

Trauma Clinical Guideline

Evaluation and Management of Blunt Abdominal Trauma

The Trauma Medical Directors and Program Managers Workgroup is an open forum for designated trauma services in Washington State to share ideas and concerns about providing trauma care. The workgroup meets regularly to encourage communication among services, and to share best practices and information to improve quality of care. On occasion, at the request of the Emergency Medical Services and Trauma Care Steering Committee, the group discusses the value of specific clinical management guidelines for trauma care.

The Washington State Department of Health distributes this evaluation and management of blunt abdominal trauma care guideline on behalf of the Emergency Medical Services and Trauma Care Steering Committee to assist trauma care services with developing their trauma patient care guidelines. Toward this goal the workgroup has categorized the type of guideline, the sponsoring organization, how it was developed, and whether it has been tested or validated. The intent of this information is to assist physicians in evaluating the content of this guideline and its potential benefits for their practice or any particular patient.

The Department of Health does not mandate the use of this guideline. The department recognizes the varying resources of different services and that approaches that work for one trauma service may not be suitable for others. The decision to use this guideline depends on the independent medical judgment of the physician. We recommend that trauma services and physicians who choose to use this guideline consult with the department regularly for any updates to its content. The department appreciates receiving any information regarding practitioners' experience with this guideline. Please direct comments to 360-236-2874.

This is a trauma assessment and management guideline. It was adapted from professional literature. The workgroup reviewed the guideline, sought input from trauma care physicians throughout Washington State, and used that input to make changes. Both the Emergency Medical Services and Trauma Care Steering Committee and the Department of Health Office of Community Health Systems endorsed the guideline. This guideline has not been tested or validated.

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The problem:

Abdominal trauma remains a leading cause of mortality in all age groups. Blunt abdominal injury (BAI) is common and usually results from motor vehicle collisions (MVC), falls and assaults. In children (less than or equal to 14 years of age), blunt abdominal trauma is the second most frequent cause of mortality preceded by head injuries. Injuries in the abdomen occur from direct forces causing compression or shearing type injuries or deceleration injuries that result in damage to relatively fixed structures. The most common organ injured is the spleen, followed by the liver and small bowel.

Assessment:

The evaluation of the abdomen is very challenging and can often result in missed intraabdominal injury or overuse of diagnostic imaging such as computed tomography (CT). A systematic approach should be taken when assessing the trauma patient. This systematic approach should include the Primary and Secondary Survey with considerations for possible intraabdominal injury.

The primary survey should address any life-threatening injuries before evaluating the abdomen in the secondary survey. However, assessment of circulation in the primary survey should account for potential internal hemorrhage in the abdomen. As part of the primary assessment, a pelvic X-ray and a focused assessment with sonography for trauma (FAST) should be considered in the unstable patient. A positive FAST exam with instability is usually an indication for operative management. The secondary survey should include an inspection of the abdomen for symmetry, distension, and the location of contusions. Lateral contusions across the abdomen (seatbelt sign) are associated with a 20 percent occurrence of internal injury and should alert the provider of possible internal injury. Bowel sounds should be auscultated for presence. Hypoactive or absent bowel sounds are associated with internal injury. Gentle palpation of the abdomen and pelvis should be performed. Any increase in pain or instability should raise suspicion of internal injury or pelvic fracture. Abdominal pain, rigidity, and guarding are considered classic signs of internal injury.

Many trauma patients for various reasons are not examinable or certain physiological reasons may make your exam less reliable. Not examinable (non-examinable) patients are those who are less than fully conscious with a Glasgow Coma Scale (GCS) of less than 15, intubated patients, those under the influence of intoxicating substances (alcohol and drugs), patients who may require general anesthesia in the next six to eight hours, and any patient who may have a spinal cord injury or those who have a loss of sensation. Non-examinable patients should be evaluated through CT to aid in diagnosis.

