

Hands-On Differential: Shoulder to Digit Specialized Examination

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Objectives

- Review components of a comprehensive musculoskeletal physical exam.
- Identify specialized musculoskeletal exams for the upper extremity.
- Demonstrate appropriate specialized musculoskeletal exam techniques.
- Recognize positive findings.
- Correlate physical exam findings with differential diagnosis.

Components of Musculoskeletal Physical Examination

- Inspection
- Palpation
- Range of motion
  - Active typically followed by passive
- Neurologic
  - Sensory and motor
- Peripheral vascular
- **Specialized Exams**
  - High sensitivity, negative result → rules out (SnNout)
  - High specificity, positive result → rules in (SpPin)

Shoulder

Case 1: “It hurts right on top”

A

30 M, lifts five days a week

Worse on bench press and dips

Points to one spot with one fingertip

No numbness, no night pain

B

44 M, warehouse

Worse reaching overhead all shift

Grabs the side of the shoulder with a whole hand

Aches at night lying on it

Where does the pain live and where in the arc does it appear?



CC BY

Pain Provocation Test: Painful Arc Test

Patient actively abducts arm from side to overhead; observe for pain during arc of motion

- Positive: Pain between 60-120° of abduction
- Indications: Rotator cuff disease, subacromial impingement

*Note: Pain only at the top, then consider AC joint

Sensitivity 71% · Specificity 81%

Cross-Body Adduction Test

Passively adduct arm across body with shoulder at 90°

- Positive: pain elicited and localized to the AC joint
- Indications: Chronic AC joint conditions, subacromial impingement syndrome

Sensitivity 77% · Specificity 79%



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One test, two answers

The arc tells you which joint

A

Cross-body adduction +

Point tender directly over the AC joint

Pain in the LAST 20° of elevation

AC joint pathology

Consider distal clavicular osteolysis in a lifter. Modify the lift first.

B

Cross-body adduction equivocal

Tender laterally, not on the AC joint

Pain at 60–120°, quiet above and below

Subacromial pain syndrome

Scapular mechanics and cuff strengthening.

A patient who points with one fingertip has told you the diagnosis before you touched them.

Case 2: “I can’t get my arm over my head”

A

58 yo

Four months, no injury

Sleeps in the recliner

Can’t reach the top shelf

B

63 yo

Fell on an outstretched arm 3 weeks ago

Hikes the shoulder to lift

Ache down the lateral arm

C

52 yo

Four months, steadily worse

Can’t fasten her bra

Now stiff more than painful

D

55 yo

Six weeks, no clear injury

Can’t tuck in his shirt

Can’t reach his back pocket

Which one already worries you, and why?

Neer Sign

Examiner stabilizes scapula and passively forward-flexes the arm overhead in internal rotation/pronation

- Positive: Pain with forward flexion
- Indication: Subacromial impingement

Sensitivity 64–75% · Specificity 30–61%



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Hawkins Test (Hawkins-Kennedy)

