Ninety per cent of runners wear the wrong-size shoes
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HEALTH

Common running injuries and how to avoid them

Corns, heel pain, fat-pad atrophy — the experts tell Peta Bee how to treat and avoid foot problems

Peta Bee

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For many people, going for a long run has been a liberation during lockdown. Some may even be contemplating including jogging to work as a way to actively commute once the restrictions are eased. However, it's important not to push your body too far, too soon, as overdoing the activity can result in numerous niggles and complaints.

A study of more than 16,500 elite athletes published in the *British Journal of Sports Medicine* last year confirmed that while in other sports problems strike in the thighs, upper body and trunk areas, in endurance runners injuries are most likely below the knee. Blisters and blackened toenails, tendon pain and the dreaded plantar fasciitis, caused by overloading the connective plantar fascia tissue that runs from your heel to your toes, are all commonplace among long-distance runners, but now there is another concern to add to the list — fat loss in your feet.

Most runners strike the ground with their forefoot or heel and, particularly for heel strikers, the almost inch-thick, pillowy pad between our skin and heel bone acts as a shock absorber, protecting the bones and arch of the feet whenever we move.

Over time, the wear and tear that comes with ageing can cause these fatty pads to diminish, resulting in what's known medically as fat-pad atrophy, a loss of natural heel cushioning that can eventually make weight-bearing movement of any kind unbearable. "Usually it's a case of heel fat being displaced rather than depleted," says Trevor Prior, a consultant podiatric

surgeon and spokesman for the College of Podiatry. “Imagine a balloon filled with water that spreads outwards as you apply pressure to it from the top — it’s that kind of effect on the fat pads as they become dispersed over time so that protection is lost.”

There’s no evidence, Prior says, that running or other forms of exercise accelerate fat pad atrophy. “It’s a natural consequence of ageing that affects some people, but certainly not everyone and far from every runner,” he says. “Some people can run ultra-distances for many years with no fat pad atrophy while others might experience it on minimal mileage.”

A study by Korean researchers published in the journal *Annals of Rehabilitation Medicine* found that it most commonly affects people over the age of 40 and that thinning heel pads are exacerbated by the loss of collagen and elastic tissue that occur as we age, which combine to reduce shock absorbency in the foot. Steroid injections to the feet, sometimes used to treat other injuries, can make matters worse, weakening collagen and shrinking fat cells.

For runners who are affected - and you need only google the term “fat pad syndrome” to discover that it plagues triathletes and marathon runners — the discomfort can be debilitating. What often starts as a dull, bruise-like ache in the heel can gradually worsen to a soreness that impacts every step. Running is a high-impact activity in which the force of up to six times your body weight reverberates from the heels through the legs, so the shock of every running stride is felt more sharply. As the throbbing pain becomes most severe, people start to walk on tiptoes in an attempt to avoid it. There are different strategies for treating it. Restricting exposure to hard surfaces — no barefoot walking — and the use of orthotic insoles may help, provided that they have a supportive heel cup. “A podiatrist can strap the foot in a specific way to prevent the fat pad spreading out,” Prior says. “Or wearing compression socks can have a similar effect.”

A more controversial option is to use fat harvested from elsewhere on the body to plump up the flattened heel pad. It’s an approach that is popular in the US and is now available here with Dr Ian Day, a former NHS surgeon and the founder of Soul Care Aesthetics in Staffordshire, who is among the first to be offering it to patients, at a cost of £2,200. “The technique involves drawing off a small amount — about 20ml — of excess body fat in a non-surgical procedure and combining it with the patients’ blood using a platelet-rich plasma,” Day explains. “The heel is numbed with a local anaesthetic and the mixture is then immediately injected deep into the heel so that it re-inflates the fat pockets.” Since fat in the heel is different from fat in many parts of the body — it is interspersed and held in place by collagen fibres - it needs to be drawn from specific places. “The closest is the fat near to the pelvis in the abdominal area,” Day says. “When possible, that’s what we use.”

Researchers at the University of Pittsburgh have had success in treating patients with the technique in a series of studies. In one small investigation involving seven patients published last year they revealed how fat grafting, mostly in both heels, restored foot function "by preserving shock absorbing soft tissue and reducing pain", which "allowed many of our patients to resume previously untolerated activities". In the past 12 months Day has performed 15 to 20 heel-fat grafting procedures, with the most notable success in runners. Among them is Ruth Woodward, 50, from Staffordshire, who had been running for more than a decade, covering an average of 10km a day, six days a week, when she began to experience heel pain. "It gradually built up over time, in one foot at first and then in the other as well," she says. "I went out for a run one day and the pain was so excruciating that I had to stop and walk home."

