



# ORTHOPÆDICS

A complimentary publication from OAD Orthopaedics  
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*Review*



## The Dislocated Shoulder

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# Hut Hut Hike!

Sports fans are a happy lot with fall and winter sports well under way. Whether you're an athlete, die-hard or fair-weather fan, it seems impossible to escape sports. And thanks to the Blackhawks' championship last season, many fans have renewed hope in Chicago's sports teams.

Sports injuries, however, can sideline an athlete's personal achievement and/or weaken their team's chance for victory. OAD is proud of its *Sports Medicine Center of Excellence's* ongoing success at getting athletes back in their games—safe and healthy. Fellowship trained and/or subspecialty board certified in sports medicine, OAD's sports medicine specialists, Drs. Aaron Bare, Matthew Gimre, Lenard LaBelle, William Sterba, and David Watt, provide their expertise to patients of all levels of athletic performance. Each physician treats scores of patients off and on the field as they serve as team physicians for area colleges and high schools. From acute traumatic injuries and injury prevention to surgical intervention and personalized rehabilitation, the entire spectrum of orthopaedic sports medicine care and services is available at OAD's *Sports Medicine Center*.

This issue's feature, *The Dislocated Shoulder*, is presented by David H. Watt, MD, who holds a Subspecialty Certificate in Orthopaedic Sports Medicine and specializes in all types of shoulder and knee conditions and injuries. An avid sports enthusiast and team physician at Wheaton College and Wheaton North High School, Dr. Watt is the epitome of a sports medicine specialist. He recently traveled to Merida, Mexico with the Athletes in Action Sports Performance team to teach coaches and athletes at an engineering university, Instituto Tecnológico de Mérida. He also visited the Universidad Autónoma de Yucatán's medical school to teach sports medicine.

Matthew D. Gimre, MD, is another highly-regarded OAD sports medicine specialist with expertise in the nonsurgical management of athletic injuries and musculoskeletal conditions. Fellowship-trained in sports medicine at the Cleveland Clinic Foundation, Dr. Gimre has extensive experience in treating athletes conservatively. On page 10, *Anterior Knee Pain: A common problem in runners*, Dr. Gimre details patellofemoral pain syndrome, which often does not require surgery and offers a good prognosis with prompt diagnosis and treatment.

To complement these articles, we present *Shoulder Instability* by Kristin Siebert, MPT, for a therapist's overview of rehabilitating various forms of shoulder instability. As in our last issue, we're pleased to showcase another patient's OAD success story in *Patient's Perspective*—a young man's experiences in pursuing Shotokan Karate Do and competitions while overcoming medical obstacles.

Thanks to our extremely supportive and generous vendors and business partners, we can continue to offer an interesting and informative publication. Welcome to our tenth issue of *OAD Orthopaedics Review!*

