

Active Bones

Orthopaedic Surgery and Sports Medicine
Teaching and Research Foundation Newsletter



otrfund.org

Spring / Summer 2022

Dear Readers:

After being cooped up all winter and the past two years because of COVID, I am excited to be outside and back into my regular routine. However, I am easing into whatever I do so I don't injure, strain or sprain something. I suggest everyone warm up and stretch thoroughly before tackling the yard or the golf course and build up to walking, running and even throwing a baseball. Slow and easy will keep you in the game.

It's been six years since lacrosse became an Illinois High School Association (IHSA) sanctioned sport so we decided to look at what, if anything, changed. A lot and too much to cover in this issue so we focused on changes made to help reduce injuries. There's still more to be done but read about the safety improvements that have been made on page two.

On page three we look at a less common injury, pectoralis major tendon rupture, that is increasing in frequency among weight- and power lifters, football players and professional body builders. Additionally, I recently published research on a new procedure I developed to repair torn pec tendons. More research needs to be done, but our initial trials prove very promising.

Research Roundup explains why you should ditch sit-ups and offers new ideas on getting healthier without medication that I think you will find very interesting and satisfying.

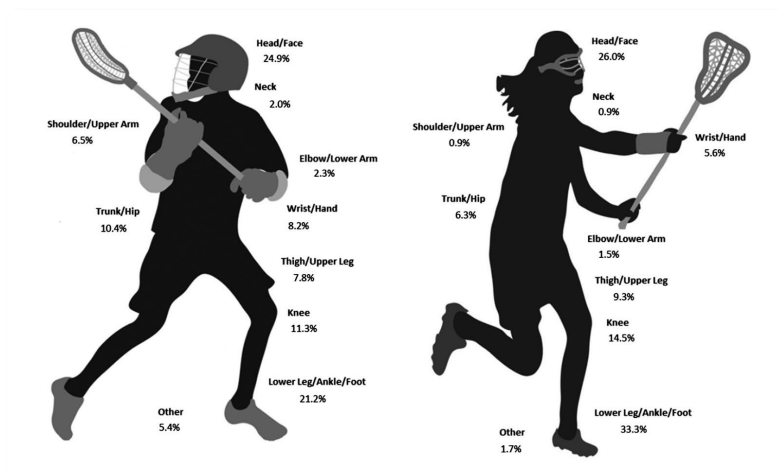
Thank you for reading **Active Bones**.

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



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Lacrosse implements rules, equipment changes to help decrease injuries



Body sites injured in boys' and girls' high school lacrosse by sex (2008 through 2012.) Source: *the American Journal of Sports Medicine*.

In 2016, lacrosse became an Illinois High School Association (IHSA) sanctioned sport. In doing so, the sport joined many other IHSA sports overseen by the National Federation of State High School Associations (NFSHS) which writes competition rules for school sports and activities, as well as for safety, equipment, playing fields/courts, uniforms, etc.

Since 2016, several rule changes were enacted for girls' and boys' lacrosse (LAX) to help reduce the number and types of injuries. For

example, in 2020, the NFSHS Rules Committee announced all protective eyewear for girls must be SEI-certified to the current ASTM lacrosse standard F3077 in order to be legal for play. Boys wear certified helmets with facemasks instead of goggles. Most recently, NFSHS updated a chest protector rule passed in 2021 that all boys' field position players—including the goalie—must wear shoulder pads/chest protector that meet the NOCSAE ND200 standard and contain a SEI certification mark to help prevent commotio cordis (fatal disruption of the heart rhythm) as a result of a ball hitting the chest directly over the heart. Although a rare occurrence, the injury is the second-most common cause of sudden cardiac death in athletes. Only the goalie in girls' lacrosse wears shoulder pads/chest protector which also must adhere to the same NOCSAE ND200 standard as the boys'.

