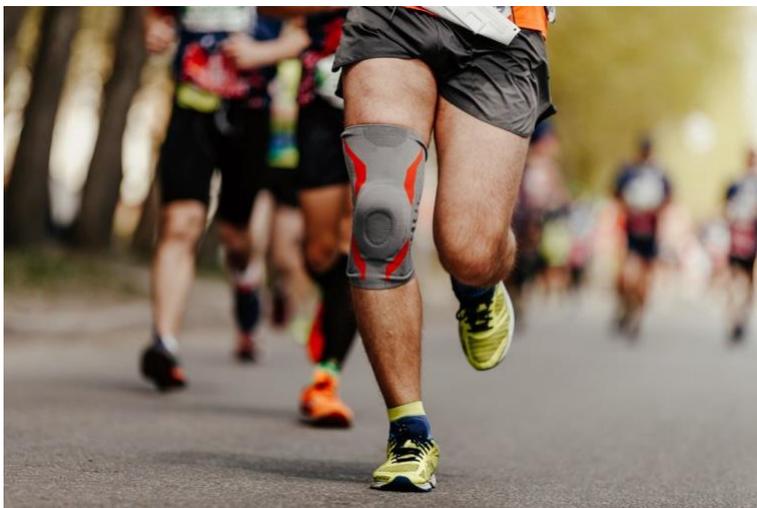


The secret to pain-free knees this running season: avoid high-impact sports, work on quad strength and always warm up thoroughly, doctors say

- The knee joint is complex and prone to injury, but running keeps it healthy and lowers the risk of osteoarthritis; marathon training can even repair some damage
- Doctors say losing excess weight, doing quadriceps-strengthening exercises and warming up well before every run will help keep your knees pain-free

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The knee is prone to stress and injury, but regular running keeps the joint lubricated and builds up cartilage, lowering the risk of arthritis. Avoiding high-impact sports and working on your quad strength will help keep knees pain-free, doctors say.

As the running season gets going again in subtropical Asia after a pandemic-induced hiatus – the Hong Kong Standard Chartered Marathon and Moontrekker events are back in October, though with a smaller field for the first, and in a virtual format for the second – it's time to resolve a common misconception: that pounding the roads and trails is bad for the knees.

Of the 360 joints in the human body, the knee is the largest and the most complex. Our knees allow for efficient walking and enable us to lift and lower our body. They help keep us upright while bearing much of our body weight.

The joint's components include bones, muscles, cartilage, ligaments and tendons. The four major bones involved are the thigh bone (femur), the shin bones (tibia and fibula) and kneecap (patella).

The kneecap is lined by the body's thickest layer of cartilage, and is also our biggest "sesamoid" bone, meaning it is not attached to another bone by a true joint.



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It is also unusual in that we are not born with kneecaps. From birth, it takes about three years for them to fully develop. Like our fingerprints, everyone's kneecaps are unique.

Many muscles work together to correctly position the knee and allow it to bend: the four quadriceps muscles in the front thigh that straighten the knee, three hamstring muscles at the back of the thigh that bend it, and muscles known as the gluteus medius and gluteus minimus, or "glutes", in the buttocks that are key to maintaining the alignment of the knee and reducing twisting forces.

The knee also has meniscus and articular cartilage, both acting as shock absorbers. The ligaments connect bones to bones, while the tendons connect bones to muscle. They all enable the knee to carry out subtle movements beyond bending, such as rotating the thigh on the shin bone.

A fibrous membrane bag surrounds the knee joint, filled with synovial fluid to lubricate and nourish it. About 14 small fluid-filled sacs called bursa produce this fluid, which alleviates friction between the knee's tissues and prevents inflammation.

The knee's complex nature makes it vulnerable to injury – little wonder, given that the stress knees bear is four or five times our weight.



Runners jog through Mong Kok during the Standard Chartered Hong Kong Marathon.

