

Yoga Therapy for Your Arches

Sick of sore feet? The aches and pains caused by weak or fallen arches become less easy to ignore as we age. Try our simple asana tips to soothe your soles. No arch support required!

By DOUG KELLER



Our cultural epidemic of weak and fallen arches provides a sure and steady income to the orthotics industry. But many of us still suffer from aches and pains that arch supports and padded insoles can't quite eradicate. For instance, when you first hop out of bed in the morning, do you get a rude awakening from sore feet and tight calves? This is just one kind of soreness from chronic strain to a

muscle whose job is to help lift the inner arch of your foot. Fallen arches can result in tendonitis and contribute to the development of bunions, shin splints, and pains in the knees and hips—and can even affect the lower back, neck, and shoulders.

The strength of your arches depends upon two factors: the tone, or tightness, of the ligaments that hold the bones of the feet together, and the strength of supporting muscles. When the ligaments are loose, or become loosened over time, we must make an extra effort to strengthen the supporting muscles.

The muscle most immediately affected by the collapse of the arches due to loose ligaments is the *tibialis posterior*, a deep muscle that runs along the back of the shinbone and down to the inner arch of the foot (Fig. 1), which lifts the inner arch of your foot. The tendon of this muscle runs behind and underneath a knob of bone at the inner ankle (the medial malleolus) and inserts into the

bones at the sole of the foot at the inner arch, just in front of the ankle (Fig. 2). These insertions in the sole of the foot are arranged in pinnate fashion—

literally, like a bird's feather. The form a kind of net that can be quite strong when acting to lift the inner arch at the medial malleolus. The muscle is at its strongest over a very limited range of

Photography: Jim Filipski / Guy Cali Assoc.; Wardrobe: A Tank and Practice Short by O!Mgirl; Model: Nema Nyar; Opposite page: Fig. 1 illustrations: Reprinted from Netter Anatomy Illustration Collection, © Elsevier Inc. All rights reserved; Fig. 2 illustration: Doug Keller

movement, and lifts the arch only a little. If the arch collapses beyond the muscle's zone of strength, the muscle and its tendons—usually the small tendons inserting into the sole of the foot—are strained. The result is an achy soreness at the inner edge of your heel, at the back of your heel, or in the sole of your foot at the inner arch. You may also feel soreness, tightness, and a sensitivity to touch at the back of your calf where the belly of the tibialis muscle lies. The tendons of the tibialis posterior will benefit from exercises that lift the arches; in addition, the muscle itself



*Fig. 1: **THE TIBIALIS POSTERIOR** is a deep muscle that lifts the inner arch of the foot (left). When the arch is weak it collapses and strains the tendon of this muscle, causing soreness in the foot and calf muscles (right).*



*Fig. 2: **THE TENDON OF THE TIBIALIS posterior** runs behind and underneath the inner anklebone, under the medial malleolus, and inserts into the bones of the foot.*

will need some stretching. The challenge of working with the tibialis posterior is to find a way to accomplish both.

THE TIBIALIS POSTERIOR IN ACTION

The tibialis posterior not only lifts the instep of the foot at the medial malleolus, but also inverts the foot (pulling the inner edge of the foot toward the body) and medially rotates the foot (turning it toward the midline of the body). If your tibialis posterior is very short and tight, you may have a pigeon-toed stance, with the weight of your body resting on the outer edge of your feet (Fig. 3a). The misalignment of the legs in this posture—with the knees and feet turned in—tends to increase the tightness of this muscle by causing it to work overtime. A short, tight tibialis posterior can also be at play in the opposite situation, in which the arches are fallen and the feet turn out (Fig. 3b). In this case the arches are so structurally weak that the tibialis posterior is pulled down with them—and the tight



Fig. 3a: PIGEON TOES When the tibialis posterior is tight and short it inverts the feet, turning your knees and feet inward.

tibialis posterior pulls down on everything above it, affecting the knees and hips, as well as straining its own tendons in the soles of the feet.

An excessively lifted instep and an excessively collapsed instep are two sides

Fig. 3b: FLAT FEET When the tibialis posterior is weak, your insteps collapse, your feet turn out, and your shinbones fall in and down.

of the same coin: the tibialis posterior exerts a strong pull in both cases—in one case upward, the other downward. And in both cases you'll find the knees turned inward, though the appearance of the legs will be different. The pigeon-toed individ-

ual will appear to be more bowlegged, while someone with flat feet is likely to be more knock-kneed.