Arm at 90° forward flexion, elbow at 90°; passively internally rotate shoulder

- Positive: Pain with internal rotation
- Indications: Subacromial impingement

Sensitivity 76–80% · Specificity 26–48%

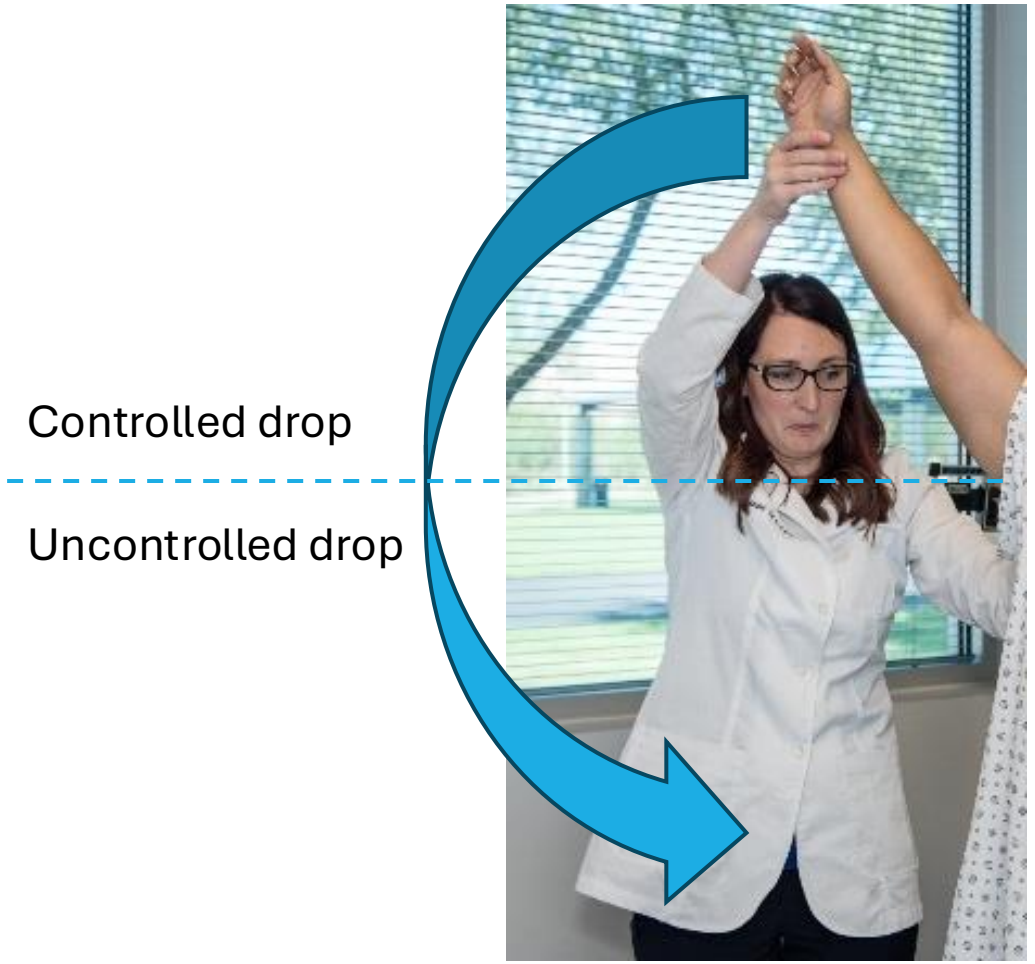


Drop Arm

Patient abducts arm and slowly lowers arm to side

- Positive: Inability to control descent or arm drops suddenly at 90°
- Indications: Full-thickness rotator cuff tears

Sensitivity 24% · Specificity 93–98%



Empty Can (Jobe Test)

Arm at 90° forward flexion and abduction in the scapular plane, full internal rotation (thumb down); resist downward pressure

- Positive: Pain and/or weakness with resistance
- Indications: Supraspinatus tears

Sensitivity 52–88% · Specificity 50–82%



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External Lag Sign

Arm at side with elbow at 90°; examiner passively externally rotates the shoulder maximally, then releases

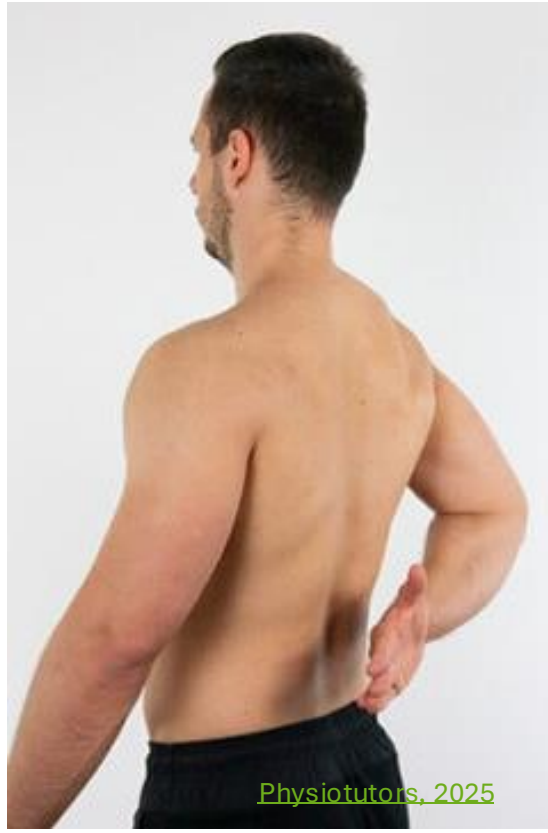
- Positive: Arm drops into internal rotation when released
- Indications: Infraspinatus/supraspinatus tears



Sensitivity 47% · Specificity 94%

Lift-off	Sensitivity 34–68% · Specificity 50–77%
Belly press	Sensitivity data limited · Specificity 85%

Gerber Lift Off/Belly Press


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Gerber Lift Off: Patient places the dorsum of the hand against the lower back; examiner then asks the patient to actively lift the hand away from the back while maintaining the arm position.

- Positive Test: unable to lift or maintain the hand away from the back

Belly Press: patient places palms flat against abdomen and presses inward while keeping the elbow forward

- Positive Test: inability to maintain elbow position or wrist flexion

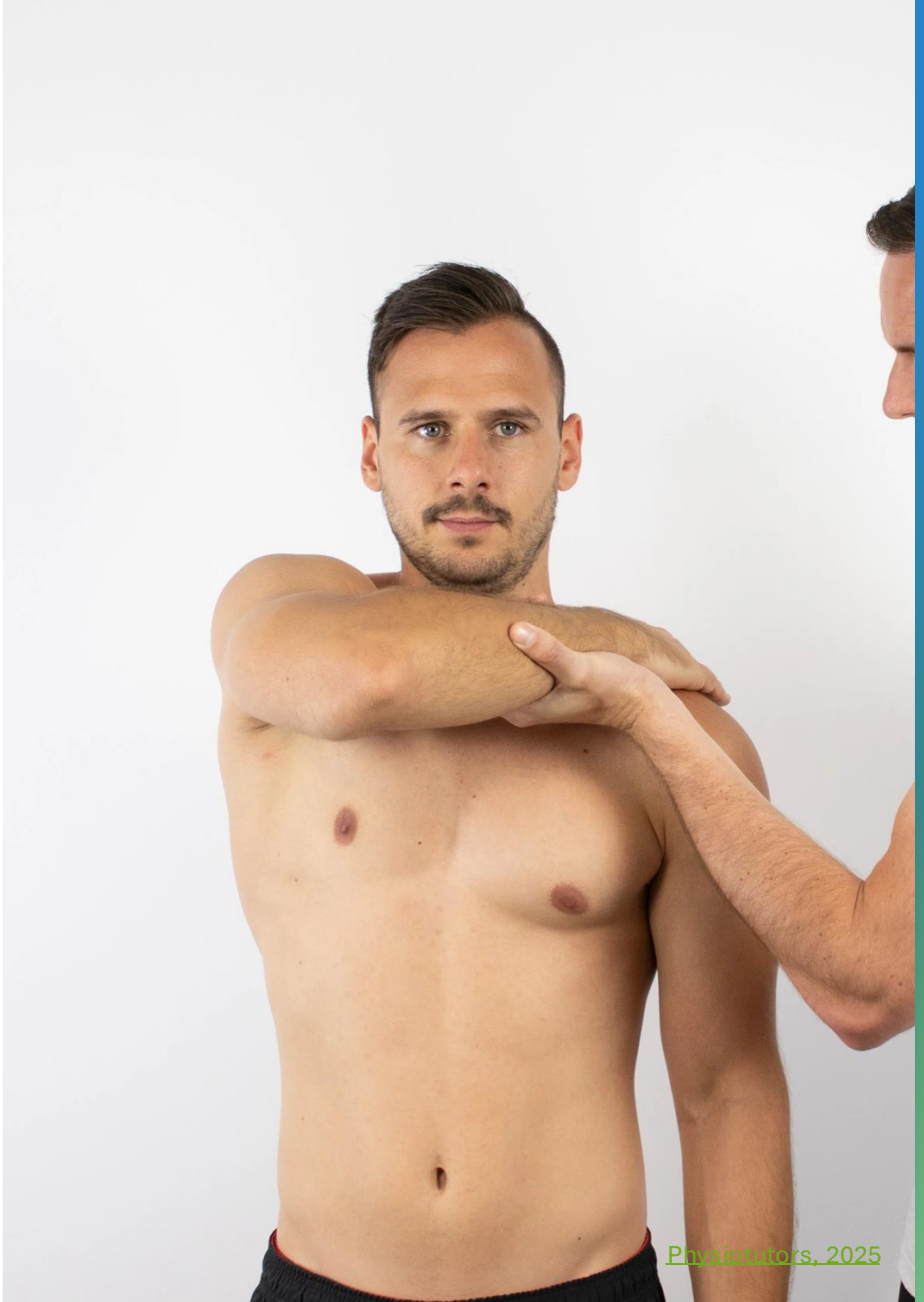
- Indication: subscapularis weakness or tear


