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In Motion

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Common Hip Injuries in Kids

By Kevin Shea, MD

Pediatric athletes are subject to several different acute hip injuries. These injuries include problems around the growth plate and around the femur and pelvis. In some cases, acute symptoms can develop in association with previous hip conditions. Two common hip injuries are discussed below.

Slipped Capitol Femoral Epiphysis (SCFE)

Young athletes may develop significant pain during sports participation. Other athletes may present to a doctor's office with the chief complaint of pain in the hip, thigh, and/or knee. In patients with open growth plates, fractures may develop. These fractures may be a displaced fracture, where the bone snaps into two or more parts and moves so that the two ends are not lined up straight. In other cases, a fracture may occur on a pre-existing stress fracture of the growth plate. In each of these instances, an evaluation of the hip joint is necessary to ensure there is no evidence of a femur (large leg bone) fracture or SCFE. These athletes may present with sudden onset of pain, limp, or inability to bear weight. In some cases, they may also have a history of previous hip pain/discomfort, and loss of motion in some cases. These injuries require urgent evaluation, and prompt referral to an orthopaedic specialist. Delayed treatment can lead to disruption of the blood supply to the hip, and may predispose the athlete to arthritis in the future.

Hip Avulsion

A hip avulsion is an injury that occurs when a small chunk of bone that is attached to a tendon or ligament gets pulled away from the main part of the bone. This injury may occur in several areas around the hip joint. In many cases, they are associated with sprinting activities, including track/field, soccer, basketball, football, etc., and are due to very high impact forces on the tendon/muscles that attach to the bone. Hip avulsions can be identified by physical examination in some cases, although specific location of the injury is not always possible with examination alone. X-rays may be beneficial to identify the specific tendon and bone avulsion regions. While most of these injuries do not require emergent treatment, the recovery can take several months. Early evaluation, activity restriction, and appropriate therapy and return to sports will improve the outcome.

It is important for parents and coaches to be aware of hip pain in young athletes and make all necessary efforts to recognize quickly and treat to prevent future complications.

Preparation Ahead of Your Triathlon Key to Success

By Lance LeClere, MD

After an especially brutal winter for much of the U.S., many people with fitness goals and cabin fever may be anxious to jump into triathlon training. While triathlons can be extremely rewarding and beneficial for individuals looking to improve their physical fitness, triathlons and the extensive training that precede them, can pose substantial risks without proper planning and precautions.

A recent study found that in a group of athletes training for a triathlon, more than half had an overuse injury during the course of training![1] So how can you avoid this pitfall? Below are a few basic principles that can help keep you on track with your training, and ultimately help get you across the finish line.

Plan, Plan, Plan

The first step in any training program is to choose the distance and competition that is right for you. If you are just beginning, consider a sprint distance and work up to longer distances over time. Outline a comprehensive and personal training plan based on your individual skills and goals. Consult websites such as USA Triathlon to find a local triathlon coach and links to helpful training tips. Finding a coach or training partner that can help teach and emphasize proper technique and may help prevent injuries. Once your individual training program has been designed, be sure to stay disciplined and on track. If you fall behind, don't try to make up for lost time and overcompensate—this can lead to injury!

Maintain Proper Nutrition

Eating a well-balanced, healthy diet is always important, but during triathlon training, it is essential. Nutrition has often been called "The Fourth Leg" of the triathlon. Remember that you will be burning calories at a high rate (possibly up to 1,000 calories per hour with intense training). Eating foods with complex carbohydrates prior to training sessions and supplementing with gels during a prolonged workout can help ensure adequate carbohydrate intake. It is also critical to be disciplined with maintaining hydration!

