

Rib Fracture Pathway

Category:	Guideline
	- This guideline provides a framework for the assessment and management of all adult patients with blunt chest wall injury - Provides guidance regarding which patients can be discharged and which patients need admission for the input of specialist teams - Created to improve patient flow in both the emergency department and in specialist services
Equality Analysis undertaken:	n/a
Valid From:	May 2025
Date of Next Review:	May 2026
Approval Date/ Via:	May 2025 (MTC Clinical Governance)
Distribution:	OUH intranet via MTC Sharepoint
Scope	This guideline is relevant to all staff involved in the care of adult patients with rib fractures, but is of particular relevance to those working in the Emergency Department, Major Trauma, Anaesthesia and Acute Inpatient Pain, Cardiothoracic Wards, Complex Medical Unit, Acute General Medicine and the Horton General Hospital
Related Documents:	Pain guidelines – flowchart for analgesia in blunt chest trauma (through the Eolas app) Eolas Medical OUH Professional Standards in Emergency Department Document  OUH Standards for Urgent and Emergency Care (UEC) At a Glance document
Author(s):	Dr Shvaita Ralhan (Consultant Physician - Perioperative Medicine & Geratology) Dr Joanna White (Consultant Anaesthetist - MTC Oxford Adult Clinical Lead)
This Document replaces:	Revised Document

Table of Contents

Document History	3
Endorsement.....	5
Introduction.....	6
Background.....	6
Initial Clinical Assessment & Imaging.....	6
Analgesia.....	7
Initial Patient Pathway	8
Horton General Hospital Patients	10
Post CTW/CTCC patient pathway John Radcliffe Hospital:	11
References	12

Document History

Date of revision	Version number	Author	Reason for review or update
April 2019	1.1	Dr S Ralhan	New document
Jan 2020	1.2	Dr S Ralhan	Updated document (not published on intranet due to Covid-19)
October 2020	1.3	Dr S Ralhan	Updated document
July 2021	1.4	Dr S Ralhan	Updated document
Sept 2024	1.5	Dr S Ralhan Dr J White	Updated document

Consultation Schedule

Who? Individuals or Committees	Rationale and/or Method of Involvement
Blunt Chest Wall Trauma – working group Lois Brand (ED Consultant) Alex Novak (ED Consultant) Jowan Penn-Barwell (Trauma Consultant and Trauma Clinical Lead) Matthew Giles (Acute General Medicine Governance Lead) Shvaita Ralhan (Consultant Perioperative Medicine - Major Trauma Centre Geriatrics Lead) Dionisios Stavroulias (Thoracic Surgery Consultant & Clinical Lead) Edward Sellon (Radiology Consultant) Jane Quinlan (Consultant Anaesthetist and Pain Team Lead) Joanne Wooley (Consultant Anaesthetist – Pain Team)	Regular group meetings to develop this guideline
Major Trauma Centre Governance Meeting	Presentation of pathway and feedback from attendees
AGM Clinical Governance Meeting	Presentation of pathway and feedback from attendees
CMU Clinical Governance Meeting	Presentation of pathway and feedback from attendees Pathway and feedback from all CMU consultants through email

Cardiothoracic Clinical Governance Meeting	Presentation of pathway and feedback from attendees
Emergency Department Clinical Governance Meeting	Presentation of pathway and feedback from attendees

Endorsement

Use this table to list relevant Divisional and/Directorate leads who have endorsed the policy/procedural document.

Endorsee Name:	Endorsee Job Title
Dr Larry Fitton	MRC Divisional Director
Mr Dionisios Stavroulias	Clinical Lead Thoracic Surgery
Dr Sudhir Singh	AMR Clinical Director
Dr Joanna White	Major Trauma Centre Clinical Director

Introduction

This guideline aims to present a robust pathway for all adult patients presenting to the emergency department with blunt chest wall injury, either in isolation or in combination with additional injury.

This document provides guidance as to which patients can be discharged and which patients need admission for the input of specialist teams (e.g. trauma, medicine or thoracic surgery). This pathway has been created to improve patient flow in both the emergency department and in specialist services.

Background

Rib fractures are common injuries that usually do not require surgical intervention, but can lead to significant morbidity, especially in the elderly or those with multiple comorbidities, when associated with underlying injuries (pneumothorax, haemothorax, pulmonary contusions, and pneumonia).

Battle et al created a prognostic model to aid in the risk assessment of patients with rib fractures; the score corresponds with the probability of developing respiratory complications. The Battle score should be calculated for rib fracture patients on admission to the emergency department. It is not an absolute categorisation method as certain variants, such as age, can affect the score wildly; therefore it can be used in conjunction with assessment of the patients' clinical condition.

