ILIOTIBIAL BAND PAIN IN RUNNERS: Is Inflammation the Cause or a Symptom?

By: John Fiore, PT

Lateral knee pain is a common running overuse injury. The iliotibial band (see figure 1), is a large fibrous connective tissue band extending from the tensor fascia latae and gluteal musculature. The widely accepted cause of lateral knee pain in runners is known as iliotibial band friction syndrome (ITBFS). Methods of traditional ITBFS diagnosis include assessment of iliotibial band tightness, pain to palpation along the lateral tibia (Gerdy’s tubercle), and pain to palpation along the distal IT band. The traditional explanation for IT band pain in runners is excessive friction of the IT band as it slides in an anterior-posterior direction as the knee moves from an extended to flexed position.1 Further anatomical investigation coupled with the relatively poor short-term results in the treatment of IT band pain warrant further discussion.

Fig 1:

Muscles of Hip and Thigh

![Muscles of Hip and Thigh Diagram]
Iliotibial band pain is a topic all too familiar to me. Two weeks ago following a three-hour trail run, I experienced the stiffness and sharp, achy pain in my lateral knee characteristic of ITBFS. Conservative treatment helped initially, but a short run a week later proved the cause of the symptoms had not been addressed. Rest (from running) combined with all of the modalities and Kinesio Tape techniques I could throw at it produced positive results in all non-running activities. Today, however, the IT band symptoms returned at mile 14 of a 50-mile trail running race. By mile 20 I was unable to run and walked the next 16 miles only to drop out of the race at mile 34. At mile 20, I felt my proximal tib-fib joint (see figure 2) "pop" and the tension of the IT band progressively increased. Over the next 16 miles I ruminated over the kinematics of the tib-fib joint, hip joint, knee joint (tibia-femoral), and ankle joints. “If the IT band is the cause, then why does my hip feel tight?” “If the IT band is the cause, then why does my foot and ankle feel clumsy on the rocky trail?”

**Fig 2:**

Underlying causes of lateral knee pain in the region of the iliotibial band in runners should be included in a comprehensive physical therapy assessment. Traditional treatment techniques are temporary and time consuming. The following contributing causes will facilitate a more effective long-term resolution of symptoms and a return to pain-free running.

**ILIOTIBIAL BAND FRiction FACT OR FALACY**

The IT band is not an independent structure which slides over the lateral femoral condyle as widely thought. The IT band is an extension of the fasciae latae which encases the upper thigh. In addition to its attachment to the tibia (Gerdy’s tubercle), the IT band also has fibrous anchors to the femur, making significant...
movement of the IT band over the femur unlikely. A richly innervated layer of fatty tissue beneath the IT band becomes inflammed and painful when tension under load (running) increases through the IT band (Fairclough, it al).

MUSCULAR IMBALANCE AND WEAKNESS
Deep cross friction massage or aggressive Astym or Gua Sha treatments may further irritate the painful region. Releasing the more proximal IT band and hip/gluteal musculature through manual therapy techniques (active release, contract-relax, muscle energy) and deep tissue massage will decrease the tension through the painful distal IT band. Muscular weakness in the gluteus medius muscle results in overuse or over-compensation of the tensor fascia latae muscle (TFL). The TFL extends distally to the lateral knee via the iliotibial band. Overuse of the TFL leads to increased IT band tension and compression.

HIP JOINT STIFFNESS
Hip joint stiffness decreases the efficiency with which the hip absorbs torsional forces and impact associated with running. Limited hip mobility results in increased joint compression and lateral knee tension. Chronic hip weakness and degenerative changes contribute to hip joint stiffness. Assessing the full range of motion of the hip joint may reveal an asymmetry worthy of treatment for IT band pain. Joint mobilization and contract-relax techniques will help to restore healthy hip mobility.

