

MCHENRY WESTERN LAKE COUNTY EMS SYSTEM
Paramedic, EMT-B and PHRN
Optional Continuing Education
2019 #5
Abdominal Trauma

Trauma is the fourth leading cause of death for all age groups in the United States. It is the leading cause of death for individuals between the ages of 1 and 44 years. Abdominal injuries rank third among the causes of traumatic death, preceded only by head and chest injuries. Death and disability from traumatic injury have become a significant health and social problem. Intra-abdominal trauma is seldom a single organ injury or single system injury; therefore a concomitant rise in morbidity and mortality rates is evident.

There are two injury mechanisms for abdominal trauma: blunt and penetrating. Blunt abdominal trauma often results from a motor vehicle collision or pedestrian versus auto collisions. These types of cases account for nearly 75 percent of all abdominal trauma cases. Blows to the abdomen account for about 15 percent while falls account for about 10 percent. The most common cause of mortality in the abdominal trauma patient is from blunt trauma. The mortality rate is 10-30% for blunt trauma. Penetrating abdominal trauma usually is from gunshots which accounts for 5-15% mortality, while stabbing are at 1-2% mortality. Approximately 1/3 of all stabbing victims will require surgical intervention. The main concern is for intra abdominal hemorrhage and shock or sepsis and peritonitis from the damaged intestines.

The Abdomen: Anatomy and Physiology

In the Thoracic Abdomen there are the liver and spleen that are protected on each side by the lower ribs. Life threatening hemorrhage can take place in the liver or spleen since they are both very vascular.

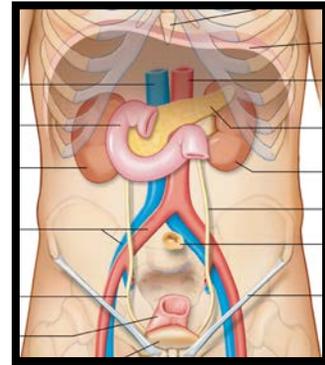


Thoracic Abdomen

True Abdomen

True abdomen contains small intestines and bladder. Intestinal injury can result in infection, peritonitis, and shock. In females, uterus, fallopian tubes, and ovaries are part of pelvic portion of true abdomen.

Retroperitoneal Abdomen



Retroperitoneal abdomen is located behind thoracic and true abdomen. It contains kidneys, ureters, pancreas, posterior duodenum, ascending and descending colon, abdominal aorta, and inferior vena cava. The retroperitoneal abdomen can conceal massive amounts of blood loss with very little external signs.

Mechanism of Injury

Knowledge of mechanism of injury is essential to good trauma care. If there is a direct compression of the abdomen, there can be a fracture of the solid organs such as the liver and spleen. There can also be a “blow out” of the hollow organs or the intestines. Deceleration can cause a tearing of the organs or blood vessels away from the abdominal viscera. As mentioned above a majority of patients with abdominal injuries (70 percent) have associated head, chest or extremity injuries. These may draw our attention away from the abdomen. Unrecognized abdominal trauma is a frequent cause of preventable death.

Often times with blunt trauma there will be minimal or no external signs of trauma. Most of the significant blood loss has been concealed into the abdominal region. If there is a seat belt sign, there is a 25% chance they will have an intra-abdominal bleed. Often with the blunt trauma patient they have no pain or it is covered by pain to another area.

In penetrating abdominal trauma, there is direct trauma to the organ and the vasculature. This can be caused by the projectile such as a bullet, a fragment of a bullet or even a knife. The energy that is transmitted by the penetrated object through mass and velocity is what does the damage. These types of injuries usually involve major uncontrolled hemorrhage and vigorous fluid resuscitation may make the hemorrhage worse.

Remember that penetrating injuries do not always follow the most obvious pathways. Chest injuries can have abdominal trauma and abdominal injury may have chest trauma. Consider the bullet or projectile may have passed through multiple structures. Ballistics information such as caliber, velocity, trajectory and range may all be very helpful information.