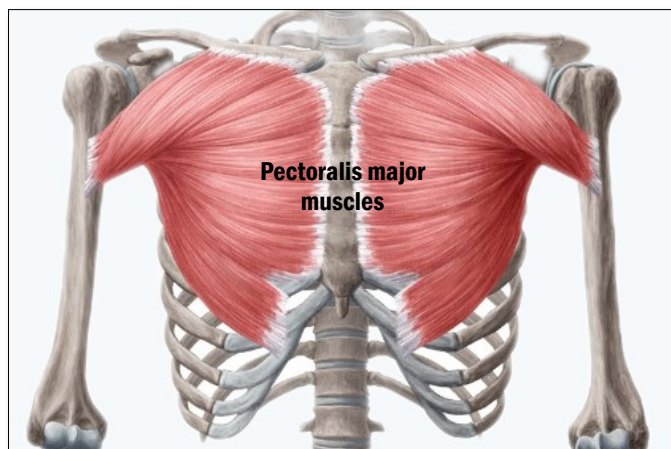
One change still under debate is whether girls' LAX should wear the same protective helmets as boys' LAX. Although similar in regard to scoring and stick use, boys' LAX is considered a full-contact sport allowing body and stick checking and mandates hard-shell helmets with full face masks. By comparison, girls' LAX prohibits body checking and stick checking to the head, but some stick checking below the shoulders is permitted because it is considered a "relatively" non-contact sport.

Despite the oversight, rule changes and equipment updates, the risk of injury for adolescent players is high. Research reports the rate of lacrosse injuries for youth players to be 1.96 per 1,000 athlete exposures for high school players and 5.4 per 1,000 athlete exposures for players in recreational leagues. According to the most recent report by *Statistica*, 113,702 boys and 99,750 girls participate in lacrosse at 3,026 high schools across the country making lacrosse one of the fastest growing sports in the United States.

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As pectoralis major tendon ruptures increase, Dr. Steven Chudik develops an alternate reconstruction technique using an iliotibial band autograft

To most people, a ruptured pectoralis major (PM) tendon isn't a familiar injury like an anterior cruciate ligament (ACL) tear, dislocated shoulder or hamstring strain so therefore it more often results in a delayed diagnosis and treatment.



There are two large PM muscles, one on each side of your breast bone that fans across the upper chest from the shoulder to the breastbone. The pectoralis muscles help control arm movement and play a part in deep breathing. Young men between the ages of 20 and 40 most often sustain a PM rupture usually during weightlifting and other bodybuilding exercises that place excessive strain on the shoulders and chest.

However, according to research and injury reports, the number of PM ruptures has risen significantly. For example, between 2000 and 2010 the National Football League (NFL) reported only 10 ruptures by the athletes. Yet, between 2010 and 2018, researchers recorded 63 ruptures. Linebackers had the highest incidence of PM tears compared with any other position. Of all injuries, 79.3 percent were sustained by defensive players. The majority of PM tears occurred during games. Only 6.9 percent of players who sustained the injury were suspended for performance-enhancing drug use during their professional career. Anabolic steroids have previously been identified by researchers as a contributor to PM ruptures. Because of the significant increase in the NFL incidence rate, the researchers called for further investigation to determine the potential causes.

Anyone suffering a PM tendon injury reports they feel a “pop” in the front of their shoulder or upper arm immediately followed by pain and weakness. Within a few hours to even days, they notice progressive swelling and bruising that masks the deformity around the chest and armpit caused by the torn tendon. This is why the diagnosis often is missed.

Treatment can be conservative which includes rest, ice, anti-inflammatories and a gradual return to exercise and activities. Physical therapy often is recommended. Without repair, loss of strength remains an issue especially for those wanting to resume weightlifting or participation in a strenuous activity such as football and wrestling.

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Lacrosse injuries

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Between 2000-2016, approximately 206,275 lacrosse-related injuries were treated in U.S. emergency rooms according to a retrospective study. Researchers noted the injury mechanism, body part injured and diagnosis differed by sex. Boys were 1.62 times more likely than girls to be injured by player-to-player contact. Girls were 2.21 times more likely than boys to sustain non-contact injuries. Overall, research showed as the age of the athletes increased, the percentage of LAX injuries from sticks decreased and player-to-player contact injuries increased.


Of the injuries diagnosed and treated in the emergency department, concussions topped the list, followed by contusions and lacerations, sprains and strains, and injuries to the head, face and lower extremities.


Based on the 16-year review of data, researchers concluded that despite additional measures taken to increase protective regulations in the sport, lacrosse continues to be a noteworthy source of injury differences between sex and age. As a result, they recommend governing bodies continue modifying and adding rules aimed at reducing the risk of injuries, as well as studying ways to improve protective equipment.

