HAND INJURIES

Who should treat?
There can be no hard and fast rules. This will depend on the skill and experience of the medical staff at the time and the nature of the injury in any individual patient

General Principles of Management

The ultimate goal of treatment is good function
Initially healing and stability are important
However normal hand function requires maximum flexibility and sensibility
Immobilisation, oedema and scar formation → STIFFNESS
Oedema can cause
- reduced arterial flow
- reduced venous drainage
- more scar formation
- pressure and discomfort
- limit movement

Scar contraction leads to joint stiffness, fixation and deformity
Pain contributes to the cycle
Eventual result is the hand in a position of non function

The position of non function is unacceptable

[Image of a hand in a position of non function]
This is avoided by
Splintage in an appropriate position
Initial rest
Elevation
As early mobilisation as the injury will allow

The Intrinsic Plus or the Protected Position
i.e. the position from which recovery of function is most likely

splints and bandages must not constrict

the minimum number of joints required to support the injured part should be immobilised

movements of adjacent joints MUST be encouraged especially in the elderly

when splintage is applied simply for pain relief, it should be removed at the earliest opportunity to allow early mobilisation

Elevation should be to the level of the heart or above

In hospital
The outpatient
Elevation in bed
Examination

Note mechanism site, size, type (incised etc)

Check movement and sensation distally
This may be difficult due to pain-try
If any doubt about nerve or tendon injury-refer
If radio-opaque foreign body possible-x-ray
If biological foreign body possible-refer
If wound clean and simple treat and refer to GP
If burst or flapped-minimum or no sutures
No tension-arrange follow up
Major injuries-refer ortho or plastics

Typical appearance in nerve injury
Sensation may be ‘different’ or absent

Closed Injuries

If very swollen, bruised or deformed-minimal gentle exam-x-ray early

If swelling, bruising minimal
Careful gentle thorough palpation
Try to make diagnosis.
At least try to pinpoint damaged structure-will allow rational x-ray request
FINGER TIP INJURIES
Nail Injuries

Anatomy

Fractures
Most closed fractures are of no serious significance
Most are very painful-protect with padded dressing
Subungual haematoma should be trephined (A below)
Injury to the sensitive pulp plus swelling often produces prolonged persistent tenderness
Angulated fractures are more serious and should be treated as below.

Repair of nailbed
Poor healing produces scars which cause troublesome nail deformity
Careful repair with a 6.0 absorbable suture is necessary
This requires exposure by removal of the nail
We tend not to replace the nail after removal
**Repair of nail bed with phalanx fracture**
The nail bed along with the germinal matrix is often avulsed as the fracture angulates. The germinal matrix should be sutured back into the proximal nail fold.

**Amputation of fingertip**
Most pulp amputations can be treated conservatively
With antiseptic cream in an occlusive dressing
-plastic glove-
More extensive tissue loss may require skin grafting or local flaps e.g. V-Y advancements
seek advice

**Finger amputations**
As much length as possible should be preserved-REFER

**Thumb amputations**
The thumb should be regarded as a vital organ. Reconstruction should always be considered-see advice re Plastic referral

**FRACTURES**

**General Principles**
Most fractures are stable and can be treated by a short Period of immobilisation and then rapid mobilisation with two-finger strapping
clinical examination should differentiate STABLE and Unstable injuries. Unstable injuries will require fixation with k-wires, screws and or external fixator devices. These should be referred beware or rotatory deformity.

**Distal Phalanx**
Treat soft tissue injury as above. If fracture is transverse and unstable then fixation with k-wire required.
**Mallet Injury**
If no fracture or small fragment treat with mallet splint, give advice card and refer to clinic at 2 weeks. Usually require 6 weeks splintage-2 weeks night splintage. With large fragments joint may be unstable-require fixation-refer

**Fractures (cont.)**

Fracture terminology
- Deforming forces in hand fractures
Middle and Proximal Phalanges

<table>
<thead>
<tr>
<th>Fracture Type</th>
<th>Stability</th>
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<tbody>
<tr>
<td>Neck and condyles</td>
<td>almost always unstable-refer</td>
</tr>
<tr>
<td>Shaft-stable</td>
<td>buddy strap &amp; refer next # clinic</td>
</tr>
<tr>
<td>Shaft-unstable</td>
<td>refer</td>
</tr>
<tr>
<td>Base-transverse</td>
<td>often angulated-refer</td>
</tr>
<tr>
<td>Base-fracture-dislocation (PIPJ)</td>
<td>very unstable-refer</td>
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Metacarpals
From little to index and with multiple fractures these is increasing soft tissue swelling, restriction of motion and longer recovery

