LA ROADRUNNERS

Understanding and Avoiding Running Injuries

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You're out for your daily 5 miler when you notice a tinge in your knee. Like hundreds of other aches and pains you sometimes feel, during and after a run, this one is tough to diagnose. Is it just another minor case of overuse of the early signs of runner's knee?

It is important to know the difference. Most running injuries can be stopped or avoided if they are controlled early in the training program. The Roadrunners manual is to get you to your desired goal without developing any serious injuries.

Several years ago, Doug Jackson, an orthopedic surgeon, and I began a clinical study of long distance runners to determine the nature and variety of injuries that occur. After analyzing over 4,000 runners with injuries, we found that there were several common running injuries and we were able to define the profile of the average long distance runner. Before discussing these parameters, we should understand that all runners get sore muscles, bones, joint aches from running. These usually dissipate by the next day workout. Other times, the pain may last for several days and this can lead to disabling injuries.

In general, we should realize that there are five major causes of running injuries.

1. Improper training methods
2. Muscle dysfunction and inflexibility
3. Improper shoes
4. Faulty foot biomechanics
5. Training surfaces

When discussing running injuries, we can divide the symptoms into four categories

1. Pain and discomfort after activity. Gone within 24 hours.
2. Pain and discomfort, before, during and after the running program. Not alleviated by warm up lasts up to 48 hours.
3. Workout compromised by pain. Athletes alter performance and gait.
4. Unable to workout or self-imposed rest. The pain is aching in nature and intensifies with activity.

It is obvious that we do not wish our athletes to run through category 2-4. Obviously, at this point, one must review their training programs. The Roadrunners have devised

a running program for all levels of runners. By adhering to these training principals, your chance of injury is greatly diminished. The most common running injuries are (1) plantar fasciitis or pain under the heel. 2. Shin splints. 3. Runner's knee. 4. Some type of foot fracture. 5. Achilles tendonitis. These will be explained in detail at a later point.

A proper stretching and strengthening program is also necessary. Runners tend to be extremely inflexible, due to the repetitive nature of the sport. Regular stretching needs to be imitated at the introduction of the running program. The hamstrings and the gastrosoleus complex are strengthening from running but need additional stretching. The quadriceps and anterior tibial muscle groups are not strengthened as much and will require additional specific strengthening programs. Stretching should be a static activity and if there is pain, the specific stretch should be avoided. Strength workouts only need to be performed three times a week on alternate days. Upper body strengthening should also be included as an integral part of the training program.

The next area of concern regards the biomechanics of running. Runners have a wide variation in the alignment of the lower extremity. Some of these variations are vulnerable to injury. The most common predisposing factors are rear foot varus, forefoot varus, tibial torsion, pes planus, pes cavus, among others.

If we look at the gait cycle in a cursory manner, we can see that the foot hits the ground with the heel first and this causes heel strike. The foot rolls forward and this is called the support phase and as the foot leaves the ground, this is called toe off. When the heel hits the ground, the foot pronates, during the midstance the foot is in the neutral position and prepares to supinate for toe off. So one can say that the foot hits the ground as a 'bag of bones' and lifts off the ground as a rigid lever. If there are any defects in this mechanism, injuries may occur.

It is rather difficult for the runner to determine their foot type. The measurements usually are made with regard to rear foot and forefoot range of motion. However, one can classify themselves as to foot configuration. These are high arches (pes cavus), low arches, (Pes planus) and normal feet (rectus foot).When we discuss biomechanics, we refer to pronation, (rolling of the foot to the inside) or supination (rolling to the outside).

Pronation and supination are normal motions of the foot during running. However, when one over pronates or over supinates, malalignment occurs and biomechanical or over use injuries may occur. If one constantly develops plantar fascitis, tendonitis, chondromalacia or knee pain, shin pain, calf strain, there is a good chance that there is an underlying biomechanical deformity.

How can these problems be eliminated. First, one can start a foot strengthening program. These are simple and easily to perform. Secondly, the choice of a good running shoe is necessary and if there are definable foot defects, some type of foot orthoses may be necessary.

Foot Strengthening. First, one must analyze which muscles need to be strengthened. This is most difficulty for the beginning runner. Basically, there are four muscles that run around the ankle and into the foot. They go in four directions. Up, down, in and out. If your foot is sore on the outside, work the muscle that moves your ankle out. Work on muscles that seem to tighten in the injured area. In general, it is advisable to work all the muscles. Same with the knee, if the knee is injured, tighten the front and back of the knee muscles. There are also small muscles in the foot that are often ignored. Strengthening the flexor and extensor muscle of the foot is advisable. Using marble pickups and resistant exercises will certainly help strengthening the foot.

Other important causes of running injuries are improper shoe gear. In general, one needs a good supportive shoe with a durable outsole and a well cushioned midsole for shock absorption. The toe box should have depth and width so as not to abrade on the toe area. The heel counter should be firm to reduce abnormal foot rotation.

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