Concurrent injuries:

The abdomen and pelvis include a network of organs and vessels that are adjacent to other body cavities where injuries can also occur. When injuries occur in adjacent body regions, they are referred to as concurrent injuries. The most common concurrent injuries occur in the thoracic cavity. Any injury that occurs between the nipple line and inguinal crease could result in both abdominal and thoracic injury. Injuries involving the diaphragm can affect the thoracic organs as well as abdominal organs. Fractured ribs can result in both liver and spleen injuries. Pelvic fractures are a frequent cause of injuries to the urinary system. Consider the possibility of concurrent injuries when treating the abdominal injured patient.

Predictors of blunt abdominal injury:

Certain injuries have predictive values and increase the odds for abdominal injury. Many times those predictive values are developed into rules that can help guide the assessment and choice of interventions. Predictive rules help determine patients who are at high risk from those at low risk for abdominal injury. Predictors for blunt abdominal injury include:

- Abdominal pain and tenderness during exam
- Pelvic or femur fracture
- Abdominal contusions (seatbelt sign or handlebar mark)
- Lower rib fractures
- Pneumothorax
- Costal margin tenderness
- Lumbar spine fracture
- Hematocrit less than 30 percent
- Hematuria
- Positive FAST

Children who are preverbal with a normal exam should be assessed for risk factors which increase the possibility of injury. If present, further evaluation and diagnostic imaging should be considered. Risk factors include:

- Hypotension
- Abdominal Tenderness
- ALT >125
- AST >200
- HCT <30%
- Hematuria >5rbc/hpf
- GCS \leq 13
- Femur Fracture

Diagnostic studies:

FAST exam has become an increasingly valuable tool in the diagnosis for intraabdominal injury. A positive FAST exam in the unstable patient is an indication of intraabdominal injury requiring a surgical intervention. As the amount of intraabdominal fluid decreases the FAST exam becomes less reliable, requiring other diagnostic tools. This is especially true for pediatric patients (\leq 14) where the FAST exam has only modest sensitivity.

Over the past decade the use of CT has increased and is commonly relied upon to diagnose abdominal injury. Over the past several years research has demonstrated that potential harmful effects can occur from CT and the overexposure to radiation. This is especially true in children, where increased malignancies have been reported. When possible the use of CT should be limited. Using the abdominal prediction rules and risk factors can help differentiate low-risk patients who would not require abdominal CT for diagnosis, which would ultimately prevent the overexposure to radiation. Stable patients considered non-examinable or positive for predictors of BAI should receive an abdominal CT exam. CT is generally not required for unstable patients who will ultimately require surgical intervention. These patients should receive immediate surgical consultation. In circumstances where surgery is unavailable, unstable patients should be resuscitated and then rapidly transferred to the most appropriate higher level trauma service with surgical capabilities.

Several laboratory studies are helpful in determining intraabdominal injury. Hematocrit less than 30 percent is indicative of continuous bleeding often seen in liver and spleen injuries. Elevated liver enzymes alanine aminotransferase (ALT), aspartate aminotransferase (AST) are commonly elevated with liver injury. Pediatric non-accidental trauma (NAT) patients with elevated liver enzymes are at increased risk for intraabdominal injury. Lastly, hematuria is a common finding with urinary system injuries.

Non-operative management:

Non-operative management of stable abdominal injuries has become common practice in recent years. Patients who are hemodynamically unstable or have peritonitis should be immediately referred to surgery. Those patients who are hemodynamically stable may require a CT to assess the extent of injury before the determination of non-operative management can be made.

If non-operative management is chosen the patient must be admitted to an area of the hospital which is familiar with this type of management of intraabdominal injury. There should also be the ability to provide continuous monitoring with serial clinical exams. The ability to provide emergent operative intervention must be available 24 hours per day. If operative intervention (surgical capability) is unavailable the patient must be transferred.

