BLUNT ABDOMINAL SOLID ORGAN INJURIES (SOI) MANAGEMENT - CHW

PRACTICE GUIDELINE ©

DOCUMENT SUMMARY/KEY POINTS

- This document describes the management of the following blunt abdominal solid organ injuries:
  - Liver
  - Spleen
  - Pancreas
  - Kidneys
- Abdominal injuries are divided into two types according to the mechanism of injury either blunt or penetrating.
- Most paediatric blunt abdominal solid organ is managed non-operatively usually with strict bed rest, +/- indwelling urinary catheter, adequate analgesia, and gentle chest physio.
- Urology consult for renal lacerations grade 3 and greater.
- Penetrating injuries are more likely to require operative intervention and are not covered in this guideline.
- Changes in vital signs need to be escalated as per the Between the Flags (BTF)-Clinical Emergency Response System (CERS) guideline

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy Procedure and Guideline Committee	
Date Effective:	1st August 2023	**Review Period:** 3 years
Team Leader:	Trauma Clinical Nurse Consultant	**Area/Dept:** Surgical/Trauma Service CHW

CHANGE SUMMARY

- Added in-patient chest physiotherapy referral flowchart.
- Added recommendations for when and when not to do a CT Abdomen.

READ ACKNOWLEDGEMENT

- Discretionary – local manager to determine which staff, if any, are to read and acknowledge the document or acknowledge the document only.

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1 Purpose and Scope

The purpose of this guideline is to assist the Medical Officers and Nurses in managing children with blunt abdominal solid organ Injuries (SOI).

The goal is to ensure that these injuries are managed in a consistent and appropriate manner.

This document describes the management of the following blunt abdominal SOI:

- Liver
- Spleen
- Pancreas
- Kidneys

2 Definition of Blunt Abdominal Solid Organ Injuries

Abdominal injuries are divided into two types according to the mechanism of injury either blunt or penetrating.

Blunt abdominal SOI results from a direct blow to the abdomen. These injuries can be difficult to detect initially if the patient has no signs of external trauma or alteration to their vital signs. The most common mechanisms of blunt abdominal SOI trauma are motor vehicle crashes, injuries from sports, falls, and violence/abuse.

Most paediatric blunt abdominal SOI are managed non-operatively usually with strict bed rest, +/- indwelling urinary catheter, adequate analgesia, and gentle chest physio.

Penetrating injuries are more likely to require operative intervention and are **not** covered in this guideline.

3 Diagnosis of Solid Organ Injuries (FAST,CT ABDOMEN & Pathology)

The diagnosis of SOI requires a thorough history, physical examination, pathology tests and +/- medical imaging.

Pathology Investigations

Full blood count, liver function test, lipase, amylase, group and hold, electrolyse, urea & creatinine coagulation.

This Guideline may be varied, withdrawn or replaced at any time.
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FAST & CT Abdomen

The Role of FAST (Focused Assessment using Sonography in Trauma) in paediatric trauma is controversial. Non-contrast FAST appears to miss a significant number of injuries; however, these injuries are usually minor and unlikely to require transfusion or surgical intervention. In unstable patients, a positive FAST identifies abdomen as the source of bleeding. The role of contrast-enhanced ultrasound is evolving.

The following six elements have been identified as predictive of a **positive** CT Abdomen in a study done at The Children's Hospital at Westmead[1]. If the patient has one or more of the following elements, CT abdomen **is** recommended:

- Abnormal abdominal examination- tenderness, distension, bruising and peritonitis
- Elevated ALT>125 IU/l
- Gross haematuria
- Abnormal pelvic radiograph
- Low haematocrit <30%
- Positive FAST

The following seven elements have been identified by the Pediatric Emergency Care Applied Research Network (PECARN) as very low risk for intra-abdominal injury, and therefore CT abdomen is **not** recommended[2]:

- GCS 14 or 15
- No abdominal pain
- No vomiting
- No abdominal tenderness
- No chest wall tenderness
- No abdominal bruising
- Normal breath sounds bilaterally.