A program aimed at merely strengthening the arches by strengthening the tibialis posterior will not fix fallen arches or overcome foot pain and cramping. A proper solution involves maintaining a balanced foundation in the feet while practicing exercises that bring both strength and length to the muscles.

Hatha yoga does just that. Much of what we do in hatha yoga is “eccentric” (pronounced ee-centric) work with the muscles, which means that we both contract the muscle *and* lengthen it at the same time, slowly releasing the contraction while maintaining some degree of muscular engagement. This is the kind of strength and suppleness demanded of the tibialis posterior as it works to maintain the arches.



Fig. 4: ACTIVATE THE ARCH by extending your big toe and inner heel away from your ankle as you engage the tibialis posterior.

The key to exercising this muscle correctly is to resist inversion and medial rotation of the foot by keeping the ball of the big toe and inner heel grounded while still working to lift the arch (Fig. 4). As you reach out through these two points at the inner edge of the foot, you also keep the tibialis posterior long and extended, even while it’s hard at work.

BUILDING STRENGTH

Let’s begin by learning some resistance work that strengthens the muscle with-

out shortening (i.e., tightening) it, working one leg at a time. If you have a tendency toward flat feet and knock-knees, use an elastic exercise band to create the resistance, following an exercise designed by EasyVigour project founder Bruce Thomson. (Although anything that offers some resistance—and a little give, such as a yoga belt or a nylon stocking—will do. Even if you don't have flat feet, this exercise will help you learn and practice good action in the feet. The essence of the exercise is to learn how to keep the inner heel and ball of the big toe grounded while lifting the arch, and not throw all of the weight to the outer edge of the foot.

Place the band around the outer ankle of one foot. Step on the band with the other foot and adjust the tension so that it pulls the foot toward pronation (i.e., toward a fallen arch). We want to restore proper tone by working the tibialis posterior to lift the arch, against the helpful resistance of the band. Keep the knees slightly bent to protect them, because the knee of the working leg is likely to be in a

vulnerable, slightly knock-kneed position. To keep track of what your knee is doing, place your fingers at the outer knee.

Now lift the inner arch, contracting the tibialis posterior so that the ankle presses out against the band. This is more than just shifting your weight to the outer heel; while the inner heel and ball of the big toe stay grounded, the lift comes from the inner ankle. If the lift comes *only* from the inner ankle rotating the shin out, the knee will get a damaging twist. You may feel pain in the knee, or just a hardening and pulling of the muscles at the outer calf and ankle.

To protect the knee as you lift the arch of the foot, engage the muscles of the inner thigh so that they lift and press out against the bone. The thighbone will not only shift laterally, but will also rotate out slightly, keeping up with the outward rotation of the shinbone and preventing any twisting in the knee (Fig. 5). Notice that all of this begins with the lift of the tibialis posterior; and the inner thigh muscles need to learn to move *with* that



Fig. 5: USE AN ELASTIC BAND Lift the arch of your left foot as you engage your inner thigh. This action will encourage your thigh and shinbone to rotate outward.

lift to readjust the alignment and action in the thighbone, for the benefit and protection of the knees and hips.

STEP BY STEP: PRASARITA PADOTTANASANA

Prasarita padottanasana (wide-legged standing forward bend) offers us an excellent opportunity to strengthen and lengthen the tibialis posterior, using the action we just explored with the elastic band. Sometimes people complain of ankle pain in this pose, usually in the form of pinching or pulling at the outer ankle. Both kinds of pain are indications

of a collapsed ankle (due to a flat foot) or overstretched ankle (i.e., pigeon-toed); by lifting the tibialis posterior in coordination with the rest of the leg, this discomfort can be eliminated.

To begin, step the feet wide apart and parallel. Avoid the common tendency to turn your feet out too much, which tightens the lower back and limits mobility in the pose. With a microbend in your knees (to avoid locking them), fold forward at the hip joints and, if possible, touch the floor with your fingers while maintaining a straight spine (Fig. 6a). Experienced practitioners can come into the ultimate expression of the pose, touching the crown of the head to the floor (making the necessary adjustments to the distance between the feet) with only a slight rounding of the spine.

