

Wrist and Hand Pain

Improved Treatment for Carpal Tunnel Syndrome with Active Release Techniques® (ART®)

The increase in desk jobs, along with the widespread use of computers in our lives has led to a dramatic rise in the number of muscle and joint conditions involving the wrist and hand. Most complaints are diagnosed as Carpal Tunnel Syndrome, but can also include other conditions such as Ulnar Nerve Syndrome, Wrist Sprain or Strain, Overuse Injury, or a variety of other diagnoses. Not only are wrist and hand problems extremely common, but they can be extremely slow to respond to traditional types of care. In many cases surgery is recommended, although this is far from a perfect solution. All of this leads to a considerable amount of frustration for the wrist or hand pain sufferer, as the problem interferes with work, normal everyday activities, and a good night's sleep.

Now for the good news, a relatively new treatment technique known as **Active Release Techniques® (ART®)** is proving to be a very effective method to treat many common wrist and hand problems, including Carpal Tunnel Syndrome. Through ART® treatments, many wrist and hand pain sufferers are now able to finally get a handle on their pain and get back to doing their favorite activities. But before we talk about how ART works so effectively, you first need to understand how the wrist and hand becomes injured in the first place.

How Does Wrist and Hand Pain Occur?

The wrist and hand is a very complex area. Although it is a small region, it consists of a complex system of muscles, nerves, tendons, and joints which work together to enable us to perform what are known as fine motor skills such as typing or buttoning a shirt. In order to accomplish these tasks there are many separate muscles that must properly move and control the many bones of the wrist, and each individual finger.

In addition to the intricate systems of muscles in the hand itself, many muscles that move the wrist and hand are actually located in the forearm. These forearm muscles have long tendons that attach to each bone of the wrist, hand, and each individual finger. There are many different muscles in this region, and these muscles are arranged in several layers. As each individual muscle contracts it actually slides on the adjacent muscles. For example, if you were to just move your index finger, only the muscle that controls this finger would shorten, and when it does, it would slide against the other muscles around it. Under normal circumstances this muscle arrangement works very effectively and allows us to accomplish a wide range of complex and intricate movements with our hands and fingers.



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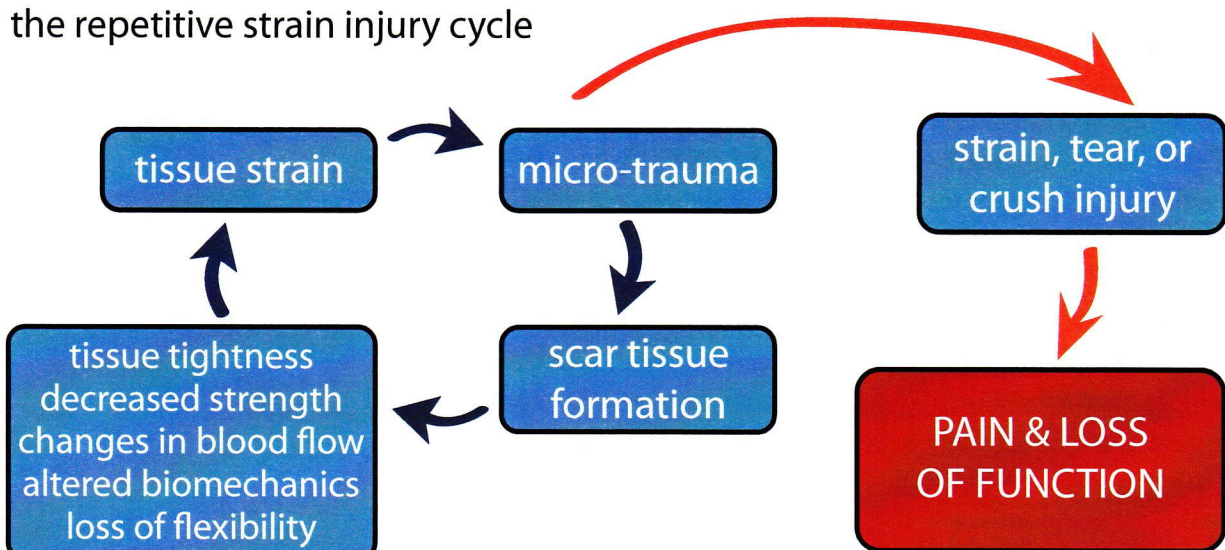
Unfortunately, in many cases, the muscles located in the forearm, wrist, and hand become strained leading to pain and injury. In the large majority of cases the muscles become strained from repetitive use. Keep in mind that these muscles are small and, as a result, can fatigue easily with prolonged or extended use. The chance of an overuse type of injury occurring is greatly increased with jobs that involve computers or any other occupation that requires prolonged use of the hands such as, but not limited to: assembly line workers, mechanics, dental hygienists, hair stylists, and ultrasonographers. In most cases, the task itself is not overly strenuous, but it is the repetitive nature of the task, performed in a compromised position, that leads to the problem.

