

## 4.2 Hand injuries

**These are very common and often very disabling. It is essential to manage these well from the outset, as it can be an unforgiving area.**

- Always draw diagrams.
- Document presence or absence of tendon activity, nerve function and vascularity.
- Document method of injury, handedness, time of injury, and occupation.
- If in doubt ask for senior advice, or treat with rest, elevation (admission to Ward 1 if necessary) and A&E RC for senior to see in the morning.

### Thumb 8D

SITE OF INJURY	LOOK OUT FOR	1e MANAGEMENT	DISPOSAL
Ulnar collateral ligament MCP jt	Instability (ie no end-point on stressing), Steiner bony fragment	High arm sling	Immediate Hand Surgery referral
Radial collateral ligament MCP jt	Instability (ie no end-point on stressing), Steiner bony fragment	FWS with thumb extension	A&E RC 5-7 days
Prox phal # not involving joint	Deformity	Immobilize in a backslab.	If cannot be corrected then immediate Hand Surgery referral. If corrected A&E RC 5-7 days
First MC # involving C-MC joint (Bennetts #)	Displacement	Analgesia and high arm sling.	Immediate Hand Surgery referral

### Finger-tip injuries

- In children do remarkably well with minimal treatment. Resist the desire to do anything surgical!
- In adults there is still scope for a lot of recovery, though severe mutilations will need terminalising. We usually carry this out in our department under local anaesthetic, but this can be delayed for a suitable time/surgeon in A&E. Most of these patients DO NOT NEED ADMITTING. If sutures are required, please use catgut. See also "Nail injuries"

### Nail injuries

- If significantly damaged, remove the nail under ring block. You will often find a rip in the nail bed. If so, suture it with 5/0 vicryl. If possible put the nail back over the repair, as it acts as an excellent non-stick dressing.
- In children, the nail must be re-located, but further surgery is usually not required. Beware of injuries where the nail bed is flipped over the epinychial fold; these must be re-located, and in children may conceal an epiphyseal fracture.

### **Fish-hook injury**

If the hook is still present, anaesthetise the injured area, clip the hook with cutters, and put it through in its original direction of travel. Cover for tetanus. Clean and dress the wound, give prophylactic antibiotics and discharge.

### **FINGER FRACTURES**

- Generally need anatomical reduction, which is usually achieved by local anaesthetic block, simple traction (be brave here!), and holding in reduction.
- Maintenance position may vary (flexed or straight), consider neighbour strapping, Zimmer splinting, or palmar pad. If in doubt and no senior available, place in position of comfort and bring back to next A&E RC.
- Always do post reduction Xray. Exceptions are mallet fractures, which need a special Mallet splint, and 5th metatarsal head or neck (not shaft) fractures, which don't require reduction.
- Take special care of proximal phalangeal fractures as these can lead to poor repair with deformity

### **Fingers 8D**

<b>SITE OF INJURY</b>	<b>LOOK OUT FOR</b>	<b>1e MANAGEMENT</b>	<b>DISPOSAL</b>
# prox phalanx	Rotation, AP or lateral deformity, oblique fractures	MUA if displaced, neighbour strap & volar slab or palmar pad	If cannot be corrected then immediate Hand Surgery referral otherwise A&E RC 5-7 days
PIP dislocation	avulsion #, instability	MUA, post reduction xray, neighbour strap & palmar pad	A&E RC 5-7 days
volar plate injury PIP	avulsion #, instability	Neighbour strap & palmar pad	A&E RC one week
avulsion # middle phalanx	instability	Neighbour strap & palmar pad	A&E RC one week
mallet with avulsion #	Subluxation. >1/3 of articular surface fractured	mallet splint	A&E RC 5-7 days. If >1/3 articular surface fractured the refer to hands at SJUH
mallet - no #		mallet splint	A&E RC 2 weeks

### **Flexor tendon injury**

Any significant wound over a hand/finger flexor surface may have injured the underlying tendons. Therefore examine them specifically and note your findings. If there is a definite tendon injury, discuss with A&E Senior, then refer to Hands St James'. If you are not sure, bring the patient back to the next A&E RC.

### **Trigger finger**

Painful clicking of the finger on flexion. The cause is a nodule on the flexor tendon, which catches on the sheath. Best treated with a steroid injection; refer to A&E RC 5-7 days.

