

Carpal Tunnel Syndrome

Conservative Physical Therapy Management & Ergonomics

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Clinical Practice Guide

Professional Scope Note: This document focuses entirely on conservative physical therapy, soft tissue mobility, and postural ergonomics. It does not interfere in medical or surgical matters.

1. Understanding Carpal Tunnel Syndrome (CTS)

Carpal tunnel syndrome is a frequent nerve entrapment condition occurring when the median nerve becomes compressed as it travels through the carpal tunnel—a narrow rigid passageway located on the palmar side of the wrist formed by carpal bones and the transverse carpal ligament.

When the surrounding tendons or tissues swell or become inflamed due to repetitive physical strain, mechanical pressure increases inside the tunnel. Because the transverse carpal ligament is unyielding, this extra pressure directly compromises the median nerve, triggering localized sensory and functional disturbances in the hand.

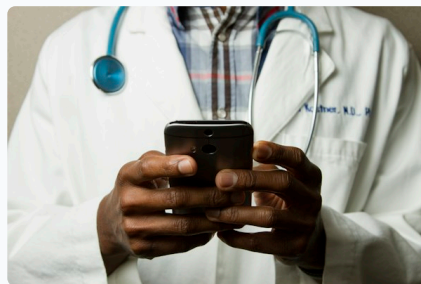


Anatomical overview of wrist structures

2. Common Presentation & Clinical Signs

Patients typically report symptoms that develop gradually over time, often beginning in their dominant hand. Common subjective complaints include:

- **Sensory Alterations:** Intermittent numbness, tingling, or "pins and needles" sensations in the thumb, index, middle, and radial half of the ring finger.
- **Nocturnal Discomfort:** Symptoms frequently worsen at night or upon waking, often relieved temporarily by shaking or hanging the hand over the bedside.
- **Functional Impact:** Difficulty holding small objects, buttoning clothes, or gripping items securely due to perceived weakness or reduced fine motor dexterity.



Clinical presentation patterns in hand and wrist evaluations

3. Physical Therapy Assessment & Evaluation

As physical therapists, our examination centers on functional movement screens, postural analysis, and evaluating upper quarter mechanics. Identifying contributing stressors along the entire kinetic chain (from the cervical spine down to the fingers) is essential for effective conservative care.

Postural & Cervical Screening
Assessing cervical spine alignment and upper thoracic mobility. Nerve root irritation from the neck can mimic or compound distal median nerve entrapment symptoms.

Palpation & Soft Tissue Tone
Evaluating hypertonicity in the forearm flexor musculature, examining fascial restrictions across the volar wrist crease, and assessing local tendon glide.

4. Conservative Physical Therapy Interventions

Conservative management aims to reduce pressure within the carpal tunnel, improve tendon gliding, and optimize upper limb biomechanics through targeted non-invasive strategies:

Intervention Category	Clinical Description & Objectives
Splinting & Positioning	Instructing patients on wearing a neutral wrist orthosis (particularly during sleep) to prevent extreme flexion or extension angles that narrow the canal.
Tendon & Nerve Gliding	Guiding patients through specific rhythmic exercises designed to promote differential gliding of the median nerve relative to surrounding flexor tendons.
Ergonomic Modification	Analyzing workstation layouts, keyboard/mouse posture, and tool handling to minimize repetitive mechanical stress and high volar wrist pressure.
Manual Therapy	Applying gentle soft tissue mobilization to the forearm flexors and manual carpal bone mobilization to enhance joint play and reduce restriction.



Gentle forearm stretches and active mobility management

5. Home Exercise Program & Self-Management

Empowering the patient with a structured home exercise program is vital for long-term symptom relief and prevention of recurrence. Consistency and proper technique are emphasized during physical therapy sessions.

1. Gentle Wrist Extensor Stretch

With the elbow extended and forearm pronated, gently apply overpressure into wrist flexion using the opposite hand. Hold for 20–30 seconds to ease tension in forearm extensors.

2. Nerve Gliding Sequences

Perform slow, sequential hand and finger movements (from straight fingers to a fist and hook position) as instructed by your physical therapist to encourage smooth median nerve excursion.

6. Workplace Ergonomics & Injury Prevention

Preventative education focuses on reducing cumulative microtrauma. Key ergonomic recommendations include:

- **Neutral Wrist Posture:** Maintain wrists in a straight, neutral line while typing, avoiding downward dropping or upward extension on keyboard rests.
- **Frequent Micro-Breaks:** Implement brief 60-second rest intervals every hour to stretch fingers, rotate wrists, and shake out tension.
- **Optimized Desk Setup:** Adjust chair height and armrests so elbows rest comfortably at a 90-degree angle without direct pressure on the volar wrist.

Clinical Summary: Through dedicated conservative care, ergonomic adjustments, and guided home exercises, many individuals experience meaningful relief from carpal tunnel symptoms. If severe motor deficits or persistent sensory loss occur, prompt medical referral is indicated.