Prasarita padottanasana is obviously a stretch to the hamstrings, but a big part of the stiffness that holds us back from fully expressing the pose comes from tight adductors. These inner thigh muscles



Fig. 6a: WIDE-LEGGED FORWARD BEND WITH BENT KNEES Keep your inner heels and the balls of your big toes grounded. Then lift the arches of your feet as you draw energy from the ground up through your knees and thighs. This will firm your inner thighs and rotate your knees slightly outward.



Fig. 6b: WIDE-LEGGED FORWARD BEND *Keep the arches lifted as you straighten your legs. Make sure your feet are parallel and your kneecaps are pointing forward.*

pull the thighbones toward each other, tightening and even locking the hip joints. And you will find that what goes hand in hand with tight adductors is the inability of the tibialis posterior to keep the arches of the feet lifted. As the arches fall, the outer

The muscular work we do in hatha yoga strengthens and lengthens our muscles at the same time.

ankles can begin to feel pinched. Or if you overcompensate by putting too much weight on the outer edges of the feet, your outer ankles may feel overstretched.

Take a moment to look at your feet and knees in *prasarita padottanasana*. Are your arches collapsing and your knees turning inward—or are you turning your feet out to help you bend forward? In either case, reposition your feet so they point straight ahead, keeping an imaginary line from the middle of your ankle to your second toe parallel (Fig. 6b). If your arches are collapsing, if your

knees are turning inward at the kneecaps, or if your hips feel locked or tight at your inner thighs, bend your knees more. Draw your inner thighs back so that your sit bones move back and apart and your lower back arches more, like a football player at the scrimmage line.

While keeping your inner heels and the balls of your big toes firmly grounded, begin to lift the instep of both feet just as you did against the resistance of the elastic exercise band. Your weight will begin to shift toward your outer heel, but don't let the inner heel slide forward or rotate, twisting, inverting or sickling the foot (so that it ends up in an abnormal crescent shape).

Draw the energy all the way from your inner arches through the inner knees and thighs so that your inner thigh muscles firm, lift, and press outward. Press your thighs apart as if you were sitting on a balloon that was inflating. At the same time, keep your upper inner thighs drawing back, so that your lower back does not round. If you are very flexible, engage the middle of your gluteal muscles by pressing into the floor through the center of your heels. This will protect your hamstrings while helping to engage your quadriceps and inner thighs.

Watch the connection between (a) your arches lifting, and (b) the shins and thighs (just below and above your knees) rotating slightly out in harmony with each other. Your kneecaps should be in line with the second toe of each foot. Straighten your legs slowly and smoothly, maintaining the actions of these muscles; don't allow your knees to lock or turn inward, and don't let your lower back round. Firm and lift your lower belly just above the pubic bone, and you will be able to fold more deeply into the pose.

If you practice this pose with attention to the lift of the arches, you will strengthen the tibialis posterior and restore proper tone to its tendons, reducing pain and soreness in the feet from damage caused by fallen arches. Prasarita padottanasana

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has the added bonus of realigning and protecting the knees against damage from rotation of the bones. All of the standing poses in hatha yoga involve the same work for the tibialis posterior in both feet: focus on keeping the inner heel anchored as you work this muscle to lift your arches. As it gets stronger, you'll experience less soreness in your feet—and a newfound lightness in your step. +

{ NEED ARCH SUPPORTS? }

In the orthopedic world, what is often offered as a solution for fallen arches—particularly when they cause a knock-kneed condition—is support in the form of a lift or orthotics in the shoe. The artificial arch takes over the job of the tibialis posterior—and certainly the support is appreciated over the course of a long day as our feet get tired. Yet when the tibialis posterior is not working properly, a host of postural misalignments ensue, and some of them are not rectified by arch supports. With arch supports, changes do happen in the lower leg: the arch is lifted, and the shinbone of the lower leg (i.e., the tibia) rotates out from its base at the ankle, as it should.

But not much changes in the thighbone: it remains inwardly rotated and, in the case of knock-knees, adducted. This means that while the shin is now rotating out, the inner thigh muscles remain tight and pull the femur in toward the midline of the body, causing a twisting and grinding in the knee. It's not enough to shore up the arches. This simply shifts the problem up the leg to the knee, where the twisting can damage the knee ligaments and cartilage. The solution, beginning with the tibialis posterior, has to involve the whole leg.

+ Visit YogaPlus.org and click on “Yoga Therapy for Your Arches” for more exercises that will support healthy, pain-free feet.