

Shoulder and Related Upper Extremity Radiating Pain

ICD-9-CM codes: 723.3 Cervical brachial syndrome

ICF codes: Activities and Participation Domain codes:

d4301 Carrying in the hands (Taking or transporting an object from one place to another using the hands, such as when carrying a drinking glass or a suitcase.)

d4452 Reaching (Using the hands and arms to extend outwards and touch and grasp something, such as when reaching across a table or desk for a book.)

Body Structure code: **s7208** Structure of shoulder region, other specified

s7308 Structure of upper extremity, other specified

Body Functions code: **b28014** Pain in upper limb

b2804 Radiating pain in a segment or region

Common Historical Findings

Paresthesias, pain, and numbness in upper extremity

Symptoms aggravated by postures or activities that put stretch on neurovascular bundle
(e.g., reaching tasks, sleeping with arms overhead)

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

Symptoms reproduced with nerve tension test

Symptoms reproduced with provocation of the peripheral entrapment site (e.g., scalenes, clavipectoral fascia, pectoralis minor)

Physical Examination Procedures:



Nerve Tension Test
Median Nerve Stretch Test

Performance Cues:

Position patient with shoulder off edge of table and with the trunk and lower extremities diagonally on the table

Establish baseline level of symptoms and determine the change in symptoms as the following components are moved toward end range:

- Scapular depression
- Elbow extension
- Humeral external rotation
- Forearm supination
- Wrist, fingers, thumb extension
- Humeral abduction

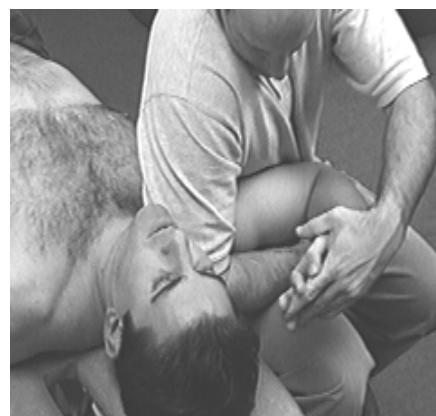
Attempt to alter symptoms by moving a component two segments proximally or distally
(e.g., alter elbow pain with cervical side bending; alter shoulder pain with wrist flexion and extension)



Nerve Tension Test
Radial Nerve Stretch Test

Performance Cues:

- Components:
- Scapular depression
 - Elbow extension
 - Humeral internal rotation
 - Forearm pronation
 - Wrist, finger, thumb flexion
 - Humeral abduction



Nerve Tension Test
Ulnar Stretch Test

Performance Cues:

Components: Scapular depression
Elbow flexion (to 90 degrees)
Humeral external rotation
Forearm pronation
Wrist, finger extension
Elbow flexion (to available and range)
Humeral abduction

Shoulder 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
"Thoracic Outlet Syndrome"

Description: Thoracic outlet syndrome (TOS) is a complex of signs and symptoms caused by compression or stretching of the nerves and vessels (portions of the brachial plexus, subclavian artery, and subclavian vein) to the upper limb where they pass through the interval between the scalene muscles, over the first rib, and down into the axilla. Patient complains of numbness, tingling, weakness of hands and arms and pain in the upper chest, back and neck. The location of paresthesias, pain, numbness, and muscle weakness in the shoulder, arm, and hand depend on what nerve is vulnerable to compression. The patient with TOS may also report vascular symptoms such as swelling of the fingers and hands, heaviness of the upper extremities, clumsiness and coldness of hands, and tiredness, heaviness on elevation of arms. TOS symptoms are worst with postures and ADLs that stress the neurovascular bundle, such as combing hair, driving, or carrying bags with strap on sore shoulder. TOS symptoms are also reproduced with activities such as lifting heavy objects, looking up (neck extension), arm overstretched or reaching and overhead activities for extended periods of time.