ANKLE AND KNEE JOINT (TIB-FIB) STIFFNESS
The more I study the kinematics of the ankle the more I realize how underappreciated the ankle is! Pronation (controlled lowering of the arch with weight bearing) is an intrinsic means to absorb shock and transfer tension and stress associated with running toward the more muscular hip and knee. Ankle pronation with weight bearing results in a medial (inward) rotation of the tibia relative to the femur when the knee is flexed, and a lateral (outward) rotation of the tibia relative to the femur when the knee is extended. The fibula (lateral lower leg bone) has a proximal and distal joint attachment to the tibia. Anterior-posterior and rotational motion must be occur during running in the proximal and distal tib-fib joints to effectively transfer tension through the knee and to the hip where muscle stability absorbs the impact of running. Stiffness in the proximal and/or distal tib-fib joints transfers stress and tension associated with running in the lateral knee.

STRESS FRACTURE
Pain in the area of the lateral knee and proximal tib-fib joint which does not respond to conservative treatment or assessment of the secondary causes of lateral knee pain warrants diagnostic testing. Second only to metatarsal stress fractures, stress fractures in the tibia and fibula are common as these are the first long bones subjected to torsional stress while running. An X-ray may show a stress fracture, but the fracture may not show up on an X-ray prior to the formation of a bone callous later in the healing phase.
Magnetic Resonance Imaging (MRI) may more accurately show a stress fracture but the cost is much higher.

Treatment techniques, therefore, must address each of the possible contributing factors, therefore, to bring about a comprehensive, effective, long-term solution. A physical therapist skilled in manual therapy techniques specific to runners can be a source of information and treatment knowledge to get you back to your favorite running routes and races.


**PHYSICAL THERAPY: Pregnancy and Postpartum**

*By: Rachael Herynk, DPT*

With my own due date approaching, I am thrilled to be able to help myself and other women avoid and treat issues that arise during pregnancy and postpartum.

**During Pregnancy**

Exercise during pregnancy promotes improved maternal and fetal health, including growth and energy. It can also decrease stress, risk of gestational diabetes, pain and discomfort, and pelvic floor muscle dysfunction, and prevent injury to mother and fetus. Pelvic floor exercises started during pregnancy result in less incontinence and pain after delivery. Physical therapy can provide help in establishing general exercise guidelines and also specific exercises to reduce pain and prevent injury. Physical therapists can help in finding good birthing positions, not only to help with delivery but also to reduce discomfort and promote relaxation during labor. Physical therapy can also help with instruction on how to perform perineal massage, gentle stretching of the tissue between the vagina and anus, prior to delivery. Controlled studies show that perineal massage does seem to result in a greater likelihood that the perineum will be intact at the time of delivery.

**Postpartum**

Proper body mechanics are very important for reducing pain and injury after delivery. Physical therapists provide instructions for improving postures and reducing stresses placed on the body during repetitive infant care activities such holding, lifting/carrying, nursing, changing diapers, carrying car seats and pushing strollers. Pelvic Floor muscle exercises are important prior to delivery and may feel even more important after delivery, especially if a new mother is experiencing incontinence. Physical therapy provides progressive exercises for strengthening the pelvic floor to reduce episodes of incontinence. Exercises can usually starting within 1 week of an uncomplicated, vaginal delivery and after 6 weeks in cases of cesarean sections. Resuming exercise and finding ways to
exercise with a new baby is important in helping new mothers bond with their baby, return to their pre-pregnancy weight, improve cardiovascular fitness, decrease urinary incontinence, and promote energy and feelings of well being. Physical therapy can also be helpful in screening for postpartum depression in new mothers.

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3. Picture: Netter images
Mommy & Me: Exercising with your baby


Postpartum body mechanics

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POST-RACE RECOVERY:
Tips & Tested Techniques

By: John Fiore, PT

As the Missoula Marathon and Half-Marathon approach and trail running races are going full speed, post-race recovery must be a priority. Training programs for half-marathons, marathons, and ultra-marathons are as varied as the runners participating in these races. The weeks and months of training allow your body to gradually develop a tolerance to the demands of distance running. Recovery during a pre-race training program is often less structured and received less emphasis. Successful recovery during training reduces injury and allows the body to prepare for the next training goal.

