers 9. Lack of adult supervision 10. Untreated chronic illnesses 11. Malnourishment and unsafe living environment 12. Delay in reporting injuries 13. Implausible explanations 14. Suspicious bruises (buttocks, genitalia, thighs, ears, side of face, trunk, upper arms) <p>F. Emergency medical care guidelines for child abuse</p> <ol style="list-style-type: none"> 1. Gaining entry—Request law enforcement if necessary. 2. Dealing with the child—Speak softly, call the child by his first name, and do not ask the child to tell you what happened while he is still in the crisis environment. 3. Examining the child—If you have reason to suspect abuse, perform a head-to-toe (or toe-to-head) rapid trauma assessment. 4. Dealing with the caregivers—Tell the caregivers that the child should be taken to the hospital, and ask caregivers to describe how the injury occurred in a separate room from the child; do not question caregivers about abuse. 5. Transporting the child—Do not allow the child to be left alone with the suspected abuser. 6. Providing documentation—Privately convey your suspicions to the receiving physician, and know state and federal reporting laws for child abuse; document everything objectively. 7. Talk about your feelings with someone you can trust (but do not divulge particulars of the case). 	<p>Discussion Question What are some indications of abuse or neglect?</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • How should you interact with a child you believe has been abused or neglected? • What is the EMT's role in situations of suspected abuse or neglect? <p>Teaching Tip Bring examples of any forms that EMTs must fill out if they suspect abuse or neglect.</p> <p>Knowledge Application Students should be able to apply the information in this section to scenarios of suspected abuse or neglect.</p>
5	<p>XLII. Special Care Considerations—Emergency Medical Services for Children (EMSC)</p> <p>A. Program designed to ensure that all children and adolescents, no matter where they live, attend school, or travel, have access to and receive appropriate care in a health emergency.</p>	<p>Discussion Question What is the purpose of EMS for Children?</p>

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	<p>B. Administered by Maternal and Child Health Bureau of the United States Department of Health and Human Services Health Resources and Services Administration and the National Highway Traffic Safety Administration.</p>	<p>Teaching Tip Discuss any local or state EMS for Children–funded projects.</p>
<p style="text-align: center;">5</p>	<p>XLIII. Special Care Considerations—Family-Centered Care</p> <p>A. Suggests that health care providers acknowledge and make use of the family’s knowledge of the family member’s condition and make use of the family’s abilities to communicate with the family member</p> <p>B. Major principle is the need for a comprehensive understanding of normal growth and development, enabling the EMS provider to better anticipate the physiologic and emotional needs of the child who is affected by illness or injury.</p> <p>C. Advocates open communication with family members throughout the assessment and management of the child</p>	<p>Discussion Question What is the idea behind family-centered care?</p> <p>Critical Thinking Discussion What can you do to ensure that sick and injured children receive the best care possible?</p>
<p style="text-align: center;">5</p>	<p>XLIV. Special Care Considerations—Taking Care of Yourself</p> <p>A. Taking care of a critically ill or injured child is one of the most challenging facets of an EMS career.</p> <p>B. EMTs who treat infants or children commonly experience stress and anxiety from the following.</p> <ol style="list-style-type: none"> 1. Lack of experience in treating children 2. Fear of failure 3. Identifying patients with their own children <p>C. Practices to help alleviate stress</p> <ol style="list-style-type: none"> 1. Understand that much of what you learned about adults does apply to children. 2. Learn skills and practice using equipment with and examining children. 3. Focus on the task at hand while treating infants and children. 4. Control your emotions during the incident; however, deal with those feelings after the incident is over. 	<p>Discussion Question What are some common reactions to caring for ill and injured children?</p> <p>Knowledge Application Students should be able to apply the information in this section to the care of ill and injured children.</p>
<p style="text-align: center;">10</p>	<p>XLV. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • Is there any way Jason’s obstructed airway could have been prevented? • What types of objects pose choking hazards to small children?

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	<p>chapter material. Follow up with questions to determine why students would or would not change their answers.</p> <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 38 Summary. 2. Complete Chapter 38 In Review questions. 3. Complete Chapter 38 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 38 quiz 	<p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 39

Geriatrics

215–230 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about physiological changes, special assessment concerns, and emergency care considerations for geriatric patients.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What can you do to ensure good communication with Mrs. Vaughn? • What are common causes of breathing difficulties in the elderly?
10	<p>II. Effects of Aging on Body Systems—The Cardiovascular System</p> <p>A. People are living longer with chronic illnesses (constituting a larger percentage of an EMT's patient volume).</p> <p>B. The aging body has fewer reserves with which to combat diseases and decreased efficiency of compensatory mechanisms, leading to the incidence of acute medical and traumatic emergencies.</p> <p>C. With age, calcium is progressively deposited in areas of deterioration, especially around the valves of the heart.</p> <ol style="list-style-type: none"> 1. Stenosis (narrowing) of the valve opening 2. Regurgitation (backward flow of blood) <p>D. Walls of the heart become generally thickened without any increase in the size of the atrial or ventricular chambers (cardiac hypertrophy).</p> <ol style="list-style-type: none"> 1. Decreases stroke volume of the heart 2. Decreases the efficiency of the body's compensatory mechanisms in the face of stress that may be brought about by illness or injury <p>E. Older patients generally have higher resting heart rates than younger people; however, older hearts have less ability to raise their rate to meet an increased demand from physical activity, stress, or illness.</p> <p>F. Dysrhythmias, irregular contractions of the myocardium secondary to electrical disturbances in the heart, also deteriorate cardiac output in the geriatric patient.</p>	<p>Teaching Tip Generate discussion by asking students what they think of when they think of the elderly.</p> <p>Class Activity Have students write a paragraph describing how they envision themselves and their lives when they are 70 years old. Students can read the thoughts aloud to the class to generate discussion.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the effects of aging on the heart valves? How do these changes affect cardiac output? • What are the effects of arteriosclerosis? <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • How would you expect the aging

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	<p>G. Arteries lose their elasticity, creating greater resistance against which the heart must pump to maintain adequate blood flow.</p> <p>H. Arteriosclerosis tends to occur with age, further increasing pressure the heart must pump against.</p> <p>I. A drop in baroreceptor sensitivity often leads to orthostatic hypotension, a drop in systolic pressure and elevation in the heart rate when the patient goes from a lying to a standing position.</p>	<p>process to affect an elderly patient's response to blood loss?</p> <ul style="list-style-type: none"> • How might it change the signs and symptoms associated with shock? <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on aging hearts and arteries and hypertension.</p>
5	<p>III. Effects of Aging on Body Systems—The Respiratory System</p> <p>A. Muscles used for respiration decrease in size and strength.</p> <p>B. Rib cage becomes less pliable.</p> <p>C. Decline in diffusion of oxygen and carbon dioxide across the alveolar membrane as alveolar surfaces decrease</p> <p>D. Chemoreceptors in the aortic arch become less sensitive (failing to detect hypoxia or hypercapnea).</p> <p>E. Decrease in the number and strength of smooth muscle fibers that support smaller airways, diminishing airflow to the terminal alveoli during inspiration and possibly trapping exhalation</p> <p>F. Airflow velocity diminishes after 30.</p> <p>G. The ability of the lungs to inhibit or resist disease and infection is also diminished with age.</p>	<p>Discussion Question How does aging affect the respiratory system?</p>
10	<p>IV. Effects of Aging on Body Systems—The Neurological System</p> <p>A. Decrease in the mass and weight of the brain, increasing the amount of cerebral spinal fluid that occupies extra space in the skull</p> <p>B. Overall ability of the brain to operate becomes impaired by plaques and tangles.</p> <p>C. Nerve cells degenerate, causing slowing of reflexes and difficulty sensing body position.</p> <p>D. Ability to perceive hunger and thirst is altered.</p> <p>E. Ability of the brain to regulate vital functions may not operate with efficiency during stressful times.</p> <p>F. Sensory perception (sight, hearing, touch, smell, pain) tends to diminish.</p> <ol style="list-style-type: none"> 1. Diseases affecting sight <ol style="list-style-type: none"> a. Cataracts 	<p>Discussion Question How does aging affect the nervous system? What are the consequences of these changes?</p>

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	<ul style="list-style-type: none"> b. Glaucoma c. Macular degeneration d. Retinal detachment 2. Presbycusis (age-related hearing loss) is most marked at higher frequencies; remember that elderly patients may have/be wearing a hearing aid. G. Neuropathy is any derangement or abnormal function of the motor, sensory, and autonomic nerve tracts (pain, numbness, tingling, swelling, absent pain perception) and may further complicate presentation of findings characteristic to a particular problem. 	<p>Teaching Tip Alter several pairs of cheap glasses to mimic age-related vision changes. Assign students to perform various tasks, such as reading aloud from the textbook.</p>
5	<p>V. Effects of Aging on Body Systems—The Gastrointestinal System</p> <ul style="list-style-type: none"> A. Reduction in food enjoyment due to sensory loss (taste, smell) B. Deterioration of structures in the mouth and drop in salivary flow C. Chronic heartburn from muscle tone loss in the stomach and esophagus D. Decrease in liver's in size, weight, and function E. Food takes longer to move through the system due to slowing smooth muscle contractions in the gastrointestinal tract. F. Nutrients are not as readily absorbed (small intestine), and fecal impaction and constipation are common (large intestine). G. Degeneration of the sphincter muscle can cause loss of bowel control. 	
5	<p>VI. Effects of Aging on Body Systems—The Endocrine System</p> <ul style="list-style-type: none"> A. Changes in the endocrine system may have no noticeable effect on overall health, with the exception of increasing the risk of some health problems (Type II diabetes). B. Changes that can lead to hypertension and orthostatic hypotension <ul style="list-style-type: none"> 1. Increase in the levels of hormones that increase blood pressure 2. Derangement of hormones that regulate fluid balance 3. Decrease in target organ response to beta (sympathetic) stimulation in the heart C. Mild carbohydrate intolerance and a minimal increase in fasting blood glucose levels (drop in receptor cell responsiveness to insulin) D. Increased serum level of atrial natriuretic hormone, leading to fluid imbalance E. Decrease in metabolism of thyroxine, leading to decreased conversion into triiodothyronine and affecting body temperature, growth, and heat rate 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on healthy aging.</p>

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5	<p>VII. Effects of Aging on Body Systems—The Musculoskeletal System</p> <p>A. Osteoporosis makes bones more brittle and susceptible to fractures and slows the healing process.</p> <p>B. Kyphosis is the characteristic curvature of the spine seen in many elderly patients and results when the disks located between the vertebrae of the spine start to narrow.</p> <p>C. Joints begin to lose their flexibility, and ligaments begin to lose their strength.</p> <p>D. Elderly experience progressive loss of skeletal muscle mass.</p>	<p>Weblinks</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on balance problems in the elderly and frailty and aging.</p>
5	<p>VIII. Effects of Aging on Body Systems—The Renal System</p> <p>A. Kidneys become smaller in size and weight due to loss of nephrons (less surface area to filter blood).</p> <p>B. Changes in the cardiovascular system result in a drop in renal blood flow (less blood passing through the kidneys for filtration).</p> <p>C. Kidney malfunction or injury can lead to disturbance in fluid balance and electrolyte distribution.</p> <p>D. Drug toxicity is more likely to occur.</p>	
5	<p>IX. Effects of Aging on Body Systems—The Integumentary System</p> <p>A. Skin becomes thinner, and there is less attachment tissue between the dermis (inner layer) and epidermis (outer layer).</p> <p>B. Skin is much more prone to injury and takes longer to heal.</p> <p>C. Less perspiration is produced, and sense of touch is dulled.</p> <p>D. Diminished effectiveness of the skin as a protective barrier</p>	<p>Knowledge Application</p> <p>Students should be able to integrate knowledge of age-related physiological changes into the assessment and management of elderly patients.</p>
15	<p>X. Special Geriatric Assessment Findings—Assessment Finding: Chest Pain or Absence of Chest Pain</p> <p>A. Heart attack (myocardial infarction)</p> <ol style="list-style-type: none"> 1. Geriatric patients may experience a “silent heart attack”—Patient may have no, or very little, chest discomfort. 2. Common symptoms may be very general (e.g., weakness, fatigue, confusion, syncope). 3. Look for nitroglycerin at the scene. 	<p>Teaching Tip</p> <p>Assign small groups of students to each of the topics in the section. Give students 20 to 30 minutes to research their topic before presenting it to the class. Be prepared to correct misconceptions and fill in gaps.</p>

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	<ul style="list-style-type: none"> 4. Emergency medical care <ul style="list-style-type: none"> a. Administer high-flow, high concentration oxygen. b. Administer nitroglycerin as appropriate in consultation with medical direction. c. Transport the patient expeditiously. B. Congestive heart failure <ul style="list-style-type: none"> 1. May have acute or chronic onset 2. Caused by a heart that becomes weakened over time as a result of the changes in ages, hypertension, arteriosclerotic disease, and heart valve damage. 3. A “backup” in the peripheral blood vessels and vessels in the lungs causes fluid to leak out of the vessels. <ul style="list-style-type: none"> a. Assessment findings b. Jugular vein distention, c. Altered mental status, d. Fatigue e. Crackling f. Wheezing g. Dyspnea h. Orthopnea, i. Tachypnea j. Chest pain k. Anxiety 4. Emergency medical care <ul style="list-style-type: none"> a. Administer high-flow, high-concentration oxygen. b. Place the patient in the Fowler’s position. c. Expedite transport and be prepared to ventilate. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How is the presentation of the elderly patient with a heart attack often different from that of younger patients? • What is the relationship between aging and congestive heart failure?
20	<p>XI. Special Geriatric Assessment Findings—Assessment Finding: Shortness of Breath (Dyspnea)</p> <ul style="list-style-type: none"> A. One of the most common complaints in the elderly B. Remember that any additional burden to an already diminished respiratory function can lead to inadequate breathing. C. Pulmonary edema <ul style="list-style-type: none"> 1. Fluid in the lungs, resulting in inadequate gas exchange and respiratory distress 2. Gradual or sudden onset that can result in death if care is not provided 3. Causes include CHF, heart attack, or valve damage 	<p>Discussion Question</p> <p>What are some causes of shortness of breath in elderly patients?</p>

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	<ul style="list-style-type: none"> 4. Assessment findings <ul style="list-style-type: none"> a. Severe respiratory distress (orthopnea) b. Altered mental status, c. Coughing with possibly blood-tinged sputum d. Other signs of CHF 5. Emergency medical care <ul style="list-style-type: none"> a. Administer oxygen at 15 lpm by nonrebreather mask (or positive pressure ventilation, if necessary). b. Place the patient in a Fowler's position. c. Monitor for inadequate breathing. d. Transport expeditiously. D. Pulmonary embolism <ul style="list-style-type: none"> 1. Blockage in the arteries of the lungs 2. Very sudden onset with localized chest discomfort 3. Usually occurs when a blood clot (embolism) breaks free from veins of the lower extremities or pelvis 4. Signs and symptoms may include hypotension, localized wheezing, and low pulse oximeter reading. 5. If a large embolism occludes more than half of the pulmonary circulation, rapid death can result. 6. Predisposing factors <ul style="list-style-type: none"> a. Aging b. Smoking c. Cancer d. Fractures of large bones e. Major surgery f. Existing cardiovascular disease g. Prolonged bed rest h. Trauma 7. Emergency medical care <ul style="list-style-type: none"> a. Administer oxygen and monitor for inadequate breathing. b. Provide positive pressure ventilation (if necessary). c. Transport the patient rapidly to the hospital. E. Pneumonia <ul style="list-style-type: none"> 1. Infection of the lungs caused by bacterium, virus, or other pathogen 2. Aspiration pneumonia often results from accidental aspiration of food or vomitus into the lungs. 3. Tendency to strike with following multiple factors 	

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	<ul style="list-style-type: none"> a. Advancing age b. Bed ridden at home or institutionalized c. Immune system compromise d. History of other pulmonary diseases e. Cancer f. History of inhaled toxins 4. Common symptoms in the elderly (may not present with common symptoms for younger patient) <ul style="list-style-type: none"> a. Increased respiration rate b. Progressive worsening of dyspnea c. Dyspnea with exertion d. Congestion (with or without chills) e. Cough with some sputum f. Wheezing g. Malaise h. Altered mental status i. Inadequate breathing (severe) j. Hypotension (severe) k. Dehydration (severe) l. Dull sounds upon percussion (severe) m. Increased vocal fremitus (severe) 5. Emergency medical care <ul style="list-style-type: none"> a. Maintain the patient's airway. b. Administer high-flow, high-concentration oxygen. c. Transport the patient in a Fowler's position or position of comfort. d. If breathing is inadequate, provide oxygen via positive pressure ventilation. F. Chronic obstructive pulmonary disease <ul style="list-style-type: none"> 1. Disease complex that includes number of individual pulmonary disease processes that result from gradual deterioration of the pulmonary structures 2. Patient may complain of respiratory distress, use accessory muscles, or be on a home oxygen unit. 3. Emergency medical care <ul style="list-style-type: none"> a. Administer oxygen at 15 lpm by nonrebreather mask if breathing is adequate. b. Provide positive pressure ventilation with supplemental oxygen if breathing is inadequate. 	

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	<ul style="list-style-type: none"> c. Assist with administering prescribed metered-dose inhaler if approved by medical direction. d. Transport the patient in a position of comfort (Fowler's). 	
35	<p>XII. Special Geriatric Assessment Findings—Assessment Finding: Altered Mental Status</p> <ul style="list-style-type: none"> A. Never assume that a patient's altered mental status is "normal" for him or that it is "senility". (Family members may help provide information.) B. Stroke <ul style="list-style-type: none"> 1. Blood vessel in the brain becomes blocked by a clot, obstructing blood flow, or ruptures and allows blood to accumulate in the brain tissue itself. 2. Intracranial pressure sharply increases, carbon dioxide increases, and nerve cells in the brain start to die. 3. Signs and symptoms <ul style="list-style-type: none"> a. Inequality of pupils b. Slurred speech or abnormal speech patterns c. Headache d. Memory disorders e. Alterations in the respiratory pattern f. Rapid, or abnormally slow, heart rate g. High systolic pressure which gradually becomes normal or hypotensive h. Possible seizures i. Nausea or vomiting j. Muscle weakness or paralysis k. Sensory loss 4. Emergency medical care <ul style="list-style-type: none"> a. Recognition, aggressive oxygenation, and ventilation b. Maintain patent airway. c. Transport in a Fowler's position or lateral recumbent position (if unresponsive). C. Transient ischemic attack (TIA) <ul style="list-style-type: none"> 1. Similar in presentation to a stroke, but the signs and symptoms are completely reversed within 24 hours of onset, usually sooner. 2. Occurs when blood supply to an area of the brain is temporarily occluded, causing a malfunction of brain tissue that is not being perfused 3. Treatment steps are the same as for a stroke. 	<p>Discussion Question What are some causes of altered mental status in elderly patients?</p>

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	<p>D. Seizure</p> <ol style="list-style-type: none"> 1. Sudden and temporary alteration in the mental status caused by massive electrical discharge in a group of nerve cells in the brain 2. Common causes <ol style="list-style-type: none"> a. Cardiac arrest b. Low blood sugar c. Tumors d. Head trauma e. Stroke/TIA f. Infections g. Electrolyte imbalance from kidney problems 3. Emergency medical care <ol style="list-style-type: none"> a. Do not physically restrain the patient while he is actively seizing. b. Monitor the airway and suction as necessary. c. Administer oxygen at 15 lpm by nonrebreather mask (if breathing is adequate) or positive pressure ventilation (if breathing is inadequate). d. Place patient in recovery position to help prevent aspiration (if unresponsive). <p>E. Syncope</p> <ol style="list-style-type: none"> 1. Temporary loss of responsiveness that usually reverses once the patient is lying down 2. Caused by a reduced blood flow to the brain and can be a sign of a number of underlying diseases as well as side effects or even strong emotion 3. Emergency medical care <ol style="list-style-type: none"> a. Ensure an adequate airway. b. Provide high-flow, high-concentration oxygen by a nonrebreather mask or with positive pressure ventilation. c. Place the patient in recovery position (if unresponsive). d. If patient suffered a fall, fully immobilize him as a precautionary measure. <p>F. Hyperosmolar hyperglycemic nonketotic syndrome</p> <ol style="list-style-type: none"> 1. Diabetic condition in which the blood glucose level elevates because of inadequate insulin secretion or action on target cells; however, enough insulin is secreted to keep mass amounts of fat from being metabolized for energy. 2. Glucose level does not raise high enough to cause excessive urination 	

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	<p>from osmotic diuresis, causing severe dehydration.</p> <ol style="list-style-type: none"> 3. Signs and symptoms <ol style="list-style-type: none"> a. Altered mental status (gradual onset) b. History of diabetes c. Elevated glucose level d. Polydipsia e. Polyuria f. Dry oral mucous membranes g. Dizziness h. Confusion i. Seizures j. Significant dehydration 4. May be the first indication of a diabetic condition 5. Check the blood glucose level in any patient who presents with signs of excessive urination, thirst, or dehydration. 6. Emergency medical care <ol style="list-style-type: none"> a. Protect the airway. b. Provide supplemental oxygen (or positive pressure ventilation if patient is breathing inadequately). c. Provide circulatory support. d. Consider ALS intercept during transport to the hospital. <p>G. Drug toxicity</p> <ol style="list-style-type: none"> 1. Adverse or toxic reaction to a drug or drugs 2. Elderly are at greater risk since they tend to have a number of coexisting diseases. 3. Emergency medical care <ol style="list-style-type: none"> a. Figure out how the drug is affecting the patient's airway, breathing, and circulation status. b. Maintain airway and oxygenation, and prevent aspiration. c. If possible, take all medications found on the patient or at the scene to the hospital with the patient. <p>H. Dementia and delirium</p> <ol style="list-style-type: none"> 1. Dementia is a condition resulting from malfunctioning of normal brain activity <ol style="list-style-type: none"> a. Chronic, irreversible condition that can be severely worsened by infection, medication change, trauma, or other acute condition. b. Signs and symptoms <ol style="list-style-type: none"> i. Chronic changes in cognition, loss of short-term memory 	<p>Discussion Question Why are the elderly more prone to drug toxicity?</p>