4 Grading of Blunt Abdominal Solid Organ Injuries

Abdominal SOI are scaled according to the American Association for Surgery of Trauma (AAST). They range from minor contusions (grade1) to major devascularisation (grade V) of the organ with avulsion of the organ (grade VI) being generally non survivable.

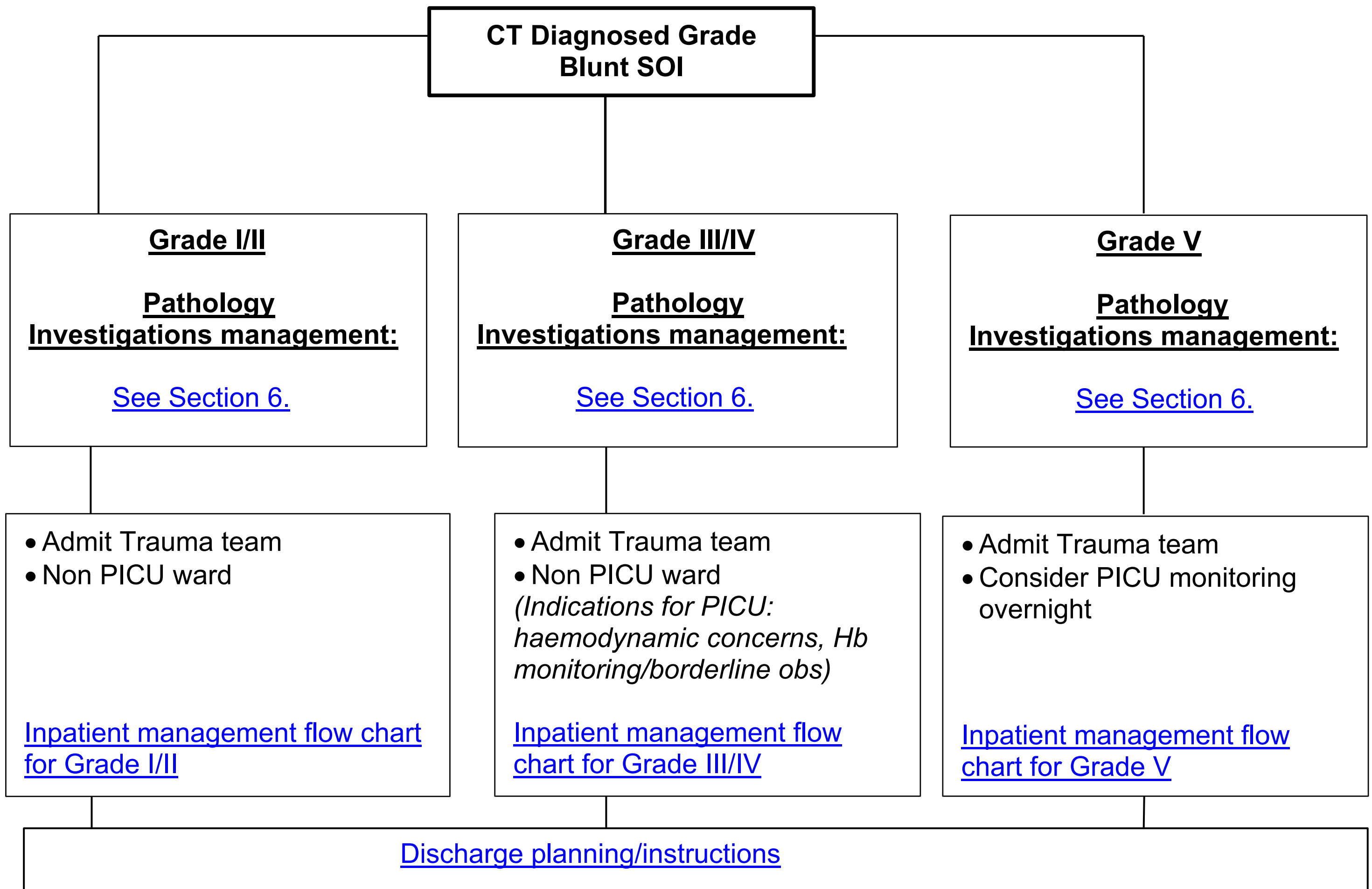
If there are multiple injuries to the same organ the scale advances one grade up to grade III.

