What To Know About Carpal Tunnel Syndrome

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What is Carpal Tunnel Syndrome?

• AKA: median nerve compression/entrapment
• A repetitive stress injury that causes pain, tingling, and numbness in the hand, often at the base of the palm
What is Carpal Tunnel Syndrome?

• The median nerve is compressed when the tendons in the carpal tunnel become inflamed
• Primarily affects the thumb, index and middle fingers
• More common in females
• More common over age 50
- Along with the median nerve, **9 finger tendons** pass through the carpal tunnel (A tendon connects a muscle to a bone)

Improper use and repetitive stress on wrist muscles can cause tendons to become inflamed and swollen, causing pressure on the median nerve.
Repetitive stress on muscles and poor wrist alignment → Tendons in the carpal tunnel become inflamed and swollen → Increased pressure within the carpal tunnel → Median nerve is compressed → Tingling, numbness, and pain in the hand and fingers result.

In the diagram, the carpal tunnel is shown with the median nerve compressed. The normal carpal tunnel is compared to the carpal tunnel with the median nerve compressed.
Symptoms:

• Can be worse at night
• May interfere with sleep
• Symptoms can increase with writing, typing, using a blow dryer or power tool, housework
• Your hand may feel weak, or the fingers may feel numb, or both
• You may tend to drop things
• Fine finger-control moves (e.g. fastening buttons) may be difficult
Carpal Tunnel vs. Arthritis

Osteoarthritis

Rheumatoid Arthritis

Carpal tunnel
Possible Causes of CTS

- Work that places a heavy demand on your wrist
- Vibrating tools
- Poor wrist position while sleeping
- Wrist arthritis
- Hormonal changes that increase fluid retention or swelling of connective tissues (e.g. during pregnancy)
- Some medications
- Diabetes
- Wrist fracture
- Obesity
- Small carpal tunnel (genetic)
FYI: Finger numbness can also be caused by:

- Cervical radiculopathy
- Diabetes
- Raynaud’s disease
- De Quervain’s tenosynovitis
- Rheumatoid arthritis
- Ulnar nerve entrapment
- Multiple Sclerosis
- Stroke

Bottom line: see your physician for a proper diagnosis!
Diagnosis and Tests for CTS

- **Tinel’s test for median nerve injury** (tapping the nerve at the wrist to check for tingling or numbness)
- **Phalen’s (wrist flexion) test** (hold position for 30-60 sec to check for pain, tingling, or numbness)
- EMG and nerve conduction tests
- Grip strength
- Pinch test
Phalen’s Maneuver
Tests for carpal tunnel syndrome (median nerve compression)

1. Raise arms to shoulder level
2. Bring dorsum of hands together in midline
3. Hold wrist in forced flexion for 30-60 secs

Positive Test: Tingling and numbness over median nerve distribution
Sensory Nerve Conduction Studies (Electrodiagnosis) of the Median Nerve Across the Carpal Tunnel

Surface stimulation of the median nerve at the wrist. This sends a nerve impulse through the carpal tunnel into the hand and activates the specific muscles and sensory structures supplied by the median nerve.

Recorded sensory nerve response at the index finger from the median nerve stimulation at the wrist.

Time Delay ("Latency")
- A measure of nerve velocity within the carpal tunnel
- A prolonged delay may indicate median nerve dysfunction
Treatment of CTS

- Splints
- Drugs (pain killers and steroids)
- Ultrasound (may produce anti-inflammatory effect)
- Surgery
- Physical Therapy and Exercise
- Alternative therapies (acupuncture, osteopathy, yoga, Alexander technique, biofeedback, massage, etc.)
Splints, Braces, Products

- Classic CTS brace
- Gel wrist support
- Anti-vibration gloves
- Wrist ice-pack
- Push-up stands
Adapting Your Environment

• Sleeping

The worst!

Better
CTS and Computers

- 30% of frequent computer users complain of tingling, burning, or numbness of limbs
- 10% of frequent computer users have a diagnosis of carpal tunnel syndrome
- Taking insufficient breaks while working at computers is a key factor in the development of CTS
Adapting Your Environment

• Keyboard & Mouse Ergonomics

Split keyboard with wrist rest

Mouse pad with wrist rest
Adapting Your Environment

Proper Desktop Position:
- Neutral head position
- Shoulders relaxed and back straight
- Elbows close to body at a 90°-100° angle
- Support for natural back arch
- Hip angle 90°-100°
- Knee angle 90°-100°
- Chair adjusted so feet are flat on ground (or use a footrest)
- Top of monitor level with eyes
- Monitor about an arm's length away
- Wrists in straight line with forearm

Wrong Sitting Posture

Correct Sitting Position

Correct Standing Position
Adapting Your Environment

RIGHT!

WRONG!

RIGHT!

WRONG!

LAPTOP
Ergonomics
Stink!

Er, Problematic?
CTS and Video Games

• How you hold and grip the controller is key

• Repetitive poor alignment can lead to injury
Feel-Good Moves (do them for no other reason than that they feel good!) You deserve it! Breathe!!

