Elbow Mobility Deficits

ICD-9-CM code: 812.40 Ulnohumeral Capsulitis

ICF codes: Activities and Participation codes: **d4300** Lifting, **d4452** Reaching
Body Structure code: **s73001** Elbow joint
Body Functions code: **b7101** Mobility of a several joints

Common Historical Findings:
Trauma (e.g., fracture)
Stiffness following immobilization and healing
Pain at end ranges of flexion and/or extension

Common Impairment Findings - Related to the Reported Activity Limitation or Participation Restriction:
Limited elbow flexion and/or extension ROM (usually more limited in flexion)
Pain at end ranges
Limited ulnohumeral accessory motions

Physical Examination Procedures:

Elbow Accessory Movement Test
Ulnar Distraction

Elbow Accessory Movement Test
Ulnar Distraction

Performance Cues:
Stabilize humerus at humeral shaft; or at lateral epicondyle
Distract ulna from humerus using finger pads; or use hypothenar and thenar eminence with a flexed wrist

Elbow Mobility Deficits: Description, Etiology, Stages, and Intervention Strategies

The below description is consistent with descriptions of clinical patterns associated with the vernacular term "Ulnohumeral Capsulitis"

Description: Pain and stiffness in the elbow. The pain is most noticeable at the end ranges of flexion or extension movements, such as carrying a heavy object with the arm hanging or while attempting to dress, groom, or eat.

Etiology: Inflammation of the ulnohumeral capsule leads to increased fibrinogenesis of the collagen tissue that forms the capsule – eventually leading to capsular adhesions if the capsule is immobilized, such as following a trauma (e.g., fracture) and subsequent casting and/or splinting.

Acute Stage / Severe Condition: Physical Examination Findings (Key Impairments)

ICF Body Functions code: **b7101.3** SEVERE impairment of mobility of several joints

- Limited elbow flexion and extension ROM – usually flexion limitation of motion is greater than the extension motion limitation
- Pain at end ranges of active and passive movements
- Limited ulnohumeral accessory motions
- Restricted myofascia – especially the one-joint elbow flexors and extensors (brachialis and short head of the triceps)
- Pain with palpation of the ulnohumeral joint

Sub Acute Stage / Moderate Condition: Physical Examinations Findings (Key Impairments)

ICF Body Functions code: **b7101.2** MODERATE impairment of mobility of several joints

As above, except:

- Resisted tests reveal strength deficits – especially if the elbow has been immobilized for an extended period of time

Settled Stage / Mild Condition Physical Examinations Findings (Key Impairments)

ICF Body Functions code: **b7101.1** MILD impairment of mobility of several joints

As above, except:

- Mild pain at end ranges of flexion and/or extension

Intervention Approaches / Strategies

Acute Stage / Severe Condition

Goals: Reduce pain with elbow flexion and extension
Increase elbow range of motion
Increase elbow function

- Physical Agents
  Ice packs
  Utrasound

- Therapeutic Exercises
  Gentle passive range of motion stretching

- Re-injury Prevention Instruction
  Rest/relaxation to reduce pain

Sub Acute Stage / Moderate Condition

Goals: Improve flexibility of the involved extremity
Improve strength of the involved extremity

- Approaches / Strategies listed above

- Manual Therapy
  Soft tissue mobilization to the restricted myofascia – (e.g., the brachialis myofascia)
  Joint mobilization to the restricted ulnohumeral accessory movements – including mobilization with movement

- Therapeutic Exercises
  Gentle, prolonged PROM and AROM stretching
  Initiate strengthening program to the tolerance of the patient

- External Devices (Taping/Splinting/Orthotics)
  Apply preventive brace in elbow if reinjury a potential fear.

Settled Stage / Mild Condition

Goals: Restore normal flexibility of the involved extremity
Restore normal strength of the involved extremity
Improve tolerance with participating in function activities of involved extremity

- Approaches / Strategies listed above

Intervention for High Performance / High Demand Functioning in Workers or Athletes

Goal: As above
Return to optimum level of patient function

- Approaches / Strategies listed above

Selected References

Bonutti PM et al. Static progressive stretch to reestablish elbow rang of motion. *Clinical Orthop.* 1994;303:128-34.