Successful recovery following a targeted racing event, however, is crucial to future running success and to your health in general. While some recovery techniques are founded in login and physiology, many are rooted in unsubstantiated tradition and anecdotal success.
Below are several components and techniques to be included in a successful recovery program to insure future running success and overall wellness following competition:

ICE BATH
Circulation is a key component to speedy and effective recovery. A post-race ice bath is a sure way to kick your circulatory system into gear. Restoring circulation will aid in removal of lactic acid following prolonged muscle use which will result in less post-race soreness.

We are fortunate to have the cool waters of the Clark Fork River in our backyard. A five to ten minute lower body submersion is effective and may be used in place of your bathtub filled with cold water and ice cubes.

HYDRATION
Dehydration is a common condition following a summer race. Even though we drink throughout the race, we inevitably lose more fluids through sweat and respiration than we can realistically replenish. Post-race hydration should begin immediately following the race and continue for two to three days.

Water is simple and familiar to the body, but electrolyte fluids will aid in a more rapid recovery and return to running. The fact that caffeinated beverages and alcohol are diuretics should not be your sole re-hydration source.

NUTRITION
Post-race nutrition is necessary to enable the body to repair itself following the rigors of a race. Consuming calories within the first hour following a race or strenuous workout boosts recovery. Many runners have a preferred post-race meal. Favorites range from smoothie concoctions to chocolate milk. Whatever your favorite is, be sure your calories are a balance of protein, carbohydrates, and even some fat to rebuild muscle tissue and fuel your recovery.

SLEEP
Much of our actual tissue (muscle, tendon, ligament, bone) healing following a race or workout takes place while we are sleeping. While uninterrupted sleep may be difficult following a race due to malaise or exhaustions, consider a solid 8+ hours of sleep a priority the week following competition. Relaxation breathing, visualization, and reading are great ways to calm the mind in order to allow the body to sleep and recover.

HEART RATE
A low resting heart rate is a trademark of an endurance athlete. The cardiovascular system becomes more efficient pumping blood and oxygen throughout the body with endurance training. Fatigue level can be documented by taking your resting heart rate the morning following a race. If your resting heart rate is 10% greater than your normal resting heart rate, your body need rest and your training should be adjusted accordingly.
MASSAGE
Massage encourages circulation, relaxes fatigued, tight muscles, and aids in overall relaxation during recovery. Many runners utilize rollers, or recovery (retrograde or effleurage) massage. Make sure your post-race massage is not too aggressive or deep, and be sure the physical therapist or massage therapist you see is experienced working with runners.

DRY NEEDLING
Dry needling kicks the body’s innate healing potential into full speed. Both homeostatic acupressure points and symptomatic acupressure points are treated to speed recovery by unlocking your body's natural potential. See our website or call John to find out more about how dry needling could be the missing piece of your training and recovery puzzle.

ACTIVE REST
Recovery following a race does not allow you to become a couch potato. Active rest is not only positive for the body, but also for the mind. While your body recovers from a high-end running effort, enjoy other cross training activities. Among my favorites are bicycling, yoga, Pilates, and hiking. Keep the intensity of your active rest period (the duration of the active rest period depends on your level of soreness/fatigue, and the duration of your race) mild and be sure you are not increasing your muscle soreness.

REBUILD YOUR FOUNDATION
Extensive training and racing break down your body’s intrinsic support system. Key areas to rebuild during your recovery period include the hips, feet, and core. Our hip, foot, and core musculature and associated connective tissue provide us with the stability required to run. Remember to rebuild your foundation musculature to insure injury-free running.