### Extensor tendon injury

- Partial injuries where function is preserved do not need repair.
- Don't rely on the wound appearance but on function. Beware around the thumb/radial styloid where tendon loss may not be detected clinically.
- For partial damage, close the skin wound and protect the tendon by splinting the digit in extension (usually with a zimmer splint). Bring back to A&E RC either 2 days for wound check (if risk of infection) or 3 weeks for removal of splintage.
- If complete division of tendon, seek senior help. These injuries need to be repaired using non-absorbable suture, closure of skin, antibiotics then splint and follow up as above.
- If in doubt what to do and no senior help available, close the skin, put on antibiotics, splint and bring back to next A&E RC.

### Mallet finger

This is a dropped distal inter-phalangeal joint, often following fairly minor injury. Flexion is possible but not extension. Check the X-ray for a fracture. If fragment is less than 1/3 of joint surface, treat in a mallet splint which must not be removed for 4 weeks. If fragment is greater than 1/3 joint surface, ask A&E senior or refer Hands St James's. If no fracture, Mallet splint for 6 weeks. Give information leaflet to stress the need not to remove the splint. Bring back to A&E RC after 2 weeks for all cases (unless sent to St James's).

### Metacarpal fractures

See Hand 8H

*Shaft:* Check for angulation (>30degrees) or rotation of digit. If present, manipulation required. If unstable at manipulation, refer to Hands St James's for internal fixation. If stable, volar slab for index or middle metacarpal, ulnar border slab or ring or little finger metacarpal with fingers in extension.

*Neck:* Much more deformity acceptable. Operative treatment or manipulation rarely undertaken. Immobilize in a palmar pad, or, if required for stability, a moulded POP.

### Hand 8H

SITE OF INJURY	LOOK OUT FOR	1e MANAGEMENT	DISPOSAL
carpo-metacarpal dislocation	Associated #	MUA, Colles backslab	A&E RC 3-4 days
# thumb metacarpal	Subluxation of thumb carpo-mc jt	If simple fracture of Metacarpal then MUA and Scaphoid cast	A&E RC 5-7 days.
# dislocation thumb carpo-mc jt (Bennett's)	Don't try manipulation	Analgesia and high arm sling	Immediate referral to the Hand Surgeons, St James's
# base 5th mc ("baby Bennett's")	Subluxation of carpo-mc jt	Ulnar border POP, unless subluxed	A&E RC 5-7 days. If subluxed, immediate referral to the Hand Surgeons, St James's

SITE OF INJURY	LOOK OUT FOR	MANAGEMENT	DISPOSAL
# mc neck	Gross angulation	MUA only if <b>grossly</b> displaced, neighbour strap, volar slab or palmar pad and high arm sling	A&E RC 3-5 days
# mc shaft	Gross angulation, shortening, rotation of finger	MUA if clinically displaced, POP volar slab to fingertips in slight flexion & high sling	A&E RC 3-5 days

### 4.3 Management of traumatic wrist pain.

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#### OBJECTIVE

To describe a process for the safe and efficient management of traumatic wrist pain, which rapidly discriminates between simple sprain and more serious pathology.

#### CLINICAL CONDITION

Trauma sustained to the wrist is a common cause of presentation to the Accident and Emergency department. The most common mechanism of injury is a fall on the out stretched (or less commonly flexed) hand. Other less common mechanisms are crush, knocks or punches, RTA, and hyperextension injuries<sup>1</sup>. The most common significant injury after trauma to the wrist is a fracture of the scaphoid bone but many other differentials exist.

#### TARGET PATIENT GROUP

Trauma patients who subsequently complain of wrist pain.

#### SEQUENCE OF INVESTIGATIONS and DIAGNOSIS

- There is no substitute for taking a *careful history* of the mechanism of injury. This does not need to be lengthy, but does need to be precise. A fracture will usually be preceded by significant injury, and if the patient has no history of injury, this will usually mean no fracture. In the same way, high impact trauma will often result in a significant injury. This guideline does not attempt to cover non-traumatic conditions.
- The examination finding of *non-focal tenderness* implies either trivial injury, or (if the injury is high energy), an injury which may require follow up after simple rest (high sling & analgesia). High impact injuries may result in lunate dislocation, or lesser variations (dorsal or volar intercalated segmental instability) and warrant senior medical involvement. The range of other investigations that may be required is outside the scope of this guideline.
- *Focal tenderness* should lead to x-ray. Occasionally the tenderness is associated with a history of repetitive use, and there is soft tissue crepitus on

