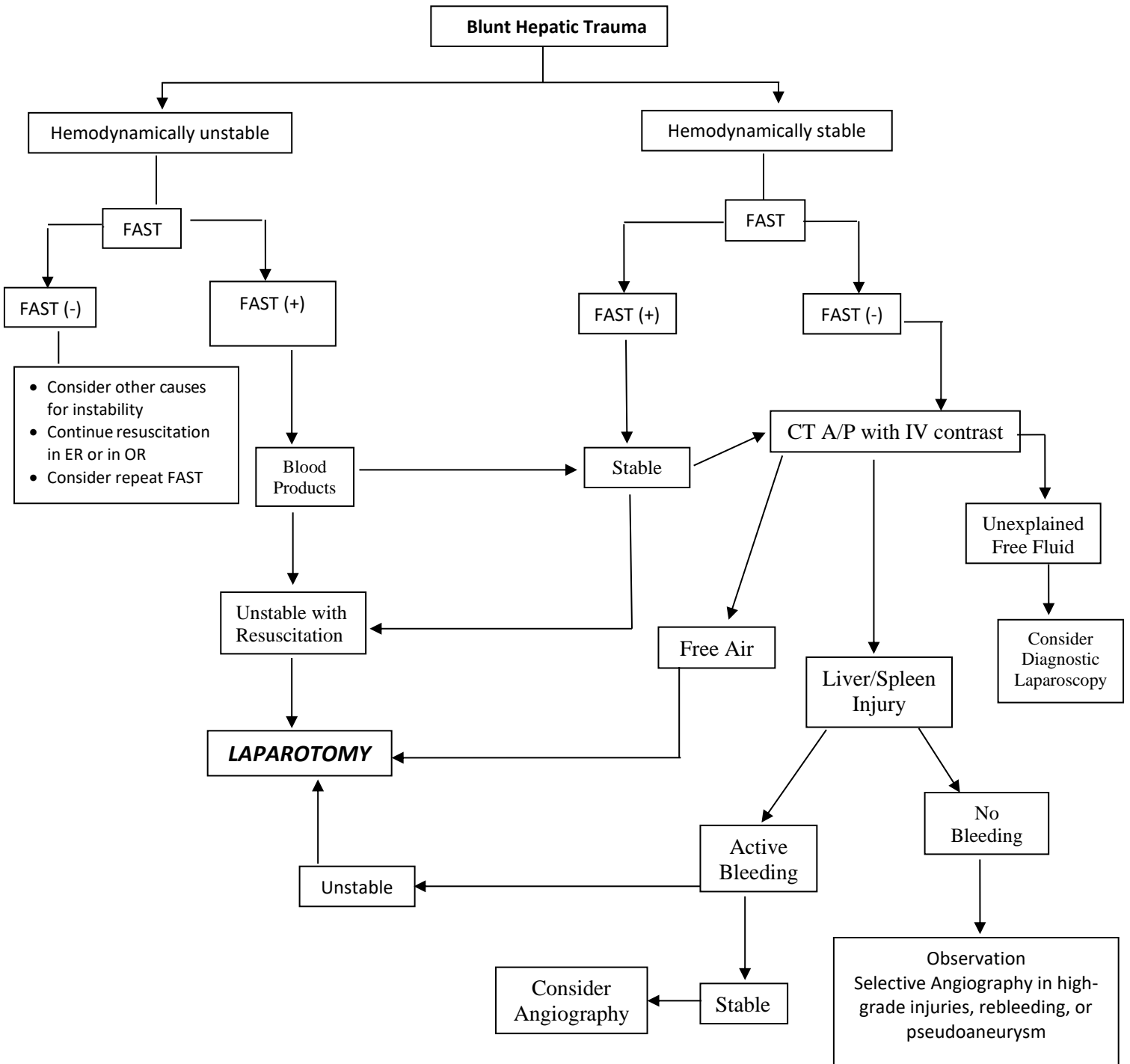


**Trauma Center Practice Management Guideline**

*Iowa Methodist Medical Center — Des Moines*

<b><i>Hepatic Injury Evaluation and Management Guideline</i></b>	
<b>ADULT Practice Management Guideline</b>	<b>Effective: 04/2014</b>
<b>Contact: Trauma Center Medical Director</b>	<b>Last Revised: 04/2024</b>