REFLECT ON YOUR RACE
Every race is an experience of multiple emotions. Every race is an experience we can learn from. Reflect on the positives of your race and learn from the lessons your race has taught you. Do not dwell on your race. Reflect on it, learn from it, and move on to your next goal, knowing you gave it your best effort.

REVERSE TAPER
A fairly outdated recovery guideline is one day off for every mile raced. Obviously, such a guideline is not realistic when half-marathon, marathon, and ultra-marathon distances are at stake. A better guideline is to take care of hydration, nutrition, sleep, resting heart rate, and actively rest. When you begin training for your next race, gradually build up your mileage and intensity in a graduated, reverse taper progression.

REDISCOVER RUNNING
The anticipation and pressures of racing can be as exhausting as running itself. Avoid burn out associated with racing by returning to the basics. I run to explore the amazing mountain trails around
Missoula and the Rocky Mountains. Return to what excites you about running. Whether it is running with friends, exploring new trails, or trying new training programs, rediscover why you enjoy running as you complete your recovery and have your legs beneath you.

Every race is a lesson. Every race is humbling. Every time you complete a race you have completed a significant effort. You owe it to yourself and to your health to recover to enjoy running and racing again.

John Fiore, PT

**SUMMER 2013: Schedule of Upcoming Events Near You**

By: Lindsey Flint, DPT

June 19: Missoula Ten Spoon 10K
June 21-23: Missoula XC Mountain Bike Race at Marshall Mountain
June 22: Mullan, ID - St. Regis Trail Rail Run 50 mile, 50K, 30K, 10K
June 29: RATPOD in Dillon, MT 130 mile bicycle ride to benefit Camp Mak-A-Dream
June 29: Condon Celebrate the Swan Half Marathon, 10K, 5K, 5K walk, 1 mile fun run
June 29: Potomac Pioneer Festival 11 mile, 6 mile, 1 mile fun run
June 29: Ronan Santa Maria Tri-Tip 5K Run/Walk
June 29: Missoula Blackfoot Challenge Kayak/Canoe/SUP races to benefit Missoula Food Bank
July 4: Missoula 4 on the 4th at the Fairgrounds ½ mile, 4 mile
July 13: Devil’s Backbone 50 mile trail run, Bozeman, MT
July 14: Missoula Marathon and Half-Marathon
July 20: St. Ignatius 34th Buffalo Run Half Marathon, 7 mile
July 27: Lake Como Triathlon 1500 yd swim, 12.6 mile mountain bike, 7.7 mile trail run
July 27: Missoula Book’n It for the Library 8K, 3K

August 25: Missoula River City Roots 4 Mile Run/Walk

September 7: Missoula Dirty Dash
September 14: Rut Mountain 12K and 50K - Big Sky Montana
September 14: Missoula Diploma Dash 5K, 1 mile Run/Walk
September 21: Victor, MT Sweathouse Half Marathon
September 25: Missoula Wednesday Night Cyclocross
September 28: Missoula Heart Walk and 5K Run
September 29: Missoula 3rd Annual Rockin’ Race for AIDS Awareness 10K, 5K

Check out [www.406running.com](http://www.406running.com), [www.runmt.com](http://www.runmt.com) for a full list of running races and [www.montanacycling.net](http://www.montanacycling.net) for a full list of cycling events around the state.
In runners with iliotibial band syndrome, Prolotherapy would be recommended into and around their knees and hips. If the hip is evaluated and considered stable, then an athlete with iliotibial band syndrome will get Prolotherapy to the area on the tibia where the iliotibial band attaches. If there are other parts of the iliotibial band that are tender on the athlete besides the attachments, then these areas are treated with the components of Comprehensive Prolotherapy, including Neurofascial Prolotherapy, and/or Platelet Rich Plasma to increase healing to the area. Isolated iliotibial band rupture after corticosteroid injection as a cause of subjective instability and knee pain in a military special warfare trainee. Mil Med.