Bruce G et al. Elbow pain. *Primary Care* 1988 Dec:15 (4):725-35

Byl NN et al, et al. Effects of phonophoresis with corticosteroids: A controlled pilot study. *J of Orthop Sports Phys Ther* 1993 Nov: 8(5):590-600

Chumbley EM et al. Evaluation of overuse elbow injuries. *American Family Physician* 2000 Feb:61(3):691

Davila SA et al. Managing the Stiff Elbow: Operative, Nonoperative, and Postoperative Techniques. *J Hand Ther* 2006;19:268-81.

Kaltsas DS. Comparative study of the properties of the shoulder joint capsule with those of other joint capsules. *Clin Orthop* Mar 1983: 173:20-6

King GJ, Faber KJ. Posttraumatic elbow stiffness. *Orthop Clin North Am* 2000 Jan;31(1):129-43

Klaiman MD, et al. Phonophoresis vs ultrasound in the treatment of common musculoskeletal conditions. *Med Sci Sports Exer* 1998 Sep:30(9):1349-55

Leo KC et al. Effect of TENS characteristics on clinical pain. *Phys Ther* 1986 Feb 66(2):200-5

Light KE, Nuzik S, Personius W, Barstrom A. Low-load prolonged stretch vs. high-load brief stretch in treating knee contractures. *Phys Ther*. 1984;64:330-333.

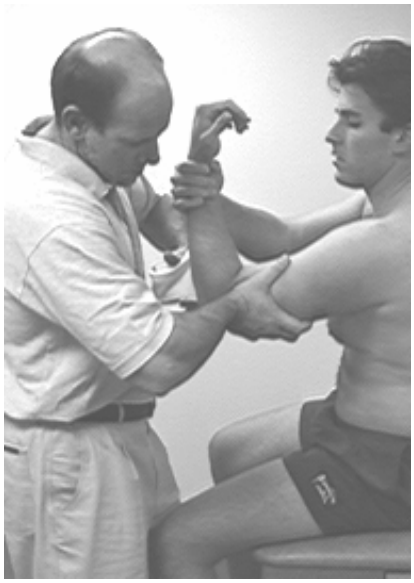
Marti RK. Progressive surgical release of a post traumatic stiff elbow. *Acta Irthop Scand* 2002 73(2):144-50

Nielsen KK, Olsen BS, No stabilizing effect of the elbow joint capsule; *Acta Orthop Scand* 1999; 70 (1):6-8

Rizk TE, Christopher RP, Pinals RS, et al. Adhesive capsulitis (frozen shoulder): a new approach to its management. *Arch Phys Med Rehabil*. 1983;64:29-33.

Wing GJ, Faber KJ. Posttraumatic elbow stiffness. *Orthop Clin of North Am*, 2000 Jan 31(1):129-43

Impairment: Limited and Painful Elbow Flexion



Elbow Flexion MWM

Cues: Position patient sitting on the edge of a raised treatment table
Stabilize the lateral side of the distal humerus with one hand
Laterally glide the ulna (and radius) using the thenar eminence or 2nd metacarpal head of the other hand
Use a pad to limit ulnar nerve discomfort
Sustain the lateral glide as the patient actively flexes his/her elbow
Alter the amplitude and direction of the lateral glide to achieve painfree active flexion
If indicated, the patient can use his/her uninvolved hand to apply passive overpressure at the end range of available active flexion

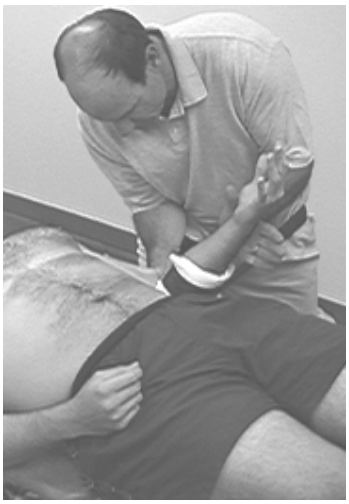
The following reference provides additional information regarding this procedure:
Brian Mulligan MNZSP, DipMT: Manual Therapy, p. 85-87, 1995

