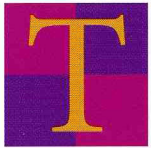


Fractures

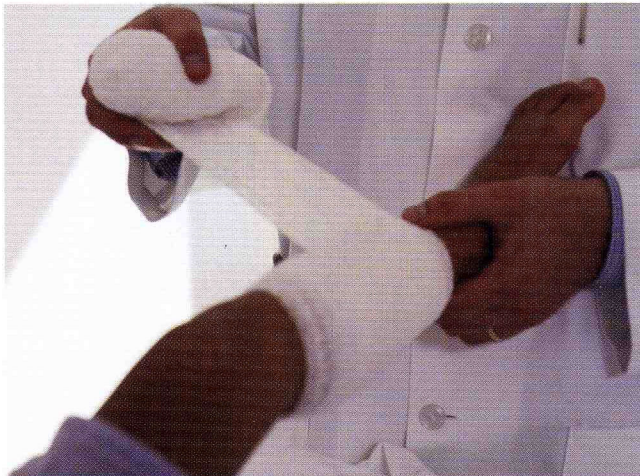


Thank goodness it's only a fracture—I thought it might be broken!" People often think that a fracture is less severe than a broken bone, but fractures *are* broken bones.

What bones are made of

To understand why bones break, it helps to know what bones do and what they are made of. The bones of the body form the human frame, or skeleton, which supports and protects the softer parts of the body. Bones are living tissue. They grow rapidly during one's early years, and renew themselves when they are broken.

Bones have a center called the marrow, which is softer than the outer part of the bone. Bone marrow has cells that develop into red blood cells that carry oxygen to all parts of the body and white blood cells that help fight disease. Bones also contain the minerals calcium and phosphorous. These minerals are combined in a crystal-like or latticework structure. Because of their unique structure, bones can bear large amounts of weight.



Broken bones must be prevented from moving out of place.

How fractures occur

Bones are rigid, but they do bend, or "give" somewhat when an outside force is applied to them. When this force stops, bone returns to its original shape. For example, if you fall forward and land on your out-stretched hand, there's an impact on the bones and connective tissue of your wrist as you hit the ground.

The bones of the hand, wrist and arm can usually absorb this shock by giving slightly and then returning to their original shape and position. If the force is too great, however, bones will break, just as a plastic ruler breaks after being bent too far.

Types of fractures

The severity of a fracture usually depends on the force that caused the fracture. 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 collision 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, contamination of the bone and soft tissues may occur, which can lead to infection.

Treating your fracture

Because fractures hurt and make it difficult if not impossible to use the part of the body that is injured, most people call a doctor or seek emergency care quickly. In some cases there may be little, if any, pain even though a fracture has occurred. If you think a bone may be broken, you should seek medical help immediately. A medical examination and X-rays are usually necessary to know for certain and to ensure proper treatment.

It is very important to immobilize a broken bone. Moving a broken or dislocated bone can cause additional damage to the bone, nearby blood vessels, and nerves or other tissues surrounding the bone. First aid or emergency treatment may include splinting or bracing your injury before medical treatment is given. Also, if there is an open wound it should be covered by a clean cloth or bandage on the way to further medical treatment.

At the emergency room, clinic or doctor's office, the physician usually applies a splint to prevent further damage, lessen the pain and help stop any bleeding. The patient is usually asked to elevate the injured part because elevation helps to reduce local swelling.

X-rays can help the physician determine whether there is a fracture, and if so, what type of fracture it is. If there is a displaced fracture, the doctor will "reduce" it by restoring the parts of the broken bone to their original positions; this is usually performed with some type of anesthesia.

All forms of treatment of broken bones follow one basic rule: the fractures must be restored and maintained in a satisfactory position until they are healed. Broken bones heal as new bone ("callus") is formed, bridging the fragments. The specific method of treatment depends on

- the severity of the break
- whether it is "open" or "closed"

- the specific bone involved—a broken bone in the spine (vertebra) is treated differently from a broken leg bone or a broken rib.

Types of treatment

The following treatments are used for various types of fractures:

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 immobilized in a cast.

