ALFRED I. duPONT HOSPITAL FOR CHILDREN
NEMOURS CHILDREN'S CLINIC-WILMINGTON

CLINICAL MANAGEMENT GUIDELINE	PAGE 1
NO. 5.08	REVISION NO. 3
EFFECTIVE DATE: 04/2019	SUPERSEDES: 08/16

DEPARTMENT (DIVISION): Trauma
TITLE: Management of Abdominal Solid Organ Injuries

PURPOSE

The vast majority of pediatric abdominal injuries are due to blunt trauma. The spleen and liver are the two most commonly injured organs in pediatric patients sustaining blunt abdominal trauma, and a majority can be managed non-operatively. Early recognition and standardized management are associated with excellent outcomes. The following guideline has been established to facilitate standardized, evidenced-based management of the physiologically stable pediatric trauma patient with an isolated abdominal solid organ injury.

POLICY

To provide a guideline for care of the pediatric patient sustaining injuries to abdominal solid organs.

DEFINITIONS

Spleen Injury: The spleen is the most commonly injured abdominal organ in children. Injured patients may demonstrate left upper quadrant pain, left shoulder pain ("Kehr's sign"), abdominal distention, and ecchymosis/abrasions to the left upper quadrant.

- Criteria for staging splenic injury (based on American Association for the Surgery of Trauma (AAST) splenic injury scale):
  1. Grade I: subcapsular hematoma of less than 10% of surface area or capsular tear of less than 1cm in depth). May be coded as "Minor"
  2. Grade II: subcapsular hematoma of 10-50% of surface area, intraparenchymal hematoma of less than 5cm in diameter, or laceration of 1-3 cm in depth and not involving trabecular vessels. May be coded as "Moderate"
  3. Grade III: subcapsular hematoma of more than 50% of surface area or expanding and ruptured subcapsular or parenchymal hematoma, intraparenchymal hematoma of more than 5cm or expanding, or laceration of more than 3 cm in depth or involving trabecular vessels. May be coded as "Major"
  4. Grade IV: laceration of segmental or hilar vessels with devascularization of more than 25% of the spleen. May be coded as "Major"
  5. Grade V: shattered spleen or hilar vascular injury. May be coded as "Massive"

Liver Injury: The liver is the second most commonly injured intra-abdominal organ. The right lobe is injured slightly more frequently than the left. Patients who sustain an injury to the liver frequently complain of abdominal pain and right shoulder pain. Elevated transaminases are highly suggestive of a liver injury.

- Criteria for staging liver injuries (based on AAST liver injury scale):
  1. Grade I: subcapsular non-expanding hematoma of less than 10% of surface area or capsular tear of less than 1cm in depth parenchymal disruption.
  2. Grade II: subcapsular non-expanding hematoma of 10-50% of surface area, intraparenchymal non-expanding hematoma of less than 2cm in diameter, or laceration of less than 3 cm in parenchymal depth and <10 cm in length.
  3. Grade III: subcapsular hematoma of more than 50% of surface area or expanding and ruptured subcapsular or parenchymal hematoma, intraparenchymal hematoma with active bleeding, or laceration of more than 3 cm in parenchymal depth.
  4. Grade IV: ruptured central hematoma or parenchymal destruction involving 25%-75% of hepatic lobe
  5. Grade V: parenchymal destruction >75% of hepatic lobe or juxtahepatic venous injuries (retrohepatic cava/major hepatic veins)
  6. Grade VI: hepatic avulsion

PROCEDURE

1) All trauma patients with blunt abdominal injury should have a thorough physical examination. If signs or symptoms are suggestive of intra-abdominal injury and patient is hemodynamically stable, a CT of the abdomen and pelvis should be performed with intravenous contrast.
    a. Indications for abdominal CT:
        i. Evidence of abdominal wall injury (ecchymosis, abrasions to abdominal wall)
        ii. Positive lab screening (In a patient with an equivocal abdominal examination)
        iii. Lack of reliable abdominal examination (i.e. patient with neurological deficit, absence of a witness/ too young to provide information, ETOH, altered mental status)
        iv. Provider discretion
    b. Hemodynamically unstable patients are not to be taken to CT scan
    c. There is limited evidence to support Focused Assessment with Sonography (FAST) exams in pediatric population; Provider discretion advised.
2) A baseline hemoglobin & hematocrit (H & H) as well as a type and screen should be obtained.
3) Grading (1-5) of the spleen/liver injury by radiologist and surgeon.

