

Active Bones

Orthopaedic Surgery and Sports Medicine
Teaching and Research Foundation Newsletter



otrfund.org

Spring / Summer 2023

Dear Readers:

As you pass by your neighborhood parks this spring, don't be surprised to see every tennis court busy. But chances are the games being played aren't tennis, but rather pickleball. With more than 4.8 million participants in the United States, pickleball is the fastest growing sport in the world. As a sports medicine physician, I am delighted to learn about its popularity but concerned because the rapid expansion is outpacing information about potential injuries and measures to take to avoid them. Therefore, in this issue on page four, you'll find an overview of the game along with a way to obtain a warm-up and exercise program developed by my foundation, the Orthopaedic Surgery & Sports Medicine Teaching & Research Foundation (OTRF), so picklers can enjoy a summer of fun with family and friends rather than be an observer or worse, become a patient.

We didn't forget about another of our favorite pastimes—baseball. On page two, you'll find an article focusing on a thrower's worst nightmare—a torn ulnar collateral ligament (UCL)—better known as the reason for Tommy John surgery. However, in this story, I share the surgical technique I developed that doesn't drill large holes in the bones but rather, attaches the ligaments directly back to the bone. It's a less invasive approach that avoids drilling large bone tunnels associated with the traditional surgery.

On page eight, there are two examples of how one size doesn't fit all. In this article we look at two young athletes who might not have been able to return to play sports, let alone receive scholarships, had their injuries been treated with the orthopaedic standard of care. I'm grateful that my innovative surgeries gave them the chance to return to a normal life with opportunities to participate in collegiate athletics.

Thank you for reading **Active Bones**.

Steven Chudik, MD
President OTRF
Orthopaedic Surgeon and Sports Medicine Physician



Dr. Steven Chudik develops tunnelless UCL surgery to spare bone, maintain native alignment

Ulnar collateral ligament sprains are tears of the ligament on the inner side of the elbow. The ulnar collateral ligament (UCL) is a structure that helps maintain the normal relationship of the humerus (upper arm bone) and the ulna (one of the forearm bones). This ligament can be injured in throwing activities or after elbow dislocations. It could happen as a sudden tear or gradually stretch with time and repetitive stress. This ligament is rarely injured in daily activities.



In the late cocking and early acceleration phases of an overhand pitch, the medial elbow endures as much as 64 Nm valgus, with the elbow in 90 to 100 degrees of flexion where the UCL is the most critical stabilizer.

For throwers, the UCL is the most vulnerable to injury during the late cocking and early acceleration phases of an overhand pitch because the medial elbow endures most of the force, as much as 64 Nm valgus, with the elbow in 90 to 100 degrees of flexion where the UCL is the most critical stabilizer. According to researchers, the mean maximum load to failure for a native UCL is 34.29 Nm and for a reconstructed UCL 30.55 Nm in the late cocking stage—or enough stress with every pitch in the late cocking phase to cause a UCL tear. Other sports with overhead motions, such as throwing a football, hitting a volleyball or tennis serve do not have the same mechanics and don't cause the same injuries as a baseball pitch.

The UCL can be torn after a single throw or stretched out over time from chronic overloading. When torn, the UCL usually does not heal or may heal in a lengthened position (loose). Surgery usually is indicated for people who wish

to return to throwing and are having persistent pain and symptoms with a torn or incompetent UCL tear and have failed nonoperative options. Researchers report player return to sport rates with nonoperative treatments are less than 42 percent compared to 97 percent with only a 6.7 percent failure rate when surgery was performed.

The initial reconstruction of the UCL in athletes was reported in the *Journal of Bone and Joint Surgery* in 1986. It involved lifting the flexor muscles and drilling two holes in the ulna and three holes in the medial epicondyle to recreate the attachment point of the native UCL. The surgeon then passed a donor tendon making a figure eight and attached the two ends together. With this technique, more than 60 percent of elite throwing athletes returned to sport at their preinjury level. Since the creation of this initial technique, it has undergone many modifications. The main technique difference involves the treatment of the ulnar nerve, graft configuration and how the graft is attached. No studies have shown a clear benefit of one technique over another. All techniques involve drilling tunnels in the bones to fix the UCL graft in place.

