

Early Mobilisation for Tendon Repairs in the United Kingdom

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Aims lecture

- **Discuss therapeutic regimes used within the UK and discuss evidence base behind the decisions**
- **Flexor tendon rehabilitation**
- **Extensor tendon rehabilitation**

Controlled Early Mobilisation

Advantages

- **Maintains tendon glide**
- **Helps prevent tendon tethering**
- **Helps reduce and prevent stiffness**
- **May allow quicker return to activities and work**

Disadvantages

- **Increase risk of tendon rupture**
- **Increase risk of tendon lagging**
- **May increase non compliance and allow patient more freedom to use hand**

Flexor tendon rehabilitation

- **Most literature now agrees that early tendon glide is important and suture techniques can withstand this.**
- **Modified Belfast Regime/Early Active motion/Controlled active motion (Small et al.1989)**
- **Duran regime (Duran and Houser 1975)**
- **Kleinert regime (Kleinert et al. 1967)**

Splint Zones I-IV



- **6-8 week protocol**
- **No functional use of hand for 0-4 weeks**
- **Hourly exercises**
 - **active and passive flexion**
 - **active extension fingers to splint**
- **Week 4 remove splint for exercises including wrist joint and gradual build up of light activities. Splint continues for protection.**
- **At 6-8 weeks discard protective backslab, gradually increase function/resistive activities and passive extension**

Zone V injury only



Thumb flexors

- 8 week protocol usually early mobilisation
- Kleinert regime may be preferred if rupture rate high



Rupture Rate 2006

- **Generally low**
 - 4.5% fingers
 - 7.5% thumbs
- **Usually within the first 4 weeks due to failed suture or patients activities**
- **Monitored within hand therapy and hand therapy clinics**

Patient satisfaction questionnaire 3, 7 and 12 week post operation

- **Patients need more information on prognosis and outcome**
- **Fear and psychological issues**
- **More information to reassure patients in traumatic period**
- **Booklet designed which has good reviews**

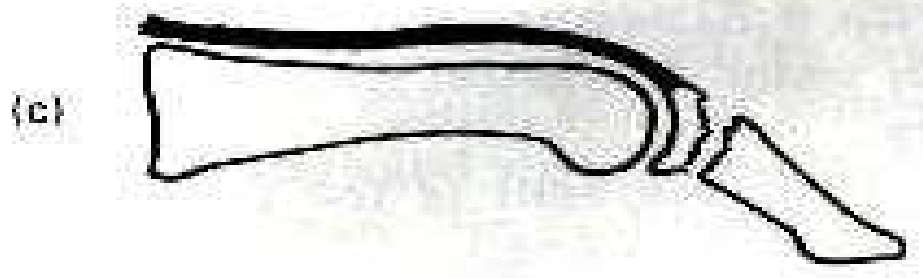
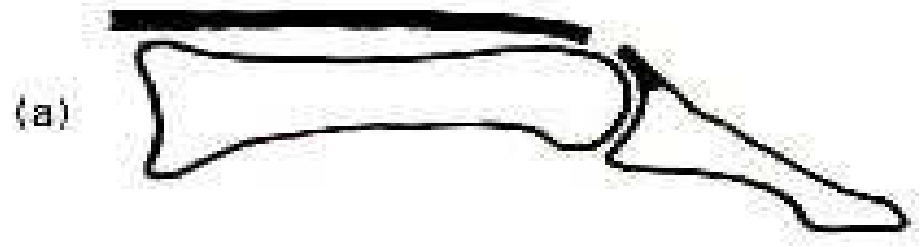
Extensor tendon rehabilitation

- Amount literature on extensor tendon injuries increasing over recent years
- Mallet Injury (Zone 1-2).
- Central Slip Injury (Zone 3-4).
- Extensor Tendon Injury (Zone 5-7).

