ED/UC Suspected Extremity Fracture

ALGORITHM

Suspected Extremity Fracture

Triage, Intake, or Direct Bed
*See ESI level Chart below
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 → select pain category

! If patient already received treatment in a category, consider stepping up treatment to next treatment level

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

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

*Do not delay x-ray- Can be completed after x-ray

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**
- **Consider Oral Opioid**
  Acetaminophen-Hydrocodone *(0.15mg/kg, max of 10mg- hydrocodone comp)*
  Oxycodone if patient received tylenol *(0.05-0.15mg/kg, max 10mg)*

*Should be completed prior to x-ray

Severe Pain
Score= 7-10
Screaming/sobbing, difficult to comfort, quivering, etc.

*ESI level 2 and RN should call provider to order pain medications ASAP
- **Splint, Elevate, Ice**
- **Ibuprofen or Acetaminophen**
- **Intranasal fentanyl** *(1mcg/kg, max 100mcg)*, if patient has IV, use morphine

*Should be completed prior to x-ray

X-ray (if indicated)

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)

X-ray result shows fracture?
- No → **Off Pathway**
- Yes ↓

! Refer to Femoral Shaft or Supracondylar Pathways if applicable

Is injury consistent with child development and mechanism?
- No → **Off Pathway** Consult Child Protection Team
- Yes ↓

Ortho Consult Needed?
- No → **Splint and Discharge**
- Yes ↓

! Do not prescribe acetaminophen with codeine (T3)

Reduction Needed?
- No → **Splint and Discharge**
- Yes → **Refer to Sedation Manual**

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

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

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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 improvement[1].

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 xray 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

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

Lower Extremity Splinting Recommendations

Reference Only- contact orthopedics if further clarification is needed

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

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 asssment

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
  - Intanasal 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

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APPROVED BY

ED/UC Pathways & Policies Committee – February 15, 2017
Pharmacy & Therapeutics Committee – April 6, 2017
Clinical Pathways and Measures Committee – April 11, 2017

MANUAL/DEPARTMENT	Clinical Pathways/Quality
ORIGINATION DATE	April 11, 2017
LAST DATE OF REVIEW OR REVISION	March 15, 2019 (Colorado Springs alignment)
COLORADO SPRINGS REVIEW BY	Michael DiStefano, MD Chief Medical Officer, Colorado Springs
APPROVED BY	Lalit Bajaj, MD Medical Director, Clinical Effectiveness

REVIEW | REVISION SCHEDULE

Scheduled for full review on April 11, 2021.

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