

**EARLY NOTIFICATION and MANAGEMENT OF BLUNT CHEST INJURY
(CHIP – Chest Injury Pathway)**

Cross References (including NSW Health/ SESLHD policy directives)	Management of the Elderly Trauma Patient Service Level Agreement Aged Care & Trauma Trauma Triage Activation Criteria SGSHHS CLIN Trauma High Flow Oxygenation SGSHHS CLIN 187
1. What it is	Evidence based early notification mechanism and patient centred bundle of care by a multidisciplinary team to expedite evidence informed effective care for patients with isolated blunt chest wall injury
2. Risk Rating	Medium Patients with at least three rib fractures have a significantly increased risk of in-hospital mortality ^{1,2} , an effect even more pronounced in older patients ³ in whom each additional rib fracture increases the risk of mortality by 19% and of pneumonia by 27% ⁴ . Even an isolated rib fracture is associated with significant consequences, particularly in the elderly ^{5,6} . This rule is applicable to patients with or without radiologically confirmed rib fractures as 50% of rib fractures cannot be detected by plain antero-posterior chest x-rays ⁷ . Further, it highlights the importance of incorporating evidence around risk factors for complications into clinical pathways, for example underlying respiratory disease, age and cardiopulmonary disease ^{5,8,9} . Research conducted at St George Hospital in 2014 demonstrated that this protocol reduced the odds of a blunt chest injured patient at St George hospital developing pneumonia by 56% ¹¹ .
3. Employees it Applies to	Emergency Department (ED) medical and nursing staff Trauma registrars (in hours) and Surgical registrar (out of hours) Physiotherapy Trauma Service Switch board Pain service / anaesthetics

4. Process

This Clinical Business Rule (CIBR) seeks to describe the criteria for activation of the ChIP Team. Members of this team will receive a message via their page to review patients with blunt chest wall injury who meet criteria. This CIBR also describes the recommended treatments to tailor for each patient dependent on their needs.

1. All patients with isolated blunt chest injury (radiological or clinical diagnosis) are to be considered for this pathway
2. The role of the ED Doctor and/or nurse is to assess the patient for likelihood of injury, attend to their immediate analgesia (+/- opiates), respiratory support needs and likelihood of admission before the ChIP page is activated (see Appendix 1)
3. To activate the ChIP page call 777, state ChIP call, and relay the patient MRN
4. The ChIP page will alert the Trauma, Anaesthetic Registrar (out of hours) or pain team registrar, trauma nurse, ICU Liaison Nurse and Physiotherapist to enable early contact

- and optimal management. This should be responded to within 60 minutes of the page activation.
5. The physiotherapist should liaise with the trauma nurse prior to patient review to ensure analgesia has been administered to facilitate physiotherapy intervention
 6. The trauma or surgical registrar should arrange consultations with specialist teams such as Aged Care, Respiratory and ICU teams as needed and per the aged care service level agreement
 7. All patients 55 years and older with proven or suspected rib fractures, or a painful chest injury with underlying respiratory disease and/or requiring opiate analgesia should be admitted under the Trauma Service. A ChIP page should be activated to facilitate management.
 8. All patients under 55 years with 3 or more rib fractures or a painful chest injury with evidence of deterioration (tachypnoea, decreased SaO₂, respiratory fatigue) should also be admitted under the Trauma Service. A ChIP page should be activated to facilitate management.
 9. A bundle of care including the following interventions should be charted and initiated and adapted for each patient according to their analgesic and respiratory support needs.
 - Patient education on deep breathing and coughing and the following treatments
 - Chest support pillow / splint (eg folded rolled towel)
 - Chest physiotherapy
 - Incentive spirometry (triflow)
 - Supplemental Oxygen, humidified via highflow nasal prongs – should commence at 35lt/min and titrated to an SpO₂ goal in patients with pain not well controlled by oral analgesia and/or lung disease. A haemo/pneumothorax does not exclude the use of HFNP. Management of the haemo/pneumothorax should be discussed with the trauma consultant / fellow
 - Analgesic regimen: PO Paracetamol and PO Oxycodone hydrochloride with Naloxone hydrochloride (Targin) or Oxycontin regularly if no contraindications/allergies & appropriate dose. PRN Oxycodone hydrochloride (Endone). NSAIDs should be considered in patients without contraindications
 - If inadequate analgesia despite above, escalate early to pain service for PCA, intercostal blocks or epidural
 - Regional anaesthesia techniques, such as an Epidural or Paravertebral block, should be considered on a case by case basis. In particular those patients with: 3 or more rib fractures and/or age greater than 55 years. Additional consideration and factors that may infer patient benefit to those with (or without) the above factors include flail segment/s, underlying lung disease, history of smoking¹⁰
 - Aperients and anti-emetics
 - Early mobilisation as clinically appropriate
 10. Patient should be admitted to a ward with HFNP capability (3South, 2 East). Notify ICU2 if the patient requires an FiO₂ of .50 or greater.
 11. Weaning of analgesia and HFNP should be conducted on individual patient needs. The patient should be discharged when their pain is well controlled with oral analgesia, their respiratory function has been optimised and any other factors (i.e. mobility and any medical issues that may have precipitated a fall) are resolved
 12. ChIP patients should be followed up by their GP within 3 days and their analgesia. Discharge letter should include instruction on this for the GP

- 13. Patients should attend the trauma clinic (appointments 9113 2595) within 1-2 weeks.
- 14. Patients and their family should be educated on the important of continuing with regular analgesia as prescribed, signs of deterioration and advice to represent if necessary.

