Examining The Shoulder: A Guide to Assessing Shoulder Pain

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Contents

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CAUSES OF SHOULDER PAIN – WHAT YOU SHOULD CONSIDER

Shoulder pain is an extremely common reason for a visit to a family physician. One estimate from Great Britain is that 1% of all adults over 45 will seek medical attention each year for a new episode of shoulder pain.

While it is essential that the examiner consider all possible causes (see "The Fine Print"), shoulder pain most commonly arises from a handful of syndromes. These will be the focus of this monograph:

1. pain referred from the CERVICAL SPINE
2. pain from the ACROMIOCLAVICULAR JOINT
3. pain from the ROTATOR CUFF
4. pain from the GLENOHUMERAL JOINT

The Fine Print: POSSIBLE SOURCES OF SHOULDER PAIN

- ***referred***
  - from distant structures
    - subdiaphragmatic (gall bladder, peritoneal irritation)
    - mediastinal (cardiac, pericardial)
  - from nearby structures
    - **cervical spine** **
    - brachial plexus
    - apex of the lung (Pancoast tumour)

- ***shoulder***
  - bone (humerus, glenoid, acromion, clavicle)
    - fracture
    - tumour
    - infection
  - joint (inflammation, infection, degeneration, dislocation)
    - **acromioclavicular** (most commonly, degenerative causes) **
    - coracoclavicular (invariably traumatic dislocation)
    - glenohumeral
      - **articulation****
      - **capsule** **
  - rotator cuff
    - **tendonosis****
    - **tear** **
  - subacromial/subdeltoid bursa (inflammation, infection)

** the most common considerations in a patient presenting with shoulder pain

Most shoulder pain is unilateral – if it is bilateral you should consider an inflammatory process, such as rheumatoid arthritis or polymyalgia rheumatica.

Essential Surface Anatomy

- the sternoclavicular joint
- the clavicle
- the acromioclavicular joint
- the coracoid process
- the acromion
- the subacromial gap and the subdeltoid/subacromial bursa
- the greater tuberosity
- the bicipital groove *
- the lesser tuberosity *
- the scapula – margins and spine
- deltoid, supraspinatus, infraspinatus muscles

* often cannot be identified by palpation due to overlying muscles, but tenderness may be elicited

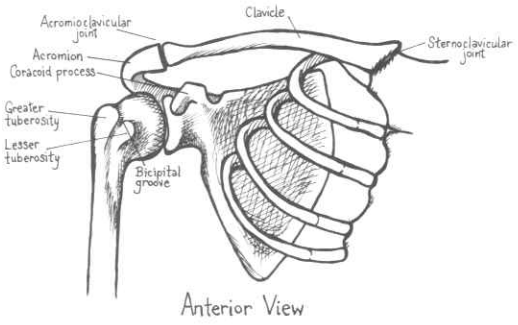


Fig 1

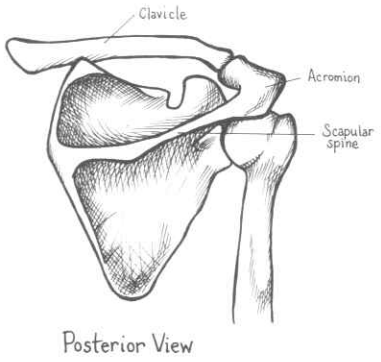


Fig 2

How it Relates to Function and Dysfunction

The glenoid fossa of the scapula is shallow and minimally constrained (see Figure 3). The lack of bony constraints permits tremendous shoulder mobility at the expense of stability – the glenohumeral joint has the largest range of movement of any joint in the body. Shoulder joint stability, therefore, depends primarily on the surrounding soft tissues – ligaments, muscles and the joint capsule.

The joint capsule provides static stability.

The rotator cuff muscles, the long head of the biceps and the remaining shoulder girdle muscles provide dynamic stability.

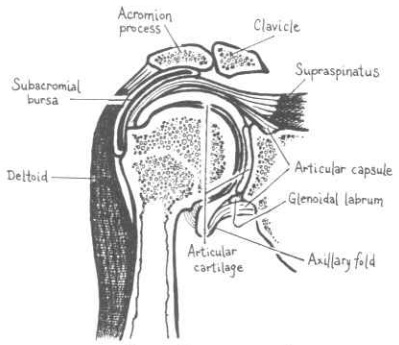
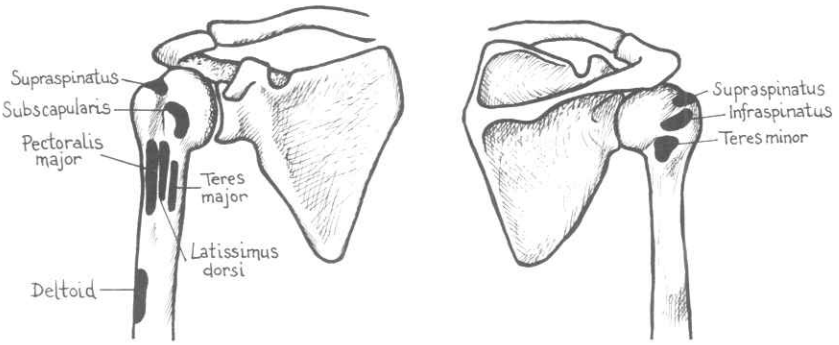
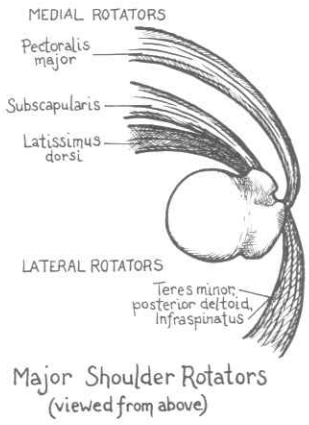


Fig 3



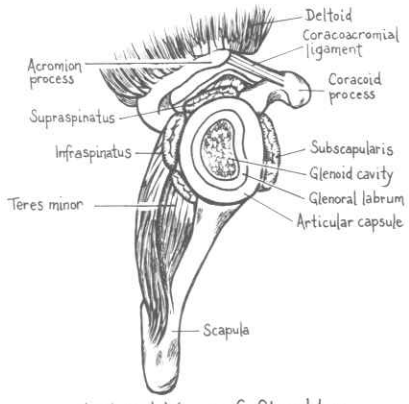
Muscle Insertions

Fig 4



Major Shoulder Rotators
(viewed from above)

Fig 5



Lateral View of Shoulder
-with humerus removed

Fig 6

The fine print:

- Rotator cuff inpingement syndrome refers to compression of the rotator cuff against the coracoacromial ligament (see Figure 6) and the underside of the acromion. It is elicited as the arm is brought forward and upward (above 90° forward flexion) and simultaneously is internally rotated.
- The subacromial bursa, because it lies between the deltoid muscle/undersurface of the acromion AND the supraspinatus tendon, may also become involved in the impingement syndrome. (see Figure 3)
- The lax axillary fold of the articular capsule permits an extraordinary range of abduction and rotation – in the "frozen shoulder" syndrome (also known as adhesive capsulitis); it becomes taut and contracted. (see Figure 3)

How it Relates to Function and Dysfunction (cont.)

