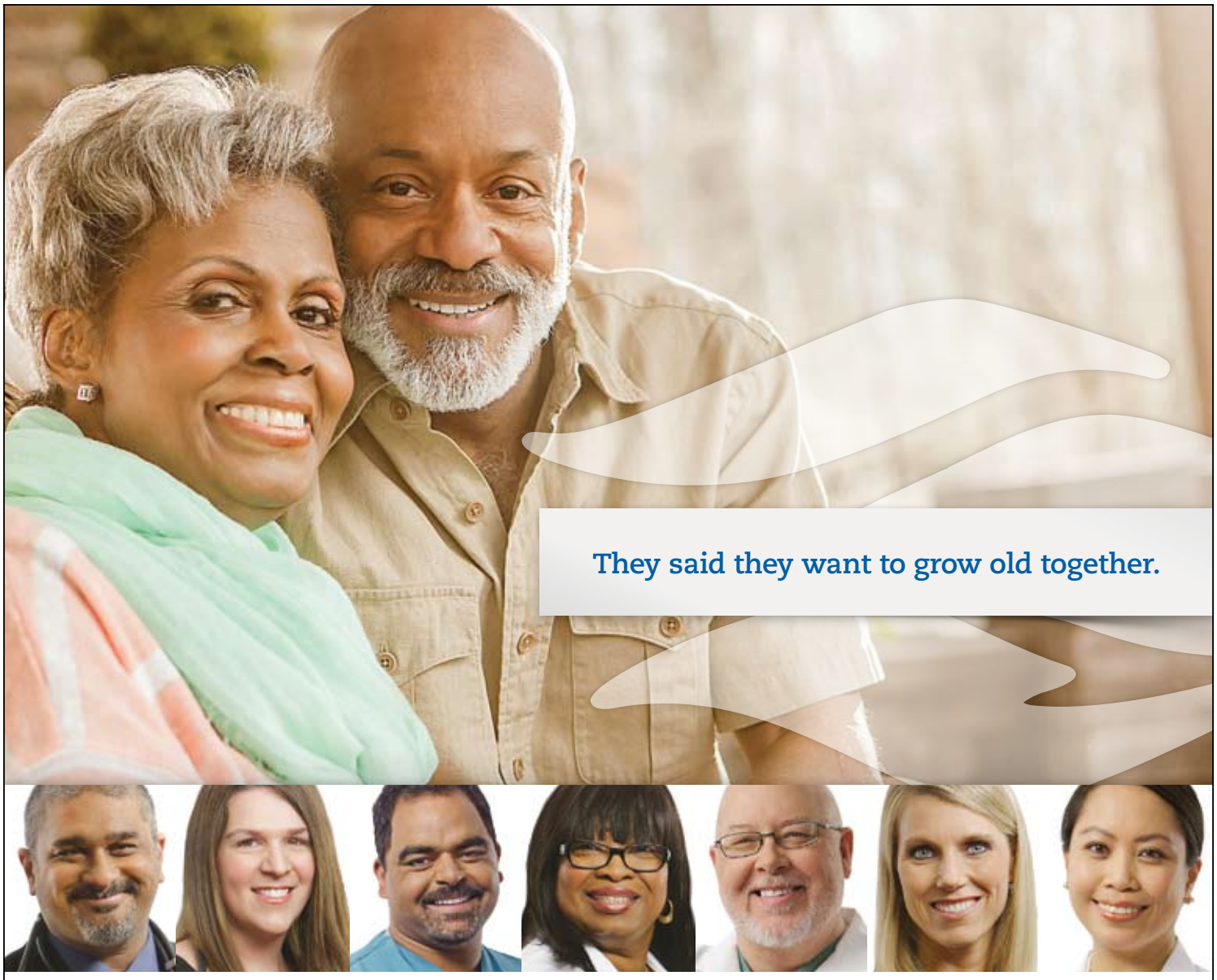
OAK ORTHOPEDICS Journal

Volume 1 · Issue 1



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OAK ORTHOPEDICS

Welcome

Welcome to this edition of our Orthopedic Review and Newsletter. We at OAK Orthopedics think you will find it both interesting and informative.

OAK Orthopedics has been serving the Midwest since 1945 and has come to represent stability, strength and longevity. OAK has grown and evolved from a community based practice to one with regional prominence that continues to receive numerous awards and national recognition. With surgeons and physicians ranked as “Five-Star Doctors” (highest ranking) and fellowship trained in numerous orthopedic specialties our directive is to continually look for ways to better serve our patients with state-of-the-art orthopedic care and diagnostic imaging.

The practice of medicine is constantly evolving and OAK Orthopedics is committed to maintaining our excellence and expertise to best serve our patients with cutting-edge orthopedic care, including specialized options, minimally invasive procedures and computer assisted surgical techniques.

With several office locations, an Outpatient Patient Surgical Facility (OAK Surgical Institute), Digital X-ray, Open MRI, Extremity MRI, DEXA scanner and DME Department the OAK name has become synonymous with world-class orthopedics.

At OAK Orthopedics our goal is for patients to Move Better...Play Better...Live Better.

Enjoy the issue.

Sincerely

Milton J. Smit MD
President
OAK Orthopedics

Table of Contents

OAK ORTHOPEDICS Physicians

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OAK ORTHOPEDICS

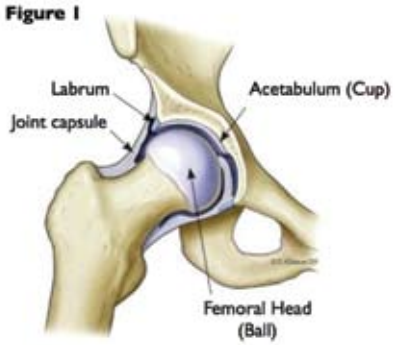
Hip Pain - Can We Prevent the Early Onset of Hip Arthritis?

