Chapter 19

Gastrointestinal and Urologic Emergencies

Unit Summary

Students who complete this chapter presentation and the related course work will understand the anatomy and physiology of the gastrointestinal, genitourinary, and renal systems. Students should be able to assess and manage various patient populations with numerous related gastrointestinal/genitourinary complaints, which include, but are not limited to, direct or referred abdominal pain, hypoglycemia, hyperglycemia, shock related to acute (medical versus trauma) or chronic gastrointestinal disorders, hemorrhage, peritonitis, and complications related to the renal system (renal dialysis).

National EMS Education Standard Competencies

Medicine

Applies fundamental knowledge to provide basic emergency care and transportation based on assessment findings for an acutely ill patient.

Abdominal and Gastrointestinal Disorders

Anatomy, presentations, and management of shock associated with abdominal emergencies:

• Gastrointestinal bleeding (pp 756–757, 762, 766–768, 770–772)

Anatomy, physiology, pathophysiology, assessment, and management of

• Acute and chronic gastrointestinal hemorrhage (pp 756–757, 762, 766–770)

• Peritonitis (pp 756–760, 766–771)

• Ulcerative diseases (pp 756–757, 760–761, 766–770)

Genitourinary/Renal

• Blood pressure assessment in hemodialysis patients (pp 771–772)

Anatomy, physiology, pathophysiology, assessment, and management of

• Complications related to

○ Renal dialysis (pp 764–765, 771–772)

○ Urinary catheter management (not insertion) (p 772)

• Kidney stones (pp 764–765)

Knowledge Objectives

1. Describe the basic anatomy and physiology of the gastrointestinal, genital, and urinary systems. (pp 756–758)

2. Define the term *acute abdomen*. (p 758)

3. Describe pathologic conditions of the gastrointestinal, genital, and urinary systems. (pp 758–766)

4. Explain the concept of referred pain. (p 760)

5. Describe other organ systems that can cause abdominal pain. (pp 759–760, 765–766)

6. Identify the signs and symptoms, and common causes, of an acute abdomen. (pp 760–64)

7. Describe the assessment and management of acute and chronic gastrointestinal hemorrhage, peritonitis, and ulcerative diseases. (pp 758–764, 766–770)

8. List the most common abdominal emergencies, with the most common locations of direct and referred pain. (p 760)

9. Describe the assessment of a patient with a gastrointestinal and urologic emergency. (pp 766–770)

10. Describe the procedures to follow in managing the patient with shock associated with abdominal emergencies. (p 767–768)

11. Describe the emergency medical care of the patient with gastrointestinal or urologic emergencies. (pp 770–772)

12. Explain the principles of kidney dialysis. (p 771–772)

Skills Objectives

1. Demonstrate the assessment of a patient’s abdomen. (pp 769–770)

Readings and Preparation

Review all instructional materials including Emergency Care and Transportation of the Sick and Injured, Twelfth Edition, Chapter 19, and all related presentation support materials.

• Provide students with evidence-based research articles relating to various gastrointestinal/genitourinary topics. This activity helps to validate the effectiveness and necessity of the basic assessment tools that the EMT is learning to master during his or her training program.

• Review any pertinent local protocols, especially those related to assessment for suspected hypoglycemia/hyperglycemia, abdominal pain, and kidney stones, as well as the transport destinations for patients with medical or traumatic injuries involving the gastrointestinal/genitourinary system.

Support Materials

• Lecture PowerPoint presentation

• Case Study PowerPoint presentation

Enhancements

• Direct students to visit Navigate.

• If possible, set up a short clinical observation in the emergency department or in the operating room during an abdominal surgery. This experience will immensely benefit the EMT’s understanding of the vast range of gastrointestinal/genitourinary disorders that may occur in the prehospital setting.

• Students will benefit from visiting a local dialysis clinic or hospital unit to observe the renal dialysis procedure (hemodialysis). This experience will help them understand the importance of patients complying with their treatment regimens.

• Content connections: The information in Chapter 10, “Patient Assessment,” relates to how the EMT should approach a patient complaining of a gastrointestinal/genitourinary problem. Because these medical conditions present in a vague manner, it is best to approach the situation with no preconceived notions about the patient’s condition.