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Bear Hug

- Patient places the palm of the affected side on the opposite shoulder, elbow forward; examiner attempts to lift the hand off the shoulder while the patient resists
- Positive: Unable to keep the hand on the shoulder, or measurable weakness against resistance
- Indication: Subscapularis tear, particularly upper tendon tears

Sensitivity 52–72% · Specificity 85–92%



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Back to the Basics: Passive ROM breaks the tie

Neer and Hawkins were positive in three of the four

A

Painful arc 60–120°

Neer +, Hawkins +

Strength intact

Passive ROM full

Subacromial pain syndrome

PT. No imaging.

B

Drop arm +

External rotation lag +

Empty can weak

Passive ROM full

Full-thickness cuff tear

MRI with acute trauma

C

Impingement tests “+”

…but limited by stiffness

Passive ER blocked

Active = passive

Adhesive capsulitis

No MRI. Injection + PT

D

Belly press weak

Lift-off: unable

Bear hug +

Passive ROM full

Subscapularis tear

Refer to ortho. These don’t self-resolve.

Passive external rotation is what separates them. It is not a special test and yet it outperforms every test on this slide.

Case 3: “It’s deep, in the front”

Anterior shoulder pain — groove or labrum?

A

46 M, painter

Anterior pain for two months

Worse lifting a gallon of milk palm-up

Can point to the spot

B

24 F, collegiate volleyball

Deep pain in the cocking position

A clunk, and a sense of catching

Cannot localize it — gestures inside

C

19 M, football

Arm forced into abduction and external rotation

Now guards when reaching back to throw

Reduced on the field, never imaged

Superficial and pointable, or deep and vague? That distinction survives the whole workup.

Speed’s Test

Extend elbow with full supination, 60-90° shoulder flexion and ask patient to resist downward pressure

- Positive: pain along the biceps tendon
- Indication: biceps tendonitis

Sensitivity 54–87% · Specificity 53–81%



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Yergason Test

Elbow at 90° flexion at side; resist supination and external rotation

- Positive: Pain in bicipital groove

- Indication: Biceps tendon pathology, SLAP lesions



Sensitivity low · Specificity 83–98%

O’Brien Test

Arm at 90° forward flexion, 10-15° adduction, full pronation; resist downward force.

Repeat with supination.

- Positive: Pain with pronation that decreases with supination; pain deep in shoulder

- Indications: primarily SLAP lesions



Sensitivity 47–98% · Specificity 11–79%

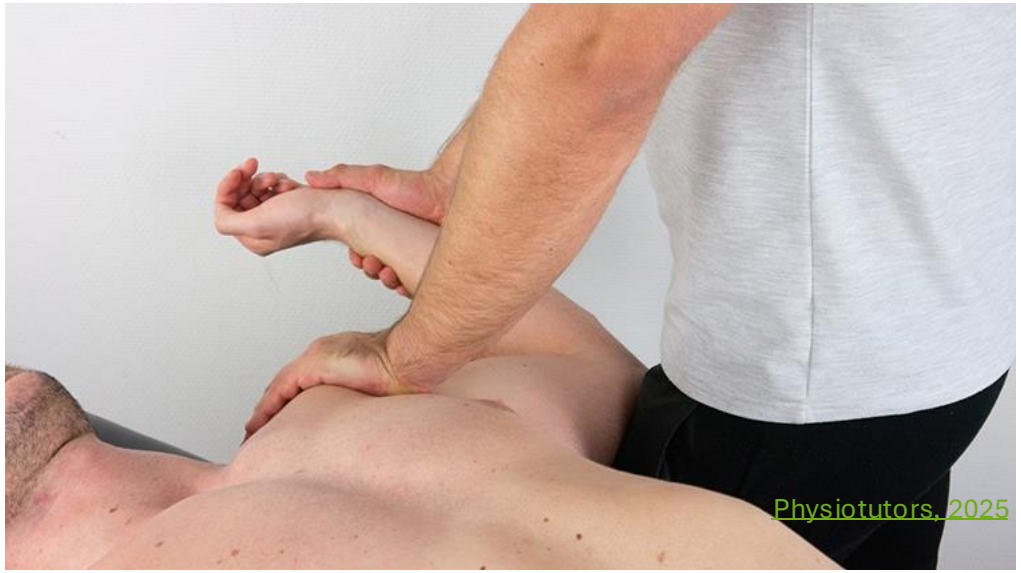
Apprehension-Relocation-Release

Apprehension: Patient supine with elbow flexed and arm abducted at 90 degrees. Gently apply external rotation at the shoulder while observing for apprehension.

