Clinical Decision-Making Exercises

1. You suspect that Paul has an acute inflammatory response. List three observations that would confirm this suspicion.

2. Carol has a severe sprain of her left ankle. Describe the clinical and cellular components that produce the signs and symptoms (redness, heat, swelling, pain, loss of function) that occur with this injury.

3. Your patient has a stage IV pressure ulcer. Identify the processes that would occur during wound healing of this ulcer.
Chapter 06: Adaptive Immunity

Clinical Decision-Making Exercises

1. Mr. Jones became infected with the HIV virus on Friday night. The following Monday, he donated a unit of blood. The blood will be screened for the presence of HIV using an antibody test. Will his blood test be positive for the virus? Why?

2. Judi Smith, age 5, is about to receive a vaccine during her regular checkup. Her mother asks you why she needs this “shot.”

3. Discuss the difference between active and passive adaptive immunity.
Clinical Decision-Making Exercises

1. A small rural community hospital notifies the health department of 4 cases of pertussis. What will the health department need to consider about this disease to ensure community response is appropriate?

2. Paul is diagnosed with community-acquired pneumonia and is prescribed antibiotic therapy. How might the antibiotic therapy combat this disease?

3. Shelly reports she has allergies to shellfish and penicillin. Identify the type of hypersensitivity reaction that occurs when Shelly ingests either of these antigens, describe signs and symptoms that may occur, and discuss the underlying cause of these.

4. Analyze the differences between the antigen-antibody reaction in a type II and a type III hypersensitivity reaction and provide examples of each type of reaction.

5. Discuss the reason people with acquired immune deficiency syndrome (AIDS) are more likely to develop opportunistic infections when compared with healthy individuals.
Clinical Decision-Making Exercises

1. Ms. Johanson and Mr. Tompkins both have lung cancer. She has a grade I tumor of the lung and he has a grade IV tumor. Identify the similarities and differences between these tumors.

2. How would angiogenesis and invasion influence tumor growth and metastasis in a patient with breast cancer?

3. Ms. Paulson has been diagnosed with breast cancer. She is scheduled to begin her chemotherapy treatment next week. She reports that she will receive 3 different medications, but she doesn’t understand why one drug wouldn’t be enough. How would you explain the rationale for multiple therapeutic drugs for her cancer?
Chapter 10: Cancer Epidemiology

Clinical Decision-Making Exercises

1. Mr. Thompson, a construction worker, has been employed by the same southeast Alabama firm for more than 30 years. He is fair skinned and has blue eyes. Discuss Mr. Thompson’s relative risk for developing skin cancers.

2. Ms. Carlson is a 52-year-old with a prior history of alcoholism who is recently diagnosed with laryngeal cancer. Identify the most common cancers associated with alcoholism and describe the mechanisms by which carcinogenesis occurs.
Clinical Decision-Making Exercises

1. John, age 17, arrives at the hospital unconscious after being injured in a motor vehicle crash. When tested, his reflexes are normal. Explain what this tells you about the extent of his brain injury.

2. How would you differentiate between upper and lower motor neuron injury?

3. Trace the flow of cerebrospinal fluid (CSF) from formation to reabsorption and identify normal values of CSF pressure.

4. Paul suffered a closed head injury in a motorcycle crash. What would be the most appropriate position for him and why?
Chapter 15: Disorders of the Central and Peripheral Nervous Systems and the Neuromuscular Junction

Clinical Decision-Making Exercises

1. Two individuals come to the emergency room with head injuries. One, age 25, has just been in a motor vehicle crash (MVC) and has a temporal lobe injury. The other, age 65, has increasing confusion after falling earlier in the week. How would you differentiate clinically between the individual with an epidural hematoma and the one with a subdural hematoma? Which one of these individuals requires priority surgical treatment?

2. Ms. Evans is diagnosed with a complete spinal cord injury at C5 after a motor vehicle crash. You are assigned to care for her. Based on your understanding of spinal cord injuries, you anticipate what signs and symptoms?

3. Mr. Jones is a 72-year-old male admitted to the intensive care unit with right-sided weakness and slurred speech. His medical history includes hypertension and type 2 diabetes. He smokes approximately one pack of cigarettes per day and has for nearly 55 years. His CT scan upon admission shows an intracranial hemorrhage. What is the most likely cause of his hemorrhagic stroke? What are the risk factors for a stroke?

