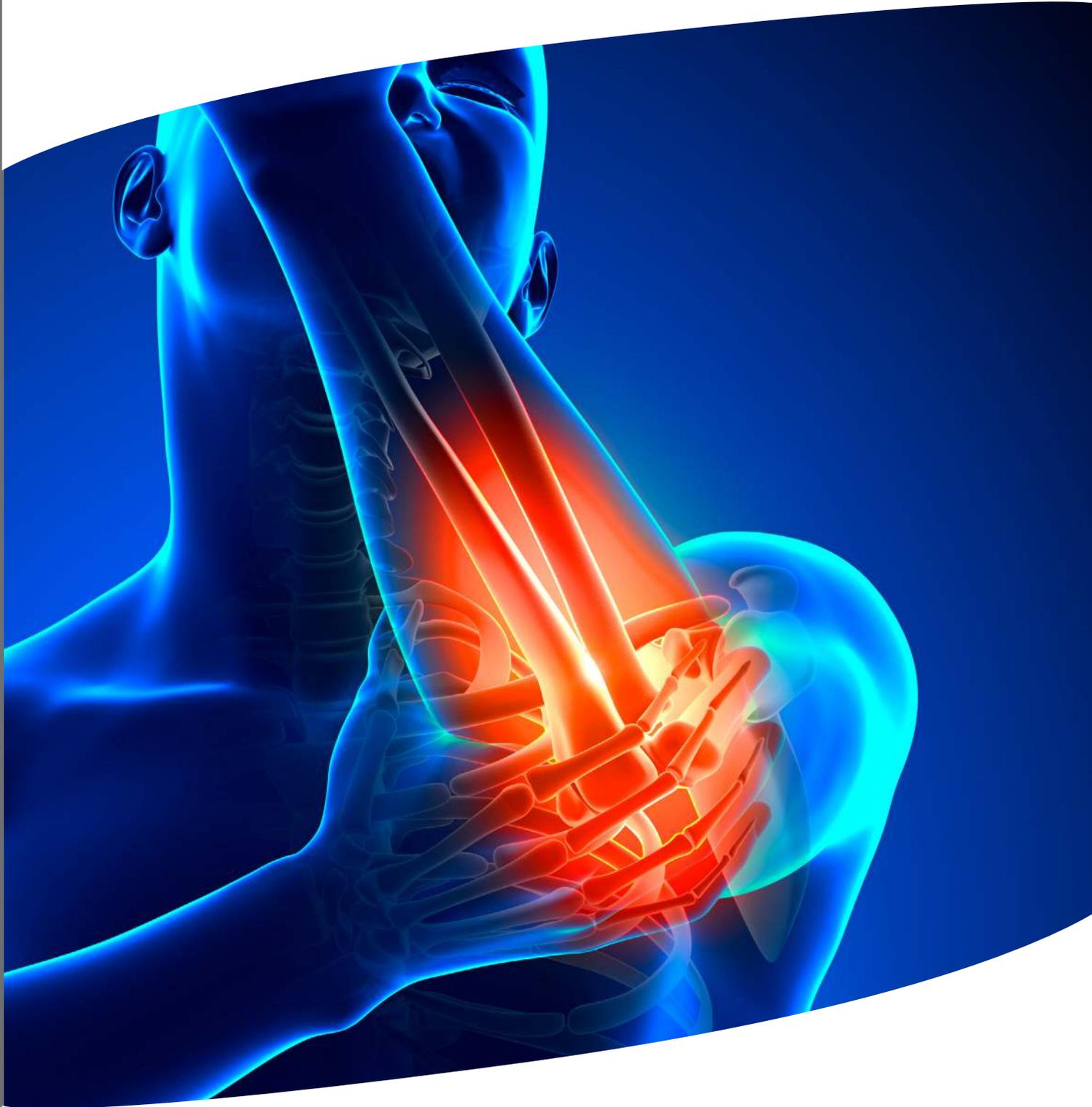


THE INTERVENTIONAL ORTHOPEDICS SOLUTION FOR
ELBOW PROBLEMS



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The elbow is a critical joint in the musculoskeletal system. It doesn't have to bear weight, like a knee or ankle does; however, think of all the things you wouldn't be able to do if you couldn't bend your arm: button your shirt, drive a car, pick up a baby, and so on. Just experiencing pain and inflammation in this important joint can make it difficult to perform daily activities.

You really can't fully understand why you have an elbow problem before you understand a little bit about how the body works as one big machine, with the whole arm being a portion of that machine with specialized parts. The elbow is controlled by spinal nerves in your cervical spine and operated by an interconnected system of tendons and ligaments, so [a problem anywhere along that kinetic chain can lead to an elbow problem](#). In interventional orthopedics, we believe that any issues at the elbow must always include an examination of the neck and shoulder as well and, based on the research, that there are very few cases where surgery would be needed for anything but the most severe elbow injuries.

