HEALTH BASICS

Long bones

Long bones are limb bones shaped to support weight and help movement.

WHAT IT IS
Limb bones with a shaft and wider ends

WHERE IT COMES UP
Anatomy lessons, injuries, scans, and bone health discussions

WHY IT MATTERS
Supports movement, growth, blood production, and mineral storage

WHAT IT IS NOT
Not a disease or diagnosis

WHO TO ASK
Primary care clinician, orthopaedic specialist, or radiology service

HOW IT IS CHECKED
Examination and imaging, usually an X-ray

Overview

Long bones are a type of bone defined mainly by their shape. They have a central shaft and wider ends. Most are longer than they are wide, but "long" does not always mean physically large.

The femur, or thigh bone, is the body's largest long bone. Much smaller finger and toe bones are also long bones because they have the same basic shape.

The main long bones are:

The clavicle, or collarbone, is usually classified as a long bone, although its shape and development differ from those of most other long bones.

"Long bones" is an anatomy term, not a disease or diagnosis. You may see it in an X-ray report, a discussion about a fracture, or information about growth and bone strength.

- The humerus in each upper arm
- The radius and ulna in each forearm
- The femur in each thigh
- The tibia and fibula in each lower leg

- The metacarpals and phalanges in the hands
- The metatarsals and phalanges in the feet

How it works

A typical long bone has several distinct regions.

The diaphysis is the long central shaft. Its outer wall is mainly compact bone, which is dense and strong. The shaft surrounds a hollow space called the medullary cavity.

The epiphyses are the wider ends of the bone. They contain more trabecular bone, also called spongy bone. Despite its name, spongy bone is firm. It forms a lightweight internal framework that helps distribute forces.

The metaphysis is the area between the shaft and each end. In children and teenagers, it contains the growth plate. This layer of cartilage allows the bone to lengthen. The growth plate is gradually replaced by bone when growth finishes.

Where a long bone meets another bone in a movable joint, its surface is covered by articular cartilage . This smooth tissue reduces friction and helps the joint move. Joint cartilage is different from a child's growth plate.

Most of the bone's outer surface is covered by the periosteum , a thin layer containing nerves and blood vessels. It helps nourish the bone and plays a part in repair after injury.

Bone marrow occupies spaces inside bones. Red marrow produces blood cells, including oxygen-carrying red blood cells, infection-fighting white blood cells, and platelets that help blood clot. Yellow marrow contains more fat. The amount and location of each type change with age.

Long bones are living structures. Old bone tissue is continually removed and replaced through a process called remodelling. This helps repair small areas of damage and allows the skeleton to respond to physical forces.

Muscles attach to long bones through tendons. When a muscle contracts, it pulls on a bone across a joint. In this way, long bones act as levers for walking, lifting, gripping, and other movements.

Why it matters for your health

Long bones support body weight and make efficient movement possible. The femur and tibia carry substantial forces during standing, walking, and running. Long bones in the arms and

hands allow reaching and precise movement.

They also store minerals, especially calcium and phosphorus. These minerals help give bone its hardness and have other roles throughout the body. Hormones and other body systems regulate how minerals move into and out of bone.

In children and teenagers, growth plates are responsible for much of the increase in height. Because growth plates are softer than mature bone, an injury near the end of a child's long bone may need careful assessment.

Bone strength reflects more than size. Bone density, internal structure, age, hormone levels, nutrition, physical activity, medicines, and some medical conditions can all affect it.

An imaging report may describe the shaft, metaphysis, or end of a long bone. Knowing these terms can help you understand where a finding is located. The words alone do not show how serious a finding is.

What can go wrong

A fracture is a crack or break in a bone. Long-bone fractures may follow a fall, collision, twisting injury, or direct blow. Bones weakened by osteoporosis or another condition can sometimes fracture with less force.

Some fractures stay aligned, while others shift out of position. An open fracture means the broken bone communicates with a wound in the skin. This needs emergency care because of the risks of infection, bleeding, and damage to nearby tissues.

A growth plate fracture affects the developing area near the end of a child's bone. Some heal without lasting difficulty, but others can affect future growth or alignment. Prompt assessment and recommended follow-up help identify these problems.

Osteoporosis is a condition in which bones become less dense and more likely to break. It can affect long bones as well as other parts of the skeleton. Fractures near the upper femur are commonly called hip fractures because they occur next to the hip joint.

Osteomyelitis is an infection in bone. Germs may reach a long bone through the bloodstream, an open injury, surgery, or nearby infected tissue. Treatment may involve antibiotics like amoxicillin or doxycycline and, in some cases, surgery.

Bone tumours can begin in a long bone, although primary bone cancer is uncommon. Non-cancerous bone growths also occur. A scan finding described as a lesion does not automatically mean cancer; "lesion" simply means an area that looks different from surrounding tissue.

Reduced blood flow can damage bone tissue. This is called osteonecrosis or avascular necrosis. It often affects the end of a bone near a joint, such as the upper femur.

What you can do

There is no routine test needed simply because you have long bones. Testing is guided by an injury, ongoing concern, medical condition, medicine use, or fracture risk.

If you have an injury, note how it happened and whether you can use the limb normally. Remove rings or other tight items early if a hand or arm is swelling. Avoid trying to straighten a limb that looks deformed.

Seek urgent same-day assessment after an injury if you cannot put weight on the limb, cannot use it normally, or have marked pain, swelling, or tenderness. A suspected growth plate injury in a child also deserves prompt assessment, even if the limb does not look badly deformed.

Call emergency services for severe bleeding, a bone visible through a wound, or a limb that becomes cold, pale, blue, numb, or very weak. These findings may signal damage to blood vessels or nerves.

Routine follow-up may be appropriate for persistent bone pain, a lump, repeated fractures, or concerns about bone density. These findings have many possible causes and need individual assessment rather than self-diagnosis.

Useful questions include:

Keep copies of imaging reports and details of previous fractures. Include the date, bone involved, cause of injury, and treatment. This record can help when discussing future bone health.

- Which bone and which part of it is involved?
- Is the growth plate or nearby joint affected?
- Do I need an X-ray or another type of imaging?
- When can I safely return to usual activity?
- Do I need follow-up imaging or a bone-density assessment?

Common questions

Are all long bones large?

No. Finger and toe bones are small, but their shaft-and-ends shape places them in the

long-bone group.

Are long bones solid all the way through?

No. They have a strong outer layer and an internal cavity or framework containing marrow. This design provides strength without making the skeleton unnecessarily heavy.

Do long bones stop changing after childhood?

They stop lengthening when their growth plates close, but bone tissue continues to remodel throughout life. Bone density and internal structure can also change with age, activity, health, and medicines.

Can an X-ray show everything wrong with a long bone?

No. X-rays are often the first test for a suspected fracture and show bone alignment well. Some small fractures, marrow changes, cartilage injuries, infections, or soft-tissue problems may require repeat X-rays, MRI, CT, or another test.

Is a bone-density scan the same as an X-ray for injury?

No. A DXA scan uses low-dose X-rays to estimate bone mineral density, usually at the hip and spine. It is used to assess bone strength and fracture risk, not to locate most recent injuries.

Does pain in a long bone always mean the bone is damaged?

No. Pain felt in a limb may come from muscles, tendons, joints, nerves, skin, or other tissues. An examination helps determine whether imaging or other testing is useful.

Sources

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