Carpal Tunnel Syndrome

Carpal tunnel syndrome is a set of symptoms thought to be caused by squashing (compression) of the median nerve in the carpal tunnel.

What is it?

The carpal tunnel is the space between a group of eight small bones in the wrist joint, called carpal bones, and the ligament that covered them (the retinaculum). This is a busy tunnel. The tendons that attach the forearm muscles to the fingers and a main nerve in the hand (the median nerve) all run through it.

The median nerve supplies the sensation of feeling to the thumb, index and middle fingers, and half of the ring finger. Just to show off, it also makes the small muscles at the base of the thumb move.

Who gets carpal tunnel syndrome?

It's mainly women in their late 50s although in later life it affects men and women in their late 70s equally.

It's more common in people who are obese and can be a family trait. It can also add to the delights of pregnancy.

What are the symptoms?

The first thing you may notice is pins and needles, often in the index and middle fingers. This is followed by pain and numbness. The skin of the affected fingers may become dry. If it gets really bad, your grip may become affected and you may notice wasting in the muscles at the base of your thumb.

Some people develop really bad symptoms but if you're lucky, you may get away with a milder form. It can affect one or both hands and may come and go to start with. You may find yourself watching a lot of late night telly, because the symptoms are often worse at night and may wake you up.

Symptoms can vary from person to person from mild to severe. One or both hands may be affected. Symptoms tend to come and go at first - often after you use the hand - and are typically worse at night. If it gets really bad, you may get symptoms all the time.

Read more about the symptoms of carpal tunnel syndrome.

What causes it?

Nobody knows for sure. One theory is that something happens to the tendons that run through the carpal tunnel, increasing the pressure in the tunnel. Pressure on the blood vessels supplying the median nerve affect the way it works and this causes the symptoms.

1 in 4 people have a close family member with it (mum, dad, brother or sister). It is, as they say, all in the genes.

Fractures and rheumatoid arthritis may lead to carpal tunnel syndrome.
Conditions that lead to your body (including your wrist) becoming water-logged can also cause it, such as pregnancy, obesity and an underactive thyroid gland. The condition can also be caused by a whole ragbag of unusual cysts and swellings arising from tendons or blood vessels.

Learn more about the causes of carpal tunnel syndrome.

Do I need any tests?

Often the symptoms are so typical that no tests are needed to confirm the diagnosis. However, these days you can't get far in a hospital without some techie wanting to try out his or her new toy. So, you may end up with an ultrasound or MRI scan. These can actually be quite useful in confirming the diagnosis and pinpointing areas that need treatment.

You may also be asked to have a nerve conduction test. This tests how long it takes for a slow speed electric impulse to go from one end of the median nerve to the other.

Find out more about the diagnosis of carpal tunnel syndrome.

What are the treatment options?

General measures
Don't overuse your wrist and do try to lose some weight if you're carrying too much. Painkillers may help and you may also need treatment for any associated condition such as arthritis.

Not treating may be an option
Some people don't need treatment, especially if they're aged under 30 years.

A wrist splint
A removable wrist splint (brace) is often the first thing to try. Often, people find wearing the splint at night is enough.

A steroid injection
A shot of steroid in or near the carpal tunnel often does the trick, although in some people the symptoms came back after a year.

Surgery
If you have severe symptoms you will almost certainly need an operation. However, the experts haven't quite worked out if surgery or an injection is best for people with moderate symptoms.

The operation involves cutting the ligament over the front of the wrist to ease the pressure on the median nerve. It's usually done under local anaesthetic. Complications are rare but can occur.

Other treatments
Lots of different treatments have been tried but they haven't been studied as well as the options mentioned above.

Which is the best treatment for me?

For mild symptoms, your best bet is splinting or a steroid injection. Constant numbness and/or weakness mean you probably need surgery, as the nerve will be at risk of permanent damage. This is especially true if you have wasting of the muscles at the base of the thumb.

Read more about the treatment of carpal tunnel syndrome.
What is carpal tunnel syndrome?

This syndrome is a set of symptoms thought to be caused by squashing (compression) of the median nerve in the carpal tunnel. In terms of age, carpal tunnel syndrome is more common in:

- People in their late 50s, particularly women.
- People in their late 70s, when men and women are equally affected.

Carpal tunnel syndrome is more common in people who are obese and it often runs in families. It is more common in women who are pregnant.

What are the symptoms of carpal tunnel syndrome?

- **Pins and needles.** This is tingling or burning in part or all of the shaded area (see Causes section). This is typically the first symptom to develop. The index and middle fingers are usually first to be affected.
- **Pain** in the same fingers may then develop. The pain may travel up the forearm and even to the shoulder.
- **Numbness** of the same finger(s), or in part of the palm, may develop if the condition becomes worse.
- **Dryness of the skin** may develop in the same fingers.
- **Weakness** of some muscles in the fingers and/or thumb occurs in severe cases. This may cause poor grip and eventually lead to muscle wasting at the base of the thumb.

Symptoms can vary from person to person from mild to severe. One or both hands may be affected. Symptoms tend to come and go at first, often after you use the hand. Typically, symptoms are worse at night and may wake you up.

The symptoms may be eased for a while by raising the hand up or hanging it down. Flicking the wrist may also give relief. Symptoms persist all the time if the condition becomes severe.

What is the carpal tunnel?