THE ROTATOR CUFF – a composite tendon formed by four muscles, Suprasinatus, Infraspinatus, Teres Minor and Subscapularis ("SITS") that have their origin at the scapula and insert, circumferentially, around the head of the humerus – has two major functions: stability and movement. (see Figures 4, 5, 6)

(1) **STABILITY** – keeping the humeral head centred in the glenoid fossa while the stronger extrinsic muscles do most of the work

- The deltoid provides most of the power involved in abduction, and as it does so it tends to pull the humeral head superiorly. If it were not for simultaneous contraction of the supraspinatus, which acts to depress the humeral head, unopposed deltoid action (something that happens when there is supraspinatus dysfunction) causes the humeral head to ride up and contact with the underside of the acromion (easily seen on the shoulder x-ray).
- The subscapularis is a powerful stabilizer preventing anterior displacement of the humeral head (particularly with overhead throwing movements).

(2) **MOVEMENT** – isolated contraction of individual cuff muscles results in abduction (supraspinatus), external rotation (infraspinatus, teres minor) and internal rotation (subscapularis). (see Figure 5)

The fine print:

- Do not ignore the contribution of scapular movement to upper extremity function.
  - integrated with glenohumeral movement
  - with abduction, upward rotation of scapula ~ 1° for every 2° of glenohumeral movement
  - abduction past 90° is entirely due to scapular rotation
- Virtually all shoulder movements are mediated by C5,6 innervation

THE COMMON SYNDROMES OF SHOULDER PAIN

What You Need to Know

pain referred from the CERVICAL SPINE

- causes include
  - ► facet irritation
  - ► nerve root irritation
  - ► degenerative disc disease

- often perceived over trapezius and suprascapular region
- pain and/or paresthesiae may be referred down the upper limb
- usually worse with extremes of neck movement

- assessed by neck range of movement, compression tests and careful dermatomal, myotomal, reflex exam (especially C5 – T1. Root involvement above C5 is rare)

pain from the ACROMIOCLAVICULAR JOINT

- may reflect trauma (including rupture of coracoclavicular ligaments) or arthritis (inflammatory, septic, degenerative)

- pain well localized to source (especially with extreme abduction of arm to 180°)
- may be visible and palpable deformity

- may palpate crepitus with shoulder shrugging
- assessed by forced adduction → pain is reproduced (this manoeuvre has a high sensitivity but low specificity – can be positive in rotator cuff tendonosis)

pain from the ROTATOR CUFF SYNDROMES (90% of atraumatic shoulder pain)

(1) ROTATOR CUFF TENDONOSIS

- *intrinsic source of pain*
  - ► most commonly involves supraspinatus > infraspinatus > subscapularis
  - ► may be complicated by mechanical factors such as repetitive overhead reaching, lifting, pushing or pulling (i.e., impingement manoeuvres)
  - ► pain usually referred to deltoid insertion (patient rubs upper outer arm and insists that the muscle, rather than the shoulder, is the problem)

- *assessment manoeuvres include*
  - ► active abduction (especially mid-arc, between 70° and 120°) (see Figure 8) – low sensitivity unless moderately advanced cuff degeneration – or by
  - ► resisted abduction – the "empty can test" (see Figures 14 & 15)

(2) THE IMPINGEMENT SYNDROME

- *extrinsic source of pain*
  - ► soft tissues of rotator cuff "impinged" upon by bony undersurface of acromion and by coracoacromial ligament
  - ► the supraspinatus outlet is narrowest when humerus is fully flexed in internal rotation, bringing the greater tuberosity into subacromial position
  - ► this subacromial space may be further narrowed by
    - abnormal downward angulation of the acromion
    - subacromial osteophytes
    - irritation and inflammatory swelling of soft tissues (especially the subacromial bursa)
    - subtle upward and anterior shift of humeral head in glenoid due to deltoid contraction insufficiently opposed by an unhealthy supraspinatus (see rotator cuff tendonosis)

- *assessed by manoeuvres designed to reproduce impingement*
  - ► Neer sign (Figure 24 & 25) and Hawkins (Figure 26 & 27) are very sensitive, but of low specificity.

(3) ROTATOR CUFF TEAR

- symptomatically similar to cuff tendonosis – night pain and impairment of and/or aggravation by overhead activities

- clinically
  - ► active movement impaired (particularly abduction)
  - ► passive range intact
  - ► impingement signs are usually present
  - ► supraspinatus weakness (Figure 15)
  - ► weakness of infraspinatus/teres minor (Figure 13)
  - ► a complete tear may be associated with positive "drop arm" test (Figure 18) – 98% specificity but only 10% sensitivity)

The fine print:

Rotator cuff syndrome (partial or complete)

- a continuum from
- bursitis/tendonosis/partial tear →
- full thickness tear →
- arthropathy
- may complicate chronic impingement, chronic tendon degeneration (including that secondary to inflammatory arthritis) or trauma

The fine print:

"Tendonosis" has replaced "tendonitis" as the preferred term, since inflammation is rarely present

- tendonosis may be due to:
- ***intrinsic*** factors (e.g., progressive tendon degeneration leading to altered supraspinatus/deltoid balance → impingement of cuff tendons on acromion with movement) – or – much less commonly –
- ***extrinsic*** factors (e.g., due to deformity of the acromion)

The fine print:

Rotator cuff tendonitis

- the least common type of rotator cuff pain
- may be part of local or generalized inflammation (e.g., rheumatoid arthritis, polymyalgia rheumatica) – in which case the pain is usually bilateral
- MRI may also give evidence of an adjacent subacromial bursitis (identical symptoms and signs)
- symptoms and assessment manoeuvres similar to rotator cuff tendonosis

