

## Carpal Tunnel Syndrome

### Overview

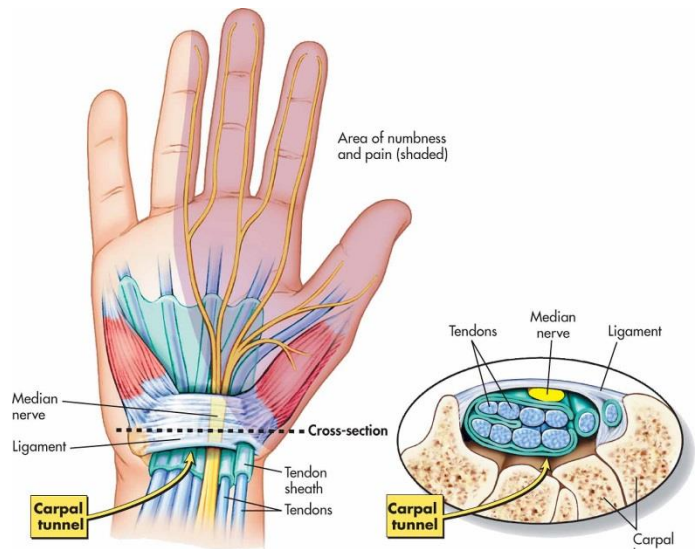
*Carpus* is derived from the Greek word *karpos*, which means "wrist." A band of fibrous tissue surrounds the wrist and supports the joint. There is a tight space between this fibrous band and the wrist bone called the carpal tunnel.

The carpal tunnel is the passageway in the wrist that connects the forearm to the middle compartment of the deep plane of the palm. The tunnel consists of bones, connective tissue, several tendons and the median nerve. The median nerve provides feeling and movement to the thumb, index and middle fingers, and the thumb side of the ring finger.

Carpal tunnel syndrome occurs when the median nerve gets trapped due to a narrowing of the tunnel.

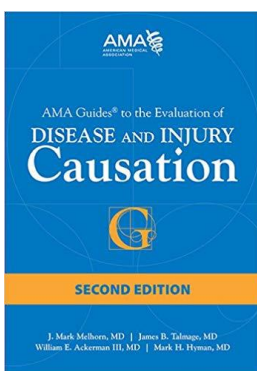
### Causes

Carpal tunnel syndrome can be caused by a variety of factors. Some people are constitutionally more likely to develop the syndrome than others, for example, if they have a small carpal tunnel. There is also very strong evidence to support an increased risk of carpal tunnel syndrome in people over forty and in females. A high Body Mass Index also increases the risk of carpal tunnel syndrome with obese people being 2.5 times more likely to develop the syndrome compared to people who are a healthy weight. There are other non occupational risk factors including wrist injuries and swelling due to medical conditions such as rheumatoid arthritis.



Patients often associate carpal tunnel syndrome with their workplace duties. However the evidence supporting such a claim varies depending on what duties the patient performs.

There is very strong evidence to suggest that forceful work is a risk factor for carpal tunnel syndrome. The repetitive forceful work puts constant strain on the wrist causing swelling and compression of the median nerve. A study has shown that there is twice the risk of diagnosis if a patient's work duties involve regular use of a forceful grip, for example, mechanics, baggage handlers et cetera.





There is low risk evidence to support vibration and awkward postures as being a risk factor for carpal tunnel syndrome, and there is insufficient evidence to link cold environments and keyboard activities with this condition.

The debating factor in any case is whether the injured worker would have been predisposed to this injury in the first place due to any of the issues aforementioned. To add to this dilemma, carpal tunnel syndrome has been known to just occur, with no causal factor being identified.

## Symptoms

Carpal tunnel syndrome may still be present with only one or two symptoms. The following are symptoms associated with carpal tunnel syndrome:

- numbness, pain (usually a burning pain), and tingling in the thumb, index, and middle fingers;
- tingling, numbness, or pain, which may move up the arm to the elbow or even the shoulder;
- hand weakness;
- dropping objects; and
- difficulty feeling and handling small objects.

Symptoms are usually worse at night and some patients report relief when shaking out their hands.

## Diagnosis

Tinel's test and Phalen's sign test are commonly used during a clinical examination to provisionally diagnose carpal tunnel syndrome.

Tinel's test involves the doctor lightly tapping the median nerve at the wrist. If the patient feels numbness, or pins and needles in the distribution of the median nerve (outlined in the image to the right) then this indicates that the patient may have carpal tunnel syndrome.

Phalen's sign test involves the patient holding their arm out in front of them with their wrist flexed at ninety degrees for about sixty seconds. If the patient feels numbness or pins and needles in the distribution of the median nerve, then they may have carpal tunnel syndrome.



No single physical examination test can definitively diagnose carpal tunnel syndrome. The gold standard test used for diagnosing this condition is electrodiagnostic testing, namely nerve conduction studies, performed by a neurologist, which measure how fast an electrical impulse can move through a nerve. A delay in the conduction velocity in the median nerve supports the diagnosis of carpal tunnel syndrome.

## Treatment

Treatment is initially aimed at reduction of swelling. Where the causal factor is another medical condition, the initial treatment will be directed towards this. Treatment options for carpal tunnel syndrome include:

<b>Immobilising braces</b>	As with treatment of many conditions, the non surgical option is usually attempted initially. Immobilising braces have been effectively used to treat carpal tunnel syndrome if the symptoms are mild to moderate.
<b>Non steroidal anti-inflammatory drugs</b>	Non steroidal anti-inflammatory drugs can be taken to reduce swelling in the affected wrist to provide some relief.
<b>Corticosteroids</b>	Corticosteroids can be taken by mouth or injected directly into the involved wrist joint and can bring rapid relief of the persistent symptoms of carpal tunnel syndrome.
<b>Surgery</b>	<p>Surgical treatment is considered in chronic cases to avoid permanent nerve and muscle damage. It involves severing the band of tissue around the wrist, thus reducing pressure on the median nerve. This is known as carpal tunnel release.</p> <p>This surgery is carried out using a small diameter viewing tube, or as open wrist surgery.</p>

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## LexiMed Consultants

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The following LexiMed consultants can provide an opinion on carpal tunnel syndrome.

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| <p>⌘ <b>Dr Peter Winstanley</b><br/>Orthopaedic Surgeon</p> | <p>⌘ <b>Dr David Shooter</b><br/>Orthopaedic Surgeon</p>  | <p>⌘ <b>Dr Steven Hatcher</b><br/>Orthopaedic Surgeon</p> |
| <p>⌘ <b>Dr Glenn Davies</b><br/>Orthopaedic Surgeon</p>     | <p>⌘ <b>Dr Richard Hudson</b><br/>Orthopaedic Surgeon</p> | <p>⌘ <b>Dr Leigh Atkinson</b><br/>Neurosurgeon</p>        |
| <p>⌘ <b>Dr Martin Wood</b><br/>Neurosurgeon</p>             |   |   |

**Reference:** American Medical Association's Guides to Disease and Injury Causation, 2nd Edition.