More information on grading of SOI can be found on the AAST website:

https://www.aast.org/resources-detail/injury-scoring-scale

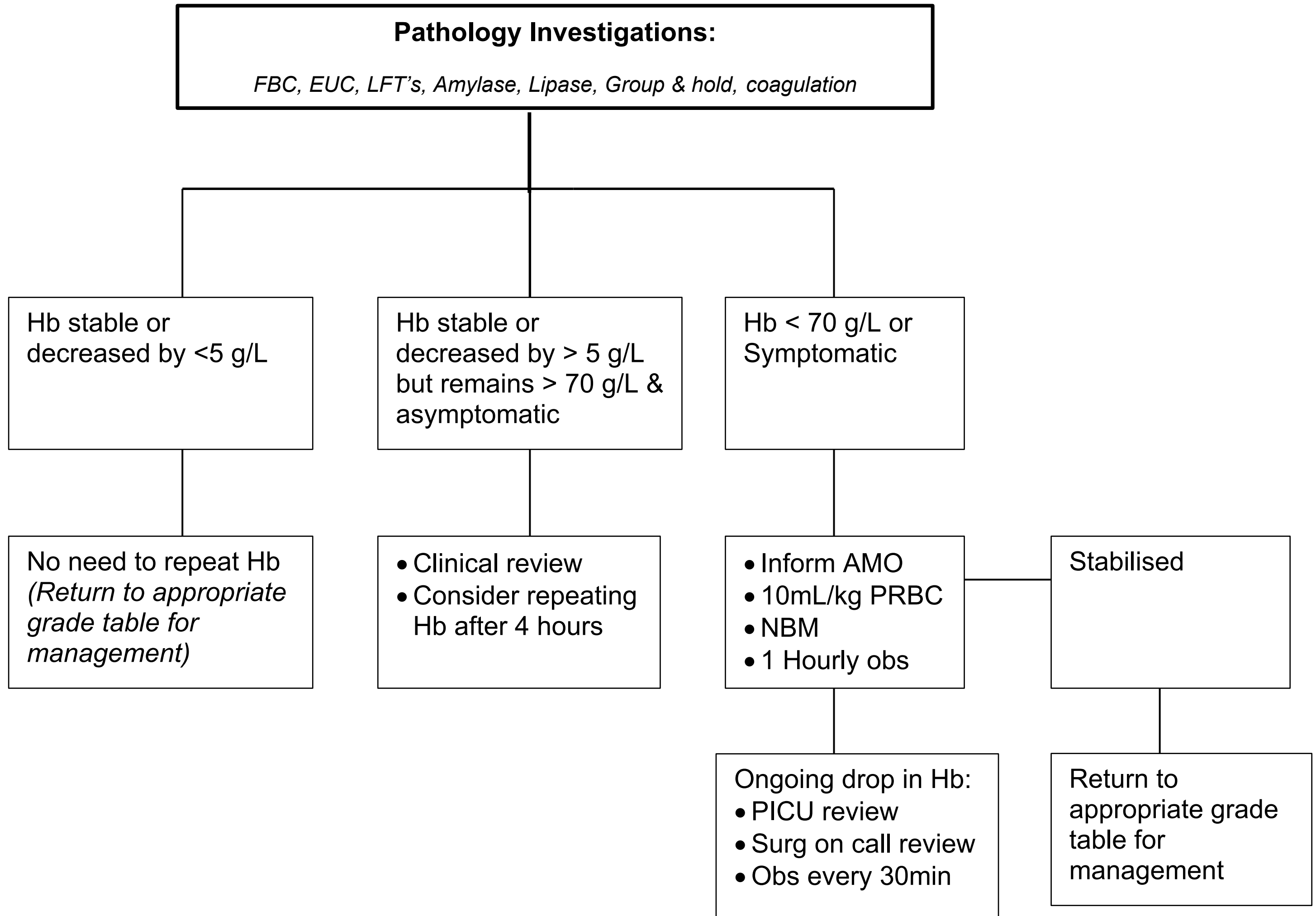
5 Management Flowchart

Patients who are **unstable** on arrival should undergo resuscitation with minimal crystalloids and early use of blood products. If they remain unstable consider angioembolisation or surgical intervention to control bleeding. If the patient fits the criteria for Code Crimson follow Code Crimson and Massive transfusion policies.



- Urology consult for renal laceration grade III/IV/V and/or suspicion of urethral injury
- Consider IDC for renal laceration grade III/IV/V if no urethral injury suspected

6 Pathology Investigations Management



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7 In-Patient Management Flowchart

Blunt Abdominal Solid Organ Injury Liver, Spleen and Kidney Grade I and II

ASPECT OF CARE	ED	Acute Care 12 hours	Day 1	Day 2	Day 3
Pain and Analgesia	Assess Pain 2-4 Hourly Simple analgesia +/- Oxycodone		Assess Pain 2-4 Hourly Simple analgesia		
Monitoring	Obs: 4th hourly*				
Activity	Toilet Privileges		Gentle ambulation	Ambulate	
Diet	Clear Fluids		Upgrade diet as tolerated	Diet as tolerated	
Elimination	Strict input and output				
Laboratory	Trauma bloods Urine analysis	As clinically Indicated			
Medications	Consider stool softener				
Allied Health	Chest physio +/- social work				
