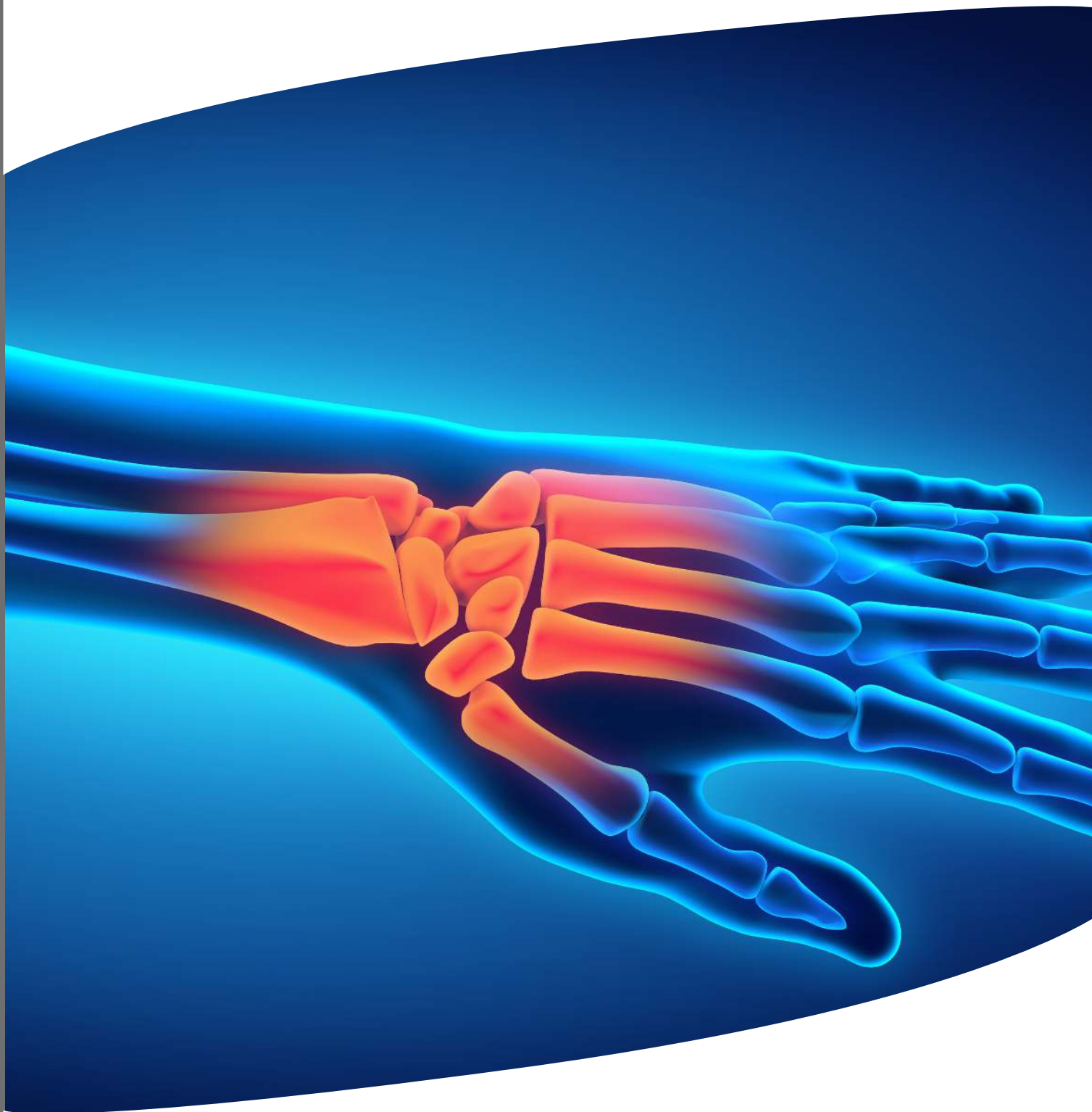


THE INTERVENTIONAL ORTHOPEDICS SOLUTION FOR
WRIST AND HAND PROBLEMS



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You don't think about how important your wrists and hands are until there's a problem and suddenly you can't write, carry things, or type without pain. Or maybe you can still do all these things, but you're realizing that it's more of a struggle and it gets more painful every time you do them.