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 occasionally used to align bones by a gentle, steady pulling action. The pulling force is transmitted to the bone through skin tapes or a metal pin through a bone. Traction may be used as a preliminary treatment before other forms of treatment.

Open reduction and internal fixation—In this type of treatment, an orthopaedic surgeon must perform surgery to properly restore the bone to the correct position and to immobilize it for healing. Various techniques may require screws, pins, rods or plates to secure the bone ends. These methods of treatment can accurately reposition the fracture fragments. Because of the risks of surgery and possible complications such as infection, they are used only when the orthopaedic surgeon considers such treatment to be necessary to restore the broken bone alignment to ensure better function.

External fixation—In this type of treatment, pins or screws are placed into the broken bone above and below the fracture site. Then the orthopaedic surgeon repositions the bone fragments. The pins or screws are connected to a metal bar or bars outside the skin.

Prevention



Even though healthy bones are very strong, any bone will break if the force applied to it is great enough. Bones that are weakened by disease or misuse may break more easily than healthy bones. To develop and maintain healthy bones, people need adequate amounts of calcium and proper exercise.

Because of the way bones are made, calcium is very important in the growth, development, and maintenance of strong bones. Adequate amounts of calcium are necessary as a child grows and for the adult as well. Women, in particular, must have enough calcium in their diet. The female hormone, estrogen, regulates the use of calcium in women's bodies. Following menopause, when women produce far less estrogen, calcium is lost from bone. It is very important that women make their bones as strong as possible through weightbearing exercise and sufficient calcium in their diets.

Bones also get stronger with regular but not excessive exercise. If a person is active, bones will become stronger and more dense. The bones of an inactive person are often not as strong and may fracture more easily than those of an active person. For this reason, older people should try to remain physically active.

Proper diet and exercise, along with an understanding of what bones are made of and how they break, may help in preventing some fractures

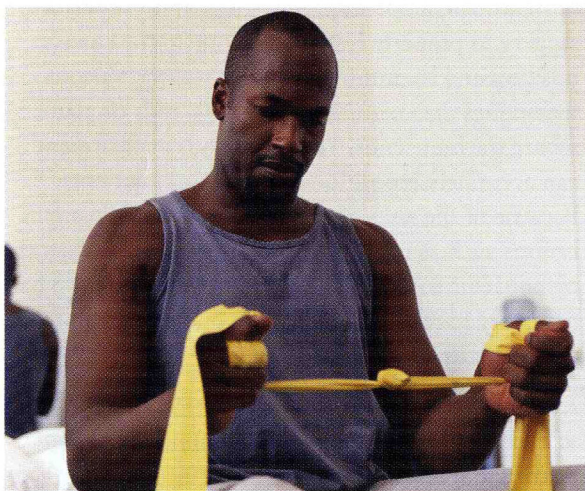
If you do break a bone, seek medical treatment and remember—follow your orthopaedist's advice.

This device is a stabilizing frame that holds the bones in the proper position so they can heal. After an appropriate period of time, the external fixation device is removed.

Each of these treatment methods can lead to a completely healed, well-aligned bone that functions normally. The method of treatment depends on the type and location of the fracture, the seriousness of the injury, and the condition and needs of the patient. The orthopaedist will provide counseling to the patient regarding the best type of treatment for their fracture.

Once the fracture has healed, exercises will be necessary to strengthen the area around the fracture and restore joint motion. A physical or occupational therapist will usually assist with this program.

Your orthopaedist is available to advise and encourage you through the healing of your fracture and your recovery.



Exercises during and after the healing process are essential to rehabilitation.

Your orthopaedist is a medical doctor with extensive training in the diagnosis and nonsurgical and surgical treatment of the musculoskeletal system, including bones, joints, ligaments, tendons, muscles, and nerves.

This brochure has been prepared by the American Academy of Orthopaedic Surgeons and is intended to contain current information on the subject from recognized authorities. However, it does not represent official policy of the Academy and its text should not be construed as excluding other acceptable viewpoints. Persons with questions about a medical condition should consult a physician who is informed about the condition and the various modes of treatment available.

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