- Shoulder rolls
- Neck moves
- Side bends
- Round and release (add a chest stretch)
- Wrist rolls and finger stretches
- Windshield wiper move with lower body (add upper body moves)
- Ankle rolls, point and flex, wiggle toes
Adapting Your Exercises
Planks, Push-ups, and Presses

Plank

Push up/plank stands

Barbell bench press

modification
Self-Management of CTS

• Take regular breaks!
• Do regular exercises
• Make sure you are sitting in the correct position
Modifying Exercises and Making Sure You’re in Good Alignment

Downward-facing dog

Face pull

Lateral raise

Upright row
The Key: Keep your wrist in neutral whenever possible!
(This helps to rest the median nerve)

Repetitive wrist flexion and extension (carpal tunnel gets smaller in these positions, circulation to the hand decreases and pressure in the carpal tunnel increases)

What Else Can You Do to Help with Pain?

- Traction
- Acupressure/Acupuncture
- Over the counter meds
- Steroid injection
- OT or PT with a certified hand therapist
- Ice
- Rest/take breaks from repetitive tasks
- Surgery

Transverse ligament is cut
Additional Coping Strategies

• When shopping, limit the weight of your shopping bags
• Consider using a backpack or a bag with a shoulder strap
• Consider avoiding handshakes (alternatives: elbow bump or cup your hands around the other person’s hand)
• Instead of clapping, shout “bravo”, stomp your feet, “shine” with your hands
• Careful with driving; maintain a neutral wrist on the steering wheel
• Push doorbells and elevator buttons with an elbow, knuckle, or umbrella
• Minimize texting—talk instead

Owch!
Instant Relief?

Acupressure

Shake it out

Heat or ice—ask your doctor which is best! (most will recommend heat)

Self CTS massage with mini-ball or mini-foam roller

https://www.youtube.com/watch?v=kkQs9ytO20M

Let’s do this!

CTS massage
Exercises

• Make a fist, then straighten your fingers (fist to stop sign). 5-10x
• Wrist flex and extend
• Wrist extension with a band
• Active finger flexion
Median Nerve Glides For Carpal Tunnel
MyCarpalTunnel.com

Starting Position 1
Wrist in neutral, fingers and thumb in flexation.

Position 2
Wrist in neutral, fingers and thumb extended.

Position 3
Wrist in neutral, fingers extended, thumb in neutral.

Position 4
Wrist, fingers, and thumb extended.

Position 5
As in position four, with palm facing up.

Position 6
As in position five, other hand gently stretching thumb.

Repeat the above exercise 3-5 times. Do the movements slowly.

Do not stay in position 6 for any length of time. Stop and return to position 1 if you feel a strong pull at any stage.
The median nerve can become pinched with CTS. Nerve gliding/flossing may help...
Scissor Spread:
Wrap the Thinking Putty around two fingers and try to spread them apart.

Thumb Press:
Put Thinking Putty in the palm of your hand. Push it with your thumb towards your small finger.

Thumb Extension:
Bend your thumb and loop Thinking Putty around it. Try to straighten your thumb.

Thumb Pinch Strengthening:
Squeeze the Thinking Putty between your thumb and the side of your index finger.

Thumb Adduction:
Keep your fingers and thumb straight as you press Thinking Putty between your thumb and index finger.

Three Jaw Chuck Pinch:
Using your thumb, index and middle finger, pull Thinking Putty upwards.

Finger Hook:
Create a hook as you press your fingers into the Thinking Putty.

Full Grip:
Make a fist while squeezing your fingers into the Thinking Putty.

Finger Pinch:
Pinch the Thinking Putty between each finger and your thumb.

Finger Extension:
Bend your finger and loop Thinking Putty around it. Try to straighten your finger.

Finger Scissor:
Take a one inch diameter ball of Thinking Putty and place it between your fingers. Squeeze it.

Finger Spread:
Spread a pancake of Thinking Putty over your fingers. Try to spread your fingers apart.
Upper body exercises that can help:

- Prone reverse fly variations (works scapular muscles essential for good upper body posture)
- Lateral neck stretches
- Wrist extension stretch
- Spinal twist
- Wall slides
Hopeful Outcomes:

1. Your hand starts to *feel* better
2. Your hand starts to *work* better
# Functional Status Scale
(keep track of how your hand is functioning)

<table>
<thead>
<tr>
<th>Activity</th>
<th>No difficulty</th>
<th>Mild difficulty</th>
<th>Moderate difficulty</th>
<th>Severe difficulty</th>
<th>Cannot do at all due to hand or wrist symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Buttoning clothes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Holding a book while reading</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Gripping smartphone</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Opening jars</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Household chores</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
<td>Carrying grocery bags</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Bathing and dressing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

To get your score, simply add up the numbers you circled and divide by 8.
Summary

- Take breaks from repetitive tasks
- Wear splints on your wrists
- Lighten up (relax your grip/reduce the force you’re using)
- Mind your flexion (stay in neutral as much as possible)
- Stretch it out
- Try over-the-counter meds
- Slather on some pain relief (e.g. topical menthol such as Biofreeze)
Resources