

## Elbow Case Scenario

### Patient History:

A 42-year-old female presents to your outpatient physical therapy clinic with right lateral elbow pain that has been ongoing for the past 3 months. She describes her pain as a dull ache that begins at the lateral elbow and radiates down the dorsum of the forearm. The pain is intermittent and ranges from 0-8/10. It is aggravated by gripping activities such as carrying groceries, holding a coffee mug, or lifting objects at home. She has noticed her grip strength feels weaker, though she is unsure if this is true weakness or due to pain.

She also has a chronic history of right-sided neck pain and stiffness, with occasional aching into her upper trapezius/shoulder. These symptoms fluctuate but have not significantly changed since the onset of her elbow pain. She does not exercise regularly but enjoys walking. Over the past 6 months, she has been performing weekend home repair projects including painting and lifting, which she believes initiated her elbow symptoms. She has stopped these activities due to pain and weakness.

Her job as a software administrator involves primarily desk work, which does not significantly aggravate her symptoms.

### Systems Review:

Overall, she is in good health. She is not taking any medications currently. Her vitals are all normal. She denies night pain, fever, sweats, chills, or change in her overall health.

### Tests and Measures:

Cervical active range of motion testing revealed flexion and extension within normal limits. Right rotation and right side-bending were limited, reproducing stiffness and mild discomfort in the cervical spine and upper trapezius area, while left rotation and side bending were full and pain-free. Passive accessory mobility testing of the cervical spine demonstrated stiffness and local pain with central posterior-to-anterior mobilization at C5-7. This was more pronounced with unilateral testing on the right, which referred pain into the right shoulder.

At the elbow, active and passive range of motion showed full and pain-free flexion, but extension was limited at end range with stiffness. Palpation identified localized tenderness over the lateral elbow region. Special testing reproduced pain with resisted middle finger extension (Maudsley's), resisted wrist extension (Cozen's), and passive wrist flexion with the elbow extended (Mill's). The chair lift test, performed by attempting to lift a chair with the elbow extended and forearm pronated, also reproduced pain. Joint accessory testing revealed radial head stiffness with posterior-to-anterior mobilization.

Examination of the wrist and hand showed normal and symmetrical range of motion compared to the contralateral side. Motor testing revealed pain and weakness with resisted finger extension, though no sensory loss was noted.

Grip strength testing with a hand dynamometer demonstrated reduced force output on the right compared to the left. The right hand produced 18 kg of maximal grip strength, which was further limited by pain during sustained gripping activity, whereas the left hand produced 32 kg with no discomfort.

1. Based on the exam findings, which differential diagnosis of the neurologic system should be considered?
  - a. C6 cervical radiculopathy.
  - b. Lower trunk brachial plexopathy.
  - c. Posterior interosseous syndrome.
  - d. Cubital tunnel syndrome.

The correct answer is **c. Posterior interosseous syndrome**. Posterior interosseous syndrome presents with isolated motor deficits (finger/thumb extensors, radial wrist extensors) without sensory loss. Radiculopathy and plexopathy involve sensory/reflex changes, and cubital tunnel syndrome affects the ulnar distribution rather than radial/posterior interosseous motor function.

2. Which diagnostic test for lateral elbow pain is the most sensitive?
  - a. Chair lift test.
  - b. Mill's stretch test.
  - c. Maudsley's test.
  - d. Cozen's test (resisted wrist extension).

The correct answer is **d. Cozen's test (resisted wrist extension)**. Cozen's test demonstrates the highest sensitivity (up to 91%) for lateral elbow pain. The chair lift test, Mill's, and Maudsley's can reproduce symptoms but are less sensitive.

3. If neurologic conditions are ruled out, which of the following modalities are not recommended in this patient?
  - a. Ice massage to the lateral elbow.
  - b. Therapeutic ultrasound to the lateral elbow.
  - c. Phonophoresis with 10% hydrocortisone gel.
  - d. Burst TENS to the most painful area.

The correct answer is **c. Phonophoresis with 10% hydrocortisone gel**. The Clinical Practice Guidelines (CPG) recommend against phonophoresis with corticosteroid gels. Ice massage and TENS may be used for short-term symptom relief, and ultrasound has conflicting evidence but is not strictly contraindicated.

4. If neurologic conditions are ruled out, which of the following interventions would not be appropriate as an initial intervention for this patient?
  - a. Cervical spine mobilizations.
  - b. Dry needling to the wrist extensors.
  - c. Radial head mobilizations.
  - d. Isometric exercises for the wrist extensors.

The correct answer is **a. Cervical spine mobilizations**. The CPG recommends a multimodal program: resisted wrist extensor strengthening (isometric, concentric, eccentric) plus manual therapy at the elbow (joint mobilizations/manipulations) and adjunctive cervical/thoracic mobilization if impairments exist. Exercise should not be omitted.

5. If the patient does not improve with 12 weeks of structured physical therapy management, what is the next most appropriate step?
  - a. Surgery for radial tunnel release.
  - b. Platelet-rich plasma (PRP) injection.
  - c. Referral for further diagnostic testing (eg, electromyography/nerve conduction study or advanced imaging).
  - d. Prolonged immobilization with bracing.

The correct answer is **c. Referral for further diagnostic testing (eg, electromyography/nerve conduction study or advanced imaging)**. Most cases respond to conservative management. Failure to improve warrants reassessment and referral for additional diagnostic testing to confirm posterior interosseous nerve entrapment or exclude alternative diagnoses. Surgery or biologics are reserved for refractory, well-documented cases.

## References

1. Lucado AM, Day JM, Vincent JI, et al. Lateral Elbow Pain and Muscle Function Impairments. *J Orthop Sports Phys Ther.* 2022;52(12):CPG1-CPG111. doi: 10.2519/jospt.2022.0302
2. Patterson JMM, Medina MA, Yang A, Mackinnon SE. Posterior Interosseous Nerve Compression in the Forearm, AKA Radial Tunnel Syndrome: A Clinical Diagnosis. *Hand.* 2024;19(2):228-235. doi: 10.1177/15589447221122822