Teaching Tips

• Make sure you set an example of professionalism and sensitivity in approaching a patient with either a gastrointestinal or genitourinary disorder/complaint, as it may cause some embarrassment during the physical examination. Ensure patient privacy when caring for pediatric, adolescent, or adult patients.

• Although there are no Skill Drills specifically designated for this chapter, make sure students understand and can use appropriate methods for obtaining a gastrointestinal and/or genitourinary assessment. The assessment procedure must be taught in a clear, organized way, because abdominal complaints can present in a vague manner. The EMT must maintain a high level of suspicion while assessing and treating patients with gastrointestinal/genitourinary disorders and complaints. A simple chief complaint of a stomach ache could result in diagnosis of an underlying severe disease.

• Have a dialysis nurse speak with the class regarding how hemodialysis works and which potential complications may arise as a result of this procedure.

• If possible, a trip to a dialysis center would provide the students with an opportunity to examine the dialysis machine and see how the patients are hooked up to it.

• Obtain a kidney from a butcher and dissect it to provide a visual reference for the students.

Unit Activities

Writing assignments: Assign each student a research article based on gastrointestinal/genitourinary diseases in the infant, child, and adult populations. After reading the article, the student can present a short summary to the class during discussion of this topic.

Student presentations: Ask students to create posters with information and drawings related to specific gastrointestinal and genitourinary diseases. This may be the same disease they researched for the writing assignment. Posters can then be passed down from class to class.

Medical terminology review: Prepare a matching activity focusing on the terminology used in the “Causes of Acute Abdomen” section within the chapter. For example:

1. Peptic ulcer disease B A. Storage for digestive juice and waste.

2. Gallbladder A B. The protective layer of mucus is eroded from the
stomach and duodenum.

Visual thinking: Photocopy Figure 19-1 or Figure 19-2 from the text. Leave in the label lines, but omit the labels and ask students to fill them in.

Pre-Lecture

### You Are the Provider

“You Are the Provider” is a progressive case study that encourages critical thinking skills.

### Instructor Directions

1. Direct students to read the “You Are the Provider” scenario found throughout Chapter 19.

2. You may wish to assign students to a partner or a group. Direct them to review the discussion questions at the end of the scenario and prepare a response to each question. Facilitate a class dialogue centered on the discussion questions and the Patient Care Report.

3. You may also use this as an individual activity and ask students to turn in their comments on a separate piece of paper.

Lecture

I. Introduction

A. Abdominal pain is a common complaint.

1. The cause of abdominal pain is often difficult to identify.

B. As an EMT:

1. You do not need to determine the exact cause of abdominal pain.

2. You should be able to recognize a life-threatening problem and act swiftly in response.

3. The patient in pain is probably anxious, requiring your skills of rapid assessment and emotional support.

II. Anatomy and Physiology

A. Abdominal cavity

1. Contains solid and hollow organs that make up three systems:

a. Gastrointestinal system

b. Genital system

c. Urinary system

2. Injury to a solid organ can cause shock and bleeding.

3. If perforation of hollow organs occurs, the contents will leak and contaminate the abdominal cavity.

B. Gastrointestinal system

1. Responsible for digestion process

2. Digestion begins when food is put into the mouth and chewed.

3. The stomach is the main organ of the digestive system.

a. Gastric juices break down food.

4. The liver assists in digestion.

a. Secretes bile

b. Filters toxic substances produced by digestion

c. Creates glucose stores

d. Produces substances necessary for blood clotting and immune function

5. The gallbladder is a reservoir for bile.

6. Food then travels to the small intestine, which consists of three sections:

a. Duodenum

b. Jejunum

c. Ileum

7. Colon (large intestine)

a. Food not broken down and used moves into the colon as waste product.

b. Water is absorbed and stool is formed.

