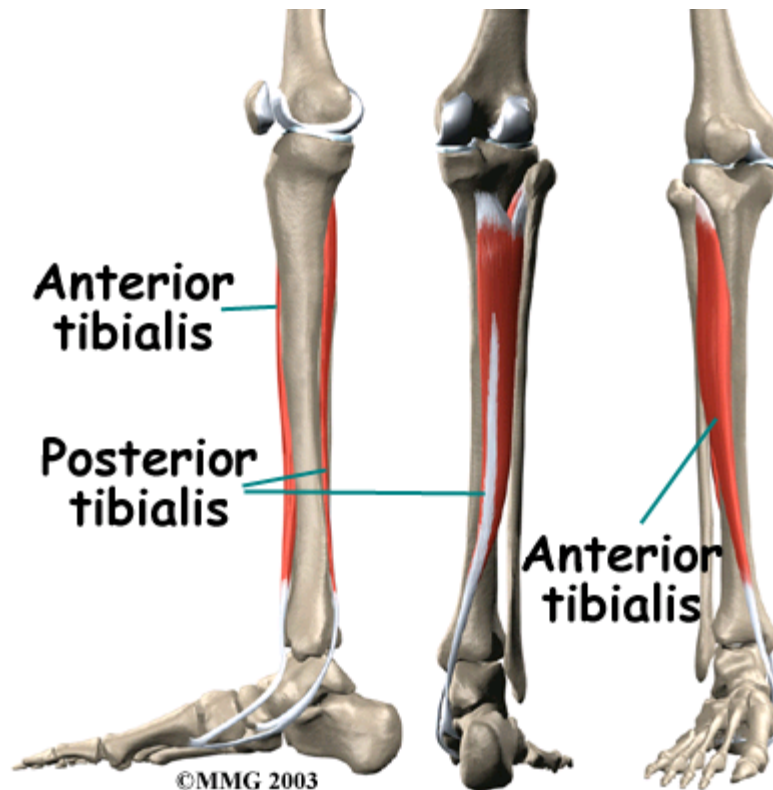


Shin Splints (Medial Tibial Stress Syndrome)



Two lower leg bones: fibula and tibia. The tibia is the largest and located in the inside. Two muscles can be involved: either the anterior tibialis or posterior tibialis which both attach onto the tibia

Shin splints is pain in the lower inside leg (along the tibia) caused by abnormal stress placed on the outside layer of the tibia bone (called periosteum) by overuse of one of these muscles, usually associated with a change in activity level.

Possible Causes

- Muscle and flexibility imbalances in the lower body
- Improper Footwear
- Overpronation (flat arches with weightbearing)
- Tight calves
- Increased training too quickly

Symptoms (may have some or all)

- dull, aching pain along the 'shin'
- redness and swelling
- tenderness with possible bumps along front or inside of lower leg
- pain with activity that eases with rest
- pain first thing in the morning
- pain with specific muscle use
 - Anterior Tibialis: actively bend your foot toward your nose
 - Posterior Tibialis: actively point your foot down and in

What Can I Do?

- Rest (modify activity)
- Ice
- NSAIDS (ibuprofen, motrin, etc)
- Calf stretching
- Soft tissue massage/mobilization
- Compression (wrap or tight soccer socks)
- Taping
- Cross-train in less weightbearing activities (biking, swimming, water jogging)
- Lower leg strengthening (cannot be painful)
- Proper footwear
 - Shock absorbing insole
 - Orthotics or Stability shoes for pronation control

When to Seek PT Treatment

- If symptoms are worsening instead of getting better
- If symptoms are persistent during rest periods
- Significant redness and swelling
- Ankle feels weak with movement
- Change in sensation in the ankle or foot (i.e. numbness, tingling)

Additional Resources

Alpine Physical Therapy, Online

www.AlpinePTmissoula.com (Resources, then Conditions)
www.HealthAndFitness101.com

