

Active Bones

Orthopaedic Surgery and Sports Medicine
Teaching and Research Foundation Newsletter



otrfund.org

Fall 2017

Dear Reader:

Fall is my favorite time of year. Mother Nature gives us a parting gift of trees aglow in brilliant yellows, reds and oranges, cooler temperatures that make outdoor activities more enjoyable and the return of football, soccer and cross country. As a team physician, I see my share of injuries. Some are severe and need surgery. Others are minor and just need rest and ice. There are injury prevention measures worth noting as a reminder to coaches, parents and athletes. Of course, the one that comes to mind first is concussions. This is a growing concern. Rules to help reduce the likelihood of concussions, as well as the diagnosis and time before athletes should return to play, continue to change and evolve to make sports like football and soccer safer. This newsletter is not the right forum for an in-depth look at all that is being done and needs to be done to prevent concussions. However, it does give me the opportunity to remind everyone that when in doubt, keep them out, and have a trained medical professional evaluate the athlete. Sitting out a game or two is worth avoiding long-term disabilities and cognitive concerns.

Dislocated shoulders are another injury I see with the return of fall and winter sports. In this issue we examine how a shoulder dislocates and the surgical and non-surgical options available that do not necessarily end an athlete's season.

Paddle and platform tennis are becoming popular because they can be played year-round. Based loosely on the game of tennis, they differ greatly, except when it comes to injuries. I hope you enjoy the article in this issue on these two emerging sports especially if you are looking for ways to expand your activities into the winter and beyond. We've also provided some recommended warm-up exercises to help prevent injuries and make the games more fun because you will be able to confidently run, jump and hit with less fear of "pulling something."

Last, but not least, is an article about a new functional capacity evaluation (FCE) I developed with the help of Kurt Gengenbacher and James Wolf. It quantitatively and qualitatively tests athletes who have had anterior cruciate ligament (ACL) reconstruction to let me know when it is safe for them to sport. This program and our preliminary outcome results were presented recently at a medical conference and received considerable interest. Through OTRF, we are continuing to evaluate and follow athletes who complete and pass the FCE. To those who have contributed to OTRF, thank you, as this is one example of how your donation is helping prevent injuries and keep people healthy and enjoying their activities.

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



Different paddle sports share similar player injuries, preventions

The assumption adage of “If it quacks like a duck.....” does not work when it comes to paddle and platform tennis. The two sports are often confused and names erroneously interchanged, but they are two different sports. Although both are derivatives of tennis, they differ greatly except for injuries.



Paddle tennis, played indoors and outdoors, is the older of the two sports and was created in 1898 as a way for children to learn tennis. Played on a tennis court one-half the size of a regulation court with a sponge-rubber ball and short-handled wooden paddle, the sport most closely follows the rules of tennis. The first paddle tennis tournament was held in New York City in 1922. Since the game’s inception, the court size has been increased twice to the current size of 20 feet wide and 50 feet long. Other

modifications made through the years include changing the rubber ball to a deadened tennis ball, shortening the net to 30 inches and eliminating the overhand serve in favor of an underhand serve. Former U.S. National Tennis Champion Bobby Riggs, best known for his match against Billie Jean King, was a paddle tennis champion before turning to tennis, but remained an involved and important promoter of paddle tennis throughout his life.

Platform tennis is a racket sport played outside year-round, usually on a raised, heated court similar in size to paddle tennis. The major difference is a 12-foot tall wire mesh fence surrounding the court so players can return a ball off the netting much like racquetball and handball. Ironically created less than 50 miles from the origins of paddle tennis in 1928, the inventors claim to have developed their sport to be played at athletic and country clubs in the suburbs of New York that also offered golf and tennis. These facilities supposedly had more serious athletes looking to stay active during the winter and the financial ability to afford the cost of building heated platforms. Historians contend the private clubs needed to find ways to slow declining membership during the Great Depression of the 1930s. Today, the sport still is played predominately at private clubs, but increasingly in public parks and recreation centers across the country. Like most sports now, there are both recreational and competitive players.

If you have an interest in learning paddle or platform tennis, or are just looking for a way to exercise during the winter months, check with your community’s park district. Many offer lessons and have courts you can reserve.

