

## Solid Organ Injury PMG

### Anticoagulation in Solid Organ Injury (SOI)

- Venous thromboembolism (VTE) prophylaxis should be initiated per routine protocol. Recommend AGAINST holding VTE chemoprophylaxis for any grade SOI
- Therapeutic Anticoagulation: For SOI patients taking pre-injury therapeutic anticoagulation,
  - o Grade 1 and 2 SOI – **No** reversal of therapeutic anticoagulation
  - o **Grade 3-5 SOI – recommend reversal of therapeutic anticoagulation**
- Antiplatelet agents: Recommend holding antiplatelet agents in SOI but recommend against active treatment with DDAVP or platelet transfusion.

### Liver Injury

Grading – AAST, updated 2018

Classification	Description
Grade 1	<ul style="list-style-type: none"> <li>• Subcapsular hematoma &lt;10% surface area</li> <li>• Parenchymal laceration &lt;1 cm depth</li> </ul>
Grade 2	<ul style="list-style-type: none"> <li>• Subcapsular hematoma 10–50% surface area; intraparenchymal hematoma &lt;10 cm in diameter</li> <li>• Parenchymal laceration 1–3 cm in depth and &lt;10 cm length</li> </ul>
Grade 3	<ul style="list-style-type: none"> <li>• Subcapsular hematoma &gt;50% surface area; ruptured subcapsular or parenchymal hematoma</li> <li>• Intraparenchymal laceration &gt;10 cm</li> <li>• Laceration &gt;3 cm depth</li> <li>• Any injury in the presence of a liver vascular injury or active bleeding contained within liver parenchyma</li> </ul>
Grade 4	<ul style="list-style-type: none"> <li>• Parenchymal disruption involving 25–75% of a hepatic lobe</li> <li>• Active bleeding extending beyond the liver parenchyma into the peritoneum</li> </ul>
Grade 5	<ul style="list-style-type: none"> <li>• Parenchymal disruption &gt;75% of hepatic lobe</li> <li>• Juxtahepatic venous injury to include retrohepatic vena cava and central major hepatic veins</li> </ul>