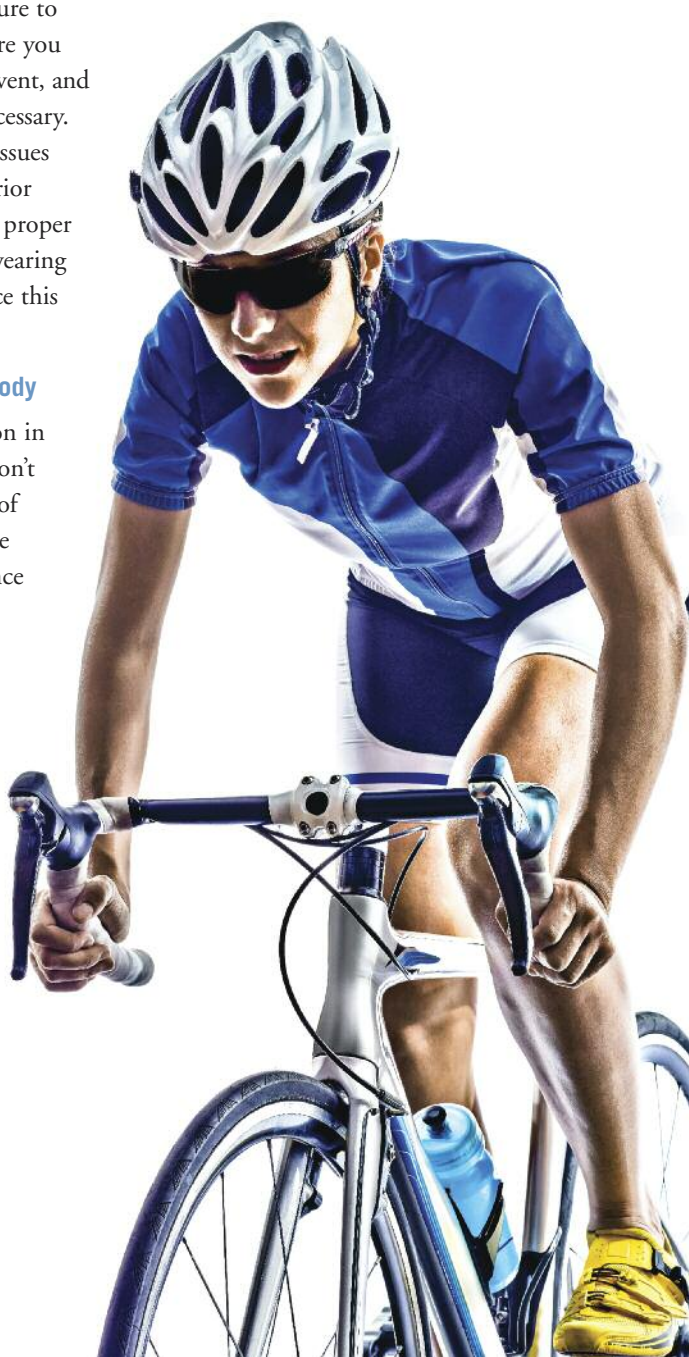
Check Your Equipment

Proper equipment is crucial. Be sure to check the water temperature where you train and at the location of your event, and consider wearing a wet suit, if necessary. Check your bike for mechanical issues and consider having it serviced prior to beginning your training. Wear proper fitting running shoes and avoid wearing a brand new pair on race day since this may lead to blisters.

Pay Attention to Your Body

Overtraining is extremely common in triathletes. If you develop pain, don't ignore it—that is the body's way of telling you that something may be wrong! If you are new to endurance sports, foot, shin, or hip pain may be a sign of a stress fracture. Tendinitis, strains, bruises, and blisters are common. But if you develop significant and/or persistent pain, seek medical attention before a potentially small problem develops into an issue that can cause you to miss your event entirely. Make sure that your training plan includes adequate time for rest and recovery too.

Whether you are training for your first triathlon or you are a seasoned veteran, injury prevention principles are the same—plan your training, maintain proper nutrition, ensure that you have appropriate equipment, and seek medical attention if necessary, but most importantly have fun!



1. Anderson CA, Clarsen B, Johansen TV, Engebretsen L. High prevalence of overuse injury among iron-distance triathletes. *Br J Sports Med.* 2013;47:857-861.

Can ACL Injuries Be Prevented in Girls?

By Alexander K. Meininger, MD

Adolescent girls who participate in competitive or recreational sports are at a higher risk for anterior cruciate ligament (ACL) injuries than adolescent boys. In fact, recent studies have shown female athletes have roughly three times greater risk of ACL tears during soccer and basketball.

Why the increased risk?

Anatomy, limb alignment, and hormonal and neuromuscular sources have been discussed by researchers as possible causes.

Patterns in female athletes during landing positions have also shown a more erect posture and tendency towards a different knee rotation when compared to males. Furthermore, females have a higher quadriceps-hamstring muscle mass ratio than males. This means female athletes are more likely to sustain alterations in knee alignment during landing due to their posture and are less likely to land properly and thus are at higher risk for ACL tear.