Alpine Physical Therapy, Three Locations

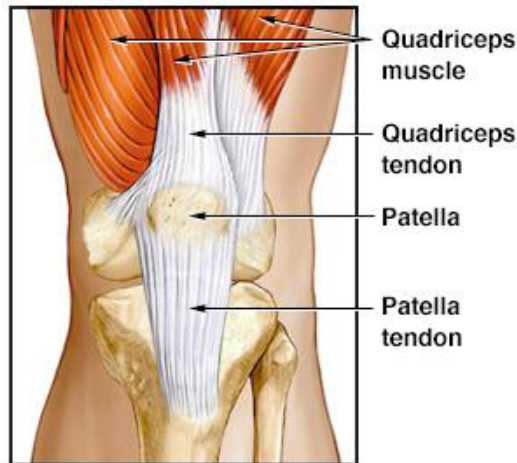
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Anterior Knee Pain (Patellar Tendonitis/Patello-Femoral Syndrome)



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The structures located in the anterior (front) aspect of the knee are the patellar tendon, the patella (knee cap), quadriceps tendon, the distal femur where the patella sits in a specific groove, meniscus (knee cartilage), and laterally the distal aspect of the iliotibial band.

Anterior knee pain can occur when there is poor tracking of the patella in the groove on the femur, when there is irritation of the patellar or quadriceps tendon due to muscle imbalances/weakness, structural imbalances from the femur, tibia, or foot.

Possible Causes

- Surface/training errors
- Over-striding
- Heel strike alignment
- Increased knee flexion at midstance
- Over-pronation at midstance
- Too little pronation (supinated foot, poor shock absorption)
- Over posting orthotics or greater rigidity than needed
- Structural abnormalities (Leg length discrepancy, increased Q-angle, increased femoral anteversion)
- BMI greater than normal
- L3 (lumbar spine) facilitation, weakness
- Joint effusion and secondary weakness, especially VMO

- Weakness in quads or decreased timing
- Decreased quad/hip flexor/ITband length
- Tight hip rotators, tight anterior hip capsule
- Poor pelvic control/strength

Symptoms

Pain in the front aspect of the knee at the patella itself, behind the patella, just below the patella (the patellar tendon), above the patella (quadriceps tendon), or to either side of the patella or tendon. The pain usually begins after increased exertion, progresses to being painful during activity, and can progress to being painful outside of the activity. There can be swelling present at the joint or either tendon. Pain may be present with some daily activities such as doing stairs, walking on hills or squatting down.

What Can I Do?

- Rest (modify activity)
- Ice
- NSAIDS
- Stretching
- Soft tissue mobilization, Cross friction massage
- Taping, patellar strap
- Cross training with good form
- Appropriate lower extremity and core strengthening
- Mobilization of patella
- Proper foot wear, possibly including orthotics
- Movement corrections with specific running drills

Additional Resources

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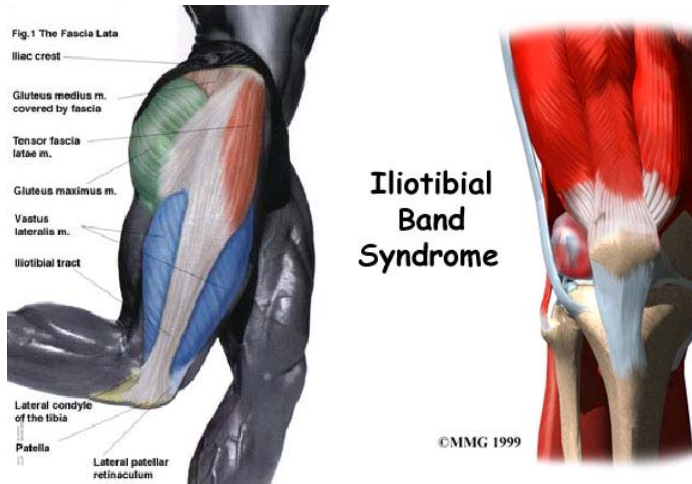
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Iliotibial Band (ITB) Syndrome



The Iliotibial Band (ITB) is a thick fibrous band that travels from the top of the pelvis, crosses the hip and knee joints and attaches at the top of the lower leg bone, called the Tibia. The Tensor Fascia Latae (TFL) and a portion of the Gluteus Maximus directly attach to the ITB.

