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Elbow Stiffness: Therapeutic Management

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3 Learning Outcomes

- After this course, participants will be able to describe the joint and soft tissue mobilization techniques of the elbow.
- After this course, participants will be able to describe neurophysiological/proprioceptive/ occupation-based interventions to reduce co-contraction phenomena.
- After this course, participants will be able to list orthotic options to prevent and resolve elbow stiffness.

Elbow Stiffness: Therapeutic Management

Osteokinematic Vs. Functional Movement of the Elbow

- Extension/Flexion (0-145)
- Supination/Pronation (85/80)
- Functional extension/flexion (30-130)
- Functional pronation/supination (50/50)

Accessory Movements

The flexion/extension axis demonstrates very little change in the instant center of rotation.

Motion occurs around a fixed axis with little translation.

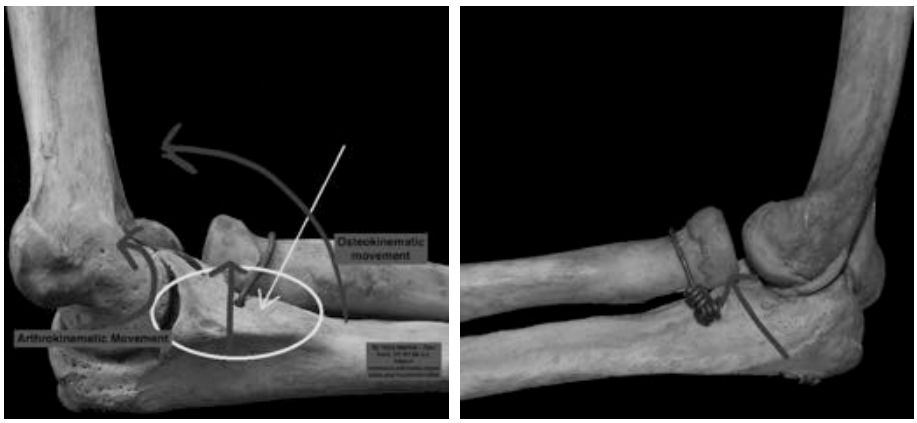
Distraction mobilization: Scoop maneuver for flexion

Gliding mobilizations: Only in same direction as osteokinematic motion

Relevant Arthrology

- Humeroulna joint: Simple Hinge joint; Concave on convex with one freedom of movement
- Humeroradial joint: Pivot joint with one freedom of movement
- Concave on convex

Superior R/U Joint: Arthrology



Closed and Open positions

Closed Pack Positions

- Humeroulna: Full extension
- Humeroradial: 90 flexion 5 supination.
- Proximal radioulnar: 5 Supination.

(*Q1)

Open Pack Position

- Humeroulna: 70 flexion in 10 supination
- Humeroradial: Full extension/supination
- Proximal radioulnar: 70 flexion, 35 supination

Joint Mobilizations of the Elbow

Humeroulna Distraction Scoop: Flexion

Proximal humeral stabilization with a second person when possible

Humeral Ventral Glide: Extension

Stabilization of the ulna

Movement through the humerus

Radial Head: Pronation

Dorsal glide moving from an

Anterior to posterior direction.

(*Q2)

Radial Head: Supination

Stabilization: Humerus

Mobilization: Radial head posterior to anterior

Soft Tissue Mobilization for Elbow Stiffness

Muscle Assessment and Treatment

Soft Tissue Management

Assessment

- Flat assessment
- Pincer assessment
- Length assessment

Treatment

- Stroking massage
- Breathing technique
- Muscle Lengthening
  - Contract-relax
  - Anchor and mobilize

Triceps Assessment/Treatment

Biceps Assessment and Treatment

(*Q3)

Pronator Teres Assessment/ Treatment

Exercise Intervention

Overhead Motion Protocol

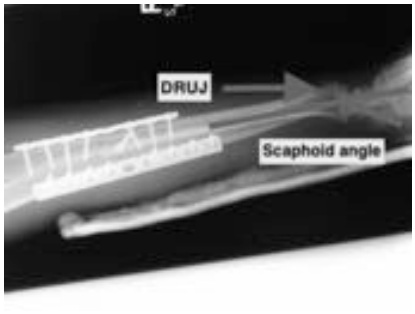
- First proposed in 2006 by Wolf & Hotchkiss. Studied again in 2015 by Scrieber, Paul, Hotchkiss & Daluiski.
  - Begin in supine (Dávilia & Johnson, 2006) for 3-4 weeks.
  - Elbow extension/flexion in pronation.
  - Elbow extension/flexion in supination.
    - 10-15 reps per exercise
    - 4-5 sessions per day

