

# Diagnostic Imaging Pathways - Paediatric, Scaphoid Fracture (Suspected)

## Population Covered By The Guidance

This pathway provides guidance on imaging children with suspected scaphoid fractures.

**Date reviewed: July 2014**

**Date of next review: 2017/2018**






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## Quick User Guide

Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points.

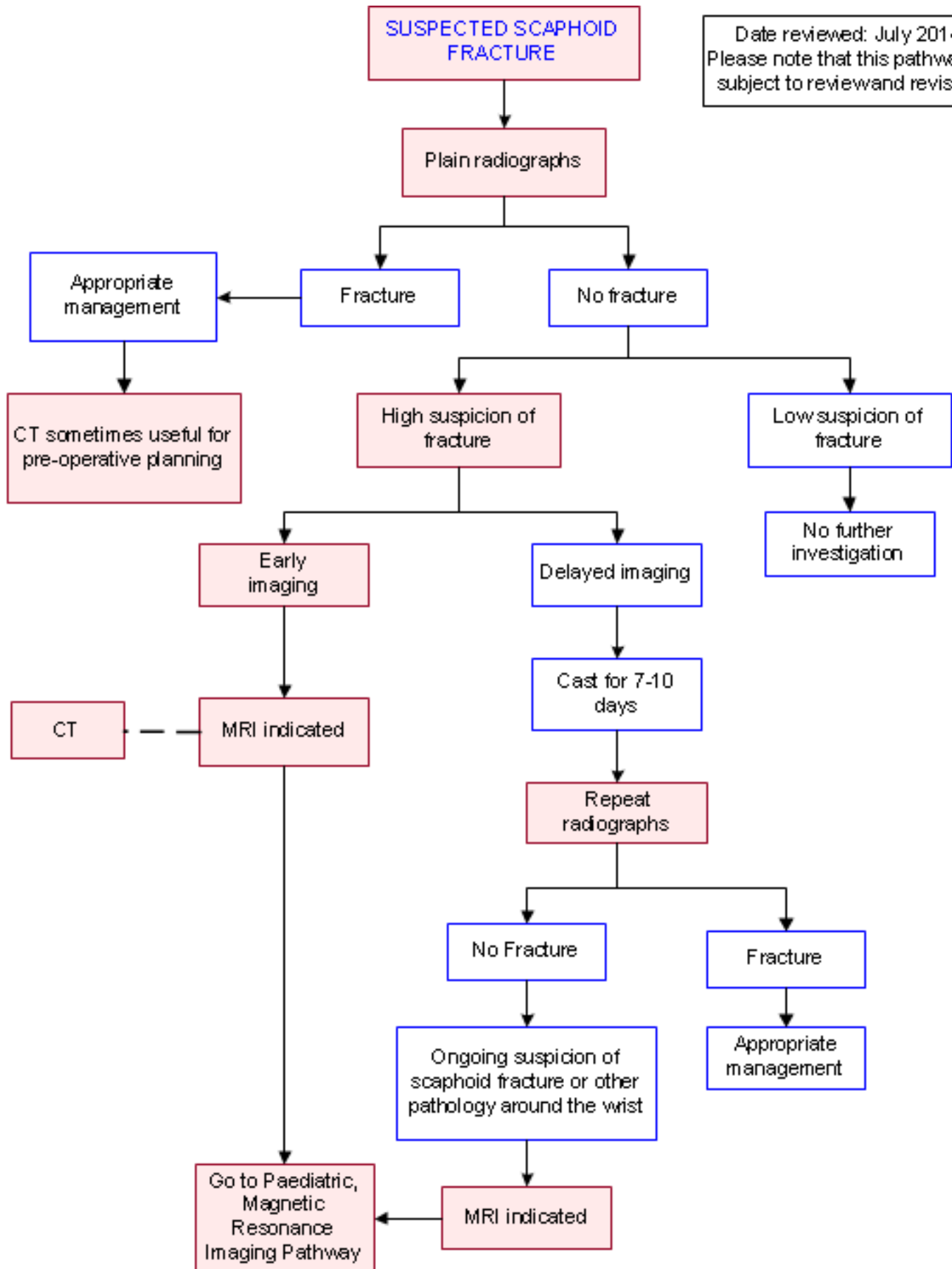
Clicking on the **PINK** text box will bring up the full text.