Impairment: Limited Elbow Extension or Flexion
Limited Ulnar Distraction (at the humeroulnar joint)

Ulnar Distraction

Cues: Stabilize the humerus via thenar eminence pressure on the lateral epicondyle – use distal thigh to help stabilize the forearm
Contact the ulna with the volar surface of a flexed wrist and provide the ulnar distraction
Counter the distraction with equal and opposite pressure on the lateral epicondyle
To improve extension - apply the distraction near the end of available extension ROM
To improve flexion - apply the distraction near the end of available flexion ROM
Generate the stabilizing and mobilizing forces using trunk rotation

Impairment: Limited and Painful Elbow Extension



Elbow Extension MWM

Cues: Position patient lying supine
Stabilize the humerus
Laterally glide the ulna using a belt
Sustain the lateral glide while the patient actively extends his/her elbow
Make sure that the belt is long enough to allow for the therapist's forearms to provide a stabilization/lateral glide force at nearly perpendicular to the humerus and ulna
Due to the elbow's "carrying angle", the direction of lateral glide will likely need to be altered as the elbow extends
Provide passive overpressure, if indicated, at the end of available active extension

The following reference provides additional information regarding this procedure:
Brian Mulligan MNZSP, DipMT: Manual Therapy, p. 85-87, 1995

ICD-9-CM code: 813.00 Proximal Radioulnar Capsulitis

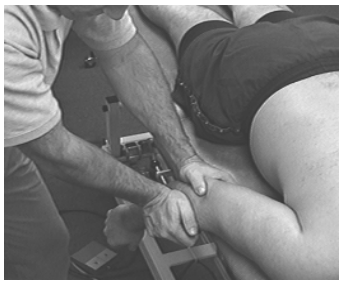
ICF codes: Activities and Participation codes: **d4453** Turning or twisting the hands or arms
Body Structure code: **s73001** Elbow joint
Body Functions code: **b7101** Mobility of a several joints

Common Historical Findings:
Trauma (e.g., contusion, dislocation)
Stiffness following immobilization, and healing
Pain at end range of supination and/or pronation

Common Impairment Findings - Related to the Reported Activity Limitation or Participation Restrictions:
Limited forearm supination and/or pronation
Pain at end range(s) of limited motion(s)
Limited radioulnar accessory movements

Physical Examination Procedures:

Radioulnar Accessory Movement Test
Radial Posterior Glide



Radioulnar Accessory Movement Test
Radial Anterior Glide

Performance Cues:
Stabilize ulna, mobilize radius
Modify the procedures to adapt to the patient who has co-occurring elbow extension ROM deficits
Determine amount of accessory motion and symptom response - compare with uninvolved side

Radioulnar Accessory Movement Test
Radial Distraction

Performance Cues:
Stabilize humerus - which stabilizes ulna via the olecranon fossa - pull radius, in line with the shaft of the radius - away from the humerus

Use a “golfers” grip on the radius
This procedure also assesses accessory movement at the radiohumeral joint
Determine availability of motion and symptom response - compare with uninvolved side

Elbow Mobility Deficits: Description, Etiology, Stages, and Intervention Strategies

The below description is consistent with descriptions of clinical patterns associated with the vernacular term "Radiohumeral Capsulitis"

Description: Pain at end range of forearm supination and/or pronation that limits function.

Etiology: Trauma (e.g., contusion, dislocation) and the resultant inflammation, immobilization, and tissue healing commonly lead to elbow and forearm stiffness

Acute Stage / Severe Condition: Physical Examinations Findings (Key Impairments)

ICF Body Functions code: **b7101.3** SEVERE impairment of mobility of several joints

- Swelling around the proximal radioulnar joint may be present
- Limited forearm supination and/or pronation active and passive mobility
- Pain at end range of limited motion
- Limited radioulnar accessory movements
- Tenderness to palpation of the proximal radioulnar joint

Sub Acute Stage / Moderate Condition: Physical Examinations Findings (Key Impairments)

