Chapter 30 - Abdominal & Genitourinary Injuries

1 National EMS Education Standard Competencies (1 of 3)
   Trauma
   Applies fundamental knowledge to provide basic emergency care and transportation based on assessment findings for an acutely injured patient.

2 National EMS Education Standard Competencies (2 of 3)
   Abdominal and Genitourinary Trauma
   • Recognition and management of
     – Blunt versus penetrating mechanisms
     – Evisceration
     – Impaled object

3 National EMS Education Standard Competencies (3 of 3)
   • Pathophysiology, assessment, and management of
     – Solid and hollow organ injuries
     – Blunt versus penetrating mechanisms
     – Evisceration
     – Injuries to the external genitalia
     – Vaginal bleeding due to trauma
     – Sexual assault

4 Introduction (1 of 2)
   • The abdomen is the major body cavity, extending from diaphragm to pelvis.
     – Contains organs that make up digestive, urinary, and genitourinary systems
   • Important for EMT to know anatomy and function of abdominal and pelvic cavities

5 Introduction (2 of 2)
   • Significant trauma to the abdomen can occur from blunt trauma, penetrating trauma, or both.
   • Injuries to the abdomen that go unrecognized or are not repaired in surgery are a leading cause of traumatic death.
     – 10% of all trauma patients have some form of genitourinary tract injury.

6 Anatomy and Physiology of the Abdomen (1 of 6)
   • Abdominal quadrants
     – Abdomen is divided into four general quadrants.
   • Quadrant of bruising/pain can delineate which organs are involved.
     – RUQ: Liver, gallbladder, duodenum, pancreas
     – LUQ: Stomach and spleen
     – LLQ: Descending colon, left transverse colon
     – RLQ: Large and small intestine, appendix

7 Anatomy and Physiology of the Abdomen (2 of 6)
   • RLQ is a common location for swelling and inflammation.
   • The appendix is a source of infection if it ruptures.

8 Anatomy and Physiology of the Abdomen (3 of 6)
   • Hollow organs
     – Stomach, intestines, ureters, bladder
     – Most contain digested food, urine, or bile
When ruptured or lacerated, contents spill into peritoneal cavity.
- Can cause intense inflammatory reaction and infection such as peritonitis
- Intestinal blood supply comes from mesentery.
  - Connects the small intestine to the abdominal wall
  - Patients with injuries to the mesentery can bleed into the peritoneal cavity.

Anatomy and Physiology of the Abdomen (4 of 6)
- Hollow organs (cont’d)
- Solid organs
  - Liver, spleen, pancreas, kidneys
  - Perform chemical work of the body: enzyme production, blood cleansing, energy production
  - Because of rich blood supply, hemorrhage can be severe

Injuries to the Abdomen
- Injuries to the abdomen are considered either open or closed.
- Can involve hollow and/or solid organs

Closed Abdominal Injuries (1 of 6)
- Blunt trauma to abdomen without breaking the skin
- MOIs:
  - Steering wheel
  - Bicycle handlebars
  - Motorcycle collisions
  - Falls

Closed Abdominal Injuries (2 of 6)
- Compression
  - Poorly placed lap belt
  - Being run over by a vehicle
- Deceleration
  - Fast-moving vehicle strikes an immovable object

Closed Abdominal Injuries (3 of 6)
- Signs and symptoms
  - Pain can be deceiving
    - Often diffuse in nature
    - May be referred to another body location
  - Blood in peritoneal cavity produces acute pain in entire abdomen.

Closed Abdominal Injuries (4 of 6)
• Signs and symptoms (cont’d)
  – Difficult to determine location of pain.
  • Guarding: stiffening of abdominal muscles
  – Abdominal distention is often the result of free fluid, blood, or organ contents spilling into peritoneal cavity.
  – Abdominal bruising and discoloration
  • May appear as abrasions initially

Closed Abdominal Injuries (5 of 6)
• Seatbelts
  – Prevent many injuries and save lives.
  – May cause blunt injuries of abdominal organs
    • Particularly when belt lies too high
    • Can cause bladder injuries to pregnant patients

Closed Abdominal Injuries (6 of 6)

Open Abdominal Injuries (1 of 6)
• Foreign object enters abdomen and opens peritoneal cavity to the outside
  – Also called penetrating injuries
  – Stab wounds, gunshot wounds
• Open wounds can be deceiving.
  – Maintain a high index of suspicion.

