

# **American Red Cross CPR/AED and First Aid**

---

- 10 participation points per day
- 30 points for notes
- 2 tests:
  - 1 demonstration 15 points
  - 1 paper assessment 30 points

# Overview of points

---

- We will be working with expensive equipment this week
  - Dummies
  - AED's
  - Babies
- If your group is not treating the equipment properly
  - Lose all participation points for the day
  - Automatic detention

# Rules

---

- 900,000 people in the US die each year from some form of heart disease.
- Heart disease is the number one cause of death in this country.
- Unintentional Injury (accidents) causes the most childhood deaths in the US.

# **Before Giving Care**

---

- 4 Steps:
  - Recognize that an Emergency Exists
  - Decide to Act
  - Activate the EMS System
  - Give Care Until Help Takes Over

# **Your role in the EMS system**

---

- Once you recognize that an emergency has occurred, you must decide how to help and what to do.
- The most common factors that keep people from responding are:
  - Panic or fear of doing something wrong
  - Being unsure of the person's condition and what to do
  - Assuming someone else will take action
  - Type of injury or illness
  - Fear of catching a disease or being sued
  - Being unsure of when to call 911 or the local emergency #

# Deciding to Act

---

- The most common germs are bacteria and viruses.
  - Bacteria can live outside of the body and do not depend on other organisms for life
    - Infections caused by bacteria can be treated with antibiotics.
  - Viruses depend on other organisms to live
    - Once in the body, it is hard to stop their progression
    - Few medications can fight viruses
    - The body's immune system is its #1 protection against infection

# Disease Transmission and Prevention

---

- Bacteria and viruses spread through direct or indirect contact:
  - Direct contact occurs when germs from the person's blood or other body fluids pass directly into your body through breaks or cuts in your skin or through the lining of your mouth, nose or eyes.
  - Indirect contact occurs when shared objects like spoons, doorknobs, pens or pencils that have been exposed to the droplets.
- Some diseases are spread more easily than others
- Diseases like HBV, HCV, or HIV get transmitted through blood-to-blood contact

# How Disease Spreads

---



- While giving care:
  - Avoid contact with blood and other bodily fluids by using PPE (Personal Protective Equipment) such as gloves and masks and CPR breathing barriers
  - Do not eat, drink, or touch your mouth, nose, or eyes when giving care, or before you wash your hands after care has been given.
  - Avoid handling any personal items such as writing utensils or combs while giving care or before you wash your hands
  - Do not touch objects soiled with blood or body fluids
  - Wash your hands thoroughly for with soap and warm running water even if you wore gloves for at least 30 seconds

# **Preventing disease transmission**

---

- Clean up the spill immediately or asap
- Use gloves and other PPE when cleaning spills
- Wipe up the spill with paper towels or other absorbent material
- After the area has been wiped up, flood the area with disinfectant
  - Make your own: 1 ½ cups of bleach to 1 gal of water (1 part bleach per 9 parts water) and let it stand for 10 min.

## **While cleaning up blood spills**

---

- Non-professionals who respond to emergencies, also called “lay responders,” rarely are sued for helping in an emergency.
- Good Samaritan laws protect people against claims of negligence when they give emergency care in good faith without accepting anything in return

# Good Samaritan

---

- In any emergency situation, follow the emergency action steps:
  - **Check** the scene and the person
  - **Call** 911 or the local emergency number
  - **Care** for the person

# Taking Action

---

- When checking the scene, you should ask yourself:
  - Is it safe?
  - Is immediate danger involved?
  - What happened?
  - How many people are involved?
  - Is anyone else available to help?
  - What is wrong?

# Check

---

- Look for signals that may indicate a life-threatening emergency.
  - Check for consciousness, unconsciousness is a life-threatening emergency
  - Watch the video for [Check-Call-Care](#)
- For purposes of first aid, an adult is defined as someone about age 12 or older
- Someone between the ages of 1 and 12 is considered to be a child
- An infant is someone younger than 1 year
- When using an AED: a child is between the ages of 1 and 8 years or weighing less than 55 lbs.