Problems that can occur in the elbow include arthritis and instability and overuse conditions, such as tennis elbow (lateral epicondylitis), golfer's elbow (medial epicondylitis), and Tommy John injury. In this report, we're going to define some of these and the traditional and [interventional orthopedics solutions to elbow problems](#). First, let's look at how the elbow works.

How Does the Elbow Work?

The elbow is a hinge joint made up of the distal end of the humerus (upper-arm) bone and the proximal ends of the radius and ulna (lower-arm) bones. Cartilage covers the ends of the bones at the joint and absorbs shock and provides smooth movement. Ligaments, tendons, and muscles form the supporting structures of the elbow joint. Movement of the elbow is similar to the knee joint in that it only allows for flexion and extension.

The functionality of the elbow relies heavily on the proper function of the ligaments and muscles, and problems with these structures can cause problems with the elbow joint. Ligaments connect bone to bone while tendons connect muscle to bone, and both provide precise tension for proper movement. There are three primary elbow-supporting ligaments: medial collateral, lateral collateral, and annular. Tendons include the biceps and triceps tendons. The arm muscles responsible for elbow support and movement include the biceps brachii, triceps brachii, brachialis, and pronator teres.

The design and function of the elbow, or any joint, makes precise replication of its biomechanics unlikely, and success rates for surgical attempts to do so are low. Unfortunately, the supporting structures, such as the ligaments and muscles are often ignored in traditional elbow treatments despite the fact that they are key players in elbow functionality.

In addition, the elbow can be affected due to a problem in the cervical spine (neck area). The spinal nerves that supply the elbow branch off the cervical spine and travel down to the elbows and even beyond, to the wrists and hands. A cervical disc bulge, stenosis, or other spinal problem could cause problems in the elbow. Even a pinched disc in the shoulder can refer pain down to the elbow as the shoulder lies within the kinetic chain that connects the spine all the way down to the hand. 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 an elbow problem just because your neck feels fine.

Tennis Elbow (Lateral Epicondylitis)

The medical term for tennis elbow is lateral epicondylitis. The problem with this term is that it suggests swelling around the epicondyle, which is the bony bump you can feel on the outside of the elbow where many forearm muscles attach at their tendons. Numerous studies show that there's really very little inflammation and that the problem is caused by the tendon becoming degenerated and torn. So a more accurate term would be epicondylopathy.

Patients have a hard time using these forearm muscles in severe cases of tennis elbow, so much so that even opening a door or shaking someone's hand can be very painful. Most physicians consider the issue to be due to overuse, but we really don't see that very much outside of occupational settings where someone is performing a repetitive motion thousands of times a day (like a factory-line worker). More commonly, we see middle-aged people who have suddenly developed the issue. Why?

One of the more common things we see as a cause of tennis elbow is low-level nerve irritation in the neck. This is because the nerves in the neck power the muscles that attach at the outside of your elbow. When the signals aren't getting through, the muscles in your forearm don't work properly and then they begin to yank too much at their attachment to the outside elbow bone. This leads to tennis elbow. What if you don't really have a lot of neck issues? Take note, because your first warning sign that the neck nerves are being irritated or pinched may well be your tennis elbow. This sometimes means that the neck will need to be treated concurrently with the elbow.

Despite this the [big-surgery approach for tennis elbow](#) would likely be a tenotomy, which is cutting the tendon or scoring it with multiple cuts (fenestrations), or debridement, which is "cleaning up" the area by removing degenerated tissue. The problem with this is that the surgeries are invasive, can have lengthy recuperation times, and the elbow never quite functions like it did before. Surgery rates for tennis elbow have been plummeting for years due to new treatments that are much less invasive and much better studied as being effective.

In interventional orthopedics, [we don't believe in invasive surgery for a tennis elbow when a noninvasive procedure, such as a precise ultrasound-guided PRP injection](#), can do the

job. We've never met a tennis-elbow patient who couldn't be successfully treated with either PRP or, in the very rare case that PRP isn't effective, stem cell injections.

Golfer's Elbow (Medial Epicondylitis)

While tennis elbow is an injury to the lateral epicondyle on the outside of the elbow, golfer's elbow is an injury to the medial epicondyle that stresses the tendons on the inside of the elbow. The medial epicondyle is the bony bump you can feel on the inside of the elbow. The medical terminology for golfer's elbow is medial epicondylitis. It's traditionally caused by repeated flexing or bending at the wrist in a certain way, such as how a golfer's motion while holding his or her club or how a football player throws the ball. It's also associated with occupational overuse similar to what we'd see with tennis elbow. However, it, too, can be caused by nerve issues generated in the upper spine.

