ED/UC Suspected Extremity Fracture

**Algorithm**

**Suspected Extremity Fracture**

- **Triage, Intake, or Direct Bed**
  - If CMS is NOT intact, patient is off pathway, notify provider immediately

**Pain Assessment**

- **Does the patient’s pain score match your assessment?**
  - No
    - Provider/RN, and Family discretion should be used on treatment modalities
  - Yes
    - Provider/RN, and Family discretion should be used on treatment modalities

**Inclusion Criteria**
- Suspected extremity fracture

**Exclusion Criteria**
- Trauma Red and Level 1 Activations
- Active bleeding
- Concern for NAT
- Concern for compartment syndrome
- Co-morbidities that put patient at risk for respiratory depression

**Triage, Intake, or Direct Bed**

- **Suspected Extremity Fracture**
  - If patient already received treatment in a category, consider stepping up treatment to next treatment level

**No Pain**
- Score = 0
- • Splint
  • Elevate
  • Ice

**Mild Pain**
- Score = 1-3
- Occasional crying, restless/tense, distractible, etc.
- • Splint, Elevate, Ice
  • Ibuprofen or Acetaminophen
  *Do not delay x-ray - may be completed after x-ray

**Moderate Pain**
- Score = 4-6
- Intermittent crying/grimace with touch, consolable, etc.
- • Splint, Elevate, Ice
  • Ibuprofen or Acetaminophen
  • Acetaminophen-Hydrocodone
  (0.15mg/kg, max of 10mg-hydrocodone comp)
  *Should be completed prior to x-ray

**Severe Pain**
- Score = 7-10
- Screaming/sobbing, difficult to comfort, quivering, etc.
- • Splint, Elevate, Ice
  • Ibuprofen or Acetaminophen
  • Intranasal fentanyl (1mcg/kg, max 100mcg)

**X-ray (if indicated)**

- **X-ray result shows fracture?**
  - No
    - Off Pathway
  - Yes
    - Off Pathway
    - **Consult Child Protection Team**

**Reassess & Document Pain Score**

- IV/Intranasal- 30min after medication given
- Oral- 60min after medication given

- **If still in pain: provider, nurse and family should create pain plan**

**ESI Level Suggestions**

- **ESI 1:**
  - Trauma with uncontrollable bleeding
  - Hemodynamic compromise
  - Absent perfusion to extremity

- **ESI 2:**
  - Severe pain
  - Dislocated Joints (except fingers/toes)
  - Open fracture
  - Digit amputation
  - Femoral point tenderness, edema
  - Impaired distal neurovascular status
  - Obvious deformity of joint/bone

- **ESI 3:**
  - Dislocated fingers/toes

- **ESI 4:**
  - Suspected clavicle fracture
  - Mild swelling without deformity of ankle in children >13 years of age
  - Edema over injury
  - Point tenderness

- **ESI 5:**
  - Suspected nursemaid’s elbow

**Trauma Activations (Excluded from this Pathway)**

- **Trauma Red:**
  - Trauma patients receiving blood prior to arrival
- **Trauma Level 1:**
  - Proximal limb amputation (above elbow/knee)
  - Significant penetrating injury to an extremity
  - Two or more humerus/femur fractures

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TABLE OF CONTENTS
Algorithm
Target Population
Background | Definitions
Initial Evaluation
Clinical Management
Imaging
Therapeutics
Parent | Caregiver Education
References
Clinical Improvement Team

TARGET POPULATION

Inclusion Criteria
- Suspected extremity fracture

Exclusion Criteria
- Trauma Red and Level 1 Activations
- Active bleeding
- Concern for NAT
- Concern for compartment syndrome
- Co-morbidities that put patient at risk for respiratory depression

BACKGROUND | DEFINITIONS

Background
Pain is under-treated in patients presenting to the ED with long bone fractures and has room for improvement1.

Definitions
Long bones- for this pathway, long bones are defined as the humerus, radius, ulna, femur, tibia, fibula, and clavicle.

INITIAL EVALUATION

- Vital signs
- Comprehensive pain assessment
  - Nursing pain assessment including pain score- see Pain Assessment and Management Policy
    - FLACC, FACES, self reporting
- Check CMS (circulation, motion, sensation) in triage/nursing assessment
- History and physical exam
Assess for pulse and any signs/symptoms of compartment syndrome or vascular injury
Check capillary refill
Check motor and sensory function distal to the injury

CLINICAL MANAGEMENT

- Assess and treat pain within 30 min of arrival to ED.
- Treat pain with both pharmacologic and non-pharmacologic modalities
  - Non-pharmacologic: ice, elevation, splint
  - Pharmacologic: based on patient’s pain score, previous treatments, and clinical assessment
  - If patient already received pain medication prior to assessment, care team should consider going “up a step” to treat pain.
- Radiographic studies performed quickly to assess for fracture.
  - Pain should be addressed prior to x-ray for moderate to severe pain
- Pain should be reassessed after pain medications based on half life of initial medication with a goal to decrease pain score by at least 2 points
  - Within 30 min for IV or Intranasal medications
  - Within 60 min for oral medications
- If patient still in pain, provider, nurse and family should create pain plan. Consider next step in WHO pain ladder.
- Orthopedics should be consulted, if necessary. Refer to the femoral shaft and supracondylar pathways if applicable.
  - If sedation is necessary, an IV should be placed and the team should refer to the sedation manual.