She visited a sports physiotherapist who diagnosed fat-pad atrophy in her heels and six months later she underwent the fat-grafting treatment. "I was off my feet for two weeks afterwards, but then I was straight back into running," Woodward says. "I was sceptical about whether it would work, but I've had absolutely no pain since."

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THE PROBLEMS WITH RUNNERS' FEET

Why you need to wear larger size footwear than normal

In research he conducted at Queen Mary University of London, Prior says he found that 90 per cent of runners wear the wrong-size shoes. "It's one of the biggest root causes of injuries," he says. "Your trainers should be foot-shaped and 1cm longer than your longest toe, usually a shoe size bigger than you normally wear." Squeezing feet into too-small trainers can cause all manner of problems, including a neuroma, the thickening or swelling of tiny nerves that pass between your toe joints. "By squeezing the bones of the foot into small shoes, you also increase pressure on the balls of the feet, raising the risk of corns and callouses," Prior says. "Bursitis, the inflammation of a small fluid-filled sac called a bursa, is also common near a joint, bone or tendon as a result of irritation and friction of small shoes." Nerve problems in the feet can be a result of small shoes, lower-back issues and small muscles in the heel irritating nerves. "Claims that running itself has caused direct nerve

damage to their feet are not usually medically founded," Prior says.

Don't run too far, too soon

Plantar fasciitis, caused by inflammation and damage to the thick fascia band that protects the foot and maintains tension and support in the arch, is among the most common injuries that result from long-distance running. It causes sharp heel pain and needs to be ruled out before fat-pad atrophy is diagnosed. "Drastic or sudden increases in mileage are among the greatest risk factors," says Paul Hobrough, a physiotherapist and the author of *Running Free of Injuries* (Bloomsbury). "If you have a job that involves a lot of standing, have flat feet and a high body mass index you are also more likely to get it if you start running too much too soon." Wearing orthotic insoles, a plantar fasciitis — or Strassburg — sock (£24.79; physioroom.com), avoiding barefoot walking and taking anti-inflammatory medication when needed are all key to recovery. "Stretch your calf muscles six times a day and drag a towel along the floor with your toes for two minutes twice a day," Hobrough says. "And write the alphabet with your foot in mid-air daily."

You can lose iron through your feet

If you're training for a marathon it's worthwhile checking your iron intake. Small amounts of iron are lost in sweat and through the gastrointestinal tract as iron-carrying blood is drawn away from the gut during intense exercise. But you can also lose some iron through your feet through a process called foot-strike haemolysis. This is where red blood cells are damaged by the feet repeatedly hitting the ground over many miles, reducing haemoglobin and iron levels. Men (and women aged over 50) need 8.7mg of iron daily, while women aged 11-50 need 14.8mg. Red meat is the richest source, although darker poultry meat and oily fish are also good suppliers. Green vegetables, such as kale, endive and broccoli also supply it, as do kidney beans, figs and almonds.

Minimalist v maximalist running shoes

Squashy soled, maximalist shoes are all the rage among runners seeking fast times and lower rates of injury. But are they any better than last year's minimalist trainers? For several years, researchers at Oregon State University have been putting different running shoes to the test with their latest study, published in January, comparing the effects of a standard "neutral" shoe with moderate amounts of cushioning, with the same shoe that had amounts of the cushioned foam added or removed. In previous trials using the same exercise, scientists had shown that recreational runners landed more heavily when wearing ultra-cushioned trainers and also pronated more — meaning their ankles rolled inward - as they prepared to push off with each stride. While not immediately problematic, they are the kind of alterations to running technique that might predispose someone to injuries if ignored in the long term. In the latest trial, runners didn't land harder in the shoes adapted to feature more foam, but they still pronated more than when wearing the other models. So, which to choose? "Everybody has an individual movement pathway which means not every style of shoe suits every runner," Prior says. "You want to find a shoe

that suits your movement pathway, that reduces the impact force with every stride and also minimises the energy required for every stride and ultimately the best test for all of this is comfort."

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