- tendon movement, in which case, consider paratendonitis crepitans. Tenderness over the anatomical snuff box should result in specific scaphoid views. Pain should be elicited at the extremes of movement and with axial loading (thumb compression). Axial pressure, AP pressure, swelling and ASB pressure with the wrist in ulna deviation may all be helpful in determining the presence of a scaphoid fracture. AP tenderness has a sensitivity of 91% and specificity of 83%, whereas ASB tenderness has a sensitivity of 86% and specificity of 72%<sup>2</sup>. It has also been suggested that pain when percussing over the head of middle metacarpal is suggestive of scaphoid fracture<sup>3</sup>.
- *Scaphoid films at day 0* have a sensitivity of 80% in detecting scaphoid fracture<sup>2</sup>. Audit has shown that of the index population sent for scaphoid x-rays, 12.7% are said to have a scaphoid fracture<sup>1</sup>, although only 9.4% of these are proven to be so on senior review, 70% of which were seen on first x-ray. Many are distal pole fractures and waist fractures only account for about 4% of the index population.
- *A normal x-ray at 10-14 days should result in an early bone scan*, which can be immediate. A normal bone scan excludes serious injury<sup>4,5</sup>, and can lead to safe discharge of the patient. It can be carried out anytime from 72 hours<sup>6</sup>.
- *MRI conveys no benefit over bone scintigraphy* on present evidence<sup>7,8</sup> for most cases, though is known to have a very high sensitivity and specificity, and may be very helpful in more difficult cases<sup>9</sup>.

