

... coddle tendons and bones

Whether you run marathons or walk, injuries are just a step away. Knowing what -- and what not -- to do can help avoid them.

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Action plan

FROM the pickup basketball player to the motivated marathoner, all who exercise can suffer the agony of the feet.

During the simple act of walking, the foot absorbs one-and-a-half times the body's weight. In running, it bears two to three times the body's weight. One giant leap to dunk a basketball can ratchet that force up even higher. Because one stress fracture can seriously derail an entire sports career, researchers are continually studying athletes to determine the optimum methods of training and treatment, to both prevent and care for these injuries.

FOR THE RECORD:

Footsteps: An article on the human foot in Monday's Health said that people take an average of 10,000 steps per mile. In fact, the average person would cover about five miles with 10,000 steps. —

The most common athletics-related injuries, say sports medicine orthopedists and podiatrists, are plantar fasciitis, Achilles tendinitis, neuromas, capsulitis and stress fractures.

Plantar fasciitis

Any activity that involves jumping, plus sudden stops and starts, can lead to plantar fasciitis. And apparently plenty of activities do. This overstretching of the ligament that runs from the heel to the ball of the foot, straight through the arch, affects about 14% of men and women ages 18 to 60, according to the American Podiatric Medical Assn.

"It comes on slowly," says Dr. Doug Richie, a Seal Beach-based podiatrist and past president of the American Academy of Podiatric Sports Medicine. "It's not a sudden event. But it's always worst first thing in the morning, and it can be worse while playing the sport."

Cause: The repeated stress of propelling the foot upward strains the ligament,

sometimes creating small tears and possibly also causing pain at the arch. Being overweight can exacerbate the condition for the additional load it puts on the foot. The injury is especially common this time of year, when resolution-makers start exercising with a little too much gusto.

Although the pain can be felt in the arch, it's usually felt in the heel in part because that's where the ligament is weakest, says Dr. John Pagliano, a Long Beach-based podiatrist and fellow of the American College of Sports Medicine. "The fascia is nice and broad in the arch, but narrows as it comes into the heel." The heel is also where the foot bears the brunt of impacts.

"It's supposed to be a nice, soft, pliable material," Pagliano says, but after taking a pounding, it can form adhesions and scar tissue, becoming "gristly and hard."

Prevention: Warm up before an exercise routine, and gradually increase your workout intensity over time. Wear shoes with adequate arch support.

Treatment: First, try rest, plus orthotics that lift the arch and take the pressure off the ligament. If that doesn't do it, try a leg splint worn at night to keep the foot at a 90-degree angle, so the plantar fascia is prevented from tightening up. For those prone to plantar fasciitis, physical therapists often recommend exercises to stretch the ligament. For instance, while seated, roll the foot on a tennis ball for about five minutes twice a day. But do the move only when warmed up — never first thing in the morning when the foot is stiff — and only on the fleshy bottom of the foot under the arch. A study published last year also showed good results, finding that curling the toes backward while flexing the ankle resulted in less pain and more improvement than those who did an Achilles stretch.

Another therapy could be on the horizon: In a pilot study presented at a meeting last year of the American College of Sports Medicine, 29 men and women recently diagnosed with the injury were given eight weeks of standard care — ibuprofen, rest and stretching exercises. Half were given glucosamine supplements, and half a placebo. Although all started off with the same severity of pain, six of the 15 who took glucosamine were pain-free after about a month, compared with only one of 14 in the placebo group.

Achilles tendinitis

The tendon that brought down the mythic hero Achilles also fells numerous runners, dancers and gymnasts. Some 6.5% of people suffer from general tendinitis, according to the American Podiatric Medical Assn. In 2002, Washington, D.C.-based sports medicine podiatrist Dr. Stephen Pribut surveyed nearly 10,000 runners via the Internet and found that 7% reported that Achilles tendinitis pain prevented them from running for more than a week.

The Achilles tendon connects the calf muscle to the back of the heel bone. But

it's the action of the foot that can cause injury, says Richie — specifically too much bounding, jumping or fast-paced running.

"The more you get up on the toes, the more that uses the Achilles," he says, "since it's the propulsive tendon of the foot, lifting the heel and driving the body forward over the foot." The less flexible the Achilles, the more strain it endures.

Cause: All that stress can eventually lead to inflammation, strains and micro-tears in the tendon, forming scar tissue that results in even more inflexibility, says Pagliano. That can cause severe pain that shoots like a thunderbolt from the back of the ankle with every step. In extreme cases, the Achilles can completely rupture.

Saying goodbye to weekend basketball games or five-mile daily runs is usually the first call to action for Achilles tendinitis sufferers, although sometimes people can substitute an activity with less impact such as an elliptical trainer or bike workout, Richie says. They should also make sure their shoes have proper cushioning for greater shock absorption.

Prevention: Do stretching exercises, three times a day when warmed up, to increase the tendon's flexibility.

Begin with a classic calf stretch, leaning against a wall, one foot in front of the other, gradually pushing the back heel down, then slightly bending that leg.

