



FUNCTIONAL DISORDERS: Plantar Fasciitis, Knee Pain, Shin Splints

PLANTAR FASCIITIS

What is plantar fasciitis?

The plantar fascia is a thick band of connective tissue that runs along the underside of the foot, from the heel bone to the metatarsals. Its function is to support the arch of the foot by carrying tension when the foot bears weight. When too much is demanded of the plantar fascia, the tissue can become inflamed, degenerate, and very painful.

Risk factors include:

- Running and dance training
- Spending long periods of time standing or walking
- Being overweight
- Wearing high heels

How to work with plantar fasciitis

Plantar fasciitis is felt in the feet, but is often related to or a direct result of chronic tension in the back of the body. Tension in the lower back can translate all the way down to the plantar fascia in the following way:

Tight lower back muscles – the quadratus lumborum and erector spinae group – pull the top of the pelvis and lumbar vertebrae closer together. This typically brings the pelvis into an anterior (forward) tilt. Tight hip flexors will also tilt the pelvis forward, and often play a role in plantar fasciitis.

An even amount of tension across the lower back might translate into plantar fasciitis pain being experienced equally in both feet. But many people have one side of their lower back or one hip that's tighter than the other. Imbalanced tightness in the lower back muscles, iliopsoas, and even the obliques can result in experiencing plantar fasciitis pain more in one foot than the other.

When the pelvis is tipped forward or when one hip is hiked up, the hamstrings get pulled tight. The hamstrings originate at the bottom of the pelvic bone, run down the back of the thighs, and insert at the tops of the tibia and fibula, the bones of the lower leg. Tension in the hamstrings pulls on the bones of the lower leg, trying to flex (bend) the knees. This attempt to flex the knees recruits the muscles of the lower leg that flex the knees as well: the gastrocnemius and the plantaris.

The gastrocnemius and the plantaris attach to the calcaneal (Achilles) tendon, which attaches to the heel bone. So when these muscles are tight, they not only flex the knee, but also plantar flex the ankle.

This finally brings us to the plantar fascia, the thick band of connective tissue that runs from the heel bone to the base of the toes, supporting the arch of the foot. When the ankle is plantar flexed, the muscles and connective tissues on bottom of the foot are tightened.

If this pulley system that goes from the lower back down to the plantar fascia is chronically tight, and a lot of time is spent on the feet, pain in the plantar fascia is almost inevitable: it's bearing the weight of the entire body while being pulled tight.

You should teach your student exercises that release all muscles of the lower back, hips, and legs, and address any imbalances in alignment in the lower body (functional leg length discrepancy, internal or external hip rotation, knee or ankle misalignment, pronation or supination of the feet).

Make these exercises a priority:

- Arch & Flatten
- Back Lift
- Iliopsoas Release
- Lower Back Release
- Hamstring Release
- Quadriceps Releases
- Gluteal Release
- Calf Release
- Shin Release
- Standing Hamstring Release
- Foot Exercises

And make sure to teach these exercises as well:

- Arch & Curl
- Side Curl
- Iliotibial Band Release
- Hip slides & Hip raises
- Hip Circles

Hip Rotation
Inversion & Eversion
Hip Directions
Seated Hamstring Release

In addition, you should educate your student about the following steps that aid in prevention and recovery of plantar fasciitis:

- Vary their activities and types of exercise in order to avoid overuse of the muscles involved in plantar fasciitis.
- Vary their footwear, wear shoes with some cushioning, and don't wear high heels.
- Reduce time spent on their feet. If they work on their feet, try to take frequent breaks.
- Put their legs in the air against a wall; this is great for circulation and relieving swollen, inflamed feet.
- Lose weight, if applicable.
- Stop doing any deep, static stretching, which activates the stretch reflex and makes muscles tighter.

KNEE PAIN

What causes knee pain?

There are several common causes of knee pain, and it may not always be completely clear exactly what is causing your student's knee pain. The most common issues you are likely to encounter are:

- Pain related to tight muscles pulling on or putting pressure on the knee joint (see below)
- Osteoarthritis (refer to CEI Level 3, Section 7)
- Tendinitis/tendinosis or bursitis (refer to CEI Level 3, Section 1)
- Iliotibial band syndrome (CEI Level 2, Section 10)
- Torn ligaments (see below)
- Being overweight

How to work with knee pain

If your student has osteoarthritis, tendinitis/tendinosis, bursitis, or iliotibial band syndrome, please refer to those sections of the course for guidance.

If your student has a torn ligament, they may have visited a doctor. They should follow their doctor's advice regarding wearing a brace, resting, doing physical therapy, or having surgery if necessary. It can take weeks or months for a ligament to fully heal; patience, rest, and

activity modification are very important during the healing process. Clinical Somatics exercises are a safe way for your student to keep moving while healing, though you and they will need to be aware of movement limitations like bending the knee and rotating the leg in any way; if it causes pain, don't do it. In addition, Clinical Somatics exercises can help your student avoid ligament injury in the future in three ways:

- Releasing tight muscles that put excess strain on the joint
- Improving alignment and movement patterns so as to reduce risk of injury
- Increasing internal awareness of body position and use, so that the student instinctively avoids injury and dysfunctional movement patterns

If your student's knee pain is directly related to chronically tight muscles, which it probably is in some way, there are three general principles to teach them:

1. Release chronic muscle tension
2. Even out imbalances in posture and movement
3. Give the knees a chance to rest and heal

1. Release chronic muscle tension

As leg muscles gradually get tighter and tighter throughout one's life, they start compressing the knee joints. Tight quadriceps, hamstrings, calf muscles, hip adductors and abductors pull on the knee joints from all directions. Increased pressure within the knee joints causes inflammation and gradual breakdown of cartilage, and prevents healing by decreasing blood flow. Tight muscles pull connective tissues taut, increasing the risk of injuring a tendon or ligament.