Mallet injury Research

Pratt A (2004) Is eight weeks immobilisation of the distal interphalangeal joint adequate treatment for the acute closed mallet finger injuries of the hand. A critical review of the literature

BAHT 9(1): 4-10

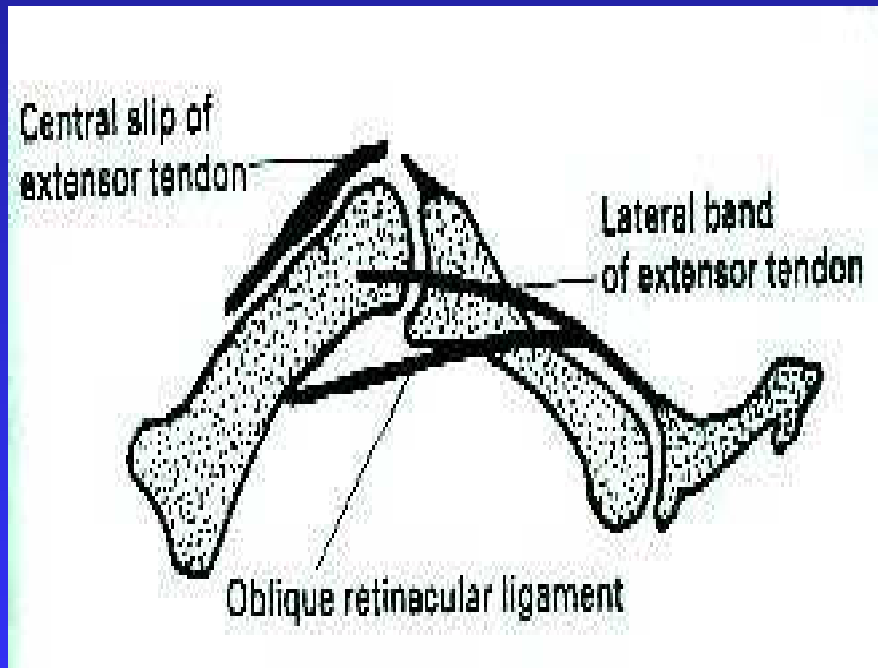


Mallet injuries

- **Best treated conservatively with splintage for 8 weeks. This holds the DIP joint into SLIGHT hyperextension.**
- **Then 2 weeks protective splint essential whilst increasing movement DIP joint**
- **Occasionally require surgical repair and fixation with K wire. Period of splintage would often be six weeks then.**



Central slip injuries



Possible regimes

- **Static extension of PIP joint 6 weeks**
(Crosby and Wehbe 1996, Boscheinen-Morin et al 1997)
- **Early motion within a Dynamic Extension Splint**
(Walsh et al. 1994, Thomas & Thomas 1995).
- **Motion PIP joint at 3 weeks post op**
(O'Dwyer & Quinton 1990, Maddy & Meyerderks 1997, Pratt et al. 2002)
- **Short arc motion (SAM)** (Evans and Thompson 1992)

Aims of therapy

- **Protect central slip for 6 weeks**
- **Promote early tendon gliding**
- **Reduce adhesions**
- **Mobilise DIP joint unless lateral band injured as well**
 - **Prevents adhesions of the lateral bands.**
 - **Stretches the oblique retinacular ligament.**
 - **Prevent DIP joint hyperextension and stiffness.**
- **Mobilise MCP joint**
- **Prevent deformity/extension lag**
- **Regain flexion as soon as possible**