Dr Diane Tai, a Hong Kong specialist in orthopaedics and traumatology, says the knee is one of the most stressed joints. It is also the joint young athletes are most likely to hurt.

Young athletes tend to suffer injury to the anterior cruciate ligament (ACL), meniscus and cartilage, whereas older patients are more likely to suffer symptoms of degeneration such as swelling.

Dr Terence Chan, a Hong Kong-based orthopaedic surgeon with a special interest in knee problems, lists tendinitis, meniscal tear and knee osteoarthritis as common injuries.



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In some ways, our knees don't seem well built to withstand pain at all, and there may be an evolutionary reason for this. A 2020 study found that adaptations the knee made in response to bipedalism (walking on two legs) probably led to the prevalence of osteoarthritis – a condition which causes stiff, sore joints and affects around 250 million people today.

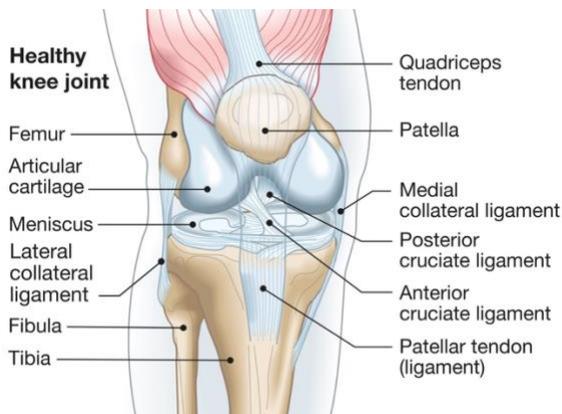
However, because the adaptations helped humans walk on two legs, they were passed from generation to generation, but so too was an increased likelihood of developing osteoarthritis. We can thank our ancestors for making us weak in the knees.

Many studies have shown that runners are less likely to get knee arthritis. Why? Running helps to keep the knees lubricated and encourages the build-up of new cartilage. Running also helps the cartilage to adapt to new demands placed upon it, studies suggest.

In fact, a 2019 study in the *BMJ Open Sport and Exercise Medicine* looked at the effects four months of marathon training had on the knees of middle-aged adults with minor pre-existing knee issues. MRI scans showed the subjects' knees had less damage after the training.

There are many ways to safeguard our knees. Tai suggests avoiding actions which can be damaging, including “high-impact sports which involve a lot of jumping and landing” – these can jar the knee or even dislocate it – and to avoid “running up and down stairs, squatting and deep lunging”.

Chan suggests that it is the sudden plunge into these activities that risks injury – the anterior cruciate ligament and medial collateral ligament are often injured through a sudden twisting movement or a bad landing.



A healthy knee joint with ligaments, meniscus, articular cartilage, femur and tibia.

Gradual wear and tear can damage the knee in other ways. Chan concludes that strength and flexibility are important for any healthy joint, and recommends warming up before exercise and, in the event of injury, seeking medical attention promptly.

Tai recommends doing exercises to strengthen the quadriceps muscle. Using a knee brace during exercise, losing excess weight and engaging in low-impact sports such as swimming and cycling can all help to protect your knees while keeping you active.

The ‘little bean’

The knee is home to a mysterious bone called the fabella, meaning “little bean” in Latin. Over human evolution, the fabella had begun to disappear – until relatively recently. A 2019 study found that the bone is now three times more common in humans than it was a century ago.

Does this mean that the bone is of any use? Apparently not. While the fabella once functioned as a kneecap, now it seems only to cause pain. The bone has been linked to knee problems such as arthritis; those with this ailment are twice as likely to have a fabella.

Scientists speculate that, as humans have grown taller and heavier, the knees have taken on more stress and the fabella has made a comeback to support them. Still, it seems more a pain than a gain.

https://www.scmp.com/lifestyle/health-wellness/article/3151126/secret-pain-free-knees-running-season-avoid-high-impact?module=perpetual_scroll&pgtype=article&campaign=3151126