Open Abdominal Injuries (2 of 6)
• Damage depends on velocity of object
  – Low-velocity injuries
    • Knives, other edged weapons
  – Medium-velocity injuries
    • Smaller caliber handguns and shotguns
  – High-velocity injuries
    • High-powered rifles and handguns

Open Abdominal Injuries (3 of 6)
• High- and medium-velocity injuries
  – Have temporary wound channels
  – Caused by cavitation
    • Cavity forms as pressure wave from projectile transfers to tissues.
    • Can produce large amounts of bleeding

Open Abdominal Injuries (4 of 6)
• Low-velocity injuries
  – Also have capacity to damage organs
  – Internal injury may not be apparent.
  – If injury is at or below xiphoid process, assume it has affected the thoracic and peritoneal cavities.

Open Abdominal Injuries (5 of 6)
• Evisceration: bowel protrudes from peritoneum
  – Can be painful and visually shocking
– Do not push down on abdomen.
– Only perform visual assessment.
– Cut clothing close to wound.
– Never pull on clothing stuck to or in the wound channel.

25 Open Abdominal Injuries (6 of 6)
• Signs and symptoms
  – Pain
  – Tachycardia
    • Heart increases pumping action to compensate for blood loss
  – Later signs include:
    • Evidence of shock
    • Changes in mental status
    • Distended abdomen

26 Hollow Organ Injuries (1 of 2)
• Often have delayed signs and symptoms
• Spill contents into abdomen
  – Infection develops, which can take hours or days.
  – Stomach and intestines can leak highly toxic and acidic liquids into peritoneal cavity.

27 Hollow Organ Injuries (2 of 2)
• Both blunt and penetrating trauma can cause hollow organ injuries
  – Blunt trauma causes organ to "pop," releasing fluids and air
  – Penetrating trauma causes direct injury
• Gallbladder and urinary bladder
  – Contents are damaging.
• Air in peritoneal cavity causes pain.
  – Can cause ischemia and infarction

28 Solid Organ Injuries (1 of 5)
• Can bleed significantly and cause rapid blood loss
  – Can be hard to identify from physical exam
  – Slowly ooze blood into peritoneal cavity

29 Solid Organ Injuries (2 of 5)
• Liver is the largest organ in abdomen.
  – Vascular and can lead to hypoperfusion
    • Often injured by fractured lower right rib or penetrating trauma
    • Referred pain to the right shoulder is a common finding with an injured liver.

30 Solid Organ Injuries (3 of 5)
• Spleen and pancreas
  – Vascular and prone to heavy bleeding
  – Spleen is often injured.
    • Motor vehicle collisions
    • Steering wheel trauma
    • Falls from heights
    • Bicycle and motorcycle accidents involving handlebars
Solid Organ Injuries (4 of 5)
- Diaphragm
  - When penetrated or ruptured, loops of bowels invade thoracic cavity.
  - Patient may exhibit dyspnea.

Solid Organ Injuries (5 of 5)
- Kidneys
  - Can cause significant blood loss
  - Common finding is blood in urine (hematuria)
  - Blood visible on urinary meatus indicates significant trauma to genitourinary system

Patient Assessment of Abdominal Injuries
- Assessment of abdominal injuries is difficult.
  - Causes of injury may be apparent, but resulting tissue damage may not be.
  - Patient may be overwhelmed with more painful injuries.
  - Some injuries develop and worsen over time, making reassessment critical.

Scene Size-up (1 of 2)
- Scene size-up
  - Standard precautions of gloves and eye protection should be a minimum
  - Be sure scene is safe for you
  - Call for additional resources early if needed

Scene Size-up (2 of 2)
- Mechanism of injury/nature of illness
  - Observe the scene for early indicators of MOI
  - Consider early spinal precautions
  - If the wound is penetrating, inspect object of penetration

Primary Assessment (1 of 5)
- Perform rapid scan.
  - Helps establish seriousness of condition
  - Some injuries will be obvious and graphic.
    - Others will be subtle and go unnoticed.
  - Injury may have occurred hours or days earlier.

Primary Assessment (2 of 5)
- Form a general impression.
  - Important indicators will alert you to seriousness of condition.
  - Don’t be distracted from looking for more serious hidden injuries.
  - Check for responsiveness using AVPU scale.
  - Address life-threatening external hemorrhage before airway and breathing concerns.

Primary Assessment (3 of 5)
- Airway and breathing
  - Ensure airway is clear and patent.
  - If spinal injury is suspected, prevent patient from moving
  - Clear airway of vomitus.
  - A distended abdomen may prevent adequate inhalation.
    - Providing oxygen will help improve oxygenation.
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39 Primary Assessment (4 of 5)
• Circulation
  – Superficial abdominal injuries usually do not produce significant external bleeding.
  – Internal bleeding can be profound.
    • Trauma to liver, kidneys, and spleen can cause significant internal bleeding.
  – Evaluate pulse, skin color, temperature, and condition to determine stage of shock.
    • Treat aggressively.