Regime one

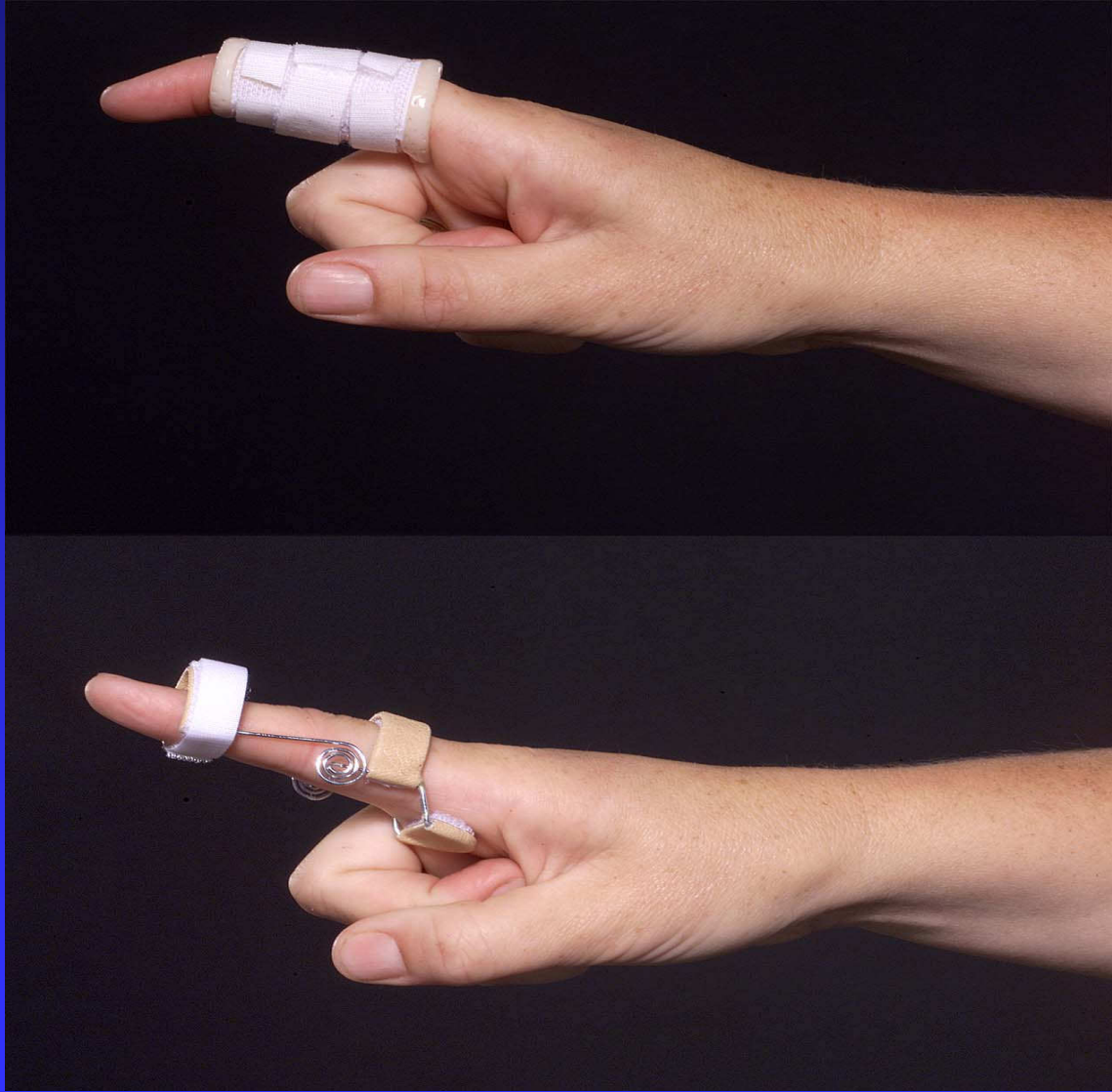
PIP joint immobilised in extension for 3 weeks.

**PIP joint mobilised within dynamic PIP joint splint
(capener)for 3 weeks.**

DIP Joint motion essential

Passive flexion at 6 weeks post-op.

**(Maddy and Meyerdierks 1997, O'Dwyer and Quinton
1990, Pratt et al. 2002)**



Outcomes

- **Pratt, Burr and Grobbelaar (2002) A prospective review of open central slip laceration repair and rehabilitation.**

Journal of Hand Surgery 27B (6):530-534.

- **Found all patients achieved an excellent or good Total Active Motion with only 5 fingers from 31 having a small extension deficit (average 6 degrees)**

Regime 2

Short Arc Motion (Evans, 1994)

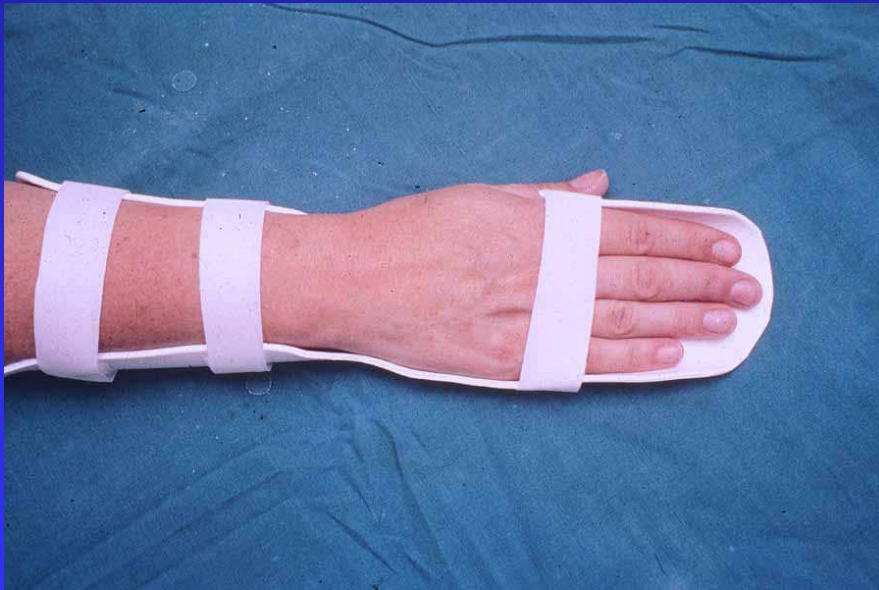
- **Allows controlled PIP joint flexion at 1 week post operation to 30 degrees. This utilises a small volar hand-based splint**
- **The use of the early controlled motion helps prevent tendon to bone adherence especially in zone IV.**
- **The 30° motion at the PIP joint allows 4 mm of extensor tendon excursion, which is stated to successfully reduce adhesions in this region.**
- **In between exercises the PIP and DIP joints are immobilised in 0° within a volar finger splint.**