References

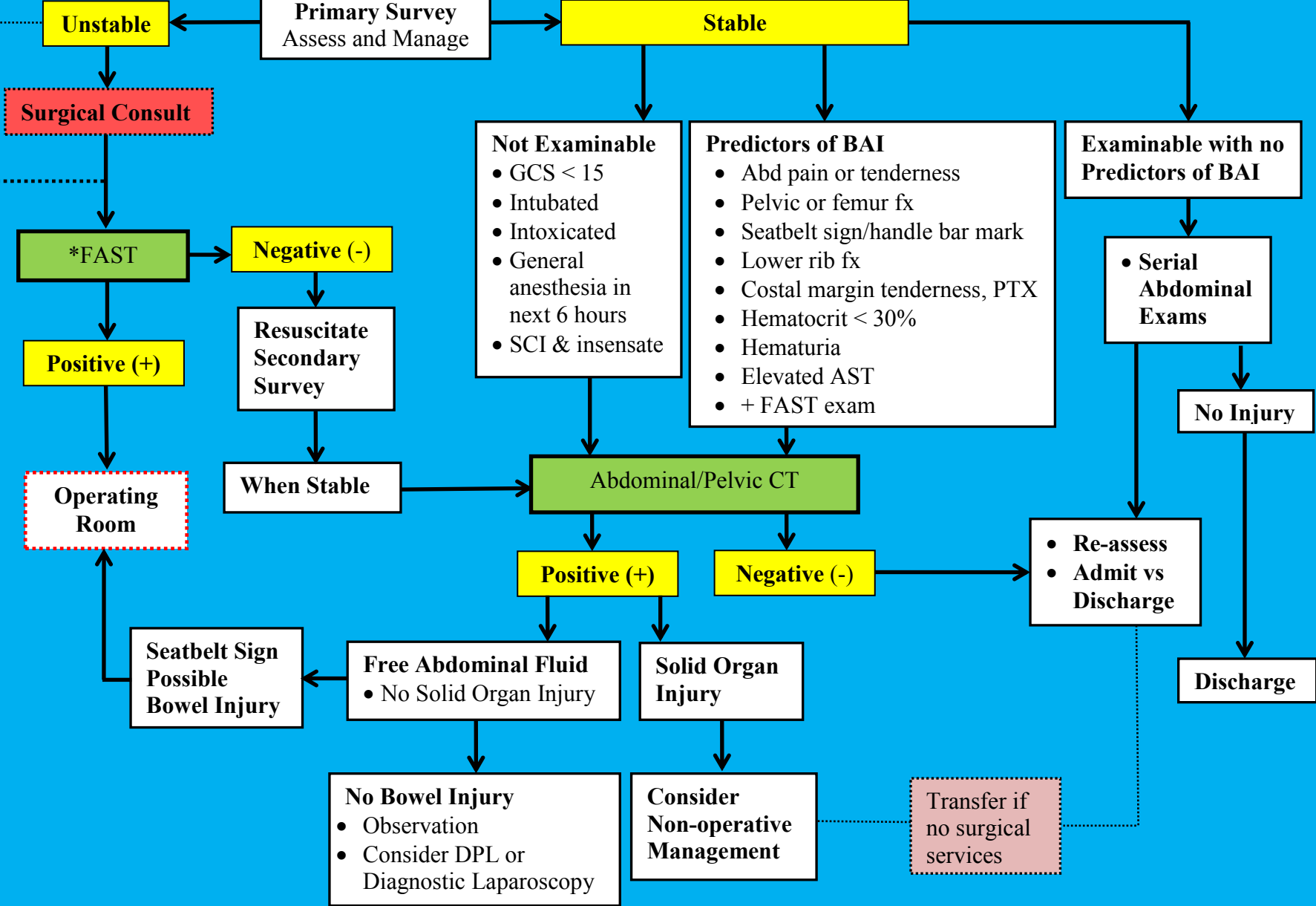
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Adult Evaluation and Management of Blunt Abdominal Trauma

[Pelvic Fracture Guideline](#)

