Work-Related Carpal Tunnel Syndrome

Diagnosis and Treatment Guideline

Gary M. Franklin, MD, MPH[a,*], Andrew S. Friedman, MD[b]

KEYWORDS

• Carpal tunnel syndrome • Causation • Diagnosis • Electrodiagnostic studies
• Evidence-based review • Treatment • Workers' compensation

KEY POINTS

- Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy, and it is associated with a large disease burden in workers' compensation systems.
- The diagnosis in workers' compensation systems should depend on the presence of specific symptoms, signs, and abnormal results of nerve conduction tests consistent with a case definition for the presence of CTS.
- Strong evidence associates the occurrence of CTS with forceful, angular, and repetitive hand use, or with vibration; CTS is less likely to occur in typists or data entry operators but may occur with intensive computer use of at least 12 to 20 h/wk.
- Conservative management in the workers' compensation system should be effective enough to maintain employment; surgical decompression is highly effective and should be entertained in workers who cannot remain at work with conservative management. Patients should continue to work until decompression is undertaken.

INTRODUCTION

CTS is the most commonly diagnosed entrapment neuropathy,[1] and it is associated with a large disease burden in the workers' compensation system.[2–4] The annual incidence in the general population has been reported to be approximately 1 in 1000.[5] The incidence of CTS in Washington (WA) workers' compensation population peaked at approximately 2.73 per 1000 in the mid-1990s.[6] One study estimated 4 to 10 million cases of CTS in the United States in 2005[7]; in 2010, 5 million workers were estimated to have CTS.[8] Among commonly performed ambulatory surgical procedures of the upper extremity, CTS release was twice as frequently as rotator cuff repair (**Table 1**).[9]

[a] Departments of Environmental and Occupational Health Sciences, Neurology, and Health Services, University of Washington, 130 Nickerson, Seattle, WA 98109, USA; [b] Department of Physical Medicine and Rehabilitation, Virginia Mason Medical Center, Seattle, WA 98101, USA
* Corresponding author.
E-mail address: meddir@uw.edu

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Table 1
National estimates of upper extremity ambulatory surgery procedures, 2006

Procedure	Number of Procedures	Rate/10, 000 Among Those Aged 45–64 y
Carpal tunnel release	576,924	37.3
Rotator cuff repair	272,148	21.1
Shoulder arthroscopy	257,541	17.1

Adapted from Jain NB, Higgins LD, Losina E, et al. Epidemiology of musculoskeletal upper extremity ambulatory surgery in the United States. BMC Musculoskelet Disord 2014;15:4; with permission.

The highest prevalence of CTS procedures in this study, reflecting a much higher rate among women and in people aged 45 to 64 years, also likely reflects similar representations of case demographics in workers' compensation systems.[10]

ESTABLISHING WORK RELATEDNESS

CTS may result from numerous conditions, including inflammatory or noninflammatory arthropathies, recent or remote wrist trauma or fractures, diabetes mellitus, obesity, hypothyroidism, pregnancy, and genetic factors.[6,11,12]

Risk for CTS strongly increases with age and among perimenopausal women for unclear reasons. In the unusual instance that CTS is acutely, traumatically induced, for example, a patient has both CTS and concomitant trauma (fracture or dislocation), the patient may require prompt carpal tunnel release (CTR).

Work-related activities may also cause or contribute to the development of CTS. To establish a diagnosis of work-related CTS, all of the following are required:

1. Exposure: workplace activities that contribute to or cause CTS
2. Outcome: a diagnosis of CTS that meets the diagnostic criteria under "Making the Diagnosis"
3. Relationship: generally accepted scientific evidence, which establishes on a more probable than not basis (greater than 50%) that the workplace activities (exposure) in an individual case contributed to the development or worsening of the condition (outcome).

Several recent meta-analyses and studies have summarized the now well-known risks of work-related CTS involving activities requiring extensive, forceful, repetitive, or prolonged use of the hands and wrists, or exposure to vibration, particularly if these potential risk factors are present in combination (eg, force and repetition or force and posture).[13–15] The risks associated with computer, keyboard, or mouse use are most likely to be present only with long durations of exposure or at least 12 to 20 h/wk of intensive exposure.[16–18] Negative studies have generally not measured exposures at this level of detail.[19–21]

Usually, one or more of the following work conditions occurring on a regular basis could support work relatedness:

1. Forceful use, particularly if repeated
2. Repetitive hand use combined with some element of force, especially for prolonged periods
3. Constant firm gripping of objects
4. Moving or using the hand and wrist against resistance or with force
5. Exposing the hand and wrist to strong regular vibrations
6. Intensive computer, keyboard, or mouse use of at least 12 to 20 h/wk