

ARM NUMBNESS & PARESTHESIA

A Physical Therapy Clinical Guide to Biomechanical Assessment & Conservative Care

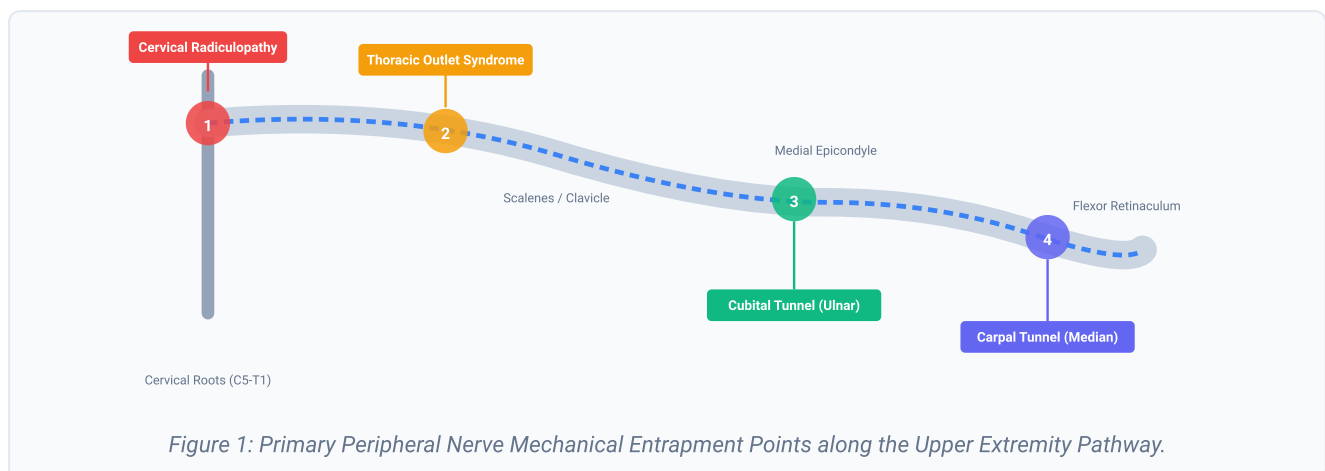
Author: PT Ahmad Al Hariri (Physical Therapist)

Specialization: Musculoskeletal & Peripheral Neural Rehabilitation

Clinical Practitioner Perspective: This guide addresses upper extremity numbness, tingling, and neural mechanical sensitivity strictly from a conservative physical therapy perspective. Diagnostic evaluation focuses on functional movement, postural dynamics, and neural entrapment sites. *Medical and surgical management fall strictly under the purview of attending physicians and orthopedic/neurological surgeons.*

1. NEURAL PATHOMECHANICS & ENTRAPMENT SITES

Arm numbness (paresthesia) is rarely a primary condition itself; it is typically a symptomatic manifestation of compressed, tractioned, or chemically irritated neural pathways. Nerves exiting the cervical spine (C5–T1) form the brachial plexus, traversing complex anatomical tunnels before reaching the fingertips. Mechanical compromise at any point along this interface impairs axoplasmic transport and conduction velocity.



2. PRIMARY ENTRAPMENT PROFILES

Spinal Cervical Radiculopathy

Mechanical compression or inflammatory irritation of nerve roots at the intervertebral foramina (often C6 or C7). Characterized by sharp, shooting pain radiating down specific dermatomal bands into the forearm or hand, often exacerbated by cervical neck extension or lateral flexion (Spurling's sign).

Plexus Thoracic Outlet Syndrome (TOS)

Compression of neurovascular structures within the interscalene triangle, costoclavicular space, or subcoracoid space. Frequently associated with forward head posture, tight scalene/pectoral muscles, or extra cervical ribs. Causes diffuse numbness when arms are elevated overhead.

Peripheral Cubital Tunnel Syndrome

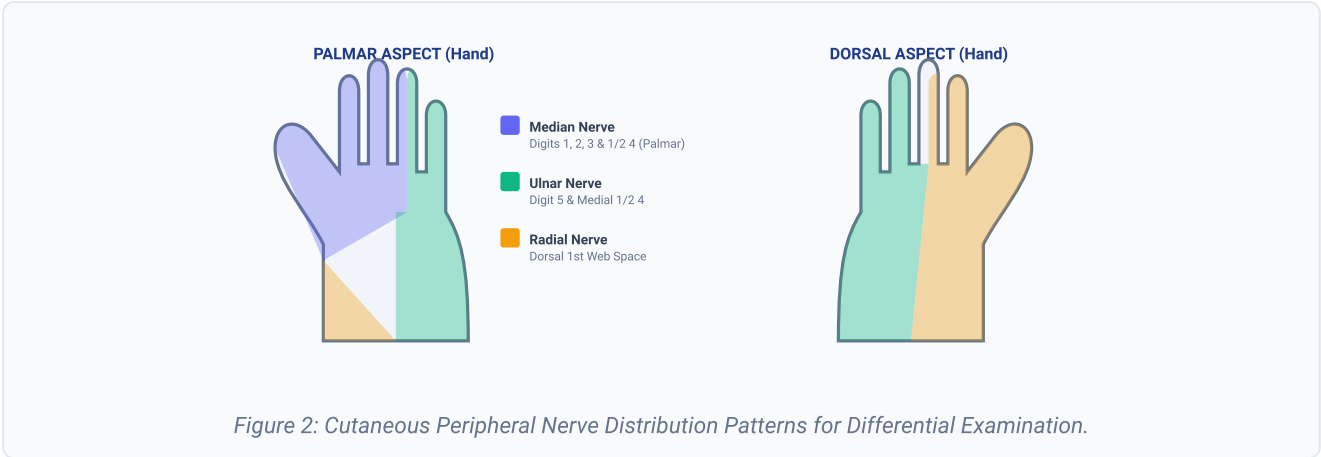
Ulnar nerve entrapment at the elbow's retrocondylar groove. Presents with paresthesia in the 5th digit (small finger) and medial half of the 4th digit (ring finger). Often aggravated by prolonged elbow flexion (e.g., cell phone holding or sleeping with flexed elbows).