40 Primary Assessment (5 of 5)
• Transport decision
  – Abdominal injuries generally indicate a quick transport to the hospital.
    • Delay in medical evaluation may result in unnecessary and dangerous progression of shock.
    • Patients with abdominal injuries should be evaluated at the highest level of trauma center available.

41 History Taking (1 of 2)
• Investigate chief complaint and MOI
  – Identify signs, symptoms, and pertinent negatives.
  – Movement of body or abdominal organs irritates peritoneum, causing pain.
    • To minimize this pain, patients will lie still with knees drawn up.

42 History Taking (2 of 2)
• SAMPLE history
  – Use OPQRST to help explain injury.
  – Ask if there is nausea, vomiting, or diarrhea.
  – Ask about appearance of any bowel movements and urinary output.

43 Secondary Assessment (1 of 5)
• May not have time to perform in the field
• Physical examinations
  – Inspect for bleeding.
  – Remove or loosen clothes to expose injuries.
    • Provide privacy.
  – Patient should remain in position of comfort.
  – Examine entire abdomen.
    • Critical step for patients with entrance wound

44 Secondary Assessment (2 of 5)
• Physical examinations (cont’d)
  – Use DCAP-BTLS.
    • Inspect and palpate for deformities.
    • Look for presence of contusions, abrasions, puncture wounds, penetrating injuries, burns.
    • Palpate for tenderness and attempt to localize to specific quadrant of abdomen.
    • Swelling may indicate significant intra-abdominal injury.

45 Secondary Assessment (3 of 5)
• Physical examinations (cont’d)
  – Palpate the quadrant farthest away from quadrant exhibiting signs of injury and pain.
  • Allows you to investigate possibility of radiation of pain
  – Perform full-body scan to identify injuries.
  • If you find life threat, stop and treat it.
  • Assess need for spinal immobilization.

Secondary Assessment (4 of 5)
• Physical examinations (cont’d)
  – Inspect and palpate kidney area for tenderness, bruising, swelling, or other trauma signs.
  • Hollow organs will spill contents into peritoneal cavity.

Secondary Assessment (5 of 5)
• Vital signs
  – Many abdominal emergencies can cause a rapid pulse and low blood pressure.
  – Record of vital signs will help identify changes in condition.
  – Use appropriate monitoring devices.
• If MOI suggests an isolated injury to the abdomen, focus your physical examination on the injured area only.

Reassessment (1 of 2)
• Repeat the primary assessment and reassess vital signs.
  • Reassess interventions and treatment.
• Interventions
  – Manage airway and breathing problems.
  – Provide spinal immobilization.
  – Treatment for shock
  – Cover wounds.

Reassessment (2 of 2)
• Communication and documentation
  – Communicate all relevant information to staff at receiving hospital.
  – Document results of physical exam and pertinent negatives.
  – Describe scene in enough detail to give trauma team a clear understanding.
  – Be cautious and diligent when dealing with patients who refuse transport.

Emergency Medical Care of Abdominal Injuries (1 of 8)
• Closed abdominal injuries
  – Biggest concern is not knowing the extent of injury.
  • Patient requires rapid transport.
    – Primarily to trauma center with surgeon
  • Position for comfort.
  • Apply high-flow oxygen if signs of hypoxia or shock.
  • Treat for shock.

Emergency Medical Care of Abdominal Injuries (2 of 8)
• Patient with blunt abdominal wounds may have:
  – Severe bruising of abdominal wall
– Liver and spleen laceration
– Rupture of intestine
– Tears in mesentery
– Rupture or avulsion of kidneys
– Intra-abdominal hemorrhage
– Peritoneal irritation and inflammation

52 Emergency Medical Care of Abdominal Injuries (3 of 8)
• Closed abdominal injuries (cont’d)
  – Patient with blunt abdominal injury should be log rolled to a supine position on a backboard.
  – Protect the spine.
  – Monitor vital signs.

53 Emergency Medical Care of Abdominal Injuries (4 of 8)
• Open abdominal injuries
  – Patients with penetrating injuries
    • Generally obvious wounds, external bleeding
    • Maintain a high index of suspicion for serious unseen blood loss.
    • Surgeon should assess damage.

54 Emergency Medical Care of Abdominal Injuries (5 of 8)
• Open abdominal injuries (cont’d)
  – Inspect patient’s back and sides for exit wound.
  – Apply dry, sterile dressing to all open wounds.
  – If penetrating object is still in place, apply stabilizing bandage around it.