By Tom T. Antkowiak, M.D. • OAK Orthopedics

Hip pain can be a bothersome issue for patients of any age: high school athletes, middle aged weekend warriors all the way through active folks in their golden years of retirement. Hip pain often keeps patients from doing the things they love; football becomes impossible, golf painful and even walking can become a problem. Pain that is truly coming from the hip joint is often felt by patients as a deep sharp pain in the groin. Occasionally, that pain can travel down the front of the thigh and even into the knee.

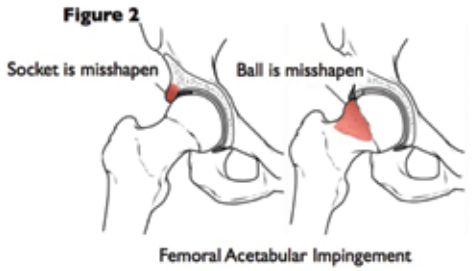
Orthopedic surgeons are discovering more and more about the precise anatomy and the tight tolerances that exist between the ball and socket of the hip joint. In order to glide smoothly in the socket, the femoral head (or ball) must be precisely shaped. This is especially true during the extremes of motion. Conversely, the acetabulum (or cup) must have a shape that fits the femoral head and does not cause pinching or abutment during range of motion. The cup of the hip joint has a soft tissue extension all along its rim called the labrum (Figure 1). This important tissue helps to provide stability and a fluid seal to the joint. When injured, the labrum can generate pain and symptoms like popping, clicking and catching often felt in the groin region.

Figure 1



When the shape of either the ball or socket is imperfect there can be painful impaction of the femoral head and neck

One of our goals as orthopedic surgeons is to help patients prevent the onset of arthritis and the need for hip replacement.

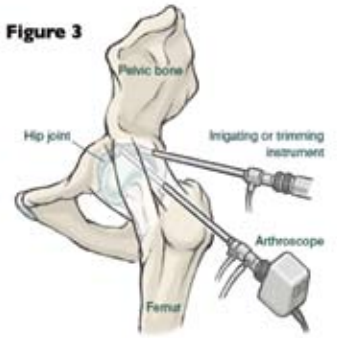


against the socket or labrum. This abnormal relationship is referred to as femoral-acetabular impingement or FAI (Figure 2). There are two major problems with FAI: First, the abnormal contact between the femoral head/neck and the labrum can be painful. Second, this abnormal contact can lead to damage to the surrounding cartilage in the hip joint.

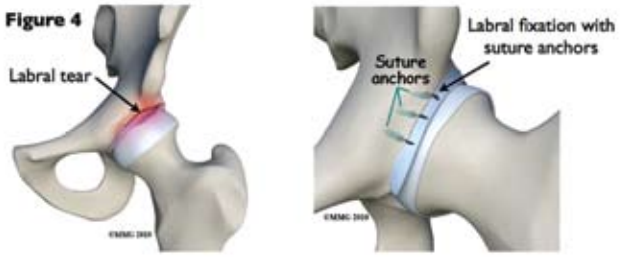
Taking this one step further: why is it that some people get arthritis in their hips and eventually require a hip replacement, while others live long active lives without any hip problems at all? Of course, the answer is multifactorial. There is a genetic component, some patients experience a direct traumatic injury to the hip, yet others have or rheumatoid arthritis, blood flow problems or infections. However, there is a subset of the population that has a mismatch in their hip anatomy (FAI) that leads to cartilage injury and early arthritis.

One of our goals as orthopedic surgeons is to help patients prevent the onset of arthritis and the need for hip replacement. To do so, we must take care to recognize patients with hip pain caused by FAI. This is done in the office by taking the time to understand a patient's symptoms, performing an exam of the hip and obtaining x-rays. An MRI is often needed to closely examine the labrum and the cartilage in the hip. Once FAI, or a labrum tear, is diagnosed we review the anatomy and the images with the patient. Together we come up with a treatment plan with the goals of reducing pain, preventing future injury to the cartilage and slowing the progression of arthritis.

As part of the early treatment plan, we do everything possible to treat the hip pain with non-operative methods. These include: anti inflammatory medications, physical therapy, hip injection, and activity modification. Such treatments are



continued as long as they are working. Unfortunately, some patients with labral tears and/or FAI will not have long term pain relief with these conservative options. In these cases, a minimally invasive hip arthroscopy procedure may be necessary. During a hip arthroscopy, the surgeon can use small access incisions in the skin to pass an arthroscope (camera) into the hip joint (Figure 3). The camera allows us to see the labral tear and/or the mismatch between the ball and socket (FAI). In the case of a labral tear the labrum can often be repaired with sutures. If the labral tissue can not be repaired the surgeon will smooth away the torn edges which should alleviate any popping, clicking and pain (Figure 4).



If there is a misshapen ball or socket, the surgeon can reshape either or both using a minimally invasive bone burr that is passed through a small skin incision. By reshaping the hip joint and repairing the labrum our hope is that the patient will have excellent, pain free hip function for years to come. This joint preserving surgery can be technically challenging and is performed by select surgeons trained in hip arthroscopy. Orthopedic surgeons around the world continue to perform research on the long term benefits of FAI surgery with the ultimate goal of reducing the prevalence of hip arthritis and the need for hip replacement surgery.