(4) PAIN FROM THE GLENOHUMERAL JOINT

(a) capsular pain ("adhesive capsulitis" or "frozen shoulder")

- pain may be acute, but often insidious, characterized as "deep, aching" and often interfering with sleep
- profound loss of both active and passive movement (abduction most of all > external rotation > internal rotation)
- may be bilateral

(b) glenohumeral arthritis

- if due to an underlying inflammatory arthritis (e.g., rheumatoid arthritis, chondrocalcinosis) there is often associated significant rotator cuff damage
- may be "idiopathic", with an intact rotator cuff
- less commonly, a result of end-stage rotator cuff syndrome – so-called "cuff arthropathy"
- as with other glenohumeral syndromes, pain is deep, aching, often interferes with sleep
- in elderly, with atrophy of overlying musculature, joint swelling and inflammation may be clinically obvious

(c) glenohumeral instability

- seen in young athletes, especially swimmers and throwers
- may be a history of shoulder dislocation or of trauma to shoulder (where the instability tends to be unidirectional)
- may also complicate ligamentous laxity (especially in young women as part of the "hypermobility syndrome") where the instability tends to be multidirectional
- commonly a sense of impending doom with extremes of movement (especially throwing – full external rotation and abduction – which threatens anterior dislocation)

The fine print:

Bicipital tendonitis/osis

- in addition to rotator cuff structures, the long head of the biceps (emerging from the bicipital groove between greater and lesser tubercles) may be compressed, leading to
- irritation, pain (usually anterior and with overhead lifting) – and even rupture (leading to a "Popeye" biceps)
- assessed by Speed's (Figure 22) and Yergason's (Figure 23) "tests" (low sensitivity, but high specificity)

The fine print:

Frozen shoulder

- may be a complication of:
  - rotator cuff tendonosis
  - referred pain to the shoulder
  - shoulder immobilization (e.g., following stroke)
- most commonly in middle-aged women, diabetics
- 3 stages – "freezing", "frozen", and "thawing" – may take up to 2 years to resolve
- no intervention (e.g., injections, physiotherapy) yet shown to speed up recovery
- arthrography shows marked reduction in intracapsular volume, loss of axillary fold of shoulder joint capsule (see Figure 3)

The fine print:

Glenohumeral instability

- Glenohumeral instability is rare over the age of 40 and when it occurs there is usually an associated rotator cuff tear
  - in 40% of 40 year-olds with evidence of instability
  - in 50% of 50 year-olds, etc.

THE APPROACH TO SHOULDER PAIN

LISTEN

- ***where is the pain?***
  - ► upper shoulder girdle (trapezius), scapula → think referred pain
    - related to neck position?
    - paresthesiae, weakness in arm or hand?
    - aggravated by coughing, straining (Valsalva)?
  - ► outer end of clavicle → think acromioclavicular joint
    - aggravated by arm movement (especially extreme abduction)?
    - worse at night, sleeping on that side?
    - aware of "grinding" with arm movement?
  - ► upper, outer arm (deltoid, especially in area of deltoid insertion a hand-breadth below the acromion) → think rotator cuff, subacromial bursa, glenohumeral joint and capsule
    - worse at night, frequently awakening?
    - worse with movement (which? reaching forward, fastening bra, combing hair, attempting abduction)?
    - weakness of movement (especially raising arm from side → full abduction, then controlled lowering – may reveal cuff tear)?
  - ► anterior shoulder (over and below bicipital groove) → think bicipital tendon

- ***how did it come on?***
  - ► acutely → often a tear, rupture, or dislocation
  - ► insidiously → most common with degenerative/inflammatory arthritis, "frozen shoulder"

- ***what is it like?***
  - ► sharp, intermittent – may reflect source in rotator cuff, glenohumeral joint
  - ► deep, aching – often reflects capsular pain of "frozen shoulder"

LOOK

- ***expose the shoulder girdle, including neck, trapezius, arms bilaterally and compare***
  - ► from the front
    - compare shoulder height and muscular development
      - often lower and greater on dominant arm
    - compare bony landmarks (especially SC and AC joints)
    - assess symmetry of shoulder girdle musculature
      - deltoid muscle atrophy ("squaring off") commonly seen in shoulder pathology
  - ► from behind
    - compare scapular margin contours (at rest and with movement)
    - assess supraspinatus and infraspinatus muscle mass
      - wasting, particularly of supraspinatus, common in rotator cuff disorders (scapular spine will be prominent)
    - 'static' scapular winging – neurologic (e.g., long thoracic nerve, radiculopathies of C3, C4, C5, or C7) or connective tissue disorders (e.g., Ehlers-Danlos syndrome)
    - 'dynamic' scapular winging very common in painful shoulder disorders

FEEL

- ***palpate sequentially***
  - ► sternoclavicular joints (check both and compare)
    - assess for asymmetrical prominence, tenderness
    - ask patient to shrug → ? palpable crepitus ? tenderness
  - ► acromioclavicular joints (check both and compare)
    - assess for asymmetrical prominence, tenderness
    - ask patient to shrug → ? palpable crepitus ? tenderness
  - ► subacromially space, from front to back
    - to feel anteriorly, ask patient to extend arm backward
    - to feel posteriorly, ask patient to flex arm forward
    - assess subacromial groove for ? subacromial bursal tenderness
  - ► identify greater and lesser tuberosity and bicipital groove
    - press firmly with fingertips, attempting to provoke discomfort at sites of insertion of supraspinatus and infraspinatus on the greater tuberosity and subscapularis (lesser tubercle), as well as bicipital groove between them
    - **it is difficult to actually feel the bicipital tendon because of overlying fibres of deltoid, but assymmetrical tenderness may suggest bicipital tendon pathology)**
  - ► coracoid prominence
  - ► supraspinatus, infraspinatus muscle mass
  - ► scapular borders (for muscle attachment pain)

MOVE

• *ACTIVE (the patient does the work)*

The examiner stands in front and asks the patient to imitate his movements – "Simon Says..." – movement is assessed, as are the patient's facial expressions

► from neutral at side, both arms to full forward flexion above head

Figure 7

► from neutral at side, both arms to full abduction above head – then from full abduction, lower slowly and simultaneously to neutral at side