Etiology: The cause of this disorder may be due to tight muscles, ligaments, fibrous bands or bony abnormalities in the thoracic outlet area. The two common precipitating factors of TOS are trauma (such as auto accidents that cause whiplash) and excessive strains from repetitive activities. Other conditions that can lead to TOS are paradoxical breathing patterns, poor posture, an extra cervical rib from the neck at birth, and tumors (such as upper lobe lung cancer).

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

ICF Body Functions codes: **b28014** SEVERE pain in upper limb

- Accentuated upper thoracic kyphosis and forward head posture leading to tightness around shoulder and neck musculature
- Excessive scapular abduction and medial rotation
- Weak cervical flexors, upper thoracic extensors, and scapular depressors/retractors
- Symptoms are reproduced with upper limb nerve tension testing

- Symptoms are reproduced with palpatory provocation of peripheral entrapment site (e.g., scalene muscles palpation will cause tingling down the arm)
- Sensory and motor deficits may be present

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

ICF Body Functions codes: **b28014** MODERATE pain in upper limb

As above, except:

Now (when less acute) examine patient for co-existing upper quadrant impairments such as cervical pathologies (extra cervical rib), assess scapular, thoracic malalignments and muscle flexibility and strength deficits – For example:

- Shortened anterior chest musculature such as pectoralis, serratus anterior
- Shortened scalene muscles, and costoclavicular approximation
- Tight muscles that are pressed against the nerves causing compression such as subclavian artery or suprascapular nerve maybe affected.
- Paradoxical breathing patterns in which the scalenes and pectorals are used as the initiators of each breath, rather than assisting the diaphragm and lower intercostals during a deep inspiration

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

ICF Body Functions codes: **b28014** MILD pain in upper limb

As above, except:

- Pain with repetitive activities such as arm elevation, hyperextension of neck or with overhead activities

Intervention Approaches / Strategies

Acute Stage / Severe Condition

Goal: Reduce neurological and vascular symptoms

- Re-injury Prevention Instruction
Limit any activity that aggravates the symptoms – e.g., avoid sleeping on stomach with arms overhead
- Manual Therapy
Soft tissue mobilization to restricted myofascia or fascia adjacent to relevant nerve and vascular entrapment sites – e.g., scalene myofascia, clavipectoral fascia, subclavius myofascia

Joint mobilization to restricted joints adjacent to relevant nerve and vascular entrapment sites – e.g., cervical articulations adjacent to lateral foramina, 1st rib adjacent to C8 nerve root

Soft tissue mobilization and manual stretching to address shortened musculature such as pectoralis minor, serratus anterior, scalene, levator scapulae

- Therapeutic Exercises
Painfree, and symptom-free nerve mobility exercises

Sub Acute Stage / Moderate Condition

Goals: As above

Improve strength of weak upper quarter musculature

- Approaches / Strategies listed above
- Therapeutic Exercises
 - Stretching exercises for shortened myofascia causing symptoms, such as pectoralis minor, or anterior scalenes
 - Strengthening exercises for upper thoracic extensors, scapular adductors and depressors, and neck flexors
 - Diaphragmatic and lateral costal breathing exercises to decrease paradoxical breathing patterns
- Neuromuscular Reeducation
 - Facilitate neutral thoracic cage and neutral scapular posture.
- Ergonomic Instruction
 - Promote efficient, painfree, motor control of the trunk, scapulae and arm with overhead activities
 - Modify activities to prevent re-injury
 - Teach proper body mechanics and modify work-setting area as required to prevent symptoms

Settled Stage / Mild Condition

Goals: As above

Progress activity tolerance

Lessen predisposition to symptoms during active repeated movements

- Approaches / Strategies listed above
- Therapeutic Exercises

Muscular endurance exercises to maximize muscle performance of the relevant trunk, scapulae, shoulder girdle muscles required to perform the desired occupational or recreational activities

Aerobic conditioning exercises such as progressive walking program with emphasizing correct breathing techniques and posture

- Ergonomic Instruction
 - As above
 - Add job/sport specific training

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

Goal: Return to desired occupational or leisure time activities

- Approaches / Strategies listed above

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