Relocation/Release: Apply posterior pressure to the humerus (relocation), can also abruptly remove pressure from the humerus (release)

- Positive: Apprehension with ROM testing AND symptoms are relieved with relaxation/relocation
- Indication: Shoulder instability





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Sensitivity 64–82% · Specificity 89–96%
Specificity is highest when relocation relieves the apprehension

Groove or labrum

Two tests each — and one shared false positive.

A

Speed's +

Yergason +

Point tender in the bicipital groove

Cuff strength intact

Biceps tendinopathy

Rarely travels alone — re-examine the cuff.

B

O'Brien +; pain DEEP, pronated

Relieved on supination

Speed's equivocal

Apprehension negative

SLAP lesion

Three concordant tests before imaging or referral.

C

Apprehension at 90/90 — guarding, not pain

Relieved by posterior pressure

Returns on release

Full passive ROM otherwise

Anterior instability

Dislocation recurrence risk is age-driven. Refer the young ones.

O'Brien with pain on TOP of the shoulder is an AC joint, not a labrum.

Elbow

Case 4: “It hurts when I grip”

A

44 yo, took up pickleball 3 months ago

Lateral elbow pain

Hurts to shake hands or lift a coffee cup

Worse with any gripping

B

41 yo, six months of lateral elbow pain

Already did therapy, a strap, and an injection

Aches at night

Nothing has helped

Patient B has the same diagnosis as patient A on her chart. Does she have the same diagnosis?

Cozen Test: Resisted Wrist Extension

Patient makes fist and extends wrist against resistance while examiner stabilizes elbow



- Positive: Pain at lateral epicondyle with resisted wrist extension

- Indication: Lateral epicondylitis

Not well studied in isolation

Maudsley Test:
Resisted Middle Finger Extension

Resist extension of the middle finger with the elbow extended

- Positive: Pain 4–5 cm distal to the lateral epicondyle, over the supinator

- Indication: Radial tunnel syndrome (posterior interosseous nerve), Lateral epicondylitis
  - Location of the pain is what separates them

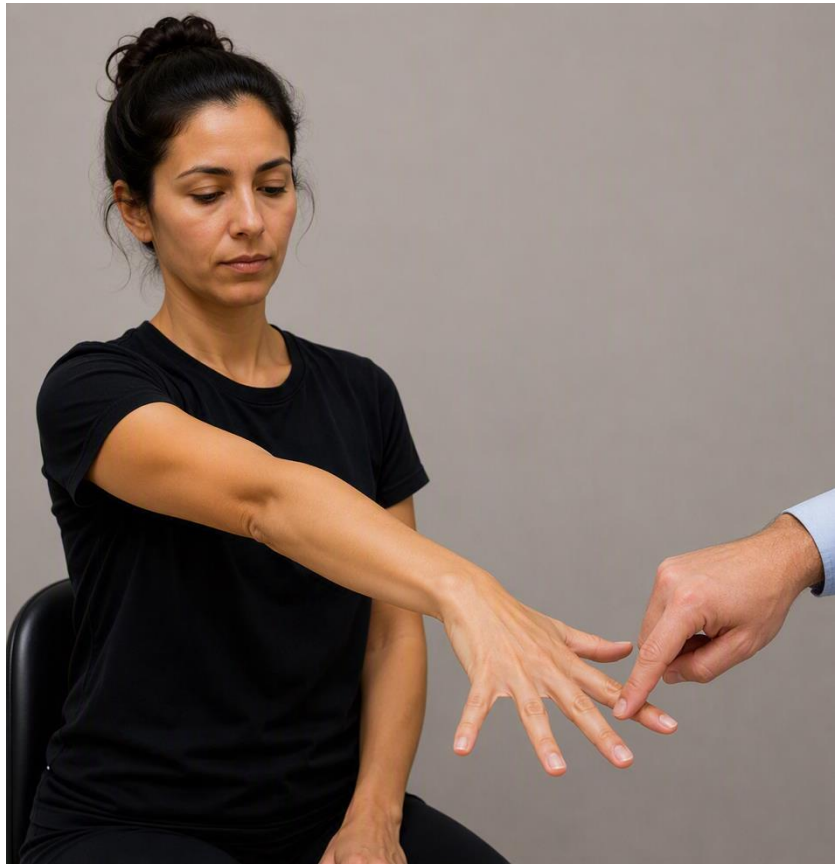


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Not well studied in isolation

Same complaint, three tendons and one nerve

Palpate in two places laterally before you commit

A

Cozen +

Tender ~1 cm distal to the lateral epicondyle

Pain on resisted wrist extension

Grip strength reduced by pain

Lateral elbow tendinopathy

Load management and time. Counsel on the natural history.

B

Cozen equivocal

Tender 4–5 cm distal, over the supinator

Resisted middle-finger extension + (Maudsley)

Night pain, aching rather than sharp

Radial tunnel syndrome

Explains why the strap and the injection did nothing.

Tendinosis, not tendinitis; there are no inflammatory cells in it.

Case 5: “It hurts when I throw”

Medial elbow pain in two pitchers.

