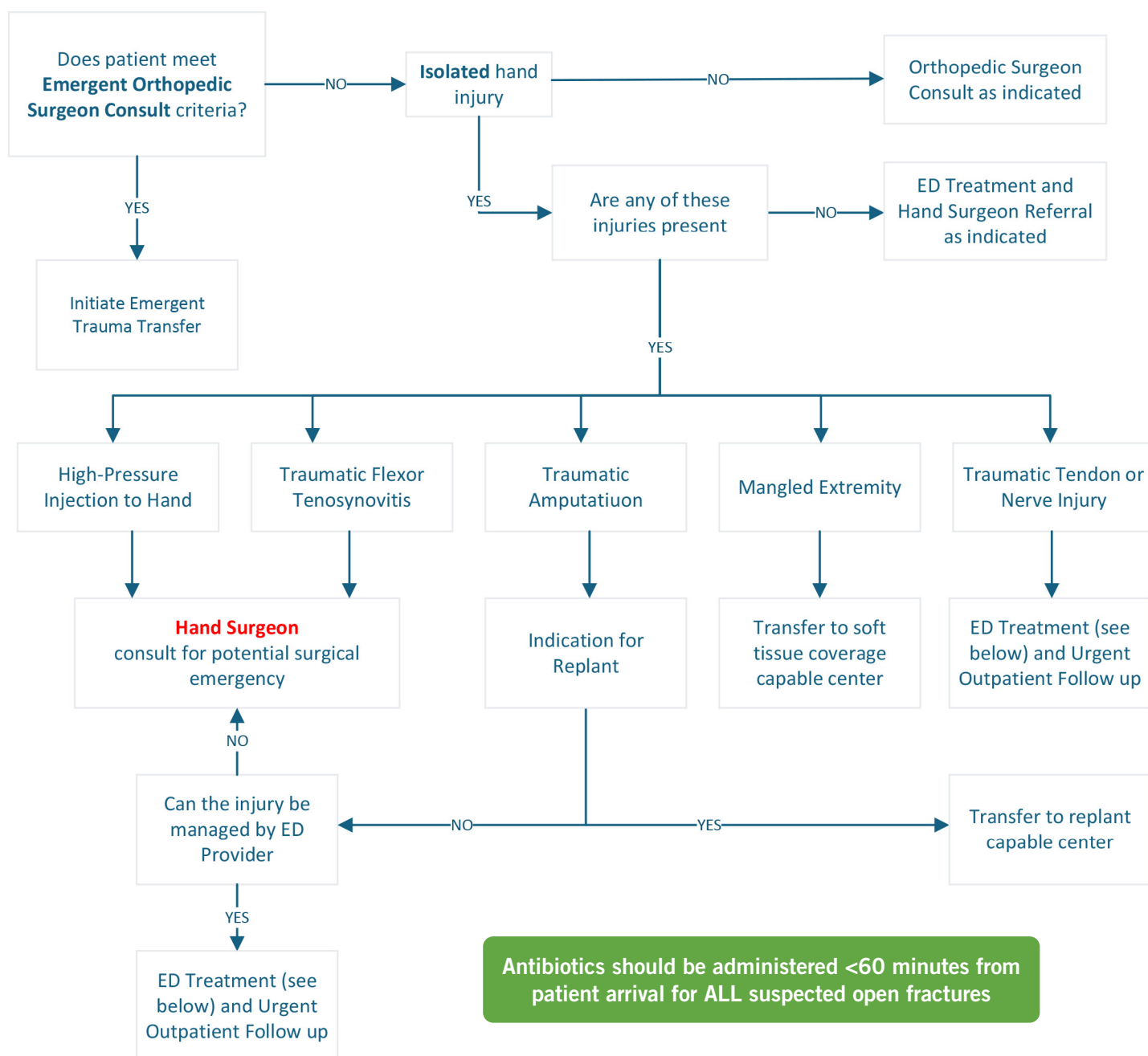


RECOMMENDED TREATMENT PATHWAY



Questions specific to emergent hand trauma cases can be directed to the Transfer Center at 1-800-200-1511.

For non-emergent hand injuries, please submit a referral (NOTE: referrals are triaged within 24 business hours). Outpatient referrals can be routed through the Epic Referral Process or for facilities not on Epic, they can fax the request to 208-625-4681. Any referral questions should be directed to 208-625-6700.

These guidelines were designed to serve as a clinical reference based upon the evidence and clinical expertise available at the time of development. They intend to serve as a general guide regarding clinical patient care practices. They are in no way intended to replace clinical judgement or dictate the care of the individualized patient.

