Elbow and Forearm Radiating Pain

ICD-9-CM code: 354.1 Other lesion of median nerve
354.3 Lesion of radial nerve
354.2 Lesion of ulnar nerve

ICF codes: Activities and Participation Domain code: **d4301** Carrying in the hands, **d4400** Picking up, **d4401** Grasping, **d4402** Manipulating
Body Structure codes: **s73018** Neural structures of forearm
Body Functions code: **b2804** Radiating pain in a segment or region

Common Historical Findings:

Medial elbow and forearm pain:
Medial elbow pain
Forearm and hand paresthesias
Unaccustomed repetitive occupational or recreational activity involving flexion and pronation(e.g., golfing)

Lateral elbow and forearm pain:
Lateral elbow and forearm pain
Paresthesias in forearm and hand
Unaccustomed repetitive activity involving gripping or manipulating objects

Medial elbow pain:
Medial elbow pain
Paresthesias in ulnar distribution of forearm and hand

Common Impairment Findings - Related to the Reported Activity Limitation or Participation Restrictions:

Medial elbow and forearm pain:
Symptoms reproduced with:
1. Median nerve stretch test
2. Palpation/provocation of median nerve entrapment in pronator teres
3. Repeated pronator teres resisted movement tests

Lateral elbow and forearm pain:
Symptoms reproduced with:
1. Radial nerve stretch test
2. Palpation/provocation of posterior interosseous branch of radial nerve in supinator muscle
3. Repeated supinator resisted movement tests

Medial elbow pain:
Symptoms reproduced with:
1. Ulnar nerve stretch test
2. Palpation/provocation of ulnar nerve in cubital tunnel area including the arcade of Struthers which is proximal to the elbow

Elbow and Forearm Radiating Pain
Description, Etiology, Stages, and Intervention Strategies

The below description is consistent with descriptions of clinical patterns associated with the vernacular term "Pronator Teres Syndrome"

Description: Vague, aching pain in the volar aspect of the elbow and forearm with accompanying paresthesias and decreased sensation in the thumb, index finger and middle finger, and may exhibit weakness of grip and palpable tenderness of the pronator teres muscle. These symptoms are exacerbated with repetitive use of the elbow flexors and wrist pronators,. Such motions are typified by weight lifting, writing, doing needlepoint, gripping and swinging a golf club, tennis racket, or hammer – or repetitive use of a tool, such as turning a screwdriver.

Etiology: Unaccustomed repetitive occupational or recreational activity involving flexion and pronation may create an overuse type of tendonitis for the insertion of the pronator teres muscle. Compression or entrapment of the median nerve can occur at the supracondylar process and ligament of Struthers, the aponeurosis of the biceps brachii muscle (lacertus fibrosus), the pronator teres muscle or the flexor digitorum superficialis muscle. Typically the median nerve or its anterior interosseous branch becomes compressed within the cubital fossa or between the superficial and deep heads of the pronator teres muscle.

Acute Stage / Severe Condition: Physical Examinations Findings (Key Impairments)
ICF Body Functions codes: **b2804.3** SEVERE radiating pain in a segment or region

- A dull aching forearm pain that is provoked with gripping, lifting, and repeated wrist and forearm movements
- Median nerve stretch test bias of the upper limb tension test reproduces the reported symptoms
- Passive stretch into wrist and finger extension with the combination, and elbow extension aggravates the patient's symptoms
- Symptoms are provoked with repeated pronator teres resisted movement tests. Exacerbation of pain with resisted forearm pronation followed by elbow extension indicates entrapment at the pronator teres muscle, the most common site of compression
- Reproduction of pain with resistance to forearm supination with elbow flexed beyond 120 degrees implicates entrapment at the bicipital aponeurosis
- Pain with resisted middle-finger flexion localizes entrapment to the flexor digitorum superficialis muscle
- Decreased static two-point and vibratory discrimination in the involved hand, compared with the contralateral hand especially over the thenar eminence
- Positive Tinel's sign may be present at the antecubital fossa.

Sub Acute Stage / Moderate Condition: Physical Examinations Findings (Key Impairments)
ICF Body Functions codes: **b2804.2** MODERATE radiating pain in a segment or region

As above, except symptoms are less – for example, the patient experiences less aching and requires less time for symptom resolution. Symptom reproduction requires a stronger palpatory provocation or more repetitions with repeated resisted tests.

Settled Stage / Mild Condition: Physical Examinations Findings (Key Impairments)
ICF Body Functions codes: **b2804.1** MILD radiating pain in a segment or region

As above, except symptoms are only noted following extensive repetitive activities that use pronator teres contractions or increase compression of the median nerve.

Intervention Approaches / Strategies

Acute Stage / Severe Condition

Goal: Restore normal, pain-free use of the involved extremity for non-strenuous activities

- Immobilization
  The elbow may be immobilized in 90 degrees of flexion, the forearm in neutral to slight pronation, and the wrist in neutral to slight volar flexion.