A

13 yo, pitches for three travel teams

Medial elbow pain late in games

No single injury

Has been pitching year-round since he was 9

B

20 yo, college pitcher

Medial pain in the late cocking phase

Velocity down 4 mph over the season

One episode of ulnar tingling after an outing

Age matters. Why?

Valgus Stress Test



Elbow at 20-30° flexion; apply valgus force to elbow while stabilizing humerus

*Moving Valgus: Examiner applies and maintains valgus stress to the elbow while flexing and extending the elbow

- Positive: Pain, laxity, or apprehension at medial elbow
  - Pain between 70 and 120 degrees of elbow flexion
- Indication: UCL (MCL) injury



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Static valgus **Sensitivity lower than the moving version**

Moving valgus stress **Sensitivity 98% · Specificity 78%**

The physis fails first

A

Point tender directly over the medial epicondyle

Pain with resisted wrist flexion

Valgus stress painful but STABLE

Open physis for age

Medial epicondyle apophysitis

Pitch counts and rest. Comparison radiographs of both elbows.

B

Tender ~2 cm distal to the medial epicondyle

Valgus stress at 20–30°: laxity and apprehension

Moving valgus stress + through 70–120°

Ulnar symptoms with repetition

Ulnar collateral ligament injury

Refer. Ulnar symptoms raise the stakes considerably.

The moving valgus stress test is substantially more sensitive than the static version.

Wrist/Hand

Case 6: “My hand goes numb”

A

41 yo, 30 weeks pregnant

Wakes at 3 a.m. shaking her hands

Dropped her coffee mug twice this week

Better once she is up and moving

B

55 yo, long-haul driver

Numb ring and small finger

Worse with the elbow bent on the door

Grip feels clumsy on the wheel

Which fingers, and how far up the arm? Those two questions localize the lesion before any test.







Neurologic Check

<u>Motor</u> examination of the hand:

Rock: Median nerve – Finger/thumb flexion

Paper: Radial nerve – Wrist/finger extension

Scissors: Ulnar nerve – Finger abduction/adduction

***OK:** Anterior Interosseous Nerve (AIN)

- Branch of the Median Nerve

Durkan Test



Apply firm pressure directly over carpal tunnel for 30 seconds

- Positive: Reproduction of paresthesias in median nerve distribution

- Indication: Carpal tunnel syndrome

Sensitivity 64% · Specificity 83%







Phalen’s Test

Hold wrist in 90° flexion for 20-30 seconds (or 60 seconds)

- Positive: Reproduction of paresthesias in median nerve distribution
- Indication: Carpal tunnel syndrome

Sensitivity 57–68% · Specificity 67–73%

Hand Elevation Test (HET)

Patient elevates both hands overhead for 60 seconds

- Positive: Reproduction of paresthesias in median nerve distribution
- Indication: Carpal tunnel syndrome



Limited data
Reported comparable or better than Phalen in some studies

Tinel’s Sign at the Wrist

Firmly and repeatedly tap over carpal tunnel at wrist

- Positive: Tingling in median nerve distribution (thumb, index, middle, radial ring finger)