# Checking the victim

---

- If you are the ALONE:
  - Call 911 *first*:
    - For any adult or child who is unconscious
    - A child or infant who you witnessed suddenly collapse
    - An unconscious child or infant known to have heart problems
  - Care *first*: (*give 2 min. of care then call*)
    - An unconscious child who you did not see collapse
    - Any drowning victim

# Caring for the Victim

---

- Generally, you should not move an injured or ill person while giving care.
- You should only move an injured or ill person when:
  - You are faced with immediate danger
  - You have to get to another person who may have a more serious problem
  - It is necessary to give proper care. (for example, if someone needed CPR, s/he might have to be moved from the bed because CPR needs to be performed on a firm, flat surface.)

# Moving an Injured or Ill Person

---



- The heart is an organ that lies between the lungs in the middle of the chest.
- It is about the size of a fist
- It is protected by the ribs, breastbone and spine.
- Cardiovascular disease is an abnormal condition that affects the heart and blood vessels
- Most common conditions of cardiovascular disease:
  - Coronary heart disease (aka coronary artery disease)
  - Stroke (aka cerebrovascular accident)

# **Cardiac Emergencies and CPR**

---

- Persistent chest pain, discomfort or pressure lasting longer than 3-5 min
- Other signals:
  - Crushing sensation in chest
  - Squeezing
  - Pain that spreads to the shoulder, arm, neck, jaw, stomach or back
  - Dizziness, light-headedness, Loss of consciousness
  - Trouble breathing
  - Nausea, pale skin, sweating

# Signals of a Heart Attack

---

- The Cardiac Chain of Survival
- Cardiac Chain of Survival
  - Early recognition and early access to EMS
  - Early CPR
  - Early defibrillation
  - Early advanced medical care

# **Recognizing and Caring for Cardiac Emergencies**

---

- Giving CPR (Adult/Child)
- Giving CPR (Infant)

# **Recognizing and Caring for Cardiac Emergencies**

---

- If you are unable for any reason to perform full CPR, give continuous chest compressions after calling 9-1-1
- Continue giving chest compressions until another trained responder or EMS personnel take over or you notice obvious signs of life

# Hands Only CPR

---

- If the chest does not rise with rescue breaths, re-tilt the head and try another rescue breath
- If you still cannot get the chest to rise, assume the airway is blocked.
- Care for an unconscious choking person involves a modified CPR technique.
  - 30 chest compressions, foreign object check, 2 breaths
  - Continue this until air goes in or victim shows signs of life

# Unconscious Choking

---

- When the heart is healthy, the brain sends out electrical signals to tell the heart to pump blood.
- IF the heart is damaged by disease or injury, its electrical system can be disrupted causing an abnormal heart rhythm (stopping blood from circulating.)
- The most common abnormal heart rhythm that causes sudden cardiac arrest occurs when the ventricles quiver (fibrillate) without any organized rhythm.
  - This is called ventricular fibrillation (V-fib).
- Another abnormal rhythm causes the ventricles to contract too quickly.
  - This is called ventricular tachycardia (V-tach)

# AED

---

- In many cases, V-fib and V-tach can be corrected by an electrical shock delivered by an AED.
- AEDs are portable electronic devices that analyze the heart's rhythm and deliver an electrical shock, known as defibrillation.
- This helps the heart to re-establish an effective rhythm, NOT RESTART a heart that has stopped beating all together.

# AED

---



- AED Basics

**AED**

---

- AEDs can be used on anyone in cardiac arrest, even children, infants, and pregnant women.
  - Defibrillation shocks transfer no significant electric current to the fetus

**AED**

---

- Make sure there are no puddles of water around you, the person or the AED.
- If there's an implanted device visible, do not place the defibrillations pads directly over the device. This may interfere with the delivery of the shock.
- Some people have a patch on their skin that automatically delivers medication through skin.
  - Most common is a nitroglycerin patch
  - Remove any patch that you see with a gloved hand
  - Never place AED electrode pads directly on top of medication patches

# AED-Special Situations

---

- If a person has excessive chest hair, press firmly on the pads to attach them to the person's chest.
- If you continually get a “check pads” message, remove the pads and shave the person's chest where the pads should be placed.
- You do not need to remove jewelry and body piercings when using an AED.
  - Taking time to remove them will delay giving the first shock.
- DO NOT use a mobile phone within 6' of the AED. Radiofrequency interference and electromagnetic interference generated by radio signals can disrupt analysis.