Upper Extremity Splinting Recommendations
Reference Only- contact orthopedics if further clarification is needed

<table>
<thead>
<tr>
<th>Splint</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volar</td>
<td>• Non-displaced distal radial fx.</td>
</tr>
<tr>
<td></td>
<td>• Buckle fx, distal radius.</td>
</tr>
<tr>
<td></td>
<td>• Wrist (carpal) fracture (except scaphoid).</td>
</tr>
<tr>
<td>Pre-Fabricated Volar</td>
<td>• Wrist Sprains.</td>
</tr>
<tr>
<td>Posterior Long Arm</td>
<td>• Supracondylar (type I) fx.</td>
</tr>
<tr>
<td></td>
<td>• Proximal radial AND ulnar fx.</td>
</tr>
<tr>
<td>Sugar-Tong</td>
<td>• Distal radial and ulnar fx.</td>
</tr>
<tr>
<td>Ulnar Gutter</td>
<td>• 4th / 5th metacarpal fx.</td>
</tr>
<tr>
<td></td>
<td>• Ulna fx.</td>
</tr>
<tr>
<td>Thumb Spica</td>
<td>• Non-displaced scaphoid fx.</td>
</tr>
<tr>
<td></td>
<td>• Non-displaced fx 1st metacarpal.</td>
</tr>
<tr>
<td>Pre-Fabricated Thumb Spica</td>
<td>• Thumb Injuries. No fx.</td>
</tr>
<tr>
<td>Finger Splint (Aluminum U-shaped)</td>
<td>• Distal phalangeal fx.</td>
</tr>
<tr>
<td>Buddy Tape</td>
<td>• Non-displaced proximal or middle phalanx fx.</td>
</tr>
</tbody>
</table>
Lower Extremity Splinting Recommendations

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<table>
<thead>
<tr>
<th>Splint</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posterior Long Leg</td>
<td>Non-displaced Proximal Tib/Fib fx</td>
</tr>
<tr>
<td>Posterior Short Leg</td>
<td>Non-displaced Ankle fx.</td>
</tr>
<tr>
<td></td>
<td>Severe Ankle Sprains.</td>
</tr>
<tr>
<td></td>
<td>Calcaneal fx.</td>
</tr>
<tr>
<td></td>
<td>Metatarsal fx.</td>
</tr>
<tr>
<td>Ankle Stirrup with Posterior Short Leg</td>
<td>Non-displaced Distal Tib/Fib fx</td>
</tr>
<tr>
<td>Pre-Fabricated Ankle Stirrup</td>
<td>Ankle Sprain.</td>
</tr>
<tr>
<td>Knee Immobilizer (Pre-Fabricated)</td>
<td>Acute soft tissue injury of the knee.</td>
</tr>
<tr>
<td></td>
<td>Patellar dislocation or fx.</td>
</tr>
<tr>
<td></td>
<td>Patella/tibial plateau fx</td>
</tr>
<tr>
<td>Cast Shoe (Pre-Fabricated)</td>
<td>Phalangeal fx.</td>
</tr>
<tr>
<td>Buddy Tape</td>
<td>Phalangeal fx.</td>
</tr>
</tbody>
</table>

Crutches SHOULD NOT be used for lower extremity sprain/pain
Ensure adequate padding when placing splint

IMAGING

Nursing order
Refer to standing order guidelines for Xray

- Triage in NOC
- Secondary assessment (DB) at Anschutz or Colorado Springs

Provider order
Use order set to order appropriate study in Intake or on first assessment

All Xrays should include at least 2 views

THERAPEUTICS

NSAIDS
- Acetaminophen (per manufacture recommendations)
- Ibuprofen (per manufacture recommendations)

Combination medications
- Hydrocodone-acetaminophen:
  - 5mg-217mg/10mL oral solution: 0.15mg/kg/dose of hydrocodone PO (max dose 10mg hydrocodone)
  - 5-325mg oral tabs: 1-2 tabs PO
Opiates

- Oral
  - Oxycodone:
    - oral solution: 0.05-0.15mg/kg/dose po (max dose 10mg)
    - immediate release tab: 0.05-0.15mg/kg/dose po (max dose 10mg)

- IV or Intranasal fentanyl
  - Intranasal fentanyl: 1-2 mcg/kg/dose IN (max dose 100mcg)
  - IV fentanyl: 1-2 mcg/kg/dose IV (max dose 100mcg)
  - IV morphine: 0.05-0.1mg/kg/dose IV (max dose 4mg)

PARENT | CAREGIVER EDUCATION

Use DC extremity trauma smart set
REFERENCES


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