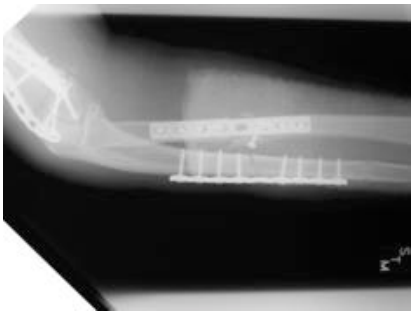
(*Q4)

Progression to Active Assisted in Sitting: 3-6 weeks

(*Q5)

Case 1. Solomon





Show Early Exercise Video
Case 2. Carol

Co-contraction Phenomena

Plyometric Approaches: Add to strengthening program: 8-12 weeks

Orthotic Intervention

Prevention and Resolution of Stiffness

Designs of Elbow Mobilization Orthoses

- Serial Static
- Dynamic
- Static-Progressive

- All designs improve PROM. No significant difference in outcomes between dynamic and static-progressive orthoses. (Müller et al., 2012)

(*Q6)

Principles of Orthotic Fabrication

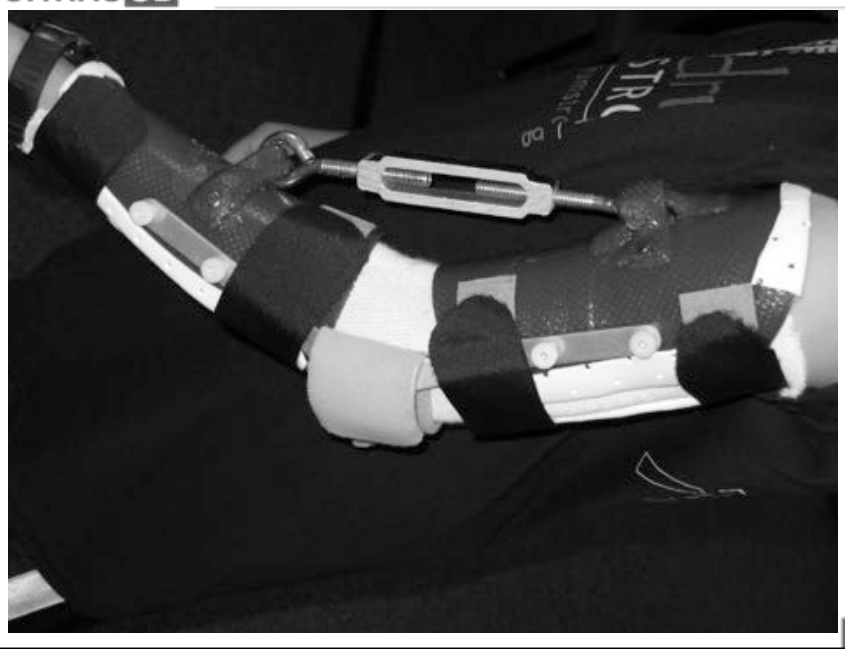
- 3-points of Fixation rule
- 2/3 length of forearm
- Mobilization force should occur directly to the area of stiffness
- Dose = applied level of force X duration
- Consider
  - Intensity
  - Frequency
  - Duration
  - Compliance

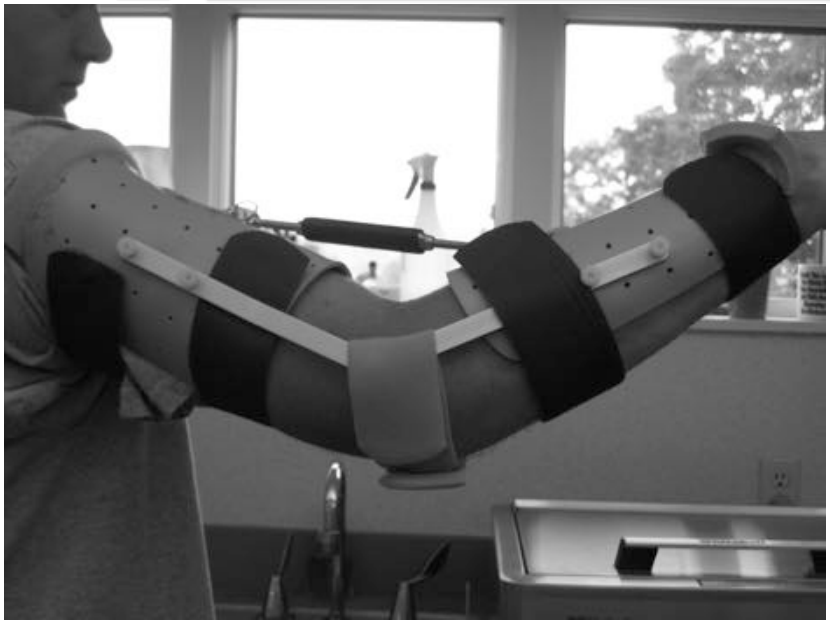
(*Q7)

Optimum dosing is unknown!