Education & Discharge Planning	Provide safety education and reassurance.		Home restrictions Safety Instructions When ready for D/C	Grade I D/C if Stable	Grade II D/C if Stable

*Escalate care as per the Between the Flags (BTF)- Clinical Emergency Response System (CERS) guideline

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Blunt Abdominal Solid Organ Injury Liver, Spleen and Kidney <u>Grade III and IV</u>

ASPECT OF CARE	ED	Acute Care 12 hours	Day 1	Day 2	Day 3	Day 4
Pain and Analgesia	Assess Pain 2-4 Hourly Simple analgesia +/- PCA/NCA – APS involvement		Assess Pain 2-4 Hourly Simple analgesia +/- Oxycodone			Simple analgesia
Monitoring	Obs 1 hourly*	Obs 2nd hourly for 8 hours*	Obs 4th hourly*			
Activity	Strict Bed Rest		Toilet Privileges	Gentle ambulation	Ambulate as tolerated	
Diet	Nil by mouth		Clear Fluids	Upgrade as tolerated		Diet as tolerated
Elimination	Strict Input and output					
Laboratory	Trauma bloods Urine analysis	Repeat in 2-4 hours if concerned	As clinically Indicated			
Medications	Consider stool softener. No NSAIDs					No NSAIDs
Allied Health	Chest physio +/- social work					
Education & Discharge Planning	Provide safety education and reassurance. Injury Prevention			Home restrictions Safety Instructions When ready for D/C		

*Escalate care as per the Between the Flags (BTF)- Clinical Emergency Response System (CERS) guideline