In interventional orthopedics, we believe a nonsurgical approach is usually the best option. We also recognize that the body is actually one interconnected machine, not a collection of individual parts. The fingers, hands, and wrists are all controlled by spinal nerves in your cervical spine and operated by an interconnected system of tendons and ligaments. Every structure is there for a purpose and functions with millimeter precision, and when body parts are replaced or surgically altered, in most cases it causes more problems than it solves. While we will focus on the wrists and hands in this report, in interventional orthopedics, our focus is on treating the entire musculoskeletal system.

There are many problems that can occur in the wrists and hands. Some of the more common include arthritis, instability, and carpal tunnel syndrome. In this report, we're going to define some of these and the traditional and [interventional orthopedics solutions to wrist and hand problems](#). First, let's look at how the wrist and hand works.

How Does the Wrist and Hand Work?

Your hand is made up of the wrist and fingers and is a complex machine with many moving parts. The wrist is eight irregularly shaped little bones between the arm bones and fingers. These little bones allow you to move your fingers and allow for a complex range of movements, such as rotation, in the wrists.

In defining the functionality of the wrist and hand, it's critical to understand all of the little ligaments (at least 20 or so) that hold this machine together. Each ligament stretches this way or that, in seemingly random patterns that are, in fact, naturally designed with millimeter precision. These ligaments allow our hands to grasp and hold objects, providing for those fine-motor mechanical skills.

The design of the wrist and hand is so complex and the function so fine and precise that accurate replication of the biomechanics is unlikely and success rates for surgical attempts to do so are low. Unfortunately, the ligaments are often ignored in traditional wrist treatments despite the fact that they are a key player in wrist functionality.

In addition, the wrist and hand commonly can be affected due to a problem in the cervical spine (neck area). The spinal nerves that supply the hands and wrists branch off the cervical spine and travel all the way down to the wrists and hands. A cervical disc bulge, stenosis, or other spinal problem could cause problems in the hand. Even a pinched disc in

the shoulder can refer pain down to the hand as the shoulder lies within the kinetic chain that connects the spine to the hand. [Nerve issues in the cervical spine or shoulder can also cause numbness in the hands](#), so numbness, as well, should not be ignored. It's important to note, too, that a problem in the spine will not necessarily cause pain in the spine, so don't rule out the cervical spine potentially being the cause of a hand or wrist problem just because your neck feels fine.

Wrist Arthritis and Instability

Trauma is the biggest cause of wrist issues, and it can cause one or more of the ligaments to become lax, or loose. This then leads to extra motion (instability) in one or more of those eight wrist bones, and this, over time, wears away the cartilage, leading to arthritis. Hence, treatment should focus on restoring the integrity of the wrist ligaments.

The triangular fibrocartilage complex (TFCC) is a complex of ligaments and a meniscus-like spacer on the ulnar side of the hand that allows you to use your opposable thumbs. It provides smooth wrist movement and stability and cushions the joint. When patients have TFCC damage, such as a tear, the ulnar side of the wrist hurts, and this gets worse with activity. There can also be swelling in the area. With TFCC damage, progressive wrist arthritis ensues, leading to pain and even deformity.

An old injury to the wrist ligaments can go unnoticed for years. Suddenly while performing downward dog in yoga, for example, pain shoots through that wrist, and it's discovered on exam that the wrist experienced some unknown injury at some point and the ligaments are now stretched and getting worse. Perhaps even swelling and arthritis have set in because of all of the excessive movement in the carpal bones in the hand.