There are eight small bones called carpal bones in the wrist. A ligament (also called retinaculum) lies across the front of the wrist. Between this ligament and the carpal bones is a space called the carpal tunnel. The tendons that attach the forearm muscles to the fingers pass through the carpal tunnel. A main nerve (median nerve) to the hand also goes through this tunnel before dividing into smaller branches in the palm.

The median nerve gives feeling to the thumb, index and middle fingers, and half of the ring finger. It also controls the movement of the small muscles at the base of the thumb.

What causes carpal tunnel syndrome?
In most cases it is not clear why it occurs. It is thought that some minor changes occur in the tendons and/or other structures going through the carpal tunnel. This may cause an increase in pressure within the tunnel. The increase in pressure is thought to squash (compress) and restrict the blood supply to the median nerve. As a result, the function of the median nerve is affected causing the symptoms.

Your genes may play a part. There seems to be some inherited (genetic) factor. About 1 in 4 people with carpal tunnel syndrome have a close family member (father, mother, brother, sister) who also has or had the condition.

Bone or arthritic conditions of the wrist, such as rheumatoid arthritis or wrist fractures, may lead to carpal tunnel syndrome.

Various other conditions are associated with carpal tunnel syndrome. For example: pregnancy, obesity, an underactive thyroid gland, diabetes, the menopause, other rare diseases, and a side-effect of some medicines. Some of these conditions cause water retention (oedema) which may affect the wrist and cause carpal tunnel syndrome.

Rare causes include cysts, growths, and swellings coming from the tendons or blood vessels passing through the carpal tunnel.

Do I need any tests?

Often the symptoms are so typical that no tests are needed to confirm the diagnosis.

If the diagnosis is not clear then a test to measure the speed of the nerve impulse through the carpal tunnel (nerve conduction test) may be advised. A slow speed of impulse down the median nerve will usually confirm the diagnosis. Some people may also be referred for an ultrasound scan or an MRI scan to look at their wrist in more detail.

What are the treatment options?

General measures
Try not to over-use your wrist by excessive squeezing, gripping, wringing, etc. If you are overweight, losing some weight may help. Painkillers may be prescribed to ease the pain. If the condition is part of a more general medical condition (such as arthritis) then treatment of that condition may help.

Not treating may be an option
In up to 1 in 4 cases the symptoms go without treatment within a year or so. (In about 2 in 3 cases that develop during pregnancy, the symptoms go after the baby is born.) So, not treating is an option, particularly if symptoms are mild. The situation can be reviewed if symptoms get worse. Symptoms are most likely to go in people less than 30 years of age.

A wrist splint
A removable wrist splint (brace) is often advised as a first active treatment. The aim of the splint is to keep the wrist at a neutral angle without applying any force over the carpal tunnel so as to rest the nerve. This may cure the problem if used for a few weeks. However, it is common to wear a splint just at night, which is often sufficient to ease symptoms.

A steroid injection
An injection of steroid into, or near to, the carpal tunnel is an option. One research trial found that a single steroid injection eased symptoms in about 3 in 4 cases. In this trial the symptoms returned in some people over the following year. Other studies report variable success rates with steroid injections.

Surgery
Surgery is recommended for severe cases but the jury is still out as to whether it is better than injections for moderate symptoms. A large trial is being conducted to answer this question.

A small operation can cut the ligament over the front of the wrist and ease the pressure in the carpal tunnel to give your nerve more space. This usually cures the problem. It is usually done under local anaesthetic. There are two main types of surgery - open and keyhole. Your surgeon will discuss which technique is appropriate for you.
You will not be able to use your hand for work for a few weeks after the operation. A small scar on the front of the wrist will remain. There is a small risk of complications from surgery. For example, following surgery there is a very small risk of infection and damage to the nerve or blood vessels. Sometimes, the nerve can get caught up in the scar and become stretched when the wrist is moved: this is known as tethering.

**Other treatments**

Over the years, a wide range of other treatments has been advocated. For example, controlled cold therapy, ice therapy, laser therapy and exercises. None of these treatments has good research evidence to support its use and so they are not commonly advised. However, they can work for some people. There is some evidence that acupuncture may work for some people.

Steroid tablets may ease symptoms in some cases. However, there is a risk of serious side-effects from taking a long course of steroid tablets. Also, a local injection of a steroid (described above) probably works better. Therefore, steroid tablets are not usually advised.

**Which is the best treatment for me?**

A non-surgical option may be advised if your symptoms are mild - for example, if your symptoms come and go and mainly consist of tingling, pins and needles or mild discomfort. A wrist splint (brace) may work but a steroid injection is probably the most effective non-surgical treatment.

If you try a non-surgical treatment and it does not work, do return to your doctor. In particular, see your doctor if you have constant numbness in any part of your hand, or if you have any weakness of the muscles next to the thumb. These symptoms mean that the nerve is not working well and is at risk of permanent damage.

Surgery gives the best chance of long-term cure. It is quite a common operation. It is done if symptoms continue (persist) despite other treatments, or if symptoms are severe and the nerve is in danger of permanent damage.

**Treatment for severe symptoms**

If you have severe symptoms - in particular wasting of the muscles at the base of the thumb - then you will probably need surgery. This is to relieve pressure on (decompress) the trapped nerve quickly, which aims to prevent any permanent long-term nerve damage.

**Carpal tunnel syndrome during pregnancy**

Symptoms commonly go after the baby is born. Therefore, a non-surgical treatment, such as a splint, is usually advised at first. Surgery is an option if symptoms persist.

**Further reading & references**

- Carpal tunnel syndrome; NICE CKS, September 2016 (UK access only)

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