

Injuries to the Abdomen

I. Anatomy

- A. Abdominal cavity – inferior to the diaphragm and superior to the top of the pelvis.
- B. Contains major organs of the digestive, urinary and endocrine system. Also, contains a major division of the aorta – the abdominal aorta.
- C. Not protected by bony structures like the thoracic cavity. Makes the organs susceptible to injury from trauma.
- D. Posteriorly it is protected by the spine and muscles of the back. Anteriorly it is protected by abdominal muscles.
- E. Lined by a two layer sheath-like membrane called the peritoneum.
 1. Visceral peritoneum adheres to and supports the organs.
 2. Parietal peritoneum adheres to the walls of the abdominal cavity itself.
 3. A lubricant fills the space (peritoneal cavity) between the two layers. The space is a potential space similar to the potential space between the visceral and parietal membranes of the lungs.
- F. The organs that lie in the posterior portion of the abdominal cavity and are outside the peritoneum are called retroperitoneal organs (e.g. kidneys).
- G. Contains hollow and solid organs and vascular structures.
 1. Hollow organs
 - a. Stomach, gallbladder, small and large intestine, and the urinary bladder.
 - b. Less stationary than solid organs.
 - c. Not vascular. Don't bleed much when injured.
 - d. Instead they spill their contents (gastric juices, partially digested food, etc.) into the peritoneal cavity causing irritation and inflammation (peritonitis).
 2. Solid organs
 - a. Liver, spleen, pancreas, and kidneys.
 - b. Highly vascular. Bleed heavily when injured leading to shock.

3. Vascular structures

- a. Abdominal aorta and the inferior vena cava.
- b. Carry large amounts of blood. Will bleed massively and rapidly lead to shock and death.

H. No bony landmarks so abdomen is divided into quarters with the belly button (umbilicus) as the reference point.

1. LUQ

- a. Most of the stomach – hollow – starting point for the digestion of food.
- b. Spleen – solid – behind and to the right of the stomach. Aids in the production of blood cells as well as storage and filtering of blood.
- c. Pancreas – gland - aids in digestion and regulates carbohydrate metabolism.
- d. Large intestine – hollow – reabsorbs fluid from the intestinal contents enabling secretion of solid waste from the body.
- e. Small intestine – hollow – absorbs nutrients from intestinal contents
- f. Left kidney – paired organs - behind the abdominal lining in the peritoneum – excrete urine and regulate water, electrolytes and acid-base balance.

2. RUQ

- a. Liver – most of – solid – filters the nutrients from the blood as it returns from the intestines, stores glucose and certain vitamins, plays a part in blood clotting, filters dead red blood cells and aids in the production of bile.
- b. Gallbladder – hollow – underneath the right side of the liver – hold bile that aids in the digestion of fat.
- c. Part of the large intestine.
- d. Right kidney
- e. Small intestine

3. RLQ

- a. Appendix
- b. Large intestine

- c. Female reproductive organs
 - d. Small intestine
4. LLQ
- a. Large intestine
 - b. Female reproductive organs
 - c. Small intestine

II. Abdominal Injuries

A. Can be open or closed.

B. Caused by blunt or penetrating trauma.

1. Blunt trauma is especially lethal because of the large number of organs involved.
 - a. Can crush, tear or rupture organs causing severe internal bleeding.
 - b. Often associated with MVA (largest %), falls, pedestrian-MV accidents, motorcycle collisions, crushing injuries from industrial machinery, etc.
 - c. For a MVA, try to ascertain the following:
 - i. Type of vehicle & Approximate speed
 - ii. Type of collision and points of impact
 - iii. Whether pt was driver, passenger or pedestrian
 - iv. Where pt was found and his/her position
 - v. Whether pt was thrown from the vehicle
 - vi. Impact marks to windshield, dash or steering wheel.
 - vii. Whether pt was belted or an airbag deployed.
2. Penetrating trauma would involve knives, gunshot wounds, ice picks, sharp metal, broken glass, etc.
 - a. Bullet wounds may involve injuries in other areas of the body. Look for exit wounds for clues as to other body areas affected. Do not focus solely on the entrance wound.

- b. Violence cause many penetrating abdominal wounds.
 - i. Think scene safety.
 - ii. Look for weapons
 - a. For knives try to estimate length, width and nature of the blade.
 - b. For guns try to estimate caliber.

C. s/s

1. DCAP-BTLS
2. Position of patient – typically pt is lying very still with knees flexed to take tension off of the abdominal muscles.
3. Tenderness on palpation to areas other than the site of the injury.
4. Rigid abdominal muscles.
5. Distended abdomen.
6. Discoloration around the umbilicus or to the flank.
7. Rapid shallow breathing.
8. Signs of shock.
9. N & V
10. Abdominal cramping
11. Pain may radiate to shoulder
12. Weakness

D. Assessment – General comments

1. Abdominal injuries cause extreme pain and pt will likely be very vocal about that point. Don't focus totally on that region and miss other possibly life-threatening injuries.
2. Check for pulses in all extremities. If the lower peripheral pulses are weaker or absent, suspect internal bleeding and treat for shock.
3. Look for rigidity and distention.
4. Look for discoloration around the navel and on the flanks – indications of internal bleeding.

5. Look for pulsating masses.

E. Emergency medical care - general

1. BSI.

2. Open and maintain an open airway.

3. High flow oxygen.

4. Ventilate as needed.

5. Be prepared for vomiting. Have suction ready.

6. Treat for shock.

7. Control external bleeding.

8. Do not give anything by mouth.

9. Stabilize impaled objects.

10. Position the patient.

- a. Flexed knees if injuries to hip, pelvis, spine or lower extremities are not present.

- b. Longboarded if spinal injuries suspected.

11. MAST.

12. Transport immediately.

F. Emergency Medical Care - Evisceration

1. Expose the wound.

- a. Do not attempt to place organs back into the abdomen.

- b. Do not touch organs.

2. Position pt

3. Apply a moist sterile dressing over the wound. Use sterile water or saline on dressing. Don't use any dressing that might cling to the organs.

4. Cover with an occlusive dressing.

- a. Avoid aluminum foil if possible as the foil may lacerate the organs.

- b. If aluminum foil must be used make certain bulky dressing completely covers the wound.
- 5. Apply a second dressing over the original dressing and bandage in place.