INCLUSION CRITERIA:

- Trauma directly to the Hand
- Pressure Injury to the Hand
- Bite Injury or Complications

EXCLUSION CRITERIA:

- Poly-system trauma

KEY DEFINITIONS:

Indication for Emergent Orthopedic Consultation

- Hemodynamically unstable secondary to pelvic fracture
- Suspected extremity compartment syndrome
- Fractures/dislocations with risk of avascular necrosis (i.e. femoral head or talus)
- Vascular compromise related to fracture or dislocation

Indications for Replantation

- All pediatric amputations
- Thumb
 - Proximal with pulp preserved
 - Consider if proximal to DIP joint
- Involvement of multiple digits
- Revision amputation may be indicated if Allen Type 1 or 2

Relative Contraindications of Replantation

- Single digit between the PIP and DIP joints
- Amputation related to crush injury
- Mechanism associated with significant contamination
- Patient has peripheral vascular disease
- Patient has systemic disease with vascular compromise

Preservation of Amputated Digit

- Wrap the amputated digit in moist gauze, then place in a sealed plastic bag in ice water
- The amputated digit should be viable for 6-12 hours.

Pseudomonas Risk Factors

- Fight bite
- Fresh water injury
- IVDU
- Immunocompromised
- Diabetes Mellitus

INITIAL EVALUATION AND TREATMENT

History:

- Mechanism of trauma
- Timing of trauma
- Hand dominance and occupation
- If injection injury
 - Composition of injected material
 - Volume Injected
 - Force of Injection
- Relevant past medical history, including vascular risk factors
- Tetanus vaccinations status

Exam:

- Standard Primary assessment for trauma
- Appearance at resting position
- Appearance of skin:
 - Swelling
 - Dislocation
 - Erythema
- Area of tenderness, with particular attention to tendon sheaths
- Nail evaluation
 - Subungual hematoma
 - Nail bed lacerations
- Distal blood flow
- Active range of motion
 - Evaluation of flexor and extensor tendons
 - Evaluation of motor nerve function
- Passive range of motion, with particular attention to pain
- Nerve function
 - 2-point discrimination
 - Radial, ulnar, median nerve distributions

Labs: Per ED provider discretion

Imaging: Xray

Standard Treatment:

- Digital block/nerve block :
 - Lidocaine 1% or 2% without epinephrine (maximum dosage of 4 mg/kg)
 - Bupivacaine 0.25% or 0.5% without epinephrine (maximum dosage of 2.5 mg/kg)
- Antibiotics
- Prophylaxis: 1st generation cephalosporin for 7 days, Unasyn/Augmentin for bites
- Flexor Tenosynovitis or Injection
 - Vancomycin + Ceftriaxone (no pseudomonas risk)
 - Vancomycin + Cefepime or Zosyn (if pseudomonas risk)
- Update Tdap

Fingertip Amputations

- If the pulp defect is small (<1 cm²) and without exposed bone, a traumatic fingertip amputation can be managed non-operatively
 - The wound can be closed primarily by an emergency physician with close outpatient hand follow-up
 - This can be done using absorbable sutures or tissue adhesive glue
 - In select cases, healing by secondary intention is another option
 - Typically, the defect is then repaired by suturing through the nail into the pulp of the finger to close the defect
- Revision amputations are recommended for injuries unable to be closed to maintain mobility and hand function
 - Many of these can be cleaned and dressed within the ER and be seen in the outpatient setting with rapid follow up
 - Speak with the on call provider at the Hand Clinic during business hours or the on call Hand Surgeon after hours or on weekends to determine best setting for management

Tuft Fractures with Nailbed Injuries

- Tuft fractures are often associated with nail bed injuries
 - When associated with a nail bed injury, tuft fractures are considered open fractures
 - A systematic analysis of four randomized controlled trials assessing prophylactic antibiotics in open tuft fractures showed no statistically significant difference in superficial infections or osteomyelitis
 - IV Cefazolin + Oral antibiotics, such as a 7-day course of cephalosporins, may be considered if the wound is contaminated or in a high-risk patient
 - Care in the ED should focus on prompt irrigation, debridement, repair of the nail bed, and splinting
 - Once closed, these injuries can follow up in Hand Clinic within the next 48-72 hours
- Subungual hematomas
 - If <50%, drain via trephination of the nail
 - If >50%, consider removal of the nail to evaluate for nail bed laceration
 - A more conservative approach may be considered if there is no disruption of nail edges or nail fold
 - After trephination of a subungual hematoma, advise patients to soak the finger in warm water with antibacterial soap 2-3 times daily for up to 1 week
- Repair of nail bed lacerations
 - 6-0 absorbable sutures should be carefully placed to create as smooth a surface as possible for the new nail to grow flush against the repaired nail bed
 - Newer studies suggest that replacing the nail or stenting the nail fold after laceration repair may not always be critical to maintaining optimal cosmetic/functional outcomes; however, forgoing this step is not yet routinely recommended
- Complicated avulsion injuries may ultimately require grafting or nail matrix transfer; thus, referral to a hand specialist is necessary

