

Toe and Forefoot Fractures

Fractures of the toes and forefoot are quite common. Fractures can result from a direct blow to the foot—such as accidentally kicking something hard or dropping a heavy object on your toes. They can also result from the overuse and repetitive stress that comes with participating in high-impact sports like running and basketball.

Although fracturing a bone in your toe or forefoot can be quite painful—it rarely requires surgery. In most cases, a fracture will heal with rest and a change in activities.

Anatomy

The forefoot has 5 metatarsal bones and 14 phalanges (toe bones). There are 3 phalanges in each toe—except for the first toe, which usually has only 2.

All the bones in the forefoot are designed to work together when you walk. A fracture, or break, in any of these bones can be painful and impact how your foot functions.

Description

Toe and forefoot fractures often result from trauma or direct injury to the bone. Fractures can also develop after repetitive activity, rather than a single injury. This is called a "stress fracture."

Fractures may either be "non-displaced," where the bone is cracked but the ends of the bone are together, or "displaced," where the end of the broken bones have partially or completely separated.

Fractures can also be divided into "closed fractures" where the skin is not broken and "open fractures" where the skin is broken and the wound extends down to the bone.

Open fractures are particularly serious because, once the skin is broken, bacteria can enter the wound and cause infection in the bone. Immediate treatment is required to prevent infection.

Symptoms



The most common symptoms of a fracture are pain and swelling. Other symptoms may include:

- Bruising or discoloration that extends to nearby parts of the foot
- Pain with walking and weight bearing

First Aid

If you think you have a fracture, it is important to see your doctor as soon as possible. A fracture that is not treated can lead to chronic foot pain and arthritis and affect your ability to walk.

While you are waiting to see your doctor, you should do the following:

- Apply ice to help reduce swelling.
- Elevate your foot as much as possible.
- Limit weight bearing.
- Lightly wrap your foot in a soft compressive dressing.

Doctor Examination

Physical Examination

When you see your doctor, he or she will take a history to find out how your foot was injured and ask about your symptoms. Your doctor will then examine your foot and may compare it to the foot on the opposite side.



Your foot may become swollen and discolored after a fracture.

During the exam, he or she will look for:

- Swelling
- Tenderness over the fracture site
- Bruising or discoloration—your foot may be red or ecchymotic ("black and blue")
- Deformity
- Skin abrasions or open wounds
- Loss of sensation—an indication of nerve injury

Imaging Studies

Your doctor will also order imaging studies to help diagnose the fracture.

X-rays. X-rays provide images of dense structures, such as bone. An x-ray can usually be done in your doctor's office.

Most fractures can be seen on a routine plain x-ray. A stress fracture, however, may start as a tiny crack in the bone and may not be visible on a first x-ray.

In many cases, a stress fracture cannot be seen until several weeks later when it has actually started to heal and a type of healing bone called "callus" appears around the fracture site.



(Left) In this x-ray, a recent stress fracture in the third metatarsal is barely visible (arrow). **(Right)** Several weeks later, there is callus formation at the site and the fracture can be seen more clearly.

Magnetic Resonance Imaging (MRI) scans. If your doctor suspects a stress fracture but cannot see it on a plain x-ray, he or she may recommend an MRI scan. This type of study uses a magnetic field and radio waves to create a computerized image of your foot.

More sensitive than an x-ray, an MRI can detect changes in the bone that may indicate a fracture. Unlike an x-ray, there is no radiation with an MRI. The study takes 40 minutes to do, however, and has to be scheduled separately from your doctor's visit.

Treatment

Treatment for a toe or forefoot fracture depends upon:

- The location of the injury
- The type of fracture

Fractures of the Toes

Even though toes are very small, injuries to the toes can often be quite painful.

A fracture of the toe may result from a direct injury, such as dropping a heavy object on the front of your foot, or from accidentally kicking or running into a hard object. A fracture may also result if you accidentally hit the side of your foot on a piece of furniture on the ground—and your toes are twisted or pulled sideways or in an awkward direction.

The proximal phalanx is the toe bone that is closest to the metatarsals. Because it is the longest of the toe bones, it is the most likely to fracture.

A fractured toe may become swollen, tender and discolored. If the bone is out of place, your toe will appear deformed.

