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## **Iliotibial Band Tendinitis**

(Runner's Knee)

### **ANATOMY**

The iliotibial band (or tract) is a thick band of tissue that starts on the pelvis and upper thigh and passes along the outside of the knee and attaches to the outer tibia. When the knee moves the iliotibial band slides over a bony prominence on the outer knee (lateral femoral epicondyle). Iliotibial band friction syndrome or iliotibial band tendinitis is a painful condition on the outer (lateral) aspect of the knee that is common in long distance runners.

### **INJURY**

The iliotibial band friction syndrome is an overuse injury caused by repetitive friction of the iliotibial band crossing the lateral femoral epicondyle. It is a well recognized cause of knee pain in runners, so it is commonly called "**runner's knee**". It can also occur in other athletes.

The average jogger strikes the foot against the ground 3,000 times per mile.

This adds up to 60,000 foot impacts for every twenty miles. While running you only have one foot on the ground at a time. When walking, 30 percent of the time, both feet are on the ground. When running, the force of landing has been estimated to be about three times your body weight. This means that if you weigh 150 pounds, the force in your leg when you land is around 450 pounds. Shoe mileage should also be considered. After 500 miles most shoes retain less than 60% of their initial shock absorption capacity.

When cycling, with each pedaling stroke, the iliotibial band slides over the lateral femoral epicondyle. Knee flexion and extension occur approximately 4800 times an hour (at an average cadence of 80 revolutions per minute), so the iliotibial band is susceptible to repetitive irritation.

### **Treatment**

The injury is the result of too much running. In the simplest terms, if you stop running, the injury will eventually heal. There are ways, however to continue to run if you modify your training schedule and technique.

Initial treatment has two objectives: to reduce the inflammation and to allow the iliotibial band to heal. When the knee is painful and swollen, you must rest it. Avoid activities that aggravate the pain. Reduce your activity to a pain free level. Keep your knee straight while sitting, and avoid repetitive squatting. Let pain be your guide. Mild discomfort or ache is not a problem but do not do activities that cause definite pain.

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Ice your knee for 20 minutes, two or three times a day and after any sporting activities— apply a bag of crushed ice over a towel. This reduces swelling, inflammation and pain. Aspirin, Aleve or Advil sometimes helps to relieve pain and reduce inflammation.

A physical therapist or Dr. Nelson can recommend exercises to strengthen the muscles. Exercises can also be used to stretch and balance the thigh muscles. In rare cases surgery may be indicated.

## **Sports**

Use your judgement. When your knees hurt, avoid sports that may aggravate your knee problems. Total elimination of running may be required for a while. When your knee is better, you should be able to return to most sports.

**Sports that aggravate iliotibial band syndrome:** distance running, cycling, volleyball, basketball, soccer, racquetball, squash, football, weightlifting (squats).

**Sports that may or may not cause symptoms:** baseball, hockey, skiing and tennis.

**Sports that are easiest on the knees:** Swimming (especially with a flutter kick), walking (avoid up and down hills), and cross-country skiing.

Although many sports can cause or aggravate the iliotibial band, running is the main culprit. It is better to vary your running schedule and use interval training: run sprints three days a week, intermediate distance two days a week and long distance once a week.

## **Exercises**

The following **exercise program** should be followed as instructed by Dr. Nelson or physical therapist. For the straight leg lift and short arc lift, ankle weights can be added to increase resistance and strength of the quadriceps. Generally, after one or two weeks, ankle weights can be added (starting at one pound) and increased by one pound per week until you build to five pounds. The exercises should be done daily until ankle weights are added. At this time, the straight-leg lift, short-arc lift and wall slides should be done every other day and the stretches should continue daily. When you have built up to five pounds on the straight-leg and short-arc lifts, continue the exercises two times per week for maintenance.

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1. Straight Leg Raise- Lay flat on back, unaffected knee bent to 90 degrees. Keep involved leg straight and raise it so that your thighs are equal. Hold for count of 6. Perform 3 sets of 15 reps. Add 1-2 pounds to your ankle until you can reach your goal weight of 10-15 pounds.



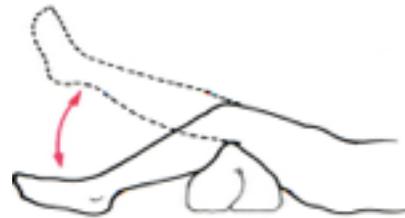
2. Side laying Hip adduction- Lay on side that is affected. Keep your ankle, knee, hip and shoulder in a straight line. Raise the affected leg so that your foot is just past midline. Hold for a count of 6 and repeat 3 sets of 15 reps. Add weight just like #1 until you reach the goal weight of 10-15 pounds.



3. 1/4 Squats- Stand with your feet shoulder width apart. Toes pointing straight ahead. Look down at your feet, Lean with your butt first and squat down slowly until your knees pass over your toes then stand back up to start position. Perform 3 sets of 15 repetitions. You may hold dumbbells to add resistance.



4. Short Arc Knee Extension- Place 2-3 towels rolled up under the knee to the affected knee. This will have the knee bent to 30 degrees. Bring the leg up into full extension. Hold for a count of 6 and repeat 3 sets of 15 repetitions. Add weight just like #1 until the goal weight is reached of 10-30 pounds.



5. Quad Sets- Isometric exercise. This can be done where ever the knee is straight. (laying in bed, standing, or reclined in the lax-y-boy) Tighten up your thigh muscle as tight as you can make it. Hold for a count of 10. Relax and repeat 3 sets of 15 repetitions.



6. Wall Squats- Put your back flat against the wall. Stand with your feet shoulder width apart. Heel approximately 18 inches from the wall. Toes point straight ahead. Slide down the wall until your knee is at a 60 degree angle. Stay in this position for a count of 30. Return to start position. Repeat 3 sets of 15.



7. Standing Hamstring Curl- Stand facing a table, using the table for balance and support. While standing on the uninjured limb bend the injured knee up toward the buttock. Hold this flexed position for one second. Slowly lower the foot back to the floor. Keep the thighs aligned as shown in the illustration. Repeat twenty times.



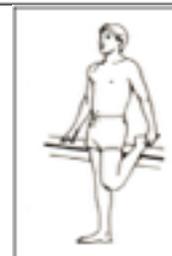
8. Standing toe raises- Stand facing a table, hands on the table for support and balance. Keep the knees extended fully. Tighten the quadriceps to hold the knee fully straight. Raise up on 'tip-toes' while maintaining the knees in full extension. Hold for one second, then lower slowly to the starting position. Repeat twenty times.



9. Hamstring Stretch- Perform this stretch in the position illustrated at the right. Bend slowly forward at the hips, keeping the knee fully extended until you feel gentle stretch in the back of your thigh and knee. Hold the stretch for fifteen to twenty seconds and repeat three to five times.



10. Quadriceps Stretching- This stretch is performed in the position illustrated at the right. Lean gently backward as if bringing your heel toward the buttock. When a stretch is felt in the front of the thigh and knee, hold fifteen to twenty seconds for three to five repetitions.



11. Calf Stretch - In the position illustrated, keep the heel flat on the floor and the knee fully extended. Lean forward at the hips with the arms supporting your weight. When you feel a gentle stretch in the back of your calf and knee, hold for fifteen to twenty seconds, three to five repetitions.



12. Lateral hip and thigh stretch (for the iliotibial band) Cross your left (right) leg over in front of the other. Lean to the left (right), bending at the waist and letting your right (left) hip jut out. When you feel a gentle stretch in the out side of hip, hold fifteen to twenty seconds, three to five repetitions.

