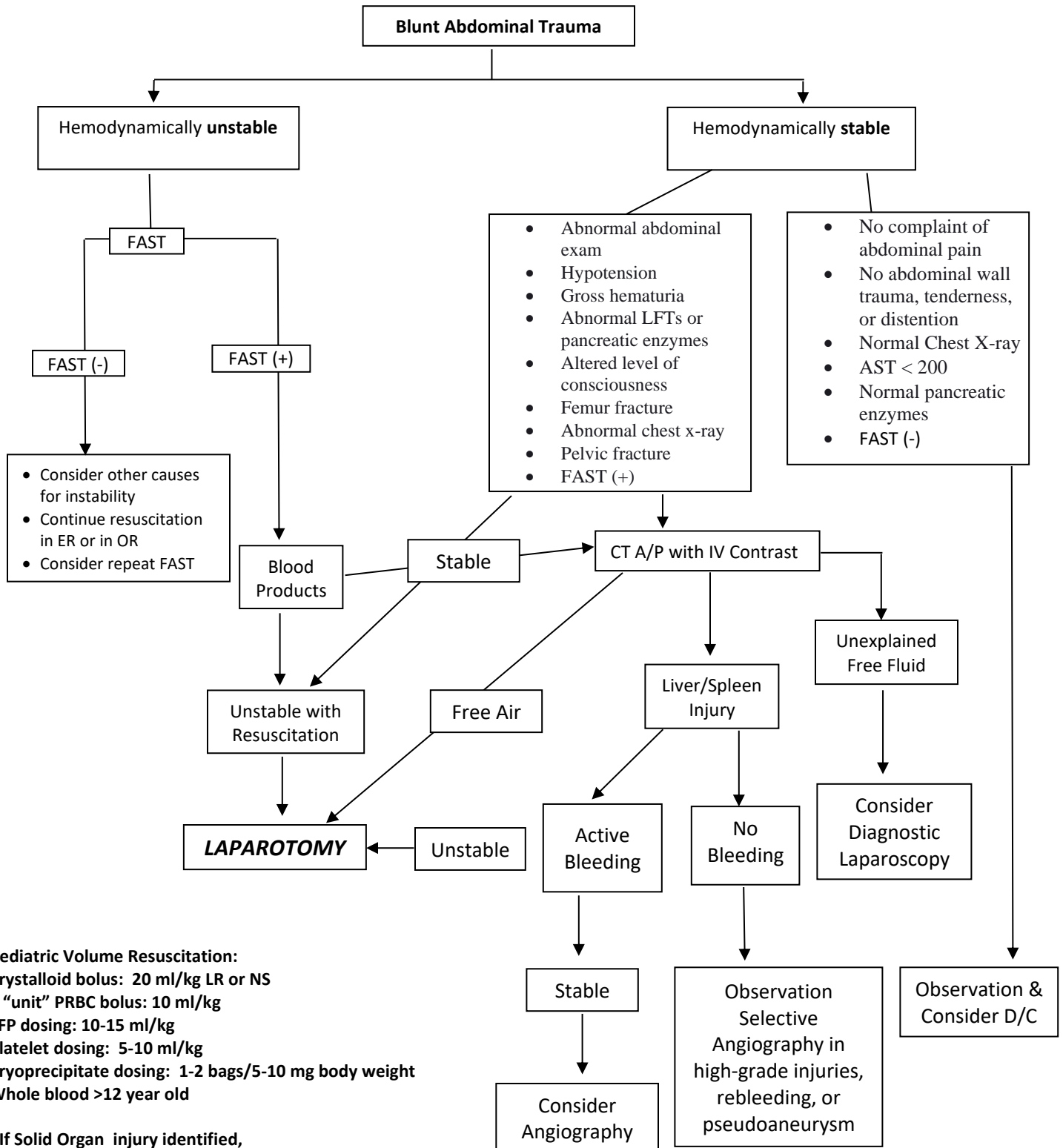


Trauma Center Practice Management Guideline

Blank Children's Hospital — Des Moines

Blunt Abdominal Trauma Evaluation and Management Guideline

PEDIATRIC Practice Management Guideline	Effective: 06/2014
Contact: Trauma Center Medical Director	Last Reviewed: 04/2024



*** Pediatric Volume Resuscitation:**
 Crystalloid bolus: 20 ml/kg LR or NS
 1 "unit" PRBC bolus: 10 ml/kg
 FFP dosing: 10-15 ml/kg
 Platelet dosing: 5-10 ml/kg
 Cryoprecipitate dosing: 1-2 bags/5-10 mg body weight
 Whole blood >12 year old

**** If Solid Organ injury identified,
 Refer to Activity Restriction Guideline**

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PURPOSE

To address the evaluation of pediatric patients presenting acutely after blunt abdominal trauma.

