

**TRAUMA SERVICES**  
**DEPARTMENTAL GUIDELINES AND**  
**PROCEDURES**

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**TITLE:** BLUNT LIVER INJURY MANAGEMENT

**PURPOSE:** To provide a guideline for the initial evaluation, management and non-operative management of blunt liver trauma at the Ben Taub Hospital.

**GUIDELINE/PROCEDURES STATEMENT:**

**ELABORATIONS:**

Non-operative management has become the standard of care for the hemodynamically stable patient with blunt liver trauma. The following is a guideline for the initial evaluation and management of blunt liver injury and for the non-operative management of blunt liver injury.

**I. PROCEDURE:**

- 1) Patients with blunt liver injury and hemodynamic instability or peritonitis should be taken to the operating room (OR) emergently for an exploratory laparotomy.
- 2) Patients with blunt liver injury without peritonitis or hemodynamic instability should be managed non-operatively according the following guidelines:
  - All patients should receive an abdominal computed tomography (CT) with intravenous contrast to properly grade the injury and assess for active bleeding (extravasation of contrast).
  - Any patient with arterial extravasation or evidence of pseudoaneurysm on CT should be referred to interventional radiology for angiography.
  - Grade of injury alone is not an indication for angiography and injuries without contrast extravasation on CT imaging do not require angiography.
  - Embolization should be selective, and proximal hepatic, right hepatic, and left hepatic artery embolization should be avoided.
  - Patient who have embolization do not require a course of antibiotic treatment.
  - All patients with blunt liver injury being managed non-operatively must be admitted to a monitored setting to assess continuous vital signs, frequent urine output, and laboratory draws.

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- Patients with grade IV and V injuries managed non-operatively should be admitted to the TSICU.
  - Patients who have extravasation of contrast on CT imaging should be admitted to the TSICU.
  - Patients who undergo hepatic angiography, with or without embolization, should be admitted to the TSICU.
  - Patients with low grade (I – III) blunt hepatic injury without extravasation of contrast should be admitted to a monitored setting, with a level of care determined on a case by case manner and based upon associated injuries and global clinical factors.
  - Hemoglobin (Hgb) and hematocrit (Hct) measurements should be done every four hours until there are three stable measurements.
  - Transfusion of hemodynamically stable patients should be in accordance with the packed red blood cell (PRBC) transfusion guideline.
  - Thromboembolic chemoprophylaxis may begin after 3 stable hemoglobin measurements when the patient is 24 hours after injury.
  - The patient may be discharged to the floor after at least 24 hours of stable Hgb/Hct measurements.
  - The presence of blunt liver injury is not an indication for bed rest.
  - The presence of blunt liver injury is not a contraindication to enteral nutritional support.
  - At the time of discharge, the patient should be counseled to limit high impact activities (e.g. contact sports) for 6 months.
- 3) Complications of non-operative management of blunt liver injury include delayed hemorrhage, bile leak and biloma, necrosis, and abscess. The following is a guideline for the evaluation and management of these complications:
- Delayed hemorrhage with hemodynamic instability should be managed with surgical intervention.

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- Delayed hemorrhage without hemodynamic instability may be evaluated by triple phase CT imaging.
- Patients with CT evidence of pseudoaneurysm or contrast extravasation should be referred to interventional radiology for angiography.
- Angiography and embolization is the preferred management of hemobilia.
- A delayed presentation of peritonitis should prompt surgical exploration.
- Patients developing fever, tachycardia, or leukocytosis, in the absence of peritonitis, should be evaluated by CT imaging of the abdomen and pelvis. Triple phase imaging through the liver should be included.
- Biloma may be managed by observation, percutaneous drainage, or ERCP, depending on the clinical scenario.
- Bile leaks should be managed by ERCP.
- Delayed bile peritonitis should be managed by laparoscopy and early ERCP should be strongly considered.
- Delayed rupture of subcapsular hematoma without hemodynamic instability should be managed by laparoscopy.
- For most hepatic abscesses image guided percutaneous drainage is the preferred management. Surgical intervention may be indicated in certain patients, either as initial therapy or following percutaneous drainage.
- Hepatic necrosis may be managed by observation, although resection may be indicated in certain patients.
- Antibiotics are not indicated in the setting of hepatic necrosis without infection.
- In cases where surgical management is required, resection of hepatic necrosis is preferred to serial debridement.

