

## CASE SCENARIO: WRIST & HAND

A 57-year-old female is referred to physical therapy for evaluation and treatment of her right carpal tunnel syndrome. She works as a legal secretary and began experiencing night pain and paresthesia in the long finger approximately 8 weeks ago. She is right-hand dominant, and her medical history includes type II diabetes and hypothyroidism.

1. Which of the following differentials should be considered based on the patient's subjective remarks?
  - a. anterior interosseous nerve injury.
  - b. C7 nerve root involvement.
  - c. cubital tunnel syndrome.
  - d. radial tunnel syndrome.
  
2. The patient reports that she is beginning to have symptoms at work and intermittently throughout the day while using her computer, so she decided to seek medical treatment from her primary care physician. She reports that she is also supposed to try a "wrist splint." What type of orthosis is indicated at this point?
  - a. a dorsal wrist orthosis that positions the wrist at 30° of extension.
  - b. a thumb orthosis that maintains the size of the thumb web span.
  - c. a volar wrist cock-up orthosis that positions the wrist at 0° extension/flexion.
  - d. a volar wrist cock-up splint that positions the wrist at 30° extension.
  
3. According to the literature, which clinical tests are useful in screening for carpal tunnel syndrome at this point in the patient's disease process?
  - a. Froment sign, Tinel sign, and two-point discrimination.
  - b. manual muscle testing the abductor pollicis brevis, Froment sign, and Finkelstein test.
  - c. QuickDASH, manual muscle testing for the abductor pollicis brevis muscle, and Semmes-Weinstein monofilaments.
  - d. Carpal Tunnel Questionnaire-Symptom Severity Scale, two-point discrimination, and Semmes-Weinstein monofilaments.
  
4. Patient education at this point in her plan of care should include:
  - a. appropriate use of the orthosis.
  - b. avoiding the neutral wrist position.
  - c. use of small handle grips.
  - d. use of Theraputty to increase grip strength.

## ANSWERS

1. The correct answer is **b. C7 nerve root involvement**. Early carpal tunnel syndrome may only show paresthesia in the long finger. This resembles the numbness and tingling that may result from nerve root compression in the C7 dermatome. Cubital tunnel syndrome results in paresthesia in the small and ulnar half of the ring finger, while radial tunnel syndrome results in complaints on the dorsal aspect of the forearm. Injuries to the anterior interosseous nerve do not involve a sensory component.
2. The correct answer is **c. a volar wrist cock-up orthosis that positions the wrist at 0° extension/flexion**. Neutral splinting most effectively reduces carpal tunnel pressure, and any position beyond 20° flexion or extension increases carpal tunnel pressure. The orthosis used to preserve the thumb web space (Choice b) is used following traumatic laceration to the median nerve.
3. The correct answer is **d. Carpal Tunnel Questionnaire-Symptom Severity Scale, two-point discrimination, and Semmes-Weinstein monofilaments**. There are a number of tests used clinically to detect the presence of carpal tunnel syndrome. According to the most recent clinical practice guideline (Erickson et al, JOSPT 2019), there is strong evidence for using monofilament and two-point discrimination testing for sensory discrimination of the median nerve. Although the Tinel sign is often used for identifying nerve sensitivity, the Froment sign is indicative of an ulnar nerve lesion, making D the most correct answer.
4. The correct answer is **a. appropriate use of the orthosis**. The patient should be educated on use of the orthosis so that the wrist is positioned correctly. The neutral wrist position is the preferred position because carpal tunnel pressures are low. Large hand grips place the flexor tendons in a more appropriate position for efficient function and decrease lumbrical muscle incursion into the carpal tunnel. Grip is a position that increases lumbrical muscle incursion, and resisted finger flexion contributes to increasing carpal tunnel pressure and both should be avoided. Avoiding prolonged posturing/positions is important for any repetitive, or overuse, injury because repetitive activity decreases efficiency and contributes to fatigue.