Assessment

A primary survey addressing the ABCD's is initiated on patient contact. A quick assessment to identify and treat life-threatening conditions is crucial to good trauma patient outcomes. The ABCD's are evaluated constantly throughout patient transport.

A brief systemic secondary survey is the next step. A head to toe assessment (including abdominal assessment) is completed. A complete set of vital signs and SAMPLE history is obtained.

A complaint of abdominal pain from an alert patient is a key indicator of abdominal injury. Peritoneal irritation is described as sharp localized pain. Referred pain complaints may signal damage to the spleen (left shoulder pain), liver (right shoulder pain), or retroperitoneal structures (back or testicular pain). Many patients who sustain abdominal injuries may not be able to participate in the physical examination because of alterations in level of consciousness or spinal cord injury; therefore, the a four-step abdominal examination including inspection, auscultation, percussion and palpation, is recommended. We do know that due to noise and time restraints auscultation and percussion are many times not feasible in pre-hospital care.

Inspection – Inspection begins with noting lower chest wall integrity. Because the last six ribs lie over abdominal structures, disruption to this area may signal organ damage, specifically to the liver, spleen or diaphragm.

The appearance of the abdomen should be described. The presence of abrasions, contusions, lacerations, burns, and surgical scars along with their location, sized, description and number of wounds should be documented. In patients who have been shot, an odd number of wounds indicates the presence of a foreign object within the body. The provider should resist the temptation to categorize wounds as entrance and exit wounds.

The abdominal contour, normally flat or slightly rounded (or convex in a heavy person), may be distended, which may indicate an accumulation of blood, other fluid or gas resulting from perforation of hollow viscus, rupture of organs (e/g/ liver, spleen) or reduced blood supply to the abdomen.

Involuntary guarding indicates injury to underlying structures. This may be less obvious or not present in patients with retroperitoneal injury. The presence of discoloration, protuberances, pulsations, abrasions and old surgical scars should be noted. Repeated inspections alerts the provider to new discolorations or other changes indicative of underlying injury. Proper inspecting includes examining the patient's back and flank area and the anterior surface for the signs mentioned. Obvious wounds or ecchymosis of the lumbar or flank areas may indicate damage to retroperitoneal or abdominal organs.

Palpation - Abdominal tenderness is evaluated by using the whole hand over all four quadrants and progressing from light to deep palpation. Tenderness is the most frequent and reliable sign of intra-abdominal injury. Gentle palpation may elicit areas of increased tone or tenderness, suggesting underlying injury. Abdominal wall injury produces focal tenderness, which increases on exertion (tensing muscles). Deep palpation is used to elicit tenderness, guarding and rebound symptoms associated with peritoneal irritation. A tender abdomen with guarding, distention and signs of peritoneal irritation can indicate organ rupture. RUQ tenderness and guarding or tenderness over the right lower six ribs may indicate liver damage. RUQ abdominal tenderness may also be a sign of duodenal or gallbladder injury. Pain elicited in the LUQ may indicate injury to the spleen, stomach or pancreas. Low abdominal or suprapubic discomfort may signal a potential for colon, bladder, or urethral injuries and may be associated with pelvic fractures.

The patient may have referred pain. Most common among these is Kehr's sign, pain in the left shoulder from diaphragmatic irritation by blood after splenic rupture. Right

shoulder pain is often indicative of liver injury. The patient must be lying flat or in Trendelenburg's position to elicit this type of shoulder pain. It is important to remember that assessment should not delay patient care and transport.

Management

Management of abdominal trauma is pretty straightforward. As with any trauma patient once the patient level of consciousness is determined using AVPU or GCS, ABC's need to be addressed with the correction of any life threats. An open airway needs to be ensured while taking c-spine precautions. Breathing and oxygenation need to be supported with the application of oxygen and assisted ventilations when needed. Transport decision should be made early to the appropriate facility or flight needs to be called. Our goal is to keep scene times less than 10 minutes. If scene time is longer than 10 minutes, the reason should be documented in your chart.