8. The spleen is located in the abdomen but has no digestive function.

C. Genital system

1. The abdominal space also holds male and female reproductive organs.

D. Urinary system

1. Controls discharge of certain waste materials filtered from blood by the kidneys

2. The kidneys are solid organs, and the ureters, bladder, and urethra are hollow organs.

3. There are two kidneys, one on each side.

4. Ureters join each kidney to the bladder.

5. The urinary bladder is located immediately behind the pubic symphysis.

6. The bladder empties to the outside of the body through the urethra.

7. A normal adult forms 1.5 to 2 L of urine per day.

III. Pathophysiology

A. The abdominal cavity is lined by a membrane called the peritoneum.

1. The peritoneum also covers the organs of the abdomen.

a. Parietal peritoneum: lines the walls of the abdominal cavity

b. Visceral peritoneum: covers the organs

2. The presence of foreign material can irritate the peritoneum, causing peritonitis.

B. Acute abdomen refers to the sudden onset of abdominal pain.

1. Often associated with severe, progressive problems requiring medical attention

C. Peritonitis

1. Can cause ileus, which is paralysis of muscular contractions that normally propel material through the intestine

a. Retained gas and feces causes distention.

b. Stomach empties by emesis.

2. Diverticulitis

3. Cholecystitis

4. Acute appendicitis

D. Abdominal pain

1. Two types of nerves supply the peritoneum:

a. Parietal peritoneum: supplied by the same nerves that supply the skin of the abdomen

i. These nerves can easily identify and localize a point of irritation.

b. Visceral peritoneum: supplied by the autonomic nervous system

i. These nerves are less able to identify and localize pain.

2. Referred pain

a. Results from the connection between the body’s two separate nervous systems

E. Common causes of acute abdomen

1. Ulcers: protective layer of the mucous lining erodes, allowing acid to eat into the organ

a. Common causes

i. Most peptic ulcers are caused by an infection of the stomach with *Helicobacter pylori* bacteria.

ii. Chronic use of anti-inflammatory drugs (NSAIDs)

b. Signs and symptoms

i. Gnawing pain in the stomach

ii. Nausea, vomiting, belching, and heartburn.

c. Complications

i. Hematemesis

ii. Melena

iii. Peritonitis

2. Gallstones

a. May form and block the outlet from the gallbladder

b. If the blockage is not relieved, inflammation of the gallbladder (cholecystitis) can occur.

c. Signs and symptoms

i. Constant, severe pain in the right upper or midabdominal region that may refer to the right upper back, shoulder area, or flank

ii. Nausea, vomiting, indigestion, bloating, gas, and belching

3. Pancreatitis: inflammation of the pancreas

a. Common causes

i. An obstructing gallstone

ii. Alcohol abuse

b. Signs and symptoms

i. Severe pain in the upper left and right quadrants that can radiate to the back

ii. Nausea, vomiting, abdominal distention, and tenderness

c. Complications

i. Sepsis or hemorrhage

4. Appendicitis: inflammation or infection in the appendix

a. Signs and symptoms

i. Initial pain that is generalized, dull, and diffuse, which may center in the umbilical area

ii. Pain later localizes to the right lower quadrant.

iii. May have referred pain

iv. Nausea, vomiting, anorexia, fever, and chills

v. Rebound tenderness

b. Complications

i. Abscess

ii. Peritonitis

iii. Shock

5. Gastrointestinal hemorrhage

a. Symptom of another disease, not a disease itself

b. May be acute or chronic

c. Can occur in upper or lower gastrointestinal tract

d. Common causes

i. Upper GI tract: esophagitis, esophageal varices, or Mallory-Weiss tear

ii. Lower GI tract: inflammation, diverticulosis, diverticulitis, cancer, and hemorrhoids

e. Signs and symptoms

i. Upper GI tract: hematemesis and melena

ii. Lower Gi tract: bright red stools

6. Esophagitis

a. Occurs when the lining of the esophagus becomes inflamed by infection or acids from the stomach

b. Gastroesophageal reflux disease (GERD)

c. Signs and symptoms

i. Pain with swallowing and feeling like there is something stuck in his or her throat

ii. Heartburn, nausea, vomiting, and sores in the mouth

7. Esophageal varices

a. Amount of pressure within blood vessels surrounding the esophagus increases, frequently as a result of liver failure.