Despite this the big-surgery approach for golfer's elbow would be an epicondylectomy, which actually involves removing the medial epicondyle to release the pressure on the ulnar nerve. The problem with this is that the surgery is not only highly invasive—once you've removed a piece of bone, you can't put it back—but as mentioned before, oftentimes the nerve issue stems from the spine, not the elbow itself.

In interventional orthopedics, we don't believe in [invasive surgery for a golfer's elbow when a noninvasive procedure, such as a precise image-guided injection of advanced orthobiologics](#) (e.g. PRP, stem cells, etc.), can do the job. Additionally, we understand that since patients with chronic elbow issues frequently have irritated nerves in the neck area of the spine, this area may need to be treated with orthobiologics as well to fully address the issue. We don't focus just where the pain is, but we look at the whole body to see if a problem elsewhere could be the source or a contributing factor.

Ulnar Nerve Entrapment (Cubital Tunnel Syndrome)

The ulnar nerve branches off the upper spine and stretches all the way down past the elbow to the wrist and hand. While you may not know this nerve by name, you're likely quite familiar with it by touch. When you hit or bump the elbow and those pin- and needle-like shocks shoot up your arm, this is your ulnar nerve reacting.

This ulnar nerve can become irritated or entrapped at any point along its journey, but when the nerve entrapment occurs at the inside of the elbow, this is called cubital tunnel syndrome. An entrapment is really a compression of the nerve. Think of a garden hose with water flowing through it. When you step on it, it compresses the hose and lessens the flow of water. A nerve is a similar thing in that it transports nutrients down its length and when it's entrapped and scarred, less nutrients make their way down the nerve. Since the nerve tunnels beneath the medial epicondyle, ulnar entrapment can also occur in conjunction with golfer's elbow. It's important to treat all areas of irritation to fully address the ulnar nerve entrapment.

When conservative treatments fail, the big surgery approach is to release the pressure on the nerve by cutting and dividing the tunnel it travels through beneath the medial epicondyle. In addition, a medial epicondylectomy (excising part of the epicondyle bone, discussed under “Golfer’s Elbow” above) may also be done to clear out additional space for the nerve. Finally, a ulnar nerve transposition is another surgical option. This big surgery actually repositions the nerve out of its groove behind the medial epicondyle to a new location in front of it. As you can imagine, any of these surgeries will require weeks of recovery time, and because they change the natural structure and function of the elbow, they can damage the nerve and create more problems than they solve.

In interventional orthopedics, we don’t recommend elbow surgery for nerve entrapment in anything but the absolute most severe elbow injuries. [After many years of treating patients with nerve injuries and entrapment, we’ve seen great success with nerve regeneration treatments.](#) Ulnar nerve entrapment can usually be effectively addressed without invasive surgery, and without changing the natural anatomy of the elbow, by using an [injection-based ulnar nerve hydrodissection, where the entrapped nerve is treated and freed up by dissecting away the scar tissue with fluid](#) (injections include orthobiologics using the patient’s own growth factors, platelets, or stem cells). Hydrodissection is like releasing that pressure on the garden hose. In addition, if the source of the problem is stemming from the upper spine, we can address this area with orthobiologics as well to treat the whole patient, not just the elbow. Recovery time is minimal as it is all done under ultrasound guidance through a needle.

Tommy John Injury (Ulnar Collateral Ligament Injury)

A Tommy John injury (aka pitcher’s injury) is an injured ulnar collateral ligament (UCL). The UCL is the “duct tape” that holds the inside of the elbow stable. When you throw, you place force on this ligament as you whip the ball, so this injury is common in throwing athletes, such as baseball players. The injury that leads to a surgical reconstruction of the ligament is a partial or complete tear. [Research has actually shown that the ulnar collateral ligament gets injured more often when there’s poor range of motion at the shoulder.](#) So the first way to deal with the injury in the elbow is to look at what’s not happening in the shoulder.

Tommy John surgery is a major surgical reconstruction of a torn ulnar collateral ligament (UCL). It’s a very invasive procedure that involves drilling holes in the elbow and stringing a hamstrings tendon to take the place of the ligament? [Recovery and rehab time can last weeks to months, no high-level research shows that Tommy John surgery is effective or any better than doing nothing, and pitchers who get this surgery have a decrease in performance.](#) Why? Because the reconstructed ligament will never have the normal biomechanics of the original equipment, and since the injury often stems from a problem in the shoulder, having surgery on the elbow doesn’t address the real problem.

