# RibScore

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 6 fractures</td>
<td>1</td>
</tr>
<tr>
<td>Flail chest</td>
<td>1</td>
</tr>
<tr>
<td>Bilateral fractures</td>
<td>1</td>
</tr>
<tr>
<td>≥ 3 severely displaced fractures</td>
<td>1</td>
</tr>
<tr>
<td>≥ 1 anterior, lateral, and posterior fracture</td>
<td>1</td>
</tr>
<tr>
<td>First rib fracture</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>
## SCARF Score

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Number Pain Score ≥ 5</td>
<td>1</td>
</tr>
<tr>
<td>Incentive spirometry &lt; 50% predicted</td>
<td>1</td>
</tr>
<tr>
<td>Respiratory rate ≥ 20</td>
<td>1</td>
</tr>
<tr>
<td>Poor cough</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4</strong></td>
</tr>
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**STEP 1**

*Admission if, after pain control using outpatient regimen, ≥ 2 of these:*
- RR > 18
- IS < 75% predicted*
- Numeric pain score ≥ 5
- Poor cough
- Age ≥ 65 years
- ≥ 3 fractures

<table>
<thead>
<tr>
<th>PO (outpatient) pain regimen:</th>
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<tbody>
<tr>
<td>▪ Incentive spirometer</td>
</tr>
<tr>
<td>▪ Acetaminophen 650 mg PO q6H</td>
</tr>
<tr>
<td>▪ Ibuprofen 600 mg PO q6H</td>
</tr>
<tr>
<td>▪ Diazepam 5 mg TID PRN</td>
</tr>
<tr>
<td>▪ Oxycodone 5-10 mg PO Q4H PRN</td>
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**STEP 2**

*If admission to hospital, PCU admission if 1 of these, SICU admission if ≥ 2 of these:*
- Age ≥ 65 years
- ≥ 6 fractures
- IS < 60% predicted*
- Flail chest
- > 4 L O2 required to maintain sat > 90%
- Associated injury requiring PCU or ICU admission
- EM/surgery staff discretion

*As determined by EM respiratory therapist*
Ice and heat to soft tissues
Ketorolac 15 mg IV q6H x 48 HR then ibuprophen 600 mg PO q6H
Acetaminophen 650 mg PO q6H
Diazepam 5 mg PO TID PRN (if age < 65 years)
Oxycodone 5-10 mg PO Q4HR PRN
IV narcotic push x 2 (if ≥ 2 doses required, move to Tier II)

Loco-regional modalities*
Thoracic epidural catheter
or Pain pump (bupivacaine infusion)
or Liposomal bupivacaine intercostal nerve blocks
or erector spinae (ESP) catheter

Narcotic PCA
Ketamine infusion (as per PAD order set)
Lidocaine infusion**

Advance to next tier if SCARF score remains ≥ 2 after intervention(s)

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* Prior to choice, consult research team to evaluate for study enrollment
** Requires PCU/ICU admission and attending authorization
Rib Fracture Physical Therapy Guidelines

Inpatient physical therapy should include but not limited to

• Full mobility evaluation
  – Ability to get into and OOB
  – Strength or ability to generate power
  – Seated and standing dynamic stability
  – Gait analysis
  – Ability to navigate stairs (applicable)

• Additional recommendations for pain control
  – Soft tissue mobilization to surrounding tissue
  – Relaxation techniques
  – Self splinting during cough, sneeze or rolling in bed
  – Ice or heat

• Education
  – Breathing techniques (diaphragmatic, avoiding holding breath with movement, segmental activation, tripod if tolerated)
  – Posture education
  – Importance of avoiding prolonged REST or BEDREST
  – Modification of home setup
  – Modification of work activity

• Additional Interventions
  – Interval pulmonary training
  – Strength training (functional activity and targeted resistance training)
Rib Fracture Outpatient Follow Up

Discharged from ED

Rib fracture Patient being discharged

Admitted to TACS, no SSRF

Follow up in TACS clinic in 2 weeks

Admitted to TACS, yes SSRF

Follow up in thoracic surgery clinic in 2 weeks with CXR

One or more of these:
- > 3 fractures
- Inpatient procedural intervention for chest trauma (e.g., chest tube, VATS)
- Age ≥ 70 years
- New O₂ requirement on dc
- Additional injury requiring TACS follow up

Follow up with PCP

*ED, emergency department; TACS, trauma and acute care surgery, SSRF, surgical stabilization of rib fractures; CXR, chest XRAY*
Rib Fracture Studies at DHMC

- **Rib Fractures**
  - Admitted
    - Flail Chest
      - ✅ Exparel vs. Pain cath during SSRF (NCT03221595)
    - ≥ 3 displaced fractures (no flail)
      - ✅ CWIS NON-FLAIL (NCT03221595)
      - ✅ Exparel vs. Pain cath during SSRF (NCT03221595)
    - All other
      - ✅ SCARF
      - (Gabapentin RCT) (NCT02856750)
- ✅ Admission algorithm