55 Emergency Medical Care of Abdominal Injuries (6 of 8)
• Evisceration
  – Severe lacerations of abdominal wall may result in internal organs or fat protruding through wound.

56 Emergency Medical Care of Abdominal Injuries (7 of 8)
• Evisceration (cont’d)
  – Never try to replace a protruding organ.
  – Keep the organs moist and warm.
  – Cover with moistened, sterile dressings.
  – Secure dressing with bandage.
  – Secure bandage with tape.

57 Emergency Medical Care of Abdominal Injuries (8 of 8)

58 Anatomy of the Genitourinary System (1 of 3)
• Controls reproductive functions and waste discharge
  – Organs of the genitourinary system are located in the abdomen
    • Kidneys, ureters, bladder, urethra
  – Male genitalia lie outside pelvic cavity.
  – Female genitalia lie within pelvic cavity.

59 Anatomy of the Genitourinary System (2 of 3)
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Anatomy of the Genitourinary System (3 of 3)

Injuries of the Genitourinary System (1 of 7)

- Kidney injuries
  - Not unusual and rarely occur in isolation
  - Kidneys lie in well-protected area.
  - Forceful blow or penetrating injury often involved

Injuries of the Genitourinary System (2 of 7)

- Suspect kidney damage if patient has evidence of any of the following:
  - Abrasion, laceration, contusion on the flank
  - Penetrating wound in region of flank or upper abdomen
  - Fractures on either side of lower rib cage or of lower thoracic or upper lumbar vertebrae
  - A hematoma in the flank region

Injuries of the Genitourinary System (3 of 7)

- Urinary bladder injuries
  - May result in rupture
  - Urine spills into surrounding tissues.
  - Blunt injuries to lower abdomen or pelvis can rupture urinary bladder.
  - In males, sudden deceleration can shear the bladder from the urethra.
  - In later trimesters of pregnancy, bladder injuries increase.

Injuries of the Genitourinary System (4 of 7)

Injuries of the Genitourinary System (5 of 7)

- External male genitalia injuries
  - Soft-tissue wounds
  - Painful and of great concern for patient
  - Rarely life threatening
  - Should not be given priority over more severe wounds unless there is severe bleeding

Injuries of the Genitourinary System (6 of 7)

- Female genitalia injuries
  - Internal female genitalia
    - Uterus, ovaries, fallopian tubes are rarely damaged.
    - Exception is pregnant uterus
      - Uterus enlarges substantially and rises out of pelvis
      - Injuries can be serious.
      - Also keep fetus in mind.

Injuries of the Genitourinary System (7 of 7)

- Female genitalia injuries (cont’d)
  - External female genitalia
    - Vulva, clitoris, major and minor labia
    - Very rich nerve supply
    - Consider sexual assault and pregnancy.
    - If external bleeding, a sterile absorbent sanitary pad may be applied to the labia.
    - Do not insert anything into the vagina.
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68 Patient Assessment of the Genitourinary System
- Potential for patient embarrassment
  - Maintain a professional presence.
  - Provide privacy.
  - Have EMT of same gender perform assessment.
  - Look for blood on patient’s undergarments.

69 Scene Size-up
- Scene safety
  - Assess the scene for hazards and threats.
  - Assess the impact of hazards on care.
- Look for indicators of MOI.
  - Patient may avoid discussion to avoid undergoing physical exam
  - Patient may provide an MOI that seems less embarrassing than the actual MOI

70 Primary Assessment (1 of 4)
- Quickly scan patient to identify and treat life threats.
  - Genitourinary system is very vascular.
  - Do not avoid this area in the rapid scan.
    - Life-threatening hemorrhage must be addressed immediately.
    - If bleeding is present, inspect exterior genitals for visible injury.
- Form a general impression.

71 Primary Assessment (2 of 4)
- Airway and breathing
  - Ensure the patient has a clear and patent airway.
    - Protect from further spinal injury.
  - Consider advanced airway if patient is unresponsive.

72 Primary Assessment (3 of 4)
- Circulation
  - Genitourinary system can be a significant source of bleeding.
  - Assess pulse rate and quality.
- Closed injuries do not have visible signs of bleeding.
- Control bleeding if seen.

73 Primary Assessment (4 of 4)
- Transport decision
  - Any injury to the genitourinary system can be life altering.
    - Often requires medical specialist for specialized care

74 History Taking (1 of 2)
- Investigate chief complaint.
  - Common associated complaints with genitourinary injuries are:
    - Nausea and vomiting
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• Diarrhea
• Blood in urine
• Vomiting blood
• Abnormal bowel and bladder habits

75 **History Taking (2 of 2)**

- **SAMPLE history**
  - Use OPQRST to learn about patient’s pain.
  - Ask patient about output.
    - Especially blood in urine
  - Ask about allergies.
  - The importance of past medical history cannot be overstated.
  - Last intake of food and fluid
  - Address events leading up to injury.