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UCL Surgery

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Dr. Chudik performs this surgery through one main limited incision on the inside of the elbow. Depending on the case, he also may arthroscopically inspect the elbow joint using a small camera. Typically, the original ligament is stretched out or torn and not repairable, so a tendon graft is needed to reconstruct the UCL. There are some patients that may benefit from a repair. For the reconstruction, a tendon usually is taken from the forearm or the knee through a small incision to make a new UCL. The primary difference with Dr. Chudik's surgical procedure is he does not drill large holes in the ulna (forearm bone) and the humerus (upper arm bone) to attach the new ligament graft.



MRI image of right elbow UCL tear

Instead, Dr. Chudik developed a technique that avoids drilling large holes/tunnels into the bone. He reattaches the UCL graft to the surface of the bone, restoring the correct anatomic position of the UCL and avoids the risk of fracture to the bone because of the bone tunnels. Return to sport with his procedure is excellent.

According to Dr. Chudik, using his technique keeps the bone strong and better able to endure the forces placed on the elbow when a thrower returns to sport. Return to sport for either procedure is the same. Heavy lifting requires a minimum of four to six months and overhead throwing and hitting sports requires nine months to one year recovery that includes completing a throwing program in addition to physical therapy.

One growing concern for orthopaedic surgeons is the increase in the number of high school pitchers with UCL injuries. Researchers noted one surgeon had an 11-fold increase in UCL reconstruction performed on high school pitchers between 1988 and 2003. Also, "there is a common myth that throwers' elbows are stronger after having a UCL reconstruction than they were prior to injury," Dr. Chudik said. "This is not true. Literature shows pitchers can return to their sport, but may not always achieve the same velocity and force with throwing after the injury and surgery. Prevention of an injury is always better," he added. "

Recovery time for nonoperative and operative treatment is significant with a gradual return to throwing. Nonoperative treatment requires a lengthy amount of rest, physical therapy and both rehabilitation protocols are dependent upon the player position. According to Dr. Chudik, heavy lifting requires a minimum of four to six month's recovery after surgery and overhead throwing and hitting sports require nine months to one year recovery time.

Pickleball participation explodes while injury knowledge, prevention lag behind

What do talk show host Stephen Colbert, quarterback greats Tom Brad and Drew Breese, NBA all-time scoring sensation Lebron James and millions of people in the United States have in common?

If you answer anything other than pickleball, you're wrong.

According to the Sports & Fitness Industry Association (SFIA), in 2017 there were more than 2.8 million pickleball players in the U.S. Last year, *Statistica* reported 4.8 million players hit the courts making it the fastest growing sport in the country. By comparison,



there are approximately 22 million tennis players and 250,000 tennis courts, but only about 30,000 pickleball courts. The good thing for pickleball players, though, is they can play on tennis courts.

Like tennis, pickleball can be played indoors or out, but that is about where the similarity ends. A pickleball court is much smaller than a tennis court, 20 feet wide by 44 feet deep compared to 36 feet wide and 78 feet deep. The net for pickleball is also two inches shorter at the center at 34 inches compared to 36 inches for tennis.

The premise that pickleball is similar to other racquet sports also was assumed when it came to injuries. However, researchers didn't find any cases or reviews and only one editorial which caused them concern. "Medical providers need to be aware of possible injuries especially for a sport growing so quickly and involving "picklers" of all ages and skills, especially in masters athletes and older adults.

According to Dr. Steven Chudik, orthopaedic surgeon and sports medicine specialist, the key is for anyone experiencing pain, swelling and loss of movement is to have a prompt and immediate evaluation by a physician. "That's not to say injuries in pickleball and tennis can't be similar," Dr. Chudik said.