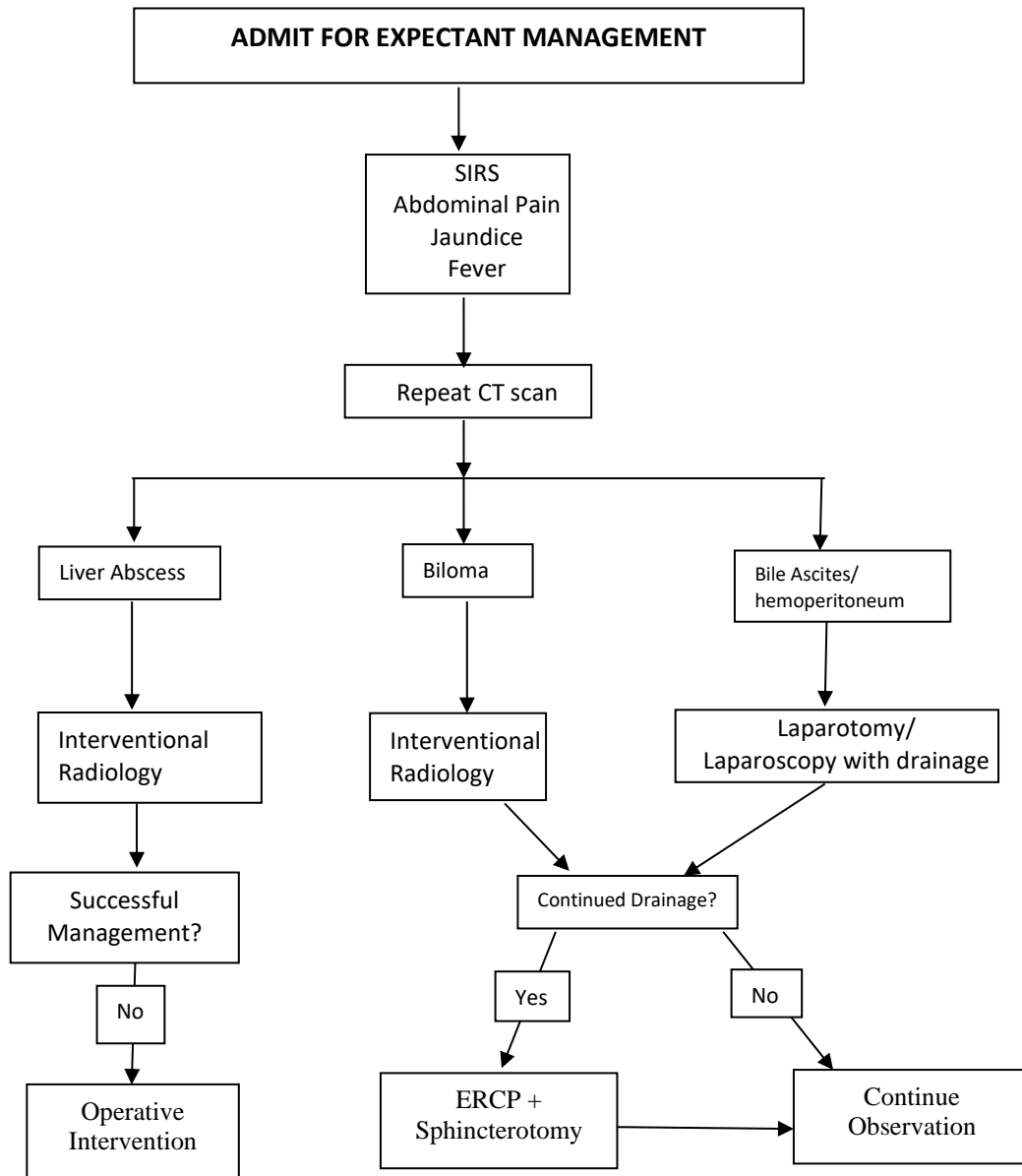


# **Trauma Center Practice Management Guideline**

*Iowa Methodist Medical Center — Des Moines*

## ***Blunt Hepatic Injury Management (Suspected or Confirmed)***

<b>ADULT Practice Management Guideline</b>	<b>Effective: 04/2014</b>
<b>Contact: Trauma Center Medical Director</b>	<b>Last Revised: 04/2024</b>

