

Carpal tunnel syndrome

Definition of causal agent

Prolonged periods of highly repetitive hand movements. The use of force and awkward position of the wrist/hand are aggravating factors.

Hand-arm vibrations (see also Annex I entry nr. 505.02 on *Angioneurotic diseases caused by mechanical vibration*).

Direct pressure causing carpal tunnel compression (see also Annex I entry nr. 506.40 on *Paralysis of the nerves due to pressure*).

Main occupational uses and sources of exposure:

Repetitive and forceful hand use, e.g. in meat cutting, fish filleting, sorting of parcels, manual assembling.

Exposure to hand-arm vibrating tools, e.g. in grinding, polishing, working with a chain saw, drilling.

Working with hand-held tools with pressure against the carpus, e.g. a chisel or repeated impacts against the carpus (e.g. using the hand as a hammer).

Definition

The carpal tunnel syndrome is a condition that consists in compression of the median nerve as it passes through the carpal tunnel.

Diagnostic criteria

Symptoms: Sensory symptoms involve numbness, tingling and/or pain in the median nerve distribution. Symptoms often occur during the night. In more severe cases motor symptoms (weakness and loss of hand function) may occur. Consideration of other known causes for carpal tunnel syndrome such as hormonal factors (e.g. pregnancy), certain medical conditions (e.g. thyroid dysfunction, rheumatoid arthritis) and trauma of the wrist. Diabetes mellitus causing neuropathy should be considered as a differential diagnosis.

Clinical signs: Clinical examination involves Tinel's test (tapping the flexor retinaculum elicits sensory symptoms in the radial 3½ fingers) and Phalen's test (maximal flexion of the wrist for 1 minute elicits symptoms in the radial 3½ fingers). A clinical test for sensibility may show impairment in the median area. Thenar atrophy and reduced hand force may be present in more severe cases.

Electrodiagnostic testing confirms the diagnosis but in obvious cases this may be omitted.

The condition may be uni- or bilateral depending on the exposure.

Exposure criteria:

Minimum intensity of exposure: Repetitive and forceful hand use:

Individual exposure history with confirmation of occupational exposure to highly repetitive hand motions. Working with the hands in awkward or extreme positions and/or using hand force aggravate the exposure.

Measurements of repetition at the work place (e.g. number of items handled, no. of hand repetitions), assessment of time spent in awkward positions and assessment of force exerted (e.g. handled weights, applied forces) may add valuable information though threshold limits for exposure are not established.

Highly repetitive procedures (guiding): >10 items handled/minute or >20 hand repetitions/minute

High force (guiding): > 1 kg. handled weights.

Hand-arm vibrations:

Individual exposure history with confirmation of the use of vibrating handheld tools.

Information on hand-arm vibration levels in different tools may be obtained from existing databases.

Vibration levels: Frequency weighted acceleration >3 m/sec² 4 hours pr. day or more for 8 years or more. Higher acceleration levels diminish the demand for exposure time.

Direct pressure:

Individual exposure history.

Minimum duration of exposure: Repetitive and forceful hand use, direct pressure: Months.

Hand-arm vibrations:

Depending on acceleration level.

3-10 m/s²: 3-10 years.

>10 m/s²: 1-3 year.

Maximum latent period: 1 month.

Induction period: As for minimum duration of exposure