Extensor tendon zone 5-7

Regime choice

- **Static Regime 3-4 weeks**
- **Dynamic extensor regime**
- **Static MCP joint and mobilise IP joints.**
- **Norwich Regime (Sylaidis 1997)**
- **Modified Norwich regime**

Static Regime 3-4 weeks.



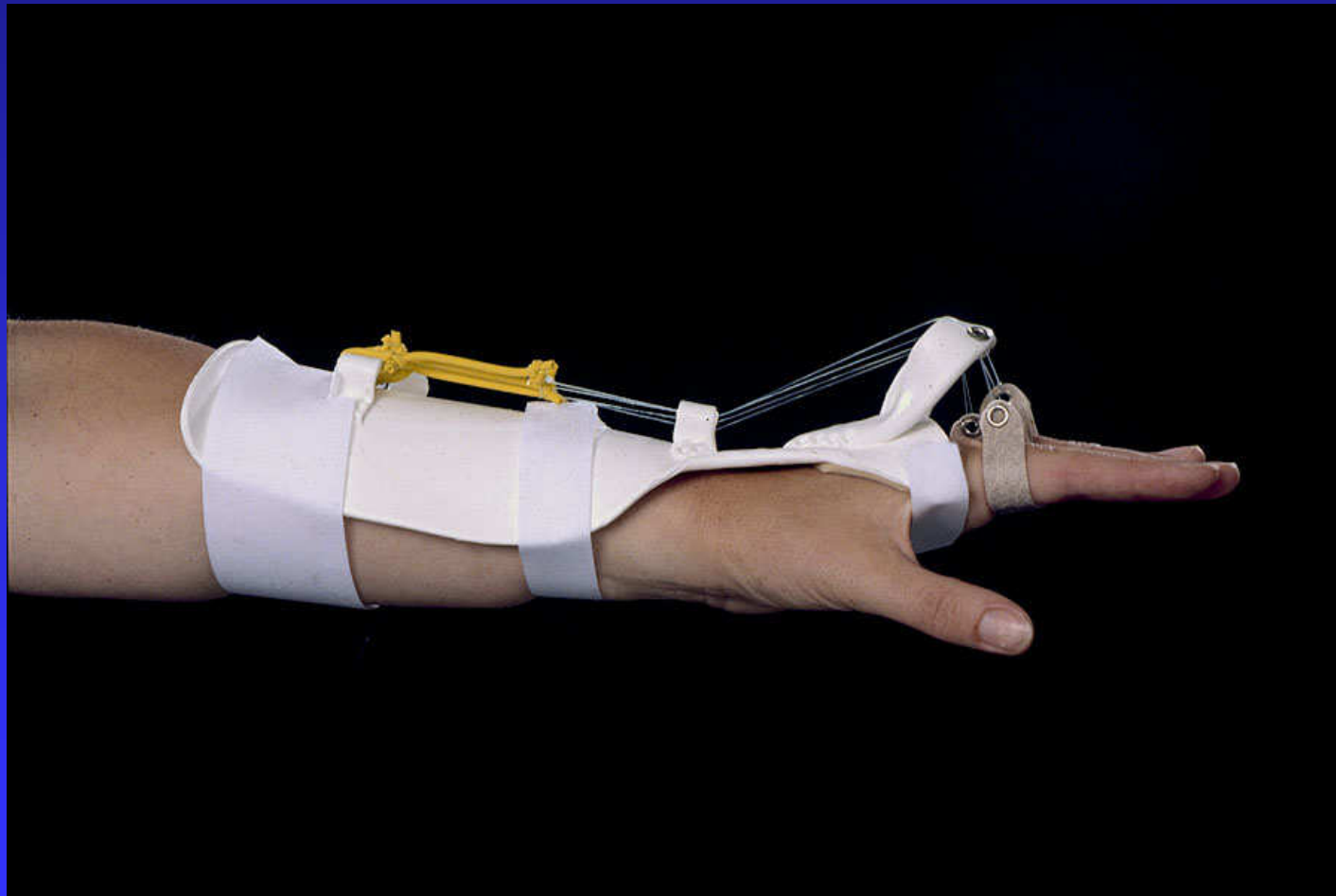
- Wrist extended
30°
- MCP & IP joints
Neutral