IV access should be established with 2 large bore IVs when possible, or initiation of IO. Fluid replacement is accomplished using normal saline to achieve a systolic blood pressure (SBP) of 90 for blunt trauma and a SBP of 80 for penetrating trauma if there is not associated head injury. Optimal SBP for a patient with a concurrent head injury is a SBP of 110. Do not delay transport to initiate IV therapy; establish IV lines whenever possible during transport.

All trauma patients should be transported on a cardiac monitor and pulse oximeter. If the patient has an advanced airway, ETCO₂ should be monitored.

Any external hemorrhage should be minimized by applying pressure.

Pain management for a patient with a SBP equal to or greater than 90 can be addressed by administering Fentanyl 1mcg/kg (max 100mcg). It may be repeated at .5mcg/kg (max 50mcg) in 5 min. Additional doses may be given with on-line medical control approval to a max of 300mcg.

Specific Injuries

An abdominal evisceration is where part of the abdominal organs has come out of the body through a wound in the abdominal wall. You should never push the viscera back into the abdomen. Gently cover the organ with a moist sterile gauze or pad and then apply a non-adhering material such as plastic wrap to prevent the organ from drying out.



An impaled object must be secured in place and not removed. There could be uncontrolled hemorrhage into the abdomen if the object were removed. Therefore the object needs to be stabilized in place to limit all movement.



Summary

Unrecognized abdominal trauma is the leading cause of unexpected death in trauma patients. Recognizing abdominal injuries and providing rapid transport is one of the best contributions you can make to a patient who has these injuries.

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POST TEST

Name: _____ **Date:** _____
Department: _____ **Level of Practice:** _____

1. (Blunt/Penetrating) trauma account for nearly 75% of all abdominal trauma.
A. True B. False

2. Intra-abdominal trauma is seldom a single organ or single system injury.
A. True B. False

3. You are caring for a 21 year old male with a single stab wound to the LUQ. He is pale, diaphoretic and alert. He denies other injury. VS BP 72/30 P 146 RR 24 Pulse ox 91% Cap refill 4 sec.
What organ do think is affected?
A. Liver
B. Spleen
C. Kidney
D. Bladder

4. What is your goal for fluid replacement
A. SBP of 110
B. SBP of 100
C. SBP of 90
D. SBP of 80

5. You are caring for a multiple trauma patient who fell off the roof of a 2 story building. You have determined that the patient has a closed head injury with a GCS of 9. He note his abdomen to be distended with tenderness and guarding to the RUQ and he has a large contusion to the right flank. You note his VS to be BP 70/P. Your goal for fluid replacement is:
A. SBP of 110
B. SBP of 100
C. SBP of 90
D. SBP or 80

6. Referred pain to the R shoulder can be indicative of injury to the
A. Spleen
B. Liver
C. Kidney
D. Abdomen

7. You are caring for a patient with an abdominal evisceration. Care of your patient would include
 - A. Try to push the protruding organs back into the abdomen
 - B. Leaving it uncovered
 - C. Covering it with a sterile moist dressing
 - D. Covering it with a sterile dry dressing

8. Because an impaled object may move and cause pain to a patient during transport it should be removed.
 - A. True
 - B. False

9. Patients with abdominal trauma can not receive pain meds because it will affect the exam the physician will to upon their arrival to the Emergency Department
 - A. True
 - B. False

10. Transport decision should be made early and scene time kept to _____.

If you are NOT a member of the McHenry Western Lake County EMS System, Please include your address on each optional quiz turned into our office. Our mailing address is: Northwestern Medicine – McHenry Hospital EMS, 4201 Medical Center Drive, McHenry, Illinois 60050. We will forward to your home address verification of your continuing education hours.

If you ARE a member of our EMS System, your credit will be added to your Image Trend record. Please refer to Image Trend to see your current list of continuing education credits. Any questions regarding this can be addressed to Cindy Tabert at 224-654-0160. Please fax your quiz to Cindy Tabert at 224-654-0165.