Lacrosse in-season strength, conditioning program helps reduce injuries, keeps players at their best

While common contact injuries may be difficult to prevent proper training and preparation may reduce non-contact injuries and keep players strong throughout the season. Too often strength wains as the season progresses. This research-based program developed by Dr. Steven Chudik and his OTRF Health Performance Team was specifically created for lacrosse players. It is quick and efficient but and requires some planning to properly schedule workouts around games and practice schedules to avoid training too close to a specific competition and negatively impacting performance. games.

For a PDF of this program, go to: <https://www.otrfund.org/sports-performance-programs/> and select lacrosse.

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Lacrosse in-season strength, conditioning program
Lacrosse is one of America's oldest activities with roots in Native American culture, and is now one of America's fastest growing sports. Because lacrosse is a free-flowing, fast-paced sport with quick changes of direction, this can lead to non-contact ligament injuries especially to ankles and knees. Boy's lacrosse is considered a moderate contact sport with full shoulder pads and chest protector, where as girls lacrosse is relatively non-contact and the only protective equipment is protective goggles. The difference between girls and boys lacrosse can lead to a slightly different set of injuries, but both are at risk to various contact injuries.

Bruses are the most common contact injury, which are the result of body-to-body, stick-to-body, or ball-to-ball impact. Concussions can occur from these same mechanisms. The most common fracture location is to hands or forearm due to stick-to-body contact. The best way to reduce the risk of these injuries is to wear proper protective equipment and adhere to rules.
While common contact injuries may be difficult to prevent (contusion, concussion, fracture), proper training and preparation may reduce non-contact injuries (muscle strains, ankle and knee sprains). Knee and ankle sprains not only are among the more common injuries, they also result in longer recovery time. The most well-known knee sprain is an ACL tear, which typically requires surgery and minimum of four to six months of rehabilitation. Proper training has been proven to reduce the incidence of ACL tears. Thorough warm-ups with good strength and conditioning can reduce the risk for muscular strains.
Injury Prevention:

- Know the rules and wear appropriate protective gear
- Warm up appropriately for games and practice
- Perform a proper, sport-specific in-season strengthening and conditioning program

A good 10 to 15 minute warm-up prepares the body's muscles, joints and nervous system for athletic movement. These often include dynamic warm-ups, form drills for jumping, cutting, and running, and acceleration drills prior to full speed activities. Generally, these should be conducted prior to sport-specific skills and drills.
An in-season strength maintenance program should be quick, efficient and timed appropriately. It requires some planning to properly schedule workouts around games and practice schedules to avoid training too close to a specific competition and negatively impacting performance. In season, schedule two days for full body workouts at least 20 to 30-minutes in duration. Players should perform strength workouts after a game or practice and plyometric workouts before any conditioning because fatigue affects proper form. Ideally, players should have 48-hours rest between workouts and 48-hours rest between workouts and games.
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PM Tendon

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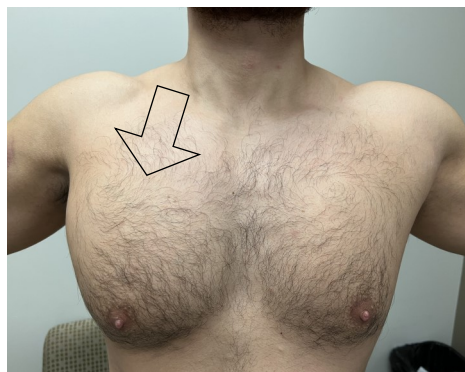


Image of the deformity around the chest and armpit caused by a torn pectoralis major tendon.

For those individuals, Dr. Steven Chudik with the Shoulder, Knee and Sports Medicine Injury Clinic recommends repair or reconstruction of reattaching the PM back to the humerus (upper arm bone) for patients with those demands.

For the best chance of recovering full strength and function, surgery should be performed within three weeks of the injury. Delaying a diagnosis and proper treatment allows the PM to retract, scar and atrophy and the tendon to shorten and become irreparable.