Peripheral Carpal Tunnel Syndrome

Median nerve compression beneath the flexor retinaculum at the wrist joint. Results in burning or numbness in the thumb, index, middle, and radial half of the ring finger. Symptoms frequently peak at night or during sustained wrist extension/flexion (e.g., typing).

3. CUTANEOUS INNERVATION & DERMATOMAL MAPPING

Accurate physical therapy evaluation requires distinguishing between **dermatomal patterns** (spinal nerve root origin) and **peripheral nerve distributions** (terminal nerve entrapments). The diagram below illustrates key sensory zones essential for differential physical therapy testing.



4. PHYSICAL THERAPY EVALUATION FRAMEWORK

A structured physical therapy clinical examination identifies mechanical provoke-and-relieve patterns without invasive diagnostic procedures. The following assessment battery guides targeted conservative care:

Condition / Entity	Provocative Physical Test	Key Subjective Signs	Physical Therapy Focus
Cervical Radiculopathy	Spurling's Test, Upper Limb Tension Test (ULTT 1)	Neck pain radiating below elbow; aggravated by head turning	Cervical retraction, foraminal opening, deep flexor strengthening
Thoracic Outlet Syndrome	Roos Test (Elevated Arm Stress), Adson's Maneuver	Heaviness/numbness during overhead work; cold hands	Scalene/Pec minor stretch, 1st rib mobilization, posture correction
Cubital Tunnel Syndrome	Elbow Flexion Test, Tinel's at Retrocondylar Groove	Small finger numbness, weakening key pinch grip	Ulnar nerve glides, avoiding elbow hyperflexion, nighttime splinting
Carpal Tunnel Syndrome	Phalen's Test, Wrist Tinel Sign, Carpal Compression	Night awakenings shaking hand; drop objects (thenar atrophy)	Median nerve flossing, neutral wrist night bracing, flexor glides

Clinical Pearl: Identifying "Double Crush" Syndrome

Occasionally, a nerve is mildly compressed at two distinct anatomical points simultaneously (e.g., cervical root irritation combined with carpal tunnel entrapment). Symptoms compound significantly because early axonal transport blockage renders the distal peripheral nerve far more susceptible to secondary pressure. Physical therapy must address *both* proximal posture and distal mechanics.

5. TARGETED NEURAL MOBILIZATION & NERVE GLIDES

Nerve gliding (neural flossing) restores normal longitudinal sliding movement of nerves relative to surrounding fascial and muscular tunnels. Unlike muscle stretching, nerve glides involve gently tensioning one end of the neural pathway while slackening the other end to avoid hyper-irritating the nerve.

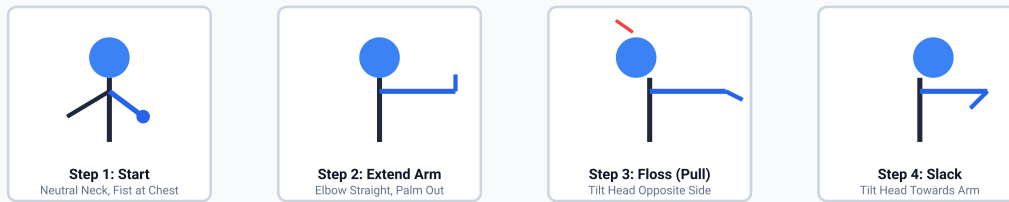


Figure 3: Median Nerve Gliding Exercise Protocol (Perform 10–12 gentle dynamic reps, twice daily).

6. WORKPLACE ERGONOMICS & POSTURAL MANAGEMENT

Postural Biomechanics

- **Forward Head Posture:** For every inch the head migrates forward, cervical spine loading increases by ~10 lbs, narrowing neural foramina.
- **Scapular Depression:** Slumped shoulders stretch the upper brachial plexus and compress the thoracic outlet.
- **Elbow Flexion >90°:** Increases cubital tunnel intraneural pressure by up to 20 times baseline.

Ergonomic Checklist

- **Monitor Height:** Top third of display aligned at natural horizontal eye level.
- **Wrist Position:** Neutral alignment (0° extension/flexion) using soft palm rests or split keyboards.
- **Sleep Positioning:** Avoid sleeping on affected arm; use night wrist cock-up splints for carpal tunnel.

7. MEDICAL & SURGICAL REFERRAL CRITERIA (RED FLAGS)

⚠ MANDATORY MEDICAL / SURGICAL REFERRAL CRITERIA

Physical therapy is a safe conservative intervention, but immediate referral to an orthopedic surgeon, neurologist, or emergency physician is required if any of the following symptoms emerge:

- **Rapid Motor Deficit:** Progressive motor weakness, muscle atrophy (e.g., thenar or hypothenar wasting), or sudden wrist drop/grip loss.
- **Cervical Myelopathy Signs:** Bilateral arm/hand numbness accompanied by gait ataxia, unsteadiness, or loss of bowel/bladder control.
- **Ischemic Signs:** Absent radial/ulnar pulses, sudden coldness, or blue/pale skin discoloration in the hand.
- **Constant Unremitting Night Pain:** Pain unresponsive to positional changes, accompanied by unexplained weight loss or fever.

Physical Therapy Care Plan Summary: Conservative management typically requires 4–6 weeks of structured intervention combining manual therapy, neural glides, and postural retraining before re-evaluating baseline clinical outcomes.