

Retiring from sport after concussion

HARRY P. BRAMLEY, D.O.

There are multiple factors to consider with families and athletes when discussing retiring from sport after concussion. As medical professionals, we need to assess risk of future injury, help the family and athlete identify the benefits of why they participate in sport, discuss ways of trying to reduce risk if returning to sport is decided, and help to assess the risks of not participating.

It is important to note that for many athletes their sport may be the most important component of their life. Retiring from sport should not be decided at the time of the acute injury, and certainly should not be taken lightly.

Assessing risk can be challenging and complicated. First, there is not a magic number of concussions that should end a career. The severity of the symptoms and the length of recovery are important. In addition, the athlete with severe symptoms after only a minor blow may indicate a lower threshold for severe injury in the future. Collision sports, such as ice hockey and football, offer more risk as compared to non-collision sports. Style of play, position, and body habitus should be taken into account, as well. For example, the athlete with a long skinny neck might be at greater risk as compared to the athlete with a short, thick neck.

Helping families and athletes understand why they participate is important. Some could easily substitute a collision sport for a non-contact sport just fine; while others may love the specific game they play. Some enjoy the friendships and just being with team and would be happy as a scorekeeper or manager, while others enjoy the competition.

Assessing ways to reduce risk should be a discussion for all athletes considering returning to play. Position change might be an option,



such as not returning as a catcher in baseball. Certain styles of play can increase risk. The ice hockey player who agitates the opposing team may open himself up for retaliatory hits later in the game, or the football player with improper tackling technique may place himself at risk for additional blows to the head.

The risks of not participating in sport should not be overlooked. What is the athlete going to do in place of athletics? For some, this is not an issue, and they will utilize this time with other productive activities. However, for others, the increased risk of nonproductive and harmful activities may be greatly increased and should be assessed.

Discussions about retiring from sport after concussion is multifactorial, takes time, and should not be taken lightly. At times the decision can be difficult, and seeking other opinions may be helpful for the family and athlete.

PRIMARY CARE SPORTS MEDICINE

Matthew Silvis, M.D.

msilvis@hmc.psu.edu
Associate Professor, Departments of Family and Community Medicine and Orthopaedics
Medical Director, Primary Care Sports Medicine
Penn State Hershey Medical Group—Palmyra, 717-838-6305
Penn State Hershey Bone and Joint Institute, 717-531-5638

Bret Jacobs, D.O.

bjacobs@hmc.psu.edu
Assistant Professor, Departments of Family and Community Medicine and Orthopaedics
Penn State Hershey—Middletown, 717-948-5180
Penn State Hershey Bone and Joint Institute, 717-531-5638

Cayce Onks, D.O.

conks@hmc.psu.edu
Assistant Professor, Departments of Family and Community Medicine and Orthopaedics
Penn State Hershey—Camp Hill, 717-691-1212
Penn State Hershey Bone and Joint Institute, 717-531-5638

George Pujalte, M.D.

gpujalte@hmc.psu.edu
Assistant Professor, Department of Family and Community Medicine and Orthopaedics
Penn State Hershey Medical Group—Fishburn Road, 717-531-8181
Penn State Hershey Bone and Joint Institute, 717-531-5638

Andrew Wren, D.O.

awren@hmc.psu.edu
Associate Professor, Department of Family and Community Medicine
Medical Director, Penn State Hershey Medical Group—
Elizabethtown, 717-361-0666

ORTHOPAEDIC SPORTS MEDICINE

Kevin Black, M.D.

kblack@hmc.psu.edu
Professor and C. McCollister Everts Chair
Penn State Hershey Orthopaedics
Penn State Hershey Bone and Joint Institute, 717- 531-5638

Robert Gallo, M.D.

rgallo@hmc.psu.edu
Assistant Professor, Penn State Hershey Orthopaedics
Penn State Hershey Bone and Joint Institute, 717-531-5638

Scott Lynch, M.D.

slynch@hmc.psu.edu
Associate Professor, Director of Sports Medicine Service
Practice Site Clinical Director of Adult Bone and Joint Institute
Associate Director of Orthopaedic Residency Education, 717-531-5638
Penn State Hershey Bone and Joint Institute, 717-531-5638

SPORTS MEDICINE PHYSICAL THERAPY

Robert Kelly, PT, ATC

Physical Therapist, Certified Athletic Trainer
Team Physical Therapist, Hershey Bears Hockey Club

Scott Deihl, ATC, PTA

Physical Therapist Assistant, Certified Athletic Trainer

Tanya Deihl, ATC, PTA

Physical Therapist Assistant, Certified Athletic Trainer,
Athletic Trainer, Annville Cleona High School

John Wawrzyniak, MS, ATC, PT, CSCS

Physical Therapist, Certified Athletic Trainer
Strength & Conditioning Specialist, Hershey Bears Hockey Club

Sports Medicine

FOR THE PRIMARY CARE PROVIDER

Cold-Related Sports Injuries

BY GEORGE PUJALTE, M.D.



