

Blunt 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 – *consider* reversal of therapeutic anticoagulation if patient has received blood products or hemodynamic instability per attending discretion
- 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"> • Subcapsular hematoma <10% surface area • Parenchymal laceration <1 cm depth
Grade 2	<ul style="list-style-type: none"> • Subcapsular hematoma 10–50% surface area; intraparenchymal hematoma <10 cm in diameter • Parenchymal laceration 1–3 cm in depth and <10 cm length
Grade 3	<ul style="list-style-type: none"> • Subcapsular hematoma >50% surface area; ruptured subcapsular or parenchymal hematoma • Intraparenchymal laceration >10 cm • Laceration >3 cm depth • Any injury in the presence of a liver vascular injury or active bleeding contained within liver parenchyma
Grade 4	<ul style="list-style-type: none"> • Parenchymal disruption involving 25–75% of a hepatic lobe • Active bleeding extending beyond the liver parenchyma into the peritoneum
Grade 5	<ul style="list-style-type: none"> • Parenchymal disruption >75% of hepatic lobe • Juxtahepatic venous injury to include retrohepatic vena cava and central major hepatic veins

****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

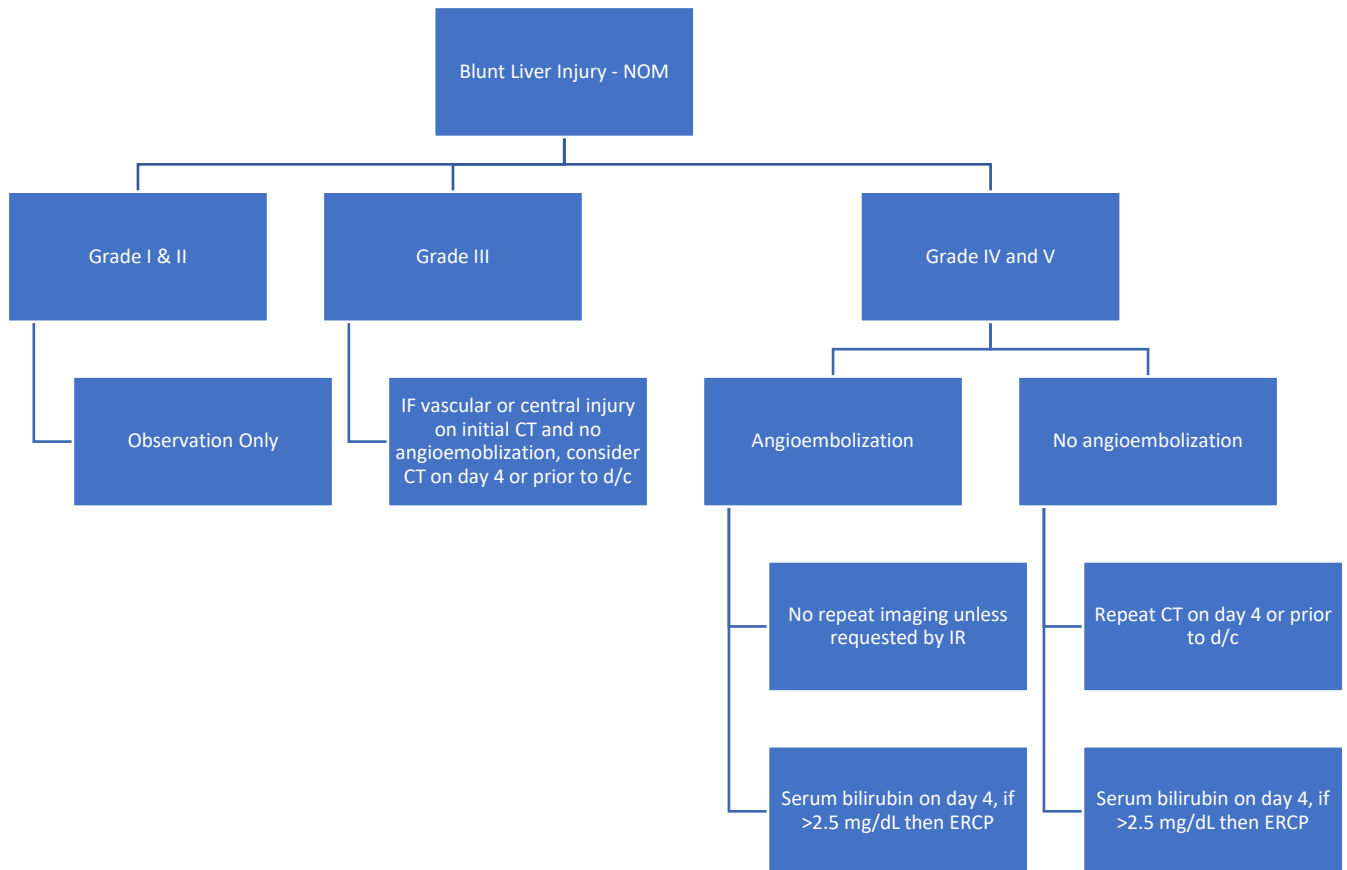
- Routine ERCP is not indicated for grades 1-3 of non-operative management (NOM) liver injury
- ERCP potentially indicated for Grades IV – V NOM liver trauma if centrally located liver injury or angioembolization has been performed
- Recommend total serum bilirubin level sent on post-injury day 4 for 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) or central injury location 025050per 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">• Subcapsular hematoma <10% surface area• Parenchymal laceration <1 cm depth• Capsular tear
Grade 2	<ul style="list-style-type: none">• Hematoma: Subcapsular, 10-50% surface area• Subcapsular hematoma 10–50% surface area; intraparenchymal hematoma <5 cm• Parenchymal laceration 1–3 cm
Grade 3	<ul style="list-style-type: none">• Subcapsular hematoma >50% surface area; ruptured subcapsular or intraparenchymal hematoma ≥5 cm• Parenchymal laceration >3 cm depth
Grade 4	<ul style="list-style-type: none">• Any injury in the presence of a splenic vascular injury or active bleeding confined within splenic capsule• Parenchymal laceration involving segmental or hilar vessels producing >25% devascularization
Grade 5	<ul style="list-style-type: none">• Any injury in the presence of splenic vascular injury with active bleeding extending beyond the spleen into the peritoneum

