Inpatient Rib Fracture Management Guideline

Guideline information

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Clinical

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Summary of document:
The aim of this guideline is to ensure the appropriate initial management of rib fractures, the prevention of avoidable harm and direct onward referral to appropriate inpatient teams.

Scope:
This guideline applies to adult patients presenting to unscheduled care with rib fractures. It should be followed by medical, nursing and other healthcare professionals involved in the management of patients with rib fractures.

To be read in conjunction with:
502 - Acute Pain Management - Patients Taking Strong Opioids Guideline (opens in new tab)
337 - Epidural Analgesia Guideline (opens in new tab)
290 - Adult Intravenous Patient Controlled Analgesia PCA Policy (opens in new tab)

971 - Administration of IV Opioids Adults 16years And Over Registered Practitioners (opens in new tab)
795 - Management of Acute Pain in the Acute Hospital Setting Guideline (opens in new tab)
1102 - Adult Continuous Regional Nerve Blocks for Acute Pain Management (opens in new tab)
CG06 Analgesia for rib fractures (SWTN)
CG05 Chest Drain Insertion (SWTN)
900 - RTF and Prehospital Procedure (Major Trauma)

Patient information:
Include links to Patient Information Library

Owning group:
Medicines Management Operational Group (MMOG)
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Executive Director job title:
Sharon Daniel – Director of Nursing, Quality and Patient Experience

Reviews and updates:
1.0 – New Guideline
2.0 – Update from trauma network and local transfers to TU, reviewed analgesic ladder

Keywords
Rib Fracture, Pain Management

Glossary of terms
WHO – World Health Organisation
NSAID – Non Steroidal Anti-Inflammatory Drug
PCA – Patient Controlled Analgesia
ESP – Erector Spinae Plane
MTC – Major Trauma Centre
TUss – Trauma Unit with Special Services (e.g. Thoracic Surgery)
TU – Trauma Unit RTF – Rural Trauma Facility
ICU – Intensive Care Unit
CCOT – Critical Care Outreach Team

Key points:
- Risk assess the probability of serious complications post blunt chest wall trauma using STUMBL and dynamic pain scores
- Appropriate onward referral to inpatient teams
- Guideline incorporates guidance on appropriate and timely pain management

Contents

Scope

This guideline applies to adult patients presenting to unscheduled care with rib fractures. This guidance relates only to patients with isolated thoracic injury and is to be used in conjunction with South Wales Trauma Network guidelines GC05 & CG06. All polytrauma patients should be considered for transfer to the University Hospital of Wales (MTC).

Aim

The aim of this document is to:

- Ensure the appropriate management of rib fractures and the prevention of avoidable harm.
- Direct onward referral to appropriate inpatient teams if admitted to hospital.

Objectives

The aim of this document will be achieved by the following objectives:

- Risk assessing the probability of serious complications post blunt chest wall trauma using STUMBL and dynamic pain scores
- Directing appropriate onward referral to inpatient teams
- Provide guidance on appropriate and timely pain management

Guideline

Blunt chest wall trauma accounts for over 15% of trauma admissions to Emergency Departments worldwide (Battle et al 2014). Management of this patient group is challenging due to the delayed onset of severe respiratory complications. A validated risk scoring tool (Battle et al 2014) was adapted and introduced at the point of triage. The score quantifies the probability of serious complications after blunt chest wall trauma and signposts to an early and appropriate analgesic intervention which can be instrumental in improving patient outcomes. Likewise, in a subset of patients, early rib fixation may improve outcomes.

Refer to Appendix 1 STUMBL Adult Blunt Chest Trauma Risk Tool to determine the probability of serious complications post blunt chest wall trauma and guidance on pain management.