- Physical Agents
  Ice
  Electric stimulation

- Manual Therapy
  Soft tissue mobilization/stretching to the myofascial restrictions in the pronator teres near the entrapment site of the median nerve

- Therapeutic Exercises
  Median nerve mobility exercises in pain-free ranges

- Re-injury Prevention Instruction / Patient Education
  Modification of daily activities to reduce compression

NSAIDS may be prescribed for symptomatic relief but have not been shown to alter the course of the impairment. Injection of corticosteroids into the area of the median nerve may be considered as a last non-operative resort with extreme caution to avoid intraneural injection. Pain and weakness that are refractory to two to three months of non-operative therapy should be referred to a hand or orthopedic surgeon for further evaluation, in which case surgery to decompress the median nerve may be required.

Sub Acute Stage / Moderate Condition

Goal: To restore normal strength and extensibility of the pronator teres

- Approaches / Strategies listed above

- Therapeutic Exercises
  Stretching exercises for tight muscles in the elbow, forearm and wrist
  Strengthening exercises for weak muscles in the elbow, forearm and wrist (e.g., progressive resistive exercises for the wrist extensors and pronators, grip strengthening exercises

- Ergonomic Instruction
  Provide instruction in optimal shoulder and cervical positioning for household and work activities as well as pacing and sufficient breaks in activity where possible.

Settled Stage / Mild Condition

Goal: Ability to use arm without symptoms

- Approaches / Strategies listed above

- Therapeutic Exercises
  Progress stretching and strengthening exercises for the elbow, forearm and wrist

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

Goal: Return to desired occupational or recreational activities

- Approaches / Strategies listed above

- Therapeutic Exercises
  Progress stretching and strengthening exercises for the elbow, forearm and wrist to include sport/job specific training

- Re-injury Prevention Instruction
  Adjust the grip size of sport equipment or hand tools
  Keep wrist at neutral

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Elbow and Forearm Radiating Pain
Description, Etiology, Stages, and Intervention Strategies

The below description is consistent with descriptions of clinical patterns associated with the vernacular term "Supinator Syndrome"

Description: Lateral elbow and forearm pain with accompaning forearm and hand paresthesias. There may or may not be accompanying wrist extensor or supinator weakness. These symptoms are exaccerbated with repetitive use of the wrist extensors and wrist supinators, such as with gripping objects or swinging a tennis racket – or repetitive use of a tool, such turning a screwdriver.

Etiology: Unaccustomed repetitive occupational or recreational activity involving gripping or manipulating objects may create an overuse type tendinitis for the insertion of the supinator muscle or the development of trigger points in the supinator muscle. Also, perhaps more common, is that repeated contraction of the supinator produces an irritation of the posterior interosseous branch of the radial nerve as it courses through the supinator. There is also evidence that a prolonged or heavily loaded pronated posture can increase the amount of pressure being placed upon the radial nerve as it travels through the supinator.

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

ICF Body Functions codes: **b2804.3** SEVERE radiating pain in a segment or region

- Symptom reproduction with radial nerve upper limb tension test
- Symptom reproduction with palpation of radial tunnel
- Limited forearm pronation
- Limited elbow extension
- End range pain with pronation with elbow extension
- Symptoms reproduced with repeated resisted supination
- Limited radial head posterior glide at the superior radioulnar joint

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

ICF Body Functions codes: **b2804.2** MODERATE radiating pain in a segment or region

As above, except:

- Symptoms more difficult to reproduce reproduced with radial nerve upper limb tension tests and repeated supinator resisted movement tests (i.e., require further end range stresses or more repetitions with resisted movements)

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

ICF Body Functions codes: **b2804.1** MILD radiating pain in a segment or region

As above, except:

- Only mild lateral elbow and forearm pain with repeated supinator resisted movements tests

Intervention Approaches / Strategies

Acute Stage / Severe Condition

Goals: Alleviate pain with active forearm movement
Improve strength of supinators

- Physical Agents
  Iontophoresis with corticosteroid
  Ultrasound: 0.5 w/cm^2 at 3 MHz pulsed at 5:1x 5-7 min
  TENS for pain control

- Manual Therapy
  Soft tissue mobilization to restricted supinator and extensor carpi radialis brevis myofascia, predominantly the myofascia near the radial head and posterior interosseous nerve

- Therapeutic Exercises
  Pain free nerve mobility exercises for the radial and posterior interossei nerve

- Re-injury Prevention Instruction
  Rest/relaxation to reduce pain
  Avoid aggravating postures and activities

Sub Acute Stage / Moderate Condition

Goals: Prevent re-injury of supinators
Improve strength of supinators

- Approaches / Strategies listed above

- Manual Therapy
  Joint mobilization to restore radial anterior glide at the proximal radioulnar joint

- Therapeutic Exercises
  Pain free nerve mobility exercises for the radial and posterior interossei nerve
  Slowly begin progressive resistive exercises for arm and forearm muscles

Settled Stage / Mild Condition

Goal: Maintain or return to optimum level of patient function

- Approaches / Strategies listed above
- Re-injury Prevention Instruction
  Modification of work activities

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

Goal: Return to opimum level of patient function

- Approaches / Strategies listed above

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Cervical Spine and Related Upper Extremity Radiating Pain
Description, Etiology, Stages, and Intervention Strategies

The below description is consistent with descriptions of clinical patterns associated with the vernacular term "Cubital Tunnel Syndrome"

Description: A peripheral compression neuropathy at the cubital tunnel (the posterior medial aspect of the elbow). This syndrome is related to repetitive activities of the elbow. Common symptoms are medial elbow or proximal forearm pain, numbness or tingling in the ring and little finger, loss of dexterity, fatigue, and possible loss of strength.