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.

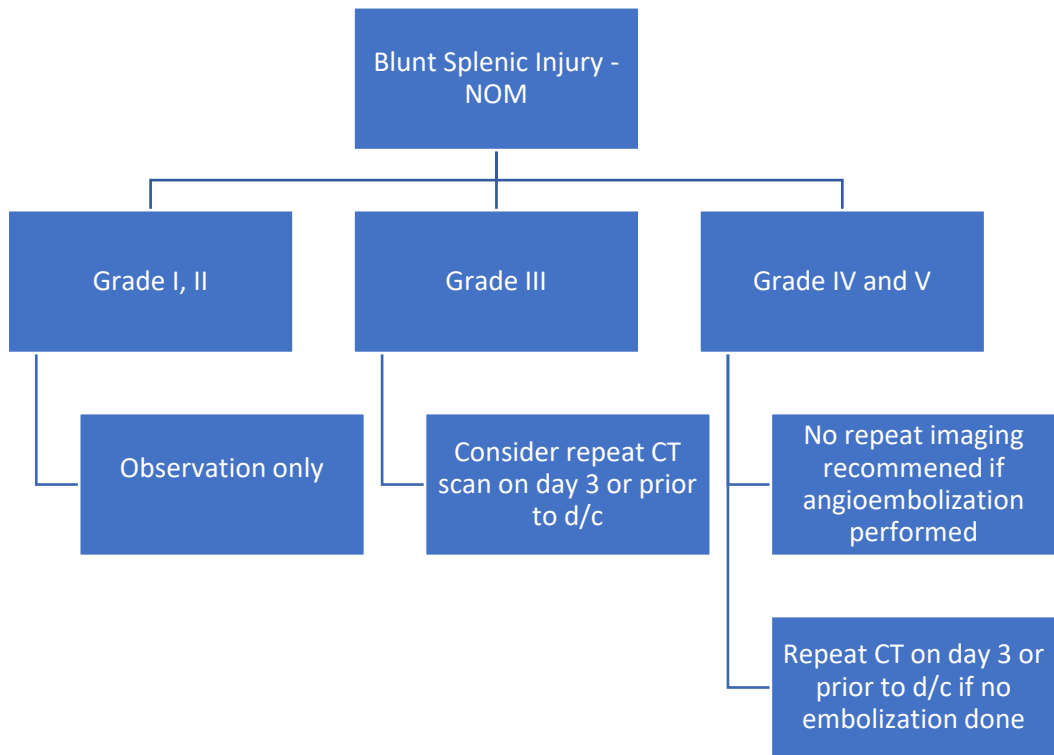
Vaccination:

- 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

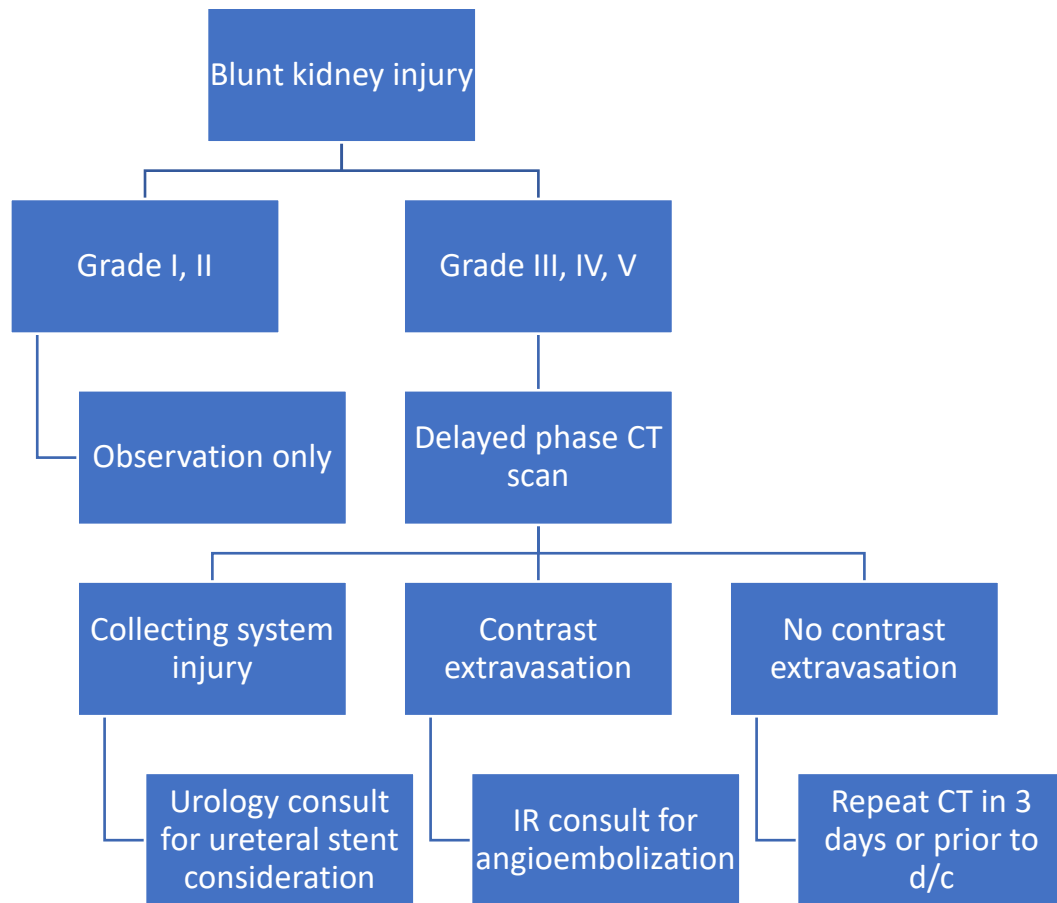
Classification	Description
Grade 1	<ul style="list-style-type: none">• Subcapsular hematoma and/or parenchymal contusion without laceration
Grade 2	<ul style="list-style-type: none">• Perirenal hematoma confined to Gerota's fascia• Renal parenchymal laceration ≤ 1 cm depth without urinary extravasation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

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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