ICF Body Functions code: **b7101.2** MODERATE impairment of mobility of several joints

As above, except:

- Resisted testing reveals weakness of the forearm supinators and pronators

Settled Stage / Mild Condition Physical Examinations Findings (Key Impairments)

ICF Body Functions code: **b7101.1** MILD impairment of mobility of several joints

As above, except:

- Mild pain at end range of with overpressure of supination and/or pronation motions

Intervention Approaches / Strategies

Acute Stage / Severe Condition

Goals: Alleviate pain in forearm supination and pronation
Decreased swelling
Increased range of motion and functional ability

- Physical Agents
  - Cool packs
  - Iontophoresis
  - Ultrasound

- Manual Therapy
  - Joint mobilization of the proximal radioulnar joint (radial posterior and anterior glides)

- Therapeutic Exercises
  - Gentle (painfree) supination and pronation mobility/stretching exercises

Sub Acute Stage / Moderate Condition

Goals: Achieve normal range of motion
Restore normal strength and extensibility of involved extremity

- Manual Therapy
  - Progress intensity of the joint mobilization procedures – including mobilizations with movements
  - Soft tissue mobilization to myofascial restrictions of the elbow and forearm region

- Therapeutic Exercises
  - Progress intensity of stretching procedures
  - Provide strengthening exercises for weak elbow and forearm muscles

Settled Stage / Mild Condition

Goal: Return to unlimited performance of functional activities of involved extremity

- Approaches / Strategies listed above

- Therapeutic Exercises
  - Progress stretching and strengthening exercises

Intervention for High Performance /High Demand Functioning in Workers or Athletes

Goals: Return to optimal performance of desired activities

- Approaches / Strategies listed above

- Therapeutic Exercises
  Progress stretching and strengthening exercises – including exercises/activities that challenge the patient with work related or sport specific demands regarding strength, flexibility, and endurance.

Selected References

Davila SA et al. Managing the Stiff Elbow: Operative, Nonoperative, and Postoperative Techniques. *J Hand Ther* 2006;19:268-81.

Kaltenborn F. Manual Mobilization of the Extremity Joints. 1989, 4th edition, p31, 91-93.

Kisner C, Colby L. Therapeutic Exercise Foundation and Techniques. 1996;p211,237-39.

Wilks K, Arrigo C, Andrews J. Rehabilitation of the elbow in the throwing athlete. *J Orthop Sports Phys Ther*. 1993; vol 17, no 6, p305-316.

Wong K, Elbow Rehabilitation. In Godges J, Deyle G, eds. Upper Quadrant: Evidence-Based Description of Clinical Practice. Orthopaedic Physical Therapy Clinics of North America, Vol. 8(1). March 1999.

Impairment: Limited and/or Painful Forearm Pronation

Forearm Pronation MWM

Cues: Stabilize the distal radius
Anteriorly or posteriorly glide the distal ulna (which ever is painless)
Sustain the glide while the patient actively pronates his/her wrist
Alter the amplitude and direction of the glide to achieve painfree active pronation
Apply overpressure, if indicated, at the end of active pronation

The following reference provides additional information regarding this procedure:
Brian Mulligan MNZSP, DipMT: Manual Therapy, p. 84-84, 1995

Impairment: Limited Forearm Pronation
Limited Radial Posterior Glide (at the superior radioulnar joint)

Radial Posterior Glide

Cues: With the patient supine, stabilize (and pad) the ulna against the table
Glide the radius posteriorly
Use folded towels as a bolster at the wrist if the patient also has limited elbow extension

The following reference provides additional information regarding this procedure:
Freddy Kaltenborn PT: Manual Mobilization of the Extremity Joints, p. 93, 1989

Impairment: Limited Forearm Supination
Limited Radial Anterior Glide (at the superior radioulnar joint)

Radial Anterior Glide

Cues: Position the patient prone with the involved forearm just off the edge of the table
Stabilize (and pad) the humerus and ulna against the edge of the table
Glide the proximal radius anteriorly - using a dummy thumb over the region of the radial head and under a thenar eminence