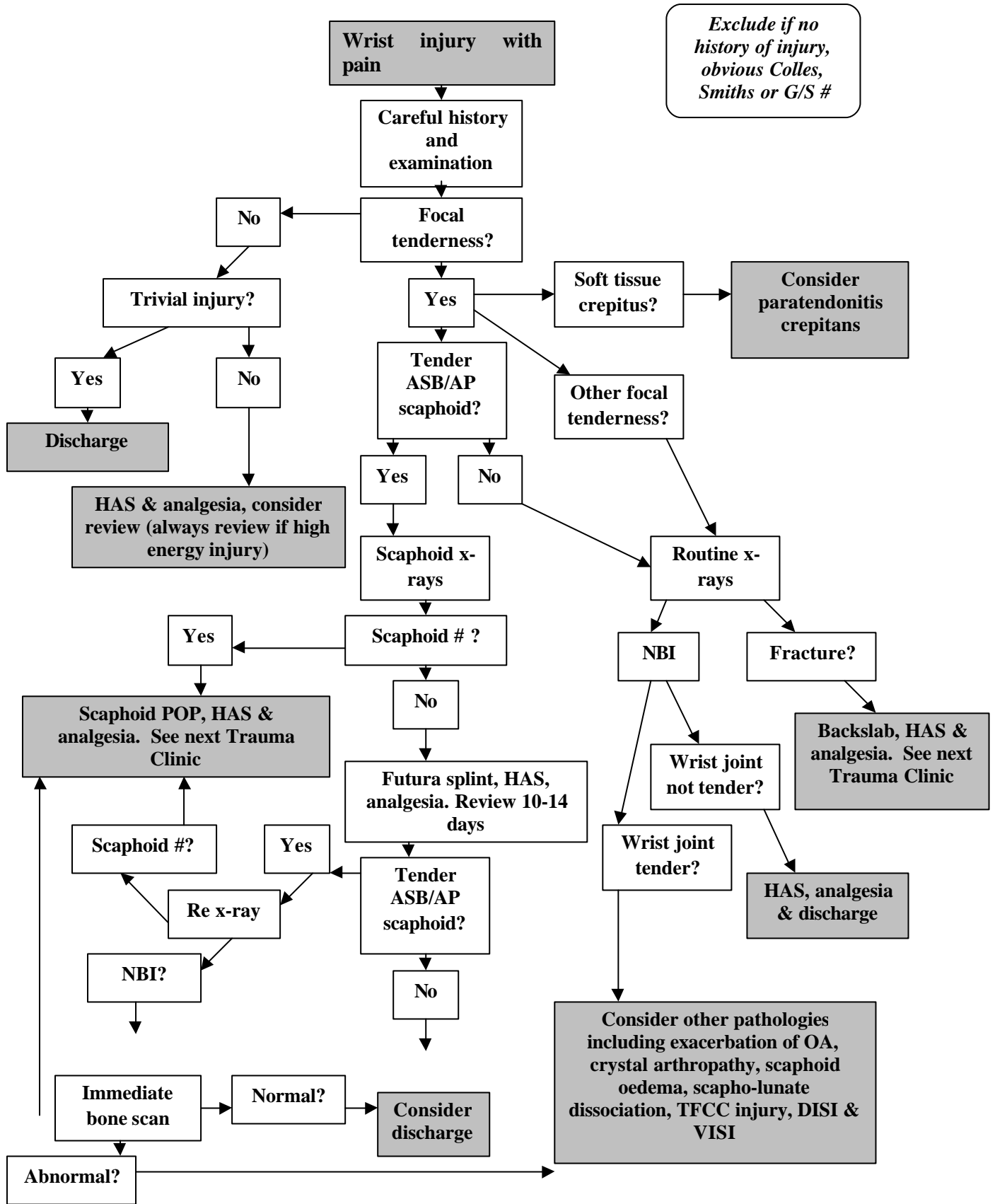
## TREATMENT

- Patients in *whom scaphoid fracture is never suspected*, and who have normal x-rays, and who do not have wrist joint tenderness may be safely discharged (high sling & analgesia).
- Those with *non-ASB wrist joint tenderness* may have other problems, such as fracture of another carpal bone, paratendonitis crepitans, exacerbation of OA, crystal arthropathy, scapho-lunate injury, dorsal or volar intercalated segmental instability, TFCC injury and median nerve compression - follow up is recommended. Further imaging and investigation will be required in some cases, and senior medical involvement is necessary. The range of treatments that may be required is outside the scope of this guideline.
- Patients in whom *scaphoid fracture is a possibility*, but who have normal x-rays should be reviewed at 10-14 days for a repeat x-ray. Immobilization can be by any means that is appropriate to the level of pain, and, as yet, there is no clear evidence to support one method of immobilization over another<sup>10,11,12</sup>. The standard that is recommended is a fabric wrist support (Futuro), with or without a thumb extension, together with a high arm sling and analgesia. Those in more pain may require a Colles backslab, or occasionally a scaphoid cast.
- *Obvious fractures* should be immobilised in a plaster or resin scaphoid cast, given a high arm sling and analgesia, and brought back to the trauma/fracture clinic the following day.
- *Displaced wrist fractures* should be dealt with according to local policy

## KEY MESSAGES

- ✓ The most effective clinical examination to detect scaphoid fracture is AP compression combined with ASB tenderness in an ulna deviated wrist
- ✓ Focally tender wrists need x-raying
- ✓ The first scaphoid x-ray is 80% sensitive for scaphoid fracture
- ✓ In x-ray negative patients with ASB tenderness, there is no evidence to support one method of immobilization over another; we recommend a semi-rigid fabric wrist support.
- ✓ In most cases follow up at 10-14 days should be arranged following a negative first scaphoid x-ray
- ✓ Bone scans can be carried out early (any time from 72 hours) though we recommend waiting until a 10-14 day second x-ray is negative.
- ✓ Non ASB wrist tenderness, or persisting ASB tenderness in the presence of a normal bone scan requires further investigation.