OAK ORTHOPEDICS

Eat to Win, Pre-Game Nutrition

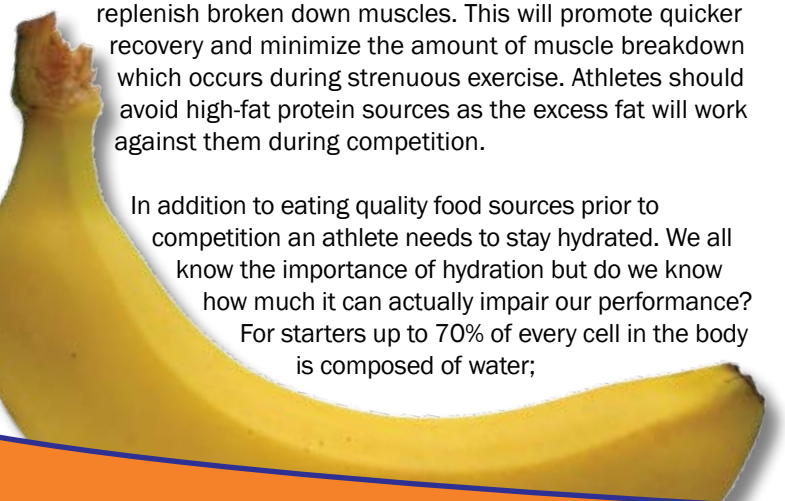
By Jeff Weber MS, CSCS • Director, OAK Athletic Development

What an athlete eats every day has a big effect on how they perform. What an athlete eats before a game has a huge effect on how they perform. The purpose of the pre-game meal is to provide the body with an ongoing fuel source which will power the athlete through the demands and requirements of the competition. This is primarily done by preventing significant drops in blood sugar during competition. The athlete's blood sugar is simply the amount of glucose (sugar) present in the blood stream. These glucose molecules are great to have available during exercise as they are quickly and easily taken up by the cells of the body where they can effectively be used to energize on-going exercise. If an athlete's blood sugar levels drop to low during competition their ability to recover and perform is significantly impaired. The body will feel fatigued and sluggish as it struggles to create glucose from other substances within the body which is a slower and much less efficient process.

This means that an athlete's pre-game meal should include primarily food with high carbohydrate content as they are most easily broken down into glucose which as we know is responsible for keeping blood sugar at adequate levels to fuel high-level performance and manage fatigue.

It is important to understand that not all carbohydrates are created equal. Avoid super sugary foods before competition in fact avoid super sugary foods almost all of the time as they will lead to huge upswings in blood sugar levels followed by giant drops or crashes, often leaving the athlete feeling worse than before. Athletes should choose carbohydrates which are slower to digest which in turn will provide a steady flow of energy to the muscles without the crash.

Protein should also be a part of an athlete's pre-game meal. The protein will provide the body the ability to repair and replenish broken down muscles. This will promote quicker recovery and minimize the amount of muscle breakdown which occurs during strenuous exercise. Athletes should avoid high-fat protein sources as the excess fat will work against them during competition.



In addition to eating quality food sources prior to competition an athlete needs to stay hydrated. We all know the importance of hydration but do we know how much it can actually impair our performance? For starters up to 70% of every cell in the body is composed of water;

we have trillions of cells within our bodies and when they are not adequately hydrated functioning at a high level is quite difficult. Even minor dehydration impairs alertness, ability to concentrate, tiredness and performance capacity. Staying adequately hydrated is one of easiest things an athlete can do to help themselves. Muscle cramping is probably caused by fatigue and poor conditioning but is also affected by the loss of fluids and electrolytes. Without adequate electrolytes in our system muscles ability to contract is significantly compromised.

The Game Plan

Purpose of the Pre Game Meal

- Maintain steady blood sugar levels during exercise, preventing second half crashes
- Help to keep the body hydrated
- Provide a steady flow of carbohydrates to the muscles to fuel athletic movements
- Prevent hunger

Guidelines

- To limit the chance of upsetting your stomach only eat

foods you know you handle well, pre-game is not the time to try something new. Minimize foods that cause gas or bloating or anything else you know gives you problems.
- Allow adequate time for food to digest. Give yourself at least two hours.
- Continue to consume liquids avoiding pops and other sugary soft drinks and caffeine containing beverages.
- Limit high-fat foods before competition as they take longer to digest and will leave you sluggish and tired.
- The pre-game meal should consist of high-carbohydrate, moderate protein and low-fat.

Options

>2 hours from game-time
- Grilled chicken breast sandwich on whole wheat bun, no mayo.
- Mixed fruit
- Baked potato with salsa (no mayo, cheese or bacon), w/ turkey sandwich
- Whole wheat pasta with chicken and low fat marinara sauce.
- Oatmeal mixed with blueberries and glass of milk
- Low fat Subway or Jimmy John's sandwich on whole grain or multi grain bread with multiple vegetables with pretzels.

<2 hours from game-time
- Banana
- Smoothie
- Energy or granola bar
- (3:1) carbohydrate to protein shake
- Crackers

Hydration
- 2 hours before= 2 cups
- 10-20 minutes before= 1 cup
- Every 10-20 minutes during exercise= 1 cup
- Do not depend on sports drinks to hydrate you right before game time. Your body can only absorb a limited amount of fluid every hour so if you are thirsty it is too late to fix it, you are already dehydrated.