Initial Clinical Assessment & Imaging

CXR is often inadequate to demonstrate the extent and severity of chest wall injury. This is particularly relevant in the elderly patient in whom a relatively minor chest wall injury can be associated with significant morbidity and mortality. Early identification of injuries in frail and elderly patients to allow close monitoring and early treatment escalation is beneficial.

CT should be considered the primary imaging investigation in patients aged 60 years and over with a history of blunt chest trauma, *with* senior clinician suspicion of a rib fracture, *plus* any of the following:

- Raised RR (>24)
- Low O2 sats (<95% on air)
- Cardio-respiratory co-morbidity
- Anticoagulated
- Mechanism of injury involving fall onto an object
- Difficult to assess – cognitive impairment, distracting injury, intoxication etc.

The patient must be examined by a consultant prior to the CT request being made. Adequate clinical details must be on the CT request.

Calculating Battle Score:

Age	1 point for each 10 years of age
Number of rib fractures	3 points per fracture
Chronic lung disease	5 points if underlying lung disease
Anticoagulant use	4 points for anticoagulant use prior to injury
Oxygen saturations	2 points for each 5% in desaturation starting at 94%

Score probability of complications:

Total risk score	Probability mean $\pm$ standard deviation
0 – 10	13% $\pm$ 6
11 – 15	29% $\pm$ 8
16 – 20	52% $\pm$ 8
21 – 25	70% $\pm$ 6
26 – 30	80% $\pm$ 6
31+	88% $\pm$ 7

Analgesia

Early adequate analgesia is imperative to the management of blunt chest wall trauma. These are the Trust pain guidelines for blunt chest wall trauma:

Link: [Eolas Medical](#) (Pain guidelines)

They are also available through the Microguide app and this includes an automatic Battle score calculator.

If the battle score is above 11 then please refer to the pain team 0800 - 1600 (bleep 1362), out of hours please contact the on-call anaesthetist on bleep 4321

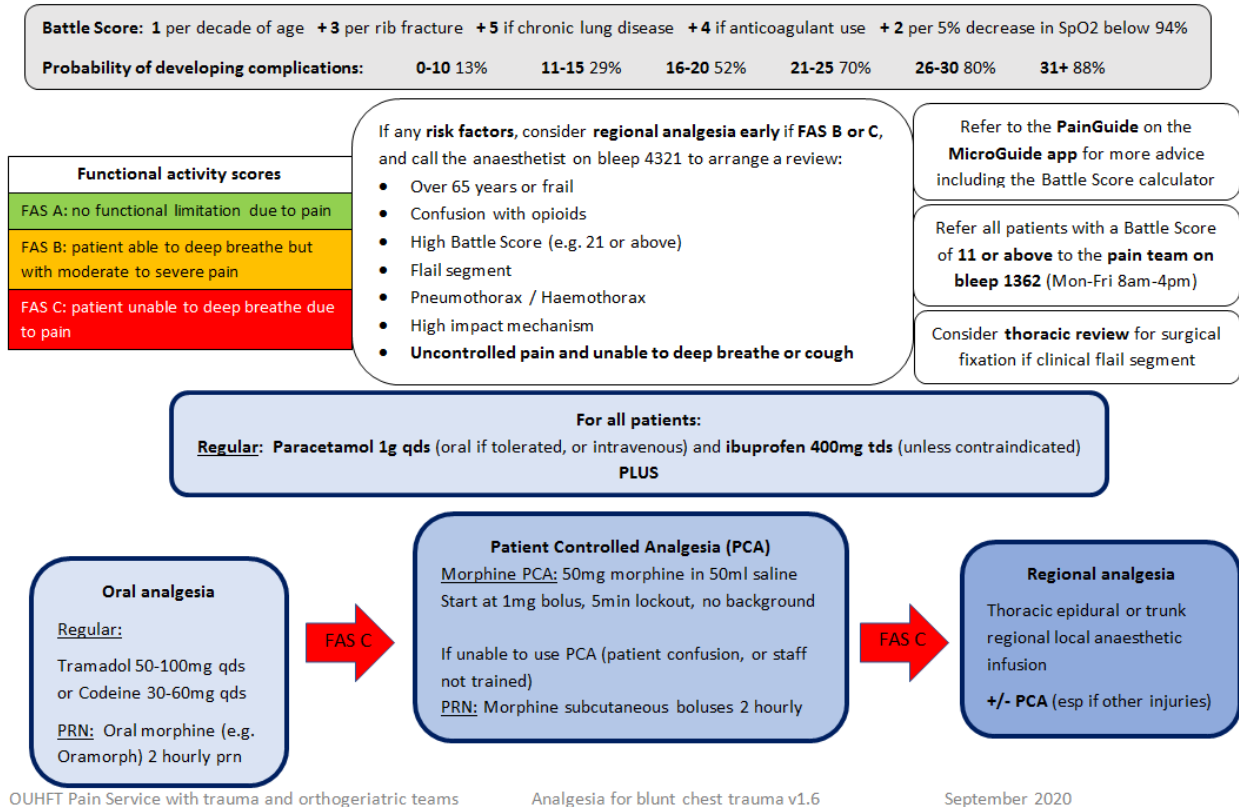
The Battle score can over estimate injury severity in the elderly.