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	<ul style="list-style-type: none"> ii. Decline in intellectual abilities iii. Decline in judgment, math abilities, and abstract thought iv. Anger c. May be caused by some medications (analgesics, sedatives), diseases (heart disease, Huntington’s chorea), visual and auditory problems, strokes, brain trauma or tumors, alcohol use, and so on d. Emergency medical care—Includes oxygen, positioning, and transport to the hospital 2. Delirium is an alteration in mental status but presents with more recent and sudden onset. <ul style="list-style-type: none"> a. Patient may have a history with a delirium episode (e.g., sedative use, fever, infectious medical condition). b. Signs and symptoms <ul style="list-style-type: none"> i. Faster onset ii. Disjointed (nonsensical) thought processes iii. Incoherent speech iv. Declines in mental status v. Increased or decreased psychomotor activity c. Additional physical findings will reflect the underlying pathology that is causing the delirium. d. Emergency medical care—Includes oxygen, positioning, protection from injury, and transportation to the hospital. If delirium is caused by a reversible cause the EMT can treat (e.g., low blood sugar), provide specific management for that condition. 3. Use patient history (from family member or primary care provider) to differentiate between delirium and dementia. <ul style="list-style-type: none"> I. Alzheimer’s disease <ul style="list-style-type: none"> 1. Causes patients to stop eating, become immobile, and be subject to numerous infections that can lead to death 2. Signs and symptoms <ul style="list-style-type: none"> a. Confusion b. Emotional depression c. Irritability d. Violence between lucid intervals e. Progressive loss of appetite f. Decreasing ability for patient to care for his own needs g. Childlike behavior (late stages) 3. Emergency medical care 	<p>Discussion Question What are some characteristics of Alzheimer’s disease?</p> <p>Video Clip Go to www.bradybooks.com and click on</p>

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	<ul style="list-style-type: none"> a. Establish and maintain airway, breathing, and circulatory status. b. Remember that acts of aggression are not against you personally but rather a symptom of the disease. 	<p>the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on Alzheimer's disease.</p>
15	<p>XIII. Special Geriatric Assessment Findings—Assessment Finding: Signs of Trauma or Shock</p> <ul style="list-style-type: none"> A. Most common trauma is blunt trauma from falls, motor vehicle crashes, and pedestrians struck by automobiles. B. Reasons for blunt trauma <ul style="list-style-type: none"> 1. Altered mental status 2. Slower reflexes 3. Failing eyesight and hearing 4. Medication effects 5. Activities that exceed physical limitations 6. Arthritis 7. Blood vessels that are less elastic and more subject to injury 8. Fragile tissues, brittle bones, and stiffer joints 9. General loss in muscle tone and strength C. Both environmental (e.g., steep steps, slipping rugs) and medical reasons (e.g., low blood pressure, dizziness) for falls; determine the cause. D. Assess for the following. <ul style="list-style-type: none"> 1. Hip fracture 2. Head injury (may take days or weeks to develop) 3. Chest and abdominal injury 4. Spine fractures 5. Fractures of the hand, wrist, forearm, or shoulder E. Shock progresses much more rapidly in the elderly than in any other age group. Organs cannot tolerate periods of hypoperfusion. F. Emergency medical care <ul style="list-style-type: none"> 1. Stabilize the spine during the primary assessment. 2. Administer high-flow, high-concentration oxygen. 3. Provide positive pressure ventilation if the patient is breathing inadequately. 4. Regard any signs of poor perfusion as signs of serious trauma and transport the patient as rapidly as possible. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on seniors' health.</p>
	<p>XIV. Special Geriatric Assessment Findings—Assessment Finding:</p>	

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15	<p>Gastrointestinal Bleeding</p> <p>A. May occur anywhere along the digestive tract and may be obvious or occult</p> <p>B. Sign that some gastrointestinal disease is present but is not a disease itself</p> <p>C. Findings that support the field impression of GI bleeding in an elderly patient</p> <ol style="list-style-type: none"> 1. Hematemesis 2. Hematochezia 3. Melena 4. Dyspepsia 5. Hepatomegaly 6. Jaundice 7. Constipation or diarrhea 8. Agitation 9. Dizziness 10. Inability to find a comfortable position 11. Shock 12. Peripheral, sacral, and periorbital edema from venous congestion 13. Low-grade fever 14. Respiratory distress and vital sign changes <p>D. Emergency medical care</p> <ol style="list-style-type: none"> 1. Ensure patent airway and provide manual or mechanical airway assistance if patient is unable to protect the airway himself. 2. If breathing is adequate, provide supplemental oxygen; if breathing is inadequate, provide oxygen via positive pressure ventilation. 3. Keep patient in recovery position if responsive, or supine if unresponsive or you are maintaining the airway. (Consider volume depletion if blood pressure is 10 mmHg lower when the patient is standing compared to lying supine.) 4. Summon ALS intercept while you expedite transport to the hospital. 	
10	<p>XV. Special Geriatric Assessment Findings—Assessment Finding: Environmental Temperature Extremes</p> <p>A. Be acutely aware of any extremes in the ambient air temperature to which the patient has been subjected.</p> <p>B. Hypothermia—A body temperature less than 35 degrees Celsius (95 degrees Fahrenheit)</p> <ol style="list-style-type: none"> 1. Factors making the elderly more prone to hypothermia include smaller insulating layer of fat, impaired reflexes and limited movement, slowing metabolic rate, reduced muscle mass, decreasing blood flow, reduced 	<p>Discussion Question</p> <p>What are some factors that make the elderly more prone to environmental emergencies?</p>

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	<p>shivering response, and limited income preventing the patient from heating home properly.</p> <ol style="list-style-type: none"> 2. Emergency medical care includes protecting the airway, maintaining normal breathing and circulatory status, and removing the patient from the cold environment (including removing wet clothing). <p>C. Hyperthermia—Increased body temperature</p> <ol style="list-style-type: none"> 1. Geriatric’s core temperature can increase more rapidly than the younger patient’s. 2. To institute prehospital cooling of a hyperthermic geriatric patient, follow the same guidelines as for treating a younger patient. 	
10	<p>XVI. Special Geriatric Assessment Findings—Assessment Finding: Geriatric Abuse</p> <p>A. Those at risk</p> <ol style="list-style-type: none"> 1. Cared for by someone under stress from other resources 2. Bedridden 3. Demented 4. Incontinent 5. Frail 6. Disturbed sleep patterns <p>B. Signs of abuse</p> <ol style="list-style-type: none"> 1. Bruises 2. Bite marks 3. Bleeding beneath scalp 4. Lacerations on face 5. Trauma to ears 6. Broken bones 7. Deformities to chest 8. Cigarette burns or rope marks <p>C. Pay attention to inconsistencies when you get your history from the patient.</p> <p>D. Do not confront the family or care provider with your suspicion.</p> <p>E. Make your suspicion known to the receiving facility.</p> <p>F. Follow local protocols or state laws regarding reporting suspected abuse.</p>	<p>Discussion Question What are some indications of abuse of the geriatric patient?</p> <p>Knowledge Application Given several scenarios, students should be able to identify and manage common complaints in geriatric patients.</p>
5	<p>XVII. Assessment-Based Approach: Geriatric Patients</p> <p>A. Approach the geriatric patient with compassion, concern, and respect.</p> <p>B. Avoid any of the purposeful or accidental stereotyping of ageism (knowingly or unknowingly discriminating against people who are old).</p>	

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	<ul style="list-style-type: none"> C. Consider the two greatest social issues: isolation and marital status. D. Consider that the geriatric patient may have dwindling finances. E. Geriatric patients may live in independent or dependent living situations (family member, assisted living, specialty care facility, hospice). Dependent living situations may create delays in getting to the patient due to locked doors, privacy gates, and so on. F. Attempt to get as much of the history as you can from the patient himself. G. Consider advance directives. H. Elderly at risk for needing health care <ul style="list-style-type: none"> 1. Live alone 2. Are incontinent 3. Are immobile 4. Have been recently hospitalized 5. Have been recently bereaved 6. Have an altered mental status 	
5	<p>XVIII. Assessment-Based Approach: Geriatric Patients—Scene Size-Up</p> <ul style="list-style-type: none"> A. Determine if there are any safety hazards to yourself, crew, patient, or bystanders. B. Take Standard Precautions (gloves and mask). C. Assess the environmental temperature. D. Determine if any additional patients are present and call for additional resources. E. Determine whether the patient is suffering from trauma or a medical problem. (Be alert to the fact that the cause of the emergency may be more complex than is first apparent). F. Maintain a high index of suspicion and be ready to change your focus of care as you gather more information during the primary and secondary assessments. 	<p>Teaching Tip Ensure that students have ample opportunities to practice assessment and management of elderly patients.</p> <p>Discussion Question Why is it especially important to assess the environment of the elderly patient?</p>
5	<p>XIX. Assessment-Based Approach: Geriatric Patients—Primary Assessment</p> <ul style="list-style-type: none"> A. Assess the mental status to determine a baseline level of consciousness and the possible need for airway protection and ventilatory assistance. B. Monitor the patient's airway and breathing, and be prepared to initiate positive pressure ventilation. C. Assess central and peripheral pulses, noting the rate, strength, and rhythm. Initial pulse check should include an assessment of the radial pulse. Note any irregularity to rhythm. 	<p>Discussion Question What unique considerations should you keep in mind when assessing the breathing of an elderly patient?</p>

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	<p>D. Skin condition and temperature</p> <ol style="list-style-type: none"> 1. Remember that the geriatric body does not display the same signs and symptoms of dehydration as in the younger patient. 2. The geriatric patient’s skin may not feel warm even if the geriatric patient does have an infection. <p>E. Categorize the patient as stable or unstable. (Err on the side to benefit the patient and manage him as stable.)</p> <ol style="list-style-type: none"> 1. Stable—An elderly patient who is alert and has an open airway, adequate breathing, signs of good peripheral perfusion, and a strong peripheral pulse 2. Unstable—An elderly patient with an acute change in mental status, an obstructed airway, inadequate breathing, or signs of poor perfusion (in need of emergency care during primary assessment) 	
15	<p>XX. Assessment-Based Approach: Geriatric Patients—Secondary Assessment</p> <p>A. Gather the history and conduct your physical exam based on the patient’s mechanism of injury (if trauma) or chief complaint (if medical).</p> <ol style="list-style-type: none"> 1. Diminished sight or blindness—Talk calmly and be positioned so that the patient can best see you if he has any sight at all. Make sure patient is wearing his eyeglasses if he has them. 2. Diminished hearing or deafness—Do not assume the patient is deaf. If the patient is wearing a hearing aid, make sure that it is turned on, and do not shout. Use your stethoscope, lip-reading, or note-writing as appropriate. <p>B. For the geriatric trauma patient</p> <ol style="list-style-type: none"> 1. Note the mechanism of injury. 2. Remember that the severity of pain is unreliable as an indicator of the seriousness of the injury. 3. Maintain a high index of suspicion and treat any complaint of pain as a symptom of a serious injury. 4. Examine the head, neck, chest, abdomen, pelvis, extremities, and posterior body, and inspect and palpate for any evidence of trauma. 5. Assess and record baseline vital signs and obtain a history. 6. In order to treat the entire geriatric patient, you need to perform an entire physical examination. <p>C. For the geriatric medical patient</p> <ol style="list-style-type: none"> 1. Patient may have one or more chronic diseases or medications which 	<p>Discussion Question What guidelines should you follow when interacting with patients with diminished sight or hearing?</p> <p>Class Activity Give pairs of students items needed to simulate age-related changes. Students should take turns playing the role of both the EMT and the patient. Have students wear the items described for additional activities to demonstrate some of the challenges faced by the elderly:</p> <ul style="list-style-type: none"> • Attempting to purchase something from a vending machine • Trying to determine the color of “pills” (pastel candies) • Trying to grasp small “pills” or buttons • Trying to read medication and household product labels

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	<p>can mask or alter the presentation of signs and symptoms.</p> <ol style="list-style-type: none"> 2. Patient's memory, hearing, sight, and orientation may be diminished, making it more difficult to determine chief complaint. However, do not assume that the patient is this way. 3. Be sure to treat the patient with concern and compassion and talk to the patient (rather than talk about the patient to others). 4. Points to remember during the physical examination <ol style="list-style-type: none"> a. The patient may become fatigued easily. b. Clearly explain what you are going to do before examining the patient. c. The patient may minimize or deny symptoms because he fears being bedridden, institutionalized, or losing his self-sufficiency. d. Peripheral pulses may be difficult to evaluate. e. Distinguish signs and symptoms of chronic problems or natural aging processes from the signs and symptoms of acute problems. 5. Questions to ask during the history <ol style="list-style-type: none"> a. Have you had any trouble breathing? b. Have you had a cough lately? c. Have you had any chest pain? d. Did you get dizzy? e. Have you fainted? f. Have you had any headaches lately? g. Have you been eating and drinking normally? h. Have there been any changes in your bowel or bladder habits? i. Have you fallen lately? 6. Address the patient as "Mr.," "Mrs.," or "Miss". 7. Be sure to remove clothing as necessary to conduct the physical exam. 8. If patient is unresponsive or has an altered mental status, perform a physical assessment to find and treat any life threats. Scan the scene for clues. 9. Collect and transport the patient's medications. 10. Assess and record the baseline vital signs. 11. Perform a secondary exam on the geriatric medical patient whether he is alert, has an altered mental status, or is unresponsive. 	<p>Critical Thinking Discussion What are some ways of demonstrating respect for elderly patients?</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • Why may elderly patients minimize their symptoms? • What are some specific questions that you should ask when assessing an elderly medical patient's complaints?
15	<p>XXI. Assessment-Based Approach: Geriatric Patients—Emergency Medical Care and Reassessment</p> <p>A. Maintain a patent airway (dentures).</p>	<p>Knowledge Application Given several scenarios, students should be able to identify and manage common</p>

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	<p>B. Insert an airway, if necessary.</p> <p>C. Assess and be prepared to assist ventilations.</p> <p>D. Establish and maintain oxygen therapy.</p> <p>E. Position the patient.</p> <ol style="list-style-type: none"> 1. Medical emergency with alert patient who is able to protect his own airway: comfortable position such as Fowler's 2. Patient with altered mental status and inability to protect his own airway: left lateral recumbent position 3. Patient with suspected spine injury: immediate manual stabilization of the spine followed by immobilization to a long backboard (accommodate curvature of the spine). 4. Unresponsive patient: immobilize patient fully <p>F. Transport.</p> <p>G. Reevaluate the geriatric patient frequently.</p> <ol style="list-style-type: none"> 1. Every 15 minutes for a stable patient 2. Every five minutes for an unstable patient 	<p>complaints in geriatric patients.</p>
<p style="text-align: center;">10</p>	<p>XXII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 39 Summary. 2. Complete Chapter 39 In Review questions. 3. Complete Chapter 39 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 39 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What things should you consider regarding the spouse's (Mr. Vaughn's) needs? • How can you make Mrs. Vaughn feel comfortable in your care? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student

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Minutes	Content Outline	Master Teaching Notes
		learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com .

Detailed Lesson Plan

Chapter 40

Patients with Special Challenges

255–300 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about assessment and emergency care for patients with special challenges.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What type of device is Mrs. Davidson talking about? What is it used for? • What would happen if the device malfunctioned?
5	<p>II. Recognizing the Patient with Special Challenges</p> <p>A. Any number of medical or traumatic conditions can cause loss of function to a body system.</p> <p>B. Changes can be mild or substantial.</p> <p>C. Impairments may result from aging, birth defects, chronic illnesses, traumas, abuse and/or neglect, and more.</p>	<p>Teaching Tip</p> <p>Ask students what experiences they have with people who have special challenges.</p> <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • Why is it important for EMS providers to be knowledgeable about special health care needs? • Are there other populations who may have special challenges in getting the health care they need? <p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on minority health.</p>

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2	<p>III. Sensory Impairments—Hearing Impairment</p> <p>A. Occurs when there is a loss or diminishment in the person’s ability to hear sounds</p> <p>B. Deafness is a term that is commonly used to describe the inability to hear.</p> <ol style="list-style-type: none"> 1. May involve one or both ears 2. Patient may be partially deaf or totally deaf. 	<p>Discussion Question</p> <p>What are some ways of improving communication with hearing-impaired patients?</p>
5	<p>IV. Sensory Impairments—Vision Impairment</p> <p>A. Etiologies</p> <ol style="list-style-type: none"> 1. Loss from disease 2. Loss from injury 3. Loss from degenerative disorders <p>B. Glaucoma results in an abnormal increase in intraocular pressure that damages the optic nerve, resulting in peripheral vision loss and eventual blindness.</p> <p>C. Diabetic retinopathy occurs when the long-term effects of diabetes mellitus damage the small blood vessels in the eye.</p> <p>D. Injury to the eye can be caused by puncture or penetration injuries, blunt trauma to the face, or chemical and thermal burns.</p> <p>E. Aging may cause degeneration of the eyeball, optic nerve, and optic nerve pathways.</p> <p>F. Cataracts are a condition in which the lens of the eye becomes cloudy from pathologic changes within the lens itself.</p> <p>G. Vision loss</p> <ol style="list-style-type: none"> 1. Acute or slow onset 2. One or both eyes 3. Whole or certain field of vision 4. Reversible or permanent 	<p>Discussion Question</p> <p>What are some causes of impaired vision?</p>
2	<p>V. Sensory Impairments—Speech Impairment</p> <p>A. Articulation disorders—Caused by impairment of tongue or other muscles needed for speech (dysarthria), learning words incorrectly, hearing impairment, or damage to nerve tracts</p> <p>B. Voice-production disorders—Damage to the larynx, vocal cords, or related supporting structure from illness or injury</p> <p>C. Language disorders—Patient displays an impaired or absent ability to understand the spoken word (congenital problems, hearing deficits, inadequate language stimulation, stroke, head trauma, brain tumor,</p>	

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	<p>significant emotional stress).</p> <p>D. Fluency disorders—“Stuttering” speech patterns</p>	
6	<p>VI. Sensory Impairments—Accommodations for Patients with Sensory Impairment</p> <p>A. Hearing-impaired patient</p> <ol style="list-style-type: none"> 1. If patient has hearing aid, ensure that it is on and working properly. 2. Position yourself so that the patient can lip read. 3. Communicate in writing, if necessary. 4. If patient is able to sign, have a person at the scene who knows sign language act as an interpreter. <p>B. Visually impaired</p> <ol style="list-style-type: none"> 1. Speak clearly and always explain what you are going to do before you do it. 2. Follow local protocol and service policies when deciding whether or not to transport a service dog. 3. You may need to act as the patient’s guide. <p>C. Speech impairment</p> <ol style="list-style-type: none"> 1. Ask questions in a way that allows patients to answer in as few words as possible. 2. Allow patients time to respond to your questions, and do not attempt to finish words or statements. 3. Never pretend you understood something when in fact you didn’t. 4. Use family or other communication techniques only when verbal communication has failed. 	<p>Teaching Tip Discuss local protocol regarding transportation of service animals.</p> <p>Critical Thinking Discussion How should you interact with a service animal?</p> <p>Knowledge Application Students should be able to integrate information from this section into the assessment and management of patients with sensory impairment.</p>
3	<p>VII. Cognitive and Emotional Impairments—Mental or Emotional Impairments</p> <p>A. Impairment may range from mild to significant.</p> <p>B. Patient with an extreme emotional dysfunction may be unable to focus on your questions or respond appropriately.</p>	
3	<p>VIII. Cognitive and Emotional Impairments—Developmental Disabilities</p> <p>A. Conditions that interfere with how a body part or system operates</p> <p>B. Often present as birth defects</p> <p>C. May not be noted until the child fails to reach certain developmental</p>	<p>Critical Thinking Discussion What are some organizations that help people with developmental disabilities lead more productive lives?</p>

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	<p>milestones</p> <ul style="list-style-type: none"> D. Can be a result of trauma in utero, during the birth process, or at any time after birth E. May involve brain, spinal cord, nervous system, and endocrine system F. Common disabilities <ul style="list-style-type: none"> 1. Down syndrome 2. Fragile X syndrome 3. Autism 4. Fetal alcohol syndrome 5. Phenylketonuria (PKU) 6. Hypothyroidism 7. Rett syndrome 	<p>Class Activity Assign students to research a developmental disability outside of class and make short presentations to the rest of the class at the next class session.</p>
3	<p>IX. Cognitive and Emotional Impairments—Accommodations for Patients with Mental, Emotional, or Developmental Impairments</p> <ul style="list-style-type: none"> A. Treat the patient with respect as you would any other patient. B. You may need to gather history from primary care provider if you discern developmental or cognitive problems. C. Use care providers' experience with patients to help you determine diminishment in the patient's mental status or other condition when trying to gather chief complaint. D. Provide clear explanations in an attempt to assist the patient in understanding the situation and what is occurring during emergency care and transport. E. Patients are still sensitive to body language and tone of voice. F. Patients may be wary of strangers, and it is important to gain their trust. G. Avoid loud noises or extreme changes in lighting, and keep the primary care provider near. 	<p>Discussion Question What are some guidelines for interacting with patients with developmental disabilities?</p>
3	<p>X. Cognitive and Emotional Impairments—Brain-Injured Patients</p> <ul style="list-style-type: none"> A. Causes can include infant abuse, meningitis, encephalitis, and head injury. B. Cerebral palsy is an umbrella term for motor impairments (muscular stiffness, joint contractures, wringing of hands, drool, facial grimacing) that result from brain abnormalities that arise early in development. C. Brain trauma can range from mild to severe. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on cerebral palsy.</p>
3	<p>XI. Cognitive and Emotional Impairments—Accommodations for Brain-Injured Patients</p> <ul style="list-style-type: none"> A. Presenting signs and symptoms should be categorized as either chronic or 	

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	<p>acute.</p> <p>B. Gathering a history will reveal the type of injury sustained earlier and identify any changes in the patient’s current condition as either chronic or acute.</p> <p>C. Brain-injury patients may use a large amount of medical technology in order to survive, and the EMT must manage this equipment during transfer.</p> <p>D. While emergency care will depend on the condition(s) for which you are summoned, remember to maintain a patent airway, ensure adequate breathing, and keep peripheral perfusion intact.</p> <p>E. Consider summoning ALS for a patient who is critically unstable or deteriorating.</p>	<p>Discussion Question What are some additional considerations in managing severely brain-injured patients?</p> <p>Knowledge Application Students should be able to apply this information to interactions with patients with emotional and cognitive impairments.</p>
15	<p>XII. Paralysis—Accommodations for Paralyzed Patients</p> <p>A. Complete loss of muscle function to one or more groups of muscles</p> <p>B. You may have to make accommodations for a patient’s preexisting paralysis while also treating him for the reason for the EMS call.</p> <p>C. Patients who are paralyzed are susceptible to multiple additional problems (e.g. respiratory infections, urinary infections, necrosis, and emergencies from feeding tubes).</p> <p>D. Paraplegic patient will display paralysis from the waist down and should be able to communicate with you normally as long as there is no cognitive decline.</p> <ol style="list-style-type: none"> 1. Concern is moving the patient from his bed or wheelchair to your cot. 2. Taking the patient’s wheelchair is often not allowed by the EMS agency, and you should coordinate with family or primary care provider for this and other items to be brought to the hospital. <p>E. Quadriplegic patient is paralyzed to all four extremities and may not be able to breathe adequately on his own.</p> <ol style="list-style-type: none"> 1. Keep settings on the home ventilator the same as when you arrived. 2. Keep suction and bag-valve mask nearby. 3. Look to see if the patient has a urinary catheter before moving him, and keep the urinary collection bag at a level above the insertion site or at the same level of insertion. 4. Remain alert to the patient’s needs and medical equipment (especially while moving the patient). <p>F. Never allow the necessary accommodations distract you from the reason for the initial call to EMS.</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some causes of paralysis? • What are some medical terms associated with paralysis? • What are some considerations in assessment, management, and transport of patients who are paralyzed? <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on paraplegia.</p> <p>Knowledge Application Students should be able to apply information from this section to the care of paralyzed patients.</p>
15	<p>XIII. Obesity—Accommodations for Obese Patients</p> <p>A. Bariatrics is the branch of medicine that deals with the management of</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some causes and risk factors