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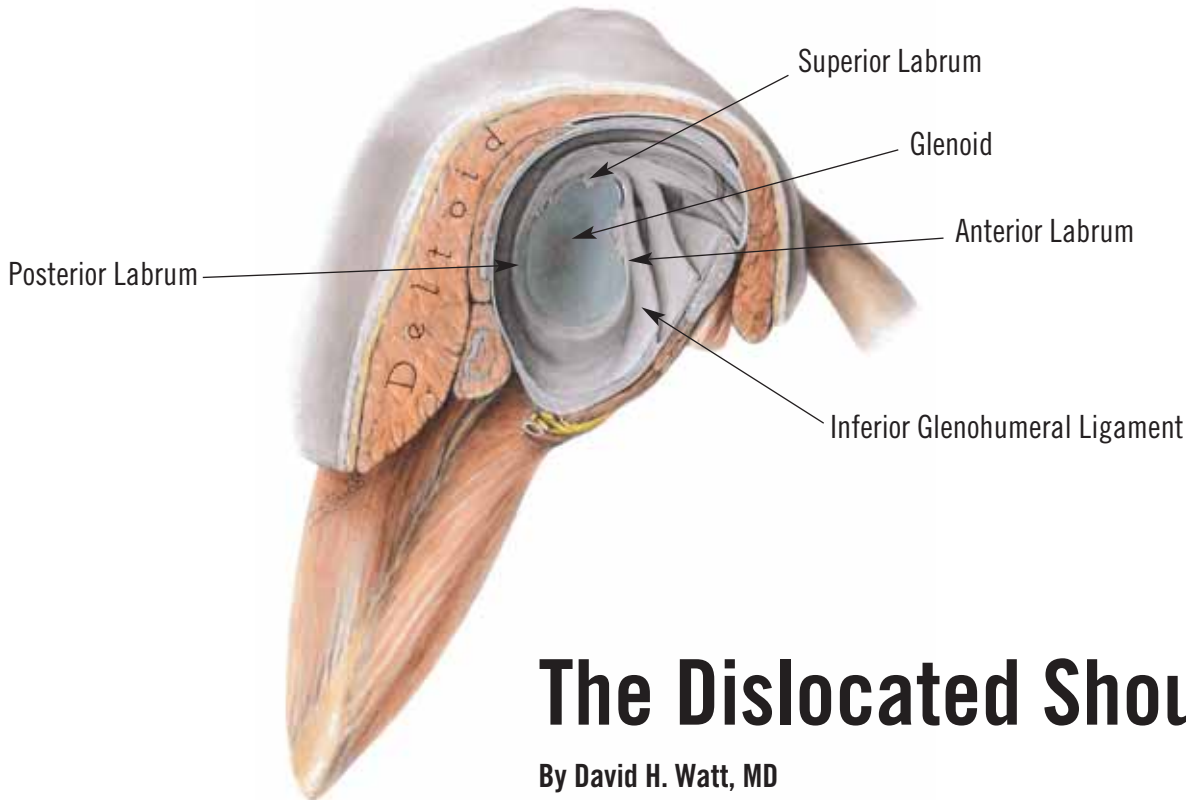
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# The Dislocated Shoulder

By David H. Watt, MD

Because the shoulder is the most mobile joint in the body it is the most commonly dislocated large joint. Shoulder dislocations have a 1.7 percent incidence in adults. They are most common in young male athletes who sustain a trauma to the shoulder, often from contact sports such as football or hockey. However, dislocations can happen in teens and adults of all ages, sometimes with as little trauma as a fall on an outstretched arm. Greater than 90 percent of dislocations are anterior, which means towards the front. This occurs when the arm is violently forced into an abducted and externally rotated position, which means the arm is out to the side and upward, as in a wind-up for a throw.

## ANATOMY

The shoulder is a ball and socket joint. The ball is the head of the humerus (arm bone) and the socket is the glenoid, a shallow dish-shaped protrusion from the scapula (shoulder blade). Because the glenoid is so shallow, it allows the shoulder to be very mobile, but also makes it inherently unstable. The shoulder depends on the soft tissues surrounding the glenoid to provide stability. The labrum is a rim of cartilage that goes around the glenoid. It deepens the socket, provides a suction cup-like fit with the humeral head,

and is the anchoring point for the ligaments and capsule that attach to the humerus. The labrum, ligaments and capsule are the static stabilizers of the shoulder. The dynamic stabilizers are the rotator cuff muscles and scapular muscles. The rotator cuff muscles work to hold the humeral head in the glenoid and guide and rotate the head within the glenoid. The scapular muscles move the scapula, thereby moving the glenoid to the most favorable position to stabilize the shoulder during motion and activity. These rotator and scapular muscles are therefore very important in rehabilitation after a dislocation or surgery to regain stability.

## DISLOCATIONS

Although most dislocations are anterior, 2-4 percent are posterior (out the back). Posterior dislocations occur either by a direct blow to the anterior shoulder or by a posterior-directed force to an adducted, flexed, internally rotated shoulder.

Ninety percent of anterior dislocations result in a tear of the anterior labrum from the glenoid bone (Bankart lesion). The other 10 percent results in tears of the ligaments off the humerus (HAGL lesion). Often there is an indentation in the back of the humeral head from the anterior glenoid (Hill-Sachs

lesion). Most of the time the indentation is small and inconsequential, but occasionally it is large, causing increased likelihood of recurrent dislocations. Posterior dislocations typically result in a tear of the posterior labrum. Football players are 15 times more likely to have posterior labral tears than non-football players.