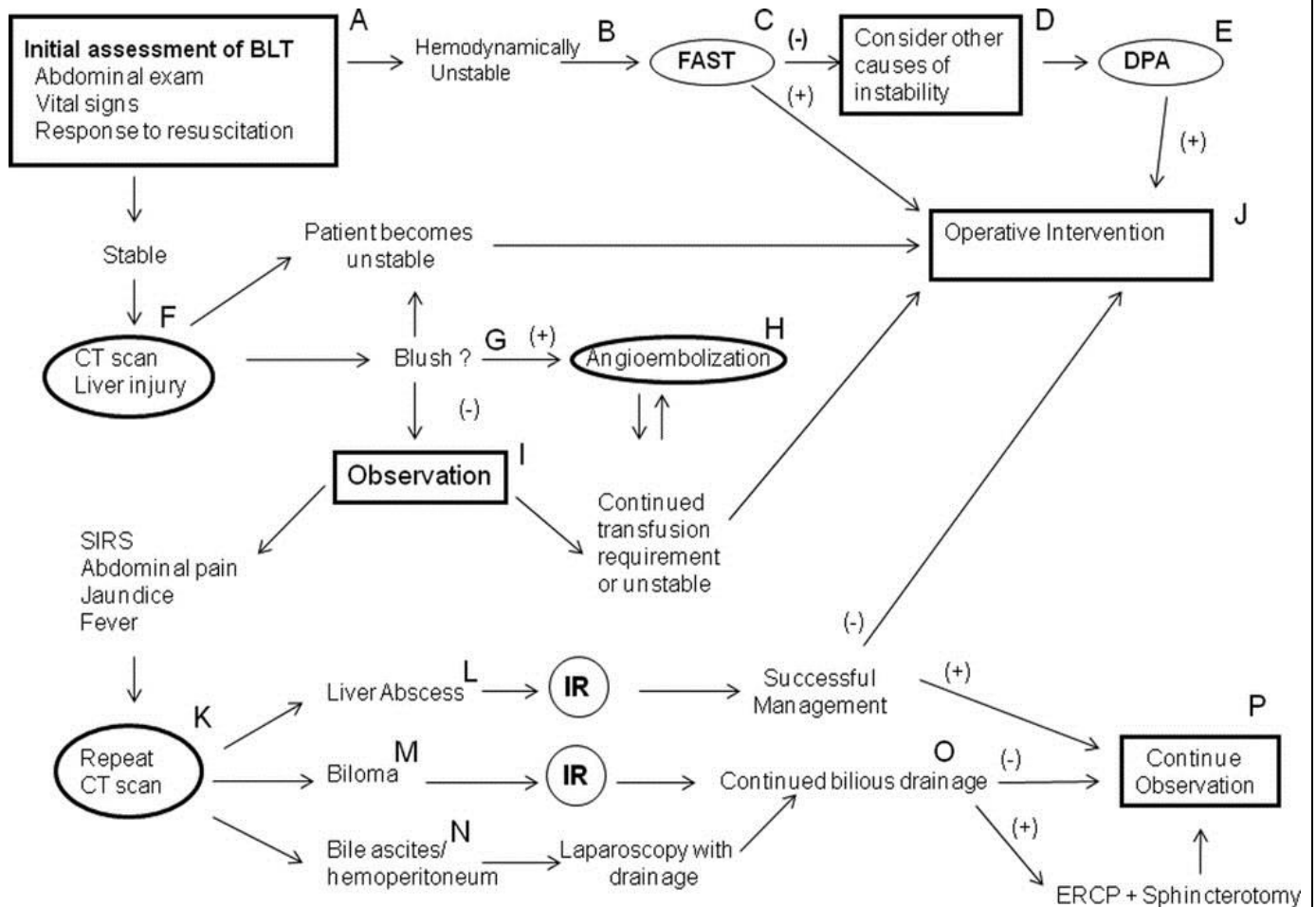
**NOTE THAT THIS GUIDELINE IS BASED ON BEST EVIDENCE AND LOCAL EXPERT OPINION. IT IS NOT TO BE UNDERTAKEN IN THE ABSENCE OF CLINICAL JUDGMENT. IF YOU ARE TO STRAY FROM IT, PLEASE DOCUMENT IN THE MEDICAL RECORD AS TO WHY.**

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#### Flow Diagram for the Management of Blunt Liver Trauma:



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**The American Association for the Surgery of Trauma (AAST) Liver Injury Grading System:**

Grade	Type of Injury	Description of Injury
I	Hematoma	Subcapsular, <10% surface area
	Laceration	Capsular tear; <1 cm parenchymal depth
II	Hematoma	Subcapsular, 10% to 50% surface area Intraparenchymal, <10 cm diameter
	Laceration	Capsular tear, 1-3 cm parenchymal depth, < 10 cm length
III	Hematoma	Subcapsular, >50% surface area Intraparenchymal, >10 cm diameter or expanding Ruptured subcapsular or intraparenchymal hematoma
	Laceration	>3 cm parenchymal depth
IV	Laceration	Parenchymal disruption involving 25% to 75% hepatic lobe 1-3 Couinaud's segments within a single lobe
V	Laceration	Parenchymal disruption involving >75% of hepatic lobe >3 Couinaud's segments within a single lobe
	Vascular	Juxtahepatic venous injury
V	Vascular	Hepatic avulsion

Advance one grade for multiple liver injuries, up to Grade III

**REFERENCES/BIBLIOGRAPHY:**

**DEPARTMENT OF PRIMARY RESPONSIBILITY:**

Trauma Services

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