The tendon can also be stretched using a large, rubbery band. While sitting on the floor, extend one leg and wrap the band under the arch of the foot. Hold the ends of the bands in both hands while pointing and stretching the foot.

Treatment: Shoes that offer a slight heel raise (about 1 1/2 inches) can take stress off the tendon while it heals. Ultrasound can help break up scar tissue, as can massage therapy.

In a promising new development, low-level laser therapy is being tested to treat Achilles tendinitis. The treatment has been used to reduce inflammation in other areas of the body, because the laser light can activate changes in the cells, such as stimulating wound healing.

In a study published last year in the British Journal of Sports Medicine, seven people who had Achilles tendinitis in both legs were given laser treatment and a placebo treatment on each. The laser treatment proved to significantly reduce inflammation and pain compared with the placebo treatment.

Neuromas

The front of the foot has its own set of sports-related problems. Neuromas are

nerves that are squeezed between tissue and metatarsal bones, those long bones behind the toes. They're especially common among cyclists, whose forefeet are under constant pressure while pedaling and who frequently squeeze into tight cycling shoes. Almost 15% of people complain of pain in the ball of the feet, says the American Podiatric Medical Assn.

Pain is usually felt on the ball of the foot, between the third and fourth metatarsal bones, behind the toes. It's often sharp, but can sometimes feel like a burning or tingling sensation, causing sufferers to doff their shoes and massage their feet the first chance they get, possibly discovering a little bump — a sign of an inflamed nerve. But trying to rub away the pain isn't the best thing to do since putting additional pressure on the area can exacerbate the injury, says Judy Seto, a physical therapist with HealthSouth in Los Angeles.

Cause: The area is thought to be a prime target for problems, says Richie, since "the nerve has an extra branch, making it more likely to be pinched." Also, some feet may have metatarsal bones that are naturally closer together, leaving even less space for the nerve.

Prevention: The first line of defense is simple: change shoes. If they're on the worn side, opt for ones with more cushioning, Richie says. If you're feeling a squeeze in the forefoot, try another brand that has a wider toe box. Orthotics may help too, especially ones that distribute pressure more evenly throughout the bottom of the foot.

Treatment: Cortisone shots can shrink the nerve and reduce pain. Some doctors inject an alcohol solution into the foot to kill the nerve. Surgery, used in a few cases, removes the nerve, usually causing no serious side effects.

Capsulitis

Basketball and tennis players — and those with unusually high arches — know the feeling well: a bruised sensation in the ball of the foot that can bring pain with every step.

Known as capsulitis and caused by inflammation around the joint capsule, the condition usually occurs under the second or third metatarsal bone.

Distinguishing between a neuroma and capsulitis is important in terms of treatment, but MRIs might help.

In a study presented earlier last year at the annual meeting of the American College of Foot and Ankle Surgeons, the scans altered the treatment for several, leading some to skip surgery and others to have more precisely targeted surgery. MRIs are helpful in detecting these injuries that usually can't be seen on X-rays.

Cause: Pounding on the ground on a hard surface can bring it on. Wearing hard-

soled shoes can intensify the condition.

Prevention: Choose well-padded athletic shoes. "You must have adequate cushioning and your shoes shouldn't be abnormally worn. That focused, unrelenting pressure compacts the foam [in the shoe]," Richie says. Another option is to wear two pairs of socks for more padding, a trick Seto says many pro basketball players use.

Treatment: Cortisone shots can reduce inflammation and orthotics can help redistribute the body's weight more evenly.

Stress fractures

For these micro-cracks within the bone, a casual walker could be as much at risk as an ultra-marathoner — if both are overdoing the activity and overtaxing the feet.

Excessive running, stair-climbing or other cardio activity can leave the bone unable to adapt and repair quickly enough by building up more calcium and becoming stronger. "In a stress fracture, the body doesn't have time to adapt to the stress, and it fails by breaking down internally," Richie says. Pain intensifies over several days, he says, but without the dreaded "pop" that's usually associated with a break.

Cause: The metatarsal bones, those skinny, long bones that connect the toes to the mid-foot, are the most common spots for stress fractures because they bear much of the body's weight. Other conditions also contribute, such as high arches, which can put even greater pressure on that area.

Stress fractures can also occur in the shins. If the feet don't do a good enough job absorbing the shock from workouts, sometimes due to over-pronation, supination or plantar fasciitis, "the shockwave goes up the leg and it's now straining the bone," says Dr. Phillip Kwong, an orthopedic surgeon at the Kerlan-Jobe Orthopaedic clinics in Los Angeles and Anaheim. The heel bone is another hot spot for stress fractures. The clue is pain that radiates all through the heel that doesn't get better with time.

Prevention: Gradually increase activities, even in pursuit of a shape-up for the new year. Says Richie: "The body needs more time to adapt and recover." Those training for a marathon, for instance, should take one or two days off after long runs.

Treatment: Rest alone usually doesn't fix the problem since even a minimal amount of walking can put stress on the foot, Richie says. More drastic measures are required to give the bone time to heal, so often the foot is immobilized in a cast for several weeks.

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