PAEDIATRIC ACUTE CARE GUIDELINE	
Fractures – Hand	
Scope (Staff):	All Emergency Department Clinicians
Scope (Area):	Emergency Department

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Fractures – Hand

This guideline is specific for the assessment and management of fractures of the hand and fingers.

Background

- Hand trauma is a common presentation in children
- Young children tend to present with crush injuries as they explore their environment with their hands
- Older children tend to sustain hand fractures from sport injuries
- At PMH, hand injuries which affect normal hand function are referred to the plastic surgery team

Assessment

- Thorough examination of normal hand function is important to detect underlying fracture, tendon or nerve injury

Examination

- Compare both hands and look for bruising, erythema, swelling and deformity
- Rotational deformities may be more obvious when the patient makes a fist
- Palpate for obvious areas of tenderness
- Assess for any neurovascular compromise
- Passive and active range of movement of all joints in hand and wrist should be

examined. Testing against resistance may identify ligamentous injury.

Investigations

X-Rays are based on clinical assessment, mechanism of injury and suspected injuries

- Standard PA and lateral view of the hand. Refer to Radiology Requests – Limb X-Rays
- Standard PA, oblique and lateral view (of affected finger). Refer to Radiology Requests – Limb X-Rays
- X-Ray specific areas of focal bony tenderness

Management

- All hand fractures distal to the carpal bones which may affect normal function are managed by the plastic surgery team at PMH
- Compound and complicated hand fractures should be referred immediately to the plastic surgery team

Initial management

- Analgesia (consider nerve block)
- Examination for neurovascular injury (if deficit evident manage immediately)
- Ice and elevation of affected limb
- Antibiotics for compound fracture and consider tetanus
- Keep nil by mouth if referral to hand surgeon is required

Further management

Complicated Hand and Finger Fractures

Refer any complicated fractures immediately:

- Compound fractures
- Amputations
- Associated tendon injury
- Neurovascular compromise

Resting Volar Splint

The resting volar splint can be used to immobilise most acute hand fractures. It is a position of safe immobilisation with minimal strain on hand ligaments.

- Splint/plaster on volar (palmar) aspect of hand and forearm
- Wrist in 30º extension
- MCP joints flexed to 60º – 90º

- IP joints at 180º (fingers fully extended)

Phalangeal Fractures

Distal Phalanx		
Distal tuft fractures	Simple tuft fractures are managed with buddy strapping or aluminium splint and simple analgesia. If associated pulp laceration, antibiotics may be required. Simple tuft fractures can be followed up by GP. If associated nail bed injury, refer to plastic surgery.	Longitudinal fracture of 3rd distal phalanx
Mallet Injury	Injury to DIP joint with extensor tendon avulsion or tear. Refer immediately if > 30% intraarticular surface involved. Stax or Zimmer splint and follow up in plastic surgery clinic. See Mallet Finger guideline.	Mallet injury
Middle Phalanx		
Undisplaced stable shaft fracture	Buddy strap and volar slab with follow up plastic surgery clinic in 5 days.	
Displaced/angulated shaft or intra-articular fracture	Reduce fracture under ring block +/- sedation if appropriate. Otherwise refer to plastic surgery. Resting volar splint and follow up plastic surgery clinic as per plastic surgeon.	Salter Harris IV fracture of middle phalanx
Volar plate injury	Resting volar splint and follow up plastic surgery clinic in 5 days.	Volar plate injury
Proximal Phalanx		
Undisplaced stable shaft fracture	Buddy strap and volar slab. Follow up plastic surgery clinic 5 days.	Undisplaced fracture of proximal phalanx

Displaced/angulated shaft or intra-articular fracture	Reduce fracture under ring block +/- sedation if appropriate. Otherwise refer to plastic surgery. Resting volar splint and follow up plastic surgery clinic as per plastic surgeon.	Intra-articular fracture of proximal phalanx
Base of thumb	Undisplaced Salter Harris II fracture – thumb spica and follow up plastic surgery clinic in 5 days. Displaced Salter Harris II fracture – reduce fracture under ring block +/- sedation if appropriate, thumb spica and follow up plastic surgery clinic as per plastic surgeon. Otherwise refer to plastic surgery. Salter Harris III avulsion fracture of ulnar collateral ligament ("Gamekeeper's" or "Skier's" Thumb)- thumb spica and follow up plastic surgery clinic as per plastic surgeon.	Salter Harris II fracture of proximal phalanx with dorsal angulation
Finger Amputations		
All finger amputations should be referred **urgently** to plastic surgery	Stump care – irrigate with saline and cover with saline soaked gauze. Care of amputated digit – irrigate with saline, wrap in saline soaked sterile gauze, place in water tight plastic bag, place in ice slurry. Keep NBM, give intravenous antibiotics and tetanus booster (if required).	Partial amputation of left index finger

Metacarpal Fractures

Metacarpal Fractures		
Undisplaced stable fractures of neck or shaft (2nd – 5th metacarpal)	Resting volar splint and follow up plastic surgery clinic in 5 days.	Undisplaced 4th metacarpal fracture

Angulated neck of metacarpal fracture – most common is 5th ("Boxer's Fracture")	Reduce fracture under nerve block +/- sedation if appropriate. Otherwise refer to plastic surgery. Resting volar splint and follow up plastic surgery clinic as per plastic surgeon.	5th metacarpal fracture
Displaced intra-articular, unstable, comminuted or irreducible fractures	Refer to plastic surgery team	
Thumb metacarpal fractures	Undisplaced fracture – thumb spica and follow up plastic surgery clinic in 5 days. Refer immediately if significant angulation or displacement.	Base of 1st metacarpal fracture

Referrals and follow-up

- Plaster check within 24 hours
- Follow up in Plastic Surgical Clinic as required

Health information (for carers)

- Pain Management Health Fact Sheet
- Patients with Plasters Health Fact Sheet
- Advise parents of signs and symptoms of compartment syndrome

Nursing

Routine nursing care.

Tags

buddy strap, crush, deformity, dislocation, finger, fingertip, fracture, fractures, growth plate, hand, hand trauma, injuries, injury, mallet, metacarpal, palmer, phalangeal, phalanx, plastic surgeon, plastic surgical, plastics, stump, thumb, volar

References

Yeh PC, Dodds SD. Pediatric Hand Fractures. *Techniques in Orthopedics.* 2009; 24(3): 150-162
Andrade A, Hern HG. Traumatic Hand Injuries: The Emergency Clinician's Evidence Based Approach. *Emergency Medicine Practice.* 2011; 13(6)

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