Big-surgery approaches for the wrist include wrist fusions and even wrist replacements. [With wrist replacements, over 50% report complications](#), such as serious contractures (when the ligaments and tendons become so scarred down the wrist won't function) and failure of the implanted devices. In a wrist fusion, cartilage is removed from bones in the wrist, a graft is placed between the bones, and a metal plate bolts the wrist to the radial bone in the forearm. The purpose is to grow the bones of the wrist together with the radial bone, making them one solid unit. As you can imagine, this surgery is permanent and eliminates movement in the wrist.

In interventional orthopedics, we don't believe in rearranging, permanently immobilizing, or replacing the wrist. Thankfully, wrist arthritis and instability can usually be treated without surgery and with ultraprecise, guided injections of advanced autologous biologics, like platelet rich plasma and stem cells. In addition, in our experience, the wrist commonly hurts due to bad biomechanics that are usually centered around a neck problem where the nerves branch all the way down to the wrists and hands. So we focus on fixing the bad movement patterns or precisely injecting your own platelets or stem cells into the TFCC, other arthritic wrist joints, ligaments, and/or neck.

Thumb-Joint Arthritis and Instability

The actual medical term for thumb arthritis is thumb carpometacarpal osteoarthritis (CMC OA), and the CMC is the joint located between the wrist bones and the base of the thumb. It is the most common diagnosis when someone complains of pain in the base of the thumb when using their hands. This problem is found 15–20 times more often in women and is [present in up to one-third of postmenopausal females](#).

Our modern society is really turning thumb pain and arthritis into an epidemic. Why? Our constant use of computer keyboards, smartphones, and other devices puts more pressure on this thumb joint, and smartphone texting, specifically, can even lead to a phenomenon termed [texting thumb](#). Add to that the fact that our necks are always flexed and looking down at some device, which places the nerves that go to the thumb (the cervical nerves in our spine) at risk, and you have a recipe for millions of people walking around with pain in the base of the thumb.

All of this pressure can make the thumb joint itself very unstable. This means [the ligaments that hold it all together become lax, and too much movement in the thumb joint ensues](#). This extra motion very commonly leads to thumb arthritis. So it's important to address the thumb instability before arthritis it sets in.

There are many surgical approaches to thumb pain and arthritis. One is tendon transposition, which takes an important tendon from the wrist and uses it to stabilize the CMC joint. Another surgery, called [tendon interposition also takes the wrist tendon, removes a bone, and then uses the coiled up tendon as a cushion for the arthritic joint](#); it also carries a 22% complication rate. In another surgery, a wrist bone is removed and a wire inserted across the painful joint to immobilize it. Bigger surgeries involve either fusing the joint solid, making it immovable, or cutting out the joint altogether and replacing it with an artificial metal or plastic joint. Big thumb-joint surgeries can lead to big complications, and in addition to complications, often patients are left still in pain.

With interventional orthopedics, most [damaged and lax thumb ligaments and arthritis can be easily treated through ultraprecise orthobiologic injections](#). These regenerative medicine solutions use the patient's own platelet rich plasma (PRP), stem cells, or growth factors and can address instability, nerve problems, and thumb-joint instability and arthritis without surgery.

Carpal Tunnel Syndrome

Carpal tunnel syndrome (CTS) occurs when the median nerve in the wrist becomes chronically compressed. This can happen either by external forces or by conditions within the body itself, affecting nerve function. A ligament called the transverse carpal ligament (TCL) makes up the roof of the space we call the carpal tunnel. The median nerve runs from the cervical spine down into the hand and through that tunnel in the wrist. When this nerve has problems anywhere along that path, it can cause pain, numbness, and tingling in the wrist, thumb, and first three fingers.

The TCL plays an important role in stabilizing all of the little bones (carpals) in the wrist. It also serves as an anchor for several important hand muscles (including the one on the meaty part of the thumb). It also acts like a pulley that helps the tendons that flex your fingers get better mechanical advantage.

The quick-fix surgery approach for carpal tunnel syndrome involves cutting the TCL to give the nerve more breathing room. [Cutting the TCL, however, has consequences](#), including instability in the carpal bones, shortened and weakened hand muscles, a bow-stringing effect in the tendons that flex the fingers, and arthritis in the wrist.

