

The Scoop on Running Injuries

Help runners to avoid common injuries—and to cope with them when they do occur.

Running places extraordinary demands on an athlete's body. Injuries can happen in many places, including the feet, shins, knees and hips. Designing a program that helps runners avoid or recuperate from common injuries is a great way to market your services.

This month's column will focus on three injuries that runners frequently encounter:

- iliotibial band syndrome
- medial tibial stress syndrome
- muscle strains of the hamstrings and adductors

Each injury requires its own set of postrehabilitation strategies, but the prevention tips can be used to avoid all three conditions.

ILIOTIBIAL BAND SYNDROME

Iliotibial band (ITB) syndrome is the most common cause of lateral knee pain in runners and may occasionally cause lateral hip pain as well (Paluska 2005). The ITB is a tough, tendinous continuation of the tensor fasciae latae and gluteus maximus. Originating at the iliac crest, the band inserts on the lateral aspect of the tibia, fibular head and patellar retinaculum (Paluska 2005). Irritation of the ITB can be caused by a variety of factors, including inappropriate footwear, improper training, a leg length discrepancy, bowing of the legs at or below the knee, running on sloped or banked running surfaces, excessive pronation, muscle weaknesses, hip inflexibility or excessive mileage increases (Paluska 2005;

Khaund & Flynn 2005; Fredericson & Wolf 2005).

ITB syndrome usually presents as diffuse pain over the lateral aspect of the knee. It typically begins as a general "achiness" but can progress into a sharp, more localized pain over the lateral structures (Khaund & Flynn 2005). ITB syndrome is generally treated conservatively by a physical therapist or an athletic trainer and rarely requires surgery. The treatment plan depends on the findings of a physical examination. For example, a runner who pronates excessively during the running stride may be fitted for orthotics, while a runner with a leg length discrepancy may be treated with a lift in one shoe. Overall, rehabilitation should focus on the runner's individual deficits in strength and flexibility (Paluska 2005).

POSTREHAB PROGRAM FOR ITB SYNDROME

Strengthening

Emphasis should be placed on strengthening the gluteus medius and eccentric muscles. Fredericson and Wolf suggest eccentric muscle exercises in triplanar patterns.

- **Pelvic Dropping** (3 sets of 10–12 reps)
 - Stand on 12-inch step with right foot planted on step and left leg off edge. Keep pelvis level.
 - Slowly lower left foot 3–5 inches toward ground while keeping right knee straight (as if shifting weight left).
 - Use gluteus medius muscle to elevate left leg until pelvis is level again.
- **Frontal-Plane Lunges** (starting with 3 sets of 5–8 reps each side and progressing to 2–3 sets of 15 reps)
 - Stand tall with abdominals drawn in and feet shoulder width apart (as if standing in center of a clock).
 - With knees slightly bent, step left leg out to 9 o'clock position until tension

runners' injury prevention tips

1. Use adequate footwear with appropriate shock absorption.
2. Avoid running on banked roads.
3. If running regularly on a track, frequently change direction.
4. Do not increase intensity, duration or pace of training programs too quickly. Begin running on a level surface and gradually increase intensity.
5. Incorporate cross-training, especially non-weight-bearing cardiovascular exercise like swimming or biking.
6. Consult with a primary care physician about adequate calcium intake and any menstrual dysfunction or other abnormality.

is felt in gluteal muscles of left leg.

- Return to starting position and repeat on opposite side, stepping right leg out to 3 o'clock position.

Variation: Perform frontal-plane lunge, as above, but also reach to same side as lunge with opposite hand.

Flexibility

Overhead Reach (starting with 3 sets of 5–8 reps each side and progressing to 2–3 sets of 15 reps)

- To stretch right iliotibial band, stand upright and cross left foot in front of right foot.
- Reach both hands overhead and clasp together.
- Side-bend trunk to left until stretch is felt in right hip.
- To stretch left iliotibial band, perform same movement on opposite side.

Foam Roller (1–2 sets of 5–10 reps

each side)

- Lie on side with full, round foam roller placed under thigh just below hip. Legs can be crossed to help maintain balance.
- Use arm or top leg (if legs are crossed) to propel body up and down roller along length of ITB (from just below hip to just above knee).

MEDIAL TIBIAL STRESS SYNDROME

Medial tibial stress syndrome (MTSS) is *not* synonymous with the term *shin splints*. This term describes a symptom of exercise-induced shin pain, but it is not an official diagnosis (Couture & Karlson 2002). MTSS, on the other hand, is a specific diagnosis that describes a stress reaction within the bone when the normal remodeling process of bone becomes maladaptive. The condition is commonly seen in avid runners. Runners with MTSS often complain of pain along the middle and lower part of the tibia's posteromedial border. In serious cases, pain is felt not only with running but also during activities of daily living (Couture & Karlson 2002).

