

Bone fractures

A broken bone or bone fracture occurs when a force exerted against a bone is stronger than it can structurally withstand.

Bones are a form of connective tissue, reinforced with calcium and bone cells. Bones have a softer centre, called marrow, where blood cells are made. The main functions of the skeleton include support, movement and protection of vulnerable internal organs.

There are different types of bone fractures that vary in severity. Factors that influence severity include the degree and direction of the force, the particular bone involved, and the person's age and general health.

Common sites for bone fractures include the wrist, ankle and hip. Hip fractures occur most often in elderly people. Broken bones take around four to eight weeks to heal, depending on the age and health of the individual, and the type of break.

Symptoms

The symptoms of a bone fracture depend on the particular bone and the severity of the injury, but may include:

- Pain
- Swelling
- Bruising
- Deformity
- Inability to use the limb.

Different types of fracture

The different types of bone fracture include:

- **Greenstick fracture** – the bone sustains a small, slender crack. This type of fracture is more common in children, due to the comparative flexibility of their bones.
- **Comminuted fracture** – the bone is shattered into small pieces. This type of complicated fracture tends to heal at a slower rate.
- **Simple fracture** – or 'closed' fracture. The broken bone hasn't pierced the skin.
- **Compound fracture** – or 'open' fracture. The broken bone juts through the skin, or a wound leads to the fracture site. The risk of infection is higher with this type of fracture.
- **Pathological fracture** – bones weakened by various diseases (such as osteoporosis or cancer) tend to break with very little force.
- **Avulsion fracture** – muscles are anchored to bone with tendons, a type of connective tissue. Powerful muscle contractions can wrench the tendon free and pull out pieces of bone. This type of fracture is more common in the knee and shoulder joints.
- **Compression fracture** – occurs when two bones are forced against each other. The bones of the spine, called vertebrae, are prone to this type of fracture. Elderly people, particularly those with osteoporosis, are at increased risk.

Complications of bone fractures

Complications can include:

- **Blood loss** – bones have a rich blood supply and a bad break can result in substantial blood loss.
- **Injuries to organs** – such as the brain (in the case of skull fractures) or chest organs (if a rib breaks).
- **Growth problems** – the fractured long bone of a young child may not grow to its intended adult length if the injury is close to a joint, since bone fuses when it heals.

First aid

Suggestions for immediate treatment of a suspected bone fracture include:

- Do not move the person unless there is an immediate danger, especially in the case of a suspected fracture of the skull, spine, ribs, pelvis or upper leg.
- Attend to any bleeding wounds first. Stop the bleeding by pressing firmly on the site with a clean dressing. If a bone is protruding, apply pressure around the edges of the wound.
- If bleeding is controlled, keep the wound covered with a clean dressing.
- Do not attempt to straighten broken bones.
- For limb fractures, provide support and comfort such as a pillow under the lower leg or forearm. However do not cause further pain or unnecessary movement of the broken bone.
- Apply a splint to support the limb.
- Immobilise the area by applying a sling for arms. Immobilise legs by tying them together above and below the fractured area.
- If possible, elevate the fractured area and apply a cold pack to reduce swelling and pain.
- In an emergency dial triple zero (000) for an ambulance.
- Do not eat or drink anything until seen by a doctor, in case surgery is required.

Diagnosis and treatment

Bone fractures are diagnosed with x-rays. CT and MRI scans may also be used.

Broken bones heal by themselves – the aim of medical treatment is to make sure the two pieces are lined up correctly. Subsequent x-rays are taken to monitor the bone's healing progress.

Depending on the site of the fracture and the severity of the injury, treatment options may include:

- **Splints** – to discourage movement of the broken limb
- **Braces** – to support the bone
- **Plaster cast** – to provide support and immobilise the bone
- **Traction** – this option is less common
- **Surgically inserted metal rods or plates** – to hold the bone pieces together
- **Pain relief.**

The healing process

The blood clots that form on the broken ends of bone are the beginning of the healing process. Over five or so weeks, the body fuses the two bone portions together with a combination of fibrous cells and cartilage. This bridge is temporary and not as strong as real bone. It can break easily with comparatively little force.

A cast or splint may be removed after a few weeks, but the bone still needs to be handled with care for at least one more month. The temporary bone (callus) is slowly replaced with real bone over the next couple of months.

Unlike skin, broken bones heal without forming scar tissue. However immobilised muscles tend to weaken and wither. Rehabilitation, including strengthening exercises, may be needed for a short time.

Where to get help

- Your doctor
- Hospital emergency department
- In an emergency dial triple zero (000) for an ambulance

Things to remember

- A fracture occurs when force exerted against a bone is stronger than the bone can structurally withstand.
- The most common sites for bone fractures include the wrist, ankle and hip.
- Treatment options include immobilising the bone with plaster casts, or surgically inserting metal rods or plates to hold the bone pieces together.

This page has been produced in consultation with, and approved by:

Ambulance Victoria

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