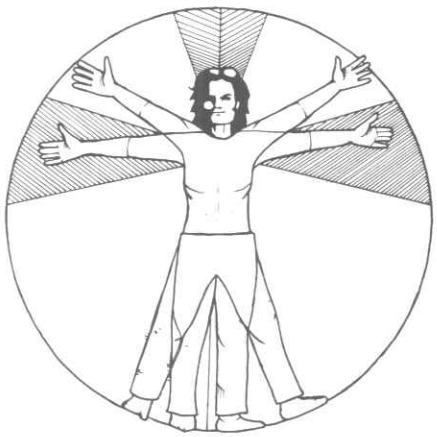


Figure 8

► from neutral at side, elbows flexed to 90°, externally rotate

Figure 9

► then, internally rotate and adduct, reaching up as high as possible with the index finger (Apley "scratch" test)
  - take a peek behind the patient to assess symmetry of hand position
  - especially compromised in rotator cuff, capsule, glenohumeral pathology

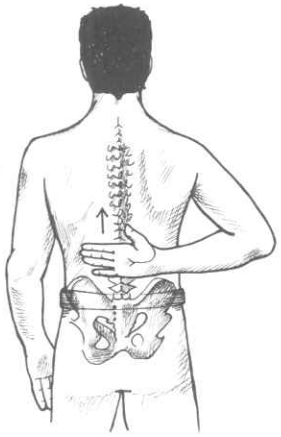


Figure 10

The fine print:

- pain in mid-range of abduction (i.e., approximately 60 to 100°) → probable cuff origin
- pain at full abduction (i.e., 180°) → probably AC joint origin
- "giving way" when lowering arm, or facial expression of pain → suggestive of subacromial pathology, especially cuff tear
- NB assess for smooth, symmetrical scapulohumeral coordination (assymmetry → probable shoulder articulation problem)

MOVE

- *PASSIVE (the examiner does the work)*

  - ► each shoulder is assessed separately
    - the examiner's "free" hand palpates and fixes the scapula. This may be done from the front (the fixing hand over the trapezius with fingers on the spine of the scapula) or from behind, the "free" hand holding the inferior angle of the scapula to the chest wall.

  - ► the examiner should gently grasp the arm to be moved just above the elbow
    - abduct the arm to the end of range (which should be at least 90°) – the end of range will be obvious as the scapula attempts to rotate upward against the "fixing" hand.
    - sliding the examining hand down to grasp the elbow, move the arm into full external rotation, then full internal rotation (both should approximate 90°)

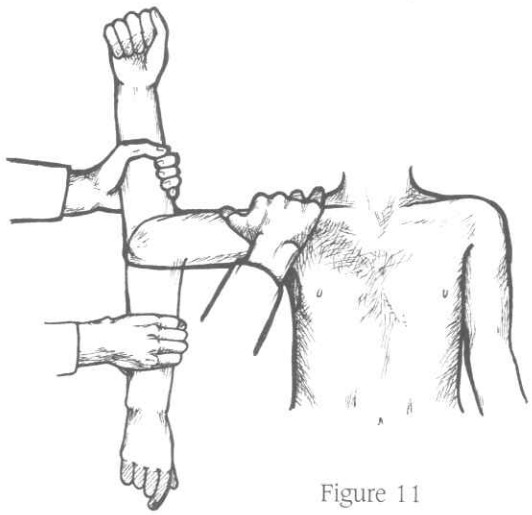


Figure 11

The fine print:

glenohumeral pathology – e.g., advanced arthritis

- all movements will be restricted – and pain caused by the attempt will be obvious. Crepitus may be felt/heard. Pain usually restricts determination of the "end-point".

joint capsule – e.g., "frozen shoulder" = "adhesive capsulitis"

- all movements will be restricted and painful, but "end-point" is "soft"
- "capsular pattern" of restriction – abduction most restricted > external rotation > internal rotation

passive range of motion – if significant pain; may be assessed supine

SPECIFIC TESTS

A. Global Assessment of Shoulder Musculature

- **THE DELTOID AND SITS MUSCLES**
  (Resisted Abduction, External Rotation, Internal Rotation)

  ► best approach permits simultaneous assessment of left and right sides
  - patient with arms hanging down at side, elbows flexed at 90°, hand and wrist in neutral (midway between full pronation and supination)
  - examiner reaches from behind patient, each arm pinning an elbow to the patient's side, examiner's forearm paralleling patient's forearm

- **ABDUCTION –**
  ask patient to press elbows away from the side against your restraining arms (testing deltoid>> supraspinatus strength) – may be compromised by shoulder pain, C5 radiculopathy (see Figure 12)

Figure 12

- **EXTERNAL ROTATION –**
  ask patient to press back of wrist/hand outward against your restraining forearm and hand (testing external rotators – infraspinatus and teres minor – weakness may indicate cuff tear, C5 radiculopathy) (see Figure 13)

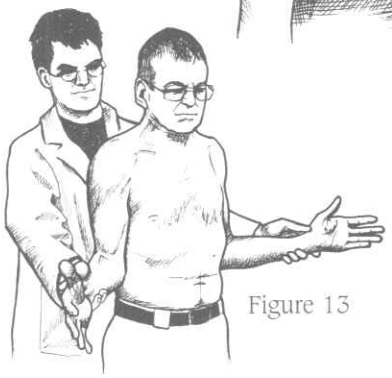


Figure 13

- **INTERNAL ROTATION –**
  with your hands then moved palm to palm with patient, ask patient to press the palms inward against your restraint (resisted internal rotation – pectoralis major and subscapularis primarily – weakness may indicate tear, C5 radiculopathy, suprascapular nerve injury) (see Figure 14)

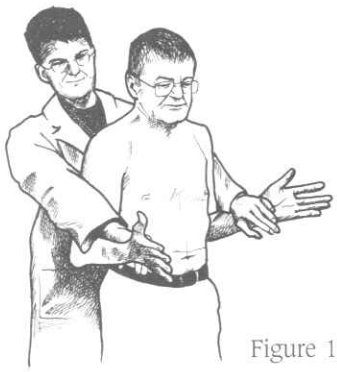


Figure 14

B. Focussed Rotator Cuff Assessment

- **THE SUPRASPINATUS (The "Empty Can" Test)**

  ► both arms abducted to 90°, flexed forward 30°, thumbs pointed to floor ("empty can test") – upper arm is now in the plane of the scapula on the thorax

