Chapter 1

Perioperative Evaluation and Management of Surgical Patients

Oral Exam Questions

Case 1

A 62-year-old man with a PMH significant for hypertension and a 40-pack-year history of smoking is found on screening colonoscopy to have a small adenocarcinoma in his sigmoid colon. He takes a diuretic for the hypertension. Elective sigmoid colectomy is planned. Describe your preoperative assessment of this patient.

OBJECTIVE 1

The student should obtain a pertinent history.

A. No chest pain, orthopnea, or paroxysmal nocturnal dyspnea

B. Exertional dyspnea with walking up two flights of stairs

C. Chronic morning cough productive of yellow sputum

D. No wheezing

OBJECTIVE 2

The student should elicit the pertinent physical findings.

A. Regular cardiac rhythm

B. No S3 or S4 gallops

C. No JVD

D. + Clubbing; no cyanosis

E. Soft bilateral end-expiratory wheezes

OBJECTIVE 3

The student should ask for appropriate lab and radiologic studies.

A. CBC and CMP normal

B. No coagulation studies

C. 12-Lead electrocardiogram shows Qs in lead 2, lead 3, and aVF.

D. Chest radiograph shows mild cardiomegaly.

OBJECTIVE 4

The student should be able to discuss an orderly strategy for further cardiac evaluation.

A. Resting echocardiogram

B. Stress echocardiogram

C. Stress electrocardiogram

D. Stress radionuclide myocardial perfusion study

OBJECTIVE 5

Additional Questions:

A. Under what circumstances does preoperative coronary revascularization reduce the risk of postoperative acute coronary syndromes?

B. What is the role of pulmonary function testing in a smoker?

Minimal Level of Achievement for Passing

The student recognizes the cardiac and pulmonary risk factors for this patient and outlines a plan for preoperative assessment of his cardiac and pulmonary function.

Honors Level of Achievement

The student interprets an ECG and describes the specific value of further cardiac testing, explaining the limitations of each.

The student interprets pulmonary function studies and describes strategies for dealing with abnormalities.

For more information on this topic, please see the section on “Cardiac Evaluation” and “Pulmonary Evaluation.”

Case 2

A 48-year-old woman undergoes an uncomplicated colostomy closure after a sigmoid resection 2 months prior for perforated diverticulitis. On postoperative day 1, she has a fever of 39°C orally.

OBJECTIVE 1

The student should obtain a pertinent history.

A. Cough
B. Wound pain
C. Dysuria
D. Chest pain
E. Dyspnea
F. IV lines
G. Abdominal pain

OBJECTIVE 2

The student should elicit the pertinent physical findings.

A. Examine the wound.
B. Inspect IV sites.
C. Auscultate the chest.

D. Examine the abdomen.

OBJECTIVE 3

The student should ask for appropriate lab and radiologic studies.

A. WBC count

B. Urinalysis

C. CXR

OBJECTIVE 4

The student should be able to discuss the differential diagnosis for postoperative fever.

Minimal Level of Achievement for Passing

The student describes a focused history and physical examination for a patient with a postoperative fever and describes potential sources.

Honors Level of Achievement

The student describes the most likely sources based on timing from surgery, preoperative risk factors, and type of surgery performed.

The student orders appropriate studies based on a focused history and physical examination to evaluate sources of infection.

For more information on this topic, please see the section on "Fever."

Case 3

A 16-year-old male with type I diabetes is admitted after a difficult open appendectomy after acute appendicitis. On postoperative day 1, his urine output is noted to be 1,000 mL/8 hours.

OBJECTIVE 1

The student should obtain a pertinent history.

A. Oral nutritional and fluid intake

B. IV fluid intake

C. Nausea and emesis

D. Insulin intake

OBJECTIVE 2

The student should elicit the pertinent physical findings.

A. Ketone odor to breath

B. Tachypnea

C. Altered sensorium

OBJECTIVE 3

The student should ask for appropriate lab studies.

A. Glucose

B. Na, K, HCO_3, BUN, and Cr

C. Urine ketones

OBJECTIVE 4

The student should be able to discuss preoperative and postoperative glucose monitoring and insulin orders for a diabetic patient.

OBJECTIVE 5

Additional Question

A. Distinguish between the consequences of hyperglycemia in the type I and type II diabetic patient.

Minimal Level of Achievement for Passing

The student recognizes a potential postoperative problem resulting from diabetes.

The student does a focused history and physical examination.

The student measures a serum glucose level and develops a plan for insulin therapy.