- Indication: Carpal tunnel syndrome

Sensitivity 25–50% · Specificity 67–87%

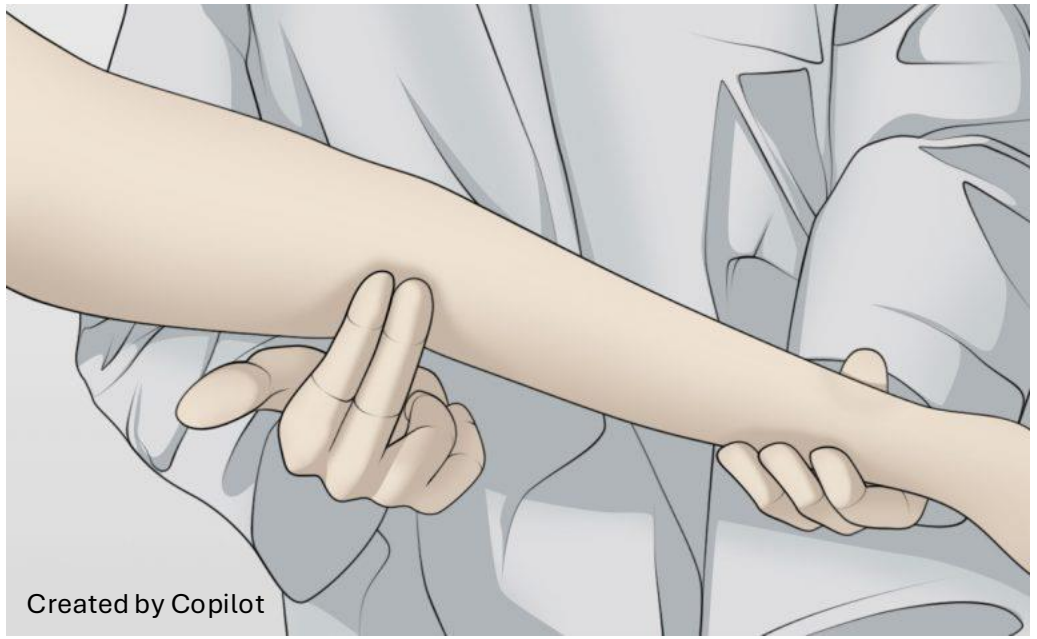




Tinel’s Sign at the Elbow

Tap over ulnar nerve at cubital tunnel

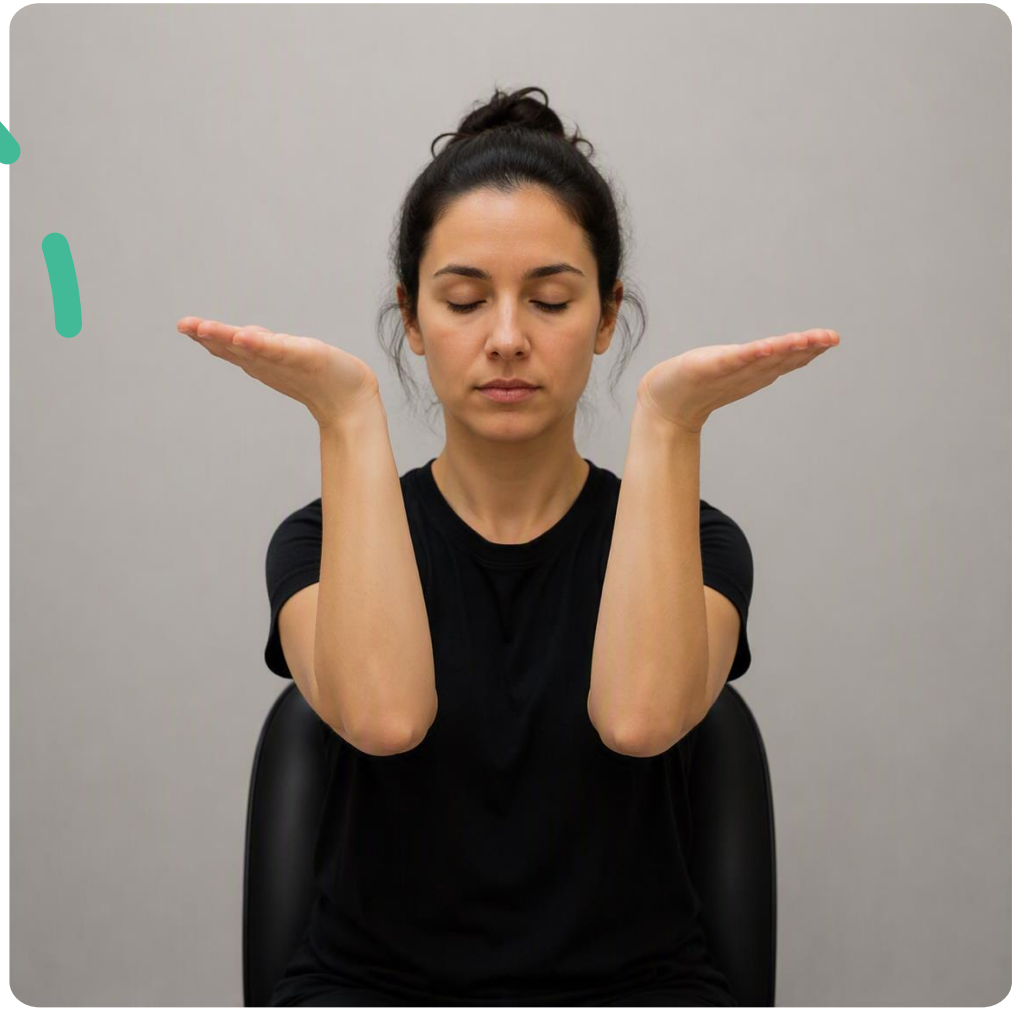
- Positive: Tingling in ulnar distribution (ring and small fingers)
- Indication: Ulnar neuropathy at elbow (Cubital tunnel syndrome)



Sensitivity 62% · Specificity 53%

Elbow Flexion Compression Test

Maximally flex elbow with forearm supinated and wrist extended; +/- direct pressure over the ulnar nerve at the cubital tunnel for 60 seconds+



- Positive: Paresthesias in ulnar nerve distribution

- Indication: Cubital tunnel syndrome

Elbow flexion alone: Sensitivity 32–75% · Specificity 98–100%

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Additional Ulnar Nerve Tests

Froment: patient pinches paper between thumb and index; thumb IP flexes to compensate → ulnar motor weakness

Wartenberg: small finger drifts into abduction, can't adduct → ulnar motor weakness

Wrist, elbow, or neck

A

Thumb, index, middle

Durkan + within 30 seconds

Phalen +, flick sign (patient shakes the hand to relieve it)

Thenar bulk preserved

Carpal tunnel syndrome

CTS-6 may prevent the need for EMG.
Night splint first.

B

Ring and small finger

DORSAL ulnar hand also numb

Tinel + and elbow flexion test + at the cubital tunnel

First dorsal interosseous weak; Froment +

Cubital tunnel syndrome

Dorsal sensation is spared in Guyon canal: that is the split.

Don’t forget the neck. Assess with EVERY tingling or numb hand.

Case 7: “My wrist hurts”

A

34 yo, six-week-old baby

Pain lifting baby under the arms

Worse with any thumb use

Some swelling on the thumb side

B

60 yo, retired seamstress

Pain opening jars and turning a key

Aches at the base of the thumb

Thinks the joint has started to look different

Put one finger on the sorest spot. The location will out-diagnose every test on the next slides.