If a patient has a high Battle score, but is clinically well, clinical judgement can be used as to whether a PCA or higher analgesic step is required.

Patients should have their pain regularly assessed and documented using the pain care plan on EPR and given regular oral analgesia.

Referral to cardiothoracic team does not automatically mean acceptance, but there must be a documented face to face registrar review of the patient.

Analgesia for patients with blunt chest trauma



OUHFT Pain Service with trauma and orthogeriatric teams

Analgesia for blunt chest trauma v1.6

September 2020

Initial Patient Pathway

Rib fracture patients have a broad demographic with very different medical needs, therefore are not best managed by one team exclusively. Although the Battle score is a good risk predictor it does not dictate where the patient should be managed in the hospital.

Patients fall into 4 broad categories:

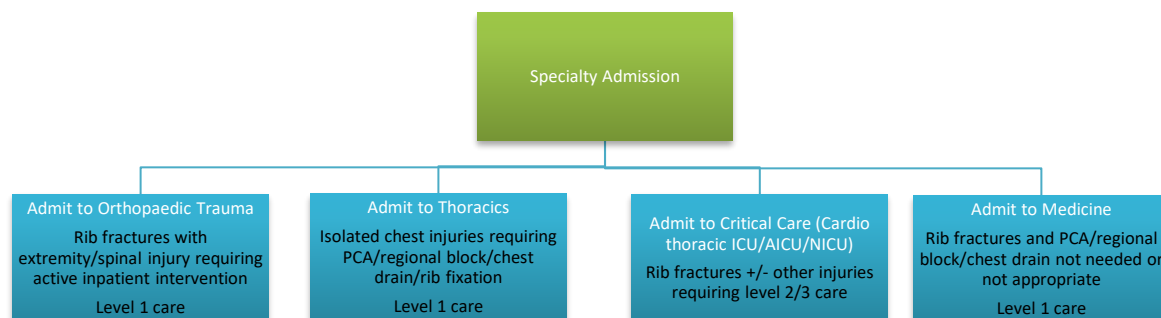
1. Patients who can usually be discharged home directly from the emergency department:
 - Simple rib fracture(s) (e.g. non-flail)
 - No additional medical/social issue that requires attention
 - Pain manageable with oral analgesic agents
 - No underlying lung injury
 - Usually have a battle score 0-10
2. Patients to be admitted directly under the orthopaedic trauma team:
 - Extremity/spinal injury requiring active inpatient intervention
 - Chest injury is not the primary concern

3. Patients to be admitted under the thoracic team (primary chest injury):

- Patient with indications for rib fracture fixation (clinical flail segment, pain not relieved by analgesia, respiratory compromise, failure to wean from a ventilator)
- Pneumothorax or haemothorax requiring an intercostal drain
- Pain not relieved by oral analgesia

4. Patients to be admitted directly under the medical team:

- PCA, regional analgesia or thoracic epidural inappropriate or unlikely to have clinical benefit
- Not requiring a chest drain
- Appropriate specialty teams (e.g. thoracic, trauma) should review the patient and documented a plan on EPR



Patients meeting the above thoracic surgical criteria with significant comorbidities will initially be managed on cardiothoracic ward/cardiothoracic intensive care (CTW/CTCC) and then referred to be moved to a CMU ward for ongoing care.

When patients do not fit easily into these categories, the clinical situation is changing rapidly, or there is a concern about the specialist input or the location in which this should take place there should be a consultant to consultant discussion to resolve this.

The MTC Geriatrics team are available M-F 0800-1600 (# 6671) for additional support. Cardiothoracic consultant cover is 24h via switchboard. Escalation if there are ongoing concerns should be via the consultant on-call to the ops manager who will escalate to the clinical director.