Honors Level of Achievement

The student quickly identifies the symptoms related to hyperglycemia and does a more complete lab evaluation.

The student discusses in more depth preoperative and postoperative glucose monitoring and insulin management, including appropriate intravenous fluid management.

For more information on this topic, please see the section on "The Diabetic Patient."

Case 4

A 47-year-old male is referred for elective cholecystectomy after an episode of RUQ abdominal pain. The information provided to you includes an ultrasound, which reveals fluid around the liver and gallbladder but no stones or biliary dilation. He was told he may have "passed a stone." Lab studies drawn during the visit to his local emergency department include a total bilirubin level of 3.8, a creatinine of 2.5, and an INR of 2.3. Describe how you would proceed with the management of this patient.

OBJECTIVE 1

The student should obtain a pertinent history.

A. Alcohol use
B. Risk factors for exposure to hepatitis
C. Weight
D. Renal failure

E. Cardiopulmonary symptoms

F. Bleeding proclivity

G. Medication use

OBJECTIVE 2

The student should elicit the pertinent physical findings.

A. Jaundice

B. Scleral icterus

C. Hepatomegaly

D. Caput medusa

E. Ascites

F. Asterixis

OBJECTIVE 3

The student should ask for appropriate lab and radiologic studies.

A. Comprehensive metabolic panel

B. Hepatitis panel

C. Autoimmune studies

D. Metabolic studies

E. Review abdominal ultrasound for masses

F. CT scan or MRI of the liver

OBJECTIVE 4

The student should be able to discuss an orderly strategy for further evaluation.

A. Assess surgical risk based on Child-Pugh Classification or MELD score.

B. Plan for surgical intervention versus nonsurgical management.

C. Further evaluation and management of liver disease.

OBJECTIVE 5

Additional Questions

A. Assuming the patient does have a need for intervention on his gallbladder, how can he be optimized to reduce his surgical risk?

B. If chronic alcoholism is the reason for his liver disease, and if he continues to drink despite his disease and the need for surgery, how should he be managed postoperatively to decrease the risk of delirium tremens?

Minimal Level of Achievement for Passing

The student identifies the pertinent history and physical findings of a patient with advanced liver disease.

The student formulates a plan for the preoperative assessment of the severity of liver disease and the plan, if any, for operative intervention.

Honors Level of Achievement

The student discusses identification and management of autoimmune and metabolic causes of liver disease, such as antimitochondrial antibodies, copper levels, and hemochromatosis.

The student distinguishes the perioperative mortality rates of varying classes of Childs-Pugh cirrhosis and MELD scores.

For more information on this topic, please see the section on "The Patient with Hepatic Dysfunction."

Case 5

A 25-year-old woman who is 18 weeks pregnant presents with acute onset of periumbilical pain and nausea.

Describe the management of this patient.

OBJECTIVE 1

The student should obtain a pertinent history.

A. Accuracy of pregnancy dates
B. More thorough description of pain and associated symptoms
C. Presence/absence of vaginal bleeding
D. Presence/absence of bowel/bladder symptoms

OBJECTIVE 2

The student should elicit the pertinent physical findings.

A. Location of tenderness
B. Presence/absence of peritoneal signs
C. Gynecologic examination
D. Recognition that elevated heart rate and respiratory rate are normal in pregnancy

OBJECTIVE 3

The student should ask for appropriate lab and radiologic studies.

A. Recognition that leukocytosis and decreased hematocrit are normal in pregnancy
B. Use of ultrasound to evaluate both the gallbladder and the appendix
C. Use of CT scan or abdominal x-rays, if appropriate, given need to provide care for the mother

OBJECTIVE 4

The student should be able to discuss an orderly strategy for further evaluation.

A. Proceed with surgery or delay until after delivery if possible

B. Risk of spontaneous abortion or preterm labor, given relative trimesters

C. Assuming surgery is appropriate, discuss strategies to minimize risk to the patient and fetus if surgery is to be performed laparoscopically

OBJECTIVE 5

Additional Questions

A. Is intraoperative fetal monitoring necessary? If not, what should be done to assess fetal viability in the perioperative period?

B. Discuss treatment of Rh-negative mothers with injuries that may involve the fetus.

Minimal Level of Achievement for Passing

The student recognizes the pertinent alterations in the physical and lab findings in the pregnant patient.

The student formulates an appropriate plan for the evaluation and management of the pregnant patient requiring potential surgical intervention.

Honors Level of Achievement

The student describes the cardiopulmonary alterations in the pregnant patient.

The student discusses appropriate positioning of the pregnant patient and the reasons for this positioning.