[In interventional orthopedics, we treat Tommy John injuries with orthobiologics, such as platelet rich plasma](#), which can stimulate healing through the release of growth factors, or stem cells for bigger or more severe tears. We've had good success with using [PRP to treat UCL injuries](#), however, all PRP isn't created equal, so it's important to find the right provider. The key is to find a provider using precise ultrasound-guided injections, not one using a blind injection somewhere in the vicinity of the UCL.

Steroids, NSAIDs, and Other Drugs Not Recommended

[Before they consider surgery, patients with tennis elbow are commonly sent to physical therapy or given a prescription of NSAIDs like Motrin, Mobic, or Celebrex. When this doesn't work, a steroid shot is usually offered](#), but there are some good reasons [you should skip steroid treatment for tennis elbow and other elbow conditions](#). While a [steroid shot is a potent anti-inflammatory, it can kill off healthy tendon cells, making the tendon weaker in the long run](#). Studies have also shown that while it can help for a few months, the pain will come back stronger than before the shot after it wears off.

Other treatments you will likely be presented with in the traditional orthopedics model for elbow 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 elbow surgeries often come with big problems, lengthy recovery times and the feeling that the elbow just isn't quite the same. Rearranging the biomechanics of the elbow with invasive surgery is rarely a good 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 elbow 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 elbow or both, 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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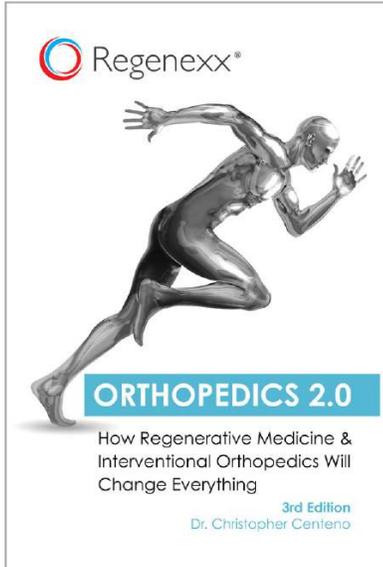
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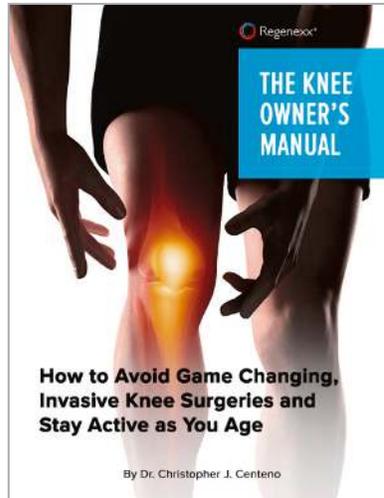


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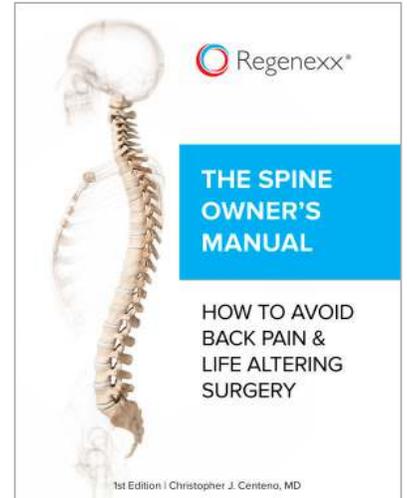
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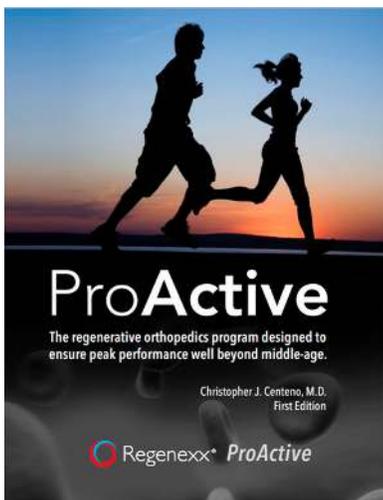
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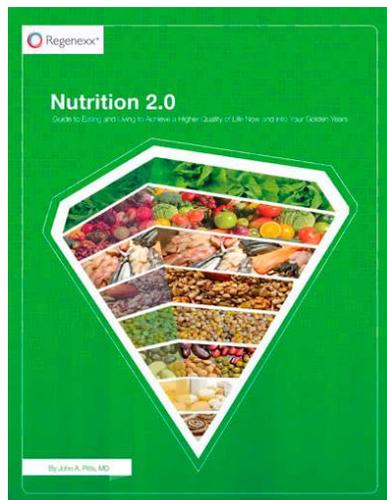
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