A shoulder dislocation is very painful. The arm is barely able to be moved and is often “stuck” somewhat away from the body. Occasionally the shoulder will pop itself back in with light movement, but typically a trip to the emergency room is necessary for an emergency room physician to reduce (put back in place) the shoulder under sedation.

How the shoulder is treated after it has been reduced is somewhat controversial. The goal of treatment is to alleviate pain and restore the range of motion (ROM), strength and function to the shoulder. This can often be accomplished in one to three weeks. However, once a shoulder has dislocated, it’s likely to happen again in the future. The three highest risk patient groups are younger age males, those who return to contact/collision sports or those who return to overhead occupational use, where recurrence rates are reported at 60-90 percent.

## RECURRENCE PREVENTION

How to prevent recurrent dislocations has been an evolving process in orthopaedic sports medicine and a “right” answer has not yet been determined. The traditional treatment of an acute, first-time dislocation has been three weeks in a sling, followed by rehabilitation; however, that has not proven to be any more effective than early ROM. Therefore a sling is used briefly for pain control, then early ROM, rotator cuff and scapular muscle strengthening and rehabilitation are recommended. A promising new technique of immobilizing the shoulder in external rotation (away from the body) may limit recurrences, but this needs more study.

Traditionally, surgery has been performed after recurrent dislocations with 90-95 percent success rates, but conservative treatment with sling, brace, rehabilitation and activity modification has been followed for acute first-time dislocations. A recent study looked at athletes who returned to their sport to complete the season after a first-time dislocation. Eighty-seven percent were able to return to their sport, possibly wearing a brace, but suffered an average of 1.4 recurrent dislocations that season. More than 50 percent of the athletes had surgical stabilization in the off-season.

Another recent study looked at 15 to 18-year-olds with first-time dislocations. Half of the teenagers were treated conservatively and half with surgical stabilization. Of those treated conservatively, 71 percent

redislocated, with only 36 percent having good-to-excellent results. Of those who had arthroscopic surgical stabilization, only 19 percent had recurrent dislocations, and 89 percent had good-to-excellent results.

One long-term study from Sweden showed that after 25 years, 50 percent of patients aged 12 to 25 treated non-operatively had no recurrence or achieved stability.

There has been a trend in orthopaedic sports medicine towards earlier surgical intervention in the dislocated shoulder, but at this point there is no one “right” answer for everyone. The orthopaedic sports medicine shoulder specialists at OAD Orthopaedics individualize the care of patients with dislocated shoulders. Discussion of the risks of recurrence with the patient and parents (as appropriate) is key in decision making. Questions that are discussed include: Is the athlete in season? What other sport(s) may be upcoming? What position does the athlete play? Can a brace be used? Which is more important, this season or next?

## SURGERY

Historically, open surgery has been used to stabilize the shoulder. Often it involved rearranging tendons or even bone with tendons to achieve stability. Stability was often achieved at the expense of mobility, and therefore sometimes at the expense of function. External rotation would often be limited, which would make it difficult for a throwing athlete to return to sport.

Over the years, arthroscopic surgical techniques have improved to achieve the success rates of open surgery, but with better ROM, function, less pain and scarring. Arthroscopic surgery has the additional advantage of repairing just the damaged tissue, restoring the anatomy rather than rearranging it. Arthroscopy provides better visualization and delineation of the injured tissue and allows repair throughout the shoulder, whether anterior, posterior, or anywhere within the shoulder.

Arthroscopic surgery is done as an outpatient procedure, under general anesthetic, sometimes with an interscalene nerve block, which provides pain relief for several hours after the surgery. Anywhere from two to four small incisions (1/4 inch to 3/8 inch) are made for the arthroscope and the operating instruments. The essence of the surgery is to repair the labrum to the glenoid (Bankart repair) and tighten or advance the ligaments which also get stretched from dislocations. The repair is accomplished with suture anchors drilled into the bone. The sutures are then placed through the labrum and ligaments and tied. The anchors may be made of metal, plastic or an absorbable material that eventually turns into bone.