# AED-Special Situations

---

- When the AED is analyzing, do not touch or move the person.
- It will affect the analysis.
- If you touch the person while defibrillating, you can get shocked.
- It is important to continue CPR so you can circulate blood that contains oxygen to the vital organs until an AED is ready to use or EMS personnel take over.

# AED

---

- Common causes of breathing emergencies include injury, illness, and disease.
- Care for breathing emergencies is basically the same for adults and children
- Care for infants is slightly different because of their smaller size.
- If not treated, some breathing emergencies can turn into cardiac emergencies.

# Breathing Emergencies

---

- Choking is a common breathing emergency that occurs when a person's airway is partially or completely blocked.
- If the choking person is coughing forcefully, encourage them to cough. Let him/her try to cough up the object.
- A person whose airway is completely blocked cannot cough, speak, cry or breathe.

# Choking

---

- If the person is choking, make sure you have consent to help them.
- A conscious adult or child who has a completely blocked airway needs immediate care.
- A combination of 5 back blows followed by 5 abdominal thrusts provides an effective way to clear the airway obstruction.
- For an infant, it is also 5 back blows followed by 5 abdominal thrusts.
  - However, you must lower your arm onto your thigh so that the infant's head is lower than his/her chest

# Choking

---



- Caring for Choking (Adult/Child)
- Caring for Choking (Infant)

# **Treating a Choking Victim**

---

- If a conscious choking victim is too large for you to reach around, is obviously pregnant or is known to be pregnant, give chest thrusts instead.



# Choking – Special Situations

---

- If you are alone and choking, bend over and press your abdomen against any firm object, such as the back of a chair, railing, or kitchen counter.
  - You can also try to give yourself abdominal thrusts, just as if you were administering abdominal thrusts to another person.
- For a person in a wheelchair, give abdominal thrusts.



# Choking – Special Situations

---

- If the adult, child, or infant becomes unconscious, carefully lower him/her to the ground (or on a firm, flat surface for an infant) and begin CPR, starting with compressions.
- Continue care for the unconscious, choking victim.
  - 30 Compressions, Foreign Object Check, 2 Breaths

# **Choking – Unconscious Victim**

---

- Dizziness or unconsciousness
- Trouble breathing
- Signals of a heart attack
- Signals of a stroke
- Loss of vision or blurred vision
- Signals of shock
- Seizures

# Sudden Illness - Signs

---

- First, do no further harm and get consent.
- Monitor breathing and consciousness
- Help the person rest comfortably.

# **Sudden Illness – What to do**

---

- Unconsciousness or altered levels of consciousness
- Trouble breathing or no breathing
- Signals of a heart attack
- Persistent abdominal pain or pressure
- Severe external bleeding
- Vomiting blood or passing blood

**Sudden Illness – When to  
call 9-1-1**

---

- Severe burns
- Suspected poisoning
  - Can also call Poison Control 1-800-222-1222
- Seizures
- Stroke
- Suspected or obvious injuries to head, neck, spine
- Painful, swollen, deformed area or open fracture

**Sudden Illness – When to  
call 9-1-1**

---



- Occurs when the normal functions of the brain are disrupted by injury, disease, fever, infection, metabolic disturbances, or conditions causing a decreased oxygen level.
- Usually lasts only a few seconds to a few minutes.

# Seizures

---

- A blank stare
- Distorted sensation
- Uncontrollable muscular contractions called convulsions

# Seizures - Signals

---

- The seizure lasts more than five minutes
- The person has multiple seizures with no sign of slowing down
- The person appears to be injured or fails to regain consciousness after the seizure
- The cause is unknown
- The person is pregnant or has diabetes
- The person is a young child or infant experiencing a febrile seizure

# **Seizures – When to call 9-1-1**

---

- The seizure takes place in the water.
- The person is elderly and could have suffered a stroke.
- The person is elderly and could have suffered a stroke.
- The person does not have a known history of epilepsy.