Treatment

Most broken toes can be treated symptomatically. For several days it may be painful to bear weight on your injured toe. As your pain subsides, however, you can begin to bear weight as you are comfortable. During this time, it may be helpful to wear a wider than normal shoe.

"Buddy taping" your broken toe to an adjacent toe can also sometimes help relieve pain.

If the bone is out of place and your toe appears deformed, it may be necessary for your doctor to manipulate or "reduce" the fracture. This procedure is most often done in the doctor's office. You will be given a local anesthetic to numb your foot, then your doctor will manipulate the fracture back into place and straighten your toe.

(Left) In this x-ray, a fracture in the proximal phalanx of the fifth toe (arrow) has caused the toe to become deformed. **(Right)** The bones in the angled toe have been manipulated (reduced) back into place.



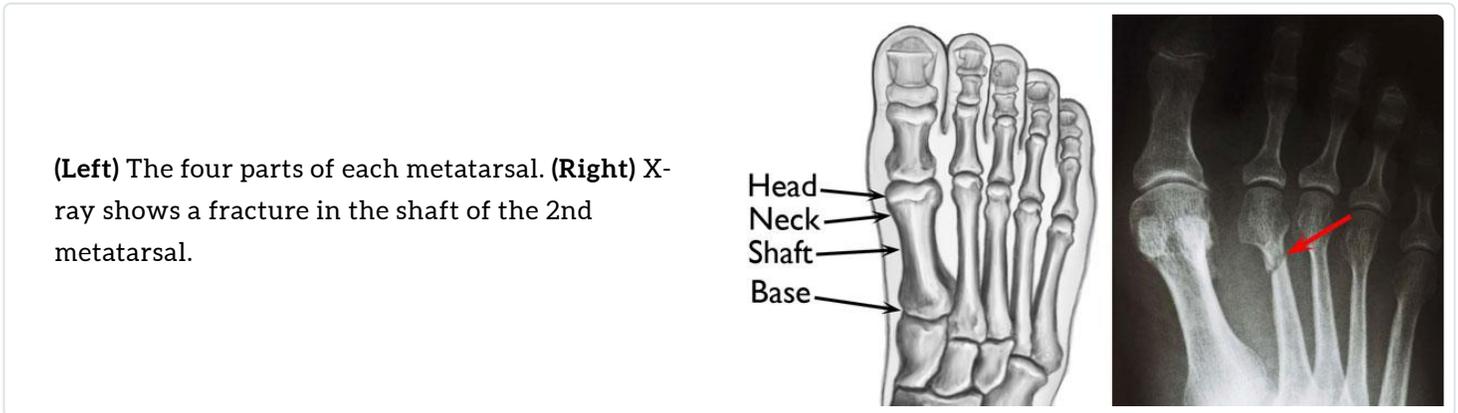
Metatarsal Fractures

The metatarsals are the long bones between your toes and the middle of your foot. Each metatarsal has the following four parts:

- Head—which makes a joint with the base of the toe
- Neck—the narrow area between the head and the shaft
- Shaft—the long part of the bone

- Base—which makes a joint with the midfoot

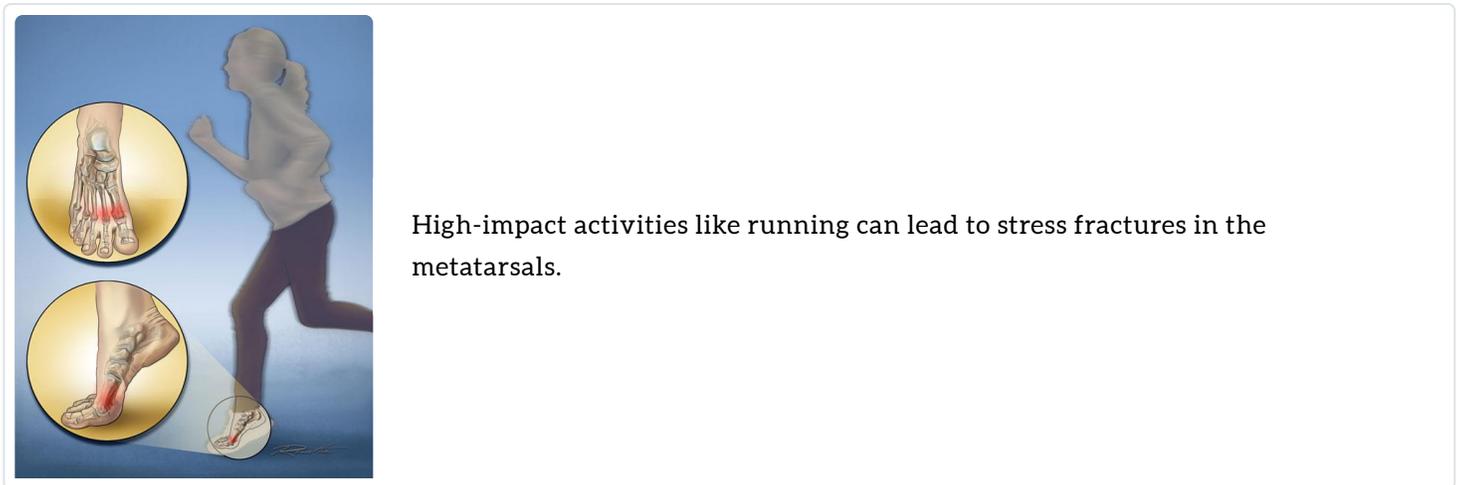
Fractures can occur in any part of the metatarsal, but most often occur in the neck or shaft of the bone.