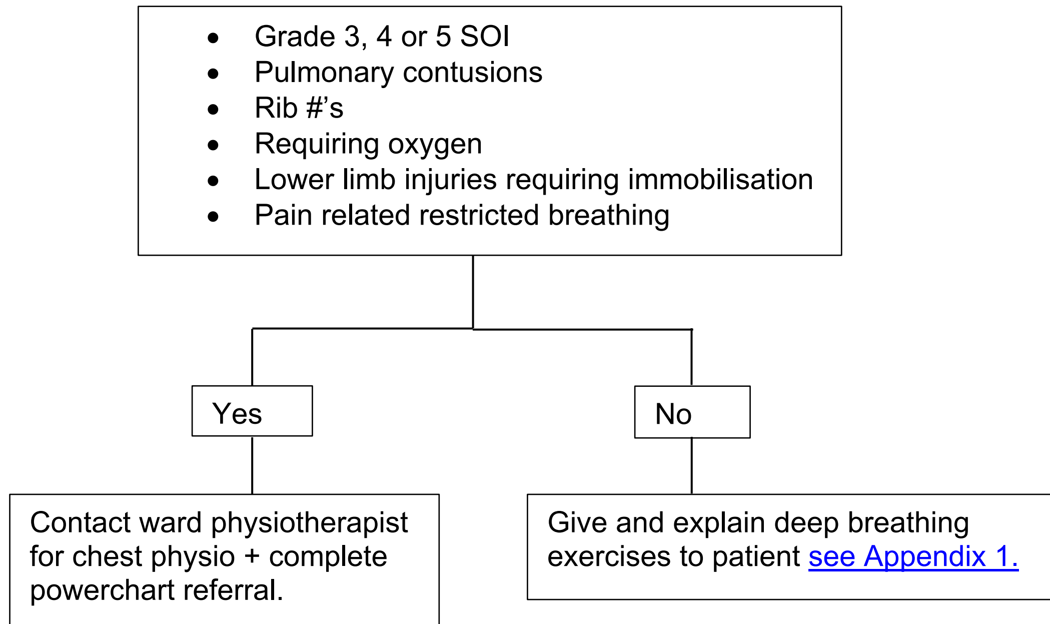
Blunt Abdominal Solid Organ Injury Liver, Spleen and Kidney Grade V

ASPECT OF CARE	ED	Acute Care 12 hours	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Pain and Analgesia	Assess Pain 2-4 Hourly PCA/NCA – APS involvement			Assess Pain 2-4 Hourly Simple analgesia +/- PCA/NCA APS involvement		Simple analgesia +/- Oxycodone		Simple analgesia
Monitoring	Obs 1Hourly*	Obs 2nd hourly for 8 hours*	Obs 4th hourly*					
Activity	Strict Bed Rest				Toilet privileges	Gentle Ambulation as indicated	Ambulate as tolerated	
Diet	Nil by mouth		Clear Fluids	Upgrade as tolerated		Diet as tolerated.		
Elimination	Strict Input and output							
Laboratory	Trauma bloods Urine analysis	Repeat in 2-4 hours if concerned	As clinically Indicated					
Medications	Consider stool softener No NSAIDs					No NSAIDs		
Allied Health	Chest physio +/- social work							
Education & Discharge Planning	Provide safety education and reassurance Injury Prevention				Home restrictions Safety Instructions When ready for D/C			

*Escalate care as per the Between the Flags (BTF)- Clinical Emergency Response System (CERS) guideline

8 In-patient chest physiotherapy referral flowchart

Does the patient with SOI have the following injuries?



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9 Discharge Instructions

Blunt Abdominal Solid organ injury discharge instructions

Discharge Instruction	Grade I	Grade II	Grade III/IV	Grade V
Return to School	1 week post injury			2 weeks post injury
No contact sports/ competitive sports or play/weight lifting *	5 weeks	6 weeks	3 months	
Follow up	• Trauma CNC phone call in 2 weeks • No follow up imaging required		• Trauma CNC phone call in 2 weeks • Follow up in OPD 4-6 weeks • follow up imaging may be required • Renal injury: regular BP checks with GP	
Other instructions	• Injury prevention education • Rest at home for 1 week with gentle mobilisation only • No wrestling/rough play/climbing/jumping on the bed. • Consider stool softener to avoid constipation			
Return to ED	Fever, Increasing pain, pallor, dizziness, vomiting, worsening shoulder pain, jaundice, blood in the urine, stool or vomit, or further injury to the abdomen			
**Contact sport includes any sport or physical activity (including trampolining) that could lead to a hit to the abdomen. Light swimming only in a private pool is allowed but no diving,or playing with friends/siblings in the pool.*				

10 References

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11 Appendix 1