

Arm and Hand Numbness While Cycling

Hand, wrist, and forearm pain and numbness commonly occur among cyclists, particularly with advancing age. We have all seen those in a pace line in front of us take their hand off the handlebars and shake their forearm and hand briefly, then grab the handlebars once again, only to repeat this move for relief a couple of miles down the road. Perhaps this even describes you. While the numbness may be annoying and common on longer rides, it is typically not dangerous. Importantly, it is often due to nerve compression and is often preventable by easy adjustments and accommodations to our riding position and/or equipment.

A basic explanation of the paths the nerves follow in our body, and the potential mechanisms of compression will allow both an understanding of and remediation of this common affliction, allowing more enjoyable riding. There are two types of nerves of interest here, one type is sensory and the other is motor. The former provides information to our brains as to how we physically feel-hot, cold, sharp, pain, etc. The latter controls muscle contraction and thus arm, wrist, hand, and finger movement. Oftentimes these two types of nerves are physically close, like the wires in the walls of our home. There are many ways nerves can be injured, including direct trauma, infection, and inflammation. Importantly, most cycling associated numbness is due to a sensory nerve being compressed or squeezed somewhere along its path from where it begins in the spinal cord until its final termination in the forearm, hand, or fingers. Temporary compression of the nerve causes a temporary decrease in the nerve blood supply and nerve function, which rapidly resolves when the compression is released. Constant or near constant pain, tingling, or muscle weakness is a red flag that something serious may be causing the problem and should prompt formal medical evaluation, rather than advice from this Cycling Medicine column. Typically, dysfunction of the motor nerves is associated with more severe injury than sensory nerve numbness or tingling, and persistent muscle weakness is also a red flag indicating medical evaluation is warranted.

The nerves of the upper extremity arise in the spinal cord in the neck, pass through notches in the vertebral bones of cervical (neck) spine, course through a web of nerves between the neck and shoulder termed the brachial plexus, then travel down the upper and lower arms in two distinct nerves (about the diameter of a brake cable) called the median and ulnar nerves,

progress through a region of the wrist near the base of the palm, enter the carpal tunnel, and then branch into smaller nerves to the palm, fingers, and back of the hand. While nerve injury could occur anywhere along this path, the most common locations are:

1) **The cervical spine.** Irregularities and bone spurs in the cervical vertebrae can impinge upon the nerves. This can vary with neck position, particularly extension (trying to look up). There are soft tissue structures, called discs, between the vertebrae. Think of an Oreo cookie-the black cookies are the vertebrae, and the white cream is a disc. Degeneration and injury to the discs can cause them to herniate or move and impinge a nerve. Disease of the cervical spine can affect all nerves in the arm, hand, and fingers.

2) **The muscles in the forearm** can compress the ulnar nerve and cause numbness and weakness in the ring and pinky fingers as well as the portion of the hand near those fingers. This problem tends to be seen in high level cyclists whose forearm muscles may contract with high and continuous force while racing, riding on turns, and mountain biking.

3) **The radial nerve** can be compressed at the wrist within the carpal tunnel, and this is more likely if the wrist is extended (bent backwards, as if waving hello). Moving or keeping the hand away from the neutral position may also lead to nerve compression. Radial nerve injury will cause numbness and weakness in the thumb, index, and middle finger as well as the area of the hand near those fingers.

4) **The palm of hand** contains nerve fibers most prominently in the fleshy prominence at the base of the thumb. These nerves can be compressed by direct pressure, and numbness may result.

Based upon the above descriptions, many cyclists can try to diagnose their specific nerve impairment, based upon both the areas of numbness or tingling as well as habits that may have provided relief (e.g. flexing the neck, moving the wrist). Again, persistent unrelenting symptoms and significant muscle weakness may be signs of a more serious injury or problem. Formal medical evaluation is recommended for this.

Armed with the above knowledge, cyclists can now help make sure that their riding position and gear help and not hurt their nerves and/or themselves. A correct size bike frame is essential. A frame that is too small will often lead to excessive hyperextension of the neck and too much weight shifting forward to

the arms, wrists, and hands. Similarly, seat position is important, and sometimes simply tilting the seat a bit more “nose up” will shift weight from the upper extremities to the buttocks (where it belongs). Handlebar position, part of a good bike fitting, may benefit from some adjustment. Adjusting or replacing the stem or head tube will move the handlebars in the vertical as well as the forward/backward axes and minimizing weight on the arms, wrists, and fingers. Inexpensive adjustable stems that facilitate quick and precise adjustment of handlebar position are available for most bikes. Minor rotation of drop handlebars upward may significantly change weight distribution and position of the wrist and palm may be helpful.

A compact, crouched racing position essentially mandates that one’s neck is hyperextended to see forward. A more upright riding position allows the cervical spine to be less extended or even flexed. A touring bike with horizontal handlebars may be a comfortable solution for many. Importantly, in the last several years many prominent bike companies have designed road rides with a more upright riding position, termed “comfort road bikes.” Examples of these more upright models include The Trek Domane and Specialized Allez that are currently very popular with SMBC members.

Aerobars, both classic and more modern variants, change riding position, particularly of the upper extremities. While these may help with some of the described problems, they are strongly discouraged for group rides by SBMC because of safety concerns.