Figure 15 – superior view showing plane of scapula

- patient is then instructed to resist examiner's attempt to move the arm from this position
- examiner places one hand just proximal to each elbow, forcefully presses downward simultaneously

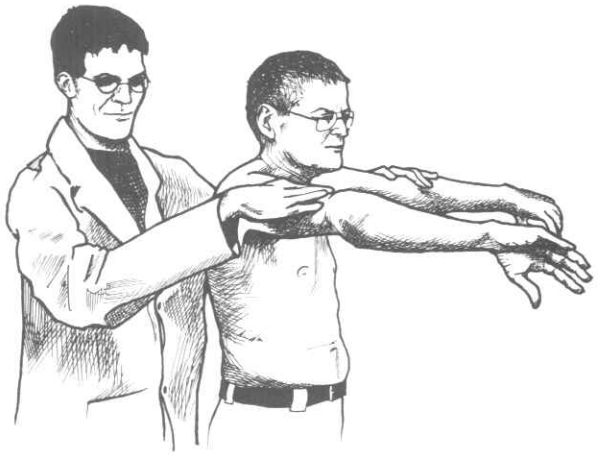


Figure 16

- patient may "give way" because of pain (supraspinatus tendonosis) or exhibit asymmetric weakness because of cuff tear or C5 radiculopathy/suprascapular nerve injury

- **THE INFRASPINATUS and TERES MINOR (The "Hornblower" Test)**

  ► patient's arm is positioned in 90° abduction, with the elbow at 90°, the examiner supporting both wrist and elbow

  ► the patient is asked to resist examiner's attempt to force the arm down into internal rotation (weakness invariably means a cuff tear)

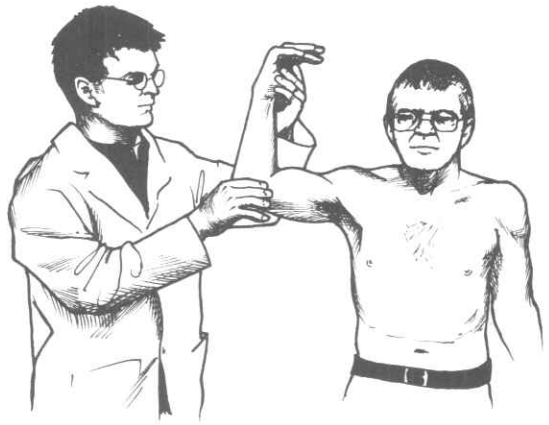


Figure 17

► a complete infraspinatus tear results in an inability to maintain the position when wrist support is removed, and the arm drops down (specific but relatively insensitive unless there is a major tendon tear)

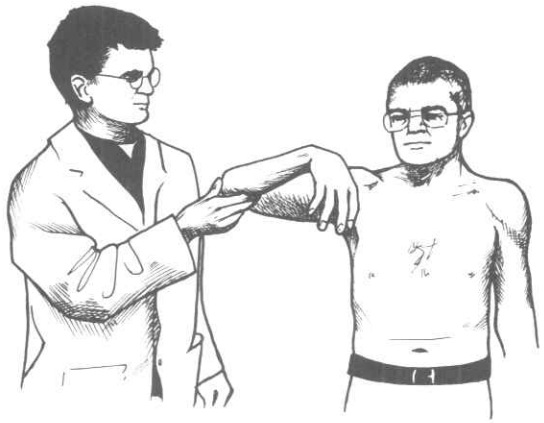


Figure 18

SPECIFIC TESTS

- **THE SUBSCAPULARIS (Resisted Internal Rotation)**

"Lift-off" test

- ► patient is instructed to place hand behind back, in the mid-lumbar region, palm outward (see Figure 19)
- ► examiner assesses patient's ability to push back ("lift" palm) away from back

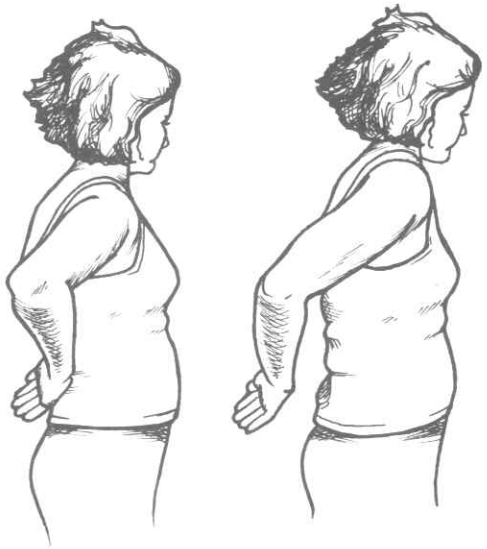


Figure 19

- **"Abdominal Press" test***
  (particularly useful if shoulder pain/impaired mobility prevents placing the hand behind the back to perform the "lift-off")

  ► examiner positions palm on patient's abdomen, patient instructed to press against abdomen while holding elbow out (forward) in the same plane (coronal) as the hand. Sides are compared for strength.

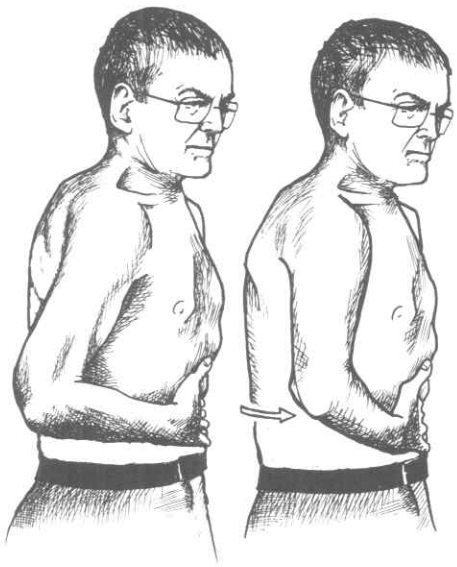


Figure 20

"Abdominal Pull-off" test*

► positioned as above, patient is instructed to resist examiner's attempt to "pull" hand away from abdomen – if subscapularis is torn, resistance will only be met after 30 to 40° of rotation (when pectoralis major takes over)

► combined tests, if positive, have sensitivity of 100% and specificity of 99.7% for subscapularis tear