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Pickleball

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Dr. Chudik provided examples of injuries that could be similar such as sprains/strains of the lower and upper extremities and possibly some torso and lower back muscle strains. But since pickleball is played more underhand than tennis, shoulder injuries are a lesser concern than falls on an out-stretched hand or arm. “That doesn’t mean pickleball is safer than tennis or without injuries,” he cautioned.

“I also would expect to see ankle sprains, calf strains or Achilles tendon ruptures, wrist and finger fractures, and acute knee injuries involving the meniscus and ligaments,” Dr. Chudik explained. “Treatment of these injuries can range from rest, icing, compression and elevation (RICE) to non-weight bearing, bracing, physical therapy or possibly surgery depending upon the severity,” he added.

According to Dr. Chudik, other potential injuries worth noting include hamstring, quadriceps, hip flexor adductor and calf muscle strains.

Based on his more than 20 years treating athletes of all abilities and ages, Dr. Chudik recommends pickleball players make sure to warm up thoroughly before playing. This includes upper body, lower body and full body exercises.

Dr. Chudik’s foundation, the Orthopaedic Surgery and Sports Medicine Teaching and Research Foundation (OTRF), has warm up , stretching and in-season performance and conditioning programs available as PDFs that can be downloaded from the foundation website at <https://www.otrfund.org/sports-performance-programs/>. Topics include a host of sports and activities that would benefit pickleball athletes such as ACL injury prevention, overhead racket sports, volleyball, sprint interval training, and more.

Oh, and what about Colbert, Brady, Brees and James? Brady, Brees and James have ownership stakes in professional pickleball teams to reportedly increase awareness of the sport. Colbert and his production company collaborated with Comic Relief US to create the pickleball tournament PICKLED, broadcast on the CBS Television Network to raise money for millions of children and families experiencing homelessness.

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Research Roundup

How often should you clean personal workout equipment?

Home workout areas became popular during the pandemic and many found them to be more convenient than a fitness center. However, the fitness center has towels and disinfectant to wipe down the machines you used. But what about your home equipment?



Because sweat can harbor bacteria and fungus, wiping down your home equipment after each use is recommended, especially if you share them with others. However, beyond just a wipe-down, you need to “deep” clean your equipment at least once a month. The following recommendations are what the cleaning experts recommend.

•Barbells and dumbbells

If you wipe down after each use with a disinfecting solution of soap and water, deep cleaning is recommended twice a month. Brush the bar to remove dirt and grit. Put some three-in-one oil on a rag and wipe the bar and the weights. Leave overnight. Wipe down the next morning. This is important to keep the metal from rusting.

•Treadmills

Wipe the exterior after each use. Once a month you need to clean the motor area. Check your owner’s manual for specific instructions. No manual? Before starting, unplug the machine, release the hook on the treadmill motor and vacuum around it thoroughly. A dry cloth also can be used.

•Kettlebells

Wipe your kettlebells after each use with a microfiber cloth and clean twice a week with warm soapy water and dry. Deep clean with disinfectant spray once a week, particularly the handles.

•Stationary bike

Wipe sweat and oil off your bike after every use with a cloth. Once a week disinfect the machine with a soap and water mixture of one part soap to nine parts warm water in a spray bottle. Spray and wipe dry any parts of the bike you touch.

•Yoga and gym mats

After each use, wipe with soap and water or a mat cleaner. Once a month, deep clean. Check the manufacturer’s instructions. Often these can be cleaned in your washing machine.