b. Common causes

i. Alcohol in industrialized countries

ii. Viral hepatitis in developing countries

c. With a gradual disease process, patients will initially shows signs of liver disease.

d. Rupture of varices is far more sudden.

i. Signs and symptoms: sudden onset discomfort in the epigastric region or sternum; difficulty swallowing, vomiting of bright red blood, hypotension, and signs of shock

ii. Complications: significant blood loss

8. Mallory-Weiss syndrome: junction between the esophagus and the stomach tears

a. Common causes

i. Violent coughing or vomiting

b. Signs and symptoms

i. Signs of shock, upper abdominal pain, hematemesis, and melena

9. Gastroenteritis

a. Infection combined with diarrhea, nausea, and vomiting

b. Can also be caused by noninfectious conditions

c. Signs and symptoms: diarrhea, with blood and/or pus, abdominal cramping, nausea, vomiting, fever, and anorexia

d. Complications: dehydration and shock

10. Diverticulitis

a. Lack of fiber in the diet causes the consistency of stools became more solid, requiring more intestinal contractions and increasing pressure in the colon.

b. Bulges in the colonic walls result from increased intestinal contractions.

i. Fecal matter becomes caught in the bulges, allowing bacteria to collect, and resulting in inflammation and infection.

c. Signs and symptoms

i. Abdominal pain localized more in the left lower quadrant.

d. Complications

i. Perforation of the intestinal wall leading to severe infection and shock.

11. Hemorrhoids: created by swelling and inflammation of blood vessels surrounding rectum

a. Common causes

i. Conditions that increase pressure on the rectum or irritation of the rectum

b. Signs and symptoms

i. Painless, bright red bleeding during defecation

F. Urinary system

1. Cystitis (bladder inflammation)

a. Also called urinary tract infection (UTI)

b. Common cause

i. Bacterial infection

c. Signs and symptoms

i. Midline lower abdominal pain

ii. Blood in the urine, an urgency and frequency in urination, and pressure and pain around the bladder

d. Complications

i. Kidney infection

G. Kidneys

1. Play a major role in maintaining homeostasis

2. When the kidneys fail, uremia results.

3. Kidney stones can grow over time and cause blockage.

4. Acute kidney failure

a. Sudden decrease in function

b. Common causes: hemorrhage, dehydration, trauma, shock, sepsis, heart failure, medications, drug abuse, and kidney stones.

c. Reversible with prompt diagnosis and treatment

5. Chronic kidney failure

a. Progressive and irreversible damage

b. Common causes

i. Diabetes or hypertension

c. Signs and symptoms

i. Lethargy, nausea, headaches, cramps, edema in the extremities and face, seizures, and coma

d. Will eventually require treatment with dialysis

e. These patients have an increased risk of heart failure and cardiac arrest.

H. Female reproductive organs

1. Gynecologic problems are a common cause of acute abdominal pain.

2. Lower quadrant pain may relate to the ovaries, fallopian tubes, or uterus.

3. Chapter 24, “Gynecologic Emergencies,” covers gynecologic emergencies in depth.

I. Other organ systems

1. The aorta lies immediately behind the peritoneum.

a. Weak areas can result in abdominal aortic aneurysm (AAA).

i. AAA is difficult to detect.

ii. Back pain with a tearing sensation

iii. Use extreme caution when trying to assess or detect AAA.

iv. If an aneurysm tears or ruptures, massive hemorrhage may occur.

2. Hernia

a. Protrusion of an organ or tissue through a hole or opening into a body cavity where it does not belong

i. Common causes: congenital defects, a surgical wound that has failed to heal, a natural weakness in an area such as the groin

b. Hernias may not always produce a noticeable mass or lump.

c. Reducible hernias pose little risk and can be pushed back into the body cavity.

d. Incarcerated hernias cannot be pushed back in and are compressed by surrounding body tissue.

e. Strangulation of an incarcerated hernia is a serious medical emergency.

i. Blood supply is compromised by the compressed surrounding tissue.

f. Serious hernia signs and symptoms:

i. A formerly reducible mass that is no longer reducible

ii. Pain at the hernia site

iii. Tenderness when the hernia is palpated

iv. Red or blue skin discoloration over the hernia

IV. Patient Assessment

A. Scene size-up

1. Scene safety and standard precautions

2. Mechanism of injury/nature of illness

a. Acute abdomen can be the result of violence, such as blunt or penetrating trauma.

b. Use assessment results to develop an early index of suspicion for life threats.