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	<p>obese patients.</p> <p>B. Traditionally, a person who is 20 percent or more over his ideal weight is considered to be obese.</p> <p>C. A morbidly obese patient weighs 50 to 100 percent more than his ideal weight or is more than 100 pounds over his ideal weight.</p> <p>D. As obesity and morbid obesity rates climb, EMS crews are encountering these patients more and more often.</p> <p>E. Obesity may occur from consuming too many calories, physiologic problems, medications, or genetic factors.</p> <p>F. “Extra” skin and adipose tissue can affect normal respiratory function when patient is in supine position</p> <ol style="list-style-type: none"> 1. Allow patient to maintain position of comfort. 2. Ensure airway is maintained in neutral position. 3. Position patient with multiple towels or bath blankets under the shoulder blades and behind the neck (if no spine injury is suspected) to provide cervical extension. 4. Use an oral or nasal pharyngeal airway to displace the tongue mechanically. <p>G. Turn your attention to oxygenating and ventilating the patient; spontaneous breathing may be impaired by body size in semi-reclined or supine position. (Remember a breathing patient does not necessarily equal an adequately breathing patient.)</p> <p>H. Perform rapid circulatory assessment; look for mentation, or alterations in heart rate or blood pressure.</p> <p>I. Use additional personnel, special cots, and bariatric loading devices as appropriate when transporting the patient.</p> <p>J. Inform receiving facility that a special stretcher or additional personnel may be needed.</p>	<p>for obesity?</p> <ul style="list-style-type: none"> • What health risks are associated with obesity? <p>Critical Thinking Discussion What do you think accounts for the negative attitudes many people have toward people who are obese?</p> <p>Teaching Tip Demonstrate any bariatric equipment available to your EMS system.</p> <p>Knowledge Application Students should be able to apply information from this section to the management of obese patients.</p>
30	<p>XIV. Homelessness and Poverty—Accommodations for Patients Who are Homeless or Poor</p> <p>A. Factors contributing to homelessness</p> <ol style="list-style-type: none"> 1. Poverty 2. Substance abuse 3. Lack of affordable housing 4. Mental illness 5. Prison release back into society 6. Domestic violence 	<p>Teaching Tip Encourage students to volunteer for an agency that provides services to the homeless.</p> <p>Class Activity Have students organize a food or clothing drive, or collect school supplies for the disadvantaged in your community.</p>

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	<ul style="list-style-type: none"> 7. Mortgage foreclosures and forced evictions 8. Natural disaster B. Disadvantages of homelessness <ul style="list-style-type: none"> 1. Reduced access to services because of lack of proper documentation or address 2. Increased risk of violence and abuse 3. Increased risk of illness/disease 4. Discrimination from others 5. Reduced access to healthcare 6. Limited or no access to education 7. Limited or no access to modern communications 8. Not seen as suitable for employment purposes C. Homeless have no address to which EMS can respond; the following are locations to which you may respond. <ul style="list-style-type: none"> 1. Abandoned or condemned buildings 2. Public places such as parks, train or bus stations, airport, college campuses 3. Vehicles 4. Outdoors in improvised shacks or on the ground with sleeping bags 5. In an unoccupied house 6. Homeless shelters D. Homeless are at risk for even greater emergencies due to poor nutrition, environmental exposure, lack of access to medication, and vulnerability to violent acts. E. Like the homeless, people who fall below the poverty level are at greater risk for illness and injury from the environment that they are in and the lack of primary medical care. F. Do not be judgmental; 90 percent of Americans will, at some time, live below the poverty level for at least a year. Remember that you are treating the patient because he needs your help. G. If the patient is worried about money to pay for the services, take the time needed to explain to the patient that almost all health care providers offer a certain degree of reduced cost or free medical care. H. Become familiar with hospitals and services in your community that provide medical care, shelter, food, or other services to families in need. 	<p>Discussion Question What are the health and health care consequences of poverty and homelessness?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource about the homeless.</p> <p>Knowledge Application Students should be able to apply the information in this section to the care of homeless and impoverished patients.</p> <p>Critical Thinking Discussion What are some resources for the homeless and impoverished in your community?</p>
	XV. Abuse—Child Abuse	

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5	<ul style="list-style-type: none"> A. Abuse is any action or failure to act that results in unreasonable suffering, harm, or misery to a person, whether physical or mental (e.g., child abuse, elder abuse, and partner abuse). B. It is the EMTs responsibility to make notifications of any suspicion of abuse to the proper authorities according to your state’s guidelines. C. Child abuse occurs when a child (newborn to 18 years in most states) falls victim to abuse or neglect. D. Abuser can be parent, siblings, stepsiblings, stepparents, or anyone else responsible for the child’s care. E. Physical abuse occurs when improper or excessive action is taken as to injure or cause harm. F. Neglect is the provision of inadequate attention or respect to someone who has a claim to the attention. G. Emotional abuse occurs when “a child is regularly threatened, yelled at, humiliated, ignored, blamed, or otherwise emotionally mistreated” (most difficult to prove). H. Sexual abuse is said to occur when a child is subject to an older child or adult’s advances that have a sexual nature (contact and noncontact events). I. Adult (care giver) who abuses a child often is evasive or hostile and may give contradictory information. 	<p>Discussion Question What are some indications of child abuse?</p>
5	<p>XVI. Abuse—Elder Abuse</p> <ul style="list-style-type: none"> A. Abuse can occur in care centers, other medical institutions, or home. B. Those at highest risk <ul style="list-style-type: none"> 1. Bedridden 2. Demented 3. Incontinent 4. Frail 5. Those with disturbed sleep patterns C. Geriatric neglect is the withholding of attention or medical care to which the victim is entitled (active or passive). D. Physical abuse can involve hitting, unnecessary restraining, shaking, or shoving. E. Sexual abuse is said to occur when there are unwanted or unwarranted advances of a sexual nature. F. Financial abuse consists of the care provider exploiting the material possessions, property, credit, or monetary assets of the elderly patient for personal gain. 	<p>Discussion Question What are some indications of elder abuse?</p>

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	<p>G. Emotional or mental abuse may include verbal assaults, verbal insults, ignoring the elderly patient, or threats of physical harm.</p>	
10	<p>XVII. Abuse—Accommodations for Victims of Abuse</p> <p>A. It may be difficult for the EMT to determine whether pediatric or child abuse has occurred.</p> <p>B. Signs of abuse may be physical (e.g., bruises, bite marks, lacerations, broken bones, rope marks, scalding burns) or emotional (e.g., depression, fear, inadequate or inappropriate coping skills or mental status).</p> <p>C. Priority is to provide emergency care for the injuries.</p> <p>D. Take into account the age group during treatment (e.g., emphasize airway and respiratory components in pediatric patient; trauma is usually worse in geriatric patient).</p> <p>E. Do not confront the family or care provider with suspicions of abuse; make suspicions known to the receiving hospital's staff so that they can follow up with the proper authorities.</p> <p>F. Remain objective in your documentation for a suspected victim of abuse.</p> <p>G. Follow local protocols or state laws regarding reporting of suspected abuse.</p>	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource about intimate partner violence.</p> <p>Knowledge Application Students should be able to apply the information in this section to the assessment and management of abused or neglected patients.</p>
15	<p>XVIII. Technology Dependence</p> <p>A. Shifting of patients from an in-hospital setting for ongoing medical care to the home setting which has increased the number of health care providers who function outside of the hospital and increased the use of medical technology</p> <p>B. Remain abreast of trends in home-based medical technology as many calls may be for medical equipment that has failed or is no longer providing the needed support.</p> <p>C. Determine what the medical device is supposed to be doing for the patient, how critical its function is to patient survival, and what type of impact the device has on other medical or traumatic emergencies that patient may suffer.</p> <p>D. Primary care provider may be helpful for information about equipment. Consider the following.</p> <ol style="list-style-type: none"> 1. Where would I get the best information from regarding this piece of equipment? 2. What does this device do for the patient? 3. Can I replicate its function should the device fail? 4. Will this equipment have an effect on how I assess the patient, or on the findings I may discover? 5. Has this problem ever occurred previously, and if so, what fixed it? 	<p>Teaching Tip Inviting an expert in home health care to speak about this and the next several sections will provide students with important information.</p>

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	<ul style="list-style-type: none"> 6. Has anyone attempted already to remediate the problem? 7. Are there specific considerations I need to make when deciding on how to best prepare the patient for movement and transport the patient? E. Constantly assess the patient for the following and intervene if deterioration should occur. <ul style="list-style-type: none"> 1. Keep the airway open and patent. 2. Ensure good ventilations with supplemental oxygen. 3. Intervene as needed to support any lost function to the circulatory system. 	
5	<p>XIX. Airway and Respiratory Devices—Medical Oxygen</p> <ul style="list-style-type: none"> A. Home oxygen equipment is similar to oxygen equipment you would use on the ambulance (e.g., oxygen source, flow regulator, oxygen supply tubing, oxygenation adjunct, in-line system for humidifying). B. Sources of oxygen for patients at home <ul style="list-style-type: none"> 1. Oxygen cylinder—Oxygen is compressed in a tank, adjusted by flowmeter, and administered to the patient via oxygenation adjunct) 2. Oxygen concentrator—Extracts oxygen from the ambient environment and supplies it to the patient 3. Liquid oxygen—Atmospheric oxygen that has been cooled to 1–183 degrees Celsius and stored under pressure in a container; larger liquid oxygen storage unit is used to refill small portable oxygen containers. C. Emergencies (relatively few) <ul style="list-style-type: none"> 1. Equipment fails to provide oxygen. 2. Patient’s condition changes or worsens, and oxygen the patient is receiving is no longer sufficient. 	<p>Teaching Tip Demonstrate any available airway and breathing devices to help students learn about their use.</p>
5	<p>XX. Airway and Respiratory Devices—Apnea Monitors</p> <ul style="list-style-type: none"> A. Designed to constantly monitor the patient’s breathing and emit a warning signal should breathing cease B. May also monitor heart rate C. Determine how long the machine has been alerting a problem and what kind of interventions the care provider has done prior to EMS arrival. D. Be thoughtful to care providers as this equipment is often used for infants, and an emergency can be very frightening to them. E. Perform a normal scene size-up and primary assessment. (Be especially diligent to respiratory rate and tidal volume.) <ul style="list-style-type: none"> 1. If breathing is adequate, provide oxygen to the infant and transport him to the hospital for evaluation. 	<p>Discussion Question Outline the assessment of a patient whose apnea monitor’s alarm has sounded.</p>

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	<ol style="list-style-type: none"> 2. If breathing is inadequate, provide airway control and positive pressure ventilation with supplemental oxygen while you transport the infant. 	
5	<p>XXI. Airway and Respiratory Devices—Pulse Oximetry</p> <ol style="list-style-type: none"> A. Medical equipment that monitors oxygen saturation and is often used by EMTs B. Common reasons for pulse oximetry in the home <ol style="list-style-type: none"> 1. Patient with chronic pulmonary disease who needs to maintain a certain level of blood oxygen saturation 2. Medical need to keep oxygen saturation within a specific therapeutic range 3. Need to monitor oxygen in a patient with fluctuating oxygen demand C. Remember that preexisting pulmonary conditions may rapidly deteriorate into respiratory distress or arrest. D. Determine what the oxygen saturation trends were prior to arrival and what interventions were done. E. Use your own pulse oximeter in assessing the patient. 	
10	<p>XXII. Airway and Respiratory Devices—Tracheostomy Tubes</p> <ol style="list-style-type: none"> A. Surgical opening made through the neck and into the trachea to provide an alternative route for air to move into and out of the body, bypassing the mouth and nose. B. Can be a temporary or permanent opening (stoma) C. Reasons for tracheostomy tube or stoma <ol style="list-style-type: none"> 1. Patients with long-term upper airway problems 2. Medical conditions that result in long-term dependence on a mechanical ventilation 3. Patients who have cancer of the larynx or neck 4. Patients with neuromuscular disorders or congenital deformities 5. Patient in coma or with spinal cord injuries D. Infants have just single lumen; however, children and adults have outer cannula and inner cannula. E. Proximal end of the tracheostomy tube has an adapter that will fit a standard bag-valve mask or flow-restricted, oxygen-powered ventilation device. F. Patient may or may not be able to speak. (Use hand gestures or writing as appropriate.) G. Emergencies <ol style="list-style-type: none"> 1. Tube may become plugged by mucus. 2. Inner cannula of the tube can become dislodged by movement or 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on tracheostomy.</p>

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	<p>occluded by a foreign body.</p> <ol style="list-style-type: none"> 3. Infection or bleeding at the insertion site <p>H. Emergency care—Tube partially or totally occluded</p> <ol style="list-style-type: none"> 1. Use a whistle-tip (soft) suction catheter to clear the airway. 2. Measure the depth of insertion for the suction catheter. 3. Apply suction and slowly withdraw the catheter while twisting it between your fingers. 4. Do not suction for longer than ten to 15 seconds in an adult or five seconds in a pediatric patient at once. 5. Oxygenate between suctioning attempts, and rinse out the lumen of the suction catheter with sterile water between attempts. 6. Keep in mind that manipulation of tracheostomy tube may be outside EMT's protocol. 7. Enlist the help of the primary care provider. <p>I. If tracheostomy tube is patent, problem may be with the patient's ventilator.</p>	
5	<p>XXIII. Airway and Respiratory Devices—CPAP and BiPAP</p> <ol style="list-style-type: none"> A. Continuous positive airway pressure (CPAP) and bilevel positive airway pressure (BiPAP) machines are designed to provide a therapeutic back-pressure during respiration via an airway circuit attached to a mask that covers the mouth and/or nose. B. CPAP device provides a constant pressure during the ventilatory cycle while the BiPAP machine provides a higher pressure during inhalation and a lower pressure during exhalation. C. Both keep the bronchioles open during exhalation, improving oxygenation and ventilation and decreasing the work of breathing. D. Commonly used in patients diagnosed with chronic obstructive pulmonary disease (COPD) and sleep apnea. EMS systems may also use equipment for congestive heart failure (CHF). E. Emergencies related to the devices are rare. F. Use may use a BiPAP machine if your protocol allows and the patient meets your inclusion criteria. G. If a patient uses a CPAP or BiPAP for sleeping and you are treating for some complaint, transport the device to the hospital with the patient and alert the receiving facility that the patient uses it during sleep. 	
5	<p>XXIV. Airway and Respiratory Devices—Home Mechanical Ventilators</p> <ol style="list-style-type: none"> A. Device designed to assist a patient with breathing who cannot breathe 	

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	<p>adequately on his own</p> <p>B. Causes for home mechanical ventilator</p> <ol style="list-style-type: none"> 1. Brain's inability to initiate a spontaneous breath 2. Structural defect to the thorax or lungs 3. History of debilitating stroke, brain damage, or long-term pulmonary problems <p>C. Negative pressure ventilators (e.g., "iron lung") encircle the patient's chest and generate a negative pressure around the thoracic cage that ultimately draws air into the lungs (rarely used).</p> <p>D. Positive pressure ventilators push air into the patient's lungs.</p> <p>E. Can come in a variety of sizes and have two or three controls: ventilatory rate (fixed or adjustable), tidal volume (adjustable), and possibly a control that adjusts the amount of oxygen provided during ventilation (fixed or adjustable)</p> <p>F. Attaches to patient by large-diameter tubing (ventilator circuit); ventilator circuit attaches to tracheostomy tube.</p> <p>G. Alarms</p> <ol style="list-style-type: none"> 1. High-pressure alarm—Activated when pressure needed to cause lung inflation exceeds the present value 2. Low-pressure alarm—Activated when tidal volume falls 50–100 mL below the set tidal volume 3. Apnea alarm—Sounds when the patient stops breathing 4. Low FiO₂—Occurs when the oxygen source is disconnected or depleted <p>H. Remember that an alarm may indicate a change in the patient's clinical condition, not necessarily a ventilator malfunction; always troubleshoot the ventilator and the patient.</p>	
10	<p>XXV. Airway and Respiratory Devices—Accommodations for Patients with Airway or Respiratory Devices</p> <p>A. Dispatch may tell you the type of medical technology the patient uses. This will allow you to start planning your approach to the patient while you are en route.</p> <p>B. Perform scene size-up, and determine if additional backup may be necessary to move the patient and his equipment.</p> <p>C. Conduct the primary assessment in the same sequence as for patients without airway or ventilatory devices (assess mental status, airway, breathing, and so on).</p> <p>D. If you find the patient has a tracheostomy tube, assess it for patency and</p>	

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	<p>clear it immediately if necessary.</p> <ol style="list-style-type: none"> 1. If primary care provider is not available, select a soft or flexible suction catheter and insert it carefully into the tracheostomy tube. 2. Use a sterile technique for suctioning, and use sterile gloves. 3. Avoid inserting the catheter farther than the length of the inner cannula of the tracheostomy. 4. Once the catheter is placed, apply suction while you withdraw the catheter (15 seconds for adults and five seconds for child). 5. Roll the catheter between your fingers during extraction. 6. Be sure to wear the necessary protective equipment, and rinse out the suction catheter with sterile water. <p>E. For dislodgement of the tracheostomy in an adult, the cuff needs to be deflated with a 10 mL syringe prior to removal of the tracheostomy.</p> <p>F. For patient dependent on mechanical ventilator who is breathing inadequately</p> <ol style="list-style-type: none"> 1. Remove the ventilator circuit. 2. Place a BVM on the 15/22 mm of the tracheostomy tube and attempt one or two ventilations. (If ventilations go in easy, problem is likely ventilator failure or problem with ventilatory circuit.) 3. If you do not see immediate rise and fall of the chest and/or the BVM is hard to squeeze, and/or you don't hear alveolar breath sounds, the problem may lie with the patient. (Reassess the airway, clear as appropriate, and reattempt ventilation.) 4. If problem persists, assess for clinical findings and provide management as appropriate for the offending problem. <p>G. Patient should be considered "unstable" and rapidly transported should there be some acute loss of function to the airway, breathing, or circulatory components.</p> <p>H. Patient should be considered "potentially unstable" if there was a mechanical malfunction or clinical change that precipitated a critical intervention by the EMT but now the current status seems stable.</p> <p>I. Patient should be considered "stable" if there was no acute loss of function, no critical interventions were warranted, and the patient is receiving primarily supportive care en route to the hospital.</p> <p>J. Special considerations when transporting</p> <ol style="list-style-type: none"> 1. If ventilator is still operating normally, use the BVM to ventilate the patient carefully while you move him to the ambulance. 2. Plug the patient's ventilator into the onboard inverter and place it back 	<p>Discussion Question What are the special considerations for assessing and managing patients receiving mechanical ventilation at home?</p> <p>Knowledge Application Students should be able to apply the information in this section to the assessment and management of patients using home care devices to support their airway and breathing.</p>

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	<p>on the patient.</p> <p>3. If ventilator is not working, you may wish to take it with you to the hospital and explain any problems to the receiving facility.</p> <p>K. Be sure to document in medically correct and legally sufficient terms exactly what was done in managing the patient’s airway and ventilation to save you from a claim or lawsuit being filed.</p>	
5	<p>XXVI. Vascular Access Devices—Central Intravenous Catheters</p> <p>A. A vascular access device (VAD) is a medical device that is used when a patient is in need of ongoing intravenous medications (usually longer than seven to ten days).</p> <p>B. A central intravenous catheter is a catheter that is placed while the patient is in the hospital and is designed to deliver medication into the central circulation of the body (long, thin, hollow tube that is inserted into the vein of the arm).</p> <p>C. A peripherally inserted central catheter (PICC) is often inserted into the patient’s arm at the antecubital fossa and from there is threaded into the body until the tip lies in the central circulation.</p>	<p>Teaching Tip If available, have several examples of VADs for students to examine.</p> <p>Critical Thinking Discussion What is total parenteral nutrition (TPN)? Why might it be necessary?</p>
2	<p>XXVII. Vascular Access Devices—Central Venous Lines</p> <p>A. Proximal port secured to the anterior chest, just below the clavicle</p> <p>B. Portion of the device remaining outside the body typically has a medical port similar to a traditional intravenous port.</p> <p>C. Commonly sutured to the skin</p>	
3	<p>XXVIII. Vascular Access Devices—Implanted Ports</p> <p>A. Totally implantable venous access system (TIVAS) is a surgically implanted medication delivery device.</p> <p>B. Disc-shaped devices that can be easily palpated beneath the surface of the skin after they are placed</p> <p>C. Typically embedded into the upper chest on the right side</p>	
5	<p>XXIX. Vascular Access Devices—Accommodations for Patients with Vascular Access Devices</p> <p>A. Catheter may become obstructed by clot formation at the tip; thrombus may break off and lodge elsewhere in the body.</p> <p>B. Person with a VAD may be placed on systemic anticoagulant therapy and be</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the complications associated with VADs? • What steps should you take if a VAD becomes dislodged?

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	<p>more susceptible to bleeding disorders.</p> <p>C. VADs can allow air to directly enter the core circulation. Suspect accidental air embolism if patient with VAD complains of symptoms (severe headache, altered mental status, sudden sharp chest pain).</p> <p>D. Keep the insertion site of the VAD dry and covered with a sterile dressing.</p> <p>E. Note any redness, tenderness, warm skin, or purulent discharge that may indicate infection.</p> <p>F. Note any bleeding from the insertion site as tension or tugging may cause the VAD to dislodge. (Cover with bulky sterile dressing and maintain pressure on the site.)</p>	<p>Knowledge Application Students should be able to apply the information in this section to the management of patients with vascular access devices.</p>
15	<p>XXX. Renal Failure and Dialysis—Accommodations for Patients on Dialysis</p> <p>A. Acute renal failure occurs when there is a rapid loss of renal function that results in poor urine production, electrolyte disturbance, and fluid balance disturbance (caused by cessation of renal blood flow or toxic overload in the bloodstream).</p> <p>B. Chronic renal failure (CRF) or chronic kidney disease (CKD) occurs when there is a progressive loss of kidney function over a period of months to years (caused by diabetes mellitus, longstanding hypertension, and inflammation or infection to the glomerulus).</p> <p>C. Dialysis is a medical procedure designed to support the lost function of the kidneys by removing toxins (although total replacement of all renal functions is not possible).</p> <p>D. Hemodialysis is the type of dialysis in which blood is extracted from the body through a membrane that also uses a dialysate fluid to help cleanse the blood.</p> <p>E. A dialysis shunt is a generic term for one of three different ways (AV shunt, AV fistula, AV graft) to join the arterial and venous systems together in such a way that the repeated needlesticks required to take and return blood to the body several times a week cause a minimal amount of damage to the body.</p> <p>F. Peritoneal dialysis is a type of dialysis that is done in the home or the extended-care facility.</p> <p>G. For patient receiving dialysis at a facility</p> <ol style="list-style-type: none"> 1. Do not attempt to remove the patient prematurely (should be done under supervision of the dialysis center staff). 2. Never attempt to obtain a blood pressure in any extremity that has an AV shunt, AV fistula, or AV graft. 	<p>Critical Thinking Discussion How do diabetes and hypertension lead to chronic renal failure?</p> <p>Teaching Tip A tour of a dialysis center will help students understand the dialysis process.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the different types of shunts used for hemodialysis? • What is the difference between hemodialysis and peritoneal dialysis?