Taking advantage of pre-competition nutrition is not difficult or complicated take advantage of it and stay fueled from start to finish.

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Expertise & Expertise

OAK Orthopedics is a multi-faceted team of Orthopedic Surgeons, Sports Medicine Physicians, Pain Management Physicians, a Podiatrist and Physician Assistants.

OAK Surgeons are fellowship trained in Sports Medicine, Hand & Upper Extremity, Foot & Ankle, and Total Joint Reconstruction.

Our Mission

Our mission is to provide high-quality, orthopedic health care for all people with musculoskeletal disorders. We offer a unique approach to medicine with highly specialized treatment options and know that the medical and surgical care we provide is the finest anywhere. We work very closely with referring physicians and we are delighted to receive direct referrals from our many satisfied patients.

The practice of medicine is constantly evolving. We are thus committed to maintaining our excellence and expertise to best serve our patients with cutting-edge orthopedic care.

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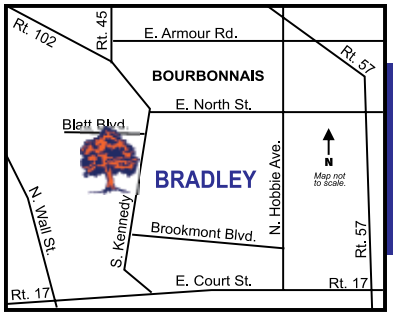

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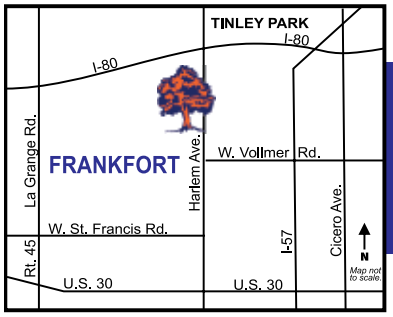

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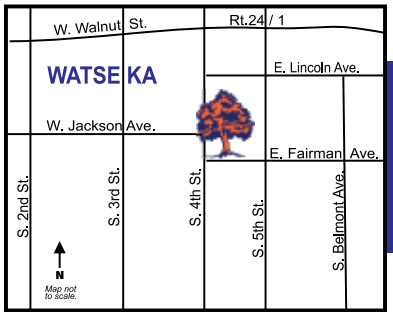

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OAK ORTHOPEDICS

Common Cartilage Conditions of the Knee

By Carey E. Ellis, M.D. • OAK Orthopedics

Knee injuries represent one of the most common types of joint injuries treated by orthopedic surgeons. Injuries to the knee may involve damage to the bones, cartilage, or ligaments. The most common of these is an injury to the cartilage. There are two distinctly different types of cartilage in the human knee. The first form of cartilage is the white shiny material that covers the ends of bones, such as that seen at the end of a chicken bone. This type of cartilage provides for smooth and painless motion within the joint and is referred to as the "articular" cartilage. In general, the damage, which occurs to the articular cartilage, is usually age related or degenerative and results in problems such as arthritis. The wearing down of the smooth shiny white cartilage results in swelling and pain of the joints that are commonly associated with arthritis. Less commonly, however, is a sudden, or acute, injury to this shiny white cartilage, which could occur from a direct traumatic episode to the knee. This form of trauma could occur with, for instance, a fall onto the knee or a motor vehicle accident in which the knee is driven into the dashboard.

The more common type of cartilage injury in the knee is an injury to the "meniscal cartilage". This form of cartilage is distinctly different from the cartilage that lines the ends of the bones. The meniscal cartilage is more like a shock absorber that lies between the two major bones of the knee joint. There is one meniscal cartilage on the inner side of the knee called the "medial meniscus" and another meniscal cartilage on the outer part of the knee referred to as the "lateral meniscus". This shock absorber effect allows for distribution of stress across the bones of the knee and is known to be extremely important in preserving normal knee function. Injuries to this meniscal cartilage generally come in two forms. The first is a wearing-down type of process, which is age related and results in degenerative tears of the meniscus. A degenerative tear means that the tissue has worn out and has gradually lost its structural integrity. In this weakened state, a small tear can occur and then propagate to become a larger tear. In many older individuals, this slowly occurring tear may not even cause pain, in fact, we know from studies done on normal older individuals who have no knee pain that they may have a meniscal tear and not even feel it.

The second type of meniscal cartilage injury is a result of a single acute event such as a twisting injury during sports. The twisting event that occurs at the knee joint can cause excessive pressure on the shock absorbing meniscal

cartilage, resulting in a tear of this important tissue. An acute tear of the meniscal cartilage generally results in pain and swelling and stiffness of the knee joint. Physical examination of the knee, by a properly trained expert, can strongly support the diagnosis of a meniscal cartilage tear. Plain x-rays of the knee will not be helpful in the diagnosis of a meniscal tear, but are generally obtained to help rule out any type of bony injury that may have occurred at the time of injury. If necessary, an MRI may be obtained to help verify the diagnosis of this type of injury. An MRI is a special test, which visualizes the soft tissue structures in the body, such as meniscal cartilage. The findings on the MRI are then correlated with the physical examination findings to help verify a torn cartilage.

The treatment of a torn meniscus cartilage is based on many factors and there is no one single treatment pathway

that fits every torn meniscus. The most important factors include age of the patient, the degree of symptoms related to the tear, the activity level of the patient, and the expectations of the patient.