- Hypotension
- Tachycardia
- Cyanosis

Transfer if no surgical services

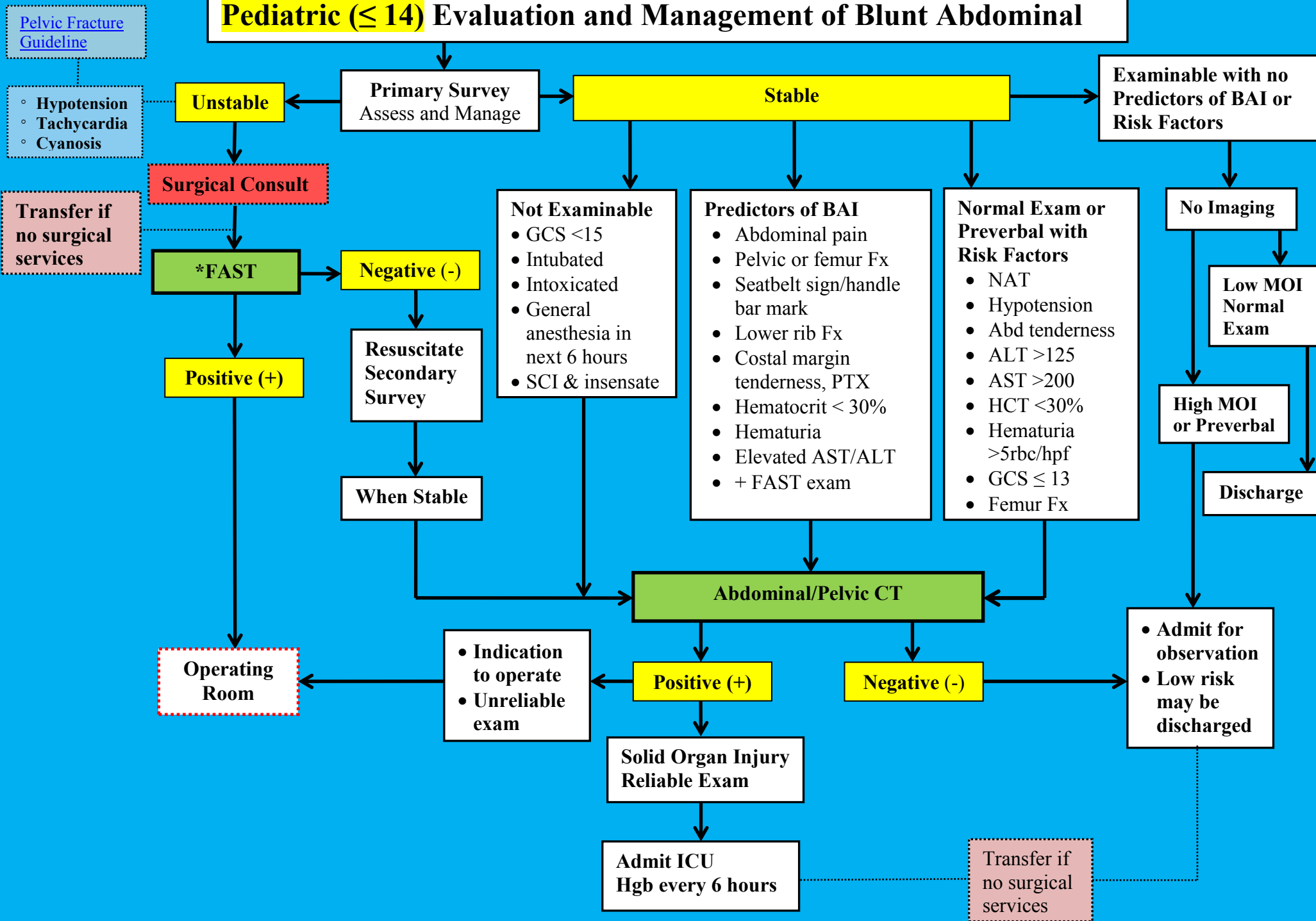


* FAST – Focused Abdominal Sonography for Trauma: A negative FAST requires another exam either DPL or abdominal CT.

** If unstable pelvic fracture see [Major Pelvic Fracture Management Guideline](#) for stabilization and treatment.

*** See [Pediatric Consultation and Transfer Guideline](#)

Pediatric (≤ 14) Evaluation and Management of Blunt Abdominal



* FAST – Focused Abdominal Sonography for Trauma: A negative FAST should be followed by abdominal CT.

** If unstable pelvic fracture see [Major Pelvic Fracture Management Guideline](#) for stabilization and treatment.

*** See [Pediatric Consultation and Transfer Guideline](#)