

# Treating Fractures

A fracture is a partial or complete break in a bone. Breaks in bones can occur from falls, trauma, or as a direct blow to the body.

Symptoms of a fracture may include:

- Pain
- Swelling
- Deformity
- Problems using or moving the injured area
- Warmth, bruising or redness

Treatment will vary based on the location, type, and extent of the injury, as well as your physical condition and needs. Your doctor will work with you to find the best treatment for you.

## Types of Fractures

The two main types of fractures are closed and open fractures. Closed fractures are the most common. With a **closed fracture**, there is a break in the bone but the bone does not stick out through the skin.

In an **open fracture**, part of the bone may stick out of the skin or there may be an open wound where the bone broke through the skin. This type of fracture can be more serious because of the risk of infection in the wound or the bone.

More on next page →

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## **What is needed to heal a fracture?**

Most fractures will heal with treatment and care. There is a risk that the fracture may fail to heal or be so slow to heal. This is called a non-union.

- **There must be live bone at the site of the fracture with a good blood supply.** If the blood vessels have been stripped away from the bone, the bone will die. Growth of new blood vessels at the fracture site is needed for healing. The growth can occur from the healthy bone or from the muscle and soft tissue around the site.
- **There must be healthy soft tissue at the fracture site.** The soft tissue includes muscle, fat and blood vessels. These healthy tissues and blood vessels are a source for new cells to make new bone to heal the fracture. The new cells grow from inside the bone, the surface of the bone and the soft tissue around the fracture.
- **Your body signals the tissue cells to make bone.** Many of the signals come from growth factors in and around bone and bone pieces at the fracture site. If the growth factors are not there, the fracture will not heal. Certain medicines and some diseases can cause there less growth factors to increase the risk of non-union.
- **The edges of the bone fracture must be stable so they do not move very much.** If there is too much movement, the cells are not able to grow across the fracture site. With too much movement, cartilage or scar may form in the fracture site, rather than bone. Placing casts or using screw, plates or rods help control the movement of the fracture.

## **Other factors that can impact healing**

There are several other things that can slow or prevent healing:

- Infection
- Tobacco use
- Certain medicines or treatments
- Nutrition
- Other health conditions such as diabetes, peripheral vascular disease and osteoporosis

## **Infection**

Infection at a fracture site will almost always slow or prevent healing. Infection can occur when there is a break in the skin with the fracture or if the bone comes out through the skin. This is called an open fracture or a compound fracture.

Infection can also be present before a fracture. If the bone is weakened by infection, it may make a fracture more likely to happen.

Germs are also present in the air. Special precautions are taken to reduce the chance of infection in the operating room. Care of your wounds will help to prevent infections too.

## **Tobacco Use**

The effects of nicotine from tobacco slow bone healing. The person who smokes is twice as likely to have a non-union. Nicotine causes the blood vessels to constrict, so the small vessels at the fracture site close down. A person who uses tobacco should stop to allow the fracture to heal. This includes smoking cigarettes or cigars and chewing tobacco.

## **Certain medicines or treatments**

Non-steroidal anti-inflammatory medicines, such as ibuprofen, naprosyn and indomethicin and steroids should be avoided until a bone fracture heals. These medicines slow or prevent bone healing.

## **Nutrition**

It is important to have a good amount of protein, calcium, and vitamins C and D in your diet for bone healing. Protein is in meats, cheeses and nuts. Milk and milk products like yogurt and cheese are good sources of calcium and some juices have calcium added to them. Citrus fruits like oranges and grapefruit are good sources of vitamin C. Spending time in the sunshine is a good way to get more vitamin D but you can also eat salmon, mackerel, tuna or sardines as good sources. Fortified milk is another good source. Ask your doctor if you should take any vitamin and mineral supplement or if you need more help with your diet.

### **Other health conditions**

If you have diabetes, keep your blood sugar as near normal as possible to promote healing and reduce your chance of complications. If blood sugars are high, it can slow healing.

Peripheral vascular disease slows blood flow in the legs. If you have a leg or foot fracture, it may take longer for healing to occur.

If you have osteoporosis, your bones may be more brittle. Your fracture may be slow to heal.

### **Treatment for Fractures**

The goal of treatment is to control the pain, promote healing, prevent complications and restore alignment of the fractured bone.

Treatments may include:

- Surgery
- Traction
- Brace, cast, splint or sling
- Use of crutches, walker or cane
- Exercises

Open fractures may also require irrigation and removing dead tissue called debridement. Irrigation is using fluid to wash out the wound where the bone came through the skin. These treatments are done to clean the wound to reduce the chance of infection and promote healing.

### **Surgery**

There are two main types of bone surgery for injuries:

- Open reduction and internal fixation
- External fixation

During **open reduction and internal fixation**, the doctor puts the bone pieces together using screws or metal plates on the outside of the bone under the skin. In some cases, a rod is put in the center of the bone to hold the pieces together.

**External fixation** also uses pins or screws to hold the broken bone together. The pins or screws are connected to bars outside the skin. The bars form a frame to keep the bones in the right position as they heal. After a period of time, the frame and pins or screws are removed. Some injuries will still require internal fixation.

### **Traction**

Traction can be used to align bone or bones by a steady pulling force. Pins may be used through the bone. Weight is used to pull the bone into the right place. Traction may be used before surgery is done for certain bone injuries.

### **Brace, cast, slings or splints**

Each of these devices is used to limit movement and protect the injured bone or joint.

- **Braces** are often made of plastic and metal pieces to limit movement and give support. The brace is often attached with Velcro straps or buckles. A brace may need to be worn at all times, or your doctor may tell you that you can remove it for periods of time. Braces may be more common with back or neck injuries.
- **Casts** are made of plaster or fiberglass. The cast material is formed around the injured body part to keep the bones from moving so they can heal. The cast may be split in half, called a bivalve cast, to allow for your skin and circulation to be checked. You will be taught how to care for your cast. If you have a foot or leg cast, you may need to wear a cast boot to keep you from slipping and to protect the cast.
- **Splints** are often made of plastic and attach with Velcro straps. Often, the splint is taken off for cleaning the skin. The splint may be worn during the day or at night to limit joint movement.

After surgery, a **splint made of plaster called a half cast** may be used. The splint is different from a cast because it does not go the entire way around the injured body part. This allows for swelling that may occur after surgery. Elastic bandages are used to wrap around the splint to hold it in place. This type of splint is often removed at the first follow up visit.

- **Slings** are often used for shoulder injuries. The sling is made of cloth and straps. It is used to keep the injured area from moving so healing can occur, or it may be worn for comfort only.

### **Crutches, walkers and canes**

These devices are used to help you balance and limit weight on an injured leg. Your doctor and therapist will work with you to decide which device is best for you to use based on your arm strength and type of leg injury. Each of these devices needs to be adjusted to fit your height. The therapist will help you learn to use the device safely. For certain injuries, you may start with a walker and then switch to crutches or a cane.

The device you are to use will depend on how much weight you are to put on your leg. The doctor will tell you how much weight you can put on the injured leg. This will change as you heal.

### **Exercises**

Your doctor may have you work with a therapist during and after these other treatments to strengthen your muscles, joint motion and movement. The exercises can aid in the healing process.

- **Talk to your doctor or others on your health care team if you have questions. You may request more written information from the Library for Health Information at (614) 293-3707 or email: [health-info@osu.edu](mailto:health-info@osu.edu).**