ITB Syndrome is when there is irritation to the ITB resulting in pain most commonly on the outside of the knee but can also cause pain in the hip or lateral thigh. Often the pain is a result of too much tension in the ITB causing excessive friction and inflaming a Bursa at the hip or knee. A bursa is a fluid-filled sac located between a tendon and a bone.

Possible Causes

- Weak Hip Abductors (specifically Gluteus Medius)
- Overpronation (falling arch in weightbearing)
- Tightness in Hip Flexors, Gluteus Maximus and Hip Rotators (i.e Piriformis)
- Quick increase in mileage
- Excessive downhill running
- Instability or Joint restrictions in the pelvis, hip or knee
- Leg Length Discrepancy
- Running on slanted surface
- Improper foot position on bike pedal (turned inward)

Symptoms (may have some or all)

- Primary pain site is sharp pain or ache on outside of knee (most common)
- Dull ache outside of thigh or down into lower leg
- Snapping over the knee with bending/straightening
- Local redness or swelling at outside of knee
- Hip Bursitis can also be a result of ITB Syndrome
- Pain with pressure at outside of knee, thigh and/or hip
- Initially pain that begins a few miles into activity
- Initially worsens after activity and improves with rest
- Pain with lying on the affected side

What Can I Do?

- Relative Rest (modify activity)
- Try water running, swimming or biking (non-impact)
- Icing to outside of knee
- NSAIDS
- Sleep on unaffected side with pillow between knees
- Check your footwear: worn out or may need medial stability shoe
- If biking: make sure your bike is properly fit
- If running: change to softer, level surface, not circular
- Cho-Pat ITB Strap (placed above knee)
- Deep Tissue Massage to ITB, not directly over pain at knee or hip
- Exercises ideas: Hip strengthening (specifically gluteus medius), hip flexor stretching (specifically TFL), Posterior hip stretching (piriformis and gluteus maximus), Sidelying rolling on Foam Roller, CORE strengthening
- Options: physician directed cortisone injections and in very severe conditions a surgical release of ITB have been reported.

When to Seek PT Treatment

- If experiencing numbness/tingling and/or apparent weakness in leg
- If experiencing concomitant low back pain
- If symptoms are worsening rather than improving
- If symptoms are persistent into rest periods
- If symptoms are affecting your performance or form and you want to continue to participate in activity

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Plantar Fasciitis (Heel Pain)



The plantar fascia (aponeurosis) is thick fibrous tissue that connects from the bottom surface of the heel bone to the bottom of the toes. The role of the plantar fascia includes: 1) holding the parts of the foot together (bones, nerves, muscles, tendons), 2) protect the bottom of the foot from injury, and 3) helps support the longitudinal arches of the foot.

Plantar fasciitis is usually an overuse injury caused by strain and inflammation of this tissue creating heel pain and potentially arch pain in the foot. Often people think this is caused by a bone spur but research has found that this is not the case. On x-ray, bone spurs are seen in people with and without heel pain. Heel pain can also occur from stress fractures, fat pad contusion, medial calcaneal nerve entrapments, tarsal tunnel syndrome, lumbopelvic spine conditions (i.e. sciatica, lumbar disc injury).

Possible Contributing Factors/Cause

- Tightness and/or weakness in muscles of the lower leg that attach in the foot.
 - o Gastroc/Soleus (usually tight)
 - o Posterior Tibialis (usually weak)
 - o Anterior Tibialis (can be weak or tight)
 - o Peroneals (usually weak)
- Weak foot intrinsic (small muscles in the foot)
- Proximal weakness in the trunk and upper legs
- Excessive pronation or supination
- Improper footwear
- Wearing high heels on a regular basis contributes to lower leg tightness.
- Repeated high direct impact (excessive heel strike with running or poor shock absorbing aka..hard landing).
- Decreased dorsiflexion range of motion/ankle equinus (old ankle sprains, tight calves, joint stiffness)
- Asymmetrical weightbearing through lower extremities (are you balanced)

Symptoms (may have some or all)

- Pain in the bottom of the heel with weightbearing.

