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Running: Preventing Overuse Injuries

What causes an overuse injury in a runner?

Overuse injury in a runner most often occurs because of a training error (running too far, too fast, too soon). With every mile that is run, the feet must absorb 110 tons of energy. Therefore, it is not surprising that up to 70% of runners develop injuries every year.

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How can overuse injury be prevented?

You can decrease your risk of injury by following these recommendations:

- Do not increase running mileage by more than 10% per week.
- Do not run more than 45 miles per week. There is little evidence that running more than 45 miles per week improves your performance, but a great deal of evidence shows that running more than 45 miles per week increases your risk for an overuse injury.
- Do not run on slanted or uneven surfaces. The best running surface is soft, flat terrain.
- Do not "run through pain." Pain is a sign that should not be ignored, because it indicates that something is wrong.
- If you do have pain when you run, place ice on the area and rest for 2 or 3 days. If the pain continues for 1 week, see your doctor.
- Follow hard training or running days with easy days.
- Change your running shoes every 500 miles. After this distance shoes lose their ability to absorb the shock of running.

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What about orthotics to reduce the chance of injury?

Orthotics are inserts that are placed in shoes to correct bad alignment between the foot and the lower leg. You will probably need orthotics if the inside of your foot turns in, a problem called pronation. If you have bad alignment but no pain with running and you do not suffer from repeated injuries, you probably do not need orthotics. Many world-class athletes with bad alignment do not wear orthotics. Your doctor may suggest orthotics if you have bad alignment, become injured and do not get better with other measures, such as rest, ice application and cross training.

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What exercises help prevent or treat injuries?

Before and after a run, perform specific stretching exercises. See the pictures below that show

stretching exercises. These exercises may also be part of your recovery from an injury. Do not bounce with each exercise. Stretch until you feel tension but not pain.

If you do develop an injury, your doctor may suggest particular strengthening exercises. Every day you should do 3 sets of each exercise, with 10 repetitions in each set. Be sure to exercise each leg, not just the leg that is injured. For the exercises that involve straight-leg raises, you will want to add ankle weights as the exercises become easier for you. These exercises may also be done as part of your overall exercise program.

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Stretching exercises



Hamstring stretch

Sit with your injured leg straight and your other leg bent. With your back straight and your head up, slowly lean forward at your waist. You should feel the stretch along the underside of your thigh. Hold the stretch for 10 to 15 seconds. Repeat the stretch 6 to 8 times. This stretching exercise may be helpful for [patellofemoral syndrome](#) (pain under and around the kneecap), patellar tendinitis (inflammation of the tendon that connects the patella and tibia) and hamstring strain (overstretching or tearing of the muscles on the back of the thigh).

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Iliotibial band stretch

Sit with your injured leg bent and crossed over your straightened opposite leg. Twist at your waist away from your injured leg, and slowly pull your injured leg across your chest. You should feel the stretch along the side of your hip. Hold the stretch for 10 to 15 seconds. Repeat the stretch 6 to 8 times. This stretching exercise may be helpful for iliotibial band syndrome (knee tenderness from irritation of the thigh's iliotibial band) and adductor strain.



Groin stretch

Sit with your feet together, your back straight, your head up, and your elbows on the inside of your knees. Then slowly push down on the inside of your knees with your elbows. You should feel the stretch along the inside of your thighs. Hold the stretch for 10 to 15 seconds. Repeat the stretch 6 to 8 times. This stretching exercise may be helpful for adductor strain (overstretching of the groin muscles).



Quadriceps stretch

Stand straight with your injured leg bent. Grasp the foot of your injured leg with your hand and slowly pull your heel to your buttocks. You should feel the stretch in the front of your thigh. Hold the stretch for 10 to 15 seconds. Repeat the stretch 6 to 8 times. This stretching exercise may be helpful for [patellofemoral syndrome](#), iliotibial band syndrome and patellar tendinitis.



