

Guideline



CCHMC Trauma Service Guidelines

Title: Management of Solid Organ Injury Guidelines

Effective Date: 03/2020

Number: TR10

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1.0 SCOPE

- 1.1. Care of the Trauma Services Patient at CCHMC.
- 1.2. This is the recommended guideline for any patient with confirmed injury to the liver, spleen, and/or kidney.

2.0 DEFINITIONS

- 2.1. **Injury Grade:** Defined by the American Association for the Surgery of Trauma's organ injury scale.
- 2.2. **Liver/Spleen/Kidney Injury:** Any evidence on CT scan of injury to the liver, spleen, and/or kidney.

3.0 GUIDELINE

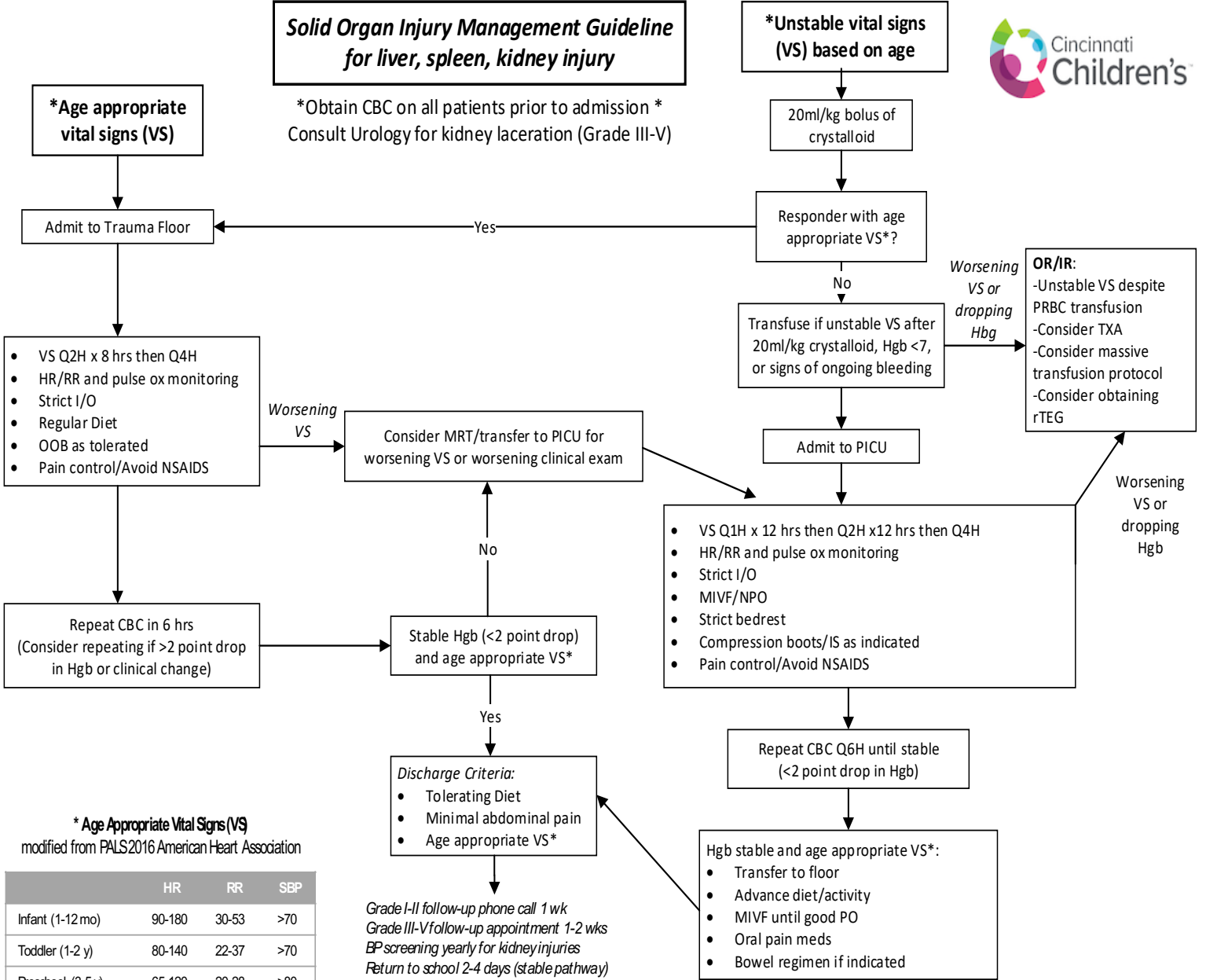
- 3.1. Obtain CBC
- 3.2. Stable Vital signs (VS) based on age +/- 20 ml/kg bolus of crystalloid
 - 3.2.1. Admit to: Floor
 - 3.2.2. Urology consult for kidney injury grade III-V
 - 3.2.3. Laboratory tests: Hematocrit: initial then 6 hours post-injury
 - 3.2.3.1. Consider repeat CBC if >2 drop in Hgb or clinical change
 - 3.2.4. Clinical assessment and monitoring:
 - a. Vital signs (VS) Q2H x 8 hours, then Q4H
 - b. Strict I&O
 - 3.2.5. Intravenous fluids (IV): Maintenance IV, then saline well once tolerating PO
 - 3.2.6. Medications: Tylenol 10mg/kg PO Q4H as needed for pain. Consider narcotic usage only as needed
 - 3.2.7. Nutrition/Diet: Regular
 - 3.2.8. Activity: Up ad lib
 - 3.2.9. Pre-discharge/Post-discharge imaging: None
 - 3.2.10. Consider MRT/transfer to PICU at any time if worsening VS or clinical exam
 - 3.2.11. Discharge criteria
 - 3.2.11.1. Tolerating diet
 - 3.2.11.2. Minimal abdominal pain
 - 3.2.11.3. Normal vital signs
 - 3.2.12. Time of activity restrictions post-injury: Grade + 2 weeks
 - 3.2.13. Return to school: 2-4 days
 - 3.2.14. Return to contact/competitive sports:
 - 3.2.14.1. Grade I: 6 weeks
 - 3.2.14.2. Grade II: 8 weeks
 - 3.2.14.3. Grade III: 12 weeks
 - 3.2.14.4. Grade IV/V: 16 weeks
 - 3.2.15. Follow-up:
 - 3.2.15.1. Grade I-II: Phone call in 1 week
 - 3.2.15.2. Grade III-V: Trauma clinic 1-2 weeks
- 3.3. Unstable VS based on age
 - 3.3.1. 20 ml/kg bolus of crystalloid
 - 3.3.2. VS stable after bolus see 3.2
 - 3.3.3. VS Unstable admit to: PICU
 - 3.3.4. Urology consult for kidney injury grade III-V
 - 3.3.5. Laboratory tests: Hematocrit: initial then Q6H until stable (<2 point drop in Hgb)
 - 3.3.6. Worsening VS or dropping Hgb
 - a. PRBC Transfusion if unstable VS after 20ml/kg crystalloid, Hgb <7, or signs of ongoing bleeding
 - b. OR/IR if unstable despite PRBC transfusion. Consider TXA, massive transfusion protocol and rTEG
 - 3.3.7. Clinical assessment and monitoring:
 - a. Vital signs Q1H x 12 hrs then Q2H x 12 hours, then Q4H
 - b. Strict I and O

