Chapter 13

Gastrointestinal and Urologic Emergencies

National EMS Education Standard (1 of 3)

Medicine

Applies fundamental knowledge of anatomy, physiology, and pathophysiology to provide basic and selected advanced emergency care and transportation based on assessment findings for an acutely ill patient.

National EMS Education Standard (2 of 3)

Abdominal and Gastrointestinal

Applies fundamental knowledge of assessment and management of acute and chronic gastrointestinal hemorrhage. Applies simple knowledge of assessment and management of peritonitis and ulcerative diseases.

National EMS Education Standard (3 of 3)

Genitourinary/Renal

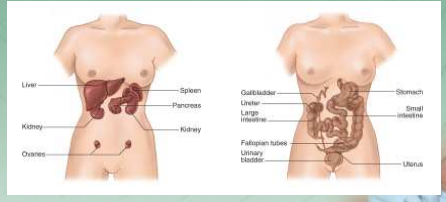
Applies fundamental knowledge of assessment and management of complications related to renal dialysis and kidney stones.

Introduction

- Abdominal pain is a common complaint.
- As an EMS professional:
  - You do not need to determine exact cause.
  - You should be able to recognize a life-threatening problem and act in response.

The Gastrointestinal System (1 of 5)

- Also known as the digestive tract
- Consists of the mouth and many other organs



The Gastrointestinal System
(2 of 5)

- Digestion begins when saliva secretes into the mouth and food is then swallowed.
  - Food travels through the esophagus to the stomach.
  - Gastric juices break down the food.
    - The stomach contracts to mix the acid and the food into chime.

The Gastrointestinal System
(3 of 5)

- The pancreas secretes enzymes to assist in digesting fats, proteins, and carbohydrates.
- The liver creates bile to aid in digestion of fats, detoxifies drugs, completes the breakdown of dead blood cells, and stores vitamins and minerals.

The Gastrointestinal System
(4 of 5)

- 90% of absorption occurs in small intestine
  - Consists of three sections:
    - Duodenum
    - Jejunum
    - Ileum

The Gastrointestinal System
(5 of 5)

- The substance that arrives in the colon is no longer chime, but rather feces.
- Primary role of large intestine is to complete the reabsorption of water
  - Also the site of bacterial digestion
- The entire digestive process takes 8 to 72 hours.

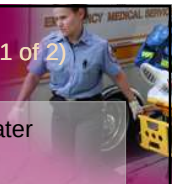
The Genital System (1 of 2)

- Male reproductive system:
  - Testicles
  - Epididymis
  - Vasa deferentia
  - Seminal vesicles
  - Prostate gland
  - Penis

The Genital System (2 of 2)

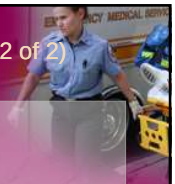
- Female reproductive system:
  - Ovaries
  - Fallopian tubes
  - Uterus
  - Cervix
  - Vagina

The Urinary System (1 of 2)



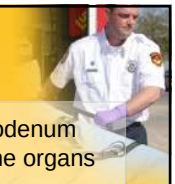
- Keeps track of the electrolytes, water content, and acids of the blood.
- Removes metabolic wastes, drug metabolites, and excess fluids.

The Urinary System (2 of 2)



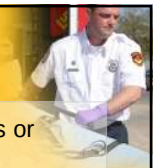
- Consists of:
  - Kidneys
  - Urinary bladder
  - Ureters
  - Urethra

Ulcers (1 of 2)



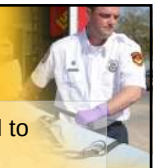
- Mucus lining the stomach and duodenum erodes, allowing acid to eat into the organs
- Peptic ulcers are usually the result of:
  - *Helicobacter pylori* infection
  - Nonsteroidal anti-inflammatory drugs
  - Alcohol and smoking

Ulcers (2 of 2)



- Burning, gnawing pain that subsides or diminishes after eating
- Some ulcers heal without intervention.
- More serious conditions can cause severe peritonitis and an acute abdomen.