**\*\*Advance one grade for multiple hepatic injuries up to grade 3.**

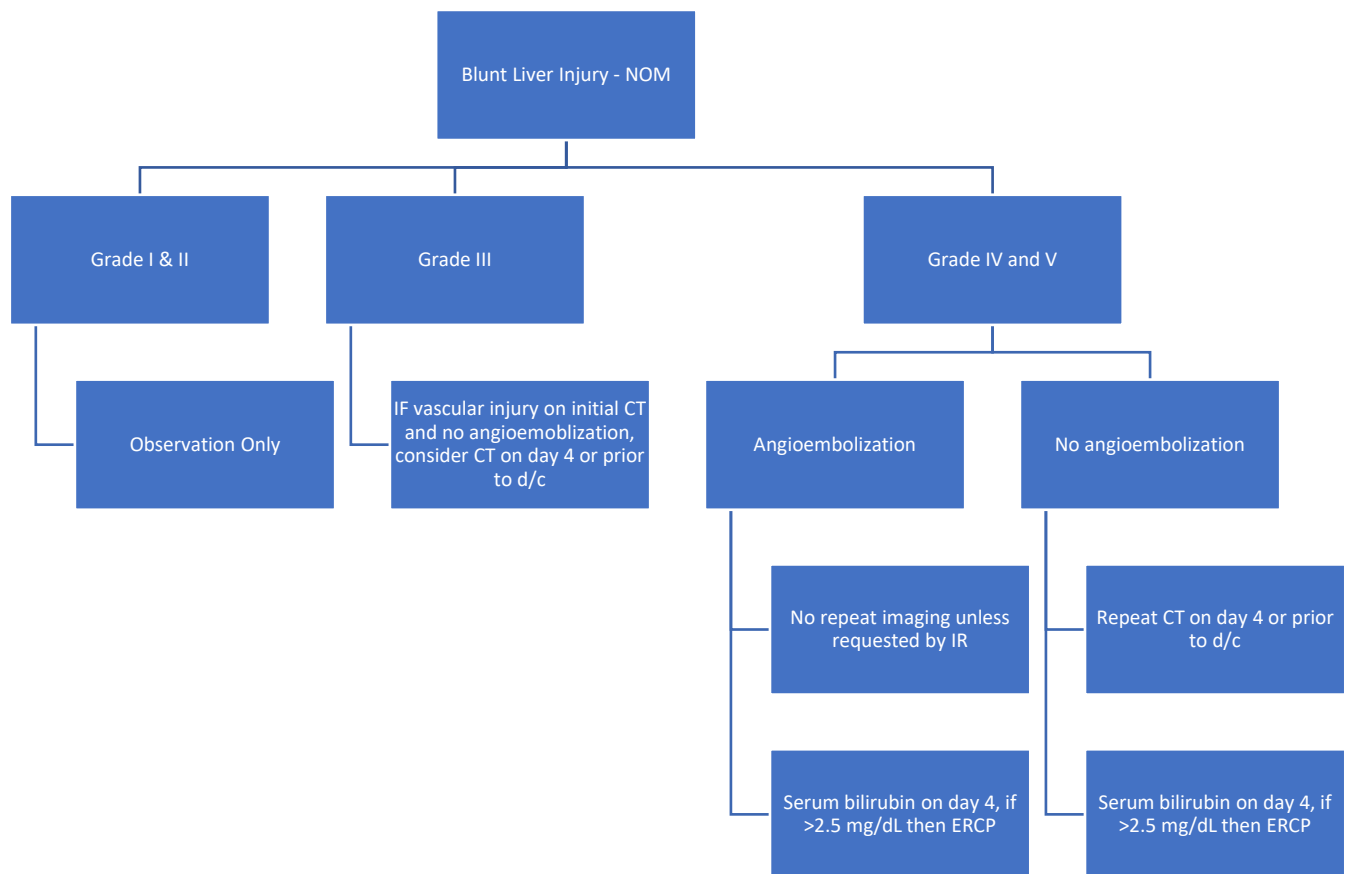
**ERCP:** Major bile leak after hepatic trauma has been reported 1-20%. Higher rates of major bile leak in higher grade liver injury (>IV) and those injuries managed operatively or with angioembolization

- Routine ERCP is not indicated for grades 1-3 of non-operative management (NOM) liver injury
- ERCP potentially indicated for Grades IV – V NOM liver trauma if centrally located liver injury or angioembolization
- Recommend total serum bilirubin level sent on post—injury day 4 for patients with Grade IV — V liver injury and those that have been embolized
- If bilirubin greater than 2.5 mg/dL, consult GI for ERCP consideration. Further imaging with CT or MRCP not necessary unless requested by GI

**Repeat or surveillance imaging\***

- No repeat imaging indicated for Grade 1 and 2 injuries
- **Consider** repeat CT on Grade 3 liver injuries with vascular component (contrast blush or pseudoaneurysm seen on initial CT scan) per Trauma Surgeon discretion
- **Recommend** repeat CT on post-injury day 4 for all Grade 4 & 5 liver injuries that do not undergo angioembolization.

\*Imaging modality of preference is CTA abdomen with arterial and venous phase



## Splenic Injury

Grading, AAST updated 2018

Classification	Description
Grade 1	<ul style="list-style-type: none"><li>• Subcapsular hematoma &lt;10% surface area</li><li>• Parenchymal laceration &lt;1 cm depth</li><li>• Capsular tear</li></ul>
Grade 2	<ul style="list-style-type: none"><li>• Hematoma: Subcapsular, 10-50% surface area</li><li>• Subcapsular hematoma 10–50% surface area; intraparenchymal hematoma &lt;5 cm</li><li>• Parenchymal laceration 1–3 cm</li></ul>
Grade 3	<ul style="list-style-type: none"><li>• Subcapsular hematoma &gt;50% surface area; ruptured subcapsular or intraparenchymal hematoma ≥5 cm</li><li>• Parenchymal laceration &gt;3 cm depth</li></ul>
Grade 4	<ul style="list-style-type: none"><li>• <b>Any injury in the presence of a splenic vascular injury or active bleeding confined within splenic capsule</b></li><li>• Parenchymal laceration involving segmental or hilar vessels producing &gt;25% devascularization</li></ul>
Grade 5	<ul style="list-style-type: none"><li>• <b>Any injury in the presence of splenic vascular injury with active bleeding extending beyond the spleen into the peritoneum</b></li></ul>

### Treatment Algorithm

#### **Grade V splenic injuries:**

- Recommend operative management for these injuries over NOM or angioembolization due to increased risk of failure with angioembolization. Ultimate management per trauma surgeon discretion.