For more information on this topic, please see the section on “The Pregnant Patient.”

Case 6

An 85-year-old male presents for evaluation of a symptomatic inguinal hernia. He has had prior cardiac surgery and has COPD.

OBJECTIVE 1

The student should obtain a pertinent history.

A. In-depth evaluation of the symptoms

B. Current cardiac symptoms

C. Current pulmonary symptoms

D. Thorough medical conditions

E. Medication use

F. Discussion of the goals of care

OBJECTIVE 2

The student should elicit the pertinent physical findings.

A. Cardiac examination

B. Pulmonary examination

C. State of hernia (reducible vs. incarcerated)

OBJECTIVE 3

The student should ask for appropriate lab and radiologic studies.

A. Recent cardiac studies or need for new studies (ECG, echocardiogram, stress test, cardiac catheterization, etc.)

B. Chest x-ray

C. Cardiology consultation

D. Assessment of renal function

OBJECTIVE 4

The student should be able to discuss an orderly strategy for further evaluation.

A. Need for surgery

B. Operative versus nonoperative management

C. Anesthetic options

D. Involvement of family (if appropriate) for discussion of the goals of care

OBJECTIVE 5

Additional Questions

A. Engage in a theoretical conversation with the family of the patient, assuming an intraoperative severe cardiopulmonary event.

Minimal Level of Achievement for Passing

The student recognizes the potential severity of the underlying cardiopulmonary issues present in the geriatric patient with known preexisting cardiopulmonary conditions.

The student appropriately assesses and further evaluates (including appropriate consultation) the perioperative risk associated with the geriatric patient.

The student appropriately weighs the relative risks and potential benefits of operative intervention to the geriatric patient.

Honors Level of Achievement

The student displays an appropriate reverence to patient autonomy, patient and family desires, and goals of care, given expected outcomes from a planned surgical procedure.

Also, the student displays an appropriate constraint when presented with unrealistic expectations on the part of patients or family members.

For more information on this topic, please see the section on "The Geriatric Patient."

Case 7

A 38-year-old morbidly obese patient presents for preoperative evaluation prior to planned laparoscopic Roux-en-Y gastric bypass surgery. His BMI is 73 kg/m^2. The patient not only describes poor exercise tolerance but also relates minimal physical activity. There is dyspnea on going up more than one flight of stairs. The patient describes excessive daytime sleepiness and frequent headaches. There are complaints of urinary frequency. The only medication the patient takes is a thiazide diuretic on an "as-needed" basis for peripheral edema.

Discuss the appropriate evaluation of the patient.

OBJECTIVE 1

The student should obtain a pertinent history.

A. Chest pain
B. Exercise tolerance
C. Sleep hygiene
D. Fluid intake
E. Accurate medication use

OBJECTIVE 2

The student should elicit the pertinent physical findings.

A. Peripheral edema
B. Jugular venous distention
C. Hepatomegaly
D. Evidence of crackles or rales

OBJECTIVE 3

The student should ask for appropriate lab and radiologic studies.

A. Comprehensive metabolic panel

B. Hemoglobin A_{1C}

C. Sleep study

D. ECG

E. Echocardiogram

F. Urinalysis

OBJECTIVE 4

The student should be able to discuss an orderly strategy for further evaluation.

A. Formal cardiac evaluation for possible heart failure risk stratification

B. Planning for venous thromboembolic event prevention

C. Diabetic evaluation and management

D. Medication management optimization

E. Need for further liver evaluation based on lab studies

OBJECTIVE 5

Additional Questions

A. Discuss the rationale for proceeding with surgery once the patient has been optimized.

Minimal Level of Achievement for Passing

The student recognizes that the patient is in unrecognized, untreated congestive heart failure. The student suggests appropriate evaluation strategies to identify the underlying comorbid conditions.

Honors Level of Achievement

The student describes the anticipated improvement in comorbid conditions with improvement of the underlying obesity (i.e., decrease in BMI to <40 kg/m^2).

For more information on this topic, please see the sections on “Cardiac Evaluation,” “Pulmonary Evaluation,” “The Patient with Hepatic Dysfunction,” and “The Diabetic Patient.”

Case 8

A 60-year-old patient who was maintained on hemodialysis for the past 3 years for end-stage renal disease presents for urgent management of a “clotted” dialysis access graft. Describe the evaluation and management of this patient.

OBJECTIVE 1

The student should obtain a pertinent history.

A. Reason for renal failure
B. Timing of most recent dialysis
C. Associated medical conditions—particularly cardiac
D. Risk factors for thrombosis
E. Prior thrombotic episodes
F. Location of dialysis access graft

OBJECTIVE 2

The student should elicit the pertinent physical findings.