- Usually worse first thing in the morning and improves during the day
- Often painful with first few steps after prolonged sitting during day.
- Aggravated by walking, standing, running (weightbearing activities)
- Eases with rest.
- Often worse if walking barefoot versus supportive shoes.
- Pain often reproduced with direct palpation of the insertion point on the heel bone and with stretching the toes into dorsiflexion (up).

What Can I Do?

- Addressing Symptoms:
 - o Supportive Footwear
 - o Taping Arch
 - o Ice (frozen plastic bottle) after activity
 - o Massage to plantar fascia and calf muscles
 - o Relative Rest – nonweightbearing ex's (swimming, water running)
 - o Heel cup, night splint, walking boot (very severe)
 - o NSAIDS
 - o Ultrasound
 - o Acupuncture
 - o Cortisone Injections (very painful)
- Addressing Mechanics:
 - o Calf stretching
 - o Ankle Strengthening
 - o Foot Strengthening
 - o Ankle Dorsiflexion stretching (joint vs muscles)
 - o Soft Strike Drills
 - o General trunk and proximal leg strengthening to improve impact
 - o Get your footwear checked
 - o Orthotics

When to seek PT treatment

- If experiencing numbness/tingling and/or apparent weakness in leg
- If experiencing concomitant low back pain or posterior leg pain
- If symptoms are worsening rather than improving
- If symptoms are persistent into rest periods
- If symptoms are affecting your performance or form and you want to continue to participate in activity
- If you want direct treatment for symptoms and assistance addressing biomechanics

Additional Resources

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Preventing Low Back Pain in Runners

What is it?

Low Back Pain is any symptom (including stiffness) that originates from a structure in the lumbar spine or pelvic. Common areas include the low back, posterior glutes, lateral hip and thigh, posterior thigh and less commonly the groin and anterior thigh.

Possible Causes in Runners

- Core strength does not equal the physical demands on your body. Relative weakness either results in excessive mobility in trunk and/or pelvis OR rigidity in spine from abdominal bracing. Goal: controlled fluid mobility.
- Stretching: not enough or poor form
- Balance Deficits: when you run you are on one foot 100% of the time
- Pathology: genetic or acquired.

Core Strengthening

- Foundational
 - Supine Base Pelvic Floor, Transverse Abdominus, Multifidus
 - Maintaining spinal position (often neutral) in static positions: tabletop, bird dog, plank
- Functional
 - Move it and challenge it: pelvic bridge with marching, side-lying plank with side leg lift, lunges with good control, running drills with good pelvic control

Stretching

- Hip Flexor:
 - Standing quad stretch- knee under hip, posterior pelvic tilt
 - Kneeling Lunge – posterior pelvic tilt
- Hamstring:
 - Standing: hinge at hips and ‘poke’ tailbone away
 - Lying: belt or hand behind thigh, knee above hip
- Gluteals
 - Figure 4/Piriformis, Knee to Chest
- Spine
 - Lower Trunk Rotation
 - Cat-Camel: segmental

- Prayer/Child's Pose

Balance

- Single Leg Challenges
 - Static x 30 seconds, eyes-open, eyes-closed
 - Static on uneven surfaces
 - Move other limbs: star taps
 - Bound and hold

When to Seek PT Treatment

- Don't ignore it or run through it if it is affecting your form.
- Worsening or not improving with self treatment and rest.
- Judge the quality of the pain: sharp is telling you something different than stiff.
- History of previous LBP that is resurfacing with increased mileage.
- Any associated Leg Weakness or Numbness/Tingling
- Still persistent after incorporating the above exercises into your routine.
- Interfering with your training and you want to make sure you are doing the right things.

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