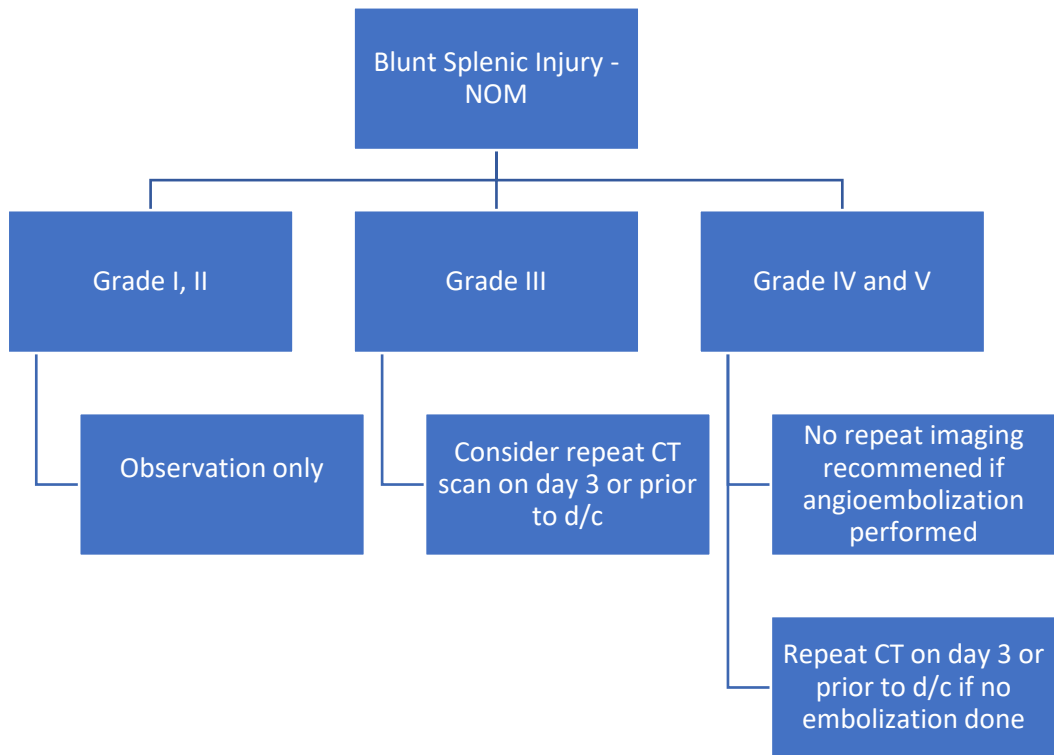
#### **Vaccination:**

- Routine post-splenectomy vaccination is NOT recommended for splenic injuries managed with angioembolization

#### **Repeat or surveillance imaging:**

- No repeat imaging indicated for Grade 1 and 2 injuries
- **Consider** repeat CT on Grade 3 splenic injuries per Trauma Surgeon discretion
- **Recommend** repeat CT on post-injury day 3 for all Grade 4 & 5 splenic injuries that do not undergo angioembolization.

\*Repeat Imaging modality of preference is CT Angio with arterial and venous phase