Pain, swelling and bruising are expected after surgery. The pain is controlled by oral narcotics. Most people sleep in a recliner or semi-sitting position. Post-operatively, the arm is placed in a sling with a small attached pillow that keeps the arm a little way away



Arthroscopic View - Anterior Labral Tear



Arthroscopic View - Anterior Labral Repair

from the chest for three to four weeks. During that time the hand may be used for light dexterity activities, and gentle dangling exercises are done with the arm.

After three to four weeks, physical therapy begins for work on ROM and gentle strengthening. Abduction and external rotation are restricted. By six weeks soft tissue healing is adequate enough to allow most normal daily activities. For athletes or physical workers, limitations continue as rehabilitation progresses. By three to four months, sport specific training and strengthening is allowed, and non-contact, non-throwing athletes can start resuming sports. For contact/collision athletes and throwing athletes, six months is often necessary before return to sport. Surgical success is about 90-95 percent, meaning there is still a 5-10 percent chance of future dislocation even after successful surgery.

Complications are infrequent, but include loss of ROM, persistent instability, infection, nerve injury, loss of fixation of the anchors and persistent pain. Both thermal capsular

shrinkage and post-op use of indwelling continuous infusion pain pumps have been associated with a rare, but devastating complication of chondrolysis where the articular cartilage and bone disintegrate, and therefore are no longer used.

In summary, the shoulder is a very mobile joint, but inherently unstable. Although any teen or adult can dislocate a shoulder, it's most frequently seen in young males in contact/collision sports. Recurrence is high, particularly in these individuals. Treatment of the first-time dislocation is controversial, but often non-operative with rehabilitation, although arthroscopic surgical stabilization is more successful. Individualization is important in decision making. Arthroscopic surgical stabilization has a 90-95 percent success rate.

The shoulder team at OAD Orthopaedics, Drs. Aaron Bare, Lenard LaBelle, William Sterba and David Watt are fellowship-trained and/or subspecialty board certified in orthopaedic sports medicine. Dr. Matthew

Gimre, non-surgeon, is board certified in sports medicine. All are team physicians at local high schools and colleges and have years of experience and expertise in treating shoulder problems. They will guide you through the decision-making process and treatment for an unstable shoulder.



**David H. Watt, MD,** joined OAD in 1990 and specializes in shoulder and knee surgery with expertise in arthroscopy, total and reverse shoulder replacement, and knee replacement. He is certified by the American Board of Orthopaedic Surgery with a Subspecialty Board Certification in Orthopaedic Sports Medicine. Dr. Watt serves as team physician at Wheaton College and Wheaton North High School, and he is a member of the Arthroscopy Association of North America and the American Orthopaedic Society for Sports Medicine.

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# Shoulder Instability

By Kristin Siebert, MPT

The shoulder complex is one of the most mobile joints in the human body; unfortunately this mobility comes at the expense of stability. The shoulder complex is made up of three bones, the scapula (shoulder blade), the humerus (upper arm), and the clavicle (collar bone) and numerous soft tissue structures (muscles, tendons, ligaments) that work in conjunction to produce shoulder movement. A condition that affects approximately 2 percent of the population is glenohumeral (shoulder) instability.

Shoulder instability is a condition in which the humerus slides partially or completely out of the shoulder socket. Shoulder instability is classified by the direction in which the humeral head moves. The most common form of instability is anterior instability. This occurs when the humeral head moves forward in the shoulder joint. This typically occurs in young athletes with great shoulder flexibility. Posterior instability is when the humeral head moves toward the back. This is less common and is often caused by a severe muscle spasm, such as a seizure.

Multidirectional instability is the third form of instability and usually occurs in athletes who are born with very loose joints. Athletes, such as swimmers or baseball pitchers, whose sport requires a great amount of shoulder range of motion may also eventually suffer from multidirectional instability. Re-injury is more common in young athletes because they have more elasticity in their shoulder capsule and ligaments.

The shoulder can become unstable in one of three ways. The first is the result of a traumatic injury, such as a hard football hit. The second is a result of repetitive shoulder motion which stretches out the joint capsule; this is usually seen in athletes such as volleyball players, baseball pitchers, and swimmers. And the third group is patients with a congenital issue with connective tissue leading to ligaments that are too elastic. In all of the above cases, if the joint capsule gets stretched out and the shoulder muscles become weak, the head of the humerus begins to move around too much in the shoulder complex. This will eventually cause pain and irritation in the shoulder.



