

IMPORTANT: Before undertaking any new exercises you should contact a Doctor or Physical Therapist to make sure that they are appropriate for you do. Without doing so, carrying any exercises out described in this article is at your own risk'

ITB Pain: Running & Cycling

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Introduction

In this article I'm going to address the various type of problems athletes report with their ITB, including pain on the outside of the knee, pain at the hip, as well as general tightness and 'twinges' that the ITB is well known for. I've also included guidelines on what to stretch and strengthen. In running, ITB is estimated to account for 12% of all overuse injuries!

What is the ITB?

ITB stands for ilio tibial band. It is not a muscle, it's a band of strong connective tissue (fashia) that runs the entire length of the thigh, from the top of the hip to knee attaching at the outside of the lower knee, the knee joint capsule and the kneecap.

The role of the ITB is to help stabilise the pelvis as well as performing some movements like moving the leg out to the side (abduction) and assist with hip flexion. What is meant by pelvis stability is the body being able to keep the pelvis relatively level while carrying out an action, for example when you stand on you right leg, muscles around the hip and pelvis work to ensure that the pelvis on the left side (the unsupported side) does not dip towards the ground. Try it out.

When you stand on one foot, the abductors (called TFL and gluteus medius) must produce a force which is *twice* that of body weight in order to achieve stability while standing on one leg. Think of how many steps you take when walking or running, and it is easy to see how abductor weakness can occur. Similarly in cycling the abductors work hard to prevent too much rocking or side to side movement of the pelvis, as the cyclist pushes down on the pedal.

These muscles call the abductors also control the amount which the leg crosses the body when running or walking (call a**D**duction). An exaggerated form of adduction is performed when walking on a single white line. Compare this to walking normally, your feet don't cross the body as much. Excessive adduction is prevented by action of the a**B**ductors (called TFL and gluteus medius).

Because the ITB assists in these actions in conjunction with the gluteus medius and TFL, weakness or imbalance in these muscles can overload the ITB leading to pain and dysfunction. A study of long distance runners with ITB syndrome showed that they all had significant weakness in their gluteus medius. After 6 weeks of strengthening their gluteus medius, 92% were pain free.



At the knee the ITB is thought to go over and back a bony prominence at the knee when bending and straightening the knee. When the ITB is tight, additional friction over this prominence can lead to inflammation and pain. This is often termed the ITB friction syndrome or iliotibial syndrome (ITBS).

Signs & symptoms associated with ITB dysfunction

Problems with the ITB can be felt from the knee right up to the lower back.

- At the knee:
 - Sharp or stabbing pain in the outside of the knee particularly when the knee is bent to 30°. It is aggravated by activity particularly when climbing hills. It can radiate up or down the ITB and over the knee. If severe, the pain can be experienced when walking or going up or down stairs.
 - Point tenderness over a bony prominence on the outside of the knee
 - The pain may not come on until mid way through a training session
 - Pain over the front of the knee or deep under the kneecap can be due to imbalances between the muscles on the outside of the knee, including the ITB, and the muscles on the inside. This imbalance pulls the kneecap towards the outside and prevents it tracking correctly over the knee leading to pain.
- Along the ITB: Tightness or 'twinges' along the length of the ITB felt during activity.
- At the hip: a tight upper ITB can be a factor in snapping hip syndrome. This is where movement of the hip produces a snapping sensation you can feel as the ITB moves over hip joint. It can cause tenderness over the hip itself and there can be pain when lying on this hip at night. Other factors such as gluteal inflexibility or hip flexor tightness can also be contributors to this syndrome.
- In the low back or pelvis: Due to its attachment at the hip, and association with other muscles in this area to maintain pelvic stability, a tight ITB can be a contributor to pain and decreased mobility in the low back or pelvis.

What's causing the symptoms?

Both cycling and running are repetitive activities. The smallest amount of misalignment, whether anatomic or equipment related, can lead to dysfunction, impaired performance, and pain.

Cause 1: Running environment & bike set up

Running Environment

- Running downhill can predispose towards ITB problems because the angle of knee flexion is in the range where friction occurs. In contrast sprinting or running fast on level straight surfaces are thought to be less likely to cause ITB pain as the knee is flexed beyond the angles at which friction occurs.
- When running on cambered surfaces (i.e. surfaces that slope) the leg closest to the side of the road (or downhill side) will endure greater forces than the uphill leg. There will be additional effort required for the abductors to maintain pelvic stability and control the tendency for the pelvis to dip more as the foot on the downhill side strikes the road. Because of this additional effort, they can weaken leading to ITBS.
- Running on running tracks. Always running the same direction around a running track can lead to ITBS due to the difference in forces through either leg. If running counterclockwise around a track there is increased tendency for the left leg adduct. To counteract this and prevent excess adduction there is an extra requirement on the abductors to control this movement.