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However before heading to the court for a game of paddle or platform tennis, it is important to perform a thorough dynamic warm-up and stretching routine, especially if you're playing outside in the winter, or if you haven't exercised outdoors since it turned cold. This will help reduce the risk of muscle strains to both your upper and lower body and increase blood flow. In fact, a recent national survey found that the most common injuries in paddle and platform tennis are shin/calf (21 percent), knee (16 percent), elbow (16 percent), ankle (13 percent), and shoulder (10 percent). The overall rate of injury was relatively high, with 66 percent of the survey's greater than 1000 respondents reporting at least one injury while playing the sports. As with any new activity, though, it is always advisable to consult a physician to ensure you are medically cleared to participate.

If you do not have a regular warm-up and stretching exercise program, here is one you can use before your first serve. **Photos and descriptions of these exercises can be found on the OTRF website in the Tennis Warm-Up program at otrfund.org/sports-performance-programs/.**

Warm-Up Exercises	Sets	Time/Reps	Notes
Jumping Jacks	1	30	
Arm Circles	1	10 forward 10 backward	
Calf Stretch	2	30 seconds	
Thoracic Rotation	2	10	
Wall Slides Facing the Wall	1	15-20	
M,T,W	1	10	To increase the difficulty/intensity, use a band with more resistance
Diagonal 1 (shoulder PNF)	2	10	Light resistance band
Leg Swings	1	15 forward 15 backward	For an alternate version perform side-to-side leg swings
1 Leg Toe Touch (balance)	2	10	
Skipping	2	30 feet forward 30 feet backward	
Wrist Stretch Top of Forearm	2	30 seconds	

New ACL Functional Capacity Exam effective in determining safe return to sport

There have been many advances in anterior cruciate ligament (ACL) reconstruction surgery and rehabilitation; however, the main question of “When can I return to play” continues. Until recently, the answer has been primarily time dependent. A research review reported that out of 264 studies, 40 percent failed to provide any criteria for return to play (RTP) after surgery. Of those that utilized criteria for RTP, decision making used only 13 percent of objective responses, and only four percent used a functional test.

Re-injury rates following ACL reconstruction vary and have been stressing the significance and the importance of RTP decision making. There has been more emphasis on utilizing criteria to confirm these athletes have the appropriate strength and function before returning them to high level activities. At the forefront of this issue, Dr. Steven Chudik, orthopaedic surgeon, sports medicine physician and president and founder of the Orthopaedic Surgery & Sports Medicine Teaching & Research Foundation (OTRF), has been using a combination of subjective, foundational and functional testing in the decision making process for predicting safe RTP. Dr. Chudik has seen the need and developed his own RTP testing for patients following ACL reconstruction. The test is built in a stepwise manner and consists of three separate components (Figure 1):

- Patient self-reported outcomes
- Objective foundational measures
- Qualitative and quantitative functional measures

The patient self-report outcomes are obtained through the use of validated questionnaires that help reveal the patient’s determination of their own function and recovery objectives. Foundational measures include quantitative assessment of swelling, range of motion of the knee and strength of the muscles involved with knee function. If the patient passes the foundational portion, then he/she can proceed to perform the functional tests. Hop testing, jump landing, shuttle run and vertical jump tests are quantitatively measured while form and mechanics are qualitatively assessed simultaneously. Knowing that each individual is different, we utilize the athlete’s healthy limb as the control for many of the tests. If they fail any portion of the test, instruction is provided and