Fig. 1 Rotator cuff strengthening using therabands



Fig. 2 Strengthening the scapular from prone position

The treatment of shoulder instability depends on a variety of factors, but usually begins with a non-operative conservative approach of physical therapy. Upon a patient's physical therapy evaluation, objective measurements are taken. These measurements include active (patient moving) and passive (therapist moving) range of motion of the shoulder, and shoulder and scapular (muscles between the shoulder blades) strength. The quality of the shoulder movement the patient possesses, assessment of the extent of shoulder laxity, and the direction of laxity are also evaluated. The patient will also complete a SPADI (shoulder pain and disability index) questionnaire to subjectively rank their pain and disability.

The primary focus of physical therapy is to adequately strengthen the rotator cuff muscles (Fig. 1) and the scapular stabilizers (Fig. 2). The rotator cuff muscles are made up of four muscles: the supraspinatus, infraspinatus, teres minor, and subscapularis, which join at the shoulder to form a thick

"cuff" over the shoulder joint. The rotator cuff muscles and tendons are essential in stabilizing the shoulder and helping to elevate and rotate the arm. Strengthening these muscles can be achieved through the use of therabands and free weights with the progression to functional training and endurance training. The scapular stabilizers, which consist of the lower, middle and upper trapezius, rhomboids and serratus anterior, also need to be strong to provide a solid base for rotator cuff function. This is necessary because patients with a risk of subluxation (instability) require the proper balance and strength of the rotator cuff muscles and scapular stabilizers to keep the humeral head from moving too far forward in the shoulder joint. Patients will also be instructed in proper posture. Correct posture is crucial because it allows the humerus to move freely within the joint. The physical therapist will also discuss applicable activity modification such as decreased pitching or overhand serves with the patient.

The ultimate goal of physical therapy is to achieve optimal function with decreased pain. Rotator cuff and scapular strengthening, patient education and activity modification are essential for patients to reach their desired goals. Studies have indicated that with an extensive course of physical therapy, six months or longer, 90 percent of patients are satisfied with their shoulder mobility and pain level. Surgical intervention may be required if there is not satisfactory results after the conservative treatment of physical therapy.



*Kristin Siebert, MPT, joined OAD Orthopaedics in 2002. She earned her Bachelor of Science in Biology from the University of Illinois. In 1998, Kristin obtained her Master's degree in Physical Therapy from Northwestern University in Downers Grove, Illinois.*



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# Anterior Knee Pain

A common problem in runners

By Matthew D. Gimre, MD

Are you a runner with a deep, aching pain in the front of your knee? Do you have pain when using stairs? Does your knee feel stiff and sore when sitting for a prolonged time, especially when standing up to begin walking? Occasionally, does your knee feel weak, as though it might give out or not support your weight? Have you reduced training to accommodate these symptoms? If so, you are not alone, as many runners suffer from anterior knee pain (pain at the front of the knee near the knee cap). Commonly called “patellofemoral pain syndrome” (PFPS), patellofemoral refers to the relationship between the thigh bone and the kneecap, at the front of the knee joint. One of the most common reasons for a runner to visit a doctor, this syndrome, if severe, can cause a runner to temporarily discontinue running.

A combination of over-training and abnormal biomechanics can cause an athlete’s anterior knee pain. Over-training is a relative term and varies among runners. Each runner has his/her own “over-training” threshold, and often a runner discovers their threshold when symptoms develop. Over-training can occur during training for an event (e.g., a marathon) or when varying a running regimen with more speed work or training on hills. These activities put a runner at risk for over-training, but regardless of an altered running regimen, natural stress on knees from running can also cause anterior knee pain.

Aside from over-training, abnormal biomechanics is the other major factor in anterior knee pain. Even if a runner is smooth and efficient, subtle biomechanical abnormalities may present risk. Abnormal biomechanics cause increased pressure between the knee cap and the groove upon which the knee cap rests at the end of the femur bone. The pressure may lead to microscopic injury, inflammation and pain. Typically, increased pressure occurs when the knee cap pulls or deviates laterally (to the outside), or when the femur bone rotates inward underneath the knee cap.