Neck of 5th metacarpal
Angulation and impaction are common. When angulation is slight or moderate (<30 degrees) it should be accepted. Always check for and document presence/absence of rotational deformity of little finger. If reasonably comfortable treat with buddy strapping/padded crepe. If very painful requires volar slab. Ortho # clinic follow up
If very angulated attempt to correct and splint MPJ in flexion
Shaft and basal metacarpal
Most are satisfactorily treated in volar or colles’ casts-ortho # clinic follow up
NB rotation at oblique and spiral fractures and marked angulation or displacement will require reduction and internal fixation. Obtain a true lateral hand x-ray if any doubt regards position of fracture.

Thumb metacarpal base
Easily mistaken for scaphoid fracture clinically

Basal shaft
If angulated should be manipulated and fixed in cast
If unstable may require k-wire fixation usually under GA

Bennet’s fracture
Best treated by reduction and k-wire fixation-refer ortho
Sprains and dislocations

NB finger joints have a volar plate and collateral ligaments with 2 parts

**Stable** collateral ligament injuries are treated with buddy strapping for 3 weeks. Pain stiffness and fusiform swelling can take many months to settle. The patient must be advised of this and encouraged to persist with mobilisation. Stability should be checked-under LA if necessary

**Unstable** injuries should be referred. Look out for avulsion fractures-if rotated-refer-will require fixation
Thumb MPJ
Complete tears of the ulnar collateral ligament are always unstable. Always check stability under LA if necessary and refer. Always check for rotated avulsion fragments. If stable support in volar slab or scaphoid cast-ortho # clinic follow up

Thumb MPJ cont.

Dislocations
Most dislocations are easily reduced under LA. Always check the integrity of the collateral ligaments and volar plate. If unstable-refer
Irreducible dislocations are uncommon but require skilled operative reduction-refer

Fracture-dislocations
PIPJ most commonly. Major injuries. Usually very unstable must be splinted in flexion after reduction-refer
Hand Infections

**Paronychia**
If no pus present   treat with antibiotics
If pus present   drain under ring block may require removal of nail. Generally
don’t require antibiotics after drainage unless tracking cellulitis/lymphangitis
NB LA often ineffective in presence of inflammation-inject well away from septic area

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**Finger Pulp Abscess**
Very painful. Rapid invasion of bone (osteitis)
Incise immediately
Ensure the pus has drained

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**Flexor sheath Infection**
Serious infection with rapid spread and destruction
of finger-spread to palmer spaces leads to septicaemia
Admit immediately.drain-IV antibiotics
Elevate-splint in protected position
Kanavel's Signs of flexor tendon sheath infection

Pathways of spread of flexor sheath infection
- Index flexor sheath: thenar space
- Ring and mid sheaths: mid palmar space
- Thumb and little finger: Parona's space

Palmar space infection
Rare - dorsal swelling can be misleading

Septic Arthritis
Primary - uncommon. Can occur with flexor sheath infection
Common ‘bite’ punch injury. If presents on day of injury x-ray for tooth fragment.
Thorough cleaning of wound. **If the wound is thought to have penetrated the joint capsule or the extensor tendon is exposed, these wounds should be referred to the orthopaedic surgeons for formal exploration.**

Osteitis
Uncommon - usually after pulp abscess

High Pressure Injection Injuries
BEWARE - may seem innocuous
x-ray for lead in paint etc
refer ortho as rapid destruction of tissues can occur
wounds need opened and cleaned in theatre
MAJOR INJURIES

Crush Injuries

Deep Abrasions

Complex Injuries

All can involve multiple tissues: skin, tendon, vessel, bone/joint
Refer orthopaedics or plastics

Vascular Injuries

Amputations, ring avulsions and degloving injuries
Refer orthopaedics or plastics

Indications for Replantation

Indications

1. Injuries to multiple digits which includes the single digit amputations in which the remaining digits are still attached although severely injured
2. Most amputations of the thumb, particularly if it is proximal to the IP joint
3. Amputations in children, sometimes even single digits
4. Clean amputations at hand, wrist or distal forearm level

Relative contraindications

1. Amputations due to severe crush or avulsion injuries
2. Single digit amputations in adults, particularly if severed between the MP and PIP joints. Here occupation, hobbies, cultural considerations and informed patient choice play a large role in determining the advisability of replantation
3. Heavily contaminated amputations
4. A significant smoking history

Absolute contraindications

1. Severe associated medical problems or injuries
2. Severe multi-level injury in the amputated part

Last reviewed January 2003