Pickleball

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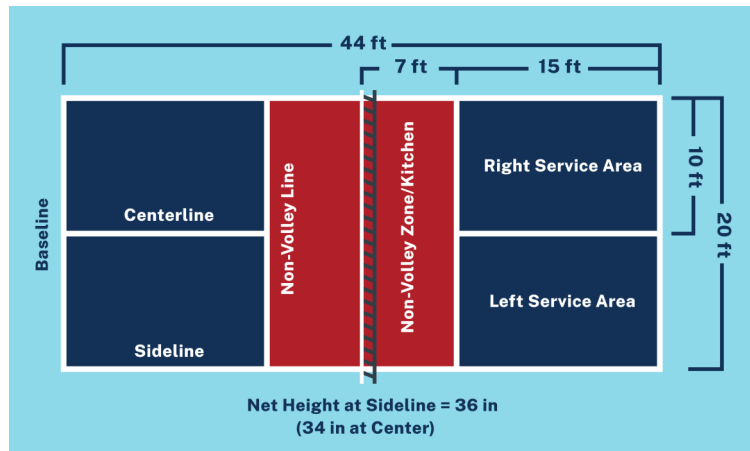
Looking for a fun sport? Become a “Pickler”

The origination of Pickleball was developed in 1965 by Joel Pritchard, a former Washington state congressman and his friends who set out to play badminton but unable to find all the necessary pieces so they improvised. Instead of strung rackets they used wooden ping-pong paddles and a plastic perforated ball to limit flight, and the badminton net adjusted to roughly the height of a tennis court net. After some experimentation, the group developed a sport the entire could enjoy together. Two years later the first permanent court was built next door to Prichard’s home and a couple of years later a corporation was created to protect the sport.

However, the greatest debate since the sport was created is the origin of the name—Pickleball. One story attributes it to Pritchard’s wife who thought various elements of the game reminded her of pickle boat crews where oarsmen were chosen from leftover crews on other boats. Another account is that it came from Pritchard’s dog named Pickles who would retrieve wayward balls upon the command, “ball.”

The game rules and standards also evolved. The court is smaller than a tennis court and includes a seven foot “no-volley zone” next to the net on both sides. The racket is constructed of wood or composite material that is larger than a ping-pong paddle and smaller than a tennis racket. The game can be played by teams comprised of singles or doubles who start by serving a perforated hard plastic ball underhand. The opponent has to return the ball within court bounds and outside the no volley zone. When the ball bounces once on each side, volley play ensues. Only the serving team can score. The game typically plays to 11, 15 or 21 points with the winning side required to win by two points or more.

Like many other sports, pickleball can be played in driveways, as well as a sanctioned scholastic sport and in amateur and professional tournaments across the country. The 2022 professional pickleball league winner took home an event purse of \$319,000.

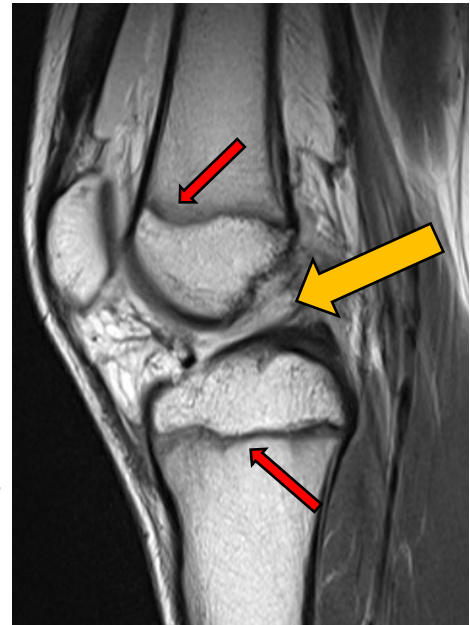


Here’s all you need to DIY your own court in your yard or drive. What are you waiting for? Get some exercise and fresh air. Get Pickling!

Novel surgery procedures by Dr. Steven Chudik let young athletes realize their dreams

It is not unusual for young children involved in sports to dream of becoming a professional athlete when they grow up. Despite the low odds of becoming a professional athlete, sports participation provides children many benefits such as staying active, being part of a team, learning to follow rules and being a good sport—win or lose—and most important, having fun.