MANAGEMENT

The plans of care as outlined on 5.08a Flow Diagram are intended to supplement the ongoing assessment and management by the treating physician. They do not supersede clinical judgment and should be adjusted as necessary for the care of an individual patient. Hemodynamic status, rather than CT grade, should guide patient disposition.

The role of interventional radiology in the management of solid organ blunt trauma in children is currently evolving. IR consult will be placed at the discretion of the Trauma Surgeon in patients with ongoing hemorrhage.

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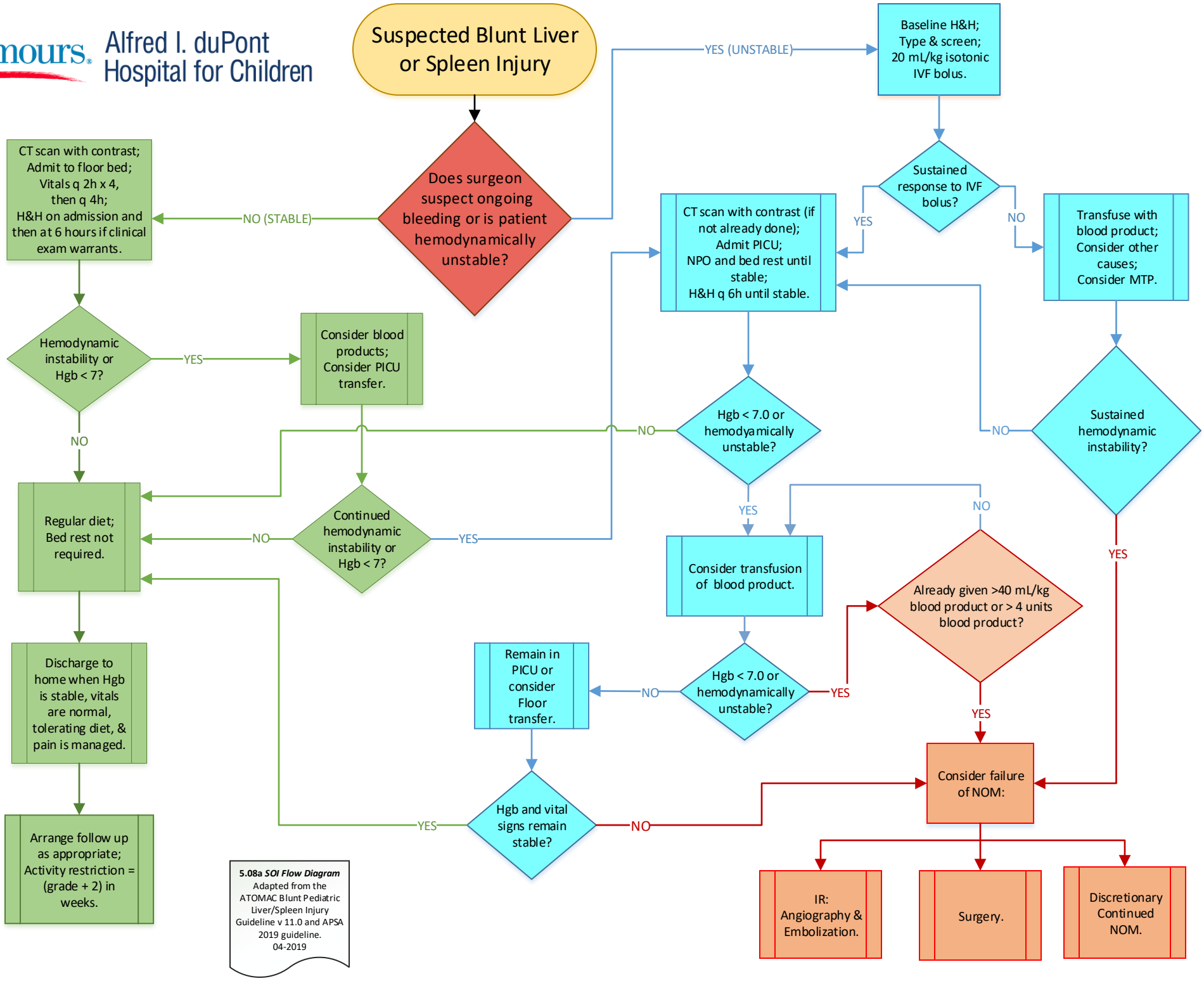

5.08a *SOI Flow Diagram*
Adapted from the ATOMAC Blunt Pediatric Liver/Spleen Injury Guideline v 11.0 and APSA 2019 guideline.
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