Finkelstein Test and Eichhoff Test

- Finkelstein: Examiner grasps thumb and deviates wrist ulnarly
- Eichhoff Modification: Patient makes fist with thumb tucked inside and examiner deviates wrist ulnarly

- Positive: Pain over radial styloid and first dorsal compartment

- Indication: De Quervain tenosynovitis



By PhilippN - Eigenes

CMC Grind Test

Grasp the thumb metacarpal shaft and move the thumb in a circular motion while applying axial loading

- Positive: Pain/crepitus
- Indication: CMC arthritis

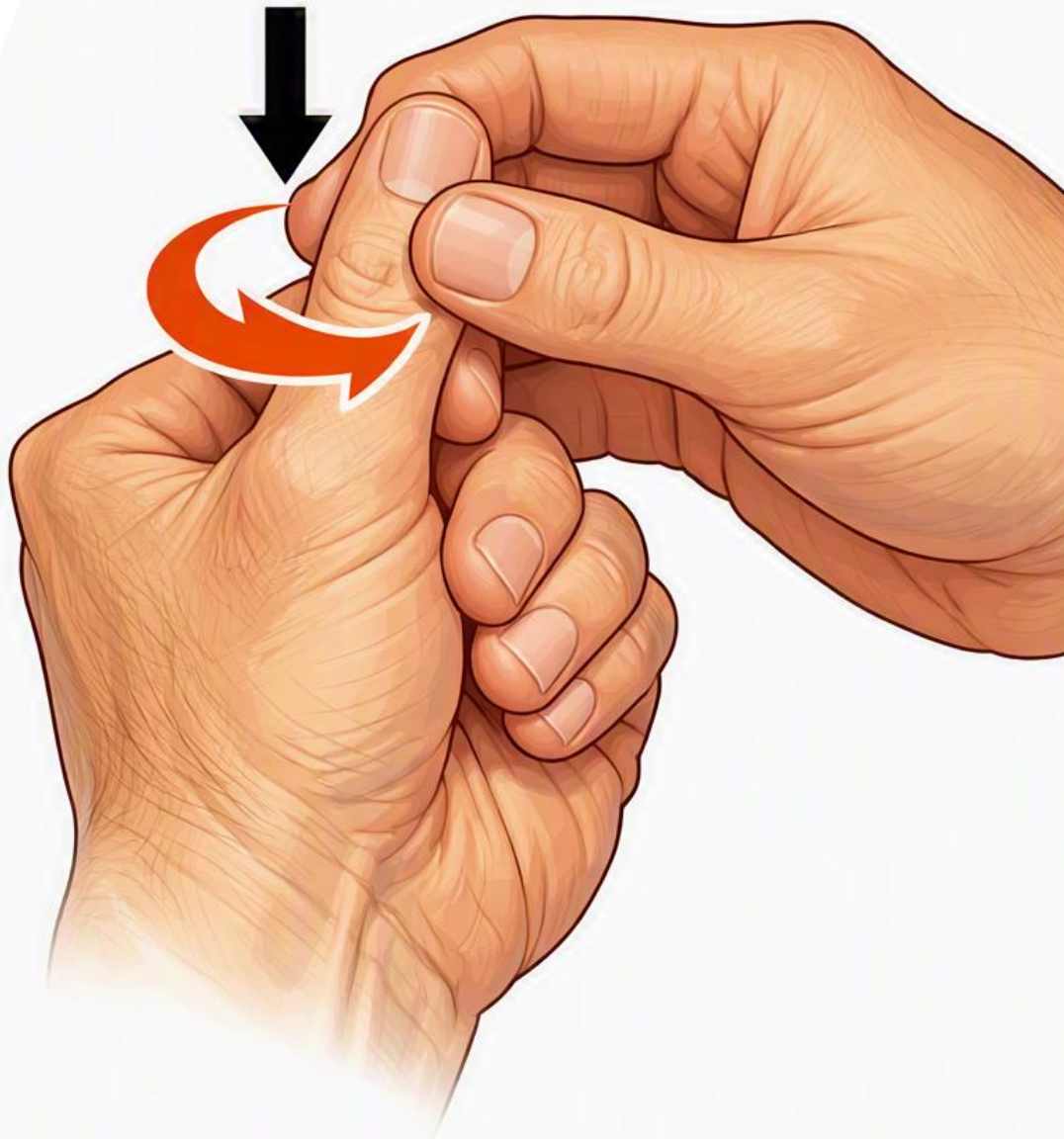


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One positive test, two diagnoses

A

Tender over the first dorsal compartment

Eichhoff / Finkelstein +

Palpable swelling over the compartment

Grind test negative

De Quervain tenosynovitis

Thumb spica splint. Very common postpartum and while nursing.

B

Tender DISTAL to the styloid, at the CMC joint

Grind test +

Shoulder sign visible (squared-off prominence at the thumb base)

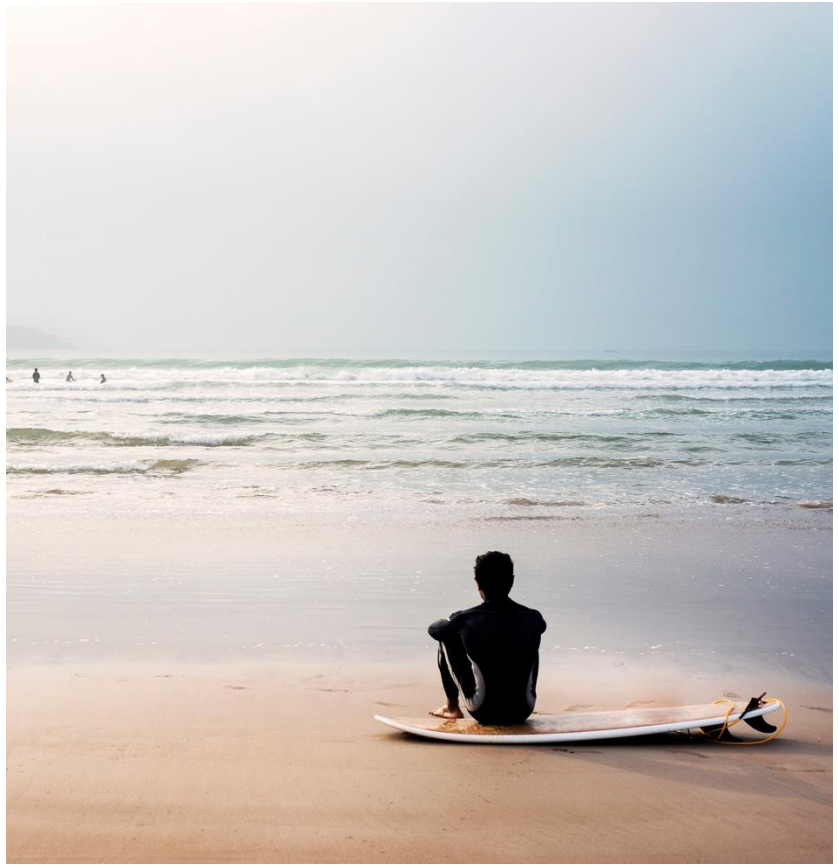
Eichhoff also “+”

