

Metatarsal fracture

What you're feeling

A metatarsal fracture is a break in one of the long bones of your foot, between your toes and your midfoot. The break causes pain, swelling and bruising over the injured bone. Standing or walking on the foot usually hurts, and getting around becomes hard. The pain is often worse when you push off the ground to step, and it eases when you take the weight off your foot.

Where the pain sits depends on which bone is broken. A break in the outer bone of your foot (the fifth metatarsal) causes pain and tenderness on the outside of your foot, and walking is difficult. Bruising can follow a direct knock to that spot. A break in the innermost bone (the first metatarsal) or in the middle bones hurts when you bear weight and when you move your foot, and it makes walking difficult. The area feels tender to touch, and the broken bone may feel like it is moving slightly under the skin.

Some breaks come from repeated loading rather than a single injury. These are called stress fractures, and they build up over weeks. The second and third metatarsals are the ones most often affected. With a stress fracture you may notice pain along the top or outside of your foot that gets worse with activity over several weeks, and settles when you rest. The second metatarsal is a common spot for dancers and running athletes.

Daily tasks that load the front of your foot become tricky: pushing a shopping trolley, climbing stairs, standing at the bench to cook, or getting to the letterbox. Swelling can make shoes feel tight.

One thing worth knowing: bruising on the sole of your foot can point to a more serious injury involving the joints of your midfoot. If you have that pattern of bruising, or your pain is severe, get assessed promptly.

What's actually happening

Your foot has five long bones called metatarsals, running from your midfoot to the base of your toes. Think of them as the beams of a bridge: each one carries its share of the load as you stand and walk. When one of these beams cracks, from a twist, a knock or a fall, you get the pain and swelling described above.

The bones do not share the work evenly. The innermost metatarsal is shorter and wider than the others and carries about one-third of your body weight with every step. The outer metatarsal and the inner one move more freely than the three middle bones, which are packed tightly together and held by ligaments, the strong straps

that connect bone to bone. That tight packing protects the middle bones, so a single break there rarely shifts out of place unless several bones are broken at once.

Breaks in these bones fall into different patterns. Some are simple cracks that stay in line. Others are pushed out of place by the force that caused them, or by tendons, the ropes that join muscle to bone, pulling on the broken piece. The outer metatarsal is a special case: a tendon attaches near its base and can tug a broken piece out of line. Breaks near that base are also grouped into three zones, from the spot where the tendon attaches, to the joint it shares with the next bone, to the shaft just beyond. Where the break sits matters, because some zones have a poor blood supply, the delivery system that brings healing cells to bone. With less blood flowing in, these breaks are slower to knit and more likely to fail to heal at all.

Stress fractures work differently. Bone constantly renews itself, and it takes about 2 weeks to do so. If you load the bone faster than it can renew, usually from a sudden jump in running or dancing, tiny cracks build up. That is why the pain creeps in over weeks rather than arriving with one injury.

What we can do about it

Dr Kieran Hirpara, an upper-limb surgeon at Mater Private Hospital Rockhampton, matches the treatment to your specific injury. Patients are generally referred to our clinic by their GP; if a physiotherapist has suggested you see us, you will still need a referral from your GP in order to be eligible for the Medicare rebate. At the clinic we take a history, examine your foot and arrange imaging where needed. X-rays from three angles show the position of the broken bone. Sometimes a CT scan, which gives a more detailed picture, is used for breaks near the base of the bone, and an MRI can show soft tissue injury or pick up a stress fracture early.

Many breaks settle without an operation. A stiff-soled shoe or a walking boot protects the foot while you bear weight as you can tolerate. Some breaks need a cast with no weight on the foot for a set period, then a gradual return to loading. We also look at why the break happened: foot shape, training load or low vitamin D can all play a part, and addressing these helps prevent another one.

Surgery is considered when the broken bone has shifted out of place, when several bones are broken together, when the break involves the joint surface, or when a break near the base of the outer metatarsal is slow to heal. The aim is to hold the pieces in the right position while they knit, using screws or a small plate, or sometimes a pin placed inside the bone. For some breaks near the base of the outer metatarsal, surgery may be recommended straight away rather than after a trial of casting, because these breaks have a poor blood supply and are more likely to fail to heal or break again. Whether to operate is a decision we make together, weighing what the break looks like against your work and activity needs.

What to expect

For most metatarsal fractures, the outlook is good. When the break is assessed properly and treated, almost all of them heal without ongoing complaints. The bone knits as it normally would, and a break that fails to heal at all is uncommon, with one notable exception: a break near the base of the outer metatarsal, where the blood supply is poor. That spot is slower to knit and more likely to cause trouble.

How long it takes depends on the type of break. A simple break near the base of the outer metatarsal, treated without surgery, is expected to heal within 8 weeks. Stress fractures of the middle bones usually settle with rest, or with a cast that takes your weight off the foot while it heals. If a stress fracture at the base of the second metatarsal does not heal despite this, an operation is sometimes needed to get the bone to knit.

If your break is out of line and surgery is used to hold it, the bone can be straightened and good results follow. For athletes with a break near the base of the outer metatarsal, surgery reliably gets them back to their previous level of competition. Major League Soccer players with this injury return to their sport at a high rate.

There are some honest cautions. If a broken bone heals in a poor position, it can cause lasting disability, which is why getting the bones lined up matters. Some people feel a dull ache where a screw sits, and hardware near the base of the outer metatarsal can be uncomfortable enough that it needs removing later. Returning to sport too soon carries a risk: coming back within 8 weeks of surgery on that bone leaves a quarter of people with a break that has not yet knit at 3 months, although it rarely causes a permanent failure to heal. A small number of people break the same spot again, even after the bone has fully knit.

Children's foot fractures generally heal well and are treated without an operation.

When to see someone

See your GP promptly if you have foot pain with swelling or bruising after a twist, a knock or a fall, especially if standing or walking on the foot is painful. Ask for a specialist review if the pain came on over several weeks with activity and does not settle with rest, because X-rays can look normal in the first 3 weeks and further scans may be needed. Go to an emergency department if you have bruising on the sole of your foot, severe pain that is much worse than expected, or a foot that is pale, cold or numb, as these can signal a more serious injury needing same-day care.