76 **Secondary Assessment (1 of 3)**

- **Physical examinations**
  - Genitourinary system injuries can be awkward to assess and treat.
    - Privacy is a genuine concern.
  - Focus on specific region of body when isolated injury is present.
  - Look for DCAP-BTLS.
  - Identify wounds and control bleeding.

77 **Secondary Assessment (2 of 3)**

- **Physical examinations (cont’d)**
  - Start with a full-body scan for significant trauma.
    - Presence of penetrating injury indicates possible internal injury.
    - Presence of burns must be noted and managed immediately.
    - Palpate for tenderness to localize the injury and presence of fractures.
    - Look for lacerations and local swelling.

78 **Secondary Assessment (3 of 3)**

- **Vital signs**
  - Obtain the patient’s vital signs.
    - Important to reassess vital signs to identify differences in condition.
    - Tachycardia; tachypnea; low blood pressure; weak pulse; and cool, moist, pale skin indicate hypoperfusion.
    - Use pulse oximetry and noninvasive blood pressure devices when available.

79 **Reassessment**

- **Interventions**
  - Provide oxygen if there are signs of dyspnea or shock and maintain airway.
  - Control bleeding and treat for shock.
  - Place patient in position of comfort and transport.

- **Communication and documentation**
  - Communicate all concerns to hospital staff.
  - Describe and document all injuries and treatments given.

80 **Emergency Medical Care of Genitourinary Injuries (1 of 11)**

- **Kidney injuries**
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– Injuries may not be obvious.
  • You will see signs of shock and blood in urine.
  • Treat for shock, transport promptly, and monitor vital signs en route.

Emergency Medical Care of Genitourinary Injuries (2 of 11)
• Urinary bladder injury
  – Suspect if you see:
    • Blood at urethral opening
    • Signs of trauma to lower abdomen, pelvis, or perineum
  – In presence of shock or associated injuries:
    • Transport promptly.
    • Monitor vital signs en route.

Emergency Medical Care of Genitourinary Injuries (3 of 11)
• External male genitalia
  – Make patient comfortable.
  – Use sterile, moist compresses to cover areas stripped of skin.
  – Apply direct pressure with dry, sterile gauze dressings to control bleeding.
  – Never move or manipulate foreign objects in urethra.
  –

Emergency Medical Care of Genitourinary Injuries (4 of 11)
• External male genitalia (cont’d)
  – Identify and take avulsed parts in bag to hospital with patient.
  – Amputation of penile shaft
    • Managing blood loss is top priority.
      – Use local pressure with sterile dressing.
    • Surgical reconstruction is possible if you can locate the amputated part.
    –

Emergency Medical Care of Genitourinary Injuries (5 of 11)
• External male genitalia (cont’d)
  – If connective tissue surrounding erectile tissue is damaged, shaft can be fractured or angled.
    • Sometimes requires surgical repair
  – Injury may occur during active sexual intercourse.
  – Associated with intense pain, bleeding, and fear

Emergency Medical Care of Genitourinary Injuries (6 of 11)
• External male genitalia (cont’d)
  – Laceration of head of penis
    • Associated with heavy bleeding
    • Apply local pressure with sterile dressing.
  – Skin of shaft or foreskin caught in zipper
    • If small segment of zipper is involved, try to unzip.
    • If long segment of zipper is involved, cut the zipper out of the pants with heavy scissors.

Emergency Medical Care of Genitourinary Injuries (7 of 11)
External male genitalia (cont’d)
  – Urethral injuries are not uncommon
    • Straddle injuries, pelvic fractures, and penetrating wounds of the perineum
    • Important to know if patient can urinate and if there is blood in urine
      – Save urine for hospital examination.
    • Foreign bodies protruding from urethra will have to be surgically removed.

Emergency Medical Care of Genitourinary Injuries (8 of 11)
  • External male genitalia (cont’d)
    – Avulsion of the skin of the scrotum may damage scrotal contents.
      • Preserve avulsed skin in a moist sterile dressing.
      • Wrap scrotal contents or perineal area with a sterile moist compress.
    – Direct blows to scrotum can result in rupture of a testicle or accumulation of blood
      around testes.
      • Apply ice to scrotal area.