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	<p>3. Apply direct pressure to the AV shunt site if it is damaged and bleeding (either internally or externally), treat for shock, and expedite transport.</p> <p>H. Emergencies with peritoneal dialysis are usually not as severe and typically revolve around a displaced catheter, inflammation at the catheter insertion site, or infection of the peritoneal space.</p> <ol style="list-style-type: none"> 1. Keep the catheter insertion site clean and dry. 2. Support any lost function. 3. Transport the patient to the hospital for evaluation. 	<p>Knowledge Application Students should be able to use information from this section to care for patients who receive dialysis.</p>
5	<p>XXXI. Gastrointestinal and Genitourinary—Feeding Tubes</p> <p>A. Medical devices that provide nutrition to patients who cannot chew or swallow because of medical or traumatic conditions resulting in paralysis or unconsciousness (enteral feeding)</p> <p>B. Flexible tube inserted through the nose and ends in the stomach is called a nasogastric tube, or NG-tube.</p> <ol style="list-style-type: none"> 1. Can help in decompressing the stomach 2. Can help in suctioning out ingested toxins 3. Used for short-term nutritional support <p>C. Flexible tube inserted through the mouth and ends up in the stomach is called an orogastric tube, or OG-tube (same functions as NG-tube).</p> <p>D. Gastrostomy is performed for patients in need of long-term nutritional support.</p> <ol style="list-style-type: none"> 1. Gastric tube (G-tube) is placed through the abdominal wall with the tip residing in the stomach. 2. Jejun tube (J-tube) is inserted through the gastric wall with the tip placed in the jejunum. 	<p>Teaching Tip Show examples of several types of feeding tubes and urinary catheters.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on feeding tubes.</p>
5	<p>XXXII. Gastrointestinal and Genitourinary—Ostomy Bags</p> <p>A. Help remove feces from the body by directing feces through the abdominal wall and into a pouch or bag that is attached outside the body</p> <p>B. May be done temporarily or on long-term basis</p> <p>C. Surgical opening is made through the abdominal wall and section of bowel is diverted through the opening.</p>	<p>Critical Thinking Discussion Why might a patient with Crohn’s disease require an ostomy bag?</p>
5	<p>XXXIII. Gastrointestinal and Genitourinary—Urinary Tract Devices</p> <p>A. Urinary catheter is a device that is used to divert urine out of the bladder when there is some type of urinary tract dysfunction.</p> <p>B. Least invasive urinary catheter is called a Texas catheter because it</p>	

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	<p>attaches to the external male urethra in the same manner as a condom would.</p> <p>C. Internal catheters are threaded into the urethra (Foley catheter).</p> <ol style="list-style-type: none"> 1. Commonly seen in home health care settings, hospitals, and extended-care facilities 2. Used for long periods of time <p>D. Suprapubic catheter is surgically inserted through the abdominal wall just superior to the symphysis and into the urinary bladder (used when Foley catheter cannot be used).</p> <p>E. Urostomy is performed when the urinary bladder is unable to collect urine. The urinary tract is surgically diverted through a stoma created in the abdominal wall where a collection bag is attached.</p>	
5	<p>XXXIV. Accommodations for Patients with Gastrointestinal or Genitourinary Devices</p> <p>A. Common problems</p> <ol style="list-style-type: none"> 1. Insertion site infection (UTIs) 2. Device malfunctions from misplacement 3. Obstruction (food/medicine) 4. Dislodgement <p>B. If problems are identified, patient will need transport to the hospital along with his medical device for evaluation and repair.</p> <p>C. If summoned for some other traumatic or medical emergency, perform your assessment and treatment in the same manner as for any other patient with a similar problem.</p> <p>D. If patient has urinary catheter, drain the collection bag prior to transport, taking note of the volume of urine removed and any irregularities. (Document information and share with receiving facility.)</p> <p>E. Always position the collection bag below the urethra so that gravity causes urine to flow into the collection bag.</p>	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some complications associated with feeding tubes? • What are some complications of ostomy bags and ostomy sites? • What precautions should you observe when transporting a patient with a urinary catheter? <p>Knowledge Application Students should be able to integrate this information into the assessment and care of patients with GI/GU devices.</p>
15	<p>XXXV. Intraventricular Shunts—Accommodations for Patients with Intraventricular Shunts</p> <p>A. Hydrocephalus occurs when excess cerebrospinal fluid (CSF) accumulates (more common in pediatrics).</p> <p>B. Excess CSF builds pressure within the skull (intracranial pressure or ICP) and can result in compression of brain tissue.</p> <p>C. Shunt is a long, hollow, and tubelike device that drains excess CSF and keeps the ICP at an acceptable level.</p>	<p>Discussion Question What is hydrocephalus?</p>

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	<p>D. Intraventricular shunts may get infected.</p> <ol style="list-style-type: none"> 1. Shunt extends to a distal site (neck, heart, abdomen, or external collection reservoir). 2. May result in systemic blood infection (sepsis) 3. May cause meningitis <p>E. Intraventricular shunts may become occluded.</p> <ol style="list-style-type: none"> 1. Caused by body trying to block off shunt or one of two ends becoming dislodged 2. ICP may rise to dangerous levels as CSF accumulates in the brain. <p>F. Speed with which the patient's symptoms develop as it relates to the ventricular shunt depends on the type of problem.</p> <p>G. Treatment is geared to supporting depressed or lost functions.</p> <ol style="list-style-type: none"> 1. Manage the airway. (Be alert for occlusion by the tongue if mental status is diminished). 2. If breathing is inadequate, provide positive pressure ventilation with oxygen. 3. Keep the patient in a lateral recumbent position to maintain the airway. 4. Rapidly transport the patient, and contact ALS if the patient is high priority. 	<p>Critical Thinking Discussion What are the indications of increasing intracranial pressure?</p> <p>Knowledge Application Students should be able to apply the information from this section to the assessment and management of patients with intraventricular shunts.</p>
15	<p>XXXVI. Terminally Ill Patients—Accommodations for Terminally Ill Patients</p> <p>A. Terminally ill patients have a disease process that is realistically expected to result in the death of the patient (usually within six months).</p> <p>B. Palliative care is used to describe medical interventions centered on reducing the severity of disease symptoms (not on reversing progression of disease).</p> <p>C. Hospice is a philosophy of care that is aimed at providing palliation of symptoms for the patients and support for their families.</p> <p>D. Common conditions</p> <ol style="list-style-type: none"> 1. Cancer 2. AIDS 3. Alzheimer's disease 4. Cystic fibrosis 5. CHF 6. COPD <p>E. Family may contact EMS when patient nears death instead of hospice provider.</p>	

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	<ol style="list-style-type: none"> 1. Provide emotional support to both the patient and the family and determine clearly their intentions. 2. Communicate with the patient's hospice program provider if the hospice does not already have a care provider at the patient's side to help determine the best course of action. 3. If you do transport patient to the hospital, make all efforts to minimize additional discomfort or pain and provide emotional support or reassurance. <p>F. Not all patients who have a terminal illness receive hospice care; communicate clearly with the patient, family, or primary care provider about any advance directives that may be in place.</p>	<p>Discussion Question What are your obligations in caring for the terminally ill patient?</p> <p>Knowledge Application Students should be able to apply this information to the care of terminally ill patients.</p>
10	<p>XXXVII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 40 Summary. 2. Complete Chapter 40 In Review questions. 3. Complete Chapter 40 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 40 quiz 	<p>Case Study Follow-Up Discussion Do you feel the patient's presentation is more consistent with infection or with obstruction of the shunt? What is your rationale?</p> <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 41

Ambulance Operations and Air Medical Response

145–180 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn to prepare themselves, their equipment, their medical supplies, and their vehicle for an ambulance run.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and En Route information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What daily actions can ensure that you and your vehicle are ready to respond when needed? • What are your responsibilities before, during, and after an EMS call?
5	<p>II. Driving the Ambulance—Laws, Regulations, and Ordinances</p> <p>A. Legal privileges in most states</p> <ol style="list-style-type: none"> 1. Exceed the speed limit, so long as you are not endangering lives or property. 2. Drive the wrong way down a one-way street; drive on the “wrong” side of the road. 3. Turn in any direction at any intersection. 4. Park anywhere as long as you do not endanger lives or property. 5. Leave the ambulance standing in the middle of a street or intersection. 6. Cautiously proceed through a red light or red flashing signal. 7. Pass other vehicles in no-passing zones. <p>B. Qualifications required by law</p> <ol style="list-style-type: none"> 1. Have a valid driver’s license. 2. Pass an approved driving course (mandatory in most states). 3. Be responding to an emergency of a serious nature. 4. Use warning devices (emergency lights, horns, sirens). 5. Exercise due regard for the safety of others. 6. Obey any specific rules or requirements of your EMS system. 	<p>Teaching Tip</p> <p>Be prepared to discuss local regulations, policies, and practices regarding emergency vehicle operations.</p> <p>Discussion Question</p> <p>What are some of the privileges generally granted to emergency drivers?</p>

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25	<p>III. Driving the Ambulance—Driving Excellence</p> <p>A. Basics of good driving</p> <ol style="list-style-type: none"> 1. Always wear a seat belt. 2. Hold the steering wheel with both hands at all times. 3. Practice driving your ambulance until you are familiar and comfortable with its responses. 4. Recognize and respond to changes in weather and road conditions. 5. When transporting a patient, select the route best suited for safe travel. 6. Maintain a safe following distance. 7. Exercise caution when using red lights and siren. <p>B. Maintaining control</p> <ol style="list-style-type: none"> 1. Braking <ol style="list-style-type: none"> a. Pump the brakes slowly and smoothly. b. Never brake on a curve. c. Rest your foot lightly on the brake when decelerating. 2. Driver distraction—Minimize as much as possible. 3. Driver alone—Focus on safe operation of the vehicle. 4. Fatigue—To avoid fatigue, get proper rest and nutrition before your shift. 5. Railroads <ol style="list-style-type: none"> a. If a long slow-moving train is blocking your path, there may be an underpass or overpass within a reasonable distance. b. Never try to drive across tracks in front of a moving train. 6. School buses <ol style="list-style-type: none"> a. Always be alert for children. b. Follow state laws regarding passing of school buses. 7. Bridges and tunnels <ol style="list-style-type: none"> a. Due to difficulty of passing, consider an alternate route. b. If there is no alternate route, try to get control of the situation before entering bridge or tunnel. c. Be sure the height of the bridge or tunnel can accommodate the height of the ambulance. 8. Day of the week—Be aware that the calendar affects the amount and flow of traffic (e.g. less urban traffic on weekends). 9. Time of day—Be aware of rush hour, school zones, and industrial plant shift changes. 10. Road surface <ol style="list-style-type: none"> a. Avoid potholes and bumps. b. Decrease speed on bad or unpaved roads. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some considerations in selecting the safest, as opposed to the quickest, route of travel to a destination? • What are some issues that may cause the driver to lose control of a vehicle? • What is the proper way to negotiate curves when driving? <p>Knowledge Application Students should be able to apply principles of safe driving, both in personal vehicles and when driving the ambulance.</p> <p>Critical Thinking Discussion If you were a policy maker, what would you do to decrease the number of injuries and deaths from ambulance crashes?</p> <p>Class Activity If your circumstances (location, liability issues and so on) allow, let students drive the ambulance in a vacant parking lot under the direction of an experienced emergency vehicle operator to get an idea of how an ambulance handles differently from a personal vehicle.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on safe driving tips.</p>

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	<ul style="list-style-type: none"> 11. Backing up—Use all resources (such as mirrors) and proceed with caution. 12. Higher speeds <ul style="list-style-type: none"> a. Negotiate curves with extra care. <ul style="list-style-type: none"> i. Brake to the proper speed before entering a curve. ii. Accelerate carefully and gradually as you leave a curve. iii. Keep your exit from the curve slow and steady. b. Use a lower gear when going down a long hill. c. Always use a smooth braking motion. 13. Aggressive drivers—Exercise extreme caution and avoid. 14. Escorts—Use only if you do not know how to find the hospital or the victim. 15. Intersection collisions—Causes <ul style="list-style-type: none"> a. A motorist speeds up and goes through just as the light is turning red. b. Motorist does not anticipate the presence of a second emergency vehicle. c. Vehicles may block your view of pedestrians in the crosswalk. C. Driving in inclement weather <ul style="list-style-type: none"> 1. Rainy or wet weather <ul style="list-style-type: none"> a. Keep mirrors cleared of water. b. Avoid sudden braking and sudden moves of the steering wheel. c. Slow down when approaching a large standing puddle, and turn on your wipers. d. If you begin to hydroplane <ul style="list-style-type: none"> i. Hold the wheel steady. ii. Take your foot from the accelerator. iii. Gently pump the brake. 2. Winter driving <ul style="list-style-type: none"> a. Make sure that your engine is tuned, your heater and defroster work, and your battery is charged. b. Carry emergency weather equipment (chains, shovel, sand, and so on). c. Equip the ambulance with studded snow tires. d. Stay aware of the temperature. e. Avoid sudden movements of the steering wheel and sudden braking. 3. Fog, mist, dust storms, smog <ul style="list-style-type: none"> a. Slow down but avoid sudden deceleration. 	<p style="text-align: center;">Discussion Question</p> <p>What are some special considerations for driving in poor weather and at night?</p>

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	<ul style="list-style-type: none"> b. Watch the road ahead and behind for other slow-moving cars. c. Turn on your lights (never high beams) and use your wipers. d. Use four-way flashers <ul style="list-style-type: none"> i. If you are traveling 15 miles or more below the speed limit ii. If you pull off the road and stop e. Use the defroster. f. Tap your brake pedal several times if you need to slow down. g. Be alert for vehicles in front of you. <p>D. Driving at night</p> <ul style="list-style-type: none"> 1. Make sure that your ambulance has quartz-halogen headlights. 2. Have your headlights on whenever traveling in an emergency. 3. Keep your headlights clean and properly aimed. 4. Replace burned-out bulbs immediately. 5. Dim your high beams <ul style="list-style-type: none"> a. 500 feet of an approaching vehicle b. 300 feet of a vehicle in front of you 6. Never stare into the high beams of another car. 7. Do not flick your high beams up and down. 8. Never use high beams when going into a curve. 9. Keep your windshield clean. 10. Keep your instrument panels dim. 11. Keep your eyes moving. 12. If your windshield is not getting properly cleaned <ul style="list-style-type: none"> a. Replace your window-washer blades. b. Try a stronger washing solution. 13. Be sure that you are properly fed and rested before a night driving shift. 14. Be alert for intoxicated or drowsy drivers, and use extreme caution in passing. 	
2	<p>IV. Warning Devices—Colors and Markings</p> <ul style="list-style-type: none"> A. Federally mandated B. Provide quick identification by the public C. Maximize visibility in traffic D. White with orange stripe around body E. Blue lettering and “Star of Life” symbol 	

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3	<p>V. Warning Devices—Warning Lights and Emergency Lights</p> <ul style="list-style-type: none"> A. Activate at all times when responding to emergency calls. B. Use lights even when not using siren. C. Turn on headlights at all times to aid in visibility. D. Lights should cast a beam above traffic and be high enough to be visible in the rearview mirror of the car in front. E. Use only minimal lighting in heavy fog or when you are parked. F. Use emergency lights only when needed (such as for rapid transport). 	<p>Discussion Question What are the risks and benefits of using warning devices?</p> <p>Knowledge Application Given several scenarios, students should be able to select the appropriate use of warning devices on the ambulance.</p>
5	<p>VI. Warning Devices—Using Your Siren</p> <ul style="list-style-type: none"> A. Do not assume that drivers are aware of you unless they respond to your presence. B. Never pull directly behind a car and blast your siren. C. Be aware that the siren may cause physical and emotional stress on the patient. D. Always let the patient know before you activate the siren. E. Be aware that the siren may unnerve you or make you tense, which in turn can push you to drive faster and with less care than you should. F. Follow state laws and local protocol regarding siren use. 	<p>Critical Thinking Discussion Does siren noise pose a risk to the hearing of EMS personnel? If so, how can they minimize that risk?</p>
5	<p>VII. Warning Devices—Using Your Air Horn</p> <ul style="list-style-type: none"> A. Avoid overuse. B. Use to clear traffic quickly when necessary. C. Use with or without siren, depending on state laws and local protocol. D. Do not sound horn when you are close to other vehicles. E. Do not assume that drivers will hear or heed the horn. 	<p>Discussion Question What are some reasons sirens and air horns may not be effective?</p>
5	<p>VIII. Roadway Incident Scene Safety—High-Visibility Apparel</p> <ul style="list-style-type: none"> A. American National Standards Institute (ANSI) / International Safety Equipment Association (ISEA) 107-2004, American National Standard for High-Visibility Safety Apparel and Headwear <ol style="list-style-type: none"> 1. Class 1: for workers in parking lots and other areas with traffic moving at less than 25 mph 2. Class 2: for personnel whose attention is diverted from traffic or where the traffic is moving at 25 mph or greater 3. Class 3: for personnel whose work greatly diverts their attention from 	<p>Teaching Tip Demonstrate the use of safety apparel and other items used to increase safety when working at roadway incidents.</p>

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	<p style="text-align: center;">traffic and where they are at serious risk from moving vehicles</p> <p>B. ANSI/ISEA 207-2006, American National Standard for High-Visibility Public Safety Vests (PSVs)</p> <ol style="list-style-type: none"> 1. Same retro-reflective material as Class 2 vest 2. Nearly the same amount of fluorescent material 3. Breakaway features and specific dimensions to allow fit over gear 4. Color-specific markings (law enforcement, fire, EMS) <p>C. On right-of-way of all federally funded highways, Code of Federal Regulations requires wearing a Class 2 or 3 of ANSI/ISEA 107-2004 or PSV (ANSI/ISEA 207-2006).</p>	
15	<p>IX. Roadway Incident Scene Safety—Safety Benchmarks</p> <ol style="list-style-type: none"> A. Do not trust approaching traffic. B. Do not turn your back on approaching traffic. C. Position the first arriving emergency vehicle to create a physical barrier between upstream traffic and the scene. D. Wear appropriate personal protective equipment and ANSI high-visibility vests. E. At night, turn off vision-impairing lights on emergency vehicles positioned to oncoming traffic. F. Use other emergency vehicles to slow down and redirect traffic. G. Use advance warning signs and other traffic control measures to reduce speed of oncoming traffic. H. Use traffic cones for traffic control. I. Assign someone to monitor oncoming traffic. J. Place your vehicle uphill and upwind from the scene to avoid potential contamination from leaking or airborne chemical or other hazards. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What steps can you take to keep yourself safer at roadway incidents? • What can cause driver distraction despite the safety measures you may take at roadway scenes? <p>Knowledge Application Given several scenarios, students should be able to identify and manage hazards when responding to roadway incidents.</p> <p>Critical Thinking Discussion What can be done to increase EMS provider safety at roadway incidents?</p> <p>Class Activity If your circumstances (location, liability issues and so on) allow, use a vacant parking lot to provide students with scenarios in which they must set up a safe roadway response scene.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency</i></p>

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		<p><i>Care</i>, 9th edition to access a web resource from the National Institute for National Safety and Health about the FACE Program.</p>
5	<p>X. Phases of an Ambulance Call—Daily Prerun Preparation</p> <p>A. Ambulance maintenance benefits</p> <ol style="list-style-type: none"> 1. Decreased vehicle down time 2. Improved response times to scenes 3. Safer emergency and nonemergency responses 4. Improved transport times to medical facilities 5. Safer patient transport to medical facilities <p>B. Daily inspection of vehicle</p> <p>C. Ambulance equipment—Check, restock, clean, maintain, and secure as needed.</p> <p>D. Personnel—Follow state laws and protocols for staffing.</p> <p>E. Dispatch: will provide information which you should write down:</p> <ol style="list-style-type: none"> 1. Location of the call 2. Nature of the call 3. Name, location, and callback number of caller 4. Location of patient(s) at the scene 5. Number of patients and severity of problem(s) 6. Any other pertinent special problems or circumstances 	<p>Teaching Tip Have students carry out all phases of an ambulance run on mock calls.</p> <p>Discussion Question What are the EMT's responsibilities in the prerun phase?</p> <p>Knowledge Application Students should be able to perform their responsibilities in all phases of an EMS call.</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on the American Ambulance Association and the Commission on Accreditation of Ambulance Services.</p>
6	<p>XI. Phases of an Ambulance Call—En Route to the Scene</p> <p>A. Before departure</p> <ol style="list-style-type: none"> 1. Check that doors are closed and secure. 2. Check that external shoreline cords are disconnected. 3. Check that jump kits are retrieved and properly stowed. <p>B. Fasten your seat belt and make sure that every else has done the same.</p> <p>C. Write down information from the dispatcher.</p> <p>D. Confirm the following dispatch information.</p> <ol style="list-style-type: none"> 1. Location of the call 2. Nature of the call 3. Location of the patient(s) 4. Number of patients and severity of problem 	