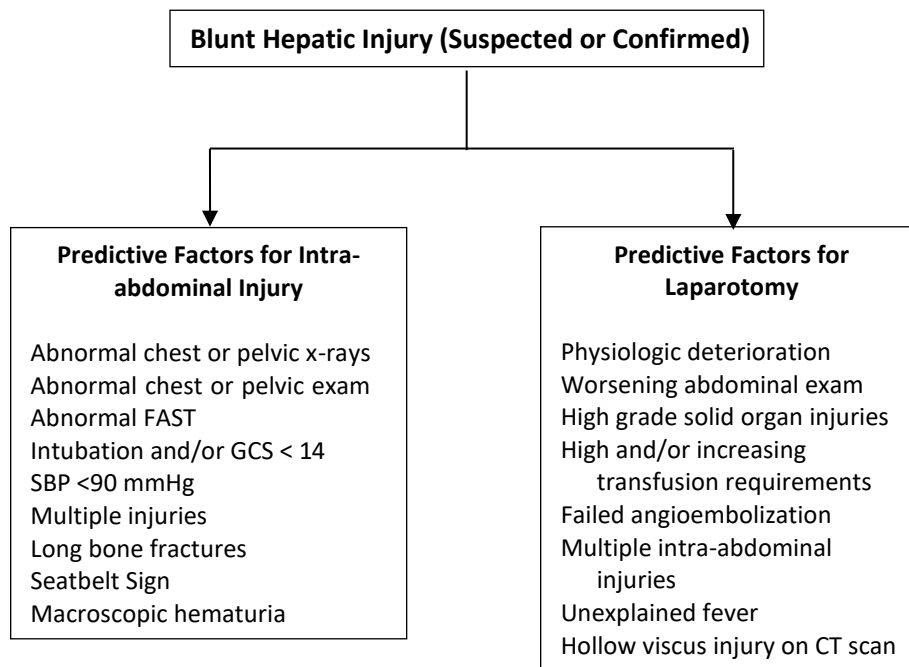


# **Trauma Center Practice Management Guideline**

*Iowa Methodist Medical Center — Des Moines*

## ***Blunt Hepatic Injury Management (Suspected or Confirmed)***

<b>ADULT Practice Management Guideline</b>	<b>Effective: 04/2014</b>
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*Iowa Methodist Medical Center — Des Moines*

***Hepatic Injury Evaluation and Management Guideline***

<b>ADULT</b>	
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**PURPOSE**

To provide an evidence-based framework for the evaluation of trauma patients with suspected or definitively identified hepatic injury.

**DEFINITIONS**

Expectant management: Intentional non-operative approach to hepatic injury management, after consideration of a patient's overall co-morbid illness and injury burden. Appropriate vigilance must be maintained to ensure patients failing non-operative management are identified without delay. Physician and nursing staff directly involved in a patient's care are to be aware of the patient's phase of care, particularly during the early period of inpatient hospital care.

On initial patient admission, a clear plan is to be communicated to resident and nursing staff for tracking a patient's (a) serum hemoglobin; (b) serial abdominal exam; and (c) vital signs. A typical schedule for serial lab draws will be every 6 to 12 hours for the first 24 to 48 hours then once or twice daily thereafter.

**POLICY STATEMENTS**

A carefully performed physical exam, with an awareness of limitations imposed by individual patient factors such as diminished mental status, remains central to decision making in the trauma bay. Appropriately selected adjunct diagnostic studies are used to minimize the risk of missed injury. A clinician deciding on which studies to recruit in the evaluation of a trauma patient will need to be cognizant of the hemodynamic stability of the patient. A modified hemodynamic instability scoring system cited in the Western Trauma Association Splenic Trauma Algorithm Guidelines provides a useful framework for classifying a trauma patient's hemodynamic status, with blunt abdominal trauma patients exhibiting Grade 4 and 5 hemodynamic instability generally requiring immediate laparotomy. Trauma patients requiring surgical intervention for hemorrhage control have better outcomes, and improved survival, if interval from injury to surgical control of bleeding is minimized. Abdominal CT scan with IV contrast is the most reliable method to identify and assess the severity of injury to the liver and other intra-abdominal solid organs. The severity of hepatic injury (as suggested by CT grade or degree of hemoperitoneum), neurological status, and/or the presence of associated injuries are not contraindications to nonoperative management. In the presence of ongoing bleeding, the decision to attempt angiographic embolization needs to be made with an awareness of the patient's evolving hemodynamic status, overall injury burden, and available endovascular capabilities. There is a significant incidence of complications with non-operative management of hepatic injuries, with complication rates for Grade IV and V injuries being 21 and 63% respectively. Adjunctive therapies such as angiography, percutaneous drainage, endoscopy/ERCP and laparoscopy remain important adjuncts to nonoperative management of hepatic injuries.