# **Seizures – When to call 9-1-1**

---

- Remove nearby objects that can cause injury
- Protect the airway
- Allow the seizure to run its course
- Do not place fingers or objects near the mouth of a person seizing.

# Seizures – What to do

---

- A Stroke occurs when blood flow is blocked from reaching part of the brain.
  - 3 Types:
    - Ischemic stroke: caused by blood clots
    - Hemorrhagic stroke: caused by ruptured blood vessels that cause brain bleeding
    - Transient Ischemic Attack: “mini-stroke” caused by a temporary blood clot

# Stroke

---

- Weakness or numbness of the face, arms or legs
- Severe, unexplained headache
- Facial droop or drooling
- Difficulty speaking or comprehending
- Vision loss or disturbance in one or both eyes
- Dizziness, confusion, agitation, loss of consciousness or other severely altered mental status
- Loss of balance or coordination
- Trouble walking
- Incontinence

# Stroke - Signals

---

- **Face**
  - Have the person smile – look for facial droop
- **Arm**
  - Ask the person to raise both arms – Does one arm drift downward?
- **Speech**
  - Ask the person to repeat a simple sentence – Can the person repeat the sentence correctly?
- **Time**
  - Try to determine the time when signals first appear

# **Stroke – Looking for signals**

---



- Diabetes is a disease that affects how the body uses food for energy.
- Because the body's cells cannot use the food properly, the blood glucose (sugar) becomes high.
- There are 3 types of Diabetes:
  - Type 1
  - Type 2
  - Gestational – occurs during pregnancy

