1. Introduction and Who Guideline applies to

Rib fractures have long been an underrecognised cause of avoidable morbidity and mortality – particularly if multiple, occurring in older people with frailty, or associated with cardiovascular comorbidities.

Access to a rib fracture management guideline is one of NHS England’s TQuINS (Trauma Quality Improvement Network System) trauma standards for Trauma Units (T16-2C-305). [1]

In ED, recognition (including appropriate use of CT), good initial analgesia and appropriate disposition (as guided by the severity of clinical features and frailty) are key. Optimal care for admitted patients includes a bundle of measures including regular physiotherapy, effective pain control (using neuroaxial techniques or PCA where appropriate), critical care outreach review, nutritional support and prompt recognition and management of complications. [2]

This guideline applies to all UHL staff involved in the management of adult patients with rib fractures in any clinical setting.

2. Guideline Standards and Procedures

2.1 ED management should be undertaken using the proforma shown in Appendix A.

2.2 Patients with flail chest and those with significant rib fractures who also require specialist care for additional, non-thoracic injuries should be transferred to the regional Major Trauma Centre unless very advanced frailty [3] makes local care more appropriate.

2.2 Patients admitted to EDU should be managed as per the EDU rib fracture pathway shown in Appendix B. The pathway is available for on-demand printing in ED.

2.3 Patients admitted to a thoracic surgical ward or ITU should be managed as per the rib fracture care for specialist wards plan shown in Appendix C. The document is available for on-demand printing in ED and copies can also be ordered from the print room.

2.4 Patients admitted to any other adult ward should be managed as per the rib fracture care plan for non-specialist wards shown in Appendix D. The document is available for on-demand printing in ED and copies can also be ordered from the print room.

3. Education and Training

No additional skills are required to follow this guideline. Awareness will be raised through members of the Major Trauma Governance Group and the Department of Geriatric Medicine HOS.

4. Monitoring Compliance

<table>
<thead>
<tr>
<th>What will be measured to monitor compliance</th>
<th>How will compliance be monitored</th>
<th>Monitoring Lead</th>
<th>Frequency</th>
<th>Reporting arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality from chest injuries</td>
<td>TARN themed report</td>
<td>Martin Wiese</td>
<td>Annually</td>
<td>To MTGG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(UHL Clinical Lead for Major Trauma)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bundle completeness</td>
<td>Departmental audits in ED / geriatric medicine and thoracic surgery</td>
<td>Martin Wiese (UHL Clinical Lead for Major Trauma)</td>
<td>Annually</td>
<td>To MTGG</td>
</tr>
</tbody>
</table>
5. Supporting References

1. Major Trauma Services Quality Indicators – TQuiNS.

6. Key Words

Major trauma, rib, fracture, chest, physiotherapy, epidural, thoracic, PCA, frail, geriatric, flail

<table>
<thead>
<tr>
<th>CONTACT AND REVIEW DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guideline Lead (Name and Title)</td>
</tr>
<tr>
<td>Martin Wiese, Emergency Physician and UHL Clinical Lead for Major Trauma</td>
</tr>
</tbody>
</table>

Details of Changes made during review:
- ED management algorithm reformatted into a proforma
- Physiotherapy team details on EDU pathway updated
- Ward care bundles
  - Renamed as care plans
  - Prompts to complete ICE referrals for pain team and dieticians added
  - Critical care outreach team details changed to DART
Appendix A. ED rib fracture management proforma.
Appendix B. Rib fracture EDU pathway.