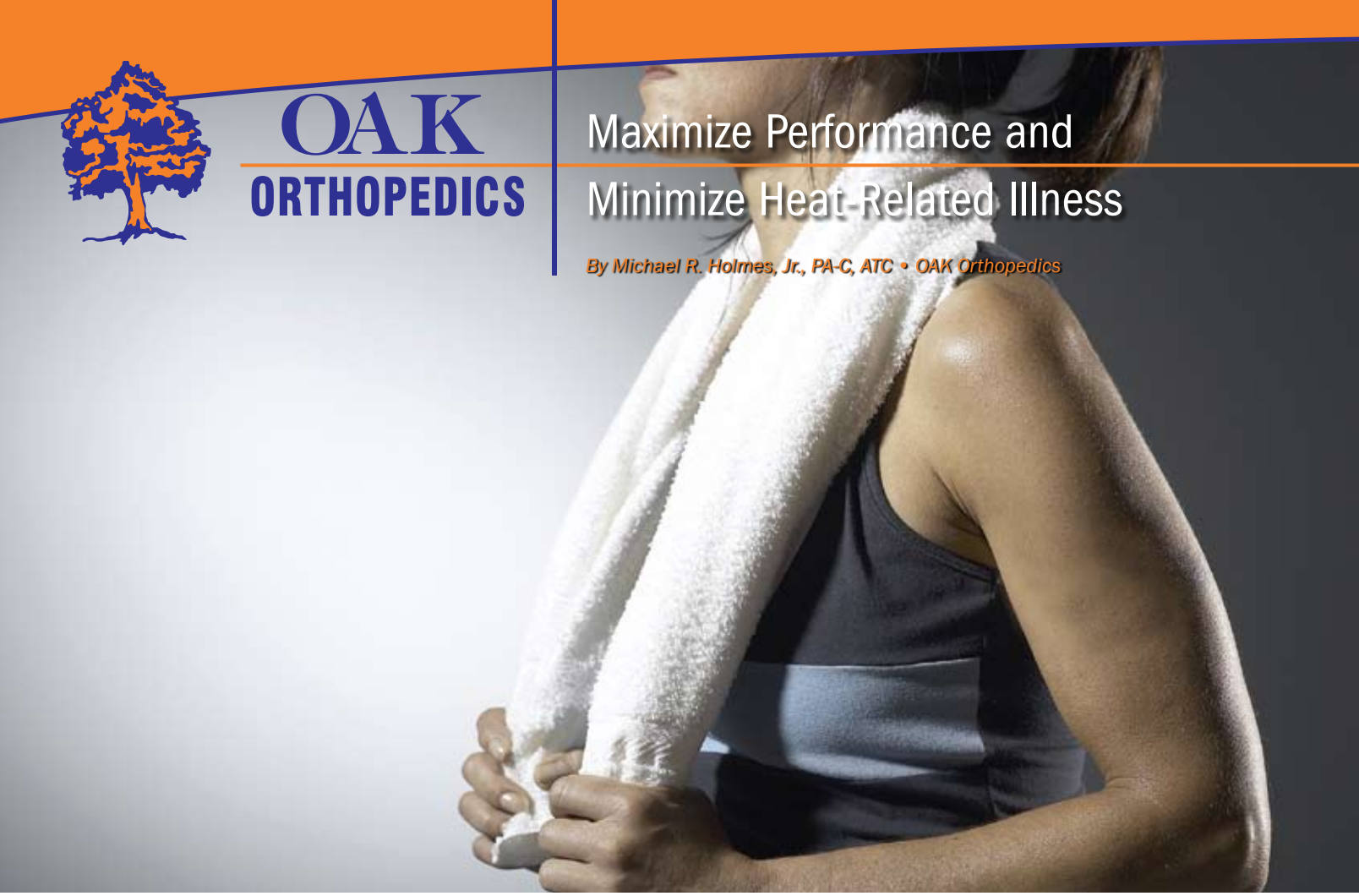
Although torn meniscal tissue was routinely completely excised in the 1970s as the preferred treatment, physicians quickly learned that complete removal of this shock absorbing tissue resulted in advanced arthritic changes in the knees in the years to follow. Thus, attention was subsequently directed to try to preserve as much of the uninjured portion of the meniscus as possible or even trying to repair the meniscus tissue so that none of it had to be removed. If the meniscal tissue is shredded at the time of injury, then this portion of the meniscus cannot actually be repaired, but it can be trimmed out using a procedure called "arthroscopic surgery." For arthroscopic surgery, two or three 1/2" incisions are made around the knee and a small camera is inserted into the knee to visualize the internal structures. Through a separate incision, instruments are introduced into the knee to trim out the shredded tissue. However, in the patient whose cartilage tear is repairable based on its size and configuration, special instruments can be used to actually stitch together a torn cartilage to repair the cartilage itself. Successful repairs of the cartilage prevent the need for removal of any of this tissue from the knee, thereby preserving the shock absorbing effect for the knee. This type of repair is reserved for relatively young patients, since the blood supply to this cartilage greatly diminishes after early adulthood. Without a healthy blood supply, a repaired meniscus may not heal and may simply result in further problems down the line, such as a repeat tear. Thus, repairs of the meniscus are generally reserved for patients roughly 40 years or younger, while older patients will generally have the torn tissue treated by arthroscopic excision of the portion of the damaged meniscus.

