

Indoor stationary and outdoor bicycle use has increased in popularity. It provides transportation, exercise, and enjoyment. The control of the bicycle requires nearly constant use of the upper extremity. One or both hands are constantly squeezing the handlebars. Different positions of holding onto the handlebars cause strain to the nerves of the neck, arm, elbow, wrists, and fingers. Vibration from rough roads, leaning more body weight forward onto the arms, or hand swelling can increase pressure and cause pain. The longer the ride, the longer the pressure is applied.

The pressure on the nerves can result in numbness/tingling in the palm and/or fingers. Sometimes hand muscles receiving energy from these nerves can weaken. When the symptoms of numbness and weakness occur, it is called a palsy. A palsy can be temporary and can immediately improve after changing position or stretching. Palsies can also worsen over time and result in longer and more permanent symptoms.

Two types of nerve palsies or pressure conditions in the hand are common in cycling. The most common involves the ulnar nerve, which enters the hand on the little finger side of the palm, where the padding over the nerve is thin. Pressure on the base of the pinky side of the palm can result in numbness. The other common pressure palsy in cyclists involves the median nerve as it crosses from the wrist into the palm. Most of the median nerve is more protected by deeper structures (inside the carpal tunnel). The median sensory branch to the base of the thumb is closer to the skin, making it less protected from palm pressures. Direct pressure on the middle of the crease where the wrist and hand meet can eventually cause the thumb area to feel numb.

## Causes

During prolonged cycling, the pressures from holding and putting weight on the handlebars can cause irritation of the nerves at the palm. The median and ulnar nerves enter the hand where the pressure from the handlebars is greatest. Common positions are "tops," "ramps," "hoods," and "drops" (see Figure 1). The "drops" position causes the most pressure on the ulnar nerve. There is slightly less pressure in the "hoods" position. The "tops" position puts significant pressure on the palm at the base of the ring finger.

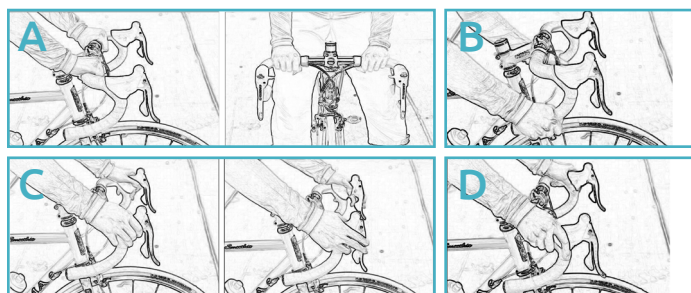


**Figure 1 - Common handlebar positions:**

A) "tops," which puts pressure on the palm at the base of the ring finger; B) "drops," which puts the most pressure on the ulnar nerve; C) "hoods"; and D) "ramps."



**Figure 2 - To reduce or distribute pressure while cycling, wear gloves with foam or gel padding in the palms.**

If a cyclist already has nerve compression at the neck or elbow, it can more easily be triggered at the palm. The combined pressures can result in carpal tunnel syndrome or cubital tunnel syndrome. A bike seat that is not adjusted properly can result in less body weight on the seat and more weight on the hands.

## Symptoms

When the ulnar nerve is affected, there can be numbness/tingling and sensory changes in the little finger and the ring finger on the side closest to the little finger. The palm may also get numb in that area. There is no numbness on the back of the hand. The symptoms can be varied depending on the site of pressure. Sometimes there is only numbness, and other times there is only weakness. However, a combination of these symptoms is most common.

If the median nerve is affected, the numbness/tingling is on the palm side of the thumb, index, long, and ring fingers (on the side closest to the middle finger). There is no numbness on the back of the hand. If the pressure on the nerves is longer or more severe, their muscles could weaken. Some cyclists have reported pain alongside hand numbness.

## Treatment

Limiting cycling is the most effective treatment for palsies. However, there are other things you can do that will allow you to continue cycling, including:

- Limiting the length or distance of the ride
- Having enough rest between longer cycling sessions
- Changing positions of grip on the handlebars
- Ice or heat
- Changing to a transverse handlebar
- Adjusting the seat height
- Reducing or distributing pressure with foam or gel padding in the palm of biking gloves (see Figure 2)

Once the pressure is gone, there should be nerve recovery, which might be gradual and could take weeks or even several months. A full recovery should be possible when treated early. Steroid injections, therapy, and oral anti-inflammatory medication are often advised. Occasionally, surgery to alleviate continuing pressure is needed.