IN SUMMARY: When a patient presents with a blunt chest trauma the following should be undertaken:

1. Risk assess the probability of serious complications post blunt chest wall trauma using STUMBL tool, pain assess & prescribe appropriate analgesia.
2. Record the calculated Total Risk Score in the patient's Clinical (Medical) Record.
3. Refer patients requiring admission to the admitting team. In most cases this will be the General Surgeons.
4. Refer appropriately to acute pain service and/or anaesthetic/ITU teams to support – see referral checklist, STUMBL and pain management recommendations in Appendix 1.
5. Rib fixation forms an important part of analgesic control of rib fractures in selected patient groups, this will require discussion with the University Hospital Wales (MTC) or Morriston Hospital (TUss) as appropriate. Refer to South Wales Trauma Network guidelines GC05 & CG06, criteria include:

    - Any patient ventilated (invasive or non-invasive) with a flail segment
    - **OR**
    - >3 rib fractures
    - Multiple co-morbidities

- Difficulty weaning from ventilator
- Failure of regional and systemic analgesia

For those meeting these criteria with isolated chest injury, discussion with Morriston Thoracic surgeons is appropriate. Remember – request 3D reconstruction of CT scans to facilitate referral and decision making.

Guidance Specific to Local Trauma Unit (GGH) Transfers

Patients with significant chest wall injuries not requiring input from thoracics at Morriston Hospital (TUss) or University Hospital of Wales (MTC), should have their in-patient management provided in a Trauma Unit (i.e. GGH).

This provides the advantages of reliable access to the major trauma service team, reliable access to regional anaesthesia techniques and greater facility for ongoing management and/or transfer in the event of deterioration.

Criteria for Patient Transfers to Glangwilli General Hospital (TU) from Withybush or Bronglais General Hospitals (RTFs):

- **ANY** patient with a STUMBL score of >25

- **ANY** patient with isolated thoracic trauma and intercostal drain in situ **not** for admission to University Hospital of Wales or Morriston Hospital

OR patients with persistent pain despite balanced analgesia, to include;

- Adequate intravenous strong opioid analgesia via PCA
- Regular paracetamol
- Regular NSAID (if not contraindicated)
  AND
- No facility locally to provide quality regional anaesthesia (inclusive of thoracic epidural if appropriate/other regional techniques not available)

General surgery is the admitting specialty for thoracic injury. The process of referral into the Trauma Unit for patients with significant chest wall injury should be undertaken via the ED duty/oncall consultant in GGH. They will notify the general surgical team of any patient being transferred and notify Intensive care if critical care is likely to be required.

The Emergency Medicine consultant is the most appropriately qualified member of on-call staff to give advice and consider a patient for transfer, particularly those with severe or multiple injuries. They are most likely to have a working knowledge of the Trauma Network and Health board trauma guidelines.

References

1. Battle CE Predicting outcomes after blunt chest wall trauma: Development and external validation of a new prognostic model. Critical Care 18(3), *2014*. Article Number:R98
2. All Wales Medicines Strategy Group (2022) All Wales Pharmacological Management of Pain Guidance. Novembers 2022.
3. British National Formulary (2022) Accessed October 13th 2022
4. Douglas C, Murtagh FE, Chambers EJ et al. Symptom Management for the adult patient dying with advanced chronic kidney disease: A review of the literature and development of evidence-based guidelines by a United Kingdom Expert Consensus Group. Palliative Med 2009;23;103-110
5. NHS UK Medicines Information (2014). Medicines Q & A's: Which opioids can be used in renal impairment? www.evidence.nhs.uk
6. Faculty Pain Medicine (2021). Surgery and Opioids: Best practice Guidelines
7. NG38: Fractures (non-complex): assessment and management
8. NG37: Fractures (complex): assessment and management [2016]
9. NG39: Major trauma: assessment and initial management

Acknowledgements

This guideline is based on:

- Cardiff & Vale UHB – Pain Management Team Rib Fractures A scoring tool to determine the probability of serious complications post- blunt chest wall trauma. Accessed (14th June 2018) at: http://nww.cardiffandvale.wales.nhs.uk/pls/portal/docs/PAGE/CARDIFF_AND_VALE_INTRANET/TRUST_SERVICES_INDEX/ACUTE_PAIN_MANAGEMENT_SERVICES/CLINICAL_GUIDANCE/RIB%20FRACTURE%20TOOL.PDF (opens in new tab).

