

Guideline



CCHMC Trauma Service Guidelines

Title: Management of Liver/Spleen Injury

Effective Date: 06/2015

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 suspected or confirmed injury to the liver and/or spleen.

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 Injury:** Any evidence on CT scan of injury to the liver or spleen.

3.0 GUIDELINE

3.1. Grade I

3.1.1. Admit to: Floor

3.1.2. Estimated hospital length of stay: 1 day

3.1.3. Laboratory tests: Hematocrit: initial then 12 hours post-injury

3.1.4. Clinical assessment and monitoring:

a. Vital signs every 2 hours x 8 hours, then every 4 hours

b. Strict I&O

3.1.5. Treatments and procedures: Incentive spirometry as need

3.1.6. Intravenous fluids(IV): Maintenance IV, then saline well once tolerating PO

3.1.7. Medications: Tylenol 15mg/kg PO/IV every 4 hours as needed for pain

3.1.8. Nutrition/Diet:

a. NPO x 6 hours, then

b. Advance diet as tolerated

3.1.9. Activity:

a. Bedrest x 6 hours, then

b. Up ad lib

3.1.10. Pre-discharge/Post-discharge imaging: None

3.1.11. Time of activity restrictions post-injury for "normal" age-appropriate activities: 3 weeks

3.1.12. Time of restricted activity post-injury for full-contact competitive sports: 6 weeks

3.1.13. Return to school: 1 week

3.1.14. Follow-up clinic visit: 1-2 weeks

3.2. Grade II

3.2.1. Admit to: floor

3.2.2. Estimated hospital length of stay: 2 days

3.2.3. Laboratory tests: Hematocrit: initial then 12 hours and 24 hours post-injury

3.2.4. Clinical assessment and monitoring:

a. Vital signs every 2 hours x 8 hours, then every 4 hours

b. Strict I&O

3.2.5. Treatments and procedures: Incentive spirometry as needed

3.2.6. Intravenous fluids(IV): Maintenance IV; saline well once tolerating PO

3.2.7. Medications:

a. Mild pain: Tylenol 15mg/kg PO/IV every 4 hours as needed

b. Moderate pain: Oxycodone 0.1mg/kg PO every 4 hours as needed (max dose 10 mg)

c. Severe pain: Morphine 0.1mg/kg IV every 2-4 hours as needed

d. Stool softener: Colace/Miralax

3.2.8. Nutrition/Diet:

a. NPO x 12 hours, then

b. Advance diet as tolerated

3.2.9. Activity:

a. Bedrest x 12 hours, then

b. Up ad lib

3.2.10. Pre-discharge/Post-discharge imaging: None

3.2.11. Time of activity restrictions post-injury for "normal" age-appropriate activities: 4 weeks

3.2.12. Time of restricted activity post-injury for full-contact competitive sports: 8 weeks

3.2.13. Return to school: 1 week

3.2.14. Follow-up clinic visit: 1-2 weeks

3.3. Grade III

3.3.1. Admit to: floor

3.3.2. Estimated hospital length of stay: 3

3.3.3. Laboratory tests: Hematocrit: initial then 12, 24, and 48 hours post-injury

3.3.4. Clinical assessment and monitoring:

a. Vital signs every 2 hours x 8 hours, then every 4 hours

b. Strict I&O

3.3.5. Treatments and procedures:

a. Incentive spirometry every 2 hours until fully ambulatory

3.3.6. Intravenous fluids(IV): Maintenance IV, then saline well once tolerating PO

3.3.7. Medications:

a. Mild pain: Tylenol 15mg/kg PO/IV every 4 hours as needed

b. Moderate pain: Oxycodone 0.1mg/kg PO every 4 hours as needed (max dose 10 mg)

c. Severe pain: Morphine 0.1mg/kg every 2-4 hours as needed

d. Stool softener: Colace/Miralax

3.3.8. Nutrition/Diet:

a. NPO x 24 hours, then

b. Advance diet as tolerated

3.3.9. Activity:

a. Bedrest x 24 hours, then

b. Up ad lib

3.3.10. Pre-discharge/Post-discharge imaging: None

3.3.11. Time of activity restrictions post-injury for "normal" age-appropriate activities: 5 weeks

3.3.12. Time of restricted activity post-injury for full-contact competitive sports: 12 weeks

3.3.13. Return to school: 1-2 weeks

3.3.14. Follow-up clinic visit: 1-2 weeks

3.4. Grade IV/Grade V

3.4.1. Admit to:

a. ICU x 24 hours or may admit to the floor based on hemodynamic stability

b. Transfer to floor when hemodynamically stable

3.4.2. Estimated hospital length of stay: 4 days

3.4.3. Laboratory tests: Hematocrit: initial then 6, 12, 24, and 48 hours post-injury

3.4.4. Clinical assessment and monitoring:

a. Vital signs every 1-2 hours x 12-24 hours, then (may be Q2H if admitted to the floor and stable)

b. Vital signs every 4 hours

c. Strict I&O

3.4.5. Treatments and procedures:

a. Incentive spirometry every 2 hours until fully ambulatory

b. Nasogastric tube and foley catheter as indicated

3.4.6. Intravenous fluids(IV): maintenance IV, then saline well once tolerating PO

3.4.7. Medications:

a. Mild pain: Tylenol 15 mg/kg PO/IV every 4 hours as needed

b. Moderate pain: Oxycodone 0.1mg/kg PO every 4 hours as needed (max dose 10 mg)

c. Severe pain: Morphine 0.1mg/kg IV every 2-4 hours as needed

d. Stool softener: Colace/Miralax

3.4.8. Nutrition/Diet:

a. NPO x 24 hours, then

b. Advance diet as tolerated.