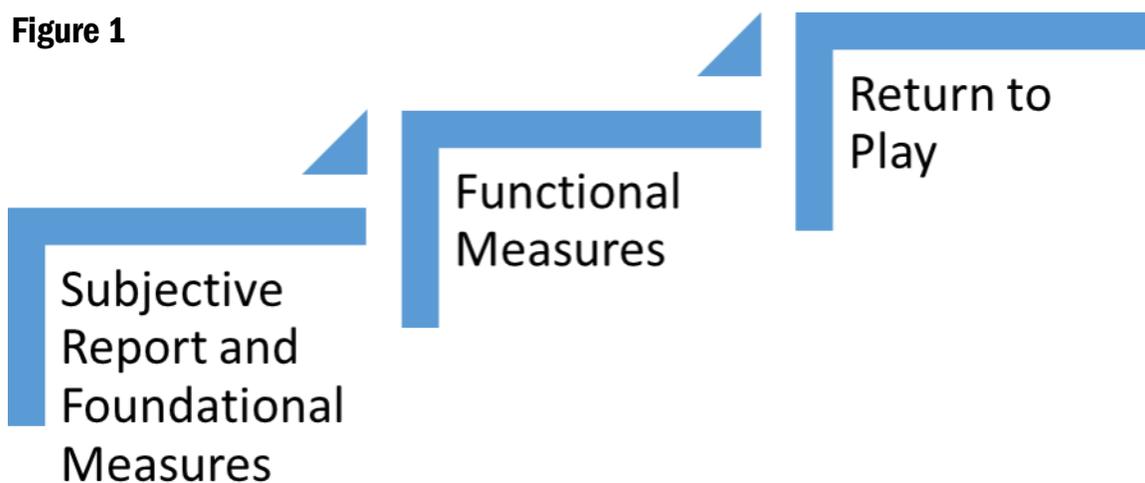


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further training is prescribed to help correct remaining deficits or errors in movement patterns, all with the goal to help the athlete pass the test and return to play safely.

One of the most unique, but critical, aspects of Dr. Chudik's ACL RTP program is that it not only measures knee function/athlete performance quantitatively, but also qualitatively. An athlete may



Step wise progression of return to play clinical decision making.

possess good knee strength and can jump high, but it is more important that he/she jump, land and cut with good form and proper mechanics. ACL literature clearly illustrates that errors in mechanics or movement patterns can increase the risk for ACL injury or re-injury. Observing how an athlete jumps, lands and cuts is much more important than how high or how fast when it comes to preventing injury.

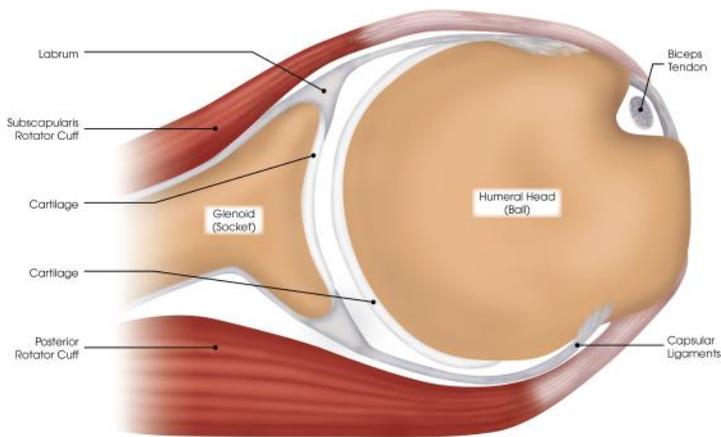
Dr. Chudik's test ensures athletes are cutting, jumping and landing properly to "pass" before he/she is released back to sport. If an athlete "fails," the test determines why and helps us incorporate future training to correct the problem.

"Our early research findings are very exciting and demonstrate that the test works as a 'pass' and equates to a decreased rate in re-injury and injury to the opposite knee after ACL reconstruction and return to play," explained Dr. Chudik

Shoulder dislocations not always a season ender

The shoulder possesses a remarkable range of motion, making it one of the most mobile and important joints in the body. Unfortunately, this increased mobility and structural complexity make it susceptible to injuries. In high school sports, more than half of the shoulder injuries are dislocations that occur when the athlete's arm is forced upward and outward behind the athlete's body, dislocating the humeral head (ball of the upper arm bone) out the front of the glenoid (shoulder socket). This injury also can tear ligaments and the labrum that help hold and stabilize the ball in socket.

When a shoulder dislocation occurs on the field, team athletic trainers and/or a team physician will examine the athlete to insure no other injuries have occurred before reducing ("popping") the shoulder back in place. This quick response from the medical team is important to



restore blood flow to the dislocated humeral head and to reduce the shoulder atraumatically (without further injury) before the shoulder muscles start to spasm and tense up. Following the reduction, early evaluation by a sports medicine physician is important to determine the extent of the injury. A physical examination, X-rays, and an MRI are performed to rule-out neurovascular (nerves and blood vessels) injuries, fractures, and ligament or rotator cuff tears.

Some fractures and tears to the rotator cuff require early surgery. Fortunately, in athletes younger than age 40, most injuries only result in tears to the ligaments and surgery can be delayed.

