Iliotibial Band Syndrome (ITBS)

Overview

Iliotibial band syndrome (ITBS), sometimes referred to as “runner’s knee,” is an overuse injury caused by repetitive movements; it results in inflammation and irritation of the iliotibial (IT) band, which can cause pain in the area of the lateral femoral condyle. The IT band runs from the hip to the knee, so patients often experience knee and/or hip pain. This article covers ITBS risk factors along with diagnosis, treatment, and prevention information. Most often, the cause of ITBS is multifactorial, so various potential risk factors should be considered.

Anatomically, the iliotibial band (ITB) structure arises from the tensor fascia latae muscle and runs down the lateral side of the leg from the hip to the knee. The ITB inserts onto Gerdy’s tubercle of the tibia (Figure 1). Repetitive friction or rubbing of the band over the lateral femoral epicondyle and can result in ITBS. An “impingement zone” occurs when the knee is flexed to 30 degrees during foot strike and the early-stance phase of the gait cycle.

According to one study, the incidence of ITBS in military recruits during basic training ranked third of all overuse injuries, at a rate of .08 (incidence/1000 training hours), compared to tibial bone stress reaction (0.33) and patellofemoral pain (0.22). A systematic review states that the incidence in military populations might range from 1% to 5.3%.

You can watch a related video with the recording and slide show from a Human Performance Resource Center (HPRC) Rx3 (Rehab, Refit, Return to Duty) webinar about Hip Pain: https://www.youtube.com/watch?v=AJfRKMlqkhU&feature=youtube

Potential Risk Factors

Biomechanical. Moderate evidence exists to suggest that hip kinematics differ between runners with a history of ITBS and healthy runners. According to one study comparing female shod runners with ITBS to healthy runners, those with ITBS had increased peak knee internal rotation and trunk ipsilateral flexion during the stance phase. The study’s authors suggest that clinicians consider screening for increased knee internal rotation and hip adduction.

Flexibility and strength. Limited flexibility and strength of anatomical structures of the hip and thigh, including the IT band and hip abductor muscles, might contribute to ITBS.
**Running surface.** Some surfaces increase stresses on the hip and knee. These include surfaces that are uneven, sloped, hilly, or too hard (such as concrete). Avoiding such surfaces or at least limiting the amount of time training on these surfaces might contribute to reduced likelihood of developing ITBS. Future studies should consider training surfaces specifically in reference to developing ITBS.  

**Improper footwear.** Footwear is designed to absorb shock through the reduction of mechanical stress waves. This occurs mainly through viscoelastic midsole deformation upon weight bearing during walking or running. Overuse of footwear causes air cells in the shoe to collapse and affect their shock-absorption capacity, which might contribute to running injuries.

Also, remind your patients that it is important to wear shoes designed for the sport in which they are participating (running shoes for running, for example). For more information, HPRC has infographics on shoe fit: [https://www.hprc-online.org/physical-fitness/training-performance/if-shoe-fits-part-2-right-fit](https://www.hprc-online.org/physical-fitness/training-performance/if-shoe-fits-part-2-right-fit) and shoe wear pattern: [https://www.hprc-online.org/physical-fitness/training-performance/if-shoe-fits-part-1-wear-patterns](https://www.hprc-online.org/physical-fitness/training-performance/if-shoe-fits-part-1-wear-patterns).

**Excessive training or increasing training too quickly.** Overtraining can contribute to overuse syndromes, including ITBS. Increasing training too quickly also can lead to overuse issues.

**Improper cycling form.** For your patients who cycle for conditioning, please have them consider the following:

- If the toe clips and pedals are not adjusted properly, this can cause undue stress.
- Is the seat height appropriate? If the seat is too high, forcing extension of the leg, it can aggravate IT band problems.
- How are gears set? If they are set too high, this might force harder legwork.

**Diagnosis**

**Diagnostic algorithm.** Before beginning any type of rehabilitation program, it is important to correctly diagnose ITBS. The algorithm from HPRC’s Rx3 program can help eliminate other potential major injuries of the hip: [https://www.hprc-online.org/physical-fitness/rx3/are-you-provider/hip-pain-algorithm](https://www.hprc-online.org/physical-fitness/rx3/are-you-provider/hip-pain-algorithm). In addition, because ITBS also can affect the knee, you also might want to refer to the Rx3 algorithm for diagnosis of knee pain: [https://www.hprc-online.org/physical-fitness/rx3/are-you-provider/knee-pain-algorithm](https://www.hprc-online.org/physical-fitness/rx3/are-you-provider/knee-pain-algorithm).

**Treatment and Prevention**

**Non-operative treatment.** Many patients who follow a conservative course of treatment, including a combination of the following, will show improvement.

**Activity modification and relative rest.** Decreasing the load on the hip is an important step in recovering from ITBS. Sometimes modifying present training/activity demands to manage and/or prevent ITBS is indicated, including substituting activities such as swimming or biking for jogging/running. If strengthening exercises such as lunges or full squats are part of the overall strengthening program, but they aggravate the hip pain, they should be discontinued temporarily until pain subsides.

Several training factors—such as implementing gradual increases in weekly training mileage, allowing adequate recovery between training sessions, and limiting hill running—have been suggested to help prevent ITBS and other chronic lower-extremity injuries.

**Rehabilitation.** It is important that clinicians address both strength and overall neuromuscular control of the hip when assessing and managing patients with ITBS. Strengthening, stretching, and proprioception exercises should be included as part of any comprehensive rehabilitation or injury prevention program. Rx3 is a guide to help Military Service Members recover from and prevent common musculoskeletal injuries, ultimately improving their overall physical fitness. It includes hip-pain resources for both providers and patients ([https://www.hprc-online.org/physical-fitness/rx3/hip](https://www.hprc-online.org/physical-fitness/rx3/hip)). Providers can direct patients to the program by using the Rx3 Prescription Pad at [https://www.hprc-online.org/physical-fitness/rx3/are-you-provider/pt-prescription-pad](https://www.hprc-online.org/physical-fitness/rx3/are-you-provider/pt-prescription-pad).

**Deep transverse friction massage.** This method is controversial because the modality involves friction over tissue that is already undergoing friction as part of...
the injurious process. However, one study found that the addition of deep friction massage did not alter the therapeutic outcome of the condition.18

**Surgery.** Surgery is considered a last resort and is used only when conservative treatment such as rest and rehabilitation fail. Various surgical techniques are available, including percutaneous release, open release, ITB Z-lengthening, and an arthroscopic technique.19-21, 11, 22

**Conclusions**

Numerous risk factors have been associated with ITBS in physically active individuals, including a high incidence in military populations. Consequently, sports-medicine practitioners need to first identify any underlying biomechanical or physiological factors specific to an individual that could increase their risk for ITBS. Once identified during this overall lower-extremity evaluation, an exercise program such as Rx3 at https://www.hprc-online.org/physical-fitness/rx3/hip as referred to in the section above on treatment and prevention, aimed at correcting these potential risk factors can be implemented in an effort to minimize return to duty time.

**References**


