

# WRIST FRACTURE

A complex joint made up of many bones, the wrist is what lets us move our hand from side to side and up and down. It also lets us rotate our hand so the palm can be either up or down.

The big bones associated with the wrist are the radius and the ulna - the bones in your forearm. The radius is the bone that runs on the thumb side of your arm, and the ulna is the one that runs along the small finger side. But there are also other tiny bones called carpal bones, in the base of your hand. There are 8 carpal bones in each hand that extend from the wrist joint to the base of the fingers. These bones are arranged in 2 rows.

The carpal bones allow the wrist to pronate, or move the palm of the hand downward. They also allow it to supinate, or turn the palm forward and up. These small bones work with the forearm bones and the finger bones and are pretty important. When one or more of them is damaged, the joint can collapse and affect other bones so that the even the function of the fingers and thumb are affected.

The median and ulnar nerves are the major nerves of the hand. The median nerve runs between the ulna and radius bones while the ulnar nerve runs along the ulna itself. Both nerves run the length of the arm and transmit electrical impulses to and from the brain, allowing us to move our wrist and feel sensations.

A fracture is simply the interruption of a bone's wholeness. Any crack or break in a bone is called a fracture.

There are two basic types of fracture of any bone. A simple fracture, which is also called a closed one, means the bone has not broken through the skin. The other type is a compound or open fracture. This type is more serious since the bone breaks through the skin and means there is now a risk of infection too.

In addition, fractures can also be displaced or not displaced. A displaced fracture means the bone has shifted its position. In a wrist fracture, even if the bone has shifted by only a few millimeters, the fracture is displaced.

Two of the most common fractures of the wrist are the Colles' fracture and the scaphoid fracture.

The scaphoid is one of the carpal bones located near the thumb. It is one of the most common carpal fractures caused in a fall. It can also be called a navicular fracture or a carpal navicular fracture. Many times this fracture masquerades as a wrist sprain.

A Colles fracture occurs in the radius of the forearm, up close to the wrist joint. It involves the whole thickness of the bone.

## Causes of a Wrist Fracture

Broken bones are a pretty common occurrence in our lives. In fact, an estimated 5.6 million fractures occur in the United States each year. And while all bones can break, the one joint that seems most prone to fractures is the wrist. The wrist breaks because we use it to stop our fall and the force of the fall is greater than the strength of our bones. Sometimes though, the fracture can occur for other reasons such as osteoporosis, which is a condition that makes bones brittle.

## Symptoms of a Wrist Fracture

- Swelling
- Tenderness
- Pain
- Deformity
- Difficulty bearing weight

## Treatments of a Wrist Fracture

While there are many ways to treat a nondisplaced Colles fracture, the one that is most acceptable is a long arm cast that also immobilizes the thumb. This cast is kept on for 6 weeks. Then, more x-rays are taken. If the bone is healing, then a short arm cast can be put on. For most simple wrist fractures like these, 8 or 12 weeks in a cast is what is needed to make sure the healing is complete.

But, if the broken bone cannot be reduced or the break is not healing as it should while in the cast, surgery will probably be needed.

For instance, many times, a break in the scaphoid is displaced. Even if the displacement is only two millimeters, there's a pretty good chance that a simple cast won't help the bone heal properly. And, if this occurs, there's a risk of bone cell death because the blood supply was also interrupted.

Different fractures involve different treatments.

The most common treatment is cast immobilization. Here, a plaster or fiberglass cast applied after the bones have been returned to their normal positions. The cast acts to keep the bones in place so they can heal. Most casts today are made from strips of fiberglass or plastic. They're relatively light, but the casting tape has sharper edges and can catch on clothing.

Sometimes though, surgery is needed to reposition the bones, particularly when they are small like the scaphoid. This kind of surgery is called open reduction. During the operation, the bone is repositioned to where it belongs. Then it is held together with special screws or by inserting rods down through the marrow space in the center of the bone. Using these rods and screws lets the orthopedic surgeon reposition the bone very exactly.

Some wrist fractures need external fixation, especially if soft tissue around the bone has also been affected. With external fixation, metal pins or rods are inserted into slits made in the skin. The pins are then placed into the bone, but not where it is broken. Then the surgeon repositions the bones and connects the pins to a metal bar outside the skin. This contraption acts like a frame and helps keep the bones in the best position to heal.

External fixators are most appropriate if the fracture is an open one or if it is unstable.

The procedure is done under a local anesthesia and one or two pins are inserted into each bony fragment. They're put in at a 90° angle to the long part of the bone and because the bones are so small, require very careful insertion.

The frame itself is made with pin holders, small vises and connecting rods. Once the pins have been inserted into the bone and the bone has been reset, the frame is placed along the wrist and the pins are connected to it.

After the pins are inserted, antibiotic ointment is applied and the area is covered with a sterile dressing for a few days. After the dressing is removed, the places where the pins have been inserted still need to be washed each day with soap and water to help minimize infection.

Most often, the pins are needed for 6 to 12 weeks. During that time, the pins can be adjusted as needed to increase the chances for proper healing. For instance, a slight adjustment in the placement of a pin could help move the bone into an even more exact position. And being able to do it all externally is far better than needing to do surgery.

Sometimes, for reasons we don't quite understand, even a simple break can fail to heal. If this happens, it is called a fracture nonunion. If a wrist fracture is not healed at 4 months, keeping it casted longer probably won't help as the stimulation to heal from the fracture is no longer present. Surgical intervention is needed at this point even including a bone graft.

In some cases, if the bones have been so displaced and so fragmented that they can't be repaired, wrist replacement surgery is called for. This is known as wrist arthroplasty.

Arthroscopy lets the doctor see into the joint and make repairs through very small incisions. The affected bones are then removed and replaced with a specially designed artificial part, called a prosthesis. This prosthesis is made of medical grade plastic with moving parts of titanium or cobalt chromium alloy, metals commonly used in prostheses for other joints of the body also.

The wrist replacement prosthesis is attached to the bones of the arm and hand once the diseased bones have been removed. The prosthesis contains small holes allowing it to be sutured to adjoining bone, muscles, ligaments, and other tissue. It is designed to enable the nerves of the hand to function properly.

Successful treatment of a fracture does have a lot to do with the patient's cooperation. A cast or fixation device will get cumbersome at times, maybe even inconvenient. Of course without it, the healing couldn't happen. And, just as they are needed, so too are exercises during the healing. The exercises your doctor or physical therapist gives you will help lessen the swelling and improve your circulation. And, importantly, after the cast is removed or the pins taken out, the exercises help you regain your range of motion

You'll need to do some exercises with the cast or fixator on. These might work on your elbow, shoulder, or your fingers. Your age, the stability of the fracture, and how it was reset are all taken into consideration before giving you the exercises to do. In all cases, the normal function of the shoulder needs to be preserved by regular exercises while the wrist is healing.

Being able to use your hand again is the goal and if you keep that in mind, the exercises take on a new and important meaning.

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