4. Mrs. Frances presented to the emergency department following a grand mal seizure. Her family reports that she has never had a seizure before, but over the past several months, she has complained of multiple headaches and has become more irritable. She has a CT scan of her head, which showed a large brain tumor in her frontal lobe with multiple small tumors in other areas of her brain. There is concern that she may have a grade IV glioblastoma multiforme. A neurosurgeon is called who explains that to treat this condition she will need surgery, radiotherapy, and chemotherapy. He also explains that these tumors are difficult to treat and the median survival time is approximately 1 year. Explain why this type of tumor is so difficult to treat.
Chapter 17: Mechanisms of Hormonal Regulation

Clinical Decision-Making Exercises

1. Explain how the sensitivity of a cell for a particular hormone is altered and how hormones interact with receptors to produce an action.

2. Explain the function of antidiuretic hormone (ADH), the stimuli that produce hormone release and the hormonal actions.

3. Explain the relationship between Thyrotropin-releasing hormone (TRH), thyroid stimulating hormone (TSH), thyroglobulin, triiodothyronine (T₃), and tetraiodothyronine (T₄).

4. How do the hormones secreted from the adrenal cortex and the adrenal medulla differ?
Huether and McCance: Understanding Pathophysiology, 5th Edition

Chapter 18: Alterations of Hormonal Regulation

Clinical Decision-Making Exercises

1. Mr. Metzner has polyuria with a urine volume of 8 L/day. His urine specific gravity is 1.02. His serum sodium (Na⁺) is 150 mEq/L, and his plasma osmolality is 300 mOsm/kg. He is always asking for more cold liquids to drink. What type of hormonal alteration is Mr. Metzner exhibiting? What are some possible causes of this alteration?

2. Ms. Metzger is newly diagnosed with type 2 diabetes. She has a sister who has had type 1 diabetes since she was 3 years old. She asks you to explain the differences in the cause between type 1 diabetes mellitus and type 2 diabetes mellitus.

3. Mrs. Johnson is admitted to your unit with tachycardia, fever, agitation, and diarrhea. Her medical history is nonsignificant except for a history of recent pneumonia, and she takes no regular prescription or over-the-counter medication. She also reports that she has been very upset at the recent death of her mother. Her diagnosis is thyrotoxic crisis. She asks you to explain what is happening to her.

4. John is a 40-year-old recently diagnosed with Addison disease. He asks you to explain what happened to him and explain how he can live a normal life.
Clinical Decision-Making Exercises

1. George, an 18-year-old, requires a splenectomy after a traumatic injury. What information should you provide to the patient before he is discharged to home?

2. Mr. J. is transferred from Boston to Denver by his employer. What physiological responses would you expect because of the change in altitude?

3. Mrs. M. has been diagnosed with neutropenia, a less than normal number of neutrophils. What complications could result from this condition, and as her nurse how could you reduce the likelihood of these complications?

4. Mr. S. has a platelet count of 50,000/mm³. What does this value indicate?
Section: Clinical Decision-Making Exercises

1. Brenda is diagnosed with pernicious anemia. She asks you to explain how she contracted this disease and why she has to get “shots” to improve the number of erythrocytes in her blood; she also wonders how long she will need to have these injections.

2. Howard, a 56-year-old smoker, has chronic obstructive pulmonary disease (COPD). He arrives at the clinic for a regular follow-up visit. His erythrocyte count, hemoglobin, and hematocrit are all elevated. What is the name of this type of disorder, and what is the likely cause?

3. Olivia is a 3-year-old recently diagnosed with acute lymphocytic leukemia (ALL) found during her annual physical examination. Her mother is very upset; she wants to know the signs and symptoms, so she may monitor her child for worsening disease.

4. Albert is a 16-year-old who has been treated for the past year for acute lymphocytic leukemia. He arrives in the emergency department with an altered level of consciousness, low-grade fever, and purulent urine. His father states Albert reported pain on urination that morning. You require two attempts to start his intravenous catheter and detect that he continues to bleed from these needle sticks after 5 minutes with hematoma formation at the first site. You suspect that Albert has developed disseminated intravascular coagulation (DIC). What diagnostic tests would be required?

5. Mr. Jones was in a motorcycle accident yesterday. His injuries included a pelvic fracture and a right femur fracture. The nurse practitioner prescribes heparin daily. Why does Mr. Jones need heparin at this time?
Huether and McCance: Understanding Pathophysiology, 5th Edition

Chapter 22: Structure and Function of the Cardiovascular and Lymphatic Systems

Clinical Decision-Making Exercises

1. Describe the significance of the pericardial fluid in health and illness.

2. You are caring for Mr. Roberts, a 76-year-old. You determine that his heart rate is 160 beats per minute. How would this heart rate influence coronary artery perfusion and myocardial oxygen delivery?

