

## Fractures (Broken Bones)

A fracture is a broken bone. A bone may be completely fractured or partially fractured in any number of ways (crosswise, lengthwise, in multiple pieces).

### Types of Fractures

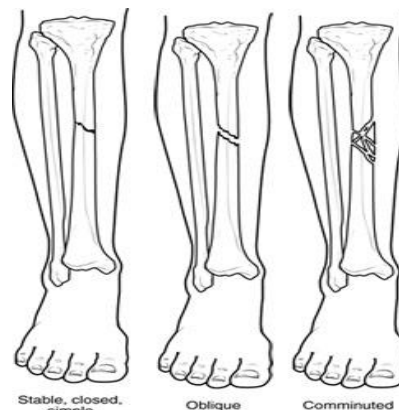
Bones are rigid, but they do bend or "give" somewhat when an outside force is applied. However, if the force is too great, the bones will break, just as a plastic ruler breaks when it is bent too far.

The severity of a fracture usually depends on the force that caused the break. If the bone's breaking point has been exceeded only slightly, then the bone may crack rather than break all the way through. If the force is extreme, such as in an automobile crash or a gunshot, the bone may shatter.

If the bone breaks in such a way that bone fragments stick out through the skin, or a wound penetrates down to the broken bone, the fracture is called an "open" fracture. This type of fracture is particularly serious because once the skin is broken, infection in both the wound and the bone can occur.

Common types of fractures include:

- Stable fracture. The broken ends of the bone line up and are barely out of place.
- Open, compound fracture. The skin may be pierced by the bone or by a blow that breaks the skin at the time of the fracture. The bone may or may not be visible in the wound.
- Transverse fracture. This type of fracture has a horizontal fracture line.
- Oblique fracture. This type of fracture has an angled pattern.
- Comminuted fracture. In this type of fracture, the bone shatters into three or more pieces.



A bone can fracture in different ways. Some common fracture types are shown here.

### Cause

The most common causes of fractures are:

- Trauma. A fall, a motor vehicle accident, or a tackle during a football game can all result in fractures.
- Osteoporosis. This disorder weakens bones and makes them more likely to break.
- Overuse. Repetitive motion can tire muscles and place more force on bone. This can result in stress fractures. Stress fractures are more common in athletes.

## Symptoms

Many fractures are very painful and may prevent you from moving the injured area. Other common symptoms include:

- Swelling and tenderness around the injury
- Bruising
- Deformity — a limb may look "out of place" or a part of the bone may puncture through the skin

## Doctor Examination

Your doctor will do a careful examination to assess your overall condition, as well as the extent of the injury. He or she will talk with you about how the injury occurred, your symptoms, and medical history.

The most common way to evaluate a fracture is with x-rays, which provide clear images of bone. Your doctor will likely use an x-ray to verify the diagnosis. X-rays can show whether a bone is intact or broken. They can also show the type of fracture and exactly where it is located within the bone.

## Treatment

### *Cast Immobilization*

A plaster or fiberglass cast is the most common type of fracture treatment, because most broken bones can heal successfully once they have been repositioned and a cast has been applied to keep the broken ends in proper position while they heal.

### *Functional Cast or Brace*

The cast or brace allows limited or "controlled" movement of nearby joints. This treatment is desirable for some, but not all, fractures.

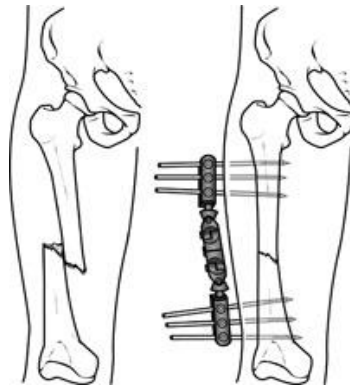
### *Traction*

Traction is usually used to align a bone or bones by a gentle, steady pulling action.

### *External Fixation*

In this type of operation, metal pins or screws are placed into the broken bone above and below the fracture site. The pins or screws are connected to a metal bar outside the skin. This device is a stabilizing frame that holds the bones in the proper position while they heal.

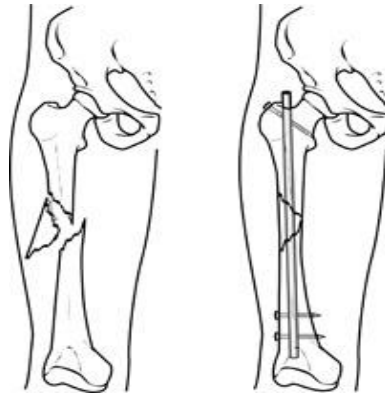
In cases where the skin and other soft tissues around the fracture are badly damaged, an external fixator may be applied until surgery can be tolerated.



An external fixator applied to a broken femur (thighbone).

### ***Open Reduction and Internal Fixation***

During this operation, the bone fragments are first repositioned (reduced) in their normal alignment, and then held together with special screws or by attaching metal plates to the outer surface of the bone. The fragments may also be held together by inserting rods down through the marrow space in the center of the bone.



A specially designed metal rod, called an intramedullary nail, provides strong fixation for this thighbone fracture.



In this x-ray, the broken bones of the forearm are held in position by plates and screws while they heal.

### **Recovery**

Fractures take several weeks to several months to heal, depending on the extent of the injury and how well you follow your doctor's advice. Pain usually stops long before the fracture is solid enough to handle the stresses of normal activity.

Even after your cast or brace is removed, you may need to continue limiting your movement until the bone is solid enough for normal activity.

During your recovery you will likely lose muscle strength in the injured area. Specific exercises will help you restore normal muscle strength, joint motion, and flexibility.

### **Prevention**

Proper diet and exercise may help in preventing some fractures. A diet rich in calcium and Vitamin D will promote bone strength. Weightbearing exercise also helps keep bones strong.