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	<ul style="list-style-type: none"> 5. Any other special conditions or problems 6. If any other units are en route E. Listen for status reports from other units on the scene. F. Think about what equipment you will take into the scene. G. Remain relaxed, yet focused. Be aware that less than five percent of all ambulance runs involve life-threatening emergencies. H. Drive responsibly. I. Determine each team member's responsibility before arriving on the scene. J. Call for advanced life support if necessary. 	
7	<p>XII. Phases of an Ambulance Call—At the Scene</p> <ul style="list-style-type: none"> A. Notify dispatch of arrival. B. Park in the safest place, one that will allow you to load the patient and depart. C. Perform a full 360-degree scene survey, looking for risk factors. <ul style="list-style-type: none"> 1. Downed electrical wires 2. Leaking fuel or fluid from accident vehicle 3. Smoke or fire 4. Broken glass 5. Trapped or ejected patients 6. Mechanism of injury D. Keep the following considerations in mind when parking. <ul style="list-style-type: none"> 1. If another emergency vehicle is positioned to block the scene, park in front of or behind a collision but never next to it. 2. If no other emergency vehicle is present, position to ambulance to provide a safety zone. 3. Block a narrow no-parking road completely. 4. Park in a driveway or on the shoulder of the road whenever possible. 5. Stay at least 100 feet from a burning vehicle. 6. Stay at least 2,000 feet from a hazardous materials spill. E. Put on approved high-visibility safety vest if you are working near a highway. F. Take necessary Standard Precautions. G. Determine whether it is safe to approach the patient. H. Call the dispatcher immediately for the following. <ul style="list-style-type: none"> 1. Mechanical failure occurs. 2. You need backup equipment or personnel. I. Be prepared to find that the situation has changed since the dispatcher's call. 	<p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video about Standard Precautions and equipment.</p>

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	<ul style="list-style-type: none"> J. Carefully observe the complete incident or scene as you approach. K. Determine the mechanism of the patient's injury. L. Determine the total number of patients before beginning to treat anyone. M. Determine the priority of care. N. Carefully gain access to patient(s) in a crashed motor vehicle and extricate him safely. O. Splint and immobilize injured extremities before moving the patient unless he is unstable and needs immediate transport. P. Carefully remove the patient from any wreckage and move him to the ambulance. Q. Transfer the patient to the ambulance. 	
7	<p>XIII. Phases of an Ambulance Call—En Route to the Receiving Facility</p> <ul style="list-style-type: none"> A. Before you leave the scene <ul style="list-style-type: none"> 1. Ensure that all hazards have been controlled. 2. Pick up and dispose of equipment properly. 3. Turn the scene over to the appropriate agency (police, fire, and so on) if required. B. Make sure the patient is settled and securely strapped to the cot; reassure him and tell him where you are going. C. Driver should check the unit, making sure that doors, equipment, and supplies are secure. D. All personnel in the unit should be seated and wearing seat belts. E. Determine the need for lights and siren during transport. F. Begin reassessment and conduct at intervals. <ul style="list-style-type: none"> 1. 15 minutes for a stable patient 2. Five minutes for an unstable patient G. Notify dispatch that you are en route. H. Check any patient interventions, oxygen flow, dressings, and splints. I. If a relative or friend accompanies the patient <ul style="list-style-type: none"> 1. Allow him in the patient compartment only if <ul style="list-style-type: none"> a. Local protocols permit b. He is under emotional control. 2. Keep in mind that it is often helpful to have a parent accompany a juvenile patient. 3. Provide adequate safety restraint, including for children. 4. Use a car seat to transport a child under 40 pounds, unless the child is immobilized on a backboard. 	<p>Discussion Question What are the EMT's responsibilities en route to, during, and when transporting patients from calls?</p>

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	<ul style="list-style-type: none"> 5. Always follow local protocol. J. Focus on the patient: reassuring him, speaking gently, listening, answering honestly, and providing explanation as needed. K. Drive prudently. L. Keep the driver informed of the patient's condition, especially if driving (bumps or speed) is affecting patient. M. Notify the receiving medical facility as soon as the patient's condition permits. N. Continue to reassess the patient's condition and notify the receiving facility if that condition deteriorates. 	
5	<p>XIV. Phases of an Ambulance Call—At the Receiving Facility</p> <ul style="list-style-type: none"> A. Notify dispatch of your arrival. B. Make the official transfer of care to appropriate health care provider at the facility. C. Transfer all patient records and information to appropriate emergency department personnel. D. Give emergency department personnel a complete oral report at the patient's bedside. <ul style="list-style-type: none"> 1. Introduce the patient by name, if you know it. 2. Repeat the patient's chief complaint. 3. Provide vital signs taken en route. 4. Report any history not given previously. 5. Report any additional treatment you provided. E. Assist emergency department personnel to lift and move patient if requested. F. Make sure that patient's personal effects or valuables are transferred with him. G. Exchange linens, spine boards, and other equipment that must stay at the hospital. H. Complete the prehospital care report before you leave. I. Ask hospital personnel if you are needed to transport the patient home or to another facility. 	
5	<p>XV. Phases of an Ambulance Call—En Route to the Station or Response Area</p> <ul style="list-style-type: none"> A. At the hospital, clean and inspect your ambulance, equipment, and supplies. <ul style="list-style-type: none"> 1. Follow your agency's biohazard disposal procedures. 2. Dispose of any contaminated linen. 	

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	<ul style="list-style-type: none"> 3. Disinfect any reusable patient care equipment. 4. If necessary, go “out of service” and return to the station to complete these steps. B. Wash your hands. C. Radio the dispatcher that you are returning. D. Buckle your seat belt and drive carefully to your station or response area. E. Refuel your vehicle according to local protocol. 	
5	<p>XVI. Phases of an Ambulance Call—Post Run</p> <ul style="list-style-type: none"> A. Guidelines <ul style="list-style-type: none"> 1. Fill out and file all required reports. 2. Check fuel tank and refill when necessary. 3. Complete an inventory of equipment and supplies; replace, clean, and disinfect as needed. 4. Change soiled uniforms. 5. Notify dispatch that you are in service. B. Infection control procedures <ul style="list-style-type: none"> 1. Dispose of sharps (needles, blades, and so on) in clearly labeled, puncture-resistant containers. 2. Wash hands: soap and water when available, otherwise with waterless antiseptic hand cleaner. 3. Clean, disinfect, or sterilize contaminated equipment. <ul style="list-style-type: none"> a. Clean up visible spills of blood or other bodily fluids. b. Disinfect reusable patient care equipment. <ul style="list-style-type: none"> i. Low-level disinfection—Routine housekeeping on surfaces such as floors and countertops when there are no visible bodily fluids and when tuberculosis is not suspected ii. Intermediate-level disinfection—Surfaces that come into contact with intact skin (stethoscope, splint, and so on) iii. High-level disinfection—Reusable instruments that come into contact with mucous membranes (laryngoscopes, blades, and so on) iv. Sterilization—Equipment that will be used invasively 4. Launder soiled clothing and linens. <ul style="list-style-type: none"> a. Handle as little as possible and wear gloves. b. Bag in clearly marked biohazard bags. c. Wash in normal laundry cycles with regular detergent. 	<p>Discussion Question What are the EMT’s responsibilities in the post-run phase?</p>

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	<p>d. Launder according to label instructions.</p> <p>5. Dispose of infectious wastes—Place in labeled and sealed biohazard bags and follow local protocol.</p>	
5	<p>XVII. Air Medical Transport—When to Request Air Medical Transport</p> <p>A. Operational guidelines</p> <ol style="list-style-type: none"> 1. The patient needs transport to a distant trauma center or other special care facility. 2. A high-priority patient is entrapped, and a prolonged extrication is expected. 3. Time of transport is critical, and air transport will clearly save time. 4. The patient is in a remote area that cannot be reached by ground vehicles. 5. Ground ambulance transport is blocked. 6. The air crew possesses special medical skills, supplies, or equipment not available to the ground crew. <p>B. Medical guidelines</p> <ol style="list-style-type: none"> 1. Acute stroke 2. Head injury with altered mental status and signs of herniation 3. Chest or abdominal trauma with sings of respiratory distress or shock 4. Serious mechanism of injury with unstable primary assessment findings or unstable vital signs 5. Penetrating injury to body cavity with unstable primary assessment findings 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Arrange for a safety demonstration by an air medical transport service. • Discuss local policies and protocols related to air medical transport. <p>Discussion Question What are the considerations in determining whether air medical transport is appropriate?</p> <p>Knowledge Application Students should be able to evaluate criteria for considering air medical transport.</p>
5	<p>XVIII. Air Medical Transport—Requesting Air Medical Transport</p> <p>A. Follow all local guidelines and policies.</p> <p>B. Provide the following information:</p> <ol style="list-style-type: none"> 1. Your name 2. Department name 3. Call-back number 4. Nature of the incident 5. Exact location of the incident (with landmarks or GPS coordinates if possible) 6. Radio frequency you use 7. Exact location of the landing zone and surrounding hazards 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on air medical services.</p>

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5	<p>XIX. Air Medical Transport—Additional Considerations for Air Medical Transport</p> <ul style="list-style-type: none"> A. Weather/environmental limitations B. Altitude limitations C. Airspeed limitations D. Aircraft cabin size E. Terrain F. Cost G. Patient preparation 	<p>Critical Thinking Discussion What are some disadvantages to using air medical transport?</p>
5	<p>XX. Air Medical Transport—Setting Up a Landing Zone</p> <ul style="list-style-type: none"> A. Make sure the landing area is clear of obstructions. B. If the landing site is a divided highway, stop traffic in both directions. C. Consider the wind direction. D. Mark each corner of the landing with a visible marker. E. Put a fifth marker on the upwind side to designate wind direction. F. Have the area wet down if conditions are severely dry. G. Keep the patient and crew clear of the air downwash. H. Assign one person to guide the pilot in. I. Give primary care to the patient and follow the pilot's instructions relating to the craft's operation. J. Be extremely cautious of the rotor-blades. K. Never approach a helicopter until the pilot indicates that it is safe. L. Secure all loose items. M. Do not smoke within 50 feet of the aircraft. N. If the helicopter has to land on a slope, always approach it from the downhill side. O. Never point spotlights up at a helicopter on its final approach at night. P. If possible, arrange a rendezvous with the helicopter at a predesignated helipad specifically designed for helicopter landings. 	
10	<p>XXI. Security and Safety—Operational Security Measures</p> <ul style="list-style-type: none"> A. Personnel <ul style="list-style-type: none"> 1. At the start of each shift, conduct a security briefing regarding any possible threats to EMS crew or service. 2. Inform EMS crew members to allow their best participation. B. Vehicle <ul style="list-style-type: none"> 1. All EMS vehicles must be tracked at all times. 	<p>Knowledge Application Students should be able to apply basic safety and security measures to prevent unauthorized use of ambulances and to prevent carbon monoxide poisoning.</p>

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	<ol style="list-style-type: none"> 2. Never leave EMS vehicle running or unattended with keys in ignition. <p>C. Tracking of vehicle access</p> <ol style="list-style-type: none"> 1. Secure all off-service vehicles at stations or other locations. 2. Conduct random and routine vehicle audits. 3. Keep a comprehensive key log to account for keys to vehicles, restricted stations, and restricted areas. 4. Enforce security measures when the EMS vehicle is off the EMS premises for repairs. 5. Remove or destroy all identifying EMS markings from any vehicle that is sold, unless sold to another EMS organization. <p>D. Uniforms and identification items</p> <ol style="list-style-type: none"> 1. Safeguard EMS patches and ID cards from unauthorized personnel. 2. Ensure that ID cards and badges are counterfeit resistant and include a photo. 3. Uniform stores—Sell only to EMS personnel with valid photo ID or other valid credentials. 	
10	<p>XXII. Security and Safety—Carbon Monoxide in Ambulances</p> <p>A. Sources</p> <ol style="list-style-type: none"> 1. Ambulance exhaust gases 2. Supplemental gasoline or liquid-petroleum-gas-powered equipment 3. Exhaust gases of vehicles parked next to or traveling by the ambulance 4. Greater outside air pressure <p>B. Symptoms</p> <ol style="list-style-type: none"> 1. Yawning 2. Dizziness 3. Dimmed vision 4. Headache 5. Irregular heart rhythm 6. Nausea or vomiting 7. Seizures and coma followed by death (if exposure is extended or if there are high concentrations) <p>C. Treatment—Remove patient from ambulance and administer oxygen by nonrebreather mask.</p> <p>D. Prevention</p> <ol style="list-style-type: none"> 1. Frequent engine tune-ups 2. Adequate exhaust system 3. Keeping rear windows shut 	<p>Teaching Tip Discuss local policies relating to security and prevention of carbon monoxide poisoning.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the signs and symptoms of carbon monoxide poisoning? • What measures can you take to decrease your risk of carbon monoxide poisoning?

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	<ol style="list-style-type: none"> 4. Keeping doors tightly shut 5. Covering any opening to the outside 6. Not using ventilation exhaust fans or static roof vents 7. Running heater or air conditioner 8. Not using supplemental gasoline or liquid-petroleum-gas-powered equipment inside the ambulance 	
<p style="text-align: center;">10</p>	<p>XXIII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 41 Summary. 2. Complete Chapter 41 In Review questions. 3. Complete Chapter 41 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 41 quiz 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • How could things have turned out differently if the EMTs had not fulfilled their obligations in the prerun phase? • How do your post-run activities affect the care of patients cared for by the next shift? <p>Class Activity</p> <p>Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan
Chapter 42
Gaining Access and Patient Extrication
110–140 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about their roles as EMTs in patient rescue situations.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What dangers to you are present? • What additional resources do you need?
5	<p>II. Planning Ahead—Dispatch</p> <p>A. As soon as you receive the call from dispatch, evaluate possible obstacles.</p> <ol style="list-style-type: none"> 1. Is the patient ill or injured? 2. What is the mechanism of injury? 3. What is the location of the incident? 4. What time of day is it? 5. What is the weather like? 6. Is there a report of entrapment? 7. Is there a report of a leak or spill? <p>B. Plan for access and extrication problems based on dispatch information.</p>	
5	<p>III. Planning Ahead—Location</p> <p>A. Identify locations and occupations in your area that may present access difficulties.</p> <ol style="list-style-type: none"> 1. Utility employees work above and below ground. 2. Construction workers work everywhere from ditches to rooftops and around heavy equipment. 3. Painters work on ladders and scaffolding, which may be placed on soft, unstable ground. 4. Antennas and water towers need periodic maintenance. 5. Industrial sites offer all these potential risks and problems and more. 	<p>Discussion Question</p> <p>What are some locations in your community that might require special consideration for access?</p>

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	<p>6. Some intersections are well known for serious collisions.</p> <p>B. Remember that most injuries result from a person falling or from something falling on him.</p> <p>C. Always have strategies in mind for gaining access to a difficult location.</p>	
5	<p>IV. Planning Ahead—Motor Vehicle Collisions</p> <p>A. EMTs encounter far more car crashes than any other type of rescue situation.</p> <p>B. Consider factors such as location and time of day as you anticipate how you will rescue patients.</p> <p>C. More crashes occur during high traffic times, but speeds are slower so there is less chance of entrapment and serious injuries.</p> <p>D. More serious crashes occur when traffic thins because speeds are faster.</p> <p>E. Entrapment is more likely to be a factor in a freeway collision than in a parking-lot collision.</p>	
10	<p>V. Sizing Up the Scene—Perform a 360-Degree Assessment</p> <p>A. Assess before getting out of the ambulance, if possible.</p> <p>B. Look at the front, both sides, and the rear of the vehicle.</p> <p>C. Inspect the vehicle above and below.</p> <p>D. Assess for potential hazards to yourself, your crew, the patient, and bystanders.</p> <ol style="list-style-type: none"> 1. Downed electrical wires 2. Broken glass 3. Leaking fuel or fluid 4. Smoke or fire near or coming from the vehicle 5. Broken glass, jagged metal, other sharp objects <p>E. Attempt to identify trapped or ejected patients and potential mechanisms of injury.</p>	<p>Teaching Tip Very briefly describe a series of scene situations, such as motor vehicle collisions, specific industrial sites, and so on. Have students list the types of hazards and issues anticipated at the scene.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What does 360-degree assessment mean? • What actions should you take as you approach a vehicle involved in a collision? <p>Knowledge Application Given several scenarios, students should be able to size up a scene.</p>

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2	<p>VI. Sizing Up the Scene—Evaluate the Need for Additional Resources</p> <ul style="list-style-type: none"> A. Extrication team or equipment B. Fire suppression C. Law enforcement D. Hazardous material team E. Utility company (electric, natural gas) F. Air medical evacuation G. Swift water rescue (if vehicle is trapped in fast-moving water) 	<p>Discussion Question What are some additional resources that you might need at the scene of a motor vehicle collision?</p>
3	<p>VII. Sizing Up the Scene—Personal Protective Equipment</p> <ul style="list-style-type: none"> A. Wear/use proper protective clothing and equipment at every incident where hazards are or may be present. B. Never jeopardize your own safety or that of any other rescuer. C. Always wear the minimum level of protective gear. <ul style="list-style-type: none"> 1. Eye protection 2. Disposable gloves 3. Any additional protection necessary to prevent direct contact with blood or bodily fluid D. If you are working on or near a roadway, wear a high-visibility safety vest. E. If you have to extricate a patient from a wreck, wear full turnout gear. <ul style="list-style-type: none"> 1. Coat 2. Brightly colored and highly visible vest 3. Bunker pants 4. Steel-toed boots 5. Head protection (such as a standard fire helmet) 6. Heavy leather gloves F. Know and follow your local protocol and standard operating policies. 	
10	<p>VIII. Sizing Up the Scene—Scene Safety</p> <ul style="list-style-type: none"> A. Electrical lines <ul style="list-style-type: none"> 1. Always assume that a downed power line is electrically alive. 2. If electrical lines are down near the crash <ul style="list-style-type: none"> a. Secure the scene. b. Clear the area for X feet from the pole in all directions, when line is downed X number of feet from pole. 3. If downed power lines are in contact with the wreck <ul style="list-style-type: none"> a. Stay away from the wreck. b. Request special assistance from the electric company. 	<p>Discussion Question What are the recommended guidelines for dealing with downed utility lines?</p>

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	<ol style="list-style-type: none"> 4. If patients are still in the vehicle <ol style="list-style-type: none"> a. Call to them over your unit's PA system. b. Tell them that the electric company is en route. c. Tell them to stay inside the vehicle. d. Tell them not to touch any metal within the vehicle. 5. If the electric company is not able to respond, specially trained rescue personnel may move the downed line. 6. If the situation is immediately life threatening <ol style="list-style-type: none"> a. You may have to tell patients to jump clear of the vehicle with feet together; they may be in contact with either the car or the ground, but not both at once. b. Tell patients to move with small shuffling steps so that both feet always touch each other and the ground. <p>B. Control traffic flow</p> <ol style="list-style-type: none"> 1. Assign someone to be solely responsible for directing traffic. 2. Stop all traffic and reroute it to different roads. 3. Channel traffic a minimum of 50 feet from the wreck. 4. Use extreme care. <ol style="list-style-type: none"> a. Use fire apparatus and other emergency response vehicles to block the safety zone. b. Angle the ambulance with the patient loading doors away from moving traffic. c. Always face oncoming traffic and be aware of erratic driving. d. Use flares, chemical lights, or reflective cones to warn drivers. e. Do not place flares where they will come into contact with a fluid or fuel spill. <p>C. Alternative-fueled vehicle systems</p> <ol style="list-style-type: none"> 1. Hybrid vehicles use a combination of electric power and gasoline. 2. High-voltage batteries and cables pose a risk of electric shock. 3. Natural gas and hydrogen used as fuel are stored in high-pressure containers that pose serious risks if punctured or exposed to fire. <p>D. Undeployed air bags: always deactivate by disconnecting the car's battery cables.</p> <p>E. Energy-absorbing bumpers can seriously injure anyone standing too close when they spring into position.</p>	<p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on traffic safety and risks posed by air bags during emergencies.</p> <p>Critical Thinking Discussion How can you find out more about particular hazards associated with specific types of vehicles?</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some hazards posed by alternative-fueled vehicles? • Why does air bag deployment remain a hazard even after a collision?
	IX. Sizing Up the Scene—Locate All Patients	Discussion Question

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2	<ul style="list-style-type: none"> A. If only one patient is involved, locate him before attempting to gain access so as to protect him from further injury. B. If more than one patient is involved, look for patients both at the site and in the immediate vicinity. C. If you see no patients at all, look for clues as to where they may be; ask bystanders; involve the police if necessary. 	<p>What are some clues that you may have more patients than initially accounted for at a scene?</p>
3	<p>X. Sizing Up the Scene—Vehicle Safety</p> <ul style="list-style-type: none"> A. Put your ambulance’s fire extinguisher near the collision if there is no fire engine on site. B. Stabilize the vehicles in the wreck. <ul style="list-style-type: none"> 1. Place stabilizing chocks under the vehicle and deflate the tires. 2. Shut off the engine, set the parking brake, and shift the automatic transmission to “park” or the manual transmission to any gear. 3. Place firm, heavy objects in front and back of wheels to minimize vehicle movement. C. Before turning off ignition or disconnecting power <ul style="list-style-type: none"> 1. Lower power windows 2. Unlock power doors 3. Move power seat to the position that provides greatest patient access D. If you have to disconnect the car battery, remove the negative cable first. E. If the vehicle is unstable and unsafe and you cannot stabilize it, wait for additional personnel. 	<p>Class Activity</p> <p>In a vacant parking lot, set up mock scenes using vehicles. Allow students to practice sizing up the scene. Be creative in planting clues to additional patients and potential hazards.</p>
10	<p>XI. Gaining Access—Residential Access</p> <ul style="list-style-type: none"> A. Locked front door <ul style="list-style-type: none"> 1. Check all the doors and windows for one that is open. 2. Shout to the patient and look for him through windows. 3. Ask the patient if a neighbor has a key. 4. Ask a neighbor if he has the key or knows who does. 5. Call for police if you need to break in; wait for their arrival if possible. B. Breaking in <ul style="list-style-type: none"> 1. Before breaking in, try steps for a locked front door. 2. If a screen blocks access through an open window, cut through the screen. 3. Choose a window to break. 	<p>Discussion Question</p> <p>What are the preferred ways of accessing a residence?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ul style="list-style-type: none"> a. Where there are no patients in the room b. Where you can see what is in the room c. Which is small and appears inexpensively and easily repaired 4. Tell the patient what you are going to do. 5. Wear eye protection, heavy work gloves, and a coat. 6. Stand alongside the window. 7. Grasp one end of a tire iron or flashlight firmly and strike the corner of the pane nearest to you. 8. Clear the broken glass out of the frame before reaching in to unlock the window or door. C. Barred windows—Call fire department or other emergency services that are equipped to force an entry. 	
10	<p>XII. Gaining Access—Motor Vehicle Access</p> <ul style="list-style-type: none"> A. Simple access <ul style="list-style-type: none"> 1. Test the car door handle to see if it is unlocked. 2. If all doors are locked, reach through an open window to unlock one. 3. If all the windows are closed, ask the patient to try, without moving his head or neck, to unlock a door or lower a window. B. Complex access—Breaking a car window <ul style="list-style-type: none"> 1. Tell the patient you will have to break in through a window to get him out. 2. Put on heavy gloves and eye protection. 3. Locate the window farthest from the patient. <ul style="list-style-type: none"> a. If time allows, cover the window with contact paper or strips of broad tape. b. If time does not allow for taping the window, cover the patient or have him cover himself. 4. Place a sharp tool such as a screwdriver or center punch against a lower corner of the window. 5. Strike the sharp tool with a hammer. 6. Carefully remove the broken glass. 7. Attempt to unlock the door; if you cannot, then cover the door edge with a blanket or tarp before crawling through the window to rescue the patient. 8. Evaluate the patient and decide to perform rapid or normal extrication. 	<p>Teaching Tip Allow students to handle simple tools, such as a spring-loaded punch, under supervision.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What is the preferred way of accessing a patient in a vehicle? • When you break a window in a vehicle or residence to gain access, what safety precautions must you observe to protect yourself and your patient? <p>Knowledge Application Given several scenarios, students should be able to gain simple access to patients and recognize when complex access is required.</p>
	XIII. Extrication—The Role of the EMT	