Emergency Medical Care of Genitourinary Injuries (9 of 11)
  • Female genitalia
    – Treat lacerations and avulsions with moist, sterile compresses.
      • Use local pressure to control bleeding.
      • Hold dressings in place with diaper-type bandage.
    – Do not pack dressings into vagina.

Emergency Medical Care of Genitourinary Injuries (10 of 11)
  • Female genitalia (cont’d)
    – Leave any foreign bodies in place after stabilizing with bandages.
    – Injuries are painful but not life threatening.
      • In-hospital evaluation required.
      • Transport urgency determined by associated injuries, amount of hemorrhage, and
        presence of shock.

Emergency Medical Care of Genitourinary Injuries (11 of 11)
  • Rectal bleeding
    – Common complaint
      • May present as blood in or soaking through undergarments
    – Possible causes include sexual assault, rectal foreign bodies, hemorrhoids, colitis, ulcers.
      • Rectal bleeding possible after hemorrhoid surgery

Sexual Assault (1 of 4)
  • Sexual assault and rape are common.
    – Victims are generally women.
    – Sometimes men and children
    • Often there is little you can do beyond providing compassion and transport.
      – Patient may have sustained multisystem trauma and need treatment for shock.

Sexual Assault (2 of 4)
  • Do not examine genitalia unless obvious bleeding requires application of dressing.
  • Follow appropriate procedures and protocol.
    – Shield patient from curious onlookers.
Sexual Assault (3 of 4)
- Follow crime scene policy of your EMS system.
  - Advise patient not to wash, bathe, shower, douche, urinate, or defecate until after examination.
  - If oral penetration occurred, advise patient not to eat, drink, brush the teeth, or use mouthwash until after examination.
  - Handle patient’s clothes as little as possible.

Sexual Assault (4 of 4)
- Make sure EMT caring for patient is same gender as patient whenever possible.
- Treat medical injuries and provide privacy, support, and reassurance.

Review
1. Peritonitis would MOST likely result following injury to the:
   A. liver.
   B. spleen.
   C. kidney.
   D. stomach.

Review
Answer: D
Rationale: In general, solid organs bleed when injured and hollow organs spill their contents into the abdominal cavity, resulting in peritonitis—inflammation of the intra-abdominal lining. Of the choices listed, the stomach is the only hollow organ.

Review (1 of 2)
1. Peritonitis would MOST likely result following injury to the:
   A. liver.
     Rationale: The liver typically bleeds into the abdominal cavity.
   B. spleen.
     Rationale: The spleen typically bleeds into the abdominal cavity.

Review (2 of 2)
1. Peritonitis would MOST likely result following injury to the:
   C. kidney.
     Rationale: The kidneys typically bleed into the retroperitoneal space and not into the abdomen.
   D. stomach.
     Rationale: Correct answer

Review
2. Which of the following organs would be the MOST likely to bleed profusely if severely injured?
   A. Liver
   B. Kidney
   C. Stomach
   D. Gallbladder
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Review
Answer: A
Rationale: The liver is a highly vascular solid organ, and contains approximately 40% of the body’s total blood volume at any given time. If severely injured, bleeding from the liver would be profuse and rapid. Other solid organs, such as the spleen and kidneys, may also produce severe bleeding if injured, though not as rapid as the liver. The stomach and gallbladder are hollow organs; if lacerated, they would spill their contents into the abdominal cavity, resulting in peritonitis.

Review (1 of 2)
2. Which of the following organs would be the MOST likely to bleed profusely if severely injured?
   A. Liver
      Rationale: Correct answer
   B. Kidney
      Rationale: This will produce bleeding, but not as rapidly as the liver.

Review (2 of 2)
2. Which of the following organs would be the MOST likely to bleed profusely if severely injured?
   C. Stomach
      Rationale: This hollow organ will spill its contents into the abdominal cavity.
   D. Gallbladder
      Rationale: This hollow organ will spill its contents into the abdominal cavity.

Review
3. Which of the following statements regarding intra-abdominal bleeding is FALSE?
   A. Intra-abdominal bleeding often causes abdominal distention.
   B. Intra-abdominal bleeding is common following blunt force trauma.
   C. The absence of pain and tenderness rules out intra-abdominal bleeding.
   D. Bruising may not occur immediately following blunt abdominal trauma.

Review
Answer: C
Rationale: Intra-abdominal bleeding is common following blunt trauma to the abdomen. Signs include abdominal distention, rigidity, bruising (may not occur immediately), and in some cases, pain to palpation. However, unlike gastric juices and bacteria, blood within the abdominal cavity does not provoke an inflammatory response; therefore, the absence of pain and tenderness does not rule out internal bleeding.