A medical student informs you that he has volunteered to help out at a clinic near a popular winter sports destination. He inquires about cold-related conditions he may encounter.

Cold temperatures can predispose winter sports athletes to two cold-related injuries in particular: hypothermia and frostbite.

Hypothermia occurs when the core body temperature falls under 35 degrees Celsius. Exhaustion predisposes athletes to hypothermia, an athlete's effort decreases as his core temperature falls. The

body then tries to generate heat by shivering, which can lead to hypoglycemia. Speech difficulties, weakness, and incoordination may manifest with continued cold exposure.

Freezing of cellular fluid leads to frostbite. Usually, the toes, fingers, ears, and nose, are affected by a mild form called "frostnip," the most common frostbite type. Reddening of the skin and a tingling sensation may be noted. Body heat may be used to rewarm frostnipped areas. Blowing through cupped hands and covering affected areas may help, as well.

The skin and subcutaneous tissues are involved in superficial frostbite. Subcutaneous tissues remain soft, while the skin becomes waxy and white. Bones and muscles are affected by deep frostbite. Getting the athlete into warm, dry clothes and blankets as soon as possible is important. Non-alcoholic hot beverages may help those who can drink. Affected athletes may be unable to think rationally and need to rely on others to get them warm and dry. An athlete in severe hypothermia below 32 degrees Celsius will be at risk for fatal cardiac arrhythmias and may need hospital care.

Trench foot and chilblains, caused by inflammatory processes, may also affect winter athletes. Prolonged wearing of a wet shoe and prolonged exposure of the feet to temperatures below 15 degrees Celsius may lead to trench foot. An initially numb, red foot may become painful and blue. It takes less time to develop chilblains. Small, red bumps appear on the skin after just one hour of exposure to wet, cold conditions below 16 degrees Celsius. As the skin rewarms, initially pruritic lesions may become painful and inflamed. For both trench foot and chilblains, dry clothing or blankets may be used for rewarming. Topical creams and popping of blisters should be avoided.

Most winter and snow sport injuries can be prevented by suitable equipment and clothing, and proper planning and preparation.



Dear Health Care Provider,

My name is Matthew Silvis. As the medical director of Primary Care Sports Medicine at Penn State Hershey, I present to you the winter edition of our *Primary Care Sports Medicine Newsletter*, a biannual newsletter of seasonal sports topics. We hope you find the information useful and appreciate any feedback you have to enhance our efforts. We have selected a variety of topics for this issue. Our guest writer is Harry Bramley, D.O., assistant professor of pediatrics and medical director of the Penn State Hershey Concussion Program.

If you'd like to receive this newsletter by email, please send your email address to my administrative assistant, Jeanne Laicha at jlaicha@hmc.psu.edu. Please send any future topic ideas to Jeanne Laicha or myself at msilvis@hmc.psu.edu.

Happy New Year!

Matthew Silvis

Matthew Silvis, M.D.
ASSOCIATE PROFESSOR
PENN STATE HERSEY FAMILY AND COMMUNITY MEDICINE
PENN STATE HERSEY ORTHOPAEDICS AND REHABILITATION
PENN STATE MILTON S. HERSEY MEDICAL CENTER

PENNSTATE HERSEY
Milton S. Hershey
Medical Center

Good People. Great Medicine.™
PennStateHershey.org



Radiographs and MRI of the Knee: When and Why to Order

BY KEVIN BLACK, M.D.

Knee complaints are common in patients of all ages. Although a careful history and physical exam, by themselves, can frequently point to an accurate diagnosis and treatment, additional imaging studies are frequently necessary. A variety of tools for visualizing knee anatomy and pathology currently exist, and the two most common are plain radiographs and MRI. This review provides guidelines for ordering these studies

Factors to be taken into consideration include the age of the patient, duration of symptoms, severity of pain, history of trauma, presence of deformity and swelling. Ultimately, one must ask themselves, 1) if their suspected clinical diagnosis must be confirmed with imaging at that time, and, 2) if there is a reasonable possibility that the results of the study will change treatment. These principles are demonstrated in the following representative cases.

1) A 36-year-old laborer presents with a nine month history of pain well localized to the medial compartment of his right knee after a twisting injury. He reports a sensation of something getting caught in the medial aspect of the knee with associated medial pain. He has been treated with two NSAIDs and restriction of activities, but states it is becoming increasingly more painful and prevents him from doing his work. Physical exam demonstrates that he stands 5 feet 10 inches and weighs 160 pounds. Abnormal findings on examination include the presence of medial joint line tenderness and circumduction pain. You suspect a medial meniscus tear and order a standing AP of each knee and a Merchant and lateral X-ray of the right knee. There is no evidence of arthritis and based upon the duration of the patient's symptoms, order an MRI to determine if a meniscus tear is present as well as to evaluate the joint for chondrosis which might not be apparent on plain radiographs.