Newport et al. (1990)

Blair & Steyers (1992)

Dargan (1969)

Dynamic Extension Splint Regime



MCP Joint immobilised IP joints free

- Wrist extended 30°
- MCP Joints neutral
- IP's free to mobilise

- Slater & Byrum (1997)
- Stuart (1965)



Norwich regime

- Wrist extended 45°
- MCP joints flexed $50 - 70^{\circ}$
- IP's neutral
- Sylaidis et al. (1997)



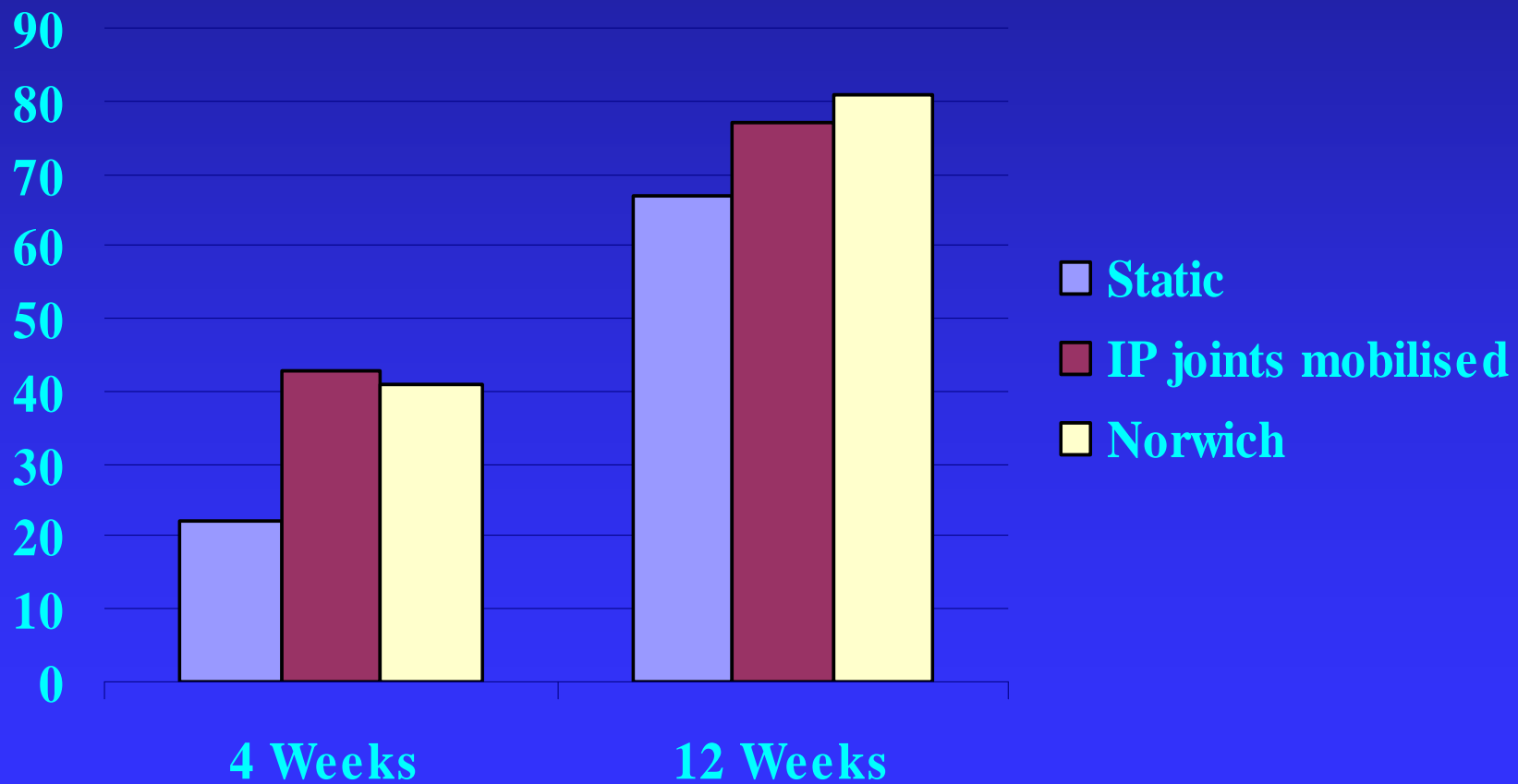
Rehabilitation

- **Advice very similar to flexor tendons**