3. John lacerates his radial artery while cutting a bagel. He loses approximately one-fourth of his blood volume before arriving at the hospital. What physiological responses do you expect in response to this blood loss?
Huether and McCance: Understanding Pathophysiology, 5th Edition

Chapter 23: Alterations of Cardiovascular Function

Clinical Decision-Making Exercises

1. Explain how diuretics, receptor antagonists, angiotensin converting enzyme antagonists, and angiotensin receptor antagonists reduce blood pressure in individuals with primary hypertension.

2. Mr. Black is a 56-year-old truck driver who comes to the clinic with reports of lower leg pain when he walks more than half a block. This pain recedes with rest but is initiated again with activity. What assessments of Mr. Black would you make related to this?

3. Differentiate between stable angina, variant angina, and unstable angina pectoris.

4. Mr. Bush, a 45-year-old middle school teacher arrives at the emergency department by EMS ground transport after he experienced severe midsternal chest pain at work. On arrival to the ED, what priority interventions you would initiate? What information would you require to definitively determine what was causing Mr. Bush’s chest pain?

5. Mrs. Muller is a 78-year-old homemaker who arrives in the emergency department with a history of chest discomfort and indigestion 2 days ago that lasted about 12 hours. She was severely fatigued after this and within the past 2 hours has become increasingly short of breath. Her initial ECG shows that she recently experienced an anterior AMI. Her skin is cold, and she is very diaphoretic and cyanotic. She is diagnosed with acute heart failure and cardiogenic shock. What will be the intent of her management, and what will be included in her management plan?
Clinical Decision-Making Exercises

1. How are the responses of the central chemoreceptors and the peripheral chemoreceptors alike, and how are they different?

2. Mr. Jones is a 44-year-old man admitted to the hospital after inhalation of smoke in a house fire. His physician tells the family that he has reduced compliance and high alveolar surface tension. They come to you for an explanation of what this really means. What would you tell them?

3. Describe how diaphragm contraction and relaxation produces pressure gradients for gas flow.

4. Joe is a 32-year-old with left lower lobe pneumonia. He tells you that all he feels like doing is lying in bed. How would this influence the distribution of pulmonary blood flow and ventilation?

5. Paul is a 16-year-old runner. How would his participation in a marathon influence his oxyhemoglobin dissociation curve and why?
Clinical Decision-Making Exercises

1. George arrives in the emergency department by ambulance with acute dyspnea, tachypnea, and cyanosis. His arterial blood gases are: pH 7.232, PaO₂ 54 mmHg, PaCO₂ 56 mmHg. How would you interpret these, and what do these values indicate?

2. Mr. Carp is a 54-year-old diagnosed with COPD who is admitted with his third exacerbation of dyspnea and a respiratory infection this year. His family is very concerned and do not understand what is causing his dyspnea and recurrent infections. What would you tell them?

3. Carol is a 60-year-old who arrives at the clinic with a 2-day history of fever of 101°F, chills, dry nonproductive cough, and fatigue and weakness. She reports that she recently returned from a large convention where there were over 5000 attendees. On examination, she has dullness to percussion in the right and left lower lobes and inspiratory crackles. She has bibasilar consolidation on radiograph. She is diagnosed with legionellosis. She asks you how she contracted this disease. What would you tell her?
Clinical Decision-Making Exercises

1. You are assigned to care for a surgical patient who just returned to the regular unit from the post anesthesia care unit. The nurse reports to you the urine output for this patient has been 20 ml/hour for the past 2 hours. What does this indicate to you? How would you respond to this information?

2. Your college roommate, Cheryl, tells you that she has a urinary tract infection (UTI). As you both talk, she wonders why many of her female friends have had UTIs, but none of her male friends have ever said that they have experienced a UTI. What would you tell her about the probability of a UTI based on gender?

3. Mr. Brown is a 50-year-old admitted to the hospital after 2 days of severe vomiting and diarrhea. His mean arterial pressure on admission is 70 mmHg. How would his renal system respond to this?

4. Carrie is a 46-year-old with newly diagnosed type 2 diabetes mellitus. She comes to the clinic for a follow-up visit, and you find that she has glucosuria. She asks why this happens. How would you explain this to her?

5. Carl has chronic obstructive lung disease. His PaO₂ typically is about 50 mmHg. How would this influence his renal system?
Clinical Decision-Making Exercises

1. Pauline comes to the clinic with fever, chills, lower back and flank pain, frequency and urgency, and dysuria. What assessment could aid you in determining the reason for these signs and symptoms?