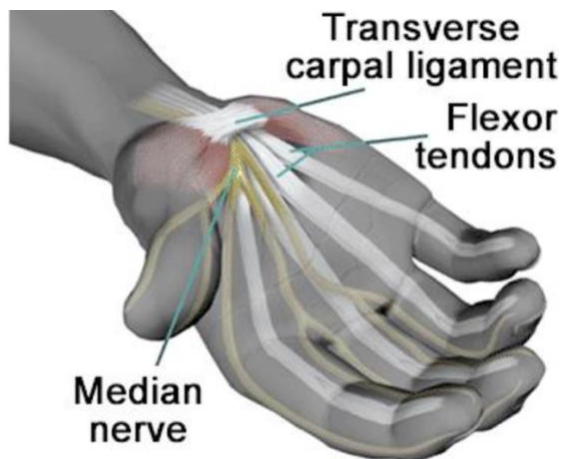
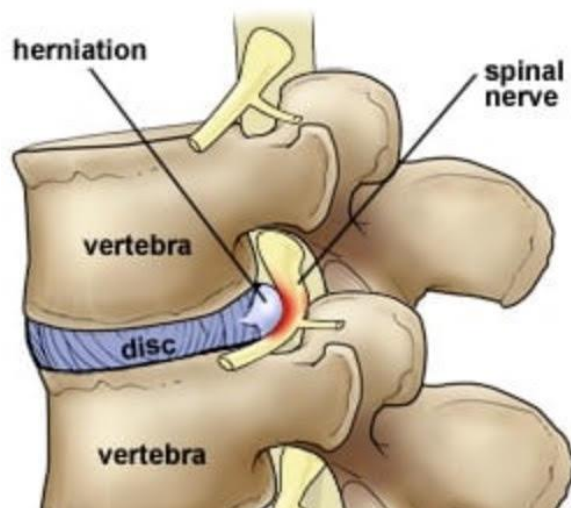
If numbness is confined to the areas supplied by the nerves on the palm of the hand (described above), then a new pair of well-padded gloves may be all that is needed for relief.

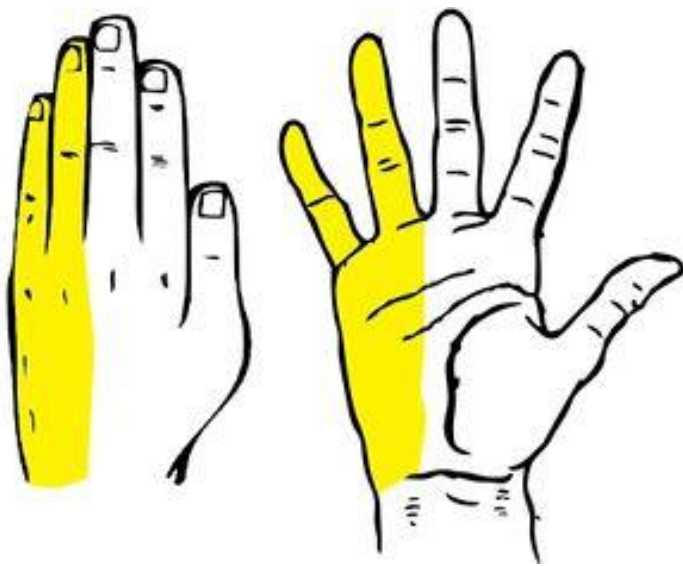
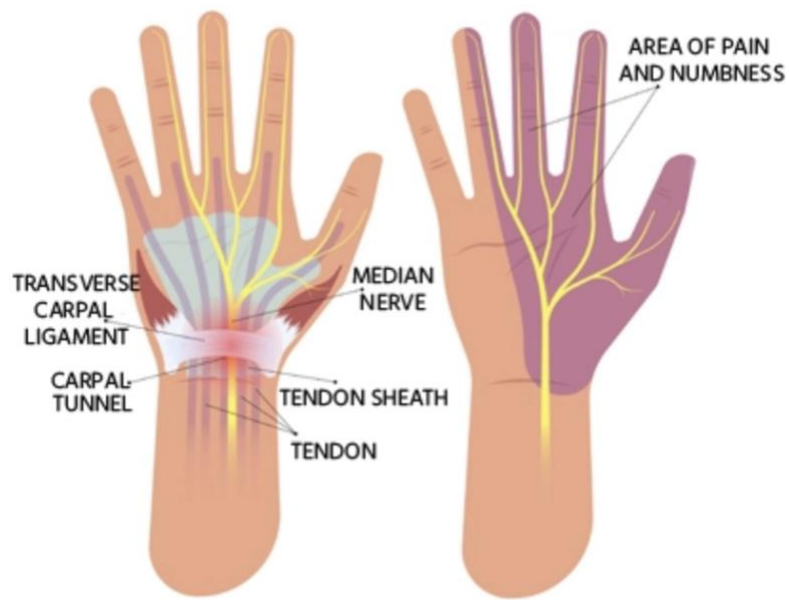
Road vibrations may also exacerbate nerve compression, and simply riding with a few pounds less air in the tires or using well padded (new?) gloves may be helpful.

If simple adjustments described above fail to provide quick relief, please consider a formal bike fitting, readily available at many excellent local bike shops. A skilled staff member will make individualized measurements and advise on optimal bike size, components, and adjustments to enhance both performance and comfort. Remember, our bodies do change in size, shape, and flexibility with age, so the perfect bike from 10 or 15 years ago may no longer be so perfect. Hopefully a few modest adjustments will, better achieve perfection (and comfort).

Key points:

- 1) Numbness and tingling are typically caused by nerve compression.
- 2) The neck, forearm, wrist and palm are the common areas where nerves may be compressed.
- 3) Small changes in bike geometry may worsen or improve nerve compression and alleviate symptoms.
- 4) Persistent numbness or weakness may be signs of more serious causes; medical evaluation is recommended.





Ulnar Nerve Distribution