One negative to playing sports is the potential for injuries. They happen at every age and in every sport. In his 20 years as an orthopaedic surgeon and sports medicine specialist, Dr. Steven Chudik with the Shoulder, Knee and Sports Medicine Injury Clinic, has treated thousands of injuries—minor and serious, common and uncommon—and each with its own unique need. As Dr. Chudik explains, every person is different which makes every injury different. In his quest to provide the best treatment for his patients Dr. Chudik has developed new instruments, surgical procedures, post-surgery rehabilitation and return-to-sport testing protocols. He has authored countless research papers and seven US patents.



MRI showing a torn ACL indicated by the gold arrow on a patient with open growth plates (red arrows).



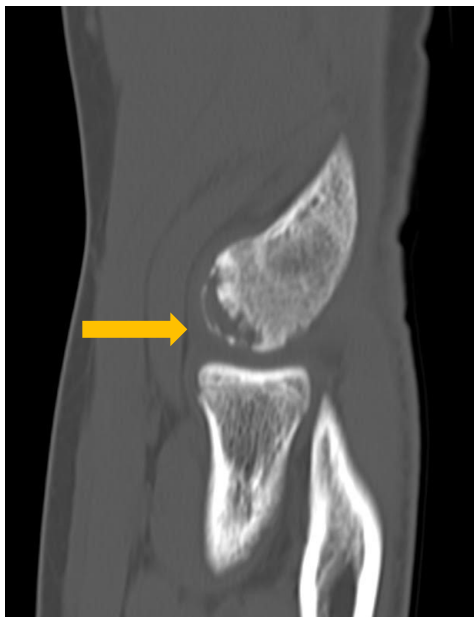
“Just because it’s a common injury, like an anterior cruciate ligament (ACL) tear, doesn’t mean it should be treated just one way,” Dr. Chudik said. “Take an adolescent with an ACL tear and open growth plates, for example. Many used to tell the child his/her sports participation was over until the growth plates close because traditional surgical techniques for a torn ACL damages the growth plates and risk growth abnormalities,” he added.

Fortunately, Dr. Chudik developed a special surgical procedure that preserves the growth plates and reconstructs the ACL allowing numerous young children to resume normal activities, including sports. Many of his patients have gone on to become collegiate and professional athletes. View the video on YouTube at www.youtube.com/watch?v=XNGQ7AflEr0/ of the physeal-sparing surgery performed on a very active ten-year-old who earned a black belt in martial arts and played varsity baseball through the years after his ACL surgery.

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Special procedures

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CT-scan reveals an OCD of the capitellum of the elbow with bone loss and just a thin shell of bone remaining to support the cartilage joint surface.

Another example of Dr. Chudik not settling for the standard treatment involved a young baseball player who developed a condition known as osteochondritis dissecans (OCD) in his elbow. OCD most often occurs in knees but also is seen in the elbow and associated with throwing sports. It is a localized injury or condition causing the bone just below the cartilage surface of a joint to fail and fracture resulting in bone fragments and cartilage to break loose. The fragments can catch in the joint causing progressively worsening pain, locking, clicking and even leave a hole in the joint surface.

The young baseball player was unaware an OCD had been developing in his elbow until he was in high school when the pain became excruciating and even made a cracking noise preventing him from throwing.

Having previously had X-rays, a Computed Tomography (CT scan) was ordered and the family met with an orthopaedist from a highly regarded university-affiliated practice. Surprisingly, neither the orthopaedist nor his colleagues knew what to do for the problem because the OCD injury was so large. They offered surgery to “just clean up the injured bone and cartilage” that would result in a larger hole in the bone and possibly the end of playing baseball.

Quitting baseball was not an option at that point. As the parents shared the disappointing results of the orthopedist’s appointment, a friend recommended they contact Dr. Steven Chudik at Hinsdale Orthopaedics, a division of Illinois Bone and Joint Institute.

Upon review of magnetic resonance imaging (MRI), CT scan and an examination of the elbow, Dr. Chudik explained the young thrower had an OCD which was not common, and understanding the patient’s goal, he suggested a new surgical procedure he developed to treat OCD in the knee that could be adapted to the elbow.