 - **No using hand first 4 weeks**
 - **Keep splint on**
 - **No Driving 8 weeks**
- **Many centres allow patients normal function between 6-8 weeks but must monitor for any signs of tendon lag**
- **No passive flexion for 8 weeks**
- **Strengthening exercises at 8 weeks**
- **Scar tethering a big concern**

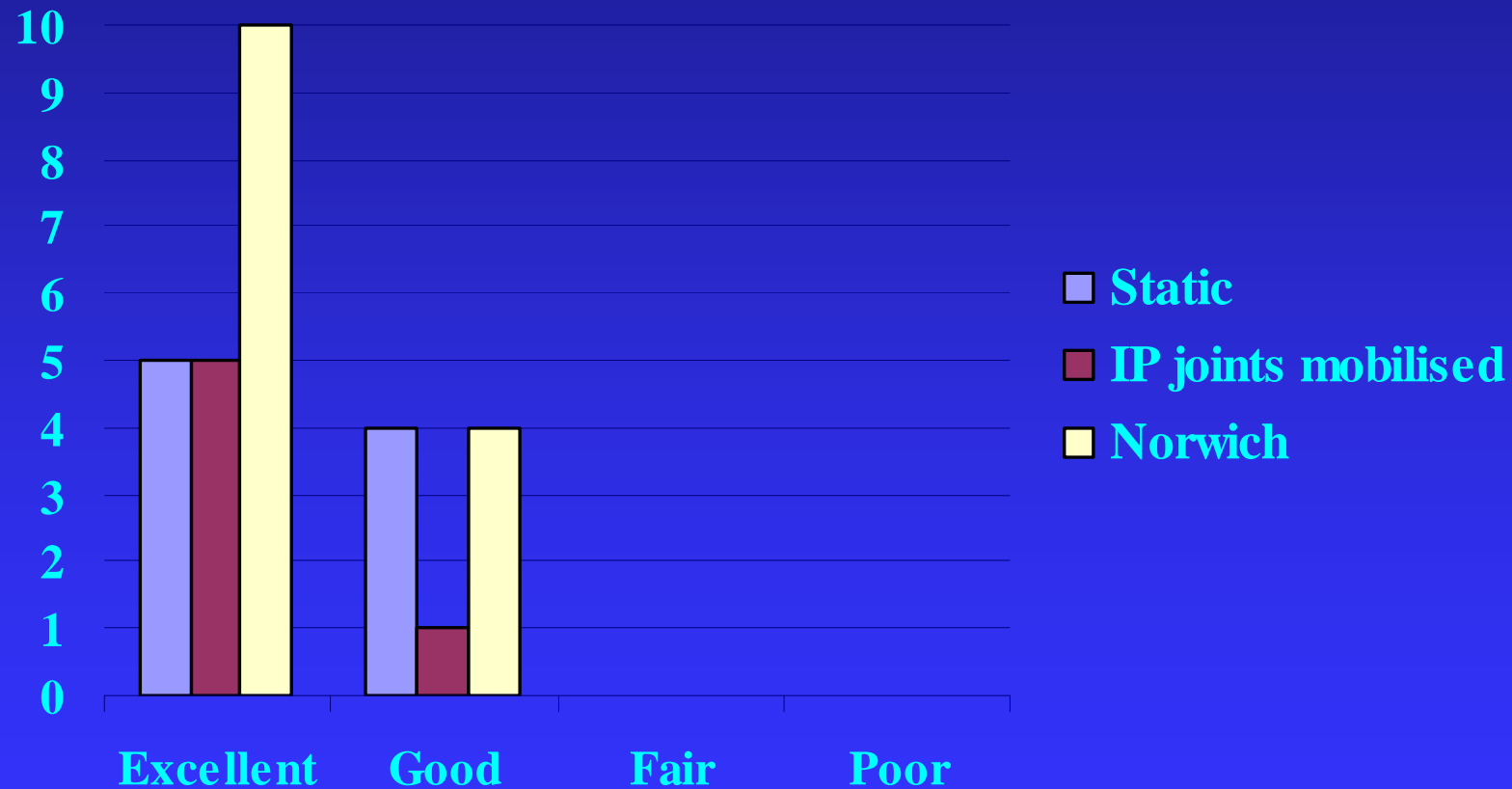
Bulstrode, Burr et al. (2005) *Journal of Hand Surgery* : 30B (2) :175-179