The interventional orthopedics approach to [treating carpal tunnel syndrome](#) doesn't involve cutting the ligament, but rather trying to make the environment for the nerve healthier, releasing scar tissue through injection, and figuring out why the nerve is in trouble in the first place (e.g., is the problem rooted in the cervical spine?). [Our hydrodissection technique involves using a tiny 1-inch needle, the smallest caliber made in the U.S., and injecting platelet lysate around the tiny nerve.](#)

Trigger Finger

Trigger finger occurs when one of the tendons that goes to the fingers becomes contracted in a tight band. This causes inflammation and the affected finger catches or gets locked up (aka “triggering”) in a curled position and is painful. It's typically caused by repetitive or constant positioning of the hand in a gripping motion (e.g., bus drivers or tennis players), and it can make it difficult, if not impossible, to do everyday things like typing on a keyboard or putting on your clothes.

Surgery for a trigger finger involves cutting into the hand to release the scar tissue or adhesions around the tendon that are locking the trigger finger in place.

The [interventional orthopedics approach to a trigger finger](#) is an image-guided hydrodissection technique using a small needle and fluid to loosen up the connective tissue and adhesions around the tendon along with the delivery of advanced biologics such as healing growth factors that will also reduce inflammation.

Ulnar Impaction Syndrome

[Wrist pain can also be attributed to something called ulnar impaction syndrome.](#) This simply means that there's too much pressure on the ulnar side of the wrist (the TFCC mentioned earlier) due to a long ulna bone. The problem with this diagnosis is that a long ulna bone seen on MRI doesn't equate to causality (i.e., the abnormal length as the cause for wrist pain or arthritis). However, the surgical-orthopedic belief is that arthritis and accumulated damage occurs when people are born with an ulna bone that's too long, so their solution is to operate to make it “normal.”

The [surgical approach when the ulnar bone is deemed too long is called an ulnar shortening osteotomy](#), and it involves literally cutting out a piece of the ulna bone to shorten it. Regrettably, [research using computer models](#) has shown that [if you change the relationship between the radius and ulnar bones, you actually put more negative forces on the wrist!](#) This has been bolstered by [other studies](#) reporting the occurrence of more arthritis due to alterations in wrist pressure caused by the surgery. Complications are vast as well and include irritation of the surrounding tissues by the plates that are used to heal the bone, delayed or nonhealing of the bone, severe chronic nerve pain, revision surgery, pain requiring hardware remove.

In interventional orthopedics, we don't believe, in most cases, that shortening the ulna is a good idea. When a patient has wrist pain and happens to have a longer ulna, we don't automatically associate the two. In our experience, the wrist commonly hurts due to a neck problem where the nerves branch all the way down to the wrists and hands or due to arthritis or both. So we focus on fixing the bad movement patterns or precisely injecting your own platelets or stem cells into the TFCC, arthritic wrist joints, ligaments, and/or neck.

Steroids, NSAIDs, and Other Drugs Not Recommended

Other treatments you will likely be presented with in the traditional orthopedics model for wrist and hand problems include steroid shots or pain medications, such as nonsteroidal anti-inflammatory drugs (NSAIDs) and opioids. [NSAIDs come with a long and growing list of dangerous side effects, such as sudden-death heart attacks, stroke, and GI bleeding, and addiction and overdose due to prescription opioids have reached epidemic proportions in the U.S.](#)

[Steroid shots have been shown to destroy local cartilage in the joint](#) (which can only progress arthritis) while providing no significant pain improvement. And the list of problems with steroid injections just keeps growing:

[Steroid injections weaken the tendons.](#)

[Steroid injections damage tissues.](#)

[Steroid injections are toxic to joint cartilage cells.](#)

[Steroid injections kill stem cells.](#)

[Steroid injections suppress brain function.](#)

Some supplements can be a good alternative for pain and inflammation. [Chondroitin and glucosamine have been shown to be effective pain relievers, and they preserve cartilage.](#) [Curcumin can also relieve pain from arthritis](#) and other issues.