SPECIFIC TESTS

- **FOR MAJOR ROTATOR CUFF TEARS ("Drop Arm" test)**

  - ► the arm is positioned in the scapular plane at 30° forward flexion
  - ► patient is instructed to hold position and the examiner's supporting hand is removed
  - ► if positive, it is very specific for major supraspinatus tear – but it is relatively insensitive for minor or partial tears

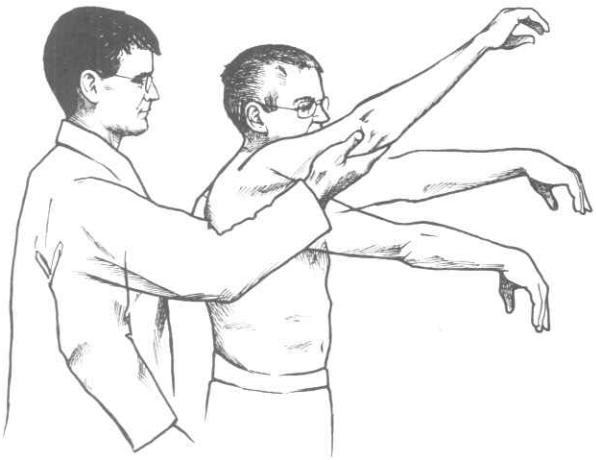


Figure 21

- **FOR BICEPS TENDINITIS**

Speed's Test*

- patients arm fully supinated, extended at elbow, and held in 60° forward flexion
- patient instructed to resist downward pressure of examiner's hand on wrist
- fingers of examiner's hand firmly pressed in the region of the bicipital groove
- pain under the examining fingers suggests bicipital tendinitis

** preferred test*
(high sensitivity but low specificity)

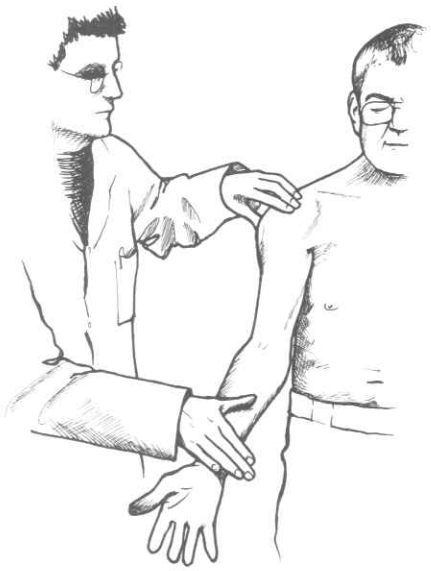


Figure 22

Yergason's Test

- patient's arm at side, elbow flexed to 90°, palm fully supinated
- examiner attempts to pronate the forearm against the patient's resistance

Figure 23

SPECIFIC TESTS

- **IMPINGEMENT SIGNS (see page 6, The Impingement Syndrome)**

Neer sign

- arm passively forced up into full flexion, first in external rotation (Figure 24), then (Figure 25) in internal rotation (to bring the greater tubercle into position where it may impinge upon the acromion &/or the coracoacromi-oligament)

- test is deemed positive if anterior shoulder pain is provoked, particularly with internal rotation

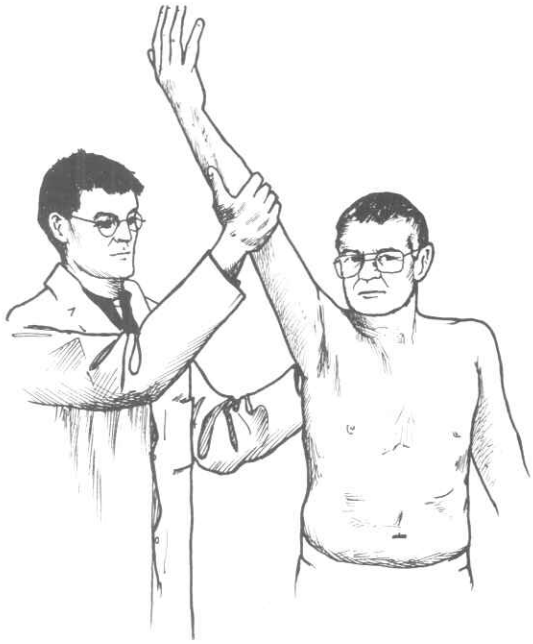


Figure 24

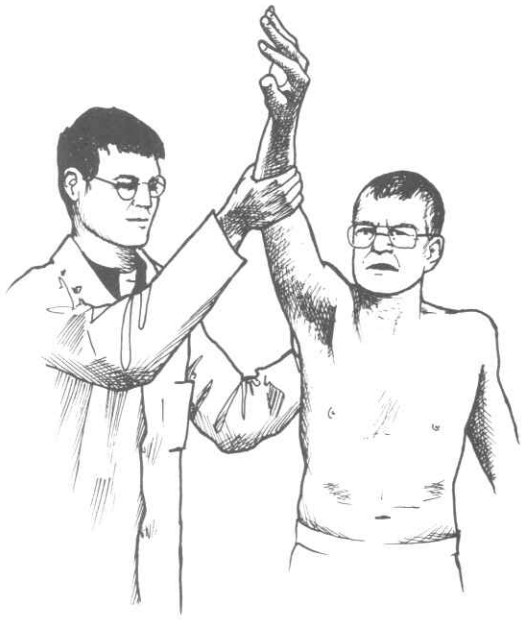


Figure 25

Hawkins test

- arm passively forward flexed to 90°, the elbow at 90° flexion, then the examiner's hand (grasping the elbow) attempts further upward flexion and internal rotation