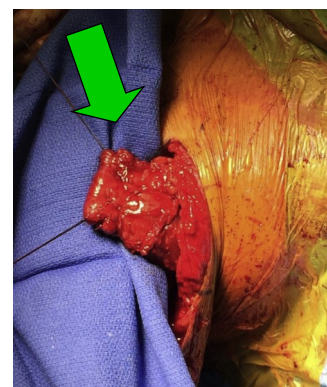
For 20 years, Dr. Chudik has been treating and repairing PM ruptures. For chronic, irreparable PM tendons, standard hamstring, bone patellar tendon, Achilles tendon, and dermal grafts have been used to reconstruct (rebuild) the tendon. Dr. Chudik investigated using an autologous iliotibial band (ITB) graft, a long piece of tendon that runs along the outside of the thigh from the pelvis to the tibia (shin bone) across the hip and knee.

According to Dr. Chudik, his decision to use an autologous ITB graft to reconstruct the PM tendon developed because of its availability, ease of harvest, low donor-site morbidity, biocompatibility, and the ability to fashion it into the similar band-like dimensions of the PM tendon.

The research and development of Dr. Chudik's pioneering procedure using an IT band graft was published in the *Journal of Shoulder and Elbow Surgery Techniques*, November 1, 2021, Vol. 1, Issue 4, pages 389-392.

Other than the choice of the graft, recovery and rehabilitation were the same—the arm is immobilized in a sling with a waistband strap to prevent arm movement for six weeks followed by physical therapy for four to six months of to regain motion, strength and function.

For additional information on PM tendon rupture injury or surgery, visit Dr. Chudik's website at <https://www.stevenchudikmd.com/shoulder/>.



Intraoperative photo showing Dr. Chudik's technique of using an IT band graft folded sutured over the pectoralis major to replace the torn tendon.

Research Roundup

Are sit-up exercises a thing of the past?



Stuart McGill, a Canadian biomechanics researcher at the University of Waterloo, Ontario, studied human spines for more than two decades. His research changed the way physical therapists, orthopaedic physicians, fitness experts and even the U.S. government think about sit-ups.

McGill's research showed sit-ups and crunches hurt peoples' backs. "The problem occurs when you flex over and over again with load from higher muscle activation

or external objects held in your hands," McGill explained. "The more often you flex your spine, the riskier it is," he added.

So what does he recommend to achieve those six-pack abs? Discontinue doing sit-ups and crunches and switch to curl-ups. They are a more subtle movement developed by McGill as a replacement to sit-ups, or incorporate planks, bird dog or dead bug exercises that every U.S. military branch and the Presidential Youth Fitness Program now uses in place of sit-ups and crunches in their training programs.

Research shows it is okay to eat pancakes and chocolate, really

A research study by the Mayo Clinic published in the February issue of *The Journal of Nutrition* evaluated the effect of food and snacks on lowering cholesterol without medication. Researchers found in their multicenter, randomized, double-blind free-living study that by eating two servings per day of foods rich in nutrients like fiber, antioxidant and omega 3 fatty acids LDL cholesterol (often referred to as the "bad" cholesterol) was reduced by nine percent was found in 30 days and as effective as medication.



Participants swapped out some of what they normally ate with two servings a day of snacks like pancakes, chocolate, smoothies, granola and oatmeal that were prepared for them. In the first phase of the study, the foods were prepared for the participants and were ordinary versions of the snacks.

In the second phase, participants ate nutrient-boosted versions of the same first phase foods that incorporated ingredients like berries, walnuts, and flax. The researchers said they were surprised at how quickly participants lowered their LDL cholesterol and how statistically significant it was from the modest ingredient changes.

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**](http://otrfund.org) /, and click on the donation link. Or, if you prefer, you can email me at [**contactus@chudikmd.com**](mailto: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



Orthopaedic Surgery & Sports Medicine Teaching & Research Foundation

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Sports Medicine Injury Clinic

Monday
Evenings

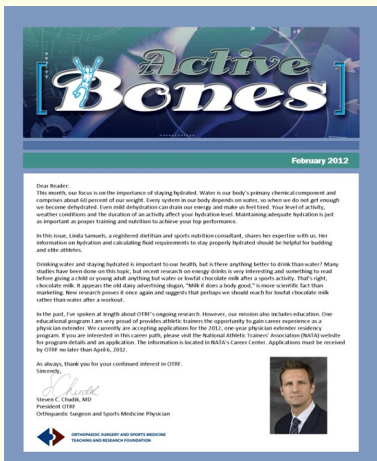
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Sign Up Today!

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

Simply email us at:
contactus@

chudikmd.com to
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