Bike Set Up

- Saddle is too high: this results in knee extension greater than 150° which can irritate the ITB
- Saddle that is too far back causing excessive forward reach stretching the ITB
- Excess internal rotation (pointing in) of the lower leg because of incorrect cleat positioning which stresses the ITB

Cause 2: Anatomical reasons

- Leg length discrepancies i.e. one leg is longer than the other. Leg length discrepancies can occur due to misalignments at the pelvis, or more unusually, if you were born with a longer leg. Similarly to running on a cambered surface, a leg length discrepancy leads to more force through the longer leg and increased demand on the abductors to maintain pelvic stability. In cycling, leg length discrepancy may mean that only one leg is correctly fitted to the pedal causing excessive stretching of the ITB on one side, and increased demand on the abductors to maintain pelvic stability.
- A varus knee alignment (knees that lean inward), or excessive pronation at the feet (rolling in)
- Muscular imbalances around the hip and pelvis such as the weakness in gluteus medius described above.

Cause 3: Training

- Recent or quick changes in training/racing intensity or distance can be an aggravator of ITB pain. Quick changes in racing intensity is one of the biggest causes of injury in athletes.
- When running a change of surface can also aggravate ITB e.g. from pavement to cross country.

Preventing or helping problems with ITB

The following is a list which should be considered as a means to prevent ITB problems, or to help resolve ITB pain if you are experiencing it. If you are experiencing ITB pain it is best to get it checked out first before you start the exercises below.

Running Environment

- If you run on cambered surfaces, and it is not dangerous to do so, try change the side or direction of the run to alternate the leg that is on the downhill side
- Alternate running clockwise and counter clockwise if running on a running track
- If you run on hills make sure your gluteus medius is strong to ensure that it doesn't get weak leading to ITB problems.

Bike Set Up

Ensure that your bike is set up correctly so it's not contributing to any of the ITB problems. The seat height may need to be lowered, or the seat brought forward a bit. Adjust the cleats so they do not cause the lower leg to rotate inwards.

Training Schedule

Review your training or racing schedule, has there been a recent dramatic change in intensity or distance, could this be a contributor? Can you roll back a bit and introduce new changes in intensity or distance gradually?

Rest

No one likes to be told that they have to rest, but when movements like running or cycling aggravates the pain, then the aggravating action needs to be stopped to allow the inflammation to decrease and the area to heal. Rest alone is not enough for long term resolution, for this you need to determine and resolve the root cause of the problem. Rest can just mean rest from the aggravating activity, try swimming or running in the pool to keep aerobic fitness up.

Ice & anti-inflammatories

If the area is inflamed and sore, place some ice over the area for 10 minutes every hour. Wrap the ice in a cloth to prevent burns, and reapply when the heat has returned to the area. Speak to your pharmacist or doctor regarding anti-inflammatories as they can also help reduce the pain and inflammation.

Stretching & Strengthening

The ITB can be difficult to stretch. A stretch is described below which can be introduced into your regular stretching routine. Foam rollers are a useful way to self massage the ITB and help loosen out tight or painful areas. Foam rollers are a cylinder of firm foam that you place under your ITB as you lie on your side. By moving the body up and down on the foam roller a self massage can be performed.

Stretch the muscles in the gluteal area. A tight Piriformis - a small muscle deep in the gluteal area which externally rotates the leg – can cause the gluteus medius to weaken and as a result overload the TFL & ITB. See the section on stretching for information on how to stretch the Piriformis. Try perform the stretch and see if yours feels tight.

As discussed above a weak gluteus medius overloads the ITB. For long term solution if it is weak it needs to be strengthened.

Taping

Kensio taping (the bright blue, pink, black or skin colour tape you may some athletes wearing) may help unload the ITB, and support the abductors contributing as an aide towards recovery.

Treatment

Get regular massages to work out tight muscles and prevent tightness turning into pain and time off training.

Attend a Physical Therapist to get a full assessment of your pelvis, knee and ankle alignment and to determine the root cause of the ITB pain. They can work with you to correct any imbalances, do some deep tissue work into areas of dysfunction and give you a rehabilitation programme to get you back to pain free activity.