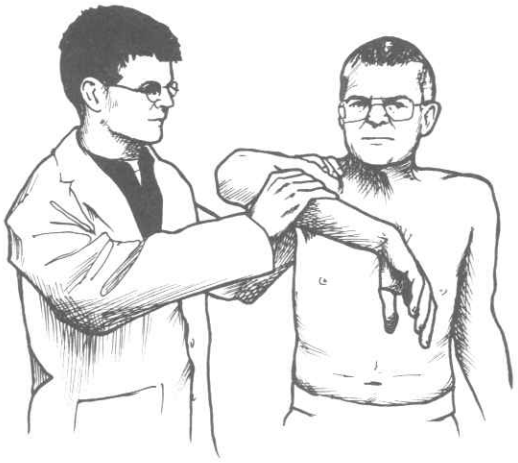


Figure 26

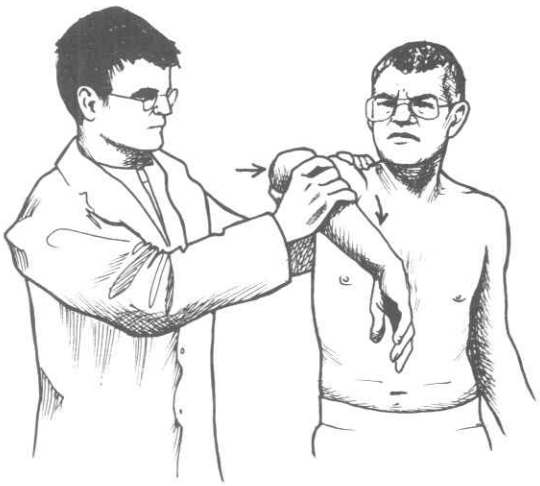


Figure 27

The fine print:

- The Impingement Test consists of injecting, subacromially, local anaesthetic. A "positive" test – implying the rotator cuff is the source of the patient's pain – consists of a 50% reduction in pain when carrying out impingement manoeuvres and improved rotator cuff strength with specific testing.

SPECIFIC TESTS

- **to assess ACROMIOCLAVICULAR JOINT (Forced Adduction)**

  - ► patient is asked to reach across chest, grasp the opposite shoulder (Figure 28)
  - ► if this does not provoke discomfort, examiner grasps the upper arm and forces it further into maximal adduction (Figure 29)
  - ► if the manoeuvre provokes pain in the acromioclavicular joint, the test is positive

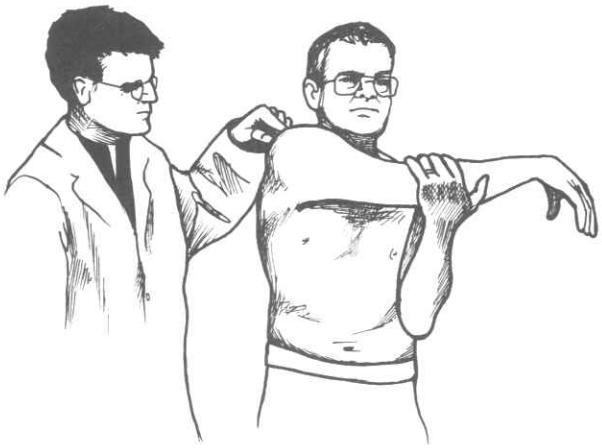


Figure 28

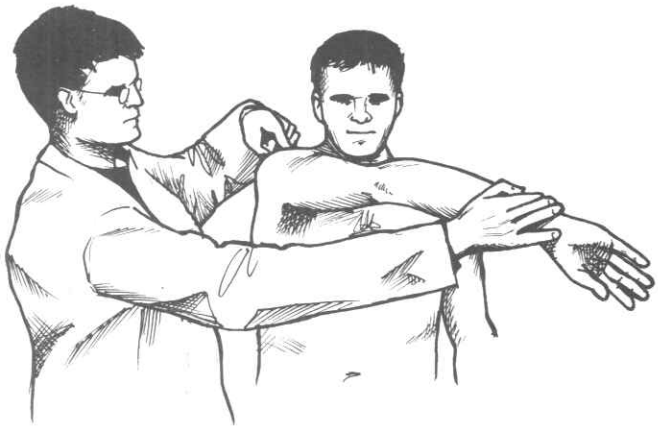


Figure 29

- **for GLENOHUMERAL INSTABILITY**
  (Initial Manoeuvre)

  ► arm hanging at side, the humeral head is grasped through the bulk of the deltoid muscle and the examiner attempts to glide the humerus anteriorly and posteriorly and assess if there is excessive "play" (this may not be particularly revealing in the unanaesthetized patient)

- **for INFERIOR SUBLUXATION**
  (The Sulcus Sign)

  ► arm hanging at side, the examiner provides direct downward traction at the elbow (Figure 30). Look for a concavity in the subacromial deltiod contour ("sulcus sign").

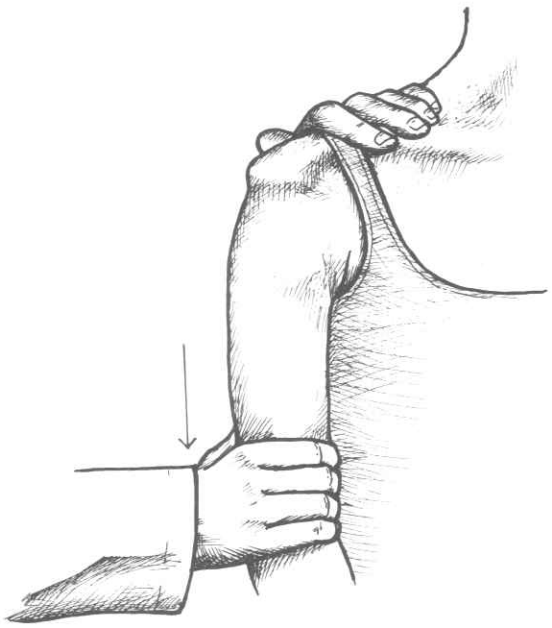


Figure 30

SPECIFIC TESTS

- **for ANTERIOR INSTABILITY ("apprehension" test)**

► the patient's arm is abducted to 90°, then firmly rotated into full external rotation by the examiner who is simultaneously pressing from behind, attempting to displace the humeral head anteriorly – a positive test consists in the patient expressing fear of impending subluxation or tensing the shoulder muscles

► if this test is positive, it is repeated with the patient lying (Figure 32). The examiner's hand then presses firmly down over the humeral head, preventing anterior movement (Figure 33) and eliminating the patient's "apprehension". Further external rotation, however, results in re-appearance of facial expression of apprehension (Figure 34).