The Trust's Professional Standards for Emergency Care document sets out the key principles teams need to follow to improve patient flow and improve performance against the four-hour target in the ED:

 [OUH Standards for Urgent and Emergency Care \(UEC\) At a Glance document](#)

Full guidance is outlined in paper agreed by the Trust Management Executive (TME) [Standards for Urgent and Emergency Care 2024](#)

Patients who require critical care input should be admitted to adult intensive care in the case of polytrauma, where chest is not the main injury and cardiothoracic critical care if the chest injury is the primary injury.

The patient's clinical condition and particularly the level of analgesia they need may change in the first 72hrs and regular review and escalation to pain team in hours or oncall anaesthetist out of hours if regional analgesia is required.

The presence of a *clinical* flail chest is associated with significant mortality (15-17%). Paradoxical movement of the flail segment during inspiration restricts the underlying lung tissue and leads to ineffective ventilation. A *radiological* flail and *clinical* flail are therefore discreet and differentiating between them requires careful review of imaging and the patient.

All rib fracture patients who are admitted under a team other than thoracic surgery must have a thoracic team review within 24h of admission and a daily ward round with a documented plan. Further thoracic intervention if needed will be assessed on an individual basis. Out of hours, each patient must have a cardiothoracic registrar review within 24h.

These patients will be added to the cardiothoracic outlier list, and can only be removed with thoracic consultant approval.

The cardiothoracic registrar is available via bleep 1963. There may be an additional thoracic registrar on bleep 1652, but this is not 24h cover. Thoracic on call consultant is contactable via switchboard.

Horton General Hospital Patients

The Horton General Hospital (HGH) is a local hospital that is part of the OUH NHS Foundation Trust. There is no capacity to perform regional anaesthetic procedures, it does not have any thoracic surgical cover and has very limited capacity for PCAs.

Patients with rib fractures on CT admitted to the HGH should be considered for urgent transfer to the John Radcliffe Hospital in the following situations:

- Pain not relieved by oral analgesia
- Pneumothorax or haemothorax requiring an intercostal drain
- Require high flow oxygen
- Transfer to be considered at a lower threshold where there is a high risk of deterioration in the short term eg significant pulmonary contusions

For isolated chest injury please refer to the thoracic team at the John Radcliffe (bleep 1963).

For polytrauma please refer to the trauma registrar on-call at the John Radcliffe (bleep 1222).

Some patients with rib fractures can be successfully managed at HGH. If they remain at HGH they should be managed on Oak ward or EAU.

Once there is no longer a need for specialist input at the John Radcliffe the patient should be referred back to the HGH for their ongoing care.

Post CTW/CTCC patient pathway John Radcliffe Hospital:

- Discharge directly home once chest injuries stable and pain under control
- Patients out of area/from other hospital trusts should be repatriated as per the Thames Valley Repatriation Agreement, as it is not Trauma Network specific. This document can be found here:  [NHS England Thames Valley Repatriation Procedure.pdf](#)
- If no further need for thoracic surgical input, but ongoing medical issues/unsuitable for discharge for other reasons (e.g. needing community hospital), patient to be reviewed by the MTC geriatrics team and be listed for transfer to the Complex Medicine Unit (CMU) ward through the operations team by emailing details to operationalManagersJR@oxnet.nhs.uk or bleep 1044. No separate accepting CMU consultant acceptance is required if the MTC Geriatrics team have reviewed and accepted the patient.
- The operations managers will check the patient's details including postcode (to ensure repatriation to another trust is not required) and identify CMU beds. These patients cannot move to other medical beds in the hospital. If they do they will remain under the cardiothoracic team.
- If the patient no longer requires acute hospital care they should also have a discharge notice completed for alternative post-acute health/social care setting e.g. community hospital, intermediate care bed as per physiotherapy and occupational therapy input.
- Escalation of the patients awaiting transfer to CMU must be conducted on a daily basis Monday-Friday through the JR operations managers, CMU beds will be offered dependent on bed availability and operational pressures in the Trust.
- Patients cannot move to CMU at weekends. (This will be reviewed after trial period)
- CMU staff will only take over the patient's care once the patient arrives on a CMU ward
- PCA, regional anaesthesia, thoracic epidural cannot be offered on CMU and so any patients on these treatments must remain on cardiothoracic ward.

References:

1. May L, Hillermann C, Patil S. Rib fracture management. BJA Education. Volume 16, Issue 1, 26-32. January 2016. <https://doi.org/10.1093/bjaceaccp/mkv011>
2. Cundy P, Williams N. Rib Fractures. BMJ Best practice. April 2018. <https://bestpractice.bmj.com/topics/en-gb/1009>
3. Battle CE, Hutchings H, Lovett S et al. Predicting outcomes after blunt chest wall trauma: development and external validation of a new prognostic model. Crit Care. 2014; 18(3): R98. May 2014. <https://doi.org/10.1186/cc13873>