

1 **Chapter 26 Abdominal Trauma**

2 **Introduction to Abdominal Injury**

- One of body's largest cavities
- Multiple vital _____
- Large volumes of blood can be lost before signs and symptoms manifest
- Must be alert for signs of transmitted injury
 - Deformity, swelling, & _____

3 **Abdominal Anatomy and Physiology (1 of 2)**

Boundaries:

- Superior: _____
- Inferior: _____
- Posterior: vertebral column and posterior and inferior ribs
- Lateral: muscles of the flank
- Anterior: _____ muscles

4 **Abdominal Anatomy and Physiology (2 of 2)**

Three specific spaces

- _____ space
 - Organs covered by abdominal (peritoneal) lining
- _____ space
 - Organs posterior to the peritoneal lining
- _____ space
 - Organs contained within pelvis

5 **Organs by Abdominal Quadrant**

6 **Penetrating Trauma**

- Energy transmitted to surrounding tissue
- Projectile _____, pitch & yaw
- Results in
 - Uncontrolled hemorrhage
 - Organ damage
 - Spillage of _____ organ contents
 - Irritation & Inflammation of abdominal lining
- Liver most commonly affected organ
- Shotgun trauma results in multiple _____

7 **Blunt Trauma**

- Produces least _____ signs of injury
- Causes
 - _____ : Contents damaged by change in velocity
 - _____ : Organs trapped between other structures
 - _____ : Part of an organ is able to move while another part is fixed

- 8 Blast Injuries
- Blunt & Penetrating MOI's
 - Irregular shaped _____ and debris
 - _____ wave
 - Compresses and relaxes air-filled organs
 - Contuse or _____ organs
 - Abdominal injury is secondary concern during blast injury
- 9 Injury to the Abdominal Wall (1 of 2)
- Skin and muscles transmit blunt trauma to internal structures
 - Typically only show _____ (red skin)
 - Visible swelling and ecchymosis occur over several hours
 - Penetrating trauma may appear minimal _____ in comparison to internal trauma
 - Muscle may mask the size of the external wound
 - _____ may be present
- 10 Injury to the Abdominal Wall (2 of 2)
- Trauma to thorax, buttocks, flanks & back may penetrate abdomen
 - Lower chest may injure _____ , liver, stomach or gallbladder
 - _____ tears
 - Herniation of abdominal contents into thorax
- 11 Injury to the Hollow Organs (1 of 2)
- May rupture with compression from blunt forces
 - May tear due to penetrating trauma
 - Spillage of contents into
 - Retroperitoneal space (behind abdominal cavity)
 - _____ space (abdominal cavity)
 - _____ space
 - Intestines have a large amount of bacteria
 - Leakage can result in _____
- 12 Injury to the Hollow Organs (2 of 2)
- Manifestations of Blood Loss
 - _____ : Blood in stool
 - _____ : Blood in emesis
 - _____ : Blood in the urine
- 13 Injury to the Solid Organs (1 of 2)
- Dense and less strongly held together
 - Prone to _____
 - Bleeding
 - _____ (rupture)

- Unrestricted hemorrhage if organ capsule is ruptured

14 Injury to the Solid Organs (2 of 2)

Pain patterns of specific organs:

- _____ : pain referred to left shoulder
- _____ : pain radiate to back
- _____ : pain radiate from flank to groin & hematuria
- _____ : pain referred to the right shoulder

15 Injury to the Vascular Structures

- Abdominal _____ & Vena Cava
 - Prone to direct blunt or penetrating trauma
 - May be injured in _____ injuries
- Blood accumulates beneath diaphragm
 - Irritation of muscular structures
 - Produces referred pain in the _____ region
 - Greater volume of blood can be lost
 - Presence of blood in abdomen, stimulates vagus nerve resulting in _____ of heart rate
- Blood can isolate in any of the abdominal spaces

16 Injury to the Mesentery and Bowel

- _____ : double fold of tissue in the peritoneum that supports the major portion of the small bowel, suspending it from the posterior abdominal wall
- Provides bowel with circulation and attachment
- Blood loss _____
- Tear of mesentery may rupture bowel
- Penetrating trauma to the lateral abdomen likely to injure _____ bowel

17 Injury to the Peritoneum (1 of 2)

- Delicate & sensitive lining of anterior abdomen
- _____ : inflammation of the peritoneum due to:
 - _____ irritation: due to torn bowel or open wound
 - _____ irritation
 - Caustic nature of digestive enzymes
 - Urine initiates inflammatory response

18 Injury to the Peritoneum (2 of 2)

- _____ does not induce peritonitis
- Progression
 - Slight _____ at location of injury
 - _____ tenderness

-Guarding
- _____, board-like feel

19 Injury to the Pelvis

- Serious skeletal injury
- Life threatening hemorrhage
- Potential injury to pelvic organs
 - _____
 - Bladder
 - _____
 - Female Genitalia
 - _____
 - Rectum
 - Anus

20 Injury During Pregnancy (1 of 4)

- Trauma is the number one killer of pregnant females
 - Penetrating abdominal trauma accounts for 36% of maternal mortality
 - _____ account for 40-70% of penetrating trauma
 - Blunt trauma due to improperly worn seatbelts
 - Auto collisions are leading cause of mortality
- Changing dimensions of uterus
 - _____ abdominal organs
 - Endangers _____ & fetus

21 Changing Dimensions of the Pregnant Uterus

22 Injury During Pregnancy (2 of 4)

- Maternal Changes:
- Increasing size & weight of uterus
 - Compression of _____ vena cava
 - Reduced venous return to heart
 - Uterus is thick and muscular
 - Distributes forces of trauma _____ to fetus
 - _____ chances for injury