Releasing chronic tightness in the leg muscles is an essential part of preventing and relieving knee pain. When your student has knee pain, don't think that releasing just the quadriceps or just the iliotibial band will solve the problem; teach them exercises to release ALL the muscles of the hips and legs, and make sure they know the exercises well enough that they can practice them on their own at home every day. The most important exercises are:

Iliopsoas Release

Hip Rotation

Hamstring Release

Quadriceps Releases

Gluteal Release

Iliotibial Band Release

Calf Release

Standing Hamstring Release

Foot Exercises

2. Even out imbalances in posture and movement

The knees bear the brunt of how we use our entire body; knee pain might be the first sign that posture or movement is out of balance. Full-body patterns of posture and movement begin in the core of the body. There are four basic ways in which tightness in the core muscles can cause knee pain:

- If the core muscles are **hiking one hip up higher than the other**, the student will be putting more pressure on one knee than the other. They will likely feel pain more in one knee than the other.
- If the lower back and/or abdominal muscles are **tipping the pelvis forward or backward**, this imbalance will create or add to tension in the quadriceps and hamstrings. This will most likely cause pain in the front or back of the knees.
- If the core muscles are **rotating the pelvis on the transverse plane** (imagine a Lazy Susan), with one hip pulled forward while the other is pulled backward, the hips and knees will have to compensate for the rotation. The student will likely feel pain on the inside or outside of one or both knees.
- If the hip rotators are **rotating the hips and knees either internally or externally**, the student will likely feel pain on either the inside or outside of one or both knees.

Identify your student's pattern or patterns of imbalance in the core of their body, and teach them exercises that address it. And remember that evening out imbalances in the core of the body involves not only releasing chronic muscle tension, but also retraining proprioception. So, be sure to do the Proprioceptive Exercises as needed with your student.

3. Give the knees a chance to rest and heal

Being active and spending parts of the day standing up are absolutely necessary for leg strength as well as cardiovascular health. But taking some time to rest the legs and knowing when to rest is also critical.

Regular loading and unloading of weight on the knees is best for the health of cartilage; too much or too little movement leads to problems. Cartilage relies on joint movement to diffuse blood and other nutrients through joint fluid. While cartilage heals much more slowly than muscle and skin, it can heal (at least somewhat, depending on the extent of the damage done) if given the chance.

Giving the knees periods of rest during the day involves listening to the knees and noticing when they feel tired, as well as potentially changing daily routines and habits. If your student's job involves standing up to the point that their knees hurt, have them brainstorm ways that they can improve their work conditions. This might include wearing more

supportive shoes, standing on a padded mat or wearing knee pads, taking shorter but more frequent breaks, or finding a way to do some of their job sitting down. They will also likely find that once they've released their tight leg muscles and improved their body use with Clinical Somatics exercises, their knees will feel much happier throughout the day.

If your student is an athlete and their exercise of choice is damaging their knees, they need to think about their priorities. There are many athletes out there who continue their routine even though they know they're doing damage to their bodies. It's easy to be in the mindset that keeping up fitness or performance level is more important than a little knee pain. But at some point, your student needs to come to terms with the fact that they could be permanently damaging their body. When they feel pain or any discomfort in their knees, their body is telling them something.

Encourage your athletic students to alternate several different forms of exercise throughout the week that use their body in different ways. Cross-training gives the joints and muscles a chance to rest and heal, preventing pain and injuries and typically improving athletic performance.

SHIN SPLINTS

What are shin splints?

The condition of shin splints is formally referred to as medial tibial stress syndrome (MTSS) or shin-splint syndrome. It is defined as pain along the tibia, the large bone in the front of the lower leg. The tibia may feel sore or tender, and may be swollen. Shin splints should be taken seriously, as they can lead to stress fracture.

Shin splints are caused by excessive pressure on the lower leg and overuse of the muscles that flex the foot. Excessive pressure of impact strains the tibia, and overuse tightens muscles and connective tissues, creating internal pressure on structures of the lower leg.

Risk factors include:

- Running, dancing, and military training
- Running or jumping on hard surfaces
- Increasing training intensity or changing training routine
- Wearing unsupportive footwear
- Being overweight

How to work with shin splints

You should teach your student exercises that release all muscles of the hips and legs, and address any imbalances in alignment in the lower body (functional leg length discrepancy, internal or external hip rotation, knee or ankle misalignment, pronation or supination of the feet).

Make these exercises a priority:

Arch & Flatten
Lower Back Release
Hamstring Release
Quadriceps Releases
*Calf Release
*Shin Release
Standing Hamstring Release
*Foot Exercises

And make sure to teach these exercises as well:

Back Lift
Arch & Curl
Side Curl
Iliopsoas Release
Hip Slides & Hip Raises
Hip Circles
Hip Rotation
Hip Directions
Gluteal Release
Iliotibial Band Release
Seated Hamstring Release

In addition, you must educate your student about the following steps that are important in prevention and recovery of shin splints:

- Modify training regimen: They should reduce (at least temporarily) the intensity of their workouts, and consider cross-training in order to reduce overuse of their lower legs. Swimming, walking, biking, and yoga can be good options.
- If they want to increase the intensity of their training regimen, they must do it gradually
- Always take the time to warm up and cool down from workouts
- If they are a runner, try to run on softer surfaces (dirt, grass, a treadmill, a rubber

running track)

- Wear supportive shoes with good shock absorption, and replace running shoes every 350-500 miles
- Lose weight if necessary
- Consider moderate leg strength training to stabilize the leg (only after pain has gone away, leg alignment has improved, and student is using Clinical Somatics exercises to release muscle tension on a regular basis)