Stretches & Strengthening Exercises

I have found that clients with ITB pain can often have tight piriformis as well as a weak gluteus medius. These are three exercises I suggest that they incorporate into their normal stretching & strengthening routine. All stretches should be performed when warmed up. Hold each stretch for 30 seconds and repeat three times daily. If you are stretching prior to racing or going training, hold the stretches for 10 seconds only.

Stretching

The ITB is difficult to stretch so I've also included a description on using a foam roller. The descriptions assume the right ITB is being stretched.

ITB Stretch :

1. Stand with one foot in front of the other with a firm surface that you can use for support on your right e.g. table or chair
2. Holding on to the support, bring the right leg behind the left, and bring it outside ways to the left.
3. Bend your left knee and use your right arm for support as you bring your leg out to the side. Your right ankle /side of foot may be touching the floor
4. Try to keep the trunk in an upright position.

ITB Self Massage with Foam Roller

When using the foam roller, do so carefully. Do not be too vigorous as you may feel pain the next day.

1. Lie on a firm surface with the side to be massaged down
2. Place the roller under the ITB
3. Move the body up and down on the roller to apply a self massage, alternatively, if there is one tender area apply pressure to this using the foam roller and wait until the tenderness eases (trigger point therapy)

Piriformis Stretch

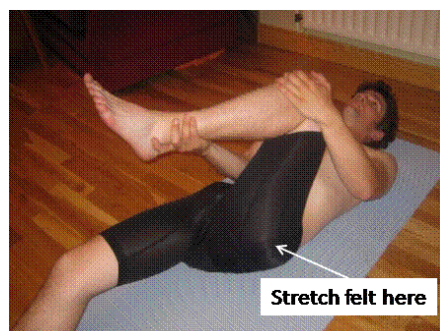
You should feel this towards the side of the gluteals near the head of the thigh bone.

1. Lie on your back
2. Bend the right leg and draw the right knee on the side to be stretch towards the LEFT (i.e. opposite) shoulder
3. Additional stretch can be added by holding the right ankle and pulling it gently towards your head.
4. Repeat on the opposite side

Piriformis - Start Position



Piriformis - End Position



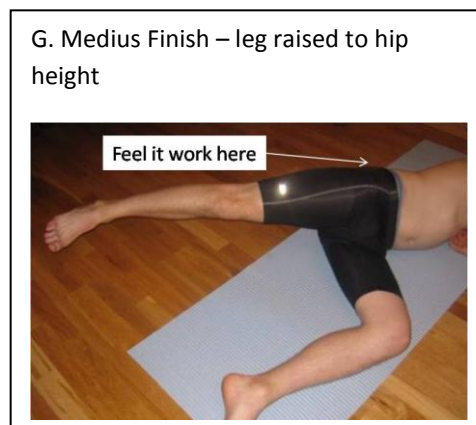
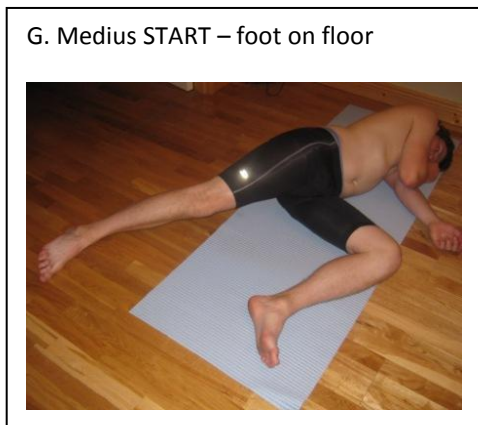
Strengthening Exercises

The keys to success with strengthening exercises are: 1) to do them slowly. If you do them fast then momentum starts to take over and the muscle is not working as much as it could; and 2) to return to the starting position slowly. This causes the muscle to contract eccentrically which is also a form of strengthening.

Gluteal Strengthening Exercise

In order to isolate the gluteus medius the position of the top leg is important. Try to keep it behind you as otherwise you start to recruit the TFL. Just raise the leg 2-3 inches above the hip. Any higher, you are recruiting additional muscles in the back to help lift the leg and not the gluteus medius

1. Lie on your left side, with your right side on top
2. Bend the lower leg slightly at the hip and knee for stability
3. Bring the right leg backwards slightly
4. Slowly raise the upper leg until 2-3 inches over the hip
5. From this position slowly lower the leg (1 repetition)
6. Perform three sets of 10-12 repetitions



Place your hand on the gluts close to the hip bone. You should feel the contraction here as you raise your leg upwards. If you don't move the leg backwards or forwards a little until you feel the contraction in this area.

Ankle weights can be added when the full three sets can be done as described above.

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