2. Victoria develops hematuria and proteinuria and oliguria with peripheral edema approximately 24 hours after an upper respiratory infection. She asks you whether she needs to go to the clinic. What would you advise and why?

3. John develops oliguria the day after he has a CT scan with contrast to aid with diagnosis of abdominal pain. What would you suspect has produced this reduction in urine production? Why does oliguria occur?

4. What are your priorities for John’s care?
Clinical Decision-Making Exercises

1. Discuss how saliva is integral to the digestive processes of ingestion, propulsion, secretion, and mechanical and chemical digestion.

2. Why does the rate of gastric emptying change? What mechanisms increase and decrease gastric emptying?

3. Paul has been taking an over-the-counter nonsteroidal anti-inflammatory drug (NSAID) for arthritis pain and told his physician he has developed “indigestion” all the time. He is prescribed an H2 receptor antagonist. He asks you to explain how and why this drug will decrease his indigestion. How would you explain this?

4. Explain why pancreatic enzymes do not digest the pancreas when released.
Clinical Decision-Making Exercises

1. William comes to the clinic because he is having trouble swallowing. You know that this could be functional or mechanical dysphagia. Distinguish between these options.

2. Paula arrives at the emergency department with reports of continuous, severe epigastric pain. Paula has a history of chronic bronchitis due to cigarette smoking and osteoarthritis. She takes over-the-counter medications to treat her pain. She says she has been having epigastric pain at night for a couple of months, and eating relieved the pain. She did have an earlier episode of nausea and vomiting, and the emesis looked like coffee grounds. What is the likely diagnosis, and what diagnostic tests do you anticipate will be required? What interventions will be used for her?

3. William is a 25-year-old who comes to the clinic with a history of diarrhea, lower abdominal pain, and weight loss of approximately 40 pounds over the past 3 months. He also has noticed peripheral dependent edema. His hemoglobin is 8.0 and hematocrit 27%. What is the most likely cause of his signs and symptoms, and what diagnostic tests will he require?
Clinical Decision-Making Exercises

1. Using the connective structure classification system for joints, compare the movement ability of joints in the human body.

2. David is a marathon runner. He is very interested in muscle physiology and he asks you to explain muscle contraction. What would you tell him?
Clinical Decision-Making Exercises

1. Joey, a 15-year-old football player, arrives at the emergency department by emergency squad following an injury during a game. His left thigh leg was splinted by the first responders, and once the splint is removed, you determine it is very edematous, deformed, and quite painful. What type of injury do you suspect he has sustained? What will be the likely therapy for this injury? What processes will be necessary for normal healing of this injury?

2. Carla is a 67-year-old neighbor who calls you one morning to say she has injured herself and asks if you would take her to the emergency department. When you arrive at her house, she has an obvious deformity of her right wrist. She states she tripped, fell forward, and tried to stop her fall with her right hand. She fractured her left hip a few months prior to this incident. Carla is typically sedentary and is small in stature and very slim. What condition would you consider might be a factor in her recent skeletal injuries? How would you advise her?

3. Your grandmother tells you that her healthcare practitioner has diagnosed her with osteoarthritis in her hips and knees. She asks you to explain this to her and advise her what to do so that she can continue her activities of daily living. What would you tell her?

4. George, a 52-year-old, arrives at the clinic and states he has gout. What would you anticipate his signs and symptoms to include?
Clinical Decision-Making Exercises

1. Dan is a 20-year-old with plaque psoriasis. He reports that his father also had severe plaque psoriasis throughout his life. Dan wants to know what causes this and what he can do to make it less noticeable to others who don’t understand the disease. What would you tell him?

2. Brian arrives at the emergency department by emergency squad with difficulty breathing, nausea and vomiting, and urticaria. He began having difficulty breathing at a luncheon after eating the soup, lobster bisque. What would your priorities for management be based on his signs and symptoms and likely diagnosis?

3. Mrs. Green, a 36-year-old neighbor, tells you that she has been diagnosed with a melanoma on her left shoulder. She asks you why she developed this, how it will be treated, and what is the likelihood that she will recover. What would you tell her?

4. William, a 16-year-old, receives a thermal injury in a house fire. When he arrives at the emergency department, he has approximately 45% body surface area injury on his arms and trunk. A majority of the injured area is covered with thin-walled, fluid-filled blisters; the remainder of the injured area appears waxy white. What type of injury does this indicate? What are your initial (first 24 hour) priorities for management of this patient?