3.4.9. Activity:

a. Bedrest x 48 hours, then

b. Up ad lib

3.4.10. Pre-discharge/Post-discharge imaging: None

3.4.11. Time of activity restrictions post-injury for "normal" age-appropriate activities: 6 weeks

3.4.12. Time of restricted activity post-injury for full-contact competitive sports: 16 weeks

- 3.4.13. Return to school: 1-2 weeks
- 3.4.14. Follow-up clinic visit: 1-2 weeks

4.0 REFERENCES

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- 4.2. 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.
- 4.3. Practice Management Guidelines for the Non-operative Management of Blunt Injury to the Liver and Spleen, 2003. Eastern Association for the Surgery of Trauma.
- 4.4. 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.
- 4.5. 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.
- 4.6. 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.
- 4.7. Notrica, David M. "Pediatric Blunt Solid Organ Injury: Beyond the APSA Guidelines." *Current Surgery Reports* 3.4 (2015): 1-6.

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
Review Date	9/01, 8/02, 6/06, 12/08, 11/10, 6/15, 12/15

Date: December 2015

ISOLATED LIVER / SPLEEN INJURY GUIDELINE

Date / Time of Injury: ___ / ___ / ___ : ___

	Grade I	Grade II	Grade III	Grade IV/V
Admit to:	Floor	Floor	Floor	ICU vs Floor if hemodynamically stable
Hospital LOS	1 day	2 days	3 days	4 days
Laboratory Tests	Hematocrit - Initial then 12 hrs post – injury	Hematocrit - Initial then 12 hrs and 24 hrs post-injury	Hematocrit - Initial then 12 hrs, 24 hrs, and 48 hrs post-injury	Hematocrit - Initial then 6 hrs, 12 hrs, 24 hrs, and 48 hrs post-injury
Clinical Assessment and Monitoring	VS q 2 hrs x 8 hrs, then q 4 hrs I+O	VS q 2 hrs x 8 hrs, then q 4 hrs I+O	VS q 2 hrs x 8 hrs, then q 4 hrs I+O	VS q 1-2 hr x 12-24 hrs (may be Q2H if admitted to the floor and stable), then q 4 hrs I+O
Treatments and Procedures	Incentive Spirometry prn	Incentive Spirometry prn	Incentive Spirometry q 2 hrs until ambulatory	Incentive Spirometry q 2 hrs until ambulatory Compression boots NG / Foley if indicated
IV	Maintenance IV, then saline well once PO	Maintenance IV, then saline well once PO	Maintenance IV, then saline well once PO	Maintenance IV, then saline well once PO
Medications	Pain medication: <u>Mild</u> - Tylenol 15 mg/kg PO/IV q 4 hrs prn	Pain medication: <u>Mild</u> - Tylenol 15 mg/kg PO/IV q 4 hrs prn <u>Moderate</u> - Oxycodone 0.1 mg/kg PO q 4 hrs prn (max dose 10 mg) <u>Severe</u> - Morphine 0.1 mg/kg IV q 2-4 prn	Pain medication: <u>Mild</u> - Tylenol 15 mg/kg PO/IV q 4 hrs prn <u>Moderate</u> - Oxycodone 0.1 mg/kg PO q 4 hrs prn (max dose 10 mg) <u>Severe</u> - Morphine 0.1 mg/kg IV q 2-4 prn	Pain medication: <u>Mild</u> - Tylenol 15 mg/kg PO/IV q 4 hrs prn <u>Moderate</u> - Oxycodone 0.1 mg/kg PO q 4 hrs prn (max dose 10 mg) <u>Severe</u> - Morphine 0.1 mg/kg IV q 2-4 prn

	Grade I	Grade II	Grade III	Grade IV/V
		Stool Softener – Colace/Miralax	Stool Softener – Colace/Miralax	Stool Softener- Colace/Miralax
Nutrition / Diet	NPO x6 hrs then ADAT	NPO x 12 hrs then ADAT	NPO x 24 hrs then ADAT	NPO x 24 hrs then ADAT
Activity	Bedrest x 6 hrs then up ad lib	Bedrest x 12 hrs then up ad lib	Bedrest x 24 hrs then up ad lib	Bedrest x 48 hrs then up ad lib
Pre-discharge and post-discharge imaging	None	None	None	None
Time of restricted activity post injury for "normal" age appropriate activities	3 weeks	4 weeks	5 weeks	6 weeks
Time of restricted activity post-injury for full-contact competitive sports	6 weeks	8 weeks	12 weeks	16 weeks
Return to school	1 week	1 week	1 -2 weeks	1-2 weeks
Follow-up clinic visit	1-2 weeks	1-2 weeks	1-2 weeks	1-2 weeks