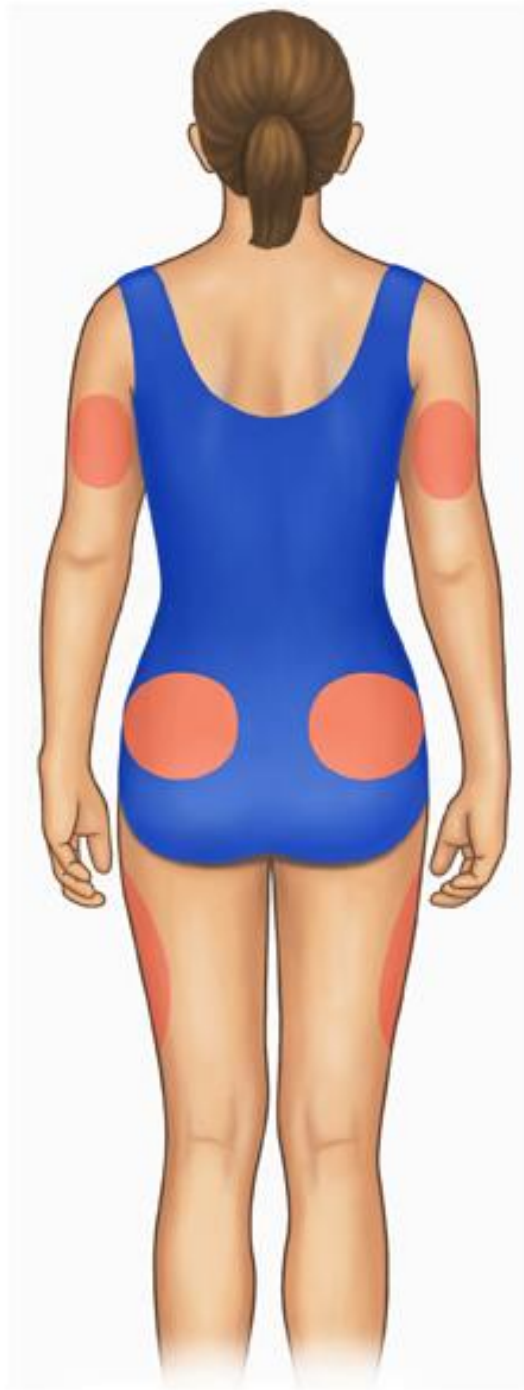
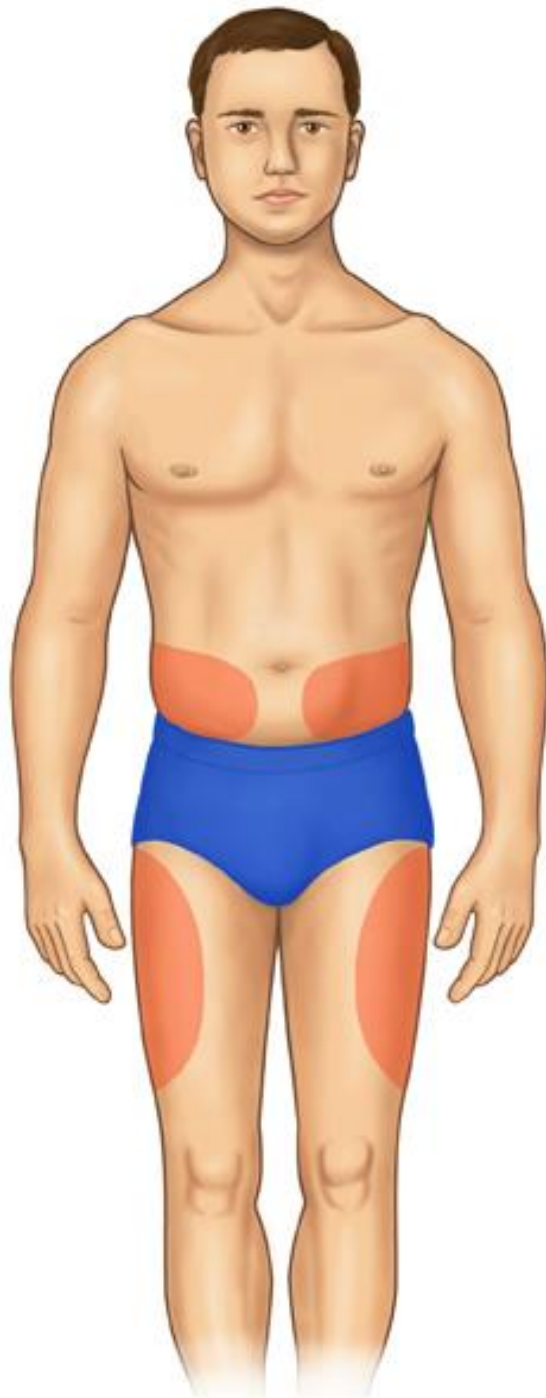
# Diabetes

---

- Usually occurs in children and young adults (under 20 years old)
- Their body (specifically the pancreas) is unable to make insulin
- To control their diabetes:
  - Healthy diet that controls starches and sugars
  - Regular exercise
  - Insulin is taken through a shot or an insulin pump

# Type 1 Diabetes

---



Cut-section view of skin



Insulin pen injector



Insulin jet injector



- Usually occurs in older adults
  - It is becoming more and more common in children and teens
- Those with Type 2 are often overweight and unfit.
- Their bodies cannot make enough insulin to control their blood sugars.

# Type 2 Diabetes

---

- Signals include:
  - Changes in the level of consciousness
  - Changes in mood
  - Rapid breathing and pulse
  - Feeling and looking ill
  - Dizziness and headache
  - Confusion

# Diabetic Emergencies

---

- When to call 9-1-1:
  - A person is unconscious or about to lose consciousness
    - Do not give them anything by mouth in this situation
  - The person is conscious but unable to swallow
  - The person does not feel better within about 5 min after taking some form of sugar
  - You cannot find any form of sugar immediately

# Diabetic Emergencies

---

- Caused by an over activity of the immune system against specific antigens (foreign substances)
- Antigens that often cause allergic reactions:
  - Bee or insect venom
  - Antibiotics
  - Pollen
  - Animal dander
  - Latex
  - Certain foods

# Allergic Reactions

---



- Allergic reactions can range from mild to severe
- Mild reactions:
  - Itchy skin rash
  - Scratchy throat
  - Itchy, watery eyes
  - Sneezing

