

Elbow fractures may result from a fall, a direct impact to the elbow, or a twisting injury to the arm. Sprains, strains, or dislocations may occur at the same time as a fracture.

## Causes

There are three main bones in the elbow (see Figure 1): the humerus, the radius, and the ulna. The radius spans the length of the forearm from the wrist to the elbow, and the head and neck of the radius bone are inside the elbow joint. The ulna also spans from the elbow to the wrist, but the head is in the wrist, and the cup-shaped part in the elbow is called the olecranon. The humerus starts at the shoulder, and the end (distal) part of it is in the elbow. The location of the fractured bone is important to identify as this will determine the proper treatment and rehabilitation. In some severe cases, multiple bones may be broken at the same time. The main types of fractures are included below.

### *Radial head and neck fractures (see Figure 2)*

The radial head and neck, which are closest to the elbow, are important for rotation of the forearm (twisting from palm up to palm down). The pain associated with these fractures is present on the outside (lateral) portion of the elbow and usually worse with forearm rotation.

The treatment for this fracture depends on the number and size of the bone fragments. Simple fractures can be treated with a brief period of immobilization with a splint or sling followed by moving the elbow to pain tolerance. Complex fractures often require surgery with screws or a plate. Some more complicated fractures may require replacing the radial head with a metal implant if there are too many bony pieces. Complex fractures may also involve ligament injuries that need to be surgically repaired.

### *Distal humerus fractures (see Figure 3)*

These fractures involve the portion of the humerus closest to the elbow joint. This bone contains the entire joint surface of the elbow. Distal humerus fractures often involve the joint and will require surgery, which involves repairing the fracture with plates and screws. These injuries are very complex and typically require multiple plates to stabilize the broken bones.

Special considerations should be made for fractures in children and the elderly. The growing areas of the elbow bones (growth plates) in a child are softer and can break with minor falls on a playground or off a trampoline. In children, many fractures can be treated with a cast, but some more severe fractures may need surgery, which involves repairing the fracture with temporary wires followed by casting. In elderly patients, the bone at the distal humerus may be brittle. In these cases, plate and screw surgery may not be an option, and a total elbow replacement with a metal implant may be more appropriate.

### *Olecranon fractures (see Figure 4)*

The olecranon is the portion of the ulna bone closest to the elbow. Fractures that occur around the olecranon usually

