BACKGROUND/RATIONALE

Clinical examination and plain radiographs are known to be poor at identifying scaphoid fractures immediately after the injury. Retrospective studies suggest that 10-33% of patients with a proven fractured scaphoid had no fracture visible on the initial plain films. In patients with clinical findings suggestive of fractured scaphoid, and normal scaphoid views, current practice is to immobilise in plaster for ten days before a repeat clinical examination and plain x-ray in the fracture clinic.

It is also known that relatively few 7-20% of patients immobilised will subsequently be shown to have a fracture. Therefore approximately 90% of such patients do not need such immobilisation which incurs a significant cost to the individual and community, in terms of lost working days.

DESIRED OUTCOME/OBJECTIVE

- To minimise the risk of long-term morbidity associated with missed fracture of scaphoid: osteoarthritis of the wrist, long-term functional disability and chronic pain.

- To standardise the documentation of clinical findings in wrist injuries with an emphasis on findings known to assist in the diagnosis of scaphoid fractures.

- Appropriate ordering of scaphoid x-rays and advanced imaging with appropriate standardised follow-up according to a clinical pathway.
INDICATIONS

For Imaging

- Majority of patients with wrist injuries need an x-ray (have low threshold).
- All scaphoid x-rays to be ordered using the appropriate yellow radiology request form.
- All scaphoid CT to be ordered using the appropriate blue radiology request form.

DEFINITIONS of patients eligible for enrolment in the current study of “early CT to rule out scaphoid fracture”

Inclusion criteria

A clinical scaphoid fracture will be defined as patients with:
- the presence of “snuffbox tenderness”.
- mechanism of injury consistent with scaphoid trauma.
- normal initial radiographs.
- ED patients over the age of 14 years.

Exclusion criteria

- Patients under 14 years of age.
- Patients who are known to be pregnant.
- Patients who are unable to give informed consent.
- Patients/guardians who do not consent to participate.

ISSUES TO CONSIDER

Background on advance imaging

Bone scan

Early (day four) radioisotope bone scans are very sensitive meaning that they are useful in ruling out scaphoid fracture, but unfortunately significantly over-diagnoses fractures. Radioisotope bone scans involve a significant radiation dose, and are expensive, costing $300 in Australia.

CT

Several small studies have advocated the role of CT in suspected scaphoid injuries (22,23,24,25,26). Unfortunately there are no larger studies that examine the role of CT in diagnosis of clinical scaphoid fracture.

A research project at BHS has demonstrated that early CT scans are a reliable, accessible, cost effective alternative. Fifty patients completed the study protocol. For any fracture (both scaphoid and other carpal fractures, early CT had a 100% negative predictive value and 100% positive predictive value. These results are currently being submitted for publications. However this is not yet accepted as standard practice outside of this trial.

MRI

MRI is more specific than bone scan (16) in detecting occult fractures of the scaphoid and other bones in the wrist, particularly in diagnosing soft tissue injuries like scapho-lunate ligament ruptures and triangular fibrocartilage tears (17, 18). While some authors state that MRI should be regarded as the gold standard (19), MR scans are expensive ($475) and difficult to obtain in Australia.
PROCEDURE

Minimum Documentation required:
- Mechanism of injury
- Presence and site/s of any tenderness, swelling or deformity
- Presence or absence of
  o snuffbox tenderness
  o AP compression tenderness
  o Thumb axial compression tenderness
Order x-ray with appropriate clinical details noted on form

- F**racture seen on x-ray:**
  - Refer to orthopaedic registrar if clinically indicated
  - Plaster appropriately and
  - Fracture clinic referral
    o Fax completed form
    o Copy to file
    o Copy to patient

Is a fracture seen on plain x-ray?

Is a scaphoid fracture suspected on clinical grounds?

Yes

Treat as soft tissue injury
Advise to see GP in 5-7 days in significant ongoing pain and disability

No

1. Offer patient opportunity to be involved in trial:
   a. If patient declines, treat in plaster for 10-14 days and refer to fracture clinic, with repeat x-ray slip.
2. Document written informed consent and place signed consent form in envelope addressed to Principal Investigator.
3. CT same day or via ED [8.00 a.m. next working day]
4. ED physician review of CT reports.
5. Treat based on CT results.
   a. If scaphoid fracture, referral faxed to fracture clinic scaphoid plaster for six weeks.
   b. If other carpal fracture, refer to fracture clinic. Plaster likely for four weeks.
   c. If no fracture seen, treat as soft tissue injury and discharge home.

Stickers to improve medical documentation.
To assist with minimum clinical information required, use the “easy to use” stickers on the chart.
All medical staff are expected to have completed meditute
on wrist injuries at [www.meditute.org](http://www.meditute.org)
NOTES / PRECAUTIONS

- Patients will be followed up and may return to ED for review if persistent pain.
- MRI can only be ordered by specialists as defined by the Health Insurance Commission.
- Enrolment kits for “early CT to rule out scaphoid fracture”
- Meditute – [www.meditute.org](http://www.meditute.org)

REFERENCES