- 3.3.8. Treatments and procedures:
 - a. Compression boots/Incentive spirometry as indicated
 - b. Nasogastric tube and foley catheter as indicated
- 3.3.9. Intravenous fluids (IV): Maintenance IV, then saline well once tolerating adequate PO
- 3.3.10. Medications:
 - a. Tylenol 15mg/kg IV Q6H
 - b. Morphine 0.1mg/kg IV Q4H PRN
 - c. Stool softener: Colace/Miralax
- 3.3.11. Nutrition/Diet:
 - a. NPO until Hgb and VS stable then advance diet as tolerated
- 3.3.12. Activity:
 - a. Bedrest until Hgb and VS stable then advance to up ad lib
- 3.3.13. Transfer to Floor when Hgb and VS stable
- 3.3.14. Pre-discharge/Post-discharge imaging: None
- 3.3.15. Time of activity restrictions post-injury: Grade + 2 weeks
- 3.3.16. Return to school: 5-7 days
- 3.3.17. Return to contact/competitive sports:
 - 3.3.17.1. Grade I: 6 weeks
 - 3.3.17.2. Grade II: 8 weeks
 - 3.3.17.3. Grade III: 12 weeks
 - 3.3.17.4. Grade IV/V: 16 weeks
- 3.3.18. Follow-up:
 - 3.3.18.1. Grade I-II: Phone call 1 week
 - 3.3.18.2. Grade III-V: Trauma clinic 1-2 weeks