Tendon or Nerve Injuries

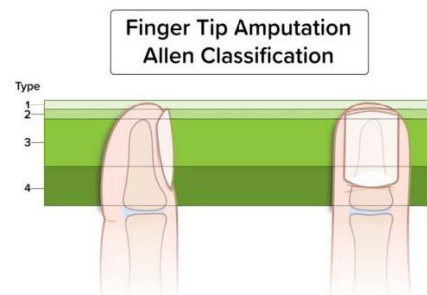
- Thoroughly clean and irrigate wound
- Antibiotics as indicated
- Close Laceration
- Splint in Extension
- Urgent outpatient follow up

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APPENDIX: HAND TRAUMA

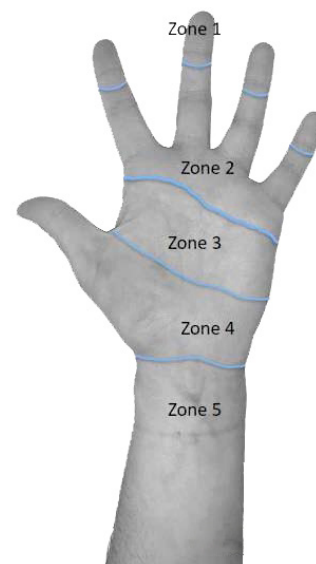
Allen Classification

- **Type 1:** Pulp only
- **Type 2:** Pulp and nail bed injury
- **Type 3:** Pulp, nail bed injury, and distal phalanx fracture
- **Type 4:** Pulp, nail bed injury, distal phalanx fracture, and nail loss



Flexor Tendon Zones of the Hand

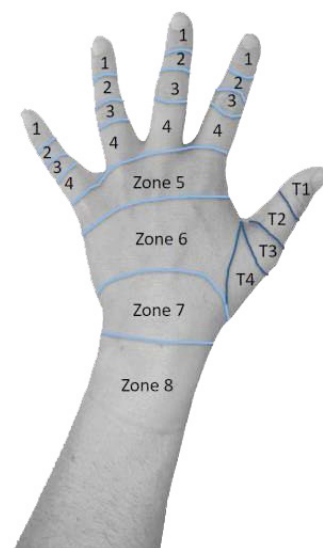
- **Zone 1:** Distal tip of digit to flexor digitorum profundus insertion
- **Zone 2:** Insertion of flexor digitorum profundus to level of A1 pulley (distal palmar crease) associated with injury to both flexor digitorum profundus and flexor digitorum superficialis tendons. Both of these tendons run in the same tendon sheath in Zone 2.
- **Zone 3:** Covers the palm, and extends from level of A1 pulley to distal carpal ligament
- **Zone 4:** Carpal tunnel associated with injury to the median nerve and recurrent motor branch of the median nerve
- **Zone 5:** Transverse carpal ligament to proximal forearm



Flexor Tendon Zones

Extensor Tendon Zones of Hand

- **Zone 1:** Disruption of the terminal extensor tendon at or distal to the DIP joint of the fingers or IPJ of the thumb. Associated with mallet finger. Extensor lag may be present, but patients are still able to extend the proximal interphalangeal joint.
- **Zone 2:** Disruption of the tendon over the middle phalanx of the finger or proximal phalanx of the thumb
- **Zone 3:** Disruption of the central slip at the PIP joint of the fingers or MCP joint of the thumb (EPL and EPB). Associated with boutonniere deformity
- **Zone 4:** Disruption of the tendon over the proximal phalanx of the finger or metacarpal of the thumb (EPL and EPB)
- **Zone 5:** Disruption over the MCP joint. **Common pitfall to assume to be a closed fist injury/human bit
- **Zone 6:** Disruption overlying the metacarpals; commonly associated with neurovascular injury. Difficult to diagnose without exploration
- **Zone 7:** Disruption at the wrist joint. Occurs under the retinaculum and is complicated by adhesions.
- **Zone 8:** Disruption of the tendon if distal, or muscle belly if proximal. Associated with injuries to the interosseous nerve



Extensor Tendon Zones

APPROVALS

- Medical Director, Transfer Center
- Medical Director, Emergency Medicine
- Medical Director, Trauma

DATE APPROVED

August 19, 2026