Review (1 of 2)
3. Which of the following statements regarding intra-abdominal bleeding is FALSE?
   A. Intra-abdominal bleeding often causes abdominal distention.
      Rationale: You may see evidence of abdominal distention.
   B. Intra-abdominal bleeding is common following blunt force trauma.
      Rationale: This is a common condition following blunt trauma.

Review (2 of 2)
3. Which of the following statements regarding intra-abdominal bleeding is FALSE?
   C. The absence of pain and tenderness rules out intra-abdominal bleeding.
      Rationale: Correct answer
   D. Bruising may not occur immediately following blunt abdominal trauma.
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Rationale: This may not occur immediately.

107 Review

4. Even when seatbelts are worn properly and the airbags deploy, injury may occur to the:
   A. chest.
   B. extremities.
   C. iliac crests.
   D. lower ribcage.

5.

108 Review

Answer: C

Rationale: Seatbelts should be positioned over the iliac crests of the pelvis. If they are positioned higher, significant intra-abdominal injury can occur. Even when seatbelts are properly positioned and the airbags deploy, injury to the iliac crests may occur as the locking mechanism of the seatbelt engages during a motor vehicle crash that involves rapid deceleration.

109 Review (1 of 2)

4. Even when seatbelts are worn properly and the airbags deploy, injury may occur to the:
   A. chest.
   Rationale: If the seatbelts are worn too high, then abdominal injuries may occur.
   B. extremities.
   Rationale: The extremities are not likely to be injured if seatbelts are worn properly.

110 Review (2 of 2)

4. Even when seatbelts are worn properly and the airbags deploy, injury may occur to the:
   C. iliac crests.
   Rationale: Correct answer
   D. lower ribcage.
   Rationale: If seatbelts are worn too high, then abdominal injuries may occur.

111 Review

5. While inspecting the interior of a wrecked automobile, you should be MOST suspicious that the driver experienced an abdominal injury if you find:
   A. a deformed steering wheel.
   B. that the airbags deployed.
   C. a crushed instrument panel.
   D. damage to the lower dashboard.

6.

112 Review

Answer: A

Rationale: Airbags save lives when used in conjunction with properly worn seatbelts. Unfortunately, however, not all drivers wear their seatbelts. If unrestrained, the driver’s abdomen may strike the steering wheel, resulting in significant trauma. Suspect this if you lift the airbag and note that the lower part of the steering wheel is deformed.

113 Review (1 of 2)

5. While inspecting the interior of a wrecked automobile, you should be MOST suspicious that the driver experienced an abdominal injury if you find:
   A. a deformed steering wheel.
   Rationale: Correct answer
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B. that the airbags deployed.
   Rationale: Typically, the face and chest are impacted by airbags if safety belts are worn properly.

114  **Review (2 of 2)**

5. While inspecting the interior of a wrecked automobile, you should be MOST suspicious that the driver experienced an abdominal injury if you find:
   C. a crushed instrument panel.
      Rationale: This would indicate the possibility of leg and hip injuries.
   D. damage to the lower dashboard.
      Rationale: This would indicate the possibility of leg and hip injuries.

115  **Review**

6. Other than applying a moist, sterile dressing covered with a dry dressing to treat an abdominal evisceration, an alternative form of management may include:
   A. placing dry towels over the open wound.
   B. cleaning the exposed bowel with sterile saline.
   C. applying the PASG to stop the associated bleeding.
   D. applying an occlusive dressing, secured by trauma dressings.

116  **Review**

   Answer: D
   Rationale: Although the preferred management for an abdominal evisceration includes the application of a moist, sterile dressing covered by a dry dressing, protocols in some EMS systems call for an occlusive dressing, secured by trauma dressings. An occlusive dressing may help prevent the loss of body heat through the abdominal wound.

117  **Review (1 of 2)**

6. Other than applying a moist, sterile dressing covered with a dry dressing to treat an abdominal evisceration, an alternative form of management may include:
   A. placing dry towels over the open wound.
      Rationale: Treatment is a moist, sterile dressing over the open wound.
   B. cleaning the exposed bowel with sterile saline.
      Rationale: EMS should not clean any exposed abdominal organs.

118  **Review (2 of 2)**

6. Other than applying a moist, sterile dressing covered with a dry dressing to treat an abdominal evisceration, an alternative form of management may include:
   C. applying the PASG to stop the associated bleeding.
      Rationale: PASG inflation is contraindicated with an abdominal evisceration.
   D. applying an occlusive dressing, secured by trauma dressings.
      Rationale: Correct answer

119  **Review**

7. You are transporting a patient with possible peritonitis following trauma to the abdomen. Which position will he MOST likely prefer to assume?
   A. Sitting up
   B. Legs drawn up
   C. Legs outstretched
   D. On his right side

8.
Chapter 30 - Abdominal & Genitourinary Injuries

Answer: B
Rationale: Patients with peritonitis often lie very still and tend to have their legs drawn up into the abdomen. This relieves strain on the abdominal muscles and may provide pain relief.