Arthroscopic meniscal surgery is an outpatient surgical procedure, which generally takes less than one hour. The procedure can be done under general anesthetic or spinal anesthetic and patients routinely go home within a couple of hours of surgery. Patients can ambulate with crutches right way and those who take part in sedentary type of job activities are often seen back at work within three or four days. Patients generally feel 80% recovered from the procedure by about three weeks and generally can return to full activities, including sports, by six weeks. This type of surgical procedure represents the most common type of orthopedic surgical procedure done today. It represents a tremendous advancement in technology and skill over the last 30 years. In the 1970s many of these procedures were done through large incisions along the knee allowing for full exposure of the interior aspect of the knee. Advances in arthroscopic techniques done initially in the relatively large joint of the knee subsequently resulted in similar arthroscopic procedures being developed for numerous other joints around the body. These procedures include arthroscopy of the shoulder joint, hip joint, wrist joint, elbow joint, and multiple other small joints including the toes. Technological advances are still occurring in terms of surgical instrumentation, surgical techniques, camera optics, and tissue engineering which continually allows orthopedic surgeons to treat injured patients more effectively and more efficiently.

OAK ORTHOPEDICS

Maximize Performance and Minimize Heat-Related Illness

By Michael R. Holmes, Jr., PA-C, ATC • OAK Orthopedics



Athletes are continually searching for ways to increase their performance. One drink which does not get enough attention is water. Every system in the human body depends on this vital fluid. For example, water removes toxins from vital organs, carries nutrients to your cells, and provides a moist environment for soft tissues. On average, total body water (TBW) is approximately 60% of body weight. Therefore, it is the body's essential chemical compound.

Hypohydration can diminish endurance performance, increase physiological strain, and elevate perceived exertion. Classically, a reduction in body water ≥ 2% of body mass has been described to consistently reduce endurance performance. Daily water loss occurs from respiration, urinary/fecal processes, and sweat loss. In exercise, the primary means of hypohydration is sweat loss and skin blood flow for a given core temperature.

Cheuvront et al. (2003) have undertaken an extensive review of published studies examining the effects of dehydration on exercise performance. Evidence has concluded, in situations of exercise in a warm environment (defined as an ambient temperature > 30 °C or >86 °F), dehydration to the extent of 2–7% of body mass consistently decreased endurance exercise performance. However, the extent of the performance decrements was highly variable, ranging from 7% to 60%.

It was concluded that, in temperate conditions, dehydration by 1–2% of body mass had no effect on endurance exercise performance when the exercise duration was <90 min, but performance was impaired when the level of dehydration was >2% of body mass and the exercise duration was longer than 90 minutes.

Thus, a greater water deficit, climb in ambient temperature, and prolonged duration of exercise potentially increases an athletes' susceptibility for diminished endurance performance.

In addition, further complications may include heat related illnesses such as: heat rash, heat cramps, heat syncope, exertional heat exhaustion, and heatstroke. As coaches, athletic trainers, strength/conditioning specialists, and physicians we want our athletes to perform at their optimal level, while focusing on injury prevention. Potential signs and symptoms of hypohydration include:

- Dry skin or lack of sweat
- Increased thirst
- Low urine output
- Darker urine than usual

- Fatigue/Lethargy
- Cramps
- Fainting
- Weakness
- Dizziness

As previously mentioned, warm temperature and hypohydration can induce undesired effects on the body during exercise. There are two tools available to aide in establishing safety parameters for exercise sessions in warm environments. The universal wet bulb globe temperature (WBGT) index and heat index are widely used and should be utilized in potential hazardous conditions (Table 1 and Table 2).

To ensure adequate fluid intake, athletes should be educated on potential methods to properly hydrate and maximize their performance. Methods for hydration recommended by the Sports Medicine Advisory Committee (SMAC) and National Federation of State High School Associations (NFHS) include:

- Weighing oneself before and after exercise to ensure weight loss does not exceed >2% body mass
- Urine should be clear to a pale yellow color prior to exercise
- 16 ounces of fluid should be consumed 2 hours before exercise
- 8 to 16 ounces of fluid 15 minutes before exercise
- During physical activity, drink 4 to 8 ounces of fluid every 15 to 20 minutes (some athletes who sweat considerably can safely tolerate up to 48 ounces per hour).
- After exercise, drink 16 to 20 ounces of fluid for every pound lost during physical activity to achieve normal hydration status before the next practice or competition.

Table 1: The Universal WBGT Index.

		Easy Work		Moderate Work		Hard Work	
Heat Category	WBGT °F	Work/Rest*	Water per hour	Work/Rest*	Water per hour	Work/Rest*	Water per hour
1	78-81.9	No limit	½ qt	No limit	¾ qt	40/20 min	¾ qt
2	82-84.9	No limit	½ qt	50/10 min	¾ qt	30/30 min	1 qt
3	85-87.9	No limit	¾ qt	40/20 min	¾ qt	30/30 min	1 qt
4	88-89.9	No limit	¾ qt	30/30 min	¾ qt	20/40 min	1 qt
5	>90	50/10 min	1 qt	20/40 min	1 qt	10/50 min	1 qt

** Rest means minimal physical activity and is measured in the shade.*

Table 2: Heat Index

Celsius	Fahrenheit	Notes
27–32 °C	80–90 °F	Caution: fatigue is possible with prolonged exposure and activity. Continuing activity could result in heat cramps.
32–41 °C	90–105 °F	Extreme caution: heat cramps and heat exhaustion are possible. Continuing activity could result in heat stroke.
41–54 °C	105–130 °F	Danger: heat cramps and heat exhaustion are likely; heat stroke is probable with continued activity.
over 54 °C	over 130 °F	Extreme danger: heat stroke is imminent.