Emergency Decision Unit Pathway

Rib fracture

Inclusion criteria

- Adults with a confirmed rib fracture who are unsuitable for immediate discharge from ED due to
  - Age 65 or above
  - Clinical frailty score (CFS) 5 or above
  - Pain insufficiently controlled
  - Unable to manage at home

Exclusion criteria

- Need for admission to a bed-holding specialty due to significant illness or additional injuries
- Persistently abnormal vital signs or test results (e.g. high WCC, newly abnormal U&Es or acid-base disturbance)
- Hypotension at any time
- Fever at any time
- Rib fractures requiring a more high level of care (see UHL rib fracture guideline)
- Flail chest
- Three or more rib fractures (NB: if aged 65 or above: two or more rib fractures)
- Chest drain in situ
- Lung contusion
- New oxygen requirement
- Chronic respiratory disease or heart failure
- BMI 40 or more

Notes to doctor completing this pathway (ED senior to ensure compliance)

- This pathway must only be used in conjunction with the UHL rib fracture guideline
- If appropriate, use it in conjunction with additional EDU pathways (e.g. ‘post-trauma’ / ‘EFU’)
- Complete drug chart as appropriate

EDU plan

- Regular analgesia (if persistent severe pain consider oxycodone)
- RADS (OT/PT rapid assessment and discharge service) review (daily 08–18:00; call 07950 883 651)
- Provide with chest injury PIL on discharge

NB:

- If severe pain remains an issue, refer to thoracic surgical team – will need regional anaesthesis or PCA
- Notify COTW (out of hours: EPIC) if NEWS increasing / clinical deterioration / OT or Physio concerned
- Admit to appropriate speciality if not ready for discharge within 48h:
  - Geriatric medicine if CFS >5
  - Thoracic surgery if CFS <6

NB:

- DO NOT request an EDU space on NerveCentre before signoff
- A drug chart must be written before pathway can be signed off

Planned & agreed by

Referring Clinician

Emergency Physician in Charge

Print names

Signatures

Ref:

UH

 Filed on 19Jn

Approved by Po

et

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Back to 1st page
### Rib Fracture Care Plan

For specialist wards (thoracic surgery & ITU)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Use 24h clock</th>
</tr>
</thead>
</table>

#### Patient details
- **Full name**
- **Sex**
- **Unit number**

#### Patient’s team to ensure that each section on this form is completed by the relevant clinician

<table>
<thead>
<tr>
<th>#</th>
<th>Task Description</th>
<th>Time completed</th>
<th>Ward doctor print name and signature</th>
<th>Reason not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Deliver humidified oxygen</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Maintain SpO2 at 94-98% (88-92% if raised CO2 on BG) |
- Use a controlled O2 device if raised CO2 on BG |
- Oxygen at flow rates ≥4L/min should be humidified |

<table>
<thead>
<tr>
<th>#</th>
<th>Task Description</th>
<th>Time completed</th>
<th>Ward doctor print name and signature</th>
<th>Reason not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Prescribe effective analgesia</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Regular paracetamol |
- Regular NSAID unless contraindicated |
- Regular Dihydrocodeine (in the elderly: codeine) |
- If pain severe, consider regular oxycodone |
- PRN IV / PO morphine for break-through pain |
- NB: In patients with an eGFR <30 there is a risk of opiate toxicity due to accumulation; use tramadol instead of codeine / dihydrocodeine and oxycodone instead of morphine |

<table>
<thead>
<tr>
<th>#</th>
<th>Task Description</th>
<th>Time completed</th>
<th>Ward doctor print name and signature</th>
<th>Reason not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Arrange catheter-based analgesia</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- ITU review within 24h to decide on appropriate technique: |
  - Epidural catheter unless contraindicated |
  - Paravertebral catheter if older patient, significant cardio-respiratory comorbidities or epidural considered unsafe |
  - Consider PCA as a stop-gap or alternative to the above |

<table>
<thead>
<tr>
<th>#</th>
<th>Task Description</th>
<th>Time completed</th>
<th>Ward doctor print name and signature</th>
<th>Reason not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Pain team review</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Daily review by the Adult Pain Management Team Mon-Fri |
- to optimise pain control; requires ICE referral |

<table>
<thead>
<tr>
<th>#</th>
<th>Task Description</th>
<th>Time completed</th>
<th>Ward doctor print name and signature</th>
<th>Reason not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Physiotherapy review</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- 1st review within 24h of admission; further input guided by assessment as per Physiotherapy Rib Fracture SOP |
- Aim is to maintain lung volume, prevent and treat lung collapse and consolidation, aid secretion clearance and facilitate mobilisation |
- Eligible pts will have received incentive spirometer in ED |