- Reviewed 42 patients with zone 5 and 6 finger injuries using three rehabilitation regimes. Found that all patients had good motion by 12 weeks post operation irrespective of the therapy regime.
- Patients undergoing early active motion regained motion and their strength quicker

MCP joint Mean Active Arc of Motion : 4 and 12 weeks



Total Active Motion (TAM) of all 3 finger joints



Results

- **Patients report preferring a regime allowing them to safely move fingers earlier.**
- **Those patients who followed the Norwich regime generally complied with treatment much better than the other groups and overall required less therapy input.**
- **At 12 weeks all outcomes are comparable, but are obtained quicker using the Norwich Regime**

Thumb extensor tendons

- The literature only discusses Early Active Motion for thumbs utilising a Dynamic extension splint (Evans 1986), Ip and Chow 1997).
- Many clinicians now use a modified Norwich regime for their thumbs but haven't written up their outcomes

- **Burr and Pratt (2006) Early Active Mobilisation for thumb extensor tendon repairs
.: A review of two case studies**

BAHT 11(4): 114-119

- **Highlighted that an early motion regime without the use of a Dynamic Extension Splint can be safely used for thumb extensor tendon injuries**

Research

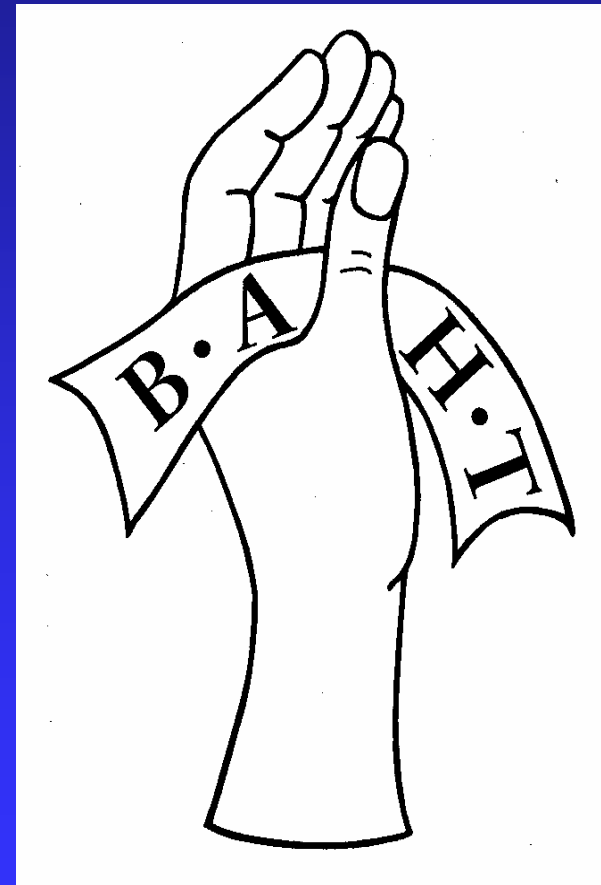
- **All Therapists must continue to inform our practice with adjustments and improvements to their rehabilitation regimes**
- **We need to safely rehabilitate these patients with less complications and a quicker return to work**

B.A.H.T Effectiveness Bulletin

(2004)

**The effectiveness bulletin
critically appraises the
evidence, lists practice
points and indicates a
number of important
areas for further research**

Cost..... £12.50



**Thank you for inviting me to
speak**

Please ask questions