Exposure to full sunshine can increase heat index values by up to 8 °C (14 °F).[7]

It should be noted that along with water loss, there is also loss of electrolytes. These electrolytes include largely sodium and chloride with a smaller amount of potassium, calcium, magnesium, iron, and other minerals. Imbalance of these electrolytes can cause decreased fluid retention and exertional muscle cramping. Athletes who are "Salty sweaters," may need supplementation with a sports drink to maintain electrolyte balance.

- A 6 to 8% carbohydrate formulation is the maximum that should be utilized in a sports drink. Any greater concentration will slow stomach emptying and potentially cause the athlete to feel bloated. An ideal sodium concentration is (0.4–1.2 grams per liter).

In conclusion, a reduction >2% of body mass, increased ambient temperature > 30 °C or >86 °F, and exercise sessions >90 minutes compromise endurance performance. Those overseeing training sessions or competitive events should be aware of potential signs and symptoms of hypohydration and heat related illnesses. Early recognition is vital. Finally, tools can aide in developing safety parameters in warm weather environments to minimize heat-related illness, while educating athletes on hydration techniques may maximize performance.

OAK ORTHOPEDICS

Ice vs. Heat – When and What to Use

By Carey E. Ellis, M.D. • OAK Orthopedics

Two of the most commonly used modalities of rehabilitation clinicians, professional athletes and recreational athletes are ice and heat. However, there is a great deal of confusion and misunderstanding when it comes to using ice or heat. So when and which one should I use?

Cold therapy (or cryotherapy) is the use of a cold modality in the event of an acute trauma and subacute injury. The important use of cold therapy is to lower the temperature in the injured area reducing the metabolic rate and decreasing the production of metabolites and metabolic heat. Thus, cold therapy reduces additional damage to the injured tissue from the inflammatory response of the body. Other benefits of cold therapy include reducing muscle spasms and pain. Cold therapy includes ice packs, cold and ice whirlpools, ice massage, commercial chemical cold sprays and contrast baths.

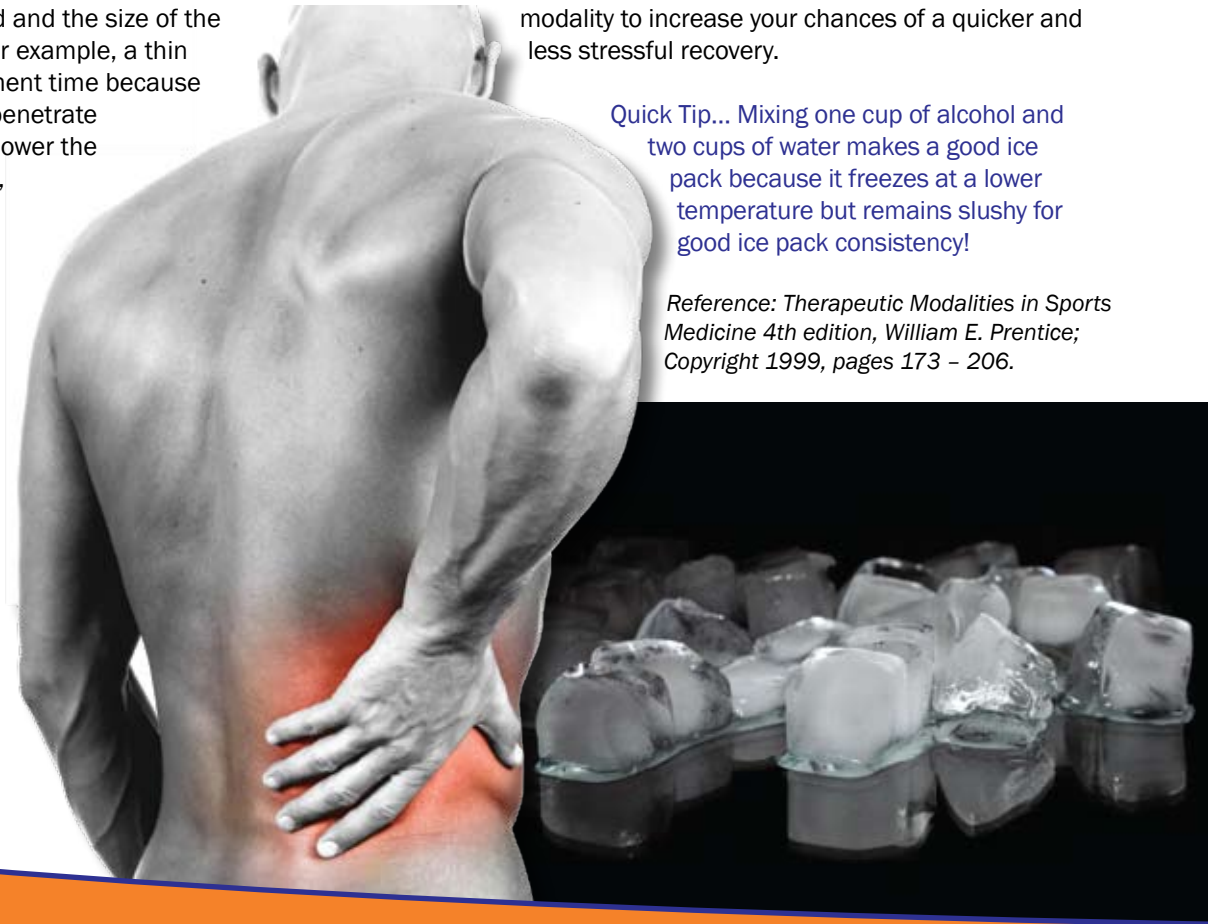
With an acute trauma or subacute injury only cold treatments should be applied in the first 72 hours to reduce the accumulation of swelling (edema), pain, muscle spasm or guarding. Treatment times vary depending on several factors including the size of the treatment area, type of cold therapy applied and the size of the individual being treated. For example, a thin person requires less treatment time because the cold does not need to penetrate through as much tissue to lower the intramuscular temperature, thus producing the desired therapeutic effect. There are four stages of cold that assist in determining the appropriate treatment time. The first stage of cold therapy is an uncomfortable feeling. Second, stinging. Third, burning or aching and finally numbness. It takes between five to fifteen minutes to reach all four stages. As a result, treatment time should be a minimum of fifteen minutes to achieve the important therapeutic effect of the treatment.