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5	<ul style="list-style-type: none"> A. Provide care to the patient. B. Care for the patient before he is removed from the vehicle unless remaining in the vehicle is life threatening. C. Cooperate with other rescuers in extrication. D. With other rescue workers and EMTs, establish a chain of command. 	
15	<p>XIV. Extrication—Caring for the Patient</p> <ul style="list-style-type: none"> A. First, ensure your own safety. B. Maintain manual spine stabilization at all times during the extrication process. C. Perform a primary assessment and manage any immediate life threats. D. Perform a controlled rapid extrication of the patient. E. Remove the vehicle from around the patient, not the patient from the vehicle, if possible. F. Use an adequate number of personnel. G. Use the path of least resistance that provides the least chance of further injury. H. Once you have gained safe access to the patient, provide the same care you would provide to any trauma patient. I. Establish a rapport with the patient (who is probably highly agitated and terrified). J. Analyze the effect of a forcible rescue on the patient. K. Protect yourself and the patient from flying glass and other debris with heavy blankets, a tarp, or a salvage cover. L. Continually monitor the patient's condition and position in relation to extraction tools and procedures. M. Advise the rescue crew if the patient's condition begins to deteriorate. N. Explain every step of the extrication process to the patient as you go; this will help keep him calm. O. Stabilize and immobilize the spine before removing the patient from the vehicle, if possible. 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the EMT's patient care priorities when the patient is entrapped? • What are the considerations in determining the approach to extrication? <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video about rapid extrication of patients.</p> <p>Knowledge Application Students should be able to use the information in this section in their roles as patient care providers.</p>
10	<p>XV. Specialized Stabilization, Extrication, and Disentanglement Techniques—Stabilizing a Vehicle</p> <ul style="list-style-type: none"> A. Upright vehicle—Immobilize the suspension. <ul style="list-style-type: none"> 1. Position plastic chocks parallel to each wheel. 2. Deflate the tires (slash them only when absolutely necessary). B. Vehicle on its side <ul style="list-style-type: none"> 1. Attach a stabilizing pole, pulling device, cable, or chain from the 	

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	<ul style="list-style-type: none"> undercarriage of the car to another vehicle or strong immovable object. 2. Crib the length of the vehicle’s side where it rests on the ground. 3. Fill every void between ground and vehicle with box cribbing and wedges. C. Vehicle on its roof <ul style="list-style-type: none"> 1. Build a box crib under the hood and trunk. 2. Use wedges to remove any remaining space. 3. Use air bags to aid in stabilization and in taking car’s weight off roof posts. 	
15	<p>XVI. Specialized Stabilization, Extrication, and Disentanglement Techniques—Extricating a Patient</p> <p>A. “Rip and blitz” disentanglement</p> <ul style="list-style-type: none"> 1. One EMT enters the vehicle and establishes and maintains stabilization of the cervical spine as others begin to place chocks under the wheels. 2. Turn off ignition then disconnect battery cables (negative cable first). 3. Cover the patient with a fire-retardant blanket. 4. Use hydraulic spreaders to pop the rear door, then cut the post between the front and rear sections of the passenger compartment. 5. Rip open the doors. 6. Remove the roof by cutting the remaining posts with hydraulic cutters. 7. If the patient is trapped under the dashboard, perform a “dash roll” (push it off him). 8. Remove the patient vertically from the wreck. <p>B. Side-impact or head-protection air bags—Be aware that these may cause serious injuries if punctured by cutting tools.</p> <p>C. Other methods of access and disentanglement</p> <ul style="list-style-type: none"> 1. Door removal <ul style="list-style-type: none"> a. Always try to open a door by the handle before you force an entry. b. Force or pop a door open with manual pry tools, hydraulic spreaders, or air chisels. c. Explain the process to the patient as you go. d. Pry at the latch site on the post to open the front doors; break and remove glass on the side to be opened. e. If there is not enough of a gap to fit the tip of the hydraulic spreader, use one of the following options. <ul style="list-style-type: none"> i. Widen the gap with a halligan or hux bar. ii. Place the tips of the hydraulic spreader in the window opening of 	<p>Discussion Question</p> <p>What is the “rip and blitz” approach to extricating the patient?</p>

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	<p style="padding-left: 40px;">the door and enlarge it.</p> <p style="padding-left: 20px;">iii. Place the partially opened tool over the door, one arm on each side; close the spreader to widen the gap.</p> <p>2. Windshield removal and roof rolling</p> <p style="padding-left: 20px;">a. Before you displace the roof, remove the windshield by cutting either the mounting or the windshield itself.</p> <p style="padding-left: 20px;">b. Cut the posts with a hack saw, air cutting tool, or hydraulic cutting tool.</p> <p style="padding-left: 20px;">c. Crease the roof; grasp and fold it up and back toward the trunk.</p> <p style="padding-left: 20px;">d. Cover the post stumps with duct tape or old pieces of fire hose.</p> <p>3. Special disentanglement procedures</p> <p style="padding-left: 20px;">a. If patient's foot is caught under the brake pedal, force the pedal sideways to free the foot.</p> <p style="padding-left: 20px;">b. If car seat must be moved or removed, gently use the seat adjustment lever or carefully and slowly remove the nuts with hand tools.</p>	
10	<p>XVII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 42 Summary. 2. Complete Chapter 42 In Review questions. 3. Complete Chapter 42 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 42 quiz 	<p>Case Study Follow-Up Discussion How can you use this information to think about your own role in extrication?</p> <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important

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		information in each chapter. This can be found under mykit at www.bradybooks.com .

Detailed Lesson Plan

Chapter 43

Hazardous Materials

90–120 minutes

MASTER TEACHING NOTES

- Case Study Discussion
- Teaching Tips
- Discussion Questions
- Class Activities
- Media Links
- Knowledge Application
- Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about special considerations related to hazardous materials emergencies.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • How would you determine whether any hazardous materials were involved in the incident? • What will your role be in a situation involving hazardous materials?
6	<p>II. Identifying Hazardous Materials—What Is a Hazardous Material?</p> <p>A. Poses a threat or unreasonable risk to life, health, or property if not properly controlled at all times</p> <p>B. Includes chemicals, wastes, and other dangerous products</p> <p>C. Poses risks of toxicity, flammability, and reactivity</p> <p>D. TRACEM: Thermal, Radiological, Asphyxiation, Chemical, Etiological, and Mechanical damage</p> <ol style="list-style-type: none"> 1. Asphyxiation 2. Skin irritation 3. Increase of risk of cancer 4. Poisoning of liver or nerves 5. Loss of coordination 6. Altered mental status 7. Burns 8. Respiratory distress 9. Nausea and vomiting 10. Tingling or numbness in the extremities 11. Blurred or double vision <p>E. Can cause widespread destruction and loss of life</p> <p>F. Safety of EMT, patient, and public is primary concern.</p>	<p>Discussion Question</p> <p>What are some locations in your community that use or store hazardous materials?</p> <p>Knowledge Application</p> <p>Students should be able to apply the knowledge in this section to the identification of hazardous materials.</p>

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9	<p>III. Identifying Hazardous Materials—Placards and Shipping Papers</p> <p>A. U.S. Department of Transportation (DOT) requirements</p> <ol style="list-style-type: none"> 1. All vehicles containing hazardous materials must be marked with hazard labels or placards. 2. Drivers of such vehicles should carry shipping papers identifying the substance, quantity, origin, and destination. <p>B. Placards</p> <ol style="list-style-type: none"> 1. Four-sided, diamond-shaped sign 2. Contains important information that can aid EMT 3. Four-digit U.N. identification number 4. Color of placard indicates class of hazard in vehicle. 5. Legend on placard indicates whether flammable, radioactive, explosive, or poisonous. 6. National Fire Protection Association—NFPA 704 system <ol style="list-style-type: none"> a. Placard divided into four smaller diamonds b. Background colors and numbers of smaller diamonds <ol style="list-style-type: none"> i. Blue: health hazard ii. Red: fire hazard iii. Yellow: reactivity hazard iv. White: symbols that give additional information v. Numbers zero through four indicate level of risk, with zero being lowest. <p>C. Shipping papers</p> <ol style="list-style-type: none"> 1. Name of substance, classification (such as flammable or explosive), and four-digit U.N. ID number 2. Required by law to be carried <ol style="list-style-type: none"> a. In cab of motor vehicle b. By train crew member in engine or caboose c. In holder on bridge of water vessel d. By aircraft pilot 	<p>Class Activity</p> <p>Have students write down the information from three different DOT placards and bring them to the next class for identification.</p>
3	<p>IV. Identifying Hazardous Materials—Using Your Senses</p> <p>A. You may see clues on the scene.</p> <ol style="list-style-type: none"> 1. Smoking or self-igniting materials 2. Extraordinary fire conditions 3. Boiling or spattering of materials that have not been heated 4. Wavy or oddly-colored vapor over a container of liquid 5. Characteristically-colored vapor clouds 	

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	<ul style="list-style-type: none"> 6. Frost near a container leak (indicates liquid coolant) 7. Unusual condition of containers (peeling, discoloration of finish, deterioration, deformity, unexpected operation of pressure-relief valves) B. You may not be able to see or smell the presence of hazardous materials; many are odorless and colorless. 	
9	<p>V. Identifying Hazardous Materials—Resources</p> <ul style="list-style-type: none"> A. Printed materials—<i>Emergency Response Guidebook</i> <ul style="list-style-type: none"> 1. Published by U.S. Department of Transportation, Transport Canada, and Secretariat of Communications and Transportation of Mexico 2. Updated every four years 3. Compact enough to carry with your gear 4. Lists more than 1,000 hazardous materials with U.N. four-digit ID numbers 5. U.N. ID numbers cross-referenced to complete emergency instructions. 6. Available in print, electronically, and in handheld PDAs B. Chemical Manufacturer’s Association—Chemical Transportation Emergency Center (CHEMTREC) <ul style="list-style-type: none"> 1. Can answer any questions on how to handle any emergency materials 2. Will locate shipper of materials for follow-up 3. 24/7 operators at 1-800-424-9300 C. Chemtel, Inc. at 1-800-255-3924 (US and Canada) or 1-813-979-0626 (outside US and Canada) D. State and local agencies including specialized “hazmat” teams and regional poison control center E. Information to provide when calling an organization <ul style="list-style-type: none"> 1. Your name, call-back number, and fax number 2. Nature and location of product 3. U.N. ID number or name of product 4. Name of carrier, shipper, manufacturer, consignee, and point of origin 5. Type of container and size (rail, truck, housed open) 6. Quantity of material 7. Local weather conditions 8. Number of injuries and/or exposures 9. Emergency services that are present or responding 	<p>Teaching Tip Provide examples of <i>Emergency Response Guidebooks</i> and material safety data sheets.</p> <p>Critical Thinking Discussion If you needed to find a material safety data sheet at your place of employment, where would you look, or whom would you ask?</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on the <i>Emergency Response Guidebook</i>, CHEMTREC, and FEMA information about hazardous materials.</p>

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3	<p>VI. Identifying Hazardous Materials—Training Required by Law</p> <p>A. First Responder Awareness</p> <ol style="list-style-type: none"> 1. Those likely to witness or discover a hazardous materials emergency 2. Trained to recognize a problem but not to take action 3. Call for proper resources and prevent others from entering the scene 4. Required for all operating EMTs <p>B. First Responder Operations</p> <ol style="list-style-type: none"> 1. Those who initially respond to emergencies in order to protect people and property 2. Trained to use specialized personal protective equipment 3. Trained to help contain the emergency <p>C. Hazardous materials technician plugs, patches, or stops release of hazardous material.</p> <p>D. Hazardous materials specialist provides command and supports activities at site of emergency.</p> <p>E. National Fire Protection Association Standard #473 deals with competencies for EWMS personnel at hazardous materials emergencies</p>	<p>Teaching Tip Provide details on the level of training required for EMS providers in your state.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access the U.S. Fire Administration site on hazardous materials.</p>
10	<p>VII. Guidelines for Hazardous Materials Rescues—General Rules</p> <p>A. Never attempt a rescue unless you have had the necessary special training; instead, radio immediately for help.</p> <p>B. Keep yourself and bystanders upwind, uphill, upstream, and away from the danger.</p> <p>C. Avoid contact with any unidentified material.</p> <p>D. Avoid risking your own life or health if there are no human victims.</p> <p>E. At First Responder Awareness level, remember the acronym RAIN.</p> <ol style="list-style-type: none"> 1. R—Recognize that a hazardous materials incident has occurred. 2. A—Avoid contact with the hazardous substance. 3. I—Isolate the area. 4. N—Notify the appropriate authorities or response agencies. 5. Cordon off the area and evacuate bystanders. 6. Use your best judgment to determine if the risk to the rescuers is justified by the possibility of saving lives and consider the following. <ol style="list-style-type: none"> a. Difficulty of the rescue b. Flammability of the materials c. Possibility of explosion d. Time/distance constraints e. Available escape routes 	<p>Teaching Tip Discuss local policy and procedure for response to hazardous materials incidents.</p> <p>Discussion Question What actions should you take to isolate the area of a hazardous materials incident?</p>

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	<ul style="list-style-type: none"> f. Probability of victim survival F. If you decide to begin rescue operations and have the necessary level of training <ul style="list-style-type: none"> 1. Act quickly. 2. Secure the scene and limit exposure of rescuers and bystanders. 3. Make sure you have the equipment and personnel to handle the emergency. 4. Make sure that everyone has adequate protective equipment. <ul style="list-style-type: none"> a. Positive-pressure self-contained breathing apparatus (SCBA) b. Full suit of chemical-protective clothing; all gaps or openings sealed with wide duct tape c. At least two layers of gloves d. Boots e. Helmet f. Eye protection g. Lifelines 5. Do not allow anyone who is not trained to the First Responder Operations level or higher to enter the scene. 	
15	<p>VIII. Guidelines for Hazardous Materials Rescues—Incident Management</p> <ul style="list-style-type: none"> A. Preincident planning <ul style="list-style-type: none"> 1. Appoint a command officer to be responsible for all rescue decisions. 2. Establish a clear chain of command between officer and rescuers. 3. Establish a system of communications. <ul style="list-style-type: none"> a. Accessible to all rescuers b. All rescuers able to use 4. Designate receiving facilities. <ul style="list-style-type: none"> a. Capacity for large number of patients b. Capable of surgery c. Have established decontamination procedures. B. Implementing the plan <ul style="list-style-type: none"> 1. Establish an incident command system and a command post. <ul style="list-style-type: none"> a. Nature of the problem b. Identification of hazardous material(s) involved c. Type and condition of containers d. Existing weather conditions e. Presence of fire 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on managing acute chemical exposures.</p> <p>Discussion Question What information do you need to implement a hazardous materials response plan?</p>

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	<ul style="list-style-type: none"> f. Time elapsed since emergency occurred g. What has already been done at the scene h. Number of victims i. Danger of victimizing more people 2. Be aware that even if there is no fire, smoke from hazardous materials spreads toxins and particles through the air. 3. Only trained firefighters should attempt to extinguish fires. C. Establishing safety zones <ul style="list-style-type: none"> 1. Hot zone—Contamination is actually present. <ul style="list-style-type: none"> a. Area immediately adjacent to accident site b. Single point for entrance/exit of all rescue personnel c. Designated emergency exit d. No smoking, eating, drinking (risk of ingesting hazardous material) e. Restricted to trained rescuers f. Hazard analysis, control of hazard or release, and rescue by trained personnel wearing appropriate protective equipment 2. Warm zone (contamination reduction zone)—Immediately adjacent to hot zone <ul style="list-style-type: none"> a. Appropriate protective gear b. Life-saving emergency care (airway management, immobilization) c. Initial decontamination 3. Cold zone—Immediately adjacent to warm zone <ul style="list-style-type: none"> a. Remove contaminated protective gear before entering. b. Decontaminate patients as fully as possible before bringing them in. c. Continue emergency care. d. Triage patients to determine the order of care. e. Perform necessary treatment and stabilize patients prior to transport. 	<p>Discussion Question What activities should occur in the hot, warm, and cold zones?</p>
15	<p>IX. Guidelines for Hazardous Materials Rescues—Emergency Procedures</p> <ul style="list-style-type: none"> A. Anyone entering hot or warm zone must be properly trained and wearing appropriate protective equipment. B. Perform initial decontamination at the entry to the warm zone. C. Perform primary assessment of victims in the warm zone; complete decontamination and assess patient condition. D. Treat major injuries, immobilize/splint as needed, and move patient to cold zone. 	

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	<ul style="list-style-type: none"> E. Remove all protective equipment before entering cold zone. F. In cold zone, take patient's vital signs and history and prepare him for transport. G. Cover exposed areas of your vehicle with thick plastic sheeting, secured with duct tape. H. Leave all clothing and equipment at scene if used/worn in hot or warm zones for proper containment for decontamination/disposal. I. Trained rescuers must decontaminate any corpses before transporting to morgue. J. If exposed to hazardous materials <ul style="list-style-type: none"> 1. Wash skin with mild detergent or green soap and plenty of running water. 2. Irrigate skin for at least 20 minutes (longer if there is still discomfort). 3. Seek medical attention. 4. Report what happened to your employer. K. Seek medical help if, in hours or days after incident, you develop the following. <ul style="list-style-type: none"> 1. Headache 2. Nausea or vomiting 3. Abdominal cramps/diarrhea 4. Difficulty breathing 5. Dizziness 6. Lack of coordination 7. Blurred vision 8. Excessive salivation 9. Irritation of eyes, nose, throat, or respiratory tract L. Decontaminate equipment and vehicle by washing thoroughly inside and out. M. Do not take your personal clothing home to launder since it may contaminate your home and the sewer system. 	
15	<p>X. Guidelines for Hazardous Materials Rescues—Radiation Emergencies</p> <ul style="list-style-type: none"> A. Exposure and contamination <ul style="list-style-type: none"> 1. Exposure <ul style="list-style-type: none"> a. Patient is in presence of radioactive material. b. Radioactive material has not touched his clothing or body. 	<p>Discussion Question What are exposure and contamination with respect to radiation accidents?</p> <p>Critical Thinking Discussion How can you find out what potential</p>

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	<ul style="list-style-type: none"> c. Exposure may harm patient but does not render him radioactive nor make him a source of contamination to others. 2. Contamination <ul style="list-style-type: none"> a. Patient has come into direct contact with source of radioactivity or with radioactive materials. b. Radioactive material is present on patient's clothing or skin. c. Contaminated patient is a source of contamination and a risk to others. B. Guidelines for radiation emergencies <ul style="list-style-type: none"> 1. Your first priority is to protect yourself and others from contamination. 2. No EMT should ever attempt to decontaminate a radiation patient. 3. Wait for a radiation safety officer (RSO). 4. If no RSO is available to come to the site, transport the patient to the hospital. <ul style="list-style-type: none"> a. Place the patient in a body bag up to the neck. b. Cover his hair completely with a cap or towel. c. Use disposable wipes to clean his face. d. Put used wipes in a plastic bag, seal it, and take it with you for disposal. 5. Time is the critical factor in managing radiation emergencies. <ul style="list-style-type: none"> a. Trained personnel should remove the patient from the source of radiation as quickly as possible. b. Increase the distance between yourself and the radiation source. c. If necessary, shield yourself and the patient from the radiation source. <ul style="list-style-type: none"> i. For alpha rays—Clothing shield ii. For beta rays—Aluminum or similar shield iii. For gamma rays—Lead shield C. Procedures for radiation emergencies <ul style="list-style-type: none"> 1. Priorities (in order of importance) <ul style="list-style-type: none"> a. Protect the safety of all rescuers and victims. b. Provide patient care. c. Decontaminate clothing, equipment, and rescue vehicle. 2. Scene safety <ul style="list-style-type: none"> a. Survey the area visually for radiation symbol on vehicles, machinery, and containers. b. Determine the location of the radiation source. c. Be alert for the presence of other hazardous materials. 	<p>sources of radiation are in your community?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access information from the CDC about radiation emergencies.</p> <p>Discussion Question What procedures should you follow when responding to a radiation accident scene?</p>

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	<ul style="list-style-type: none"> d. Park your vehicle <ul style="list-style-type: none"> i. Upwind of the incident ii. Away from any liquid spills and any leaking vehicles iii. Away from any cracked or damaged containers e. Put on positive-pressure self-contained breathing apparatus and protective clothing. 3. Personal protection <ul style="list-style-type: none"> a. Time—The less time spent near the radiation source, the less exposure to radiation. b. Distance—The greater the distance from the radiation source, the lower the dose. c. Shielding—The denser the shield, the greater the protection. d. Quantity—The less radioactive material, the less exposure; remove the patient from the radioactive material or the radioactive material from the patient. 4. Patient care <ul style="list-style-type: none"> a. Concentrate on immediate threats to the patient’s life. b. Remove him from the source of radiation as quickly as possible. c. Conduct a primary and secondary assessment and manage injuries as you normally would. d. In cases of radiation, consult with medical direction and a poison control center. 5. Personal decontamination <ul style="list-style-type: none"> a. Report and document your exposure to the radiation source. b. Follow hospital recommendations or local protocol. 6. Vehicle/equipment decontamination <ul style="list-style-type: none"> a. Any equipment used to care for patient (blankets, towels, cots, and so on) must be checked for contamination before using them again. b. Wash the transport vehicle inside and out. c. Remove radioactive dust from the vehicle. d. Pay special attention to tires and other contact points. e. Use a commercial decontamination solution on equipment (never on your skin). f. Dispose of any equipment or tools that cannot be decontaminated. D. Problems caused by radiation <ul style="list-style-type: none"> 1. Radiation sickness <ul style="list-style-type: none"> a. Caused by exposure to large amounts of radiation b. Symptoms manifest themselves from hours to days after exposure. 	<p>Discussion Question How is radiation decontamination accomplished?</p>

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	<ul style="list-style-type: none"> c. Sickness lasts from a few days to seven to eight weeks. d. Symptoms <ul style="list-style-type: none"> i. Nausea and vomiting ii. Diarrhea iii. Hemorrhage iv. Weight and appetite loss v. Malaise vi. Fever vii. Sores in the throat and mouth viii. Lowered resistance to disease and infection 2. Radiation injury <ul style="list-style-type: none"> a. Local injury generally caused by exposure to large amounts of less-penetrating particles b. Signs and symptoms include hair loss, skin burns, and generalized skin lesions. 3. Radiation poisoning <ul style="list-style-type: none"> a. Occurs when patient has been exposed to dangerous amounts of internal radiation b. Causes cancer, anemia, other serious diseases E. Protection from radiation <ul style="list-style-type: none"> 1. Factors determining amount of radiation damage from unshielded radiation source <ul style="list-style-type: none"> a. Amount and type of personal shielding b. Strength of radiation source c. Distance from radiation source d. Type of radiation e. Length of exposure f. Amount of body that is exposed 2. How to reduce risk <ul style="list-style-type: none"> a. Divide the work among many small teams of rescuers. b. Teams should relieve one another such that no one is exposed to more than 25 roentgens. c. Shield the radiation source (can use bricks, concrete, or dirt if lead shield is not available). d. Know your community's plan for hazardous materials emergencies. e. Know how to reach your Radiation Safety Officer (RSO). f. Always wear your protective gear. g. Never smoke in an area contaminated by radiation. 	