Gallstones



- If gallstones do not pass, it can lead to cholecystitis.
- Gallbladder can rupture in severe cases.
- Constant, severe pain; may refer to the right upper back, flank, or shoulder

Pancreatitis

- Inflammation of the pancreas
- Caused by obstructing gallstone, alcohol abuse, or other diseases
- Signs and symptoms:
  - Severe pain in upper left and right quadrants
  - Nausea, vomiting
  - Abdominal distention, tenderness

Appendicitis

- Inflammation or infection in the appendix
- Can eventually cause tissues to die/rupture
- Initial pain is generalized, dull, and diffuse.
- A classic symptom is rebound tenderness.

Gastrointestinal Hemorrhage

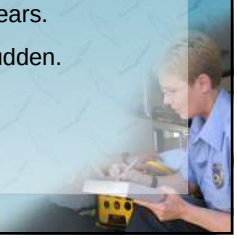
- Symptom of another disease
- Can be acute or chronic
- All complaints should be considered serious.

Esophagitis

- Lining of esophagus becomes inflamed by infection or acids from the stomach
- Pain in swallowing, heartburn, nausea, vomiting, sores in mouth

Esophageal Varices

- Pressure within the blood vessels surrounding the esophagus increases
- Patient shows signs of liver disease.
- Disease process can take years.
- Rupture of varies is more sudden.



Mallory-Weiss Syndrome

- Junction between esophagus and stomach tears causing severe bleeding.
- Vomiting is the principal cause.
- Patients may exhibit signs and symptoms of shock in extreme cases.

Gastroenteritis

- Infection with diarrhea, nausea, and vomiting
- Caused by bacterial or vital organisms.
- Diarrhea is the primary symptom.

Diverticulitis

- Fecal matter becomes caught in colon walls, causing inflammation and infection.
- Classic symptom is abdominal pain in the left lower abdomen.
- Patient may also complain of fever, malaise, body aches, chills.

Hemorrhoids

- Swelling and inflammation of the blood vessels around the rectum
- May be caused by conditions that increase pressure on the rectum
- Presents as bright red blood during defecation

Urinary Tract Infection (1 of 2)

- Usually develop in the lower urinary tract
- More common in women
- UTI in the upper urinary tract occurs most often when a lower UTI goes untreated.
  - Can lead to pyelonephritis and abscesses

Urinary Tract Infection (2 of 2)

- Common symptoms:
  - Painful urination
  - Frequent urges to urinate
  - Difficulty in urination
  - Urine may have foul odor and appear cloudy

Kidney Stones

- Originate when an excess of insoluble salts or uric acid crystallizes in the urine
- Almost always cause pain
  - Usually starts as a vague discomfort
  - Becomes intense within 30 to 60 minutes
- If suspected, obtain a patient/family history.

Acute Renal Failure

- Sudden decrease in kidney filtration
  - Accompanied by increase of toxins in the blood
- Oliguria—urine output less than 750 mL/day
- Anuria—urine production stops completely

Chronic Renal Failure (1 of 2)

- Progressive and irreversible inadequate kidney function
- Often caused by systemic diseases or congenital disorders
- Systemic complications can develop.

Chronic Renal Failure (2 of 2)

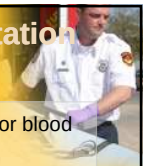
- Signs and symptoms include:
  - Altered level of consciousness
  - Nausea, cramps
  - Anemia
  - Pale, cool, and moist skin
  - Uremic frost, especially on the face
  - Edema in the extremities and face

Scene Size-Up

- Ensure scene safety.
- Use standard precautions.
- Consider eye protection, gown, and shoe coverings.

Signs and Symptoms of Irritation of the Peritoneum

- Abdominal pain
- Guarding
- Rapid, shallow breathing
- Referred pain
- Anorexia, nausea, vomiting
- Hematemesis
- Tense, distended abdomen
- Constipation or blood diarrhea
- Melena
- Pain or frequent urination
- Tachycardia
- Hypotension
- Fever



Primary Assessment (1 of 2)

- An EMS professional does not need to determine the cause of acute abdomen.
- Consider odor when forming impression.
- Assure airway patency.
- Assess breathing.
- Assess circulation.