On the other spectrum, heat for the most part is the opposite of cold. Heat treatment (or thermotherapy) is recommended in subacute and chronic conditions for reducing pain and inflammation. The principal reasons for heat therapy application is to increase tissue temperatures, increasing blood flow, therefore drawing extra nutrients into the injured area to assist in the recovery and healing process. Because of this, heat should never be used on an acute trauma or injury until the swelling is controlled. The most common use of heat therapy is a moist or dry hot pack. Treatment time for heat is between fifteen and twenty minutes. Just like when using cold therapy, it takes heat a minimum of fifteen minutes to penetrate tissue to reach and raise temperatures. Other heat therapy applications include diathermy, ultrasound, warm whirlpool, paraffin bath, infrared lamps and fluidotherapy.

The application of cold and heat therapy can be safe, simple and inexpensive. The proper use of these modalities can assist the body during the healing process and help make the trauma or injury less stressful. Do not use these therapies for skin anesthesia or open wound care. If you are still unsure of which and what to use, contact a clinician and they will evaluate and apply the appropriate therapeutic modality to increase your chances of a quicker and less stressful recovery.

Quick Tip... Mixing one cup of alcohol and two cups of water makes a good ice pack because it freezes at a lower temperature but remains slushy for good ice pack consistency!

Reference: Therapeutic Modalities in Sports Medicine 4th edition, William E. Prentice; Copyright 1999, pages 173 – 206.



Keeping Kids on the Field:

How Athletes and Their Parents Can Avoid Over Use Injuries

By Carey E. Ellis, M.D. • OAK Orthopedics

In recent years, we have seen a sharp increase in the number of children engaging in intense, year-round training for a single sport. While this practice may lead to improved skill development and performance, the young athlete that "specializes" in only one sport loses the opportunity to allow stressed body parts to rest and heal, often leading to overuse injuries.

Overuse injuries are responsible for as many as half of all sports injuries in the United States. They occur when there is too much stress on a bone, muscle, or tendon, and adequate time is not taken to allow the injured tissue to heal. The causes of this cycle of worsening damage are numerous, and include competitive pressures, parental priorities, heroic practice, game schedules, and a sense of not wanting to "let the team down."

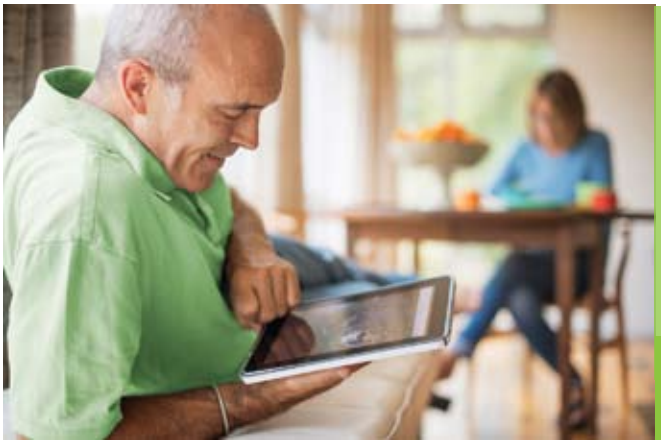
Although the mindset of playing through pain is common in athletes, parents, and coaches, there are a few clues that a seemingly minor ache may signal a more serious problem. The following are symptoms of overuse injuries that may require medical attention:

- Pain in a muscle, tendon, or bone during games or practices (even if the child is able to play).
- Pain that continues after a game or practice.
- Pain that prevents the athlete from performing at his or her typical level.
- Pain that causes an alteration in the child's mechanics or gait in order to participate.
- Constant or chronic pain, even when not playing.

Keeping tabs on an athlete's training schedule, nutrition, and athletic equipment may help parents avoid the development of injuries in their child. Limiting training to no more than five days a week and varying specific exercises from day to day allow stressed tissues time to heal.

Important benefits to sports participation in the pediatric population include the opportunity for children to interact with one another and to inspire excitement in working to reach personal or team goals. Intense training and game schedules and external pressures may transform a once pleasurable sports experience into a tedious burden. Parents should ensure that their student-athlete remains enthusiastic about an activity. Loss of interest in a sport may spread to other pursuits, such as academics. Increased moodiness, fatigue, or constant joint and muscle pain are outward manifestations of sports burnout and should facilitate open communication between athletes and parents regarding the benefit of continued participation.

Sports can be a valuable experience for both children and families. The athlete's goals must be made a priority, even at the expense of those of parents and coaches. With proper guidance and encouragement, the reward of sports participation can be a vital part of a child's development. Avoiding overuse injuries and burnout are important aspects of successful athletic involvement. Parents can play a huge role in assuring that these problems don't limit their child's opportunity to fulfill the foremost purpose of sports – to have fun.



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