BACKGROUND

A carefully performed physical exam, while being cognizant of the limitations imposed by individual patient factors such as diminished mental status, remains central to decision making in the trauma bay. A clinician evaluating a pediatric trauma patient should be aware of the fact that their injury patterns and physiologic responses can be distinctly different from those observed in adults. As with adults, appropriately selected adjunct diagnostic studies are used to minimize the risk of missed injury. A patient's hemodynamic stability or instability will often dictate the diagnostic options available for use.

Pediatric patients have certain anatomic features that alter their susceptibility to intra-abdominal injury when compared to adults. A pediatric patient's abdominal wall typically has thinner musculature and less fat, providing less protection to underlying intra-abdominal organs. Ribs protecting the thoracic abdomen have an increased flexibility compared to adult ribs and, while this protects the ribs from damage, it more easily allows the ribs to injure the abdominal organs. Additionally, solid organs within the pediatric abdomen have a larger surface area relative to adult organs, and thus a greater area is exposed to potential injury. The organ attachments are also more elastic, which increases the chance of tearing and shearing injuries. In the pediatric patient, the bladder also extends to the umbilicus, increasing its chance for injury.

Focused Abdominal Sonography for Trauma (FAST) has come to occupy a dominant role as the initial imaging study of choice in evaluating a blunt abdominal trauma patient. The trauma physicians at IMMC and BCH are encouraged to make use of FAST a routine part of their evaluation of trauma patients. FAST in children after blunt abdominal trauma has limited sensitivity for intra-abdominal injury. Studies show when the FAST was performed it did not change clinical management. Importantly, 56% of children with intra-abdominal injury requiring intervention were missed by FAST.

PROCEDURE STATEMENTS

1. ATLS precepts will guide the initial evaluation and management of trauma patients at Blank Children's Hospital.
2. Patients who are hemodynamically unstable or who have diffuse peritonitis after blunt abdominal trauma should be taken urgently for laparotomy.
3. A patient's initial hemodynamic status and early response to resuscitation will dictate/determine the parameters within which the trauma team must act in planning the patient's subsequent workup and

injury management.

4. A FAST (+) patient who requires aggressive ongoing resuscitation should be triaged to the OR. Extremely rare exceptions to this guideline may exist (e.g. assessing for fertility due to brain injury, assessing for pelvic hemorrhage that may be more amenable to angioembolization).
5. In the blunt abdominal trauma patient in whom intra-abdominal injury is suspected, FAST exam cannot reliably rule out injury and more definitive imaging by CT scan with contrast is recommended. CT of the abdomen and pelvis in blunt trauma does not require the use of oral contrast.
6. Suspected or confirmed solid organ injuries should be managed according to their respective management guidelines.
7. Contrast extravasation on abdominal CT in hemodynamically stable children is not an absolute indication for angioembolization.
8. Free intra-abdominal fluid in the absence of identifiable solid organ injury should raise a concern for hollow viscus injury. Younger children may have small amount of physiologic free fluid in the abdomen.
9. Gross hematuria in a trauma patient mandates a further workup of the patient's genitourinary system for injury, with bladder perforation from pelvic fractures being of particular concern. Microscopic hematuria, on the other hand, does not necessarily mandate performance of CT imaging. Hemorrhage at the urethral meatus will establish the need for imaging modalities such as pelvic x-ray, retrograde urethrography and CT cystogram.
10. Factors that may warrant laparotomy for a patient undergoing serial abdominal examination for blunt abdominal trauma, include worsening abdominal exam, increasing WBC, decreasing hemoglobin, fever, persisting acidosis, or worsening imaging findings.

If all the following criteria are negative, patient is considered very low risk for blunt intra-abdominal injury and CT of the abdomen can be avoided safely.

Predicted Criteria to Safely Avoid CT Imaging:

- No complaint of abdominal pain
- No abdominal wall trauma, tenderness, or distention
- Normal Chest X-ray
- AST < 200
- Normal pancreatic enzymes

High risk clinical variables for intra-abdominal injury that support the use of Abdominal CT scan:

- Abnormal abdominal exam
- Hypotension
- Gross hematuria
- Abnormal LFTs or pancreatic enzymes
- Altered level of consciousness
- Femur fracture
- Abnormal chest x-ray
- Pelvic fracture
- Positive FAST

Related References:

Calder BW, Vogel AM, Zhang J, Mauldin PD, Huang EY, Savoie KB, Santore MT, Tsao K, Ostovar-Kermani TG, Falcone RA, Dassinger MS. Focused assessment with sonography for trauma in children after blunt abdominal trauma: a multi-institutional analysis. *Journal of Trauma and Acute Care Surgery*. 2017 Aug 1;83(2):218-24

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