CLINICAL ALGORITHM



## REFERENCES

1. Elson David. LGI Clinical Governance data, January 2002.
2. Taylor, Tony. LGI Clinical Governance data, April 2001.
3. The wrist. Chapter 74 in King and Bewes. Primary surgery volume two. (trauma) Oxford Medical Publications.1987
4. Wilson AW, Kurer MH, Peggington JL, Grant DS, Kirk CC. Bone scintigraphy in the management of x-ray-negative potential scaphoid fractures. *Archives of Emergency Medicine*. 1986; 3(4):235-42.
5. Murphy DG, Eisenhauer MA, Powe J, Pavlofsky W. Can a Day 4 Bone Scan Accurately Determine the Presence or Absence of Scaphoid Fracture? *Annals of Emergency Medicine*. 1995; 26(4):434-8.
6. Stordahl A, Schjoth A, Woxhott G, Fjermeros H. Bone scanning of fractures of the scaphoid. *Journal of Hand Surgery* 1984;9B(2):189-190
7. Tiel-van Buul MM, Roolker W, Verbeeten BW, Broekhuizen AH. Magnetic resonance imaging versus bone scintigraphy in suspected scaphoid fracture. *European Journal of Nuclear Medicine*. 23(8):971-5, 1996 Aug.
8. Tiel-van Buul MM, Broekhuizen TH, van Beek EJ, Bossuyt PM. Choosing a strategy for the diagnostic management of suspected scaphoid fracture: a cost-effectiveness. *Journal of Nuclear Medicine*. 36(1):45-8, 1995 Jan.
9. Gaebler C, Kukla C, Breitenheher M, Trattnig S, Mittlboeck M, Vecsei V. Magnetic resonance imaging of occult scaphoid fractures. *Journal of Trauma-Injury Infection & Critical Care*. 41(1):73-6, 1996 Jul. Clay NR, Dias JJ, Costigan PS, Gregg PJ, Barton NJ. Need the thumb be immobilised in scaphoid fractures? A randomised prospective trial. *J Bone and Joint Surgery (Br)*. 1991; 73(5): 828-32.
11. Sjolín SU, Anderson JC. Clinical fracture of the carpal scaphoid – supportive bandage or plaster cast? *J Hand Surgery (Br)* 1988; 13: 75-6.
12. Jacobsen S, Hassani G, Hansen D, et al. Suspected scaphoid fractures. Can we avoid overkill? *Acta Orthop Belg* 1995; 61:74-8.

## Specific Wrist Injuries

### Colles fracture

Anatomical reduction should be the aim of treatment unless the patient is very elderly or disabled. Reduction can be achieved in most patients over the age of 50 using a haematoma block. This consists of the injection of up to 10mls of 1% lignocaine into the fracture site. Do not forget the ulna styloid. Adequate reduction is rarely achieved without significant traction. The procedure for reduction cannot adequately be described here, but it is well described in several books, for instance - *Practical Fracture Treatment* by McCrae. The manipulated fracture should be held in place with a dorsal back slab and the patient should leave with a high arm sling. They should be referred to Ortho trauma clinic the following day.

In terms of the best procedure for reduction, between Biers block and haematoma block, evidence shows outcomes are significantly better with the use of Biers block as opposed to haematoma block. However haematoma block seems to be the most popular method. The reasons for this appear to be lack of training, fear of complications and the fact that Bier block is more time consuming. These issues should be borne in mind when choosing the reduction anaesthetic technique.

### Lunate injury

Easily missed. Small chip dorsal fractures are common and not too important. Perilunate dislocation is a serious problem. Radiologically it is visible on the lateral as the absence of the series of 'C's which are usually seen. Needs immediate referral for senior A&E advice, or referral to St James's Hands on call.

**Ulna fracture**

See also "Forearm 8F" "Radial fracture" and "Olecranon fracture". A small fracture of the ulna styloid usually accompanies a Colles fracture. Shaft fracture should be handled as radial shaft fractures. Watch for injury to joints above and below; therefore x-ray joints above and below.

**Radial fracture**

Common injury, either as a Colles fracture, or radial head fracture. Greenstick shaft fractures are common in children. In these instances, X-ray the joints above and below to check for other fracture or dislocation

SITE OF INJURY	LOOK OUT FOR	MANAGEMENT	DISPOSAL
Colles #,	correct angles on XRay	If undisplaced, Colles POP. If displaced, haematoma block or Biers block, manipulation, colles POP, check Xray. If young adult may need GA.	Orthopaedic trauma clinic
# separation of lower radial epiphysis ("juvenile colles")	correct angles on XRay	If undisplaced, Colles POP. If displaced, probably needs GA.	Orthopaedic trauma clinic or 2C if displaced
# scaphoid	specific xrays	Scaphoid POP	Orthopaedic trauma clinic
? # scaphoid	specific xrays	Scaphoid POP	A&E RC 10-14 days
Lunate / perilunate dislocation	Commonly missed	Immediate hand surgery referral. Needs GA	Orthopaedic trauma clinic
Other carpal #'s (hamate, lunate, triquetral, pisiform)	Commonly missed	Colles POP	A&E RC 2 weeks