Unlike physical gender differences, muscle control can be improved and this may be an opportunity for sports medicine professionals to intervene. Enhanced muscular control of the lower extremities is possible through focused strengthening activities such as, plyometrics (jump training) and feedback-driven balance exercises. Exercise programs designed at preventing female ACL tears were first popularized almost 10 years ago. Since then the International Olympic Committee has acknowledged that prevention programs are effective in reducing ACL injury. Programs generally require 10 minutes or more of focused injury prevention exercises throughout the course of eight or more weeks.

Strengthening exercises that target the quadriceps, hamstrings, and gluteals, such as squats and lunges, counteract knee caving that places the athlete at high risk. Planks, prones, and core exercises also improve trunk strength and core stability.

Plyometric exercises are explosive, repetitive jumping exercises where targeted muscles in a stretched position rapidly contract. This combination of eccentric and concentric muscle contractions increases muscle power. Examples include dual and single leg squat jumps, bounding exercises, and box jumps that progressively increase in duration and intensity as the athlete gains proficiency and strength.

This type of training depends upon proper feedback and balance. Hip and gluteal strengthening can be enhanced with single leg exercises (step-ups, single leg lunges, etc.) to improve balance. Feedback from coaches and group participation can highlight deviations and reinforce proper form.

Multiple resources exist for sports medicine clinicians, coaches, and parents interested in active ACL prevention programs. **The Prevent Injury, Enhance Performance** or **PEP** program (www.smsmf.org/smsf-programs/pep-program) is one of the most common.

Enhanced muscular control of the lower extremities is possible through focused strengthening activities such as, plyometrics and feedback-driven balance exercises.

High Intensity Interval Training: Is It Right for You?

By Michael J. Leddy III, MD

Over the past decade, high intensity interval training (HIIT) has grown exponentially in popularity and participation. Franchise gyms are now available across the country offering an alternative to traditional work out programs. It has developed now into a competitive sport with lucrative sponsorships and prize money, including events such as extreme obstacle course races and athletic competitions that search for the fittest athlete.

What is high intensity interval training?

HIIT is an enhanced form of interval training that incorporates elements of Olympic weightlifting, plyometrics, powerlifting, gymnastics, calisthenics, strongman, and other exercises. It promotes the strategy of alternating periods of short intense anaerobic exercise with less-intense recovery periods. HIIT is a form of cardiovascular exercise. Usual HIIT sessions may vary from 4–30 minutes. These short, intense workouts provide improved athletic capacity and condition, improved glucose metabolism, and improved fat burning.

Why has HIIT become so popular?

HIIT offers shorter, more intense workouts that allow participants to spend less time in the gym while maximizing a workout. The workouts also change daily which breaks the monotony of boring gym routines. Workouts also are done in groups where each individual encourages the other to continue to push on.

Are there health concerns with HIIT?

As HIIT's popularity has grown, so has the prevalence of certain injuries. Overuse injuries such as tendonitis, bursitis, and muscle strains are on the rise. Many times this is due to an individual's jumping right into these programs after being sedentary for some time. Also, many of the exercises and maneuvers are new to individuals as is much of the equipment used. This can lead to poor technique and improper use that in turn could lead to serious injury. Participants should also be aware of exertional or exercise induced rhabdomyolysis. This is a potentially dangerous condition caused by significant muscle breakdown due to extreme physical exertion.

How do I get started in HIIT?

Prior to starting any exercise program, any individual with prior medical concerns should consult his or her physician. New participants should first establish a baseline level of fitness. Workouts should be held in clean, well maintained facilities, under the supervision of a certified trainer. Athletes should feel comfortable with all equipment and learn appropriate technique and form to lessen the chance of injury. If pain or discomfort does develop, have it evaluated by a physician prior to continuing. Finally, always maintain proper hydration and nutrition.

About AOSSM and *In Motion*

As a world leader in sports medicine education, the American Orthopaedic Society for Sports Medicine (AOSSM), we have designed the publication to highlight relevant information for multiple age groups from exercise and rehabilitation to nutrition and psychology.

This important educational tool is published quarterly and distributed electronically.

AOSSM members can add their practice name and logo to *In Motion*. Personalizing *In Motion* is an easy way to get pertinent, patient-friendly sports medicine information to your patients with just a click of a mouse. For more information, please e-mail Lisa Weisenberger at lisa@aossm.org or contact the Society at 847/292-4900.

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