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	<p style="text-align: center;">h. Never eat food from a contamination site.</p>	
5	<p>XI. Guidelines for Hazardous Materials Rescues—Terrorist Attacks Involving Weapons of Mass Destruction</p> <p>A. See Class 2 Poisonous Gas, Class 6 Irritants and Poisons, and Class 7 Radioactive for chemicals commonly used in terrorist attacks.</p> <p>B. Enroll in a counterterrorism class.</p>	
10	<p>XII. Follow-Up</p> <p>A. Answer student questions.</p> <p>B. Case Study Follow-Up</p> <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. <p>C. Follow-Up Assignments</p> <ol style="list-style-type: none"> 1. Review Chapter 43 Summary. 2. Complete Chapter 43 In Review questions. 3. Complete Chapter 43 Critical Thinking. <p>D. Assessments</p> <ol style="list-style-type: none"> 1. Handouts 2. Chapter 43 quiz 	<p>Case Study Follow-Up Discussion What does “uphill, upwind” mean?</p> <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan

Chapter 44

Multiple-Casualty Incidents and Incident Management

100–120 minutes

MASTER TEACHING NOTES

- Case Study Discussion
- Teaching Tips
- Discussion Questions
- Class Activities
- Media Links
- Knowledge Application
- Critical Thinking Discussion

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5	<p>I. Introduction</p> <p>A. During this lesson, students will learn about the roles and responsibilities of an EMT during a multiple-casualty incident.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and Upon Arrival information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What principles guide the management of multiple-casualty incidents? • By what criteria are decisions regarding patient care and transportation made?
5	<p>II. Multiple-Casualty Incidents</p> <p>A. Definition</p> <ol style="list-style-type: none"> 1. Places excessive demands on personnel and equipment 2. Involves three or more patients <p>B. Examples</p> <ol style="list-style-type: none"> 1. Motor vehicle crashes 2. Gang-related violence 3. Apartment fires 4. Food poisoning 5. Toxic gas inhalation 6. Refugee influx <p>C. Management</p> <ol style="list-style-type: none"> 1. Call for enough (or more than enough) help. 2. Position vehicles properly. 3. Give appropriate emergency medical care. 4. Transport patients efficiently. 5. Provide follow-up care at receiving facilities. 	<p>Teaching Tip</p> <p>Discuss events that have led to MCIs in your community and the events that your community includes in its disaster plan.</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What events (local, state, or national) can you recall that would be classified as MCIs? • Why is the number of patients that define an MCI different in different locations? <p>Critical Thinking Discussion</p> <p>What should you include in a personal disaster preparedness plan for yourself and your family?</p> <p>Weblink</p> <p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency</i></p>

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		<p><i>Care</i>, 9th edition to access a web resource on CDC information about mass-casualties.</p>
<p>20</p>	<p>III. National Incident Management System—Incident Command System</p> <p>A. National Incident Management System (NIMS)</p> <ol style="list-style-type: none"> 1. Established by federal government in 2003 2. Provides for consistent approach to managing a disaster 3. Governs Incident Command System (ICS) 4. Provides for flexibility and standardization in managing disasters 5. Compliancy with NIMS required by all EMS agencies in USA by 2006 6. Special NIMS training ensures that all responders do the following. <ol style="list-style-type: none"> a. Comprehend and employ the same terminology b. Have the same knowledge of ICS 7. Components of preparedness standardization <ol style="list-style-type: none"> a. Planning b. Training c. Mutual aid agreements d. Preparedness exercises involving multiple response agencies 8. Purposes of preparedness standardization <ol style="list-style-type: none"> a. Lessen confusion as to who is in charge b. Foster working interdepartmental relationships c. Provide responders with experience in IMS <p>B. Incident Command System (ICS)</p> <ol style="list-style-type: none"> 1. Purposes <ol style="list-style-type: none"> a. Safety of emergency responders and others b. Achievement of tactical objectives c. Efficient use of resources 2. Features <ol style="list-style-type: none"> a. Common terminology, standardization of titles, plain English for communications b. Common designations for all organizational resources c. Manageable spans of control d. Common terminology for incident facilities e. Distinct titles to designate each person’s position and responsibilities f. Action plans that identify objectives to be accomplished g. Integrated communications approach h. Accountability at all levels; orderly chain of command 3. Sections 	<p>Teaching Tip Discuss local ICS configurations.</p> <p>Discussion Question What is the purpose of NIMS?</p> <p>Knowledge Application Student should be able to apply the principles in this section in order to operate within an ICS.</p> <p>Critical Thinking Discussion What is the best way to be prepared to function well in an MCI?</p> <p>Discussion Questions</p> <ul style="list-style-type: none"> • What is the purpose of ICS? • What features are designed to make ICS effective? <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a link to the NIMS resource center.</p>

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	<ul style="list-style-type: none"> a. Command b. Finance/administration c. Logistics d. Operations e. Planning 4. EMS responsibilities <ul style="list-style-type: none"> a. Triage unit <ul style="list-style-type: none"> i. Sorts patients by how critical their condition is ii. Assigns priorities for emergency care and transport b. Treatment unit—Provides emergency care to patients c. Transport unit <ul style="list-style-type: none"> i. Moves patients to ambulances or helicopters for transport ii. Notifies receiving medical facilities d. Staging unit <ul style="list-style-type: none"> i. Holding area for ambulance, helicopters, additional equipment ii. May include a supply unit for distribution of supplies and equipment e. Morgue unit—Holding and processing area for corpses 	<p>Discussion Question What responsibilities does each of the typical EMS units in an ICS system carry out?</p>
5	<p>IV. Triage—Primary and Secondary Triage</p> <ul style="list-style-type: none"> A. What triage determines <ul style="list-style-type: none"> 1. Who needs immediate emergency care in order to survive 2. Who will survive if emergency care is delayed 3. Who will die regardless of emergency care provided B. Primary triage <ul style="list-style-type: none"> 1. Occurs immediately upon arrival of first EMS crew 2. Conducted at actual site of incident 3. Patients are tagged with different colors to show priority of care. <ul style="list-style-type: none"> a. Red: immediate care and transport (Priority 1) b. Yellow: delayed emergency care and transport (Priority 2) c. Green: minor injuries and ambulatory patients (Priority 3) d. Black: deceased or fatally injured (Priority 4) 4. Provides initial report back to EMS command C. Secondary triage <ul style="list-style-type: none"> 1. Conducted in triage unit 2. Reevaluates patient priority assigned during primary triage 	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Discuss local triage practices. • Discuss the capabilities of local hospitals. • Discuss mutual aid agreements in place for cooperation among jurisdictions. <p>Discussion Question How do responders use primary and secondary triage?</p> <p>Knowledge Application Students should be able to apply the principles of triage while working within an ICS.</p> <p>Class Activity Hold an MCI drill or, if this is not feasible,</p>

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		do a tabletop triage exercise with students.
15	<p>V. Triage—START Triage System</p> <p>A. START (Simple Triage and Rapid Transport System)—Background</p> <ol style="list-style-type: none"> 1. Allows for rapid categorization of patients 2. Recommended for adult patients 3. Can be used for child patients over the age of eight who weigh at least 100 pounds 4. Should not take more than 30 seconds per patient 5. Three basic categories—RPM <ol style="list-style-type: none"> a. R—respiratory status b. P—perfusion status c. M—mental status <p>B. Patients able to walk (ambulatory or “walking wounded”)</p> <ol style="list-style-type: none"> 1. Collect ambulatory patients and move to a safe area. 2. Tag these patients green (low priority for emergency care and transport). 3. Make sure that patients do not wander but remain in the assigned safe area. 4. Treat and transport these patients last. <p>C. Nonambulatory patients—Respirations</p> <ol style="list-style-type: none"> 1. Look, listen, and feel for respiratory efforts. 2. If respiratory rate is greater than 30/minute, tag the patient red and move on to next patient. 3. If respiratory rate is less than 30/minute, assess perfusion (see below). 4. If patient is not breathing, open the airway. 5. If patient begins to breathe at a rate greater than 30/minute, tag red and move on. 6. If patient begins to breathe at a rate less than 30/minute, assess perfusion. 7. If respiration is shallow and inadequate and requires assistance, tag red and move on to next patient. 8. If patient does not breathe after you open airway, tag black (deceased) and move on. <p>D. Nonambulatory patients—Perfusion</p> <ol style="list-style-type: none"> 1. Assess capillary refill and radial pulse. 2. If capillary refill is greater than two seconds and radial pulse is present, assess mental status. 	<p>Discussion Question How do you perform START triage?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on START.</p>

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	<ul style="list-style-type: none"> 3. If capillary refill is greater than two seconds or radial pulse is absent, tag patient red and move on to next patient. 4. Keep in mind that capillary refill time varies; therefore, radial pulse may be a more accurate indicator of perfusion. E. Mental status <ul style="list-style-type: none"> 1. If patient obeys a command to squeeze your fingers, tag him yellow and move to next patient. 2. If he is not alert, does not obey command, or is unresponsive, tag red and move on. 	
15	<p>VI. Triage—JumpSTART Pediatric Triage System</p> <ul style="list-style-type: none"> A. Background of JumpSTART <ul style="list-style-type: none"> 1. System developed specifically for pediatric patients 2. Should be used on any patient who appears to be a child (as opposed to a young adult) 3. Not designed to be used on infants less than 12 months old 4. Uses different rules from START because of physiological differences between children and adults 5. Should take no more than 15 seconds per patient B. JumpSTART ambulatory <ul style="list-style-type: none"> 1. If child can walk, tag him green and escort him to safe area. 2. If child is developmentally unable to walk but does not meet “immediate” criteria, tag him green and escort him to safe area. 3. If special-needs child does not meet “immediate” criteria, tag him green and escort to safe area. C. JumpSTART breathing assessment <ul style="list-style-type: none"> 1. If child is breathing between 15 and 45 times per minute, assess the pulse. 2. If child is breathing fewer than 15/minute, more than 45/minute, or at an irregular rate, tag red and move on. 3. If child is not breathing or breathing very irregularly, open the airway. 4. If opening the airway causes child to begin breathing normally, tag red and move on. 5. If child does not start breathing when you open the airway, check for peripheral pulse. 6. If there is no peripheral pulse, tag black (deceased) and move on. 7. If there is a pulse, provide 15 seconds of mouth-to-mask ventilation. 8. If patient does not begin breathing after ventilation, tag black and move 	<p>Discussion Question How is JumpSTART different from START?</p>

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	<p>on.</p> <p>9. If patient begins breathing after ventilation, tag red and move on.</p> <p>D. JumpSTART perfusion assessment</p> <ol style="list-style-type: none"> 1. If peripheral pulse is palpable, assess mental status. 2. If no peripheral pulse is present, tag red and move on. 3. Check pulse in the least-injured extremity. <p>E. JumpSTART mental status assessment</p> <ol style="list-style-type: none"> 1. If child is alert, responds to your voice, or responds to pain by localizing, withdrawing, or pushing away, tag yellow and move on. 2. If child does not respond to stimuli, or responds inappropriately, tag red and move on. 	
5	<p>VII. Triage—Patient Tagging</p> <p>A. Highest priority (immediate)</p> <ol style="list-style-type: none"> 1. Red tag 2. Patient with critical injuries who may survive with quick treatment and transport <p>B. Second priority (delayed)</p> <ol style="list-style-type: none"> 1. Yellow tag 2. Patient suffering severe injuries who will have a good chance of survival with some delay in treatment <p>C. Lowest priority (minor)</p> <ol style="list-style-type: none"> 1. Green tag 2. Delay in treatment will not reduce patient’s chance of survival. 3. Examples of green-tag injuries: fractures and soft-tissue injuries <p>D. Deceased</p> <ol style="list-style-type: none"> 1. Black tag 2. Fatally injured patient (no chance of survival) or dead person 	<p>Teaching Tip Show students the triage tags used in your system.</p> <p>Discussion Question How can you classify patients according to the red, yellow, green, and black color triage system?</p>
5	<p>VIII. Triage—Treatment</p> <p>A. Treatment unit characteristics</p> <ol style="list-style-type: none"> 1. Close to the area where ambulances arrive 2. On high ground 3. Covered and lit if possible 4. Safe from falling debris 5. Safe distance from incident 6. Clearly marked (with a tall flag if possible) 7. More than one treatment unit may be needed. <p>B. Treatment unit procedures</p>	

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	<ol style="list-style-type: none"> 1. Immobilize all patients before moving to treatment unit. 2. Group patients according to triage category. 3. Treat only salvageable patients. 4. Provide only necessary care to manage life-threatening injuries. 5. Treat highest-priority (red-tag) patients first and second priority (yellow-tag) next. 6. Remain in constant touch with triage and transport unit leaders. 	
5	<p>IX. Triage—Staging and Transport</p> <p>A. Staging unit—Monitors, inventories, and directs ambulances to treatment unit as needed at the request of the transport unit leader.</p> <p>B. Transport unit</p> <ol style="list-style-type: none"> 1. Responsibilities <ol style="list-style-type: none"> a. Ensure that ambulances are accessible. b. Follow orders from incident commander or operations section chief. c. Coordinate patient transportation with triage unit. d. Communicate with hospitals involved. 2. Considerations in making transport decisions <ol style="list-style-type: none"> a. Distribution of patients to each medical facility b. Surge capacity of each medical facility c. Need for transport to a specialty facility (burn unit, pediatric emergency department) d. Need for constant communication and coordination 3. How to transport efficiently and effectively <ol style="list-style-type: none"> a. Begin to transport highest-priority patients first, as soon as they are stabilized. b. Distribute these patients evenly among available hospitals. c. Give EMTs specific orders on which route to follow and where to take the patients. d. Provide EMTs with maps of the area if necessary. e. Radio the hospital that the ambulance is en route; describe the injuries; estimate time of arrival. f. Consider loading ambulatory patients onto a bus for transport, with five to ten EMTs and their equipment aboard. g. Ambulance can escort bus to hospital. 	
	X. Triage—Communications	

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2	<ul style="list-style-type: none"> A. Be prepared for a variety of communication difficulties. B. Radio communications may be difficult due to “dead spots,” frequency unavailability, and channel “gridlock.” C. ICS and mobile command center should help to reduce difficulties. D. Use plain English for all communications. 	
3	<p>XI. Triage—Follow-Through</p> <ul style="list-style-type: none"> A. At the scene—Incident manager and assistant supervise clean-up and restoration. B. At the hospital <ul style="list-style-type: none"> 1. Obey instructions of facility’s incident manager. 2. If your help is not needed <ul style="list-style-type: none"> a. Prepare your vehicle and equipment for the next EMS call. b. Update dispatch center about your status and availability. 	
5	<p>XII. Triage—Reducing Posttraumatic and Cumulative Stress</p> <ul style="list-style-type: none"> A. Try not to get overwhelmed by the overall picture of the incident; instead, follow the steps outlined in this chapter to gain control and feel that you are making progress. B. Instruct each worker to leave the hub of the disaster for rest and food at regular intervals (such as once every one to two hours). C. Rotate rest periods so that enough workers are on duty at all times. D. Ensure that each worker understands his specific responsibilities. E. Monitor workers; if anyone appears to be in trouble, give him a rest period, then assign him a less stressful task. F. Assign each worker tasks that are appropriate to his skills and experience. G. Provide the staffing area with plenty of nourishing food and beverages for the workers. H. Encourage conversation among workers as it helps to relieve stress. I. Ensure that workers have the opportunity to talk with counselors after the disaster. 	<p>Discussion Question What mechanisms should be in place to monitor for, minimize, and manage rescuer stress reactions?</p> <p>Critical Thinking Discussion What should you do if you feel overwhelmed when working at the scene of an MCI?</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource for emergency workers.</p>
5	<p>XIII. Disaster Management—Requirements of Effective Disaster Assistance</p> <ul style="list-style-type: none"> A. Preparation of the entire community: lay persons trained in basic life-supporting first aid and simple rescue procedures 	<p>Teaching Tip Discuss the response to any disasters that have occurred in your area.</p>

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	<ul style="list-style-type: none"> B. Careful preplanning C. The ability to implement a plan quickly D. Effective communications among responders E. The application of triage skills F. The ability to organize quickly and utilize fully all emergency personnel G. The ability to adapt the plan to special conditions H. A contingency plan for shelter and transportation if an area must be evacuated I. Doing the greatest good for the greatest number of people J. A plan that avoids simply relocating the disaster to the hospital 	<p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • How can you promote disaster preparedness in your community? • What type of disasters should you anticipate in your community?
5	<p>XIV. Disaster Management—Warning and Evacuation</p> <ul style="list-style-type: none"> A. Conduct an orderly evacuation if you have advance warning of a disaster (such as a flood). B. Keep evacuees in their natural social groupings as much as possible. C. Repeat evacuation warnings often and with clarity. <ul style="list-style-type: none"> 1. The nature of the disaster 2. Time that it will impact the area 3. Description of expected severity 4. Safe routes to take out of the area 5. Appropriate destinations for evacuees 6. Where evacuees can find food and shelter D. Use all possible means to spread the warning message. <ul style="list-style-type: none"> 1. Radio 2. Television 3. Roving police cars with loudspeakers 4. Public address systems in buildings 5. Short-wave radios 	<p>Discussion Question</p> <p>What types of events can be considered disasters?</p>
5	<p>XV. Disaster Management—Disaster Communications Systems</p> <ul style="list-style-type: none"> A. Establish details of communications system ahead of time as part of disaster drill. B. Appoint one person at scene to be in charge of all communications to the outside. C. This person must have appropriate equipment to stay in touch with local hospitals and rescue units. D. Area-wide communications are vital to provide warnings and other essential information. E. Establish a central registry to record personal information (such as location, 	<p>Discussion Question</p> <p>What principles of communications should you apply in disaster situations?</p>

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	<p>health status, and safety).</p> <p>F. Monitor and communicate information regarding road conditions, alternate routes, and closed roads.</p> <p>G. Monitor and link all hospitals, trauma centers, and clinics in the area.</p> <p>H. Do not allow EMTs or drivers to radio hospital en route except in an emergency.</p> <p>I. Provide rescue workers with portable radios to use on site.</p> <p>J. Record crucial communications for later reassessment.</p>	
<p style="text-align: center;">10</p>	<p>XVI. Disaster Management—The Psychological Impact of Disasters</p> <p>A. Common reactions</p> <p>1. Adults</p> <ul style="list-style-type: none"> a. Fear b. Shakes c. Sweat d. Confusion e. Irritability f. Anxiety g. Restlessness h. Fatigue, disturbed sleeping patterns, nightmares i. Difficulty concentrating j. Moodiness and suspicion k. Depression l. Nausea, vomiting, diarrhea <p>m. Reactions to surviving</p> <ul style="list-style-type: none"> i. Fear ii. Anxiety iii. Anger iv. Guilt v. Shock vi. Depression vii. Denial viii. Feelings of isolation ix. Vulnerability <p>2. Children and young people</p> <ul style="list-style-type: none"> a. Preschoolers <ul style="list-style-type: none"> i. Crying ii. Loss of bowel/bladder control 	<p>Discussion Question What is the psychological impact of disasters?</p> <p>Knowledge Application Students should be able to apply the information in this chapter to the psychological care of disaster patients.</p> <p>Video Clip Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a video on children during disasters.</p>

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	<ul style="list-style-type: none"> iii. Confusion iv. Thumb-sucking b. Elementary-school age <ul style="list-style-type: none"> i. Extreme fear ii. Confusion iii. Depression iv. Headache v. Inability to concentrate vi. Withdrawal vii. Poor performance viii. Aggressiveness against peers c. Preteens and adolescents <ul style="list-style-type: none"> i. Same reactions as elementary-school age ii. Extreme aggression iii. Severe stress B. Helping disaster patients <ul style="list-style-type: none"> 1. Disseminate information to patients' families as soon as possible. 2. Reunite families as soon as possible. 3. Group patients with their families and neighbors. 4. Encourage patients to help with necessary chores when they are able. 5. Assure the patient that his reactions are normal and that he will probably recover rapidly. 6. Explain clearly exactly what you expect of a patient (such as "Let's walk to the treatment unit"). 7. Encourage patients to talk about the disaster, ideally in groups. 8. Don't give anyone any false assurances. 9. Encourage unwilling patients to accept help; assure them this is not a sign of weakness. 10. Identify high-risk patients and target for immediate crisis intervention care. <ul style="list-style-type: none"> a. The elderly b. Children c. The bereaved d. Those with prior psychiatric illness e. Those with multiple stresses f. Those with low or no support systems g. Those from low socioeconomic backgrounds h. Those with severe injuries 	<p>Discussion Question What can the EMT do to minimize the psychological impact of disasters?</p>

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Minutes	Content Outline	Master Teaching Notes
	<ol style="list-style-type: none"> 11. Recruit anyone who is in a unique position to help people in need. 12. Arrange for all those involved (including rescuers) to get good follow-up care and support. 	
10	<p>XVII. Follow-Up</p> <ol style="list-style-type: none"> A. Answer student questions. B. Case Study Follow-Up <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. C. Follow-Up Assignments <ol style="list-style-type: none"> 1. Review Chapter 44 Summary. 2. Complete Chapter 44 In Review questions. 3. Complete Chapter 44 Critical Thinking. D. Assessments <ol style="list-style-type: none"> 1. Handouts 2. Chapter 44 quiz 	<p>Case Study Follow-Up Discussion What principles of incident management and triage were applied in this case study?</p> <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p> <p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor's Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor's Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.