The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

SYMBOL	RRL	EFFECTIVE DOSE RANGE
	None	0
	Minimal	< 1 millisieverts
	Low	1-5 mSv
	Medium	5-10 mSv
	High	>10 mSv

## Pathway Diagram

Date reviewed: July 2014  
 Please note that this pathway is subject to review and revision



## Image Gallery

**Note: Images coming soon**

## Plain Radiography

- Whilst carpal fractures are rare in children, scaphoid fractures are the most common carpal fracture and have a peak incidence in the 12 to 15 year age group. Scaphoid fractures are very uncommon in children under 8 [1](#)
- The vast majority of fractures in children occur at the distal pole with approximately 10-20% at the scaphoid waist [2,3](#)
- By early adolescence the fracture patterns are similar to adults [1](#)
- The detection of scaphoid fractures can be improved with the use of dedicated views performed with ulnar deviation and tube angulation [4](#)
- Whilst immobilisation and follow-up radiographs in approximately 10-14 days has been considered appropriate treatment, follow-up radiographs detect only very small numbers of additional fractures [5-7](#)
- Approximately 40% of patients (not necessarily paediatric) will have radiographically occult fractures detected on subsequent MRI, with around half of these scaphoid fractures [8,9](#)
- There is some evidence to suggest that early imaging is most appropriate as it results in earlier detection of fractures and other injuries and reduces unnecessary immobilisation. Delayed radiographs only detect a small number of additional fractures but remains a reasonable option depending on resources

## Computed Tomography (CT)

- Estimated sensitivity and specificity of 93% and 99% for the detection of scaphoid fractures [10](#)
- Superior to MRI for the depiction of cortical injuries but inferior to MRI for the detection of solely trabecular injuries [11](#)
- Useful for
  - Detection of occult fractures of the wrist and displacement of fractures [12](#)
  - Further characterising complicated fracture-dislocations [13](#)
- Assessment of union/non-union and avascular necrosis [14](#)

## Magnetic Resonance Imaging (MRI)

- Whilst CT also has a very high sensitivity, MRI is superior for the detection of

### solely trabecular injuries [11](#)

- Can detect additional fractures and soft tissue injuries [4,15](#)
- Estimated sensitivity and specificity of 96% and 99% for the detection of scaphoid fractures [10](#)
- Has the advantage over both CT and bone scan of involving no ionising radiation and can detect bone bruising and ligamentous injuries [4](#)
- Whilst bone scan has a similar sensitivity it has a relative lack of specificity (approx 89%) and is generally considered inferior to both CT and MRI for the investigation of suspected scaphoid fracture. Bone scan is now seldom used [10,16](#)
- Limited sequences (coronal T1 and STIR) are generally sufficient to determine the presence of a fracture and do not take much longer than a standard scaphoid series of radiographs [15,17](#)
- Where available, the early use of MRI is a sensitive and practical way to diagnose occult scaphoid fractures and saves unnecessary immobilisation [18](#)

References are graded from Level I to V according to the Oxford Centre for Evidence-Based Medicine, Levels of Evidence. [Download the document](#)

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- [6.](#) Munk B, Frokjaer J, Larsen CF, et al. Diagnosis of scaphoid fractures. A prospective multicentre study of 1052 patients with 160 fractures. *Acta Orthop Scand.* 1995;66:359-60. (Level II evidence)
- [7.](#) Jacobsen S, Hassani G, Hansen D, Christensen O. Suspected scaphoid fractures: can we avoid overkill. *Acta Orthop Belg.* 1995;61:74-8 (Level III evidence)
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- [9.](#) McCullough NP, Smith FW, Cooper JG. Early MRI in the management of the clinical scaphoid fracture. *Eur J Emerg Med.* 2011;18:133-6. (Level III evidence)



10. Yin ZG, Zhang, JB, Kan SL, Wang XG. Diagnosing suspected scaphoid fractures: a systematic review and meta-analysis. Clin Orthop Relat Res. 2010;468:723-34. (Level I evidence)
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16. Fowler C, Sullivan B, Williams LA. A comparison of bone scintigraphy and MRI in the early diagnosis of the occult scaphoid waist fracture. Skeletal Radiol. 1998;27:683-7. (Level II evidence)
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Information from this website      Information from the Royal  
Australian and New Zealand  
College of Radiologists'  
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[Radiation Risks of X-rays and  
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[Magnetic Resonance Imaging \(MRI\)](#)

[Plain Radiography \(X-ray\)](#)