Let's look at typing as an example. At first glance, typing seems like a safe and easy task. However, we are often typing for long periods at a time. Each time you move your fingers to strike a key, the various muscles in the hand and forearm contract to move the fingers. Remember, as you move your wrist in different directions or move different fingers, the contracting muscles must slide over each other. As this continues over time, the muscles will become fatigued. Increased friction and strain will develop within and between the muscles. This will in turn affect the blood flow to the area, resulting in hypoxia, which is characterized by a lack of oxygen delivery to the tissues. Over time this strain and lack of oxygen can progress into what is known as micro-trauma, very small scale damage that occurs in the muscles, tendons, nerves, and ligaments in response to small levels of strain. Although initially this *micro-trauma* is very small and is at first not

painful, the damage to the tissues still needs to be repaired. The body responds to all forms of soft-tissue damage in the same predictable way - by laying down scar tissue to repair the injured tissues. Unfortunately, over time this scar tissue will build-up and accumulate into *adhesions*. As these adhesions form they start to affect the normal health and function of the muscles. In fact, they will often lead to **pain, tightness, stiffness, restricted joint motion, muscle weakness and further diminished blood flow.**

To make matters worse scar tissue adhesions are very "sticky" and as they accumulate in the muscles, tendons, and ligaments they interfere with the normal function of the tissues. Normal sliding actions of the muscles and tendons becomes impaired, causing even more strain in the region. Think of these adhesions as being rust and grime building up in an automobile. Normally the parts of the car should be well oiled and move smoothly, but when rust and grime are allowed to build-up, the car begins to break down until eventually it does not work properly and repairs are needed. The same thing happens in the body. As scar tissue adhesions build up, they place more and more strain on the body until pain and other symptoms occur. This process is known as the "**Repetitive Strain Injury Cycle**", where continued micro-trauma leads to further adhesion formation, which in turn leads to more stress and further micro-trauma. The health of the tissues and their ability to work properly will eventually deteriorate. Eventually this process will lead to noticeable pain and injury.

the repetitive strain injury cycle

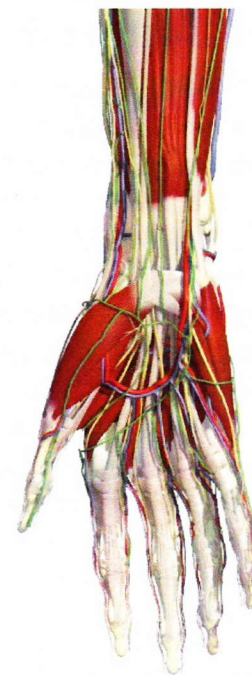


Nerves and Their Role in Wrist and Hand Pain

As indicated previously, the body responds to tissue injury in a very predictable way – by laying down new tissue to repair the damaged area. With micro-trauma the body repairs the strained tissue by laying down small amounts of scar tissue in and around the injured area. The scar tissue itself is not a problem – in fact it is a normal and necessary part of healing. The problem occurs as the body is subjected to the same forces at the hand/wrist over and over again. This in turn causes the same muscles to become strained and subsequently repaired over and over again. Over time this scar tissue will build-up and accumulate into what we call adhesions. As these adhesions form they start to affect the normal health and function of the muscles. In fact, they will often lead to pain, tightness, stiffness, restricted joint motion, and diminished blood flow.

Scar tissue adhesions will accumulate not only in and around the hand, but also at the wrist, forearm, and other areas along the kinetic chain. This scar tissue build-up will place more and more strain on the hand and wrist as the muscles must now stretch and contract against these adhesions. This further increases the strain to an already overloaded wrist, which in turn leads to

more micro-trauma. Essentially a repetitive injury cycle is set-up causing continued adhesion formation and progressive movement dysfunction. As the cycle progresses the ability of the muscles to contract properly is affected and the control and stability of the wrist/hand becomes compromised. At this point it is not uncommon for the muscles to give way and for a more severe pain to occur. As you can see from the explanation of this repetitive injury cycle, these types of injuries build-up over time and tend to not improve unless cared for effectively.



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How Can Wrist and Hand Conditions Be Fixed?

The Traditional Approach

In an attempt to relieve wrist and hand pain, a variety of treatment methods are used, either on their own, or in combination with other methods. Some of the more common approaches include anti-inflammatory medications, rest, ice, ultrasound (US), acupuncture, wrist splints, stretching and strengthening exercises, and when all else fails, surgery. Unfortunately, most of these traditional techniques generally require a long period of time before they provide any significant relief. In many cases they provide only temporary relief from symptoms instead of fixing the underlying cause of the problem.

The main reason these approaches are often ineffective is that they fail to address the underlying scar tissue adhesions that develop within the muscles and surrounding soft tissues.

These adhesions bind the tissues together, restricting normal movements, and interfering with the normal flexibility, blood flow, contraction, and sliding of the muscles and nerves in and around the forearm, wrist, and hand.

Passive approaches, such as medications, rest, ice, and ultrasound all focus on symptomatic relief and do nothing to address muscle restrictions and dysfunction. More active approaches, such as stretching and exercises are often needed for full rehabilitation of the condition and to restore full strength and muscle function. However, they themselves do not treat the underlying adhesions. Without first addressing the scar tissue adhesions, stretches and exercises are often less effective and much slower to produce relief or recovery.