Primary Assessment (2 of 2)

- Check blood pressure.
  - Orthostatic vital signs
- Assess for blood loss.
  - Make an accurate assessment of amount.
- Make transport decision.

History Taking (1 of 2)

- Use the OPQRST mnemonic.

Table 13-1
Types of Abdominal Pain

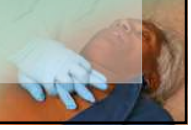
Abdominal Pain Type	Origin	Description	Cause
Visceral discomfort	Hollow organs	Difficult to localize; described as burning, cramping, gnawing, or aching; usually felt superficially	Organ contracts too forcefully or is distended (stretched)
Parietal pain/ rebound pain	Peritoneum	Steady achy pain; easier to localize than visceral; increases with movement	Inflammation of the peritoneum (caused by blood and/or infection)
Somatic pain	Peripheral nerve tracts	Well localized pain; usually felt deeply	Irritation or injury to tissue causing activation of peripheral nerve tracts
Referred pain	Peripheral nerve tracts	Pain originating in the abdomen and causing "pain" in distant locations; usually occurs after initial visceral, parietal, or somatic pain	Similar paths for the peripheral nerves of the abdomen and the distant location

History Taking (2 of 2)

- Use the SAMPLE mnemonic.
- Ask about:
  - Nausea, vomiting
  - Changes in bowel habits, urination
  - Weight loss
  - Belching or flatulence
  - Pain
  - Other signs and symptoms
  - Concurrent chest pain

Secondary Assessment (1 of 2)

- Positioning of the patient may give clues to the nature of illness.
- An acute abdomen is characterized by abdominal pain.
- Guarding occurs in an effort for the patient to protect the abdomen.

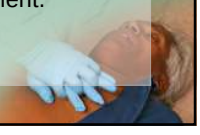


Secondary Assessment (2 of 2)

- A high respiratory rate with a normal pulse rate and blood pressure may indicate inability to ventilate properly.
- A high respiratory rate and pulse rate with signs of shock may indicate septic or hypovolemic shock.
- Use pulse oximetry and noninvasive blood pressure devices.

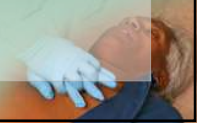
Reassessment (1 of 2)

- Reassess frequently.
- Routine monitoring should include:
  - Heart rate
  - Blood pressure
  - Respiratory rate
  - Pulse oximetry
- Monitor the effect of your treatment.



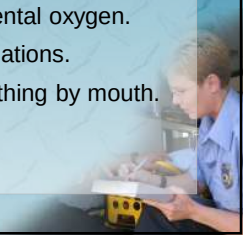
Reassessment (2 of 2)

- Try to let patient lie on his/her side.
- Call for paramedic backup if needed.
- If the patient's condition undergoes a sudden, dramatic change, repeat assessments and modify care.



Emergency Care of Acute Abdomen (1 of 2)

- Do not attempt to diagnose.
- Clear and maintain the airway.
- Anticipate vomiting.
- Administer 100% supplemental oxygen.
- Be prepared to assist ventilations.
- Do not give the patient anything by mouth.



Emergency Care of Acute Abdomen (2 of 2)

- Document all pertinent information.
- Anticipate the development of shock.
- Establish IV access.
- Make patient as comfortable as possible.
- Monitor vital signs.
- Consider ALS backup.

Renal Dialysis (1 of 3)

- Only definitive treatment for CRF
  - Peritoneal dialysis: large amounts of fluid are infused into abdominal cavity.
  - Hemodialysis: patient's blood circulates through a machine that functions as the normal kidney.

Renal Dialysis (2 of 3)

- A sudden drop in blood pressure is not uncommon.
- Electrolyte imbalance may occur.
- Shock secondary to bleeding is possible.
- If a patient misses a treatment, he or she may experience weakness, pulmonary edema, or excesses of electrolytes.