Several important points are demonstrated: 1) X-rays were obtained prior to an MRI. If arthritis is considered a possible diagnosis, which is the case for any patient age thirty-five and above, standing AP radiographs should be obtained. They are much more sensitive than non-standing films in detecting joint space narrowing and, if identified, the focus should be on a non-operative approach to the treatment of arthritis. Specifically, an MRI should not be ordered in this setting. 2) This patient had subjective complaints and physical findings suggestive of a medial meniscus tear. MRI is highly sensitive and specific in detection of meniscus pathology. 3) The timing of ordering the MRI was related to the duration and severity of the patient's symptoms. Identification of a medial meniscus tear in this patient would lead to a recommendation for arthroscopy.

2) A 62-year-old male presents for evaluation of a three-month history of left knee pain. It is generalized knee discomfort without localization to either joint line. Taking four Aleve tablets per day for one month has not relieved his pain. He reports having torn his ACL in college and having a medial meniscsectomy done in his thirties. Notable findings on exam demonstrate that he is five

feet eight inches and weighs 300 pounds. Range of motion is 110 degrees of flexion to five degrees of flexion. His medial joint line is tender. He has varus alignment. Standing X-rays are ordered and demonstrate advanced medial compartment arthritis with medial compartment narrowing, varus deformity and spur formation. An MRI is not indicated in this setting.

This patient has a classic presentation for arthritis. Once again, standing X-rays should be obtained to determine the severity of disease. An MRI should not be obtained but, if ordered, would predictably demonstrate a degenerative, extruded medial meniscus that would be of no clinical significance. The treatment should focus on treatment of the arthritis.

3) A 16-year-old female cross-country runner presents for evaluation of generalized anterior knee pain of six week duration that began one month after starting her cross country season. There is no history of trauma. Pain is worse with stairs, kneeling and squatting. She has received no treatment. Her physical exam is normal other than for demonstrating generalized ligamentous laxity. X-rays should not be ordered for this patient. She is sent to physical therapy and counseled regarding activities.

This patient's diagnosis is anterior knee patient/patellofemoral pain. Based upon her age and duration of symptoms, it is highly unlikely that plain radiographs would demonstrate any abnormality and, therefore, there is no reason to obtain any type of imaging study at present.

As always, a careful history and physical exam, and good judgment will allow for appropriate utilization of these imaging studies.



Treating Soft Tissue Injuries with Foam Roller Therapy

BY JOHN WAWRZYNIAK, M.S., A.T.C., P.T., C.S.C.S.

The use of soft tissue techniques including massage dates back to approximately 3000 BC and possibly earlier. Massage was used as a form of natural healing to relieve pain and prevent or cure illness.

Clinical and self myofascial release (SMR) techniques have gained considerable attention in the past ten years. Techniques such as Graston (instrument assisted soft tissue mobilization) and Active Release Techniques (ART) are used by clinicians to assist the healing process while restoring normal tissue integrity and promoting normal joint biomechanics. SMR techniques include the use of a foam roller (Figure 1.)

When there is compromise to soft tissue, scars and adhesions develop. This occurs after injuries such as contusions, sprains, and strains. These injuries are likely treated with rest, ice, compression, and elevation (RICE) to control the inflammatory process and allow healing to begin. During proliferation, type III collagen is deposited and provides strength to the wound until maturation.

During maturation, type III collagen is replaced by type I collagen. Initially disorganized and cross-linked, this collagen remodels and aligns along tension lines. Maturation time is dependent on size and severity of the injury and may take weeks or up to a year for complete healing.

It is during maturation that soft tissue treatments are most beneficial and at times the missing link in allowing an athlete to return to full function. The use of foam roller therapy for SMR is an inexpensive (approximately \$20, OPTP.com) and an easy way for patients to address soft tissue restrictions and promote the maturation of type I collagen. As part of a comprehensive treatment program that may include clinical techniques such as Graston and ART, the physical therapist can recommend beginner and advanced techniques for the foam roller. The foam roller can be used at home by the patient between therapy visits and continued long after therapy has been completed as part of a comprehensive fitness program.

Technique includes rolling over the affected area or muscle (Figure 2, ITB) for fifteen to twenty rolls (or about thirty seconds). Pressure from body weight on the foam roller inhibits muscle spasm and promotes collagen reorganization. Techniques for all major muscle groups including quadriceps, hamstring, hip flexors, groin, calves, lumbar, and thoracic spine can be provided by the physical therapist. There are also many "how to" videos available on the Internet. Rolling over trigger points may be painful at first but after a few sessions this resolves as tissue remodels and muscle spasms subside. Foam rolling over bony prominences should be avoided.

Winter sports, such as hockey, ice skating, and skiing, place great stress on the hips, pelvis, and surrounding musculature. Foam roller therapy can be a useful modality in treating trigger points and muscle soreness in these areas and keeping athletes functioning at their peak. Get rolling!