Sometimes, a structural abnormality of the bones can cause the abnormal biomechanics at the knee that leads to PFPS. Structural

abnormalities can include a knee cap’s abnormal bony development; an abnormal groove at the end of the femur; a knee cap tilted within the groove or resting partly out of the groove; a knee cap that easily slides out of the groove with movement; or any combination of these abnormalities. Often, there is no bony abnormality at the knee, and the abnormal biomechanics are due to soft tissue considerations, namely the runner’s relative strength and flexibility. Interestingly, strength and flexibility abnormalities often exist at sites other than the knee itself; the knee can be a “victim” of biomechanical abnormalities elsewhere.

Among soft tissue biomechanical abnormalities are inflexibility of the quadriceps muscle, hamstring muscle, hip flexors, iliotibial band (tight structure on the outside of the thigh), and the calf muscle. Weakness of the hip, buttock and abdominal muscles may also be a factor. Foot overpronation (i.e., foot flattens out and rolls inward during weight-bearing) may be another contributing factor.

Upon consulting a sports medicine physician for anterior knee pain, a patient’s running history is reviewed, a thorough physical examination is conducted to evaluate the painful area(s) and relevant biomechanical factors, and to further rule out other potential causes for pain. A complete set of knee X-rays is needed to assess for structural abnormality. On occasion, an MRI may be considered, but is not usually warranted.

If structural abnormality is not found, treatment consists of relative rest from running, cross-training with lower impact activity, avoidance of squats and lunges, ice, and anti-inflammatory medication as needed. To address biomechanical abnormalities, a structured rehabilitation program is essential. Rehabilitation is best accomplished by working with a physical therapist who guides the athlete through a progression of exercises to alleviate stress on the knee from abnormal biomechanics. To prevent a recurrence of pain, the exercises must become a consistent part of the runner’s

exercise routine. Although not typically prescribed initially, an elastic support sleeve for the knee or a more robust stabilizer brace can be considered. Depending on the runner's foot type, orthotic arch supports may be needed.

On occasion, a decrease or cessation of running may be necessary if the knee has significant structural abnormality, instability of the knee cap or significant arthritis. In rare circumstances, typically when the patella is significantly malaligned (seen on X-rays), surgery may be considered.

Although PFPS is a common pain syndrome for runners, the good news is that structural abnormality is rare, and treatment typically is nonsurgical (e.g., physical therapy); generally, the long-term prognosis is good. Consulting a sports medicine physician for a correct diagnosis leads to prompt treatment and resuming running, safely and without re-injury.



**Matthew D. Gimre, MD**, is OAD's nonsurgical sports medicine and orthopaedic medicine specialist. Fellowship-trained in sports medicine, Dr. Gimre's expertise encompasses a wide range of athletic, musculoskeletal and chronic conditions and acute injuries. With OAD since 2001, Dr. Gimre is board certified and a member of the American Medical Society for Sports Medicine.

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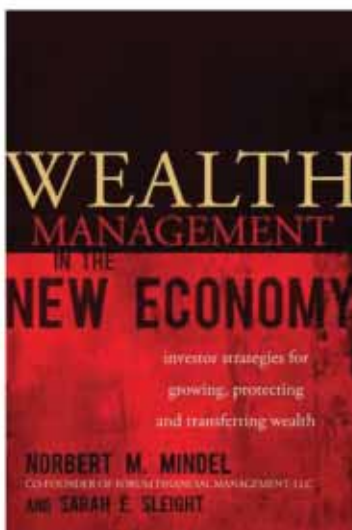
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## Going Beyond Injury

Ryan Senatore, Gold Medalist

By Karrie Welborn

When Ryan Senatore was six, he loved the Power Rangers, a Saturday morning TV program. He was not alone in his age group in this admiration. Power Rangers in both TV and large screen incarnations inspired a whole generation of boys and girls, becoming the doorway for many to enter into serious study and sport competition in the martial arts. In Ryan's case, the specific system he grew into was Shotokan Karate Do, as presented and taught statewide through the Illinois Shotokan Karate Clubs (ISKC), which Ryan attended through Wheaton Park District.