Renal Dialysis (3 of 3)

- Assess and manage ABCs.
- Provide high-flow oxygen.
- Manage any bleeding from access site.
- Position the patient sitting up.
- If shunt is leaking, tighten the connection.

Credits

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Abdominal Pain

- The worst?
  - Aortic aneurysm
  - Ruptured ectopic pregnancy
  - Perforated ulcer
  - Ruptured appendix
  - Cancer?

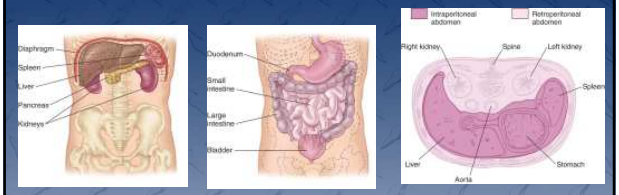
Abdominal Pain

- Look for:
  - Hypovolemia
  - Check blood sugar – DKA?
  - Pulse ox – pneumonia in kids?
  - Peritoneal signs
  - Vomiting
  - Recent trauma
- Feel for:
  - Palpate the abdomen and chart it

Abdominal Trauma

- Difficult to evaluate
  - Attention to scene and mechanism of injury
- Major cause of preventable death
  - Hemorrhage
    - Anticipate shock: immediate or delayed
    - Requires surgical intervention
  - Infection
    - Gross contamination prevention

Anatomy of the Abdomen



True abdomen

Abdominal Region Injury

- Thoracic region
  - Life-threatening hemorrhage: liver, spleen
- True abdomen
  - Infection, peritonitis, shock: intestines
  - Severe hemorrhage with signs
- Retroperitoneal abdomen
  - Severe hemorrhage hidden: major vessels

Abdominal Trauma

- Blunt
  - Most common: mortality 10–30%
- Penetrating
  - Gunshots: mortality 5–15%
  - Stabbings: mortality 1–2%
- Concern:
  - Intra-abdominal bleed with hemorrhagic shock
  - Sepsis and/or peritonitis

Abdominal Trauma

- Scene Size-up

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Blunt Abdominal Injury

- Mechanism
  - Direct compression of abdomen
    - Fracture of solid organs (spleen/liver)
    - Blowout of hollow organs (intestines)
  - Deceleration forces
    - Tearing of organs and blood vessels
- Accompanying injuries
  - Head, chest, extremity: 70% MVC victims

Blunt Abdominal Injury

- Liver and spleen injury most common
- Evidence of injury
  - Often no or minimal external evidence
  - Significant blood volume concealed in regions
  - Seat-belt sign: 25% intra-abdominal
- Pain or tenderness
  - Often no pain or overshadowed by other pain

Penetrating Abdominal Injury

- Mechanism
  - Direct trauma to organ and vasculature
    - Projectile and fragments
  - Energy transmitted from mass and velocity
- Caution:
  - Vigorous fluid resuscitation may do more harm
  - PASG may do more harm

Penetrating Abdominal Injury

- Projectile pathway not always obvious
  - Abdominal injury is chest; chest is abdominal
  - Gluteal area in 50% of significant injuries

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Abdominal Assessment

- ITLS Primary Survey: Abdomen
  - Deformities
  - Contusions
  - Abrasions
  - Punctures
  - Evisceration
  - Distension
  - Tenderness

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Signs and Symptoms

- Splenic injury
  - Referred left posterior shoulder pain
- Liver injury
  - Referred right posterior shoulder pain
- Severe hemorrhage
  - Distention, tenderness, tenseness
  - Pelvic tenderness or bony crepitation

Stabilization

Signs usually do not appear early.

If present, injury is significant.

Assess and treat for shock.

Special Situations

- Evisceration
  - Do not push viscera back into abdomen
  - Gently cover with moistened gauze
  - Apply nonadherent material to prevent drying

Special Situations

- Impaled object
  - Do not remove
    - Uncontrollable hemorrhage
  - Gently stabilize object
  - Avoid movement

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Areas of Current Study

- Destination protocols
- Serum lactate levels
- F.A.S.T. exam