Solid Organ Injury Management Guideline for liver, spleen, kidney injury

*Obtain CBC on all patients prior to admission * Consult Urology for kidney laceration (Grade III-V)



* Age Appropriate Vital Signs (VS) modified from PALS 2016 American Heart Association

	HR	RR	SBP
Infant (1-12 mo)	90-180	30-53	>70
Toddler (1-2 y)	80-140	22-37	>70
Preschool (3-5 y)	65-120	20-28	>80
School-Aged (6-12 y)	58-118	18-25	>85
Adolescent (12+ y)	50-100	12-20	>90

Grade I-II follow-up phone call 1 wk
 Grade III-V follow-up appointment 1-2 wks
 BP screening yearly for kidney injuries
 Return to school 2-4 days (stable pathway)
 Return to school 5-7 days (unstable pathway)
 Regular activity restrictions grade + 2 weeks
 Gym/Contact/competitive sports wks:
 6 (gr I), 8 (gr II), 12 (gr III), or 16 (gr IV)

4.0 REFERENCES

- 4.1. Acker et al. Lack of utility of repeat monitoring of hemoglobin and hematocrit following blunt solid organ injury in children. *J Trauma Acute Care Surg* 2015. 79 (6): 991-994.
- 4.2. Gates et al. non-operative management of solid organ injuries in children: An American Pediatric Surgical Association Outcomes and Evidence Based Practice Committee systemic review. *J Pediatr Surg*. 2019 Jan 31 epub
- 4.3. Notrica, David M., et al. "Nonoperative management of blunt liver and spleen injury in children: Evaluation of the ATOMAC guideline using GRADE." *Journal of Trauma and Acute Care Surgery* 79.4 (2015): 683-693.
- 4.4. Notrica, David M. "Pediatric Blunt Solid Organ Injury: Beyond the APSA Guidelines." *Current Surgery Reports* 3.4 (2015): 1-6.
- 4.5. Stylinos, S. and the APSA Trauma Committee: Evidence-based guidelines for resource utilization with isolated spleen or liver injury. *Journal of Pediatric Surgery* 35:164-169, 2000.
- 4.6. McVay, M.R., Kokoska, E.R., Jackson, R.J. Smith, S.D. (2008). Throwing out the "grade" book: management of isolated spleen and liver injury based on hemodynamic status. *Journal of Pediatric Surgery*, 43, 1072-1076.
- 4.7. Practice Management Guidelines for the Non-operative Management of Blunt Injury to the Liver and Spleen, 2003. Eastern Association for the Surgery of Trauma.
- 4.8. St. Peter, S.D, Keckler, S.J., Spilde, T.L. (2008). Justification for an abbreviated protocol in the management of blunt spleen and liver injury children. *Journal of Pediatric Surgery*, 43, 191-194.
- 4.9. St. Peter, S.D., Sharp, S.W., Snyder, C.L., Sharp, R.J., Andrews, W.S., Murphy, J.P., Islam, S., Holcomb III, G.W., Ostlie, D.J. (2011). Prospective validation of an abbreviated bedrest protocol in the management of blunt spleen and liver injury in children. *Journal of Pediatric Surgery*, 46, 173-177.

5.0 APPROVALS

All revisions of this guideline are approved by the Trauma Services Department. This guideline is reviewed every three years or sooner if deemed necessary. Policy authority for this document resides with the Trauma Service Department. This guideline is approved by the Trauma Services Manager and the Director of Trauma Services.

HISTORY	
Original Date	
	1/98
Revision Date	
	1/13, 3/15, 12/15, 3/20
Review Date	
	9/01, 8/02, 6/06, 12/08, 11/10, 6/15, 12/15, 6/18, 3/20