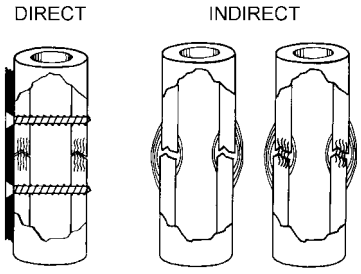
# HAND FRACTURE MANAGEMENT

| | | |
|---|---|---|
| Demographics | Hand injuries 28% of all fractures<br>Rt:Lt = 2:1<br>M:F = 3:1<br>70% aged 11-40yrJHS 1993, 18B, 511. | |
| Aetiology<br>JHS 1993, 18B, 511 | Fall | 29% |
| | Fight | 22% |
| | Sport | 19% |
| | Direct | 15% |
| | Work | 9% |
| | Home | 5% |
| | MVA | 2% |
| Site | Little | 48% |
| | Ring | 19% |
| | Middle | 12% |
| | Index | 8% |
| | Thumb | 13% |

Assessment

Bone involved
Level
Open/Closed
Stable/Unstable
Simple/Comminuted
Displaced/Undisplaced
Articular/Extra-articular




| | | |
|---|---|---|
| Fracture healing | Primary | Direct |
| | Secondary | Indirect |

Callus

Requires adequate blood supply
Not essential for healing
May be functionally replaced by internal fixation or compression
May be an indirect sign of instability, overload or corrosion of implant

Philosophy

Rigid internal fixation
Early soft tissue cover
Early mobilisation

Management

**R**eduction
**R**etention (provisional fixation)
**R**igidity (definitive fixation)
**R**ehabilitation

Reduction **Closed** ➔ **Open**

Impossible
Inaccurate

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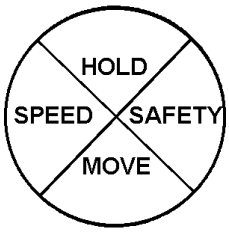
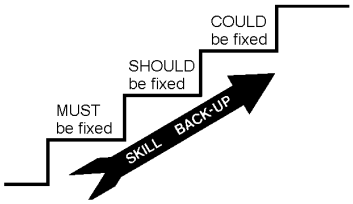
Fracture Quartet

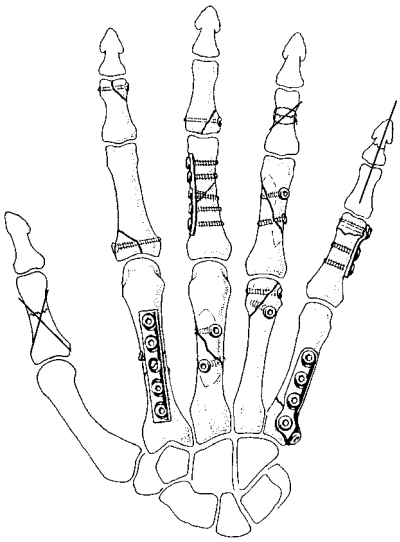



Rigidity
- Traction
- Plaster
- Functional bracing
- Internal fixation
- External fixation

**Internal fixation**

Indications
- Intra-articular #
- Peri-articular #
- Open #
- Complex injury
- Comminuted #
- Bone loss
- Unstable #
- Multiple #

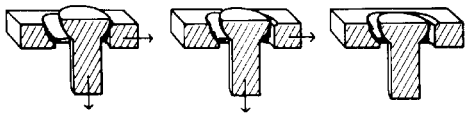


Goal
- Early restoration of function

Principles
- Aseptic technique
- Anatomical reduction
- Stable fixation
- Preservation of blood supply
- Early mobilization

Techniques
- Lag screw
- Tension band wire
- Kirschner wire
- Plate
- External fixator
- (Intramedullary nail)

Compression
- Lag(ged) screw
- Buttress plate
- Plate + compression device
- Self-compressing plate
- Dynamic compression plate (DCP)
- Tension-band wire



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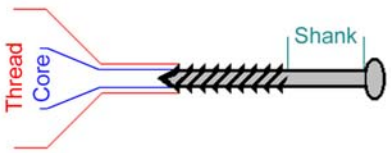
# HAND FRACTURE MANAGEMENT

**Screw anatomy**

| | |
|---|---|
| Core | Drill |
| Thread | Tap |
| Head | Countersink |
| Shank | Lag |
| Active part | Thread ø - Core ø |




**Screw technique**

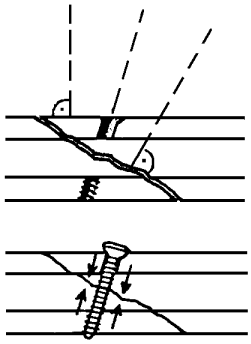
- Size
- Number
- Angle
- Lagged?
- Cortical/Cancellous
- Countersunk?

**Screw size**

| | |
|---|---|
| Carpus | 2.7mm cortical<br>4.0mm cancellous |
| Metacarpal | 2.0mm or 2.7mm cortical |
| Phalanx | 1.5mm or 2.0mm cortical |
| Fragment | <1/3 of fragment ø |

**Screw number**

| | |
|---|---|
| # < 2x bone ø | 1 screw + neutralisation plate |
| # > 2x bone ø | >2 screws |
| Plate | 3/major bone fragment |



**Screw angle**

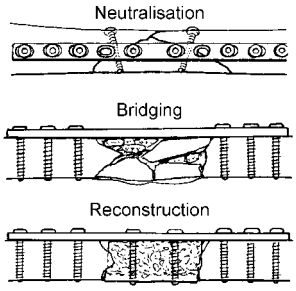
| | **Compression** | **Shear** |
|---|---|---|
| **P**arallel to # | Good | Poor |
| Parallel to cortex | Poor | Good |
| Bisects parallels | Enough | Enough |

**Lag screw**

Converts torsion to compression

**Plate**

- Neutralization
- Compression
- Buttress
- Bridging
- Tension band
- Reconstruction




**Tension-band wire**

Provides dynamic compression where it can absorb all tensile forces while bending and shear forces on the fracture are eliminated by inter-fragmental friction alone or supplemented by Kirschner wires

**Comparison**
JHS 1985, 10A, 466

- Dorsal plate
- Dorsal plate + lag screw
- Crossed K-wires
- K-wire + interosseous wire
- Interosseous wire

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