Thumb CMC osteoarthritis

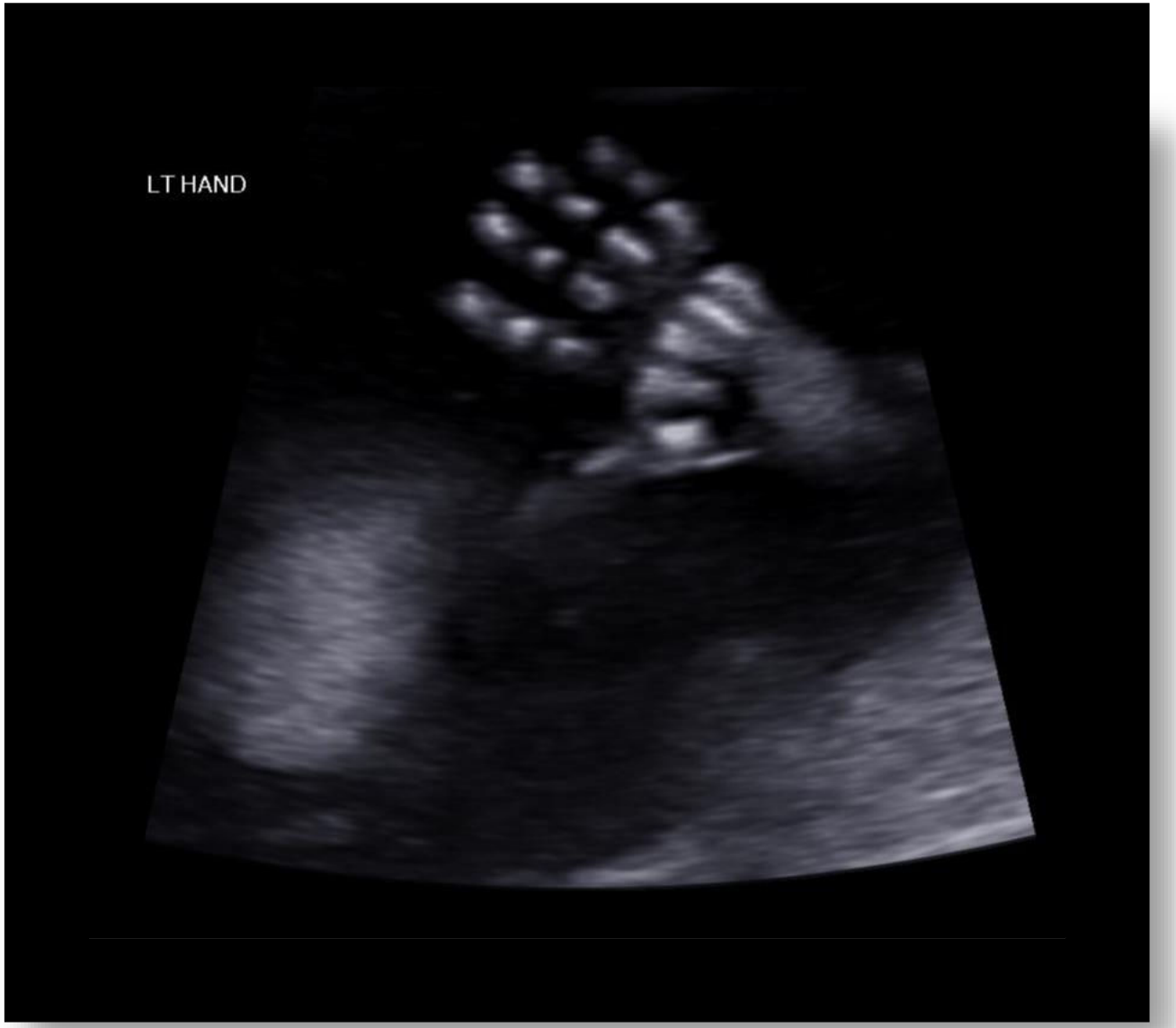
The false positive that sends people down the wrong path.

Five Things that Travel with You

- Let the patient point. One fingertip localizes better than any test.
- Passive ROM before special tests will help separate stiff from weak from painful.
- Cluster tests; don’t rely on a single test.
- Sensitive tests rule out; specific tests rule in.
- Check the neck on every numb or tingling hand.



Questions?



Resources

- AAOS: http://www.aaos.org/
- POSNA: https://posna.org/
- AAFP: http://www.aafp.org/

- Radiopaedia: http://radiopaedia.org/
- OrthoBullets: https://www.orthobullets.com

- Physiotutors. Images used with permission. Accessed December 5, 2025. https://www.physiotutors.com/

- Books:
  - *Bates' Guide to Physical Examination and History Taking*
  - *Mosby's Guide to Physical Examination*
  - Essentials of Musculoskeletal Care by the American Academy of Orthopedic Surgeons.

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Elbow Examination

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Wrist/Hand Examination

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General Upper Extremity

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