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### 1. Introduction

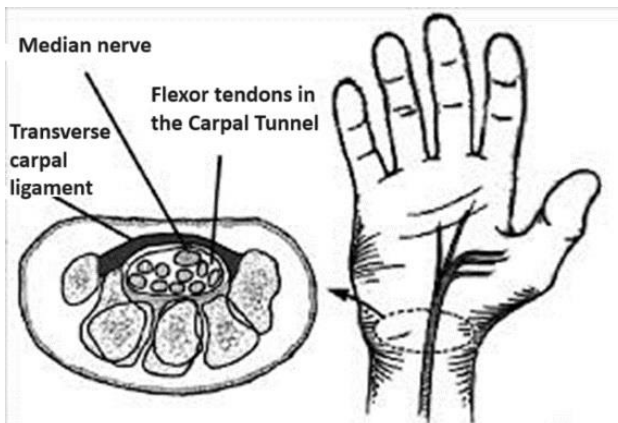
People with late effects of polio (LEoP) and post-polio syndrome (PPS) often face long-term challenges from relying heavily on their arms and hands to use mobility aids like crutches, walking sticks, walkers, and manual wheelchairs.

Studies indicate that 22% to 45% of polio survivors are eventually diagnosed with Carpal Tunnel Syndrome. Most experience mild and intermittent symptoms, such as nighttime tingling and aching in the thumb and fingers.

### 2. What is Carpal Tunnel Syndrome?

Carpal Tunnel Syndrome (CTS) occurs when the median nerve is compressed as it passes through the carpal tunnel in the wrist. The median nerve controls sensation and movement in the thumb and first three fingers. The carpal tunnel is a narrow passage that the median nerve shares with nine tendons.

Overuse can cause these tendons to swell, taking up more space and compressing the median nerve. This leads to symptoms like tingling in the fingers and an achy wrist, often worse at night or after heavy use of the hands.



Factors contributing to CTS include genetics, diabetes, hypothyroidism, arthritis, obesity, hypertension, and pregnancy. Contrary to popular

belief, using a computer keyboard is not a risk factor for CTS. The condition usually develops later in life and is three times more common in women, partly because women generally have smaller carpal tunnels.

### 3. CTS in polio survivors

Carpal Tunnel Syndrome is more prevalent among polio survivors compared to the general population. This is partly due to the initial loss of nerve fibres from polio, leaving a diminished reserve of nerve fibres if additional ones are damaged.

### 4. Diagnosis

CTS diagnosis involves identifying a pattern of symptoms, such as tingling, numbness, aching and pain in the characteristic areas, triggered and progressing in predictable patterns.

A thorough medical history, physical examination, and ruling out other causes like pinched nerves in the neck, help in diagnosis.

Once diagnosed, the extent of median nerve damage is assessed using nerve conduction studies (NCS) and electromyography (EMG):

- **Nerve conduction study (NCS):** Nerve conduction tests consist of sending some electrical shocks across the carpal tunnel and measuring how well the medical nerve conducts.
- **Electromyography (EMG):** This is more invasive; a fine needle is used to measure muscle (and therefore nerve) activity in the hand. EMG testing is only required if there is evidence in the physical examination of new and progressive muscle weakness and wasting; EMG testing might also sometimes be recommended if another diagnosis is suspected.

These tests classify CTS severity as mild, moderate, or severe. This classification can only be made with nerve conduction and possibly EMG tests.

5. Treatment

CTS management involves addressing controllable risk factors like diabetes and obesity and modifying regular or repeated activities to reduce strain on the hands and wrists.

• **Mild CTS**

Treatment for mild CTS may include:

- **Non-steroidal anti-inflammatories:** Short-term use of ibuprofen (or paracetamol) can relieve pain, but these drugs should not be taken indefinitely.
- **Splinting:** Wearing a wrist splint, especially at night, keeps the wrist in a neutral position, reducing pressure on the median nerve.

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• **Moderate CTS**

Conservative treatments should be attempted first, but moderate CTS requires more intervention as the median nerve risks permanent damage.

- **Corticosteroid injection:** Reduces swelling around the median nerve, though symptoms may return, necessitating further injections.

• **Severe CTS**

Only severe CTS (confirmed with nerve conduction studies and EMG) requires surgery.



By this time there will be visible muscle wasting at the thumb base.

- **Decompressive surgery:** Involves cutting the transverse ligament to relieve nerve pressure. This common hand surgery is **best done "open" rather than keyhole**. It is essential for the surgeon to visualise the contents of the carpal tunnel and avoid injuring any nerves that do not pass through the carpal tunnel (the palmar cutaneous branch for example). After surgery, the wrist will be bandaged to offer support and protect the incision, but to leave the fingers free for movement.

People with PPS who are planning surgery should consider the fact they developed CTS because they rely so heavily on their hands, often for mobility. Although surgery may prove unavoidable, it is especially important to time their CTS operation around their own responsibilities and commitments. How exactly are they going to cope? Recovery, and hence relative immobility, will last several weeks (likely 6 to 12 weeks).

Patients can ask for a platform crutch attachment (see below) before leaving hospital.

6. Useful NHS guidance post-surgery

- **Hand therapy advice:** <https://www.cuh.nhs.uk/patient-information/hand-therapy-advice-following-your-carpal-tunnel-release-surgery/>
- **Stiffness management (video):** <https://www.youtube.com/watch?v=Xlpa7NtedwM>
- **Critical scar management (video):** [https://www.youtube.com/watch?v=bfs5TUgH\\_3g](https://www.youtube.com/watch?v=bfs5TUgH_3g)

7. Importance for polio survivors

Timely and comprehensive treatment of CTS is crucial for polio survivors, who have a reduced capacity to recover lost nerve fibres. Untreated CTS can lead to severe consequences like paralysis and muscle loss.

8. Longer term adjustments

Polio survivors should consider longer term adjustments to prevent CTS recurrence. This includes modifying daily routines to reduce wrist strain, alternating activities, and maintaining neutral wrist positions.



Devices like platform crutch attachments that shift weight from the wrist to the forearm can be beneficial. However, instruction on how to use the adapted crutch is highly recommended. It will feel quite different to a walking stick. Ensure you consult a physiotherapist or Occupational Therapist for more tailored advice before trying to use a platform crutch attachment.

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