23 Injury During Pregnancy (3 of 4)

- Maternal Changes:
- Increasing maternal blood volume
 - Protect mother from _____
 - _____ - _____ % of blood less necessary before signs of shock
 - Risk of uterine & fetal injury increases with the length of gestation
 - Greatest risk during _____ Trimester

24 Injury During Pregnancy (4 of 4)

- Penetrating trauma may cause fetal and maternal blood _____
- Blunt trauma complications
 - _____ rupture
 - _____ placentae
 - Premature rupture of _____ sac

25 Injury to Pediatric Patients

- Children have poorly developed _____ musculature & smaller diameter
- Rib cage has more cartilage
 - Transmits injury to organs beneath easier
- Increased incidence of injury to the liver, kidneys, and spleen
- Shock
 - _____ well for blood loss
 - May not show signs and symptoms until _____% of blood is lost

26 Evaluation of MOI (1 of 4)

- Must evaluate _____ to assess seriousness of injury
- Identify strength and direction of forces
 - _____ of impact
 - Focus observations and _____ on that site
 - Develop a mental list of possible organs involved
- If auto crash
 - Determine if _____ used properly
 - Interior signs of impact
 - Steering wheel & _____ deformity

27 Evaluation of MOI (2 of 4)

Auto Crash Injury Patterns:

- _____ Impact
 - Compress abdomen
 - Liver, spleen, and rupture of hollow organs
- _____ Impact
 - Liver, ascending colon, & pelvis
- _____ Impact
 - Spleen, descending colon and pelvis

28 Evaluation of MOI (3 of 4)

Auto Crash Injury Patterns (Cont'd):

- Children & Pedestrians
 - _____ injuries common

Gunshot Wounds:

- Type & _____ of weapon
- Distance

- Is assailant still on scene???

- 29 Evaluation of MOI (4 of 4)
 For the patient who has sustained _____ injury, the analysis of the mechanism of injury is the most important element of the scene size-up and possibly of the entire assessment
- 30 Assessment of Abdominal Injuries (1 of 4)
 Scene Size-up
 - Safety
 - Evaluation of MOI
 Primary Assessment
 - _____
 - Drug or alcohol use
 - Evaluate ABC's and _____ threats
- 31 Assessment of Abdominal Injuries (2 of 4)
 Rapid Trauma Assessment (Scan):
 - Rapid & Full Trauma Assessment
 - Closely examine regions with a high index of _____
 - Expose & Examine for _____
 -If suspected pelvic injury DO NOT test _____
 -Palpate _____ abdomen
 -Evaluate for entrance & exit wounds
- 32 Assessment of Abdominal Injuries (3 of 4)
 - _____ Assessment
 -Characteristics of pain: Tenderness versus Rebound tenderness
 - _____ History
 - Vital Signs
- 33 Assessment of Abdominal Injuries (4 of 4)
 Reassessment:
 - Trend vital signs: every 5 minutes
 - Evaluate for:
 - Progressive _____
 - Progressive hemorrhage
 - BP & Capillary Refill
 - Pulse rate & Pulse _____
 - Mental Status
 - Skin condition
 - Ineffective aggressive _____ resuscitation
- 34 Pregnant Patients (1 of 2)
 Be observant for signs of _____

- _____ : signs may not develop until 30% of blood volume is lost
- Body begins shunting blood from GI/GU to primary organs
- Supine _____ syndrome

35 **Pregnant Patients** (2 of 2)

Be observant for:

- _____ contractions
- _____ hemorrhage
 - Uterine rupture versus abruptio placentae
- Uterus development
 - Abnormal _____

36 **General Management of Abdominal Injuries**

- Position Patient
 - Position of _____ unless spinal injury
 - Flex _____ or left lateral recumbent
- General shock care
- _____ application
- Specific injury care
 - Impaled Objects or Eviscerations
- Fluid Resuscitation

37 **Fluid Resuscitation of Abdominal Injuries**

- Large bore IV with _____ solution
 - Consider 2nd line
- Fluid challenge _____ ml or _____ ml/kg
 - Limit to _____ L
 - Titrate to SBP of _____ mmHg

38 **Abdominal Evisceration Care**

- Clean of _____
- Do not reinsert organs
- Cover with _____, sterile dressing
- Secure with _____ tight covering

39 **Evisceration Care**

40 **PASG Use in Abdominal Injuries**

1 Contraindications:

- Concurrent penetrating _____ trauma
- Abdomen inflation contraindicated in pregnancy
 - Inflate legs only

2 Indications:

- Evisceration
 - If BP < _____
- Intra-abdominal bleeding

- _____

41 Management of a Pregnant Patient With Abdominal Injury

- Positioning
 - Left Lateral Recumbent
 - If on backboard tilt _____ slightly
 - Facilitates _____ return
- Oxygenation by NRB or BVM
- Maintain high index of suspicion for intra-abdominal bleeding
- Consider IV and _____

Organs by Abdominal Quadrant

U p p e r	Liver, Gallbladder, Stomach (Small Part) Small and Large Intestine Head of Pancreas Upper Part of Kidney	Stomach, Tail of Pancreas Tail of Liver Small and Large Intestine Upper Part of Kidney
L o w e r	Small and Large Intestine Lower part of Kidney Half of Bladder, Appendix, Female Reproductive Organs	Small and Large Intestine Lower part of Kidney Half of Bladder, Female Reproductive Organs
	Right	Left