“This patient had a condition I normally see in young, active children. It most commonly occurs in the knees, but does occur in the elbows of young throwers or gymnasts who place a lot of

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Special procedures

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repetitive force across that joint” Dr. Chudik explained. “However, this OCD lesion was more advanced and the bone had resorbed leaving the overlying cartilage unsupported and at risk to fail. Surgery was needed to restore the supporting bone while preserving overlying cartilage,” he added.

Similar to his dissatisfaction with the standard treatment for ACL injuries in adolescents, Dr. Chudik found the need to develop a procedure to treat OCD lesions in his young patients. His pioneering OCD procedure involves carefully tunneling to the affected area to rebuild the bone behind the cartilage so it can support the cartilage and preserve the joint.

“Fortunately, I saw the patient when I did because during surgery, I discovered the cartilage joint surface was starting to break free,” Dr. Chudik detailed. “I completed the procedure as planned, carefully tunnelling to and bone grafting the injured bone without disturbing the cartilage surface,” he explained.

According to Dr. Chudik, his procedure requires the elbow to rest for an extended period of time so it heals completely before starting a slow and gradually progressive strengthening protocol. After restoration of normal strength, Dr. Chudik has the player complete a throwing program before returning to play.

Overuse that goes along with being a competitive athlete can result in potential career-ending injuries which can have a long-term negative impact on joints. It is important for athletes not to play through pain and seek early medical care. Fortunately for this young patient, he was able to return to baseball. He currently is trying to decide whether to accept a Division I scholarship to play college baseball, or directly enter the professional baseball draft.

To learn more about the many other special procedures Dr. Chudik’s developed, visit his website, [stevenchudikmd.com/](http://www.stevenchudikmd.com/). To make an appointment with Dr. Chudik, you can schedule online at <https://www.stevenchudikmd.com/schedule-online/>, or email [contactus@chudikmd.com/](mailto:contactus@chudikmd.com).



Orthopaedic Surgery and Sports Medicine Teaching and Research Foundation (OTRF) helps people stay fit, healthy

Dr. Steven Chudik, orthopaedic surgeon and sports medicine physician with the Steven Chudik Shoulder, Knee and Sports Medicine Injury Clinic, founded the Orthopaedic Surgery & Sports Medicine Teaching & Research Foundation (OTRF) in 2007. OTRF is a nonprofit, 501 (c)(3) organization dedicated to funding research and education for the purpose of keeping people active and healthy.

Dr. Chudik has seen a growing demand by patients, athletic trainers and clinicians for up-to-date medical information and unbiased research on injury prevention—especially for children—as well as facts on arthritis and wear and tear on joints, cartilage, tendons, ligaments, etc. To fulfill these requests, OTRF produces and distributes this e-newsletter, shares information about health performance-related issues like nutrition and fitness, hosts athletic training educational programs, conducts seminars for healthcare providers and the community and most important, funds unbiased research and development particularly in emerging areas such as arthroscopic and minimally invasive surgery for injuries to the meniscus, labrum, rotator cuff, anterior cruciate ligament (ACL) and cartilage.

However, none of this is possible without ongoing financial support. We are extremely grateful to all those who have contributed in the past. Many of the donations came from patients or their family members who benefited from Dr. Chudik's orthopaedic and sports medicine expertise. If you might be interested in helping us continue our research, please visit the OTRF website, otrfund.org /, and click on the donation link. Or, if you prefer, you can email me at contactus@chudikmd.com/. Also, many companies sponsor programs that match charitable contributions made by their employees. Some even match donations made by retirees and/or spouses. Matching gift programs are a great way to double your generosity. Regardless of the amount, every contribution helps make a difference.

Thank you for your interest in our newsletter, **Active Bones**, and the ongoing work of OTRF.

Steven C. Chudik, MD



OTRF Founder and President

Orthopaedic Surgeon and Sports Medicine Physician



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