Signs/symptoms of an anterior dislocation may include, but are not limited to:

- Severe pain
- Loss of shoulder/arm function
- **Loss of or decreased wrist pulse. This may indicate blood vessel involvement that can cause decreased circulation to the arm and is a serious problem requiring emergent care.**
- Numbness, tingling, weakness, or paralysis of the arm
- Shoulder wanting to "fall out of place"
- Shoulder deformity noted

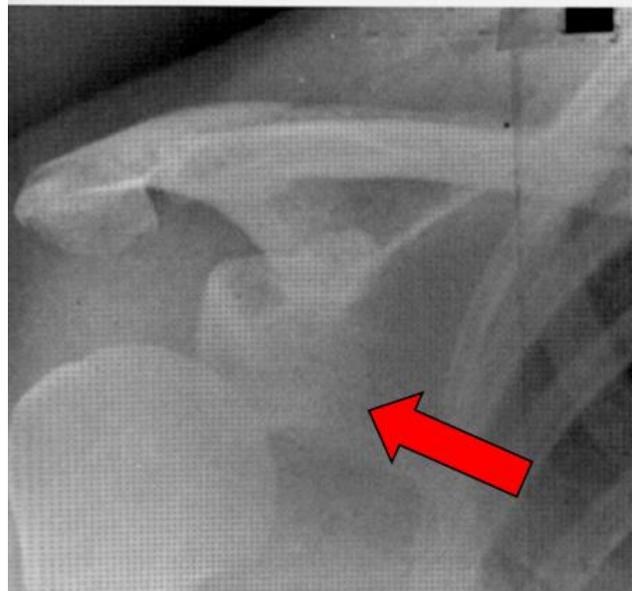
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Initially the physician will refer the athlete to a physical therapist to restore the motion, strength, proprioception (position sense) and function of the shoulder. Following several weeks in an appropriate rehabilitation program, some in-season athletes may return to play; however, most contact sports require bracing to help prevent further dislocations. Braces restrict motion and may hinder performance and preclude return to certain positions and sports (throwing arm in quarterbacks and wrestling).

Without surgery to repair (re-attach) the ligaments in the shoulder, athletes younger than age 25 have an 80 to 100 percent chance of repeat dislocation. Recent studies also suggest that early surgery to repair the ligaments may result in a better outcome as related to recurrent dislocations, development of arthritis and patient satisfaction.

The surgery can be performed with specialized arthroscopic instruments through two small, less than ½ to 1 cm incisions. Surgery is followed by six weeks of immobilization in a sling and a specific rehabilitation program with a physical therapist.



X-ray of an anterior shoulder dislocation

Physical therapy helps regain strength, mobility and normal function to the affected shoulder. Typically physical therapy includes a wide range of treatment options such as:

- Strengthening of surrounding muscle structures of affected shoulder
- Stretching tight muscles or joints
- Pain management with various modalities
- Home exercise program and education on prevention
- Manual therapy to improve joint mobility and function

Return to activities and contact sports is typically allowed after four to six months. Success rates and patient satisfaction are high, with low risks for repeat dislocation.

Shoulder dislocations are serious injuries that can result in injury to the cartilage, bone, ligaments and rotator cuff. Fortunately, if treated properly with an expert medical team of athletic trainers, physical therapists, and primary care and orthopaedic sports medicine physicians, athletes with shoulder dislocations can return to play.

Research Roundup

Weight not weak leg muscles contribute to increased OA risk for men

A study published recently in the *Annals of the Rheumatic Diseases* revealed low knee extensor strength in adolescent men does not appear to be a risk factor for developing knee osteoarthritis (OA) in middle age, according to Swedish researchers. This finding challenges currently held beliefs.



The 23-year study tracked more than 41,800 men who were required to enlist and serve in Sweden's armed forces or government at age 18. Data on isometric knee extensor strength, weight, height, smoking, alcohol consumption, parental education and adult occupation also were obtained. After excluding men without data, or those who emigrated or died before 1987, there were 40,117 men left in the study.

At enlistment, participants had a mean knee extensor strength of 324 Nm, mean body weight of 66 kg (145 lbs.) and a mean body mass index (BMI) of 21 (normal range for men is 19 to 24 and between 91 to 197 lbs.)

Approximately 14 percent were considered underweight and seven percent overweight. Less than one percent were diagnosed with OA, rheumatoid arthritis or knee meniscus/cartilage injury at their enlistment medical exam.