A. Vital signs
B. Presence or absence of thrill in graft
C. Peripheral vascular examination

OBJECTIVE 3

The student should ask for appropriate lab and radiologic studies.

A. Basic metabolic panel with particular interest in serum potassium

B. ECG with comparison to most recent

OBJECTIVE 4

The student should be able to discuss an orderly strategy for further evaluation.

A. Depending on the need for dialysis, no further studies may be necessary.

B. Further cardiac studies may be warranted based on any ECG changes.

OBJECTIVE 5

Additional Questions

A. What should be done if there are severe, potentially life-threatening electrolyte abnormalities on lab studies prior to formal intervention on the dialysis graft?

B. Assuming substantial changes on ECG, associated with severe electrolyte abnormalities, how could the anesthetic plan be changed to decrease risk?

Minimal Level of Achievement for Passing

The student recognizes the conflict of inherent surgical risk and urgent need for surgery in this patient.

The student suggests strategies for minimizing the risk to the patient.

The student assesses the "clotted" graft personally to determine the need for surgery.

The student balances the electrolyte abnormalities and cardiac risk with the need for surgery.

Honors Level of Achievement

The student understands the urgent need for dialysis for this patient and directs the preoperative management to facilitate surgical intervention (or suggest alternative procedures to allow dialysis prior to operative intervention).

For more information on this topic, please see the section on "The Patient with Renal Dysfunction."

Case 9

A 67-year-old former smoker (50-pack-year history) has been diagnosed with a lung mass abutting the interlobar fissure of the left upper and lower lung. He has been scheduled for left thoracotomy with possible left pneumonectomy.

OBJECTIVE 1

The student should obtain a pertinent history.

A. Current exercise tolerance

B. Chest pain

C. Recent smoking status

D. Recent cough/sputum production/respiratory symptoms

E. Formal evaluation of medical conditions

F. Metastatic evaluation to date

OBJECTIVE 2

The student should elicit the pertinent physical findings.

A. Wheezing

B. Resonance to percussion

C. Evidence of cachexia/nutritional status

OBJECTIVE 3

The student should ask for appropriate lab and radiologic studies.

A. ECG

B. Further cardiac studies as warranted

C. Chest x-ray

D. Pulmonary function studies

OBJECTIVE 4

The student should be able to discuss an orderly strategy for further evaluation.

A. Cardiac optimization strategies depending on cardiac testing

B. Surgical resection options depending on current status and pulmonary function testing

OBJECTIVE 5

Additional Questions

A. What is the impact of evidence of metastatic disease on the perioperative management of this patient?

B. How does the planned procedure impact the ASA classification of this patient?

Minimal Level of Achievement for Passing

The student discusses the impact of smoking history (recent and remote) on the patients' operative course.

The student describes the preoperative cardiopulmonary evaluation of this patient.

The student demonstrates an understanding of the impact of the planned operative procedure on the pulmonary morbidity profile of the patient.

Honors Level of Achievement

The student discusses impact of pneumonectomy on pulmonary function testing.

The student describes the importance of cardiac testing in patients with history of smoking and unknown other cardiac risk.

The student discusses the significance of the ASA classification.

For more information on this topic, please see the section on "Pulmonary Evaluation."

Case 10

A patient underwent a complex, lengthy abdominal procedure and had a retained foreign object inadvertently left behind.

Discuss the following regarding "never events."

OBJECTIVE 1

The student should discuss other "never events" related to surgery.

A. Surgery on the wrong body part

B. Surgery on the wrong patient

C. Wrong surgical procedure on a patient

D. Intraoperative death of an otherwise normal, healthy patient

OBJECTIVE 2

The student should describe other "never events."

A. Device-related events

B. Patient protection (e.g., suicide, disappearance)

C. Care management (e.g., medication errors, transfusion errors, pressure ulcers)

D. Environmental (e.g., burns, falls)

E. Criminal (e.g., abduction, assault, impersonation)

OBJECTIVE 3

The student should identify strategies for reducing/eliminating the risk of surgically related "never events."

A. "Timeout"

B. Surgical counts

C. Patient identifiers

D. Proper preoperative evaluation

E. Surgical debrief

Minimal Level of Achievement for Passing

The student identifies surgical “never events” and strategies to avoid surgical “never events.”

Honors Level of Achievement

The student w discusses other “never events” related to the hospital environment.

For more information on this topic, please see the section on “Perioperative Safety.”