Conclusion

Big wrist and hand surgeries often come with big complications, and even minor invasive surgeries can come with lengthy recovery times and the feeling that your wrist or hand just isn't quite the same. Rearranging the biomechanics of the wrist or hand with invasive surgery is almost always a terrible idea. It's also important to understand that where it hurts may or may not be where the primary damage is located. If you have wrist or hand pain and conservative treatment (e.g., rest, ice and heat, splinting) is having no effect, your doctor should be taking a look at your cervical spine before jumping to surgical solutions. Whether the problem is rooted in the spine or the wrist and hand, if you are a good candidate, there are interventional orthopedic solutions for both, so surgery, in many cases, can be avoided.

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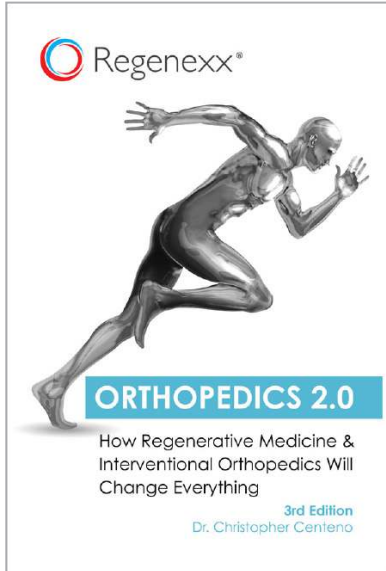


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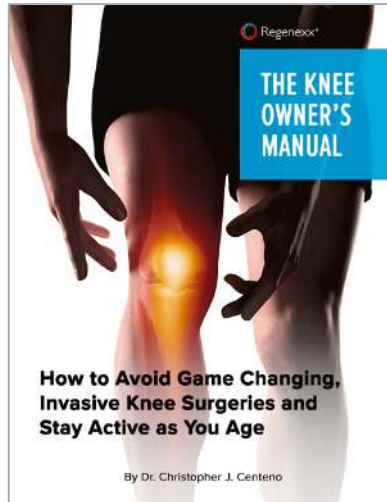
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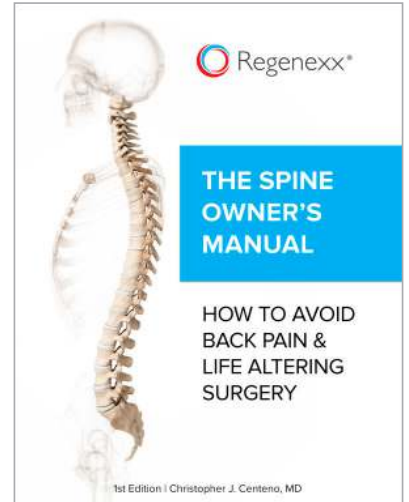
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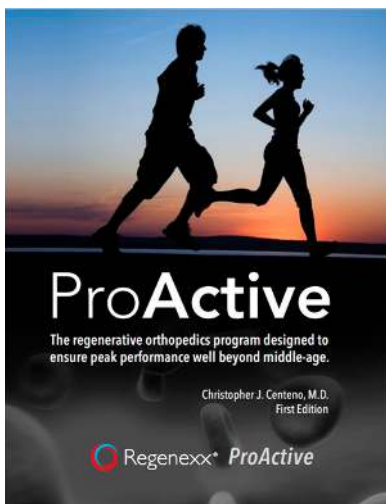
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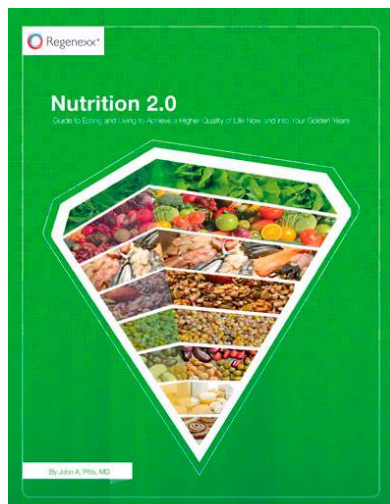
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