Runners who use improper training methods, run on poor surfaces or wear ill-fitting shoes are more susceptible to MTSS. Runners should avoid abrupt increases in intensity, duration or frequency; steer clear of sloped or banked surfaces; and use appropriate footwear. Other factors that may increase the risk of MTSS include decreased muscle strength, poor flexibility and low bone density. Initial treatment by a healthcare professional will likely include rest from running. In severe cases, individuals will be placed on crutches. After the acute stage of the injury, runners with MTSS will usually undergo physical therapy to reduce the pain and inflammation along the border of the tibia and gradually progress back to running.

POSTREHAB PROGRAM FOR MTSS

Maintaining flexibility and strength while progressing a running program is crucial. **Strengthening**

Resistance Tubing Dorsiflexion (3 sets of 12–15 reps each side)

- Client sits with legs straight out in front

and resistance tube looped around one foot. Trainer sits facing client, holding other ends of resistance tube in line of pull that enables client to feel resistance when dorsiflexing ankle.

Heel Walking (1 set of 3 reps)

- Walk on heels for 50–80 feet to recruit dorsiflexors.

Flexibility

Emphasis should be placed on maximizing the flexibility of the gastrocnemius and soleus muscle complexes.

Gastrocnemius Stretches (1 set of 3 reps each side, holding 30 seconds)

- Place both hands on wall, arms extended.
- Place one foot behind the other. Front leg should be bent, while back leg should remain straight, with heel on floor.
- Move hips slightly forward while keeping back heel on floor to produce a greater stretch.

Soleus Stretches (1 set of 3 reps each side, holding 30 seconds)

- Begin as above with gastrocnemius stretch, but slightly bend back knee while keeping heel on floor.

MUSCLE STRAINS OF HAMSTRINGS AND ADDUCTORS

Both long-distance endurance runners and sprinters are susceptible to hamstring or adductor (groin) strains. Symptoms may include sharp pain in the affected muscle and, in severe cases, bruising. Muscle strains in sprinters often result from a sudden acceleration/deceleration movement or direction change (Paluska 2005). Risk factors may include lack of flexibility, poor running technique, increased age, prior injuries or muscle weaknesses (Paluska 2005).

The hamstrings, which act to extend the hip and flex the knee, may be injured during sprinting or hill climbing. The adductor muscles (pectineus, adductor brevis, adductor longus, adductor magnus, obdurator externus and gracilis), which act to adduct the hip, may be injured if the hip is traumatically abducted or externally rotated (Paluska 2005).

Muscle strains are generally graded by their severity. Grade I represents minimal muscle fiber disruption; Grade II involves

a partial tear without muscle retraction; and Grade III involves a complete rupture of the myotendinous unit. Initially, a physical therapist or an athletic trainer will treat the pain, inflammation and loss of motion that result from a muscle strain (Paluska 2005).

When returning to running, the athlete must begin with slow running at one-third the usual distance, alternating run days with rest days until symptoms have subsided (Paluska 2005). Rest days should be continued for multiple weeks, and cross-training (e.g., biking, swimming, elliptical training, rowing) should be incorporated into the training program.

Strengthening and flexibility exercises will play an important part in reducing the risk of reinjury.

POSTREHAB PROGRAM FOR HAMSTRING AND ADDUCTOR STRAINS

Strengthening

The strength of the affected muscle group will likely have been reduced secondary to the injury. Below are some examples of exercises for both the hamstrings and adductors, but other exercises for these muscle groups may also be employed.

Supine Hamstring Curls on a Ball (3 sets of 12–15 reps, as tolerated)

- Lie supine on mat with exercise ball under heels, arms relaxed at sides.
- Tighten abdominals and squeeze gluteals while pressing through heels and lifting buttocks off mat.
- Form a straight line from heels to shoulders.
- Next, keep buttocks lifted while bending knees and curling heels inward, and use hamstrings to bring ball toward buttocks.
- Return to start.

Advanced Variation: Try single-leg hamstring curls on a ball. Unilateral curls will help avoid compensation by the non-injured leg.

Standing Pulley Hip Adduction for Groin/Adductors (3 sets of 12–15 reps each side, as tolerated)

- Stand with right foot next to lower pulley, with pulley strap around right ankle.
- Tighten abdominals and stand tall.

Adduct right leg against resistance across body, keeping both legs straight but not “locked.”

- Slowly return to start.

KEEPING DOWN THE COST

Running remains a popular mode of exercise because of its low cost and convenience. But despite its many health benefits, running may increase the risk of musculoskeletal injuries. Fitness professionals should be aware of common injuries and employ effective prevention strategies with their clients.

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