- Current literature suggests the 30 minute/3 times per day protocol attains satisfactory results. (Müller, et al., 2012).
- However: previous studies on TERT suggest a wearing schedule of 6 hours per day (Glasgow et al., 2003).
- Comparative dosing studies are not available.

(*Q8)



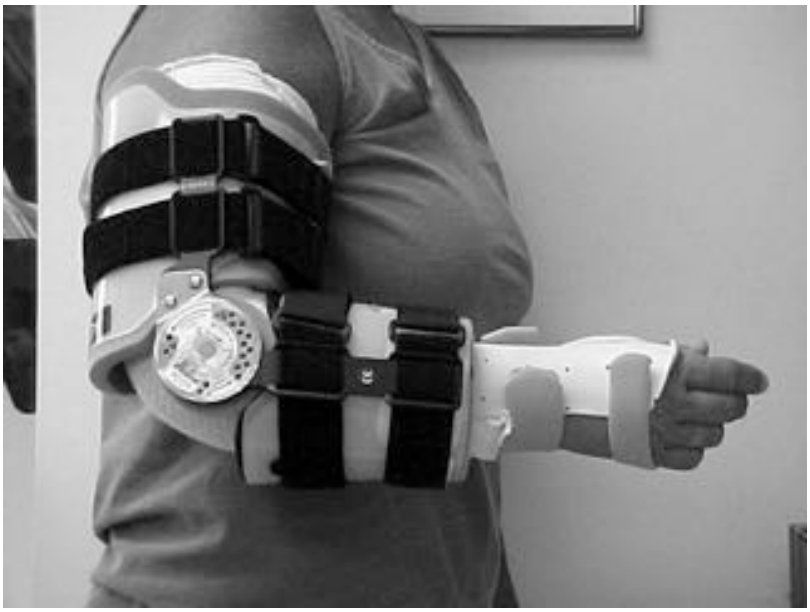


Simple Dislocation

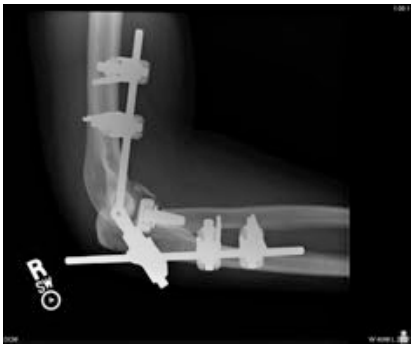
Dislocation with LCL

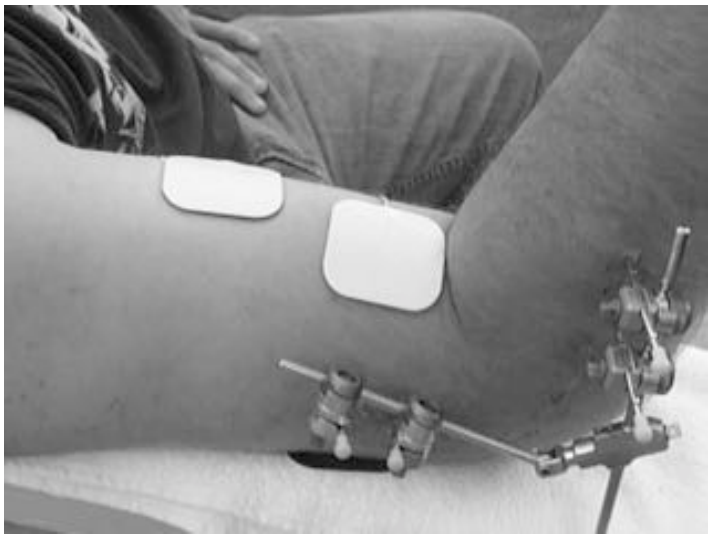
- Treatment with hinged splinting with the forearm reduced in pronation
- Hinged splint does not fully protect from varus stress. Manocha et al., (2018)

(*Q9)



Hinged Elbow Fixator





(*Q10)

Hinged Fixator Extension Splinting

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CONTINUED

Questions?

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