Ryan excelled in the sport, the discipline and the competition, but in the eighth grade he was diagnosed with Accessory Navicular, a congenital syndrome in which there is an extra piece of cartilage or an extra bone above the arch on the inner side of each foot. This was just the beginning of a medical journey for Ryan that would last for several years.

First, as both feet required surgery, they were operated on at the same time at Children's Memorial Hospital in Chicago. Then, as he healed from this surgery, Ryan experienced a growth spurt that brought four inches to his height, a drastic difference in any kind of sport but particularly so in karate. He found his physical center though,

and continued his Shotokan studies. Finally, Ryan utilized the mental and physical strengths gained from those studies to offset the frustrations and pain his additional injuries created.



Jeffrey Senall, MD

In April of 2009, just prior to the first competition since his surgery, Ryan felt a pop in his left foot accompanied by pain and swelling. Dr. Jeffrey Senall, OAD Orthopaedics' foot and ankle specialist, examined the injury.

"An MRI scan of the foot," explained Dr. Senall, "confirmed a Lisfranc sprain involving the midfoot and Ryan was promptly immobilized. Because a Lisfranc sprain is a moderately severe injury for any athlete, intermittent radiographs were taken of the foot, along with routine clinical evaluations in order to ensure that the injury would not worsen. Every effort was made to ensure Ryan would heal uneventfully, without recourse to surgery."

Ryan was placed in a fracture boot and kept on crutches until adequate signs of healing occurred. He was, however, not to be dissuaded from his goal of attending and winning at Nationals. Throughout his recovery Ryan utilized physical therapy to maintain proper strength and flexibility. Six weeks after the injury he was able to begin weight-bearing on the foot. Under Dr. Senall's guidance, he weaned himself

from the fracture boot and began a more aggressive strengthening and range of motion therapy.

"Ryan was able to resume activities without difficulty," said Dr. Senall, "although he did sustain a subsequent injury four months after the Lisfranc sprain, which included a sprain of the great toe joint. He was treated aggressively with icing, anti-inflammatories, and was shown taping techniques to stabilize the toe." Dr. Senall added, "These measures allowed him to stay as competitive as possible while his foot healed."

Ultimately, Ryan was able to increase his training, allowing him to compete at an elite level and to win the U.S. Open on Easter Sunday, 2009. Throughout the sequence of injuries, Ryan's belief in himself, his willingness to undergo whatever it took to accomplish the healing, and the mental and physical strengths he had incorporated into his personal lifestyle, were instrumental in helping him face these challenges.

Furthermore, Ryan had a group of healing professionals working with him. Under the watchful guidance of Dr. Senall, who prescribed specific instructions for Ryan's recovery, the dedicated "team" of healers, from surgical to physical therapy specialists, proves the power of comprehensive care. Michelle Senatore, Ryan's mother, utilized and increased her knowledge of nutrition in order to add to the

healing endeavor.

What is most intriguing, is that this collaborative team never actually met in person. Michelle served as a centering strength for Ryan, while being available to serve as a communication conduit between Ryan and his physicians.

“Don’t be intimidated by injury,” Michelle now tells others. “Attack the injury with the physicians and pursue the best possible path to solution.”

Ryan advises young people to “sort out all they love and find the sport or activity that they like the most and which most defines

them and then—go do it!”

As Ryan experienced, OAD Orthopaedics’ Sports Medicine Center takes pride in keeping athletes safely in ‘their games’ and on the road to reaching athletic goals. His current competitive goal is to take gold at the World Championships in his hometown of Chicago, in 2012. Now 18, and a freshman at DePaul University in Chicago in the Honors Accounting Program, Ryan will continue his Shotokan studies, balancing his academic studies with the physical and mental disciplines of Shotokan karate.

Go Ryan!

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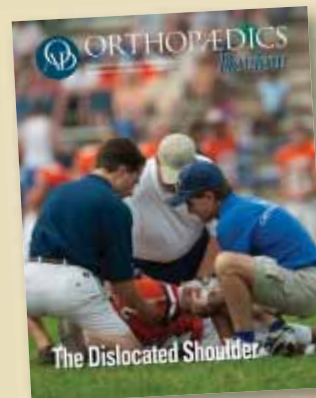
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