5. Keywords	Chest injury, analgesia, rib
6. Functional Group	All clinicians who care for patients with blunt chest wall injury
7. External References	<ol style="list-style-type: none"> 1. Testerman GM. Adverse outcomes in younger rib fracture patients. <i>South Med J.</i> 2006;99(4):335-339. 2. Holcomb JB, McMullin NR, Kozar RA, Lygas MH, Moore FA. Morbidity from rib fractures increases after age 45. <i>Journal of the American College of Surgeons.</i> 2003;196(4):549-555. 3. Kent R, Woods W, Bostrom O. Fatality risk and the presence of rib fractures. Paper presented at: Annals of Advances in Automotive Medicine - 52nd Annual Scientific Conference 2008. 4. Bulger EM, Arneson MA, Mock CN, Jurkovich GJ. Rib fractures in the elderly. <i>Journal of Trauma - Injury, Infection and Critical Care.</i> 2000;48(6):1040-1046. 5. Barnea Y, Kashtan H, Skornick Y, Werbin N. Isolated rib fractures in elderly patients: Mortality and morbidity. <i>Canadian Journal of Surgery.</i> 2002;45(1):43-46. 6. Elmistekawy E, Hammad AA. Isolated rib fractures in geriatric patients. <i>Annals of Thoracic Medicine.</i> 2007;2(4):166-168. 7. Bansidhar BJ, Lagares-Garcia JA, Miller SL. Clinical rib fractures: are follow-up chest X-rays a waste of resources? <i>The American surgeon.</i> May 2002;68(5):449-453. 8. Lee RB, Bass SM, Morris JA, Jr., MacKenzie EJ. Three or more rib fractures as an indicator for transfer to a Level I trauma center: a population-based study. <i>Journal of Trauma-Injury Infection & Critical Care.</i> 1990;30(6):689-694. 9. Battle CE, Hutchings H, Evans PA. Risk factors that predict mortality in patients with blunt chest wall trauma: a systematic review and meta-analysis. <i>Injury.</i> 2012;43(1):8-17. 10. Unsworth A, Curtis K, Asha S. Treatments for blunt chest trauma and their impact on patient outcomes and health service delivery. <i>Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine.</i> 2015;23(1):17. 11. Curtis K, Asha S, et al. ChIP: An early activation protocol for isolated blunt chest injury improves outcomes. <i>Australasian Journal of Emergency Nursing.</i> 2016
8. Consumer Advisory Group (CAG) approval of patient information brochure (or related material)	N/A

<p>9. Implementation and Evaluation Plan Including education, training, clinical notes audit, knowledge evaluation audit etc</p>	<p>Published on the SGSHHS Clinical Business Rules page. A variety of education modes will be used to implement this revised protocol. For example, key stakeholders of each impacted department have been engaged. Regular inservice, presentation at orientation sessions and trauma education The activation and appropriate use of the protocol is monitored by the existing trauma service nurses quality improvement program. Regular reports are conducted, feedback is provided where appropriate</p>
<p>10. Knowledge Evaluation</p>	<p>Q1:What are the risk factors for poor outcomes in patients with blunt chest injury? A: Age > 55yrs, Respiratory history, Respiratory compromise (eg: ↑WOB; ↑RR; ↓SpO2) ≥3 rib #s) Q2:To what ward should patients requiring high flow nasal prongs? A: A ward with capability such as 3S, 2E, ICU2 Q3: What is the simplest way to assess if the patient with blunt chest injury has adequate analgesia? A: Assess for pain and ability to deep breath/cough</p>
<p>11. Who is Responsible</p>	<p>All clinicians who care for patients with blunt chest wall injury</p>

Approval for EARLY NOTIFICATION and MANAGEMENT OF BLUNT CHEST INJURY (CHIP – Chest Injury Pathway) * N/A where appropriate	
*Specialty/Department Committee	Committee title: Trauma Chairperson name/position: Christine Bowles Date: 07.06.16
*Nurse Manager	Name/position: Andrew Bridgeman, Nurse Manager Surgery Date: 07.06.16
*Service Line Manager	Name/position: Vicki Weeden, Service Line Manager, Trauma Date: 15.06.16
*Medical Head of Department	Name /position Dr Richard Morris, Acting Head Trauma Date: 07.06.16
*Drug and Therapeutics Committee (SGH)	Chairperson's Name: N/A Signature _____ Date _____
*Drug and Therapeutics Committee (TSH)	Chairperson's Name: N/A Signature _____ Date _____
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Revision and Approval History

Date	Revision number	Author (Position)	Revision due
Jun 16	0	Kate Curtis, Trauma CNC	Jun 19

General Manager's Ratification

Name Leisa Rathborne Date: 16.06.16

Appendix 1

ISOLATED BLUNT CHEST INJURY FLOWCHART