# Allergic Reactions

---

- A severe reaction is called anaphylaxis:
- Some symptoms:
  - Hives, itching, rash
  - Weakness, Nausea, Stomach cramps
  - Vomiting, Dizziness, Trouble Breathing

# Allergic Reactions

---

- When to call 911:
  - Has trouble breathing
  - Complains of the throat tightening
  - Explains that he or she is subject to severe allergic reactions
  - Is unconscious

# Allergic Reactions

---

- Heat cramps
  - Painful muscle spasms typically in the legs or abdomen
  - They are the least severe and a first indication the body is having trouble with the heat.
  - What to do:
    - Move to a cool place and give them fluids.
    - Have the person try to stretch the body part that is cramping

## **Hot Weather related risks**

---

- Heat exhaustion
  - An overheating of the body
  - More severe than heat cramps
  - Symptoms:
    - Cold, clammy skin
    - Rapid breathing
    - Rapid pulse and other symptoms of shock
  - How to treat:
    - Loosen or remove clothing, give fluids, monitor condition.

## **Hot Weather related risks**

---

- Heat stroke (hyperthermia)
  - Body loses the ability to cool itself down
  - Symptoms:
    - Hot, very dry skin
    - Difficulty breathing
    - Sudden collapse
  - **MUST CALL AN AMBULANCE!**
  - Cool down the body as rapidly as you can.

# **Hot Weather related risks**

---

- Frostbite
  - Body tissues are frozen
  - Avoid it by wearing layers, covering all exposed skin especially the most common areas of frostbite:
    - Ears, Face, Feet, Fingers
  - How to treat:
    - Do not try to re-warm if there is a chance of refreezing.
    - For mild cases, re-warm using skin-to-skin contact.
    - For a more serious injury, soak in warm water until normal color returns.
    - Do not break any blisters.

# **Cold Weather Related Risks**

---

- Hypothermia
  - Body loses its ability to warm itself
  - Can occur in cold weather, but also wind and rain, or submersion in cold water
  - Signals include:
    - Shivering
    - Numbness
    - Glassy stare

# **Cold Weather Related Risks**

---



- How to treat:
  - Move person to a warm place
  - Remove wet clothing
  - Warm the body gradually
  - Do not give any caffeine or alcohol
- If shivering stops and person has not re-warmed, it is an emergency. Call 9-1-1

# **Cold Weather Related Risks**

---

- A *wound* is an injury to the soft tissue.
- Injuries can occur near the skin's surface or deep in the body.
- Wounds are classified as closed or open
  - Closed wound – The skin's surface is not broken. Any bleeding
  - Open wound – The skin's surface is broken and blood may come through the tear in the skin

# Soft Tissue Injuries

---

- When to call 9-1-1:
  - A person complains of severe pain or cannot move a body part without pain
  - You think the force that caused the injury was great enough to cause serious damage
  - An injured extremity is blue or extremely pale.
  - The abdomen is tender and distended.
  - Person is vomiting blood or coughing up blood
  - If you see signals of shock

# Closed Wounds

---

- Abrasions
  - Most common type of open wound
  - Usually caused by something rubbing roughly against the skin
- Lacerations
  - Cut in the skin
  - Usually caused by a sharp object
  - Can also be caused by blunt force (splitting the skin)

# Types of Open Wounds

---

- Avulsions
  - Serious soft tissue
  - A portion of the skin, and sometimes other soft tissue is partially or completely torn away
- Puncture
  - Occur when a pointed object, such as a nail, pierces the skin
- Call 9-1-1 for any major open or closed wound

# Types of Open Wounds

---



- Using Direct Pressure to Control External Bleeding (Adults)

# **Controlling Bleeding**

---

- When a person needs stitches:
  - Bleeding from an artery or uncontrolled bleeding
  - Wounds that show muscle or bone, involve joints, gape widely
  - Wounds from large or deeply embedded objects
  - Wounds from human or animal bites
  - Wounds that, if left unstitched, could leave conspicuous scars (like on the face)

# Open Wounds

---