## Kidney Injury

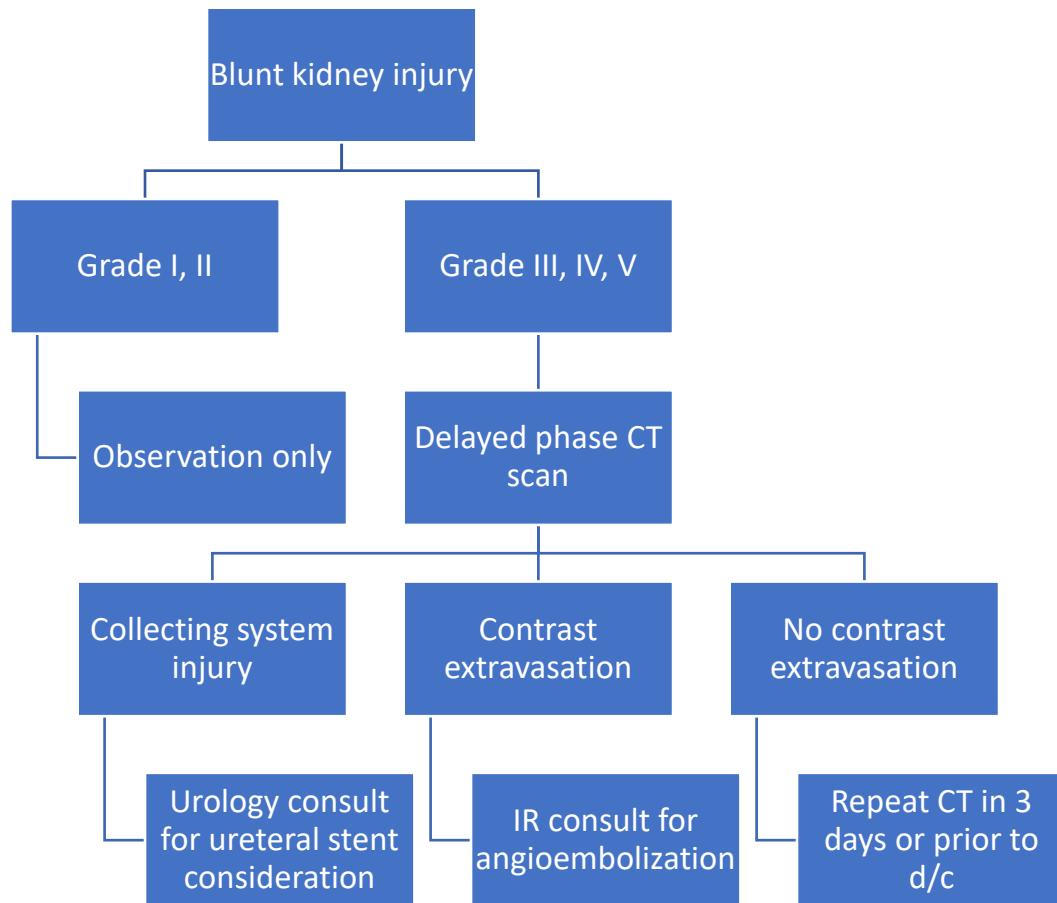
Classification	Description
Grade 1	<ul style="list-style-type: none"><li>• Subcapsular hematoma and/or parenchymal contusion without laceration</li></ul>
Grade 2	<ul style="list-style-type: none"><li>• Perirenal hematoma confined to Gerota's fascia</li><li>• Renal parenchymal laceration <math>\leq 1</math> cm depth without urinary extravasation</li></ul>
Grade 3	<ul style="list-style-type: none"><li>• Renal parenchymal laceration <math>&gt;1</math> cm depth without collecting system rupture or urinary extravasation</li><li>• Any injury in the presence of a kidney vascular injury or active bleeding contained within Gerota's fascia</li></ul>
Grade 4	<ul style="list-style-type: none"><li>• Parenchymal laceration extending into urinary collecting system with urinary extravasation</li><li>• Renal pelvis laceration and/or complete ureteropelvic disruption</li><li>• Segmental renal vein or artery injury</li><li>• Active bleeding beyond Gerota's fascia into the retroperitoneum or peritoneum</li><li>• Segmental or complete kidney infarction(s) due to vessel thrombosis without active bleeding</li></ul>
Grade 5	<ul style="list-style-type: none"><li>• Main renal artery or vein laceration or avulsion of hilum</li><li>• Devascularized kidney with active bleeding</li><li>• Shattered kidney with loss of identifiable parenchymal renal anatomy</li></ul>

### *Treatment Algorithm*

#### ***Repeat or surveillance imaging:***

- No repeat imaging indicated for Grade 1 and 2 injuries
- **Recommend delayed phase CT** at admission for all Grade 3-5 renal injuries to evaluate for urinary extravasation
- **Recommend** repeat CTA on post-injury day 3 for all Grade 3- 5 renal injuries that do not undergo angioembolization.

\*Imaging modality of preference is CTA Abdomen with arterial and venous phase



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