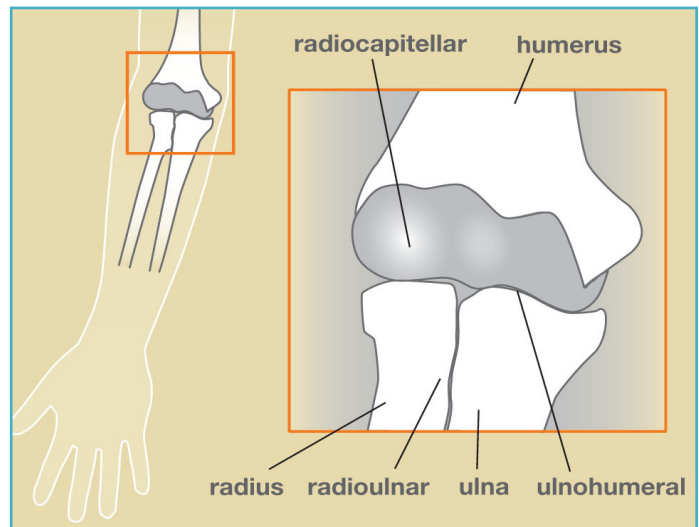


Figure 1 - The elbow joint

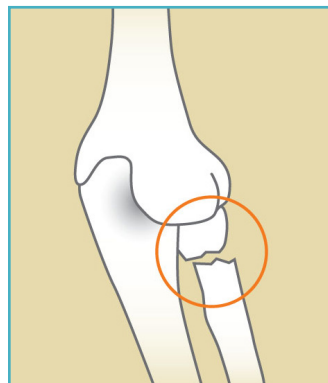


Figure 2 - Radial neck fracture

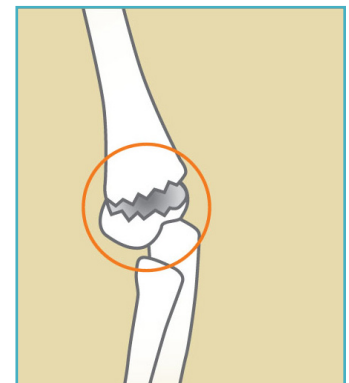


Figure 3 - Displaced supracondylar humerus fracture in a child

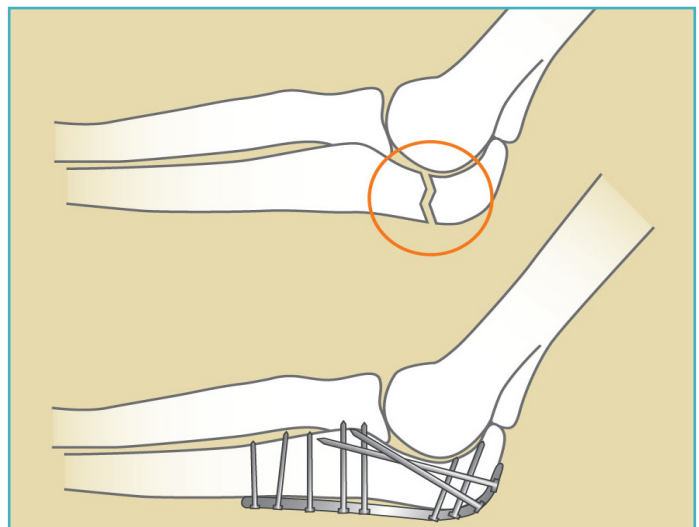


Figure 4 - Olecranon fracture and repair

are displaced due to the pull of the triceps tendon, which attaches to the tip of this bone. Most of these fractures also involve the joint surface. For these reasons, these fractures typically require surgery. The bone fragments are re-aligned and held together with pins and wires or plates and screws.

More complex olecranon injuries can result in dislocation, which is when all the ligaments around the elbow joint tear, separating the bones from their hinge.

Dislocations can also happen along with an olecranon and radial head fracture (triple triad). These typically require surgery to put the hinge joint back in place and address all broken bones and injured ligaments.

### Symptoms

Elbow fractures are associated with pain, swelling, and loss of motion. A snap or pop at the time of injury may be felt or heard. Visible deformity and decreased ability to move the elbow fully might mean that the bones are out of place or that the elbow joint is dislocated, and x-rays are used initially to confirm the injuries. Sometimes a CT (Computed Tomography) or an MRI (Magnetic Resonance Imaging) scan might be needed to get further detail.

Nerve and/or artery injuries at the time of elbow fracture are rare and result in numbness or discoloration of the arm, wrist, and hand. These injuries are temporary, but those symptoms must be urgently and carefully evaluated by a medical professional.

### Diagnosis and Treatment

Initial treatment for these fractures involves careful evaluation by a medical professional; placement of a splint, brace, or sling; and rest. Medication may be prescribed to reduce pain and swelling.

Fractures that are out of place or unstable are more likely to require surgery. Whenever a fracture is open (skin broken over the fracture), urgent surgery is needed to clean out the wound and bone to minimize the risk of infection.

When the bones are at a low risk of moving out of place or are in a stable condition, treatment calls for non-surgical measures such as a removable sling, brace, or an immobilizing cast. The elbow is unique in that moving or exercising simple, non-displaced fractures early, even while the bones are still healing, is safe and helpful to prevent stiffness.

Age is also an important factor when treating elbow fractures. Casts are used more frequently in children, even in simple fractures, as they protect the joints while they heal as children might not understand the risks of certain activities. A child's risk of developing elbow stiffness is lower; however, in an adult, elbow stiffness is much more likely.

Rehabilitation directed by your medical professional is often used to maximize motion and decrease the chance of getting elbow stiffness. This might include working with a hand therapist using exercises, scar massages, ultrasounds, heat, ice, and splints that stretch the joint.