Review (1 of 2)
7. You are transporting a patient with possible peritonitis following trauma to the abdomen. Which position will he MOST likely prefer to assume?
   A. Sitting up
      Rationale: Lying very still with the legs drawn up will help relieve the patient’s pain.
   B. Legs drawn up
      Rationale: Correct answer

Review (2 of 2)
7. You are transporting a patient with possible peritonitis following trauma to the abdomen. Which position will he MOST likely prefer to assume?
   C. Legs outstretched
      Rationale: The patient’s legs drawn up or flexed will help relieve pain.
   D. On his right side
      Rationale: The patient’s legs drawn up or flexed will help relieve pain.

Review
8. A 16-year-old boy was playing football and was struck in the left flank during a tackle. His vital signs are stable; however, he is in severe pain. You should be MOST concerned that he has injured his:
   A. liver.
   B. spleen.
   C. kidney.
   D. bladder.

9.

Review
Answer: C
Rationale: The flanks are located laterally in the back and overlie the kidneys. During football, spearing injuries occur when a player is struck in the flank by another player’s helmet. This can result in injury to the kidney ranging from bruising to severe bleeding. Injury to the liver, spleen, and bladder would more likely occur following blunt trauma to the anterior abdomen.

Review (1 of 2)
8. A 16-year-old boy was playing football and was struck in the left flank during a tackle. His vital signs are stable; however, he is in severe pain. You should be MOST concerned that he has injured his:
   A. liver.
      Rationale: The liver is associated with an injury to the anterior abdomen and right upper quadrant.
   B. spleen.
      Rationale: The spleen is associated with an injury to the anterior abdomen and left upper quadrant.

Review (2 of 2)
8. A 16-year-old boy was playing football and was struck in the left flank during a tackle. His vital signs are stable; however, he is in severe pain. You should be MOST concerned that
he has injured his:
C. kidney.
   Rationale: Correct answer
D. bladder.
   Rationale: The bladder is associated with an injury to the anterior abdomen and midline in the lower quadrants.

**Review**

9. The term “hematuria” is defined as:
   A. blood in the stool.
   B. blood in the urine.
   C. vomiting up blood.
   D. urinary bladder rupture.

**Review**

Answer: B
Rationale: Blood in the urine is called hematuria. Following trauma, the presence of hematuria suggests injury to the urinary bladder or kidneys. Bright red blood in the stool is called hematochezia; dark, tarry stools are called melena. Vomiting up blood is called hematemesis.

**Review (1 of 2)**

9. The term “hematuria” is defined as:
   A. blood in the stool.
      Rationale: This is known as hematochezia or melena (dark stools).
   B. blood in the urine.
      Rationale: Correct answer

**Review (2 of 2)**

9. The term “hematuria” is defined as:
   C. vomiting up blood.
      Rationale: This is known as hematemesis.
   D. urinary bladder rupture.
      Rationale: This will produce abdominal pain and eventually peritonitis due to a leaking into the abdominal cavity. It will also cause a lack of or a reduction of urinary output.

**Review**

10. When caring for a female with trauma to the external genitalia, the EMT should:
   A. use local pressure to control bleeding.
   B. carefully pack the vagina to reduce bleeding.
   C. remove any impaled objects from the vagina.
   D. cover any open wounds with moist, sterile dressings.

**Review**

Answer: A
Rationale: Bleeding from the external genitalia should be controlled by applying a dry, sterile dressing and local direct pressure. Never pack anything into the vagina to try to control bleeding; this increases the risk of infection, and anything you place into the vagina will only need to be removed at the hospital. Impaled objects in the genitalia should be carefully stabilized in place, not removed.
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133  Review (1 of 2)
   10. When caring for a female with trauma to the external genitalia, the EMT should:
       A. use local pressure to control bleeding.
           Rationale: Correct answer
       B. carefully pack the vagina to reduce bleeding.
           Rationale: Never pack anything into the vagina.

134  Review (2 of 2)
   10. When caring for a female with trauma to the external genitalia, the EMT should:
       C. remove any impaled objects from the vagina.
           Rationale: Impaled objects are stabilized in place and are not removed.
       D. cover any open wounds with moist, sterile dressings.
           Rationale: Apply dry, sterile dressings with local direct pressure.