Like toe fractures, metatarsal fractures can result from either a direct blow to the forefoot or from a twisting injury.

Some metatarsal fractures are stress fractures. Stress fractures are small cracks in the surface of the bone that may extend and become larger over time.

Stress fractures are typically caused by repetitive activity or pressure on the forefoot. They are common in runners and athletes who participate in high-impact sports such as soccer and basketball.



A stress fracture can also come from a sudden increase in physical activity or a change in your exercise routine.

Treatment

Most metatarsal fractures can be treated with an initial period of elevation and limited weight bearing. This is followed by gradual weight bearing, as tolerated, in a cast or walking boot. Surgery is not often required.

However, if you have fractured several metatarsals at the same time and your foot is deformed or unstable, surgery is necessary.

During the procedure, your doctor will make an incision in your foot, then insert pins or plates and screws to hold the bones in place while they heal. This is called "internal fixation."

Surgery may be delayed for several days to allow the swelling in your foot to go down. If you have an open fracture, however, your doctor will perform surgery immediately.

Fifth Metatarsal Fractures

The fifth metatarsal is the long bone on the outside of your foot. Injuries to this bone may be different than fractures of the first four metatarsals.

Most commonly, the fifth metatarsal fractures through the base of the bone. This usually occurs from an injury where the foot and ankle are twisted downward and inward.

In this type of injury, the tendon that attaches to the base of the fifth metatarsal may stretch and pull a fragment of bone away from the base. Since the fragment is pulled away from the rest of the bone, this type of injury is called an "avulsion fracture."



X-ray shows an avulsion fracture at the base of the fifth metatarsal (arrow).

An avulsion fracture is also sometimes called a "ballerina fracture" or "dancer's fracture" because of the "pointe" position that ballet dancers assume when they are up on their toes.

Another type of fifth metatarsal fracture is a horizontal or transverse fracture through the junction of the base and shaft of the bone. This is sometimes called a "Jones fracture." Since the blood supply to this area is poor, Jones fractures are more prone to difficulties in healing.

Treatment

Most fifth metatarsal fractures can be treated with weight bearing as comfortable in a walking boot. If an avulsion fracture results in a large displaced fracture fragment, however, open reduction and internal fixation with plates and screws may be necessary.

Because of its location on the bone, a Jones fracture may take longer to heal. In some cases, a Jones fracture may not heal at all, a condition called "nonunion." When this happens, surgery is often required to treat the fracture.

(Left) X-ray shows a Jones fracture at the base of the fifth metatarsal (arrow). (Right) A screw has been used to hold the bone in place while it heals.



Recovery

Healing of a broken toe may take from 4 to 8 weeks.

Metatarsal fractures usually heal in 6 to 8 weeks, but may take longer. Your doctor will take follow-up x-rays to make sure that the bone is properly aligned and healing. Even with proper healing, your foot may be swollen for several months and it may be hard to find a comfortable shoe.

Your doctor will tell you when it is safe to resume activities and return to sports. If you experience any pain, however, you should stop your activity and notify your doctor. Returning to activities too soon can put you at risk for re-injury.

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