Detailed Lesson Plan
Chapter 45
EMS Response to Terrorism
Involving Weapons of Mass Destruction
160–180 minutes

- MASTER TEACHING NOTES**
- Case Study Discussion
 - Teaching Tips
 - Discussion Questions
 - Class Activities
 - Media Links
 - Knowledge Application
 - Critical Thinking Discussion

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Minutes	Content Outline	Master Teaching Notes
5	<p>I. Introduction</p> <p>A. During this lesson, students will learn special considerations related to weapons of mass destruction.</p> <p>B. Case Study</p> <ol style="list-style-type: none"> 1. Present The Dispatch and En Route information from the chapter. 2. Discuss with students how they would proceed. 	<p>Case Study Discussion</p> <ul style="list-style-type: none"> • What principles from hazardous materials management, scene safety, and mass-casualty incidents apply when responding to a WMD incident? • What is the EMT's role in WMD incidents?
15	<p>II. Weapons of Mass Destruction</p> <p>A. Definition</p> <ol style="list-style-type: none"> 1. Weapons intended to cause widespread, indiscriminate death and destruction 2. Types—Remember these acronyms. <ol style="list-style-type: none"> a. CBRNE—Chemical, biological, radiological, nuclear, explosive b. B-NICE—Biological, nuclear/radiological, incendiary, chemical, explosive <p>B. Destructive power</p> <ol style="list-style-type: none"> 1. A small amount of a chemical agent may kill hundreds or thousands of people but cause little or no damage to structures. 2. A small nuclear device can wipe out ten city blocks and damage a much wider area. 3. Biological weapons are spread by contact and can kill enormous numbers of people. 4. Conventional explosives are most likely to be used but have the least destructive power. 5. Nuclear weapons have the greatest destructive power but the least likelihood of use. 6. Chemical and biological weapons both have a moderate likelihood of 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the general effects of conventional and nuclear bomb explosions? • How are the onset and duration of chemical and biological weapons different from those of more conventional weapons? <p>Critical Thinking Discussion</p> <ul style="list-style-type: none"> • What are some likely targets of terrorism? • What is your personal level of worry about the possibility of terrorism in the United States? • What are some ways in which public life has changed since September 11, 2001? <p>Weblinks</p>

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	<p style="text-align: center;">use and moderate to high destructive power.</p> <p>C. Prehospital management</p> <ol style="list-style-type: none"> 1. Similar to that for any mass-casualty incident 2. All local, regional, and state agencies should have disaster plans. 3. "All-hazards" approach 	<p>Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access the Department of Homeland Security website and a web resource on terrorism.</p>
2	<p>III. Prehospital Response to Terrorism Involving WMD—Supplies and Equipment</p> <ol style="list-style-type: none"> A. Establish a community response to the disaster. B. Each type of WMD incident requires different types of trained personnel, equipment, and supplies. C. Communications center must have immediate access to individuals able to deploy equipment, supplies, and personnel. D. Neighboring departments must agree to provide equipment, supplies, and personnel. 	<p>Teaching Tip Discuss any known high-risk targets for terrorism in your community.</p> <p>Discussion Question Why is it difficult for one community to be completely prepared for all possible threats?</p>
3	<p>IV. Prehospital Response to Terrorism Involving WMD—Medical Direction</p> <ol style="list-style-type: none"> A. Establish a plan for how medical direction will reach EMS personnel at the scene. B. Establish a way to confirm credentials of EMS personnel from distant areas. C. Find a way not to rely on a communication system to provide on-line medical direction; it will probably be overloaded. D. Make all protocols standing orders in the case of a WMD incident. E. Protocol should address treatment for specific agents. F. Triage protocol should ensure that minor injuries and ambulatory patients NOT proceed to hospital (it must be reserved for more serious injuries). 	<p>Discussion Question What are some anticipated issues with medical direction in the response to WMD incidents?</p>
5	<p>V. Prehospital Response to Terrorism Involving WMD—Provider Preparation</p> <ol style="list-style-type: none"> A. Personal safety is the first priority of all EMS providers. B. Understanding threats and potential consequences of the disaster is vital. C. Rushing into a scene can cause the death of many rescuers (a possible secondary objective of the terrorists). D. Be aware of the various agents that can be used as WMD. E. Do not proceed without specific guidelines on triage and management of 	<p>Discussion Question In what ways must EMTs be prepared for response to WMD incidents?</p>

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	<p>these patients.</p> <p>F. Know potential dangers to your health both during the incident and after it is over.</p>	
<p style="text-align: center;">5</p>	<p>VI. Prehospital Response to Terrorism Involving WMD—Responding to the Scene</p> <p>A. Recognize the incident and the WMD involved.</p> <p>B. Employ the same command system as for any multiple-casualty incident.</p> <p>C. Keep the rules for responding to a hazardous materials incident in mind.</p> <p>D. Establish an EMS command center if you are the first-arriving EMS crew.</p> <p>E. Be wary of secondary explosions when conventional weapons are used.</p>	
<p style="text-align: center;">10</p>	<p>VII. Prehospital Response to Terrorism Involving WMD—Issues of Scene Safety</p> <p>A. Identify the specific weapon involved.</p> <ol style="list-style-type: none"> 1. Conventional, chemical, and biological weapons <ol style="list-style-type: none"> a. Small region of impact b. Extreme strain on EMS system and medical care c. Medical facilities and personnel primarily intact after attack d. Chemical weapons may leak gas or aerosols and render the environment toxic. e. Symptoms of exposure to chemical weapons <ol style="list-style-type: none"> i. Respiratory distress ii. Dyspnea iii. Cough iv. Burning chest v. Burning eyes vi. Excessive salivation vii. Loss of bowel/bladder control viii. Tearing f. Exposure to biological weapon usually predates signs or symptoms by several days. g. Patient will therefore contaminate EMS crew and hospital personnel before agent has been identified. 2. Nuclear weapons <ol style="list-style-type: none"> a. Concentric rings of total destruction, plus death and injury b. Difficult access to scene 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are some specific considerations for scene safety in the response to WMD incidents? • What clues can help you determine what kind of weapon is involved?

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	<ul style="list-style-type: none"> c. Destroys everything inside ring of impact. <ul style="list-style-type: none"> i. Emergency services ii. Health care services and facilities iii. Shelters iv. Medical supplies v. Food and clean water vi. Electrical equipment vii. Communications systems d. Radioactive fallout begins about one hour after detonation and continues for days or weeks. B. Approach site of suspected chemical, biological, or nuclear weapon attack from upwind. C. If the site is indoors or in a confined space, only specially trained responders wearing proper protection should enter. D. Stay away from WMD scene until WMD has been identified and you can take proper precautions. E. Employ incident command system (ICS) to respond to scene. F. Establish sectors of operation. G. Coordinate with law enforcement; contact immediately if you locate a suspected perpetrator among the patients. H. Enter scene from a single staging point. I. Establish an escape plan and make sure everyone is aware of it. 	
5	<p>VIII. Prehospital Response to Terrorism Involving WMD—Role of the EMT at the Terrorist Incident Involving WMD</p> <ul style="list-style-type: none"> A. Scene size-up <ul style="list-style-type: none"> 1. First unit to arrive usually takes this role. 2. Establish incident command. 3. Size up the scene (360-degree assessment). 4. Evaluate the need for additional resources. 5. Begin to communicate essential information. 6. Estimate the number of patients involved. 7. Implement incident plan and protocol as soon as possible. B. Sector leader or officer—Usually second or third unit to arrive C. Triage—Usually units that arrive after sector officers are all assigned D. Overall goal is to do the greatest good for the greatest number of people. 	<p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on the adoption of standards for hazardous materials and weapons of mass destruction.</p>
	IX. Conventional Weapons and Incendiary Devices—Explosives	Teaching Tip

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2	<ul style="list-style-type: none"> A. Explosives ignite fuels that burn rapidly, causing hot gas to displace air violently, creating a blast. B. This blast moves out in all directions at supersonic speed, causing blast injuries. C. The farther you are from the explosion, the less likely you are to be injured. D. Barriers between you and the explosion will protect you. E. If the explosion occurs in an enclosed space, the effects are amplified. 	<p>Identify any high-risk facilities in your community, such as fuel refineries/storage facilities or fertilizer manufacturing/storage facilities.</p> <p>Discussion Question Why are conventional weapons and incendiary devices the most commonly used WMDs?</p>
2	<p>X. Conventional Weapons and Incendiary Devices—Primary, Secondary, and Tertiary Effects</p> <ul style="list-style-type: none"> A. Primary effect—Blast of the explosion B. Secondary effect—Flying debris, shrapnel, and other projectiles cause significant penetrating or blunt trauma. C. Tertiary effect—Explosion propels body against ground or objects, causing blunt trauma. 	<p>Discussion Question What types of injuries are produced in each of the three phases of a blast?</p>
1	<p>XI. Conventional Weapons and Incendiary Devices—Body Position</p> <ul style="list-style-type: none"> A. Victims standing or lying perpendicular to blast will suffer greatest injuries. B. Victims lying directly toward or away from the blast will suffer least injury. C. If you have warning of a blast, drop to a prone position facing away from the detonation. 	
10	<p>XII. Conventional Weapons and Incendiary Devices—Types of Injuries</p> <ul style="list-style-type: none"> A. Lungs <ol style="list-style-type: none"> 1. Altered mental status 2. Dyspnea 3. Blood-tinged sputum 4. Respiratory distress 5. Chest pain 6. Stroke-like signs and symptoms 7. Pneumothorax or tension pneumothorax 8. Injury to alveolar-capillary wall B. Abdomen <ol style="list-style-type: none"> 1. Bleeding or perforation of the bowel 2. Evisceration 	<p>Knowledge Application Students should be able to apply the information in this section when responding to potential WMD incidents.</p> <p>Weblink Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access a web resource on blast injuries.</p>

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	<ul style="list-style-type: none"> C. Ears <ul style="list-style-type: none"> 1. Ruptured eardrum 2. Fracture of small bones inside ears 3. Temporary or permanent hearing loss D. Crush injuries (from being buried or trapped under heavy debris) <ul style="list-style-type: none"> 1. Direct blunt and/or penetrating trauma 2. Respiratory and eye injuries from dust and smoke 3. Crushed tissue produces harmful byproducts. E. Shrapnel injuries <ul style="list-style-type: none"> 1. Solid organs are compressed and stretched. 2. Hollow organs rupture and leak contents into surrounding cavities. 3. Connective tissue injuries are usually limited to shrapnel pathway. 4. Bones fracture when struck. 	
5	<p>XIII. Conventional Weapons and Incendiary Devices—Incendiary Devices</p> <ul style="list-style-type: none"> A. Types of devices designed to burn at extremely high temperatures <ul style="list-style-type: none"> 1. Napalm 2. Thermite 3. Magnesium 4. White phosphorus 5. Gasoline, propane, or natural gas B. Primary injuries—Burns C. How to treat <ul style="list-style-type: none"> 1. Use burn-depth classification system and rule of nines to assess injury. 2. Pay particular attention to airway and ventilation. 3. Dress the burns. 	<p>Discussion Question What types of agents are used for incendiary devices?</p> <p>Class Activity Assign students to do a “windshield survey” of the community over the next week and report back any facilities that could play a role in supplying materials needed to create a WMD or that could be a target of a WMD.</p>
10	<p>XIV. Chemical Agents—Properties of Chemical Weapons</p> <ul style="list-style-type: none"> A. Forms of chemical weapons <ul style="list-style-type: none"> 1. Aerosol form—Liquid chemicals stored in munitions convert on explosion 2. Gas form—Affected by warm temperatures <ul style="list-style-type: none"> a. Hydrogen cyanide b. Chlorine c. Phosgene 3. Liquid form—Nerve and mustard agents B. Terms to remember 	<p>Teaching Tip Identify any potential sources of chemical agents in your community.</p>

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	<ol style="list-style-type: none"> 1. Volatility—Tendency of a chemical to evaporate 2. Persistence—Chemical's resistance to evaporation C. Effects on the person exposed <ol style="list-style-type: none"> 1. Aerosol, solid, vapor, or gas agent enters the body through the respiratory tracts, skin, and eyes. 2. Liquid agents enter the body through the skin and eyes. 3. Ingestion of chemicals in food is possible but rare. 	
20	<p>XV. Chemical Agents—Types of Chemical Agents</p> <p>A. Nerve agents</p> <ol style="list-style-type: none"> 1. Effects on the body <ol style="list-style-type: none"> a. Affects nervous system, airway, and respiratory system b. Interferes with brain's ability to function 2. Signs and symptoms <ol style="list-style-type: none"> a. Rapid loss of consciousness b. Seizures c. Apnea d. Difficulty in concentrating e. Inability to sleep f. Impaired judgment g. Depression h. Respiratory failure i. Obstructed airway j. Drooling k. Other signs and symptoms <ol style="list-style-type: none"> i. Acronym SLUDGE: salivation, lacrimation, urination, defecation, gastric distress, emesis ii. Tachypnea and tachycardia or bradycardia and normal blood pressure 3. Emergency medical care <ol style="list-style-type: none"> a. Establish an airway. b. Provide positive pressure ventilation at 12 ventilations per minute (adult patient). c. Suction the airway to clear secretions if necessary. d. Position the patient in lateral recumbent position and monitor closely. e. Administer antidote: atropine and pralidoxime (Protopam) (carried by 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • How would you recognize exposure to a nerve agent? • What is the treatment for exposure to nerve agents? <p>Knowledge Application</p> <p>Students should be able to apply the information in this section to the response to patients exposed to chemical agents.</p>

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	<p style="padding-left: 40px;">most EMS systems)</p> <ul style="list-style-type: none"> f. Never hesitate to administer the antidote if a patient has been exposed to nerve agents. g. To combat seizures, administer diazepam (Valium). h. Cover wounds, keep the patient warm, and transport as soon as possible. <p>B. Vesicants</p> <ul style="list-style-type: none"> 1. Signs and symptoms (may be delayed if mustard gas is the agent) <ul style="list-style-type: none"> a. Burning, redness, blistering, and necrosis of skin b. Stinging, tearing, and development of ulcers in the eyes c. Shortness of breath, coughing, wheezing, pulmonary edema d. Nausea and vomiting e. Fatigue 2. Emergency medical care <ul style="list-style-type: none"> a. Irrigate with water or chemical decontamination kit. b. Manage the blistering as chemical burns. c. Apply a dry sterile dressing after flushing. d. Patch eye injuries after flushing. <p>C. Cyanide</p> <ul style="list-style-type: none"> 1. Signs and symptoms <ul style="list-style-type: none"> a. Anxiety b. Weakness c. Dizziness d. Nausea e. Muscular trembling f. Tachycardia g. Tachypnea h. Pale, cyanotic, or normal color skin i. Apnea j. Unresponsiveness 2. Emergency medical care <ul style="list-style-type: none"> a. Manage the airway. b. If breathing is inadequate, provide positive pressure ventilation. c. If breathing is adequate, provide oxygen by nonrebreather mask at 15 lpm. d. Administer antidote: Cyanokit® (hydroxycobalamin). <p>D. Pulmonary agents</p> <ul style="list-style-type: none"> 1. Signs and symptoms 	<p>Discussion Question How do vesicants work?</p> <p>Discussion Question What would be some clues that a large number of people have been exposed to cyanide?</p> <p>Discussion Question What are some examples of pulmonary</p>

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	<p>B. Encephalitis-like agents</p> <ol style="list-style-type: none"> 1. Agents include smallpox and Venezuelan equine encephalitis. 2. Symptoms (similar to flu) include headache, fever, and malaise. <p>C. Biological toxins</p> <ol style="list-style-type: none"> 1. Botulinum (symptoms delayed by 12 hours to several days) <ol style="list-style-type: none"> a. Descending paralysis b. Double and/or blurred vision c. Dry mouth and throat d. Dysphasia (difficulty speaking) e. Dysphagia (difficulty swallowing) f. Dyspnea 2. Ricin <ol style="list-style-type: none"> a. Weakness b. Fever c. Cough d. Hypothermia (36 hours later) e. Hypotension and cardiovascular collapse causing death (another 12 hours later) 3. Staphylococcus enterotoxin 13 <ol style="list-style-type: none"> a. Fever b. Chills c. Headache and body aches d. Nonproductive coughing (three to 12 hours later) 4. Epsilon toxin of clostridium perfringens <ol style="list-style-type: none"> a. Cough, wheezing, shortness of breath (within six hours) b. Possible liver damage c. Respiratory failure and death 5. Trichothecene mycotoxins <ol style="list-style-type: none"> a. Pain, itching, redness, lesions on exposed skin, nose, and throat b. Runny nose and sneezing c. Dyspnea d. Wheezing e. Chest pain f. Hemoptysis (coughing up blood) <p>D. Other agents</p> <ol style="list-style-type: none"> 1. Cholera <ol style="list-style-type: none"> a. Vomiting b. Abdominal distension 	<p>a community may be the result of terrorism?</p> <ul style="list-style-type: none"> • What agents cause pneumonia-like signs and symptoms? • What are biological toxins? <p>Knowledge Application Students should be able to apply the information in this section to the response to patients exposed to biological agents.</p> <p>Weblinks Go to www.bradybooks.com and click on the mykit link for <i>Prehospital Emergency Care</i>, 9th edition to access web resources on smallpox and anthrax.</p>

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	<ul style="list-style-type: none"> c. Profuse watery diarrhea d. Severe dehydration 2. Viral hemorrhagic fevers <ul style="list-style-type: none"> a. Malaise b. Body aches and headache c. Vomiting d. Flushing to face and chest e. Edema f. Petechiae (small pinpoint hemorrhages) g. Easy bleeding h. Hypotension and shock (late) 3. Brucellosis <ul style="list-style-type: none"> a. Fever b. Malaise c. Body aches and joint pain d. Headache e. Cough 	
10	<p>XVII. Biological Agents—Emergency Medical Care for Biological Agents</p> <ul style="list-style-type: none"> A. Isolate infectious patients from others. B. Use personal protective equipment. C. Secure adequate airway and ensure adequate breathing. D. Administer appropriate antibiotics and antitoxins. E. Include proper immunization and prophylaxis strategies in your response plan. 	
10	<p>XVIII. Nuclear Weapons and Radiation—Radiation</p> <ul style="list-style-type: none"> A. Types of radiation <ul style="list-style-type: none"> 1. X-ray and gamma radiation 2. Neutron radiation 3. Beta radiation 4. Alpha radiation B. Radiation exposure <ul style="list-style-type: none"> 1. Primary exposure <ul style="list-style-type: none"> a. Occurs during or shortly after detonation b. Limited to blast proximity 2. Fallout <ul style="list-style-type: none"> a. Consists of radioactive dust and particles b. Energized in atmosphere and distributed by wind 	<p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the different kinds of radiation? • How does the pattern of injury from a nuclear explosion change according to the distance from the explosion? <p>Knowledge Application</p> <p>Students should be able to apply the information in this section to the response to patients exposed to radiation.</p>

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	<ul style="list-style-type: none"> c. Can spread unlimited distance d. Most immediate danger is within 48 hours of blast and in close proximity to it 	
2	<p>XIX. Nuclear Weapons and Radiation—Blast Injuries</p> <ul style="list-style-type: none"> A. Shockwave and blast produce typical shockwave injuries. B. Windblast may displace people and collapse structures, leading to crush injuries and entrapment. 	
5	<p>XX. Nuclear Weapons and Radiation—Thermal Burns</p> <ul style="list-style-type: none"> A. Result of short exposure to intense heat B. White or light clothing provides effective protection C. Flame burns may result from ignition of clothing or building materials. D. Brilliant light flash may blind patient temporarily or damage retina permanently. 	
3	<p>XXI. Nuclear Weapons and Radiation—Radiological Dispersal Devices</p> <ul style="list-style-type: none"> A. Conventional explosive attached to radioactive materials B. Contaminates a wide area with radioactive materials C. Likely to cause widespread radiation illness and contamination to environment 	
10	<p>XXII. Nuclear Weapons and Radiation—Assessment and Care for Nuclear Detonation and Radiation Injuries</p> <ul style="list-style-type: none"> A. Assessment <ul style="list-style-type: none"> 1. Activate multiple-casualty incident management plan. 2. Identify the time after exposure that the patient complains of radiation-related signs and symptoms. <ul style="list-style-type: none"> a. Nausea and vomiting b. Fatigue c. Malaise d. Clotting disorders; possible uncontrolled hemorrhage e. Loss of appetite f. Diarrhea g. Fluid loss and dehydration h. Reddening of skin i. Rapid onset of incapacitation j. Cardiovascular collapse k. Confusion l. Burning sensation 	<p>Discussion Question What are the effects of exposure to radiation on different body systems?</p>

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	<p>B. Emergency medical care</p> <ol style="list-style-type: none"> 1. Move patient to be perpendicular to wind direction, or shelter him from further contamination. 2. Manage the patient's airway and ventilatory status. 3. If he is breathing adequately, apply a nonrebreather mask at 15 lpm. 4. If he is not breathing adequately, begin positive pressure ventilation. 5. Use sterile dressings and sterile burn sheets to cover burned areas. 6. Manage blunt trauma as you normally would. 7. Keep all wounds clean to reduce possibility of infection from radiation exposure. 8. Administer iodine tablets as protection against future thyroid cancer. 	
5	<p>XXIII. Personal Protection and Patient Decontamination</p> <ol style="list-style-type: none"> A. Wear specialized suits, gloves, boots, and breathing apparatus as necessary. B. Apply the same principles you use in dealing with a hazardous materials emergency. C. Limit exposure to rescuers. D. Decontaminate patients if you are trained for this. 	<p>Teaching Tip Refer students back to Chapter 43 if you desire further discussion on this topic.</p> <p>Discussion Question What are the activities of the hot, warm, and cold zones in a hazardous materials incident?</p>
10	<p>XXIV. Follow-Up</p> <ol style="list-style-type: none"> A. Answer student questions. B. Case Study Follow-Up <ol style="list-style-type: none"> 1. Review the case study from the beginning of the chapter. 2. Remind students of some of the answers that were given to the discussion questions. 3. Ask students if they would respond the same way after discussing the chapter material. Follow up with questions to determine why students would or would not change their answers. C. Follow-Up Assignments <ol style="list-style-type: none"> 1. Review Chapter 45 Summary. 2. Complete Chapter 45 In Review questions. 3. Complete Chapter 45 Critical Thinking. D. Assessments <ol style="list-style-type: none"> 1. Handouts 	<p>Case Study Follow-Up Discussion</p> <ul style="list-style-type: none"> • What indications would you look for to determine whether a chemical agent is also involved in this incident? • At what point would it be possible to determine whether radiation or biological agents are also involved in this incident? <p>Class Activity Alternatively, assign each question to a group of students and give them several minutes to generate answers to present to the rest of the class for discussion.</p>

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	<p style="text-align: center;">2. Chapter 45 quiz</p>	<p>Teaching Tips</p> <ul style="list-style-type: none"> • Answers to In Review and Critical Thinking questions are in the appendix to the Instructor’s Wraparound Edition. Advise students to review the questions again as they study the chapter. • The Instructor’s Resource Package contains handouts that assess student learning and reinforce important information in each chapter. This can be found under mykit at www.bradybooks.com.