<table>
<thead>
<tr>
<th>#</th>
<th>Task Description</th>
<th>Time completed</th>
<th>Ward doctor print name and signature</th>
<th>Reason not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>DART review</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- 1st review within 14h of admission |
- Criterias for escalation to ITU care (unless ceiling of care below ITU previously agreed) include |
  - SpO2 below target despite high flow oxygen therapy |
  - Prolonged need for high flow (≥60%) oxygen therapy |
  - Acute hypercapnia |
  - Inability to speak in sentences |

<table>
<thead>
<tr>
<th>#</th>
<th>Task Description</th>
<th>Time completed</th>
<th>Ward doctor print name and signature</th>
<th>Reason not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Dietician review</td>
<td></td>
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</tbody>
</table>
- Within the next working day; refer via ICE |

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**ALL patients with a clinical frailty score greater than 5 should be discussed with the duty consultant geriatrician once stabilised from a thoracic surgical perspective (after 72h at the earliest) to determine further care needs. The geriatric hot phone (‘BAT phone’) 07956 185 713 can be reached Mon-Fri 8-6 (call SPA on 0300 300 1000 if no response). Where appropriate, patients will be accepted for transfer to a geriatric bed at the LRI. Please involve the LRI Senior Manager On Call (SMOC) if transfers are delayed. NB: Any delay in excess of 48h should be dated.**

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**NB:** Paper copies of this document may not be most recent version. The definitive version is held on INsite Documents.
### Rib Fracture Care Plan

**For non-specialist wards**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Time</th>
<th>Tasks</th>
<th>Reason</th>
</tr>
</thead>
</table>
| 1    | Deliver humidified oxygen  
- Maintain SpO₂ at 94-98% (88-92% if raised CO₂ on BG)  
- Use a controlled O₂ device if raised CO₂ on BG  
- Oxygen at flow rates ≥4L/min should be humidified | Time completed | Ward doctor print name and signature | Reason not done |
| 2    | Prescribe effective analgesia  
- Regular paracetamol  
- Regular NSAID unless contraindicated  
- Regular Dihydrocodeine (in the elderly: codeine)  
- If pain severe, consider regular oxycodone  
- PRN IV / PO morphine for break-through pain  
**NB:** In patients with an eGFR <30 there is a risk of opiate toxicity due to accumulation; use tramadol instead of codeine / dihydrocodeine and oxycodone instead of morphine | Time drug chart completed | Ward doctor print name and signature | Reason not done |
| 3    | Pain team review  
Daily review by the Adult Pain Management Team Mon-Fri to optimise pain control; requires ICE referral | Time of first review | Pain team print name and signature | Reason not done |
| 4    | Physiotherapy  
- 1st review within 24h of admission; further input guided by assessment as per Physiotherapy Rib Fracture SOP  
- Aim is to maintain lung volume, prevent and treat lung collapse and consolidation, aid secretion clearance and facilitate mobilization  
- Eligible pts will have received incentive spirometer in ED | Time of first review | Physiotherapist print name and signature | Reason not done |
| 5    | DART review  
- 1st review within 14h of admission  
- Criteria for escalation to ITU care (unless ceiling of care below ITU previously agreed) include  
  - SpO₂ below target despite high flow oxygen therapy  
  - Prolonged need for high flow (≥60%) oxygen therapy  
  - Acute hypercapnia  
  - Inability to speak in sentences | Time of first review | Outreach team print name and signature | Reason not done |
| 6    | Dietician review  
Within the next working day; refer via ICE | Time of first review | Dietician print name and signature | Reason not done |

**ALL** patients in whom severe pain remains an issue after 24h despite optimal systemic analgesia should be discussed with the thoracic surgical team for consideration of catheter-based regional analgesia / PCA.

Where appropriate, patients will be accepted for transfer to a thoracic surgical bed at the GGH. Please involve the LRI Senior Manager On Call (SMOC) if transfers are delayed. **NB:** Any delay in excess of 48h should be datelined.

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**Appendix D. Rib fracture care plan – non-specialist wards.**