- Swansea University Health Board STUMBL Chest injury scoring tool. Taken from SWTN Guidelines CG06 Analgesia for rib fractures. howis.wales.nhs.uk/sitesplus/862/document/518993 (opens in new tab).

- Cwm Taf Morgannwg UHB (2022). Rib fracture referral and pain management tool.

Appendix 1: Inpatient Rib Fracture Referral CHECKLIST

Box 1: How to use	**How to use this document:** • Consider risk factors and score using STUMBL • Assess the patients pain using appropriate pain tool	• Prescribe analgesia appropriate to pain and STUMBL scores • Arrange appropriate referrals (see below)
Referrals: Patients may be referred to support teams with lower STUMBL scores where clinical judgement indicates e.g. frailty, problematic pain		
All sites below	**Major Trauma Service:** GGH: 01267 229 779 Ext. 8479 Major Trauma Practitioners GGH **Bleep:** 464 / 465 Majortrauma.hdd@wales.nhs.uk	**All patients presenting with chest wall injury**
Referral checklist Glangwili General Hospital	**Acute Pain Service:** Bleep 188	**Encouraged if admitted and STUMBL score >11**
	Anaesthetics Team: Bleep 041	**Mandatory if score STUMBL score >16**
	ITU Team: Bleep 011 or 013	**Mandatory if STUMBL score >26**
	Critical Care Outreach Team: **Bleep** 360 **Ext** 1738	**Mandatory if score STUMBL score >16**
	Physiotherapy **Bleep** 119	**Encouraged if admitted and STUMBL score >11**
Referral checklist Withybush General Hospital	**Acute Pain Service:** Bleep 2169	**Encouraged if admitted and/or STUMBL score >11**
	Anaesthetics Team: Bleep 2387	**Mandatory if score STUMBL score >16**
	ITU Team: Bleep 2388	**Mandatory if STUMBL score >26**
	Critical Care Outreach Team: **Bleep** 2315 **Ext** 3362	**Mandatory if score STUMBL score >16**
	Physiotherapy **Bleep** 2029	**Encouraged if admitted and STUMBL score >11**
Referral checklist Bronglais General Hospital	**Anaesthetics Team:** Bleep 3149 or 3155	**Mandatory if score STUMBL score >16**
	Physiotherapy **Bleep** 3185	**Encouraged if admitted and STUMBL score >11**

STUMBL: Adult blunt chest wall trauma risk tool and analgesic recommendations

Age	Suspected Rib Fractures	Chronic Lung Disease	Anticoagulated Pre-injury	O2 Sats on Room Air	Total Score
Score 1 point for every complete decade (e.g. 67= 6 points)	**Score 3 points for every suspected rib fracture. Score 6 for each segmental rib # in the flail segment**	**5 points for COPD or productive chest disease (non-smoker)**	**If yes score 4**	**<94% = 2 <89% = 4 <85% = 6 (on room air)**	**Add each separate score to give a total risk score**

Risk Score	**<10**	**11-15**	**16-20**	**21-25**	**26-30**	**>31**
Patient destination	Consider discharge home with analgesia and advice sheet	D/W senior doctor in ED re admission	Consider admission to ward	Recommend admission to ward	Consider admission to Critical Care	Recommend admission to Critical Care
Oxygen delivery		**If admitted:** -Titrate to SATS	-Titrate to SATS -Nebulisers	-Humidified oxygen titrate to SATS -Nebulisers	-Nasal high flow O2 - Nebulisers	-Advanced ventilation support -Nebulisers
Team involvement		**-Admitting Team -Acute Pain Team if admitted -Physiotherapy** **If discharged:** Give analgesia and advice sheet	**- Admitting Team - Acute Pain Team - Anaesthetics - CCOT if available - Physiotherapy** **- Consider if Trauma Unit referral needed**	**- Admitting Team - Acute Pain Team - Anaesthetics - CCOT if available - Physiotherapy** **- Consider if Trauma Unit referral needed**	**-Admitting Team -Acute Pain Team - ITU - CCOT if available -Physiotherapy**	**-Admitting Team -Acute Pain Team -ITU -Physiotherapy** **-Consider surgical rib fixation, see SWTN guidelines and contact Cardiac Thoracic Team**

INPATIENT ANALGESIC CONSIDERATIONS

Select level of pain management according to the pain score and STUMBL score.