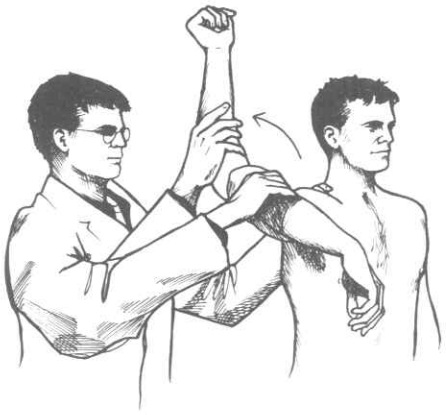


Figure 31

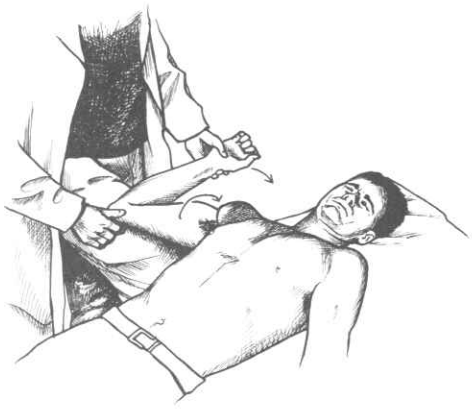


Figure 32

Figure 33

Figure 34

C. Assessing For Pain Referred From the Cervical Spine

- attempt to reproduce pain – have the patient perform a full range of neck movement (flexion, extension, rotation, lateral flexion)

Figure 35

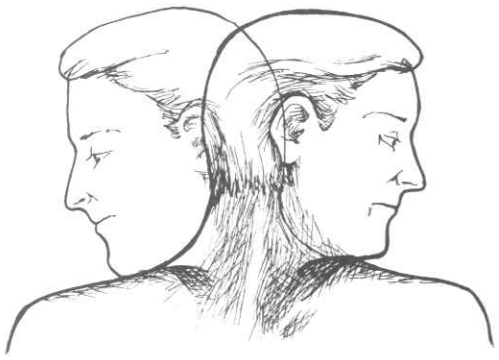


Figure 36

Figure 37

SPECIFIC TESTS

- **COMPRESSION TEST FOR CERVICAL RADICULOPATHY (Spurling's Manoeuvre) – a positive test involves pain radiating into arm**

  ► examiner exerts steady downward pressure from above (patient sitting, examiner standing behind) using both hands over vertex of skull

  ► sequentially performed until "positive" response obtained
  - patient's head in neutral ("military") position
  - patient's head in extension
  - patient's head in extension and lateral flexion
    (a variant of this involves lateral flexion and rotation to the same side)

- **assess motor (myotome) and sensory (dermatome) function, deep tendon reflexes**

	Motor	Sensory	Reflex
C5	shoulder abduction	sensation over deltoid	biceps jerk (& contraction)
C6	elbow flexion wrist extension	thumb sensation	brachioradialis jerk
C7	elbow extension finger extension	long finger sensation	triceps jerk
C8	finger flexors	little finger sensation	
T1	finger abduction and adduction	inner arm sensation about elbow	

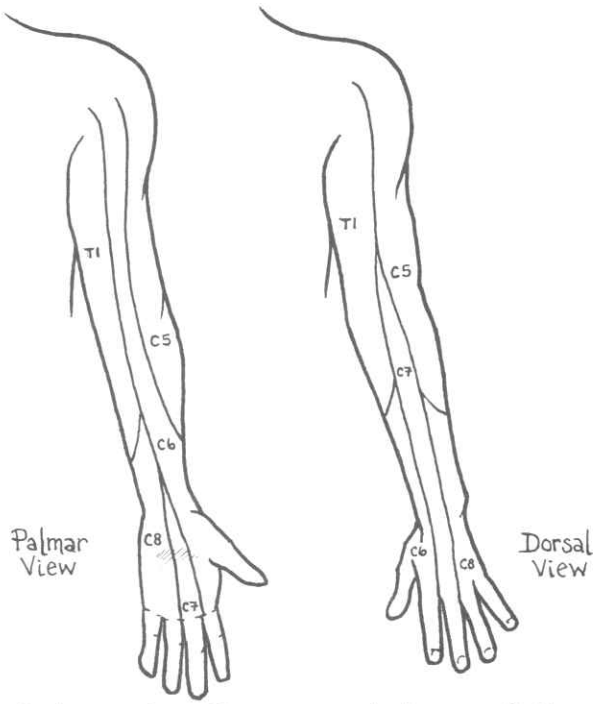

T1
C5
C6
C8
C7
Palmar View
T1
C5
C7
C6
C8
Dorsal View
Schematic Representation of the Cervical Dermatomes

Figure 38

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Dedicated To
Hugh Little MD FRCPC
mentor, colleague and friend

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SHOULDER EXAM CHECKLIST

Listen:

- ❑ **Where** is the pain?
  - its apparent origin
  - its radiation
- ❑ **What** is the pain?
  - sharp, intermittent?
  - steady, aching, deep?
  - associated with numbness or tingling?
- ❑ **When** is the pain?
  - specific movements aggravate or relieve?
  - at night?
- ❑ **How** did it start?
  - with specific activity?
  - acutely or insidiously?

Look:

- ❑ From the front
- ❑ From the back

Feel:

- ❑ Identify and palpate all shoulder landmarks

Move:

- ❑ Actively – view from front and behind
  - 180° forward flexion and return
  - 180° abduction (and return) in coronal plane
  - abduction/external rotation
  - adduction/internal rotation ("scratch test")
- ❑ Passively – scapula fixed
  - assess "end-point"
  - palpate for crepitus

Special Tests:

• for rotator cuff integrity

- ❑ Resisted abduction/internal/external rotation
- ❑ Resisted abduction at 90° ("empty can")
- ❑ Resisted internal rotation ("lift-off", "abdominal press/pull-off")
- ❑ Static/resisted external rotation ("Hornblower")
- ❑ "Drop-arm" test

• for biceps tendon

- ❑ Resisted flexion ("Speed's test")
- ❑ Resisted supination ("Yergason's test")

• for impingement

- ❑ Extended arm, full flexion, internal rotation ("Neer's test")
- ❑ Elbow at 90°, forced flexion and internal rotation ("Hawkin's test")

• for acromioclavicular pathology

- ❑ Forced adduction

• for glenohumeral instability

- ❑ Forced external rotation ("apprehension" & "relocation") – anterior testing
- ❑ Inferior distraction ("sulcus sign") – inferior testing

• for cervical radiculopathy

- ❑ Cervical compression ("Spurling's Test") – neutral/extension/ext-rotation
- ❑ Reflex testing (C5-6-7)
- ❑ Myotomal testing (C5-6-7-8)
- ❑ Dermatomal testing (C5-6-7-8-T1)

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