## **PROCEDURE STATEMENTS**

1. ATLS precepts will guide the initial evaluation and management of trauma patients at IMMC.
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 (i.e. Grade 4 or 5) instability should be triaged to the OR. Extremely rare exceptions to this guideline may exist (e.g. assessing for futility due to brain injury, assessing for pelvic hemorrhage that may be more amenable to angioembolization).
5. A negative FAST in a hemodynamically unstable patient reliably rules out the abdomen as the source of hemodynamic instability, although FAST may need to be repeated during the patient's resuscitation before this conclusion can be arrived at with appropriate certainty.
6. In hemodynamically stable patients with blunt abdominal trauma, an abdominal CT scan with intravenous contrast should be performed to identify and assess the severity of injury to the liver.
7. In patients with Grades 4 and 5 instability in whom there is reason to doubt intra-abdominal hemorrhage as the source for the instability, the trauma team should consider continuing resuscitation in the OR while further evaluation of refractory shock is continued.
8. Patients who are identified to have hepatic injuries on CT imaging should have these injuries graded according to the AAST Liver Injury Scale. Note, however, that the clinical status of the patient is the primary consideration in deciding whether the patient needs an intervention.
9. Any evidence of active ongoing hemorrhage on CT scan imaging in a stable or transient responder to resuscitation, should be addressed by angiography with embolization as a first-line intervention as an adjunct to potential operative intervention. The decision on where to perform the angioembolization (i.e. in radiology or hybrid OR) should be made by the trauma surgeon.
10. If non-operative management is attempted, monitor serum hemoglobin every 6 - 8 hours for 24 to 48 hours, and then less frequently as the patient's clinical status permits.
11. Any signs of recurrent hemorrhage should prompt a re-evaluation of the patient. A patient with recurrent hemorrhage may need emergent surgery, re-imaging, or more frequent monitoring of abdominal exam, labs and vitals.
12. Follow-up CT imaging of a patient's hepatic injury may be considered, particularly for higher grade injuries. In general, however, follow-up CT imaging is prompted by a clinical finding that raises concern for a complication (e.g. fever raising concern for abscess, or jaundice raising concern for biloma).

## Related References:

Keric, N., Shatz, D. V., Schellenberg, M., De Moya, M., Moore, L. J., Brown, C., Hartwell, J. L., Inaba, K., Ley, E. J., Peck, K. A., Fox, C. J., Rosen, N. G., Weinberg, J. A., Coimbra, R., Kozar, R. A., & Martin, M. J. (2023). **Adult blunt hepatic injury: A Western Trauma Association critical decisions algorithm.** *The Journal of Trauma and Acute Care Surgery*, 96(1), 123–128. <https://doi.org/10.1097/ta.0000000000004141>

Stassen, Nicole A., et al. **Nonoperative management of blunt hepatic injury: An Eastern Association for the Surgery of Trauma practice management guideline.** *J Trauma Acute Care Surg* 73.5 (2012): 288-293

Hoff, William S., et al. **"Practice management guidelines for the evaluation of blunt abdominal trauma: the EAST practice management guidelines work group."** *Journal of Trauma and Acute Care Surgery* 53.3 (2002): 602-615.

Kozar, Rosemary, et al., **Western Trauma Association - Nonoperative Management of Adult Blunt Hepatic Trauma.** Retrieved April 16, 2014 from <https://westerntrauma.org/algorithms/algorithms.html>  
American College of Emergency Physicians. **"Clinical policy: critical issues in the evaluation of adult patients presenting to the emergency department with acute blunt abdominal trauma."** *Ann Emerg Med.*2004;43(2):278-290.

Kozar, Rosemary, et al., **Western Trauma Association – Nonoperative Management of Adult Blunt Hepatic Trauma.** Retrieved July, 2021 from <https://www.westerntrauma.org/western-trauma-association-algorithms/published-algorithms/>. **"Western Trauma Association Critical Decisions in Trauma: Nonoperative Management of Adult Blunt Hepatic Trauma."** *J Trauma* 2009;67(6):1144-8; discussion 8-9.

Rossaint, Rolf, et al. **"Management of bleeding following major trauma: an updated European guideline."** *Crit Care* 14.2 (2010): R52.

Sudakoff GS, Rosen MP, Rybicki FJ, Blake MA, Cash BD, Desjardins B, Greene FL, Hindman NM, Oliva IB, Weiss C, Yaghamai V, Expert Panels on Vascular Imaging and Gastrointestinal Imaging. **ACR Appropriateness Criteria® blunt abdominal trauma.** [Online publication]. Reston (VA): American College of Radiology (ACR); 2012. 9 p.

Stassen NA, Bhullar I, Cheng JD, Crandall M, Friese R, Guillamondegui O, Jawa R, Maung A, Rohs TJ Jr, Sangosanya A, Schuster K, Seamon M, Tchorz KM, Zarzuar BL, Kerwin A; **Nonoperative management of blunt hepatic injury: an Eastern Association for the Surgery of Trauma practice management guideline.** *J Trauma Acute Care Surg.* 2012 Nov;73(5 Suppl 4):S288-93

Tinkoff G, Esposito TJ, Reed J, et al. **American Association for the Surgery of Trauma Organ Injury Scale I: spleen, liver, and kidney, validation based on the National Trauma Data Bank.** *J Am Coll Surg* 2008; 207:646.

J Wayne Meredith et al, **Nonoperative Management of Blunt Hepatic Trauma: The exception or the rule?** *J of Trauma* 1994; 36 (4): 529 – 535