Dynamic pain score refers to pain assessment on deep breathing, coughing and mobilization using categorical pain scale:

None, Mild, Moderate, Severe

Risk Score 11-15 / pain score is moderate to cough/ movement

- Regular paracetamol **(dose reduce if <50kg/risk factors)**
- Regular weak opioid if tolerated e.g. Codeine, avoid in elderly
- +/- regular NSAIDs (if not contraindicated)
- PRN oral morphine liquid 10mg/5ml, dose reduce in elderly and renal impairment

Pain Controlled

If pain is controlled, dynamic pain score to cough/ movement is mild

- Continue prescribed analgesic regime
- Check prescribing considerations below
- **If pain not controlled escalate and follow step below**
- **Refer to Acute Pain Team if patient admitted**

Risk Score 16-25/pain score is moderate - severe to cough/ movement

- Regular paracetamol **(dose reduce if <50kg/risk factors)**
- +/- regular NSAIDs (if not contraindicated)
- QDS plus PRN oral morphine liquid 10mg/5ml, reduce frequency and dose in elderly. STOP regular weak opioid if prescribed
- If allergic/intolerant to morphine, CKD stage 5/egfr <30ml/min use oxycodone IR liquid[2,3] **OR** PCA if higher STUMBL and pain scores
- Assess for regional technique, **early referral to on-call Anaesthetist and CCOT**

Pain Controlled

If pain is controlled, dynamic pain score to cough/ movement is mild

- Continue prescribed analgesic regime
- Check prescribing considerations below
- Lidocaine Plasters (700mg) only on recommendation from Acute Pain Team, Anaesthetics, ITU and Outreach OR where frailty and opioid addition problematic.
- **If pain not controlled call Acute Pain Team or on-call Anaesthetist**
- **Consider ITU referral if signs of respiratory distress**
- **Escalate to interventional analgesia if not already provided, and follow step below**

Risk Score>26 pain score is severe to cough/ movement

- **Refer to Acute Pain Team if not referred**
- **Referral to ITU**
- Regular paracetamol **(dose reduce if <50kg/risk factors)**
- +/- regular NSAIDs (if not contraindicated)
- **Regional technique +/- PCA, designated wards only. Referral to on-call Anaesthetist and CCOT**

Pain Controlled

If pain is controlled, dynamic pain score to cough/movement is mild

- Continue prescribed analgesic regime
- Check prescribing considerations below
- Daily review by Acute Pain Team
- **If not controlled contact Acute Pain Team or on-call Anaesthetist**

Prescribing Advice

- **Lidocaine Plasters (700mg) only on recommendation from Acute Pain Team, Anaesthetics, ITU and Outreach OR where frailty and opioid addition problematic. Duration for provision to be determined before discharge and documented on take home record, up to 21 days may be supplied if good response. GP practices are not permitted to issue further supplies.**
- Reduce paracetamol dose if < 50 kg and presence of risk factors including hepatic impairment and malnutrition
- If side effects with morphine or egfr ≤ 30[5,6], consider using oxycodone 2nd line (see BNF for opioid conversion), ensure PRN naloxone prescribed with opioids
- Use reduced dose of opioids in elderly patients
- Regular laxatives with opioids
- Reduce dose and frequency of opioids in renal impairment and avoid modified release preparations. Seek advice from Acute Pain Team or Pharmacist
- Review analgesia prior to discharge and ensure down titration plan for opioids communicated with GP and patient [6]