

## Adult Scaphoid Fracture

Carpenter CR et al. Adult Scaphoid Fracture. *Acad Emerg Med* 2014;21(2):102-21.

- **Most common** carpal fracture (70%), followed by triquetral and trapezium
- **Initial x-ray** (full scaphoid series): **Specificity is 100%** but **Sensitivity is 80%**
- **Pre-Test Probability** of scaphoid fracture in patient with scaphoid wrist pain and non-diagnostic x-rays is about **25%** (17-38% across 4 studies)
  - So 1 out of 4 people with a negative initial x-ray have a fracture
  - Or, 3 out of 4 people going home with a thumb spica don't have a fracture

	Positive LR [95% CI]	Negative LR [95% CI]
<b>Physical Exam</b>		
Clamp Sign*	8.6 [0.51-147.0]	0.40 [0.14-1.18]
Resisted Supination Pain**	6.1 [0.04-10.86]	0.09 [0.00-11.9]
Thumb Compression Pain	2.0 [1.1-3.5]	0.24 [0.06-0.99]
Vibration Pain	1.8 [0.9-3.4]	0.56 [0.24-1.32]
"Clinical Examination"	1.8 [0.08-2.9]	0.22 [0.80-2.90]
Scaphoid Tubercle	1.7 [1.3-2.1]	0.23 [0.09-0.56]
Snuffbox Tenderness	1.5 [1.1-2.1]	0.15 [0.05-0.43]
Ulnar Deviation Pain	1.4 [0.8-2.4]	0.53 [0.13- >1]
Swelling	1.3 [0.07-2.1]	0.76 [0.36-1.48]
Radial Deviation Pain	1.0 [0.9-1.2]	0.97 [0.67-1.40]
Discoloration	0.9 [0.3-2.8]	1.0 [0.73-1.38]
Resisted Pronation	0.09 [0.6-1.3]	1.44 [0.54-3.87]
<p>* <b>Clamp Sign:</b> Ask the patient "Exactly where does it hurt?" The patient will form a clamp with opposite thumb and index finger on both sides of the thumb</p> <p>** <b>Pain with resisted supination:</b> Hold the hand of the injured extremity with the patient's forearm in neutral position. Patient attempts to supination, resulting in pain when the examiner resists.</p>		
<b>Imaging</b>		
X-ray fat pad on initial x-ray	2.7 [1.4-5.2]	0.24 [0.07-0.79]
Fat pad on 10-14 day follow up x-ray	4.7 [1.6-14.4]	0.67 [0.50-0.89]
Bone scan	6.6 [3.9-11.1]	0.11 [0.05-0.23]
Ultrasound (radiologist performed)	5.6 [3.0-10.5]	0.27 [0.13-0.56]
CT	15.4 [8.8-27.0]	0.23 [0.16-0.34]
MRI	22.0 [11.9-40.1]	0.09 [0.04-0.19]

**NOTE:** There is limited usefulness for LR's with wide CIs.

### Management Plan Based on X-Ray Findings

- Displaced (>1 mm) or proximal pole fx → Ortho/Hand consult in ED
- Non- or minimally displaced fx → Splint & Ortho/Hand follow up in 5-7 days
- Suspected fracture but non-diagnostics x-rays → Splint & primary care physician or Ortho/Hand follow up for repeat exam and potentially repeat x-rays in 10-14 days

### Pearls

- The clinical exam has **high sensitivity** but **low specificity**
- **MRI is most sensitive & specific** but cost-benefit must be balanced with patient's economic loss from being splinted or a missed fracture
- Avascular necrosis and nonunion can occur leading to carpal instability and osteoarthritis – those at greatest risk = displaced fractures and missed fractures