B. Primary assessment

1. The first priority is to identify and treat life-threatening conditions.

2. Form a general impression.

3. Airway and breathing

a. May present with shallow or inadequate respirations due to pain

4. Circulation

a. Assess for major bleeding.

b. Ask the patient about blood in vomit or black, tarry stools.

c. Pulse rate, quality, and skin condition may indicate shock.

d. Check pulses in both feet.

i. A difference in pulse strength may indicate an aortic dissection.

5. Transport decision

a. Immediate transport is warranted if there are signs of significant illness.

C. History taking

1. SAMPLE history:

a. Nausea and vomiting

b. Changes in bowel habits

c. Urination

d. Weight loss

e. Belching or flatulence

f. Pain

g. Other signs or symptoms

h. Concurrent chest pain

D. Secondary assessment

1. Positioning of the patient may give clues to the nature of illness.

2. Physical examination

a. The normal abdomen is soft and not tender to the touch.

b. Pain and tenderness are the most common symptoms of an acute abdomen.

i. Localized pain may give clues to the problem organ.

ii. Muscles of the abdominal wall may become rigid involuntarily (guarding).

3. Vital signs

a. A high respiratory rate with a normal pulse rate and blood pressure may indicate improper ventilations.

b. A high respiratory rate and pulse rate with signs of shock may indicate septic or hypovolemic shock.

c. If a patient has a dialysis shunt in his or her arm, avoid taking a blood pressure in the same arm as the shunt to avoid damaging it.

E. Reassessment

1. Because it is often difficult to determine the cause of abdominal pain, frequent reassessment is important.

2. Assess the effects of interventions, including treatment for shock and emotional support.

a. Transport the patient in the most comfortable position for him or her.

b. Consider ALS support.

3. Communication and documentation

V. Emergency Medical Care

A. Although you cannot treat the causes of acute abdomen, you can take steps to provide comfort and lessen the effects of shock.

1. Treat the patient for shock even when obvious signs of shock are not apparent.

B. Position patients who are vomiting to maintain a patent airway.

1. Contain the vomitus to prevent spread of infections (use a biohazard bag).

C. Wear gloves, eye protection, a gown, and a mask.

D. When the patient has been released to hospital staff, clean the ambulance and equipment.

E. Wash your hands even though you were wearing gloves.

F. Providing low-flow oxygen may decrease nausea and anxiety.

VI. Dialysis Emergencies

A. In patients with end-stage renal disease or chronic renal failure, dialysis is the only definitive treatment.

1. Dialysis filters the blood, cleanses it of toxins, and returns it to the body.

2. If a patient misses a dialysis treatment, weakness and pulmonary edema can be the first in a series of conditions that become progressively more serious.

3. Some services transport patients to and from dialysis centers.

4. A dialysis machine functions much like normal kidneys do.

a. Patients undergoing long-term hemodialysis have a shunt that connects a vein and an artery, allowing blood flow from the body to the dialysis machine.

b. Peritoneal dialysis allows large amounts of dialysis fluid to be infused into the abdominal cavity.

i. The fluid stays in the cavity for 1 to 2 hours.

ii. Carries a high risk of peritonitis

5. Adverse effects of dialysis:

a. Hypotension

b. Dysrhythmias

c. Chest pain

d. Muscle cramps

e. Nausea and vomiting

f. Hemorrhage from the access site

g. Infection at the access site

6. Management of a dialysis patient

a. Manage XABCs.

b. Provide high-flow oxygen if indicated.

c. Manage any bleeding form the access site.

d. Position the patient sitting up in case of pulmonary edema or supine if the patient is in shock.

e. Transport promptly.

7. Some dialysis patients also have urinary catheters.

Post-Lecture

## Assessment in Action

A. Assessment in Action is available in the Navigate course.