Etiology: Symptoms may arise without any obvious compression areas. Cubital tunnel syndrome may occur due to nerve enlargement or the narrowing of the space that the nerve runs through. Certain occupations that require repetitive elbow flexion and extension, prolonged elbow flexion, or direct compression of the ulnar nerve while leaning on the medial elbow against a hard surface may be at higher risk for the condition. The ulnar nerve may be compressed by muscle hypertrophy, compression by the aponeurosis of flexor carpi ulnaris, adhesions in the cubital tunnel or trauma to the elbow.

Acute Stage / Severe Condition: Physical Examinations Findings (Key Impairments)
ICF Body Functions codes: **b2804.3** SEVERE radiating pain in a segment or region

- Impaired fuctioning of the ulnar nerve – as evidence by one or more of the following findings:
  - Muscle atrophy in hypothenar region
  - Clawing of the ring and little fingers
  - Weak ulnar intrinsic muscles (e.g., 1st dorsal interossei, positive Froment's sign)
  - Weak flexor carpi ulnaris and ulnar portion of flexor digitorum profundus muscles
  - Decreased pinch and grip strength
  - Impaired sensation of dorsoulnar portion of the hand
- Pain primarily in region of elbow that may radiate proximally or distally with active movements
- Ulnar bias upper limb nerve tension test reproduce the patient's symptoms
- Positive Tinel's sign
- Anterior subluxation of the ulnar nerve at the elbow with elbow flexion
- Symptom reproduction with palpatory provocation of the cubital tunnel or the arcade of Struthers entrapment site

Sub Acute Stage / Moderate Condition: Physical Examinations Findings (Key Impairments)
ICF Body Functions codes: **b2804.2** MODERATE radiating pain in a segment or region

As above – the severity of the ulnar nerve entrapment signs may resolve as the inflammation around the cubital tunnel diminishes

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

ICF Body Functions codes: **b2804.1** MILD radiating pain in a segment or region

As above – except less severe symptoms are exhibited

Intervention Approaches / Strategies

Acute Stage / Severe Condition:

Goals: Alleviate pain in medial elbow and forearm
Reduce ulnar nerve symptomology

- Re-injury Prevention Instruction
  Avoid any aggravating activities or postures, such as repetitive elbow flexion activities and prolonged elbow flexion postures

- Therapeutic Exercises
  Nerve mobility exercises for the ulnar nerve at the elbow in the painfree/symptom free ranges.
  Strengthening exercises for the ulnar nerve muscles found to be weak

  Note: Caution not to strain or irritate the ulnar nerve during performance of the mobility or strengthening exercises

- External Devices (Taping/Splinting/Orthotics)
  A splint to limit elbow flexion and/or wrist extension can be considered if symptoms are severe
  Elbow pad worn over the posterior medial elbow may be useful in some patients

Sub Acute Stage / Moderate Condition

Goal: Restore normal strength and extensibility of involved extremity

- Approaches / Strategies listed above

- Manual Therapy
  Soft tissue mobilization to the myofascial and fascial tissues that may be contributing to the nerve entrapment

- Therapeutic Exercises
  Stretching exercises that increase flexibility of forearm muscles, wrist and finger flexors are introduced slowly as tolerated. These exercises can be used as needed as long as symptoms are not increased.
  Gradually increase the performance of functional activities as tolerated

- External Devices (Taping/Splinting/Orthotics)
  As symptoms subside, splints can be worn only at night
  Soft elbow pads can be worn during the day to protect the ulnar nerve from direct pressure or trauma and remind patient to maintain an extended elbow and to keep from putting pressure on elbow

- Ergonomic Instruction
  Modify relevant work activity (e.g., keyboard operators should type with elbows relatively extended and arms adducted to avoid increased pressure on ulnar the nerve.)
  Modify jobs that require forceful extension (e.g., hammering, modify activity by starting action from more extended position, decrease number of repetitions, more frequent rest periods, etc.)

Settled Stage / Mild Condition

Goal: Restore normal, painfree movements of the involved upper extremity

- Approaches / Strategies listed above

- Therapeutic Exercises
  Instruct in exercises to address the patient's specific muscle strength deficits

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

Goal: To return to desired occupation or leisure time activities

- Approaches / Strategies listed above

- Therapeutic Exercises
  Encourage participation in regular activities with emphasis on modification of work areas, use of splint and elbow pad as needed to provide relief and protection of ulnar nerve.

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