When the researchers reviewed the medical follow-up data taken between 22 to 25 years later, of the 40,117 participants there were 2,049 with diagnosed knee OA. After calculating adjustments, the incidence of knee OA was 1.12 for each standard deviation (SD) of knee extensor strength, and 1.18 per 5 kg of body weight. As much as 15 percent was attributable to knee injury and physically demanding occupations. The mean age at the time of the knee OA diagnosis was 53 years.

Based on their findings, the researchers concluded that higher knee extensor strength in adolescent men was associated with an increased risk of knee OA by middle age, challenging the current belief that low muscle strength was the contributing factor. They also confirmed increased (higher) body weight was a strong risk factor for knee OA.



Research Roundup

Organized sports don't provide children with enough exercise

A recent study published in the *Journal of Sports Sciences and Medicine* by Kansas State University researchers revealed children are not getting as much exercise as parents think when it comes to organized sports and activities.

The American Heart Association, the U.S. Department of Health and Human Services and the American Academy of Pediatrics recommend children age six and older get at least 60 minutes of moderate to vigorous activity every day, including



bone and muscle strengthening activities. However, researchers found that between sitting while listening to instructions, standing in line while waiting their turn and other parts of practices, only about 30 percent of practice time is actually spent in moderate to vigorous exercise.

“Some parents might think enrolling their children in organized activities or structured sports with hour-long classes or practices would fulfill this need, but our research showed they do not,” said the lead researcher. “In an hour of practice, the children are getting about a third of the physical activity they need for the day—a little bit less activity than people would expect,” she added.

The researchers also noted that although the activities are not providing as much exercise as children need, they are still beneficial because they provide structure, companionship and character building opportunities, along with some exercise.

To help ensure children get at least 60 minutes of the daily activity they need, the researchers recommended parents make sure children have at least 40 minutes outside of practice to play freely at a playground, jump on a trampoline, play catch in the yard, hula-hoop, or engage in whatever activity the child enjoys most.

Play, participate at peak performance with sport-specific OTRF programs

Through the Orthopaedic Surgery & Sports Medicine Teaching & Research Foundation (OTRF), Dr. Steven Chudik and his health performance team provide reliable and proven training information to help athletes of all ages and abilities compete and perform at their best—no matter if it is a state athletic championship, or a weekly golf outing with friends. Created as individual programs, these popular resources are research-based, and incorporate appropriate exercises into weekly training schedules to maintain conditioning and help minimize injuries.

The health performance programs are electronically distributed with the OTRF *Active Bones* e-newsletter. To automatically receive new programs, email OTRF and request to be added to the *Active Bones* mailing list. Sports performance programs previously developed by OTRF are available as PDF downloads from otrfund.org/. To download a program, click on the Sports Performance button on the home page, or email contactus@chudikmd.com for a printed version. Make sure to include your mailing address.



ACL 5



Soccer



Baseball



**Tennis
Warm-Up**



Basketball



Tennis



Football



**Traveler's
Workout**



Golf



**Ultimate
Frisbee**



**Getting out the
Cob Webs**



Youth Sports



Lacrosse

Orthopaedic Surgery and Sports Medicine Teaching and Research Foundation helps people stay fit and healthy

Dr. Steven Chudik, orthopaedic surgeon and sports medicine physician with the Steven Chudik Shoulder, Knee and Sports Medicine 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 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 our website, otrfund.org /, and click on the donation link. Or, if you prefer, 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



Sports Medicine Injury Clinic

Monday
Evenings

Call 630-324-0402
for an appointment

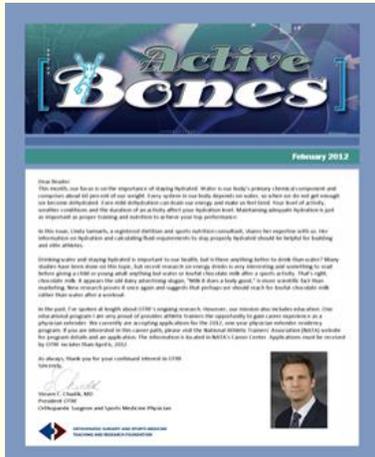
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Don't miss another issue of **Active Bones**, an email newsletter from OTRF. Each issue contains information to help you stay healthy and live an active life with tips on injury prevention, sports conditioning, research and newsmakers.

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