Calf stretch

Stand with your hands against a wall and your injured leg behind your other leg. With your injured leg straight, your heel flat on the floor and your foot pointed straight ahead, lean slowly forward, bending the other leg. You should feel the stretch in the middle of your calf. Hold the stretch for 10 to 15 seconds. Repeat the stretch 6 to 8 times. This stretching exercise may be helpful for Achilles tendinitis (inflammation of the Achilles tendon, the large tendon at the back of the ankle), [plantar fasciitis](#) (heel pain) and calcaneal apophysitis (inflammation where the Achilles tendon attaches to the heel, usually in children).



Plantar fascia stretch

Stand straight with your hands against a wall and your injured leg slightly behind your other leg. Keeping your heels flat on the floor, slowly bend both knees. You should feel the stretch in the lower part of your leg. Hold the stretch for 10 to 15 seconds. Repeat the stretch 6 to 8 times. This stretching exercise may be helpful for [plantar fasciitis](#), Achilles tendinitis and calcaneal apophysitis.

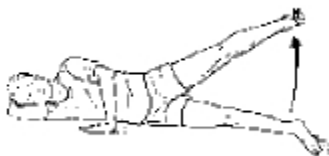
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Strengthening exercises



Straight-leg raise

Lie down with your upper body supported on your elbows. Tighten the top of the thigh muscle of your injured leg. Raise your leg on a count of 4, hold for a 2 count, and then lower the leg on a 4 count. Relax your thigh muscles. Then tighten the thigh and repeat. Do 3 sets of 10 repetitions each day. Once your leg gains strength, do the exercise with weights on your ankle. This strengthening exercise may be particularly helpful for [patellofemoral syndrome](#) or patellar tendinitis.



Side leg lift

Lie on your unaffected side, tighten the thigh muscle of your injured leg, and then slowly raise the leg off the floor. Hold the leg up for a 2 count, and lower it on a 4 count. Relax your muscles. Then tighten the thigh and repeat. Do three sets of 10 repetitions each day. Once your leg gains strength, do the exercise with weights on your ankle. This strengthening exercise may be helpful for iliotibial band

syndrome.



Inner thigh lift

Lie on your affected side with the unaffected leg crossed over the knee of your injured leg. Tighten your thigh muscles and raise the injured leg about 6 to 8 inches off the floor. Hold for 2 seconds, and then slowly lower your leg. Relax the muscles. Then tighten the thigh and repeat. Do 3 sets of 10 repetitions each day. Once your leg gains strength, do the exercise with weights on your ankle. This strengthening exercise may be helpful for adductor strain.

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Standing wall slide

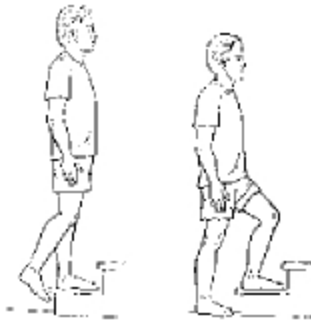
Stand with your back against the wall and your feet 6 to 8 inches away from the wall. Slowly lower your back and hips about one-third of the way down the wall. Hold the position for about 10 seconds or until you feel that the tops of your thigh muscles are becoming tired. Straighten and repeat. Perform 10 repetitions each day. This strengthening exercise may be helpful for [patellofemoral syndrome](#) or patellar tendinitis.



Lying leg raise

Lie on your stomach. Tighten your thigh muscles and slowly raise your injured leg off the floor on a 4 count. Hold the leg up for a 2 count, and then lower the leg on a 4 count. Relax your thigh muscles. Tighten the thigh and repeat. Do 3 sets of 10 repetitions each day. Once your leg gains strength, do the exercise with weights on your ankle. This strengthening exercise may be helpful for hamstring

strain.



Lateral step-ups

Stand with your injured leg on a stair or platform that is 4 to 6 inches high. Slowly lower the other leg, striking the heel on the floor. Straighten the knee of the injured leg, allowing the foot of the other leg to raise off the floor. Repeat. Do 3 sets of 10 repetitions each day. This strengthening exercise may be helpful for [patellofemoral syndrome](#) and patellar tendinitis.

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