

Systems of the Human Body: Skeletal System

Functions of the Human Skeleton

| Transcript



Narrator: When you think of animals, it's probably not ones like these that come to mind. It's more likely to be these sorts of animals, vertebrates that have bones and skeletons. Of course, humans fall into that category too. And like all vertebrates, we couldn't survive without our skeleton.

A skeleton has a number of important functions. Perhaps the most obvious function is that it gives us our shape, just as a bird's lightweight skeleton provides an aerodynamic shape and a whale's skeleton provides a frame that turns it into a living submarine. Our own skeleton is a sturdy tower of bones that enables us to walk upright on two legs. This is called bipedal motion. It's like a jigsaw puzzle consisting of up to 206 individual pieces that come in many shapes and sizes.

Without our bones, we'd be unable to move with speed or efficiency. Our muscles are anchored to bones with tough tissues called tendons. As the muscles contract, the tendons pull on the bones and they function as levers, turning relatively small movements into powerful and often rapid motion. Muscles and bones make up our musculoskeletal system. They work together to stabilise and power the machine that is the human body.

Bones are made of tough, durable materials. Proteins called collagen give them flexibility, while calcium and phosphate, which are hard minerals, make them robust. By having our most delicate organs lodged behind bones, they're protected from knocks and blows that come with moving around. For example, the brain is located inside a casing called the skull and our heart and lungs are protected by a ribcage.

Dense material called compact bone forms the external layer of bones that gives a skeleton its hardness. If our bones were made entirely of this material, they'd be so dense and heavy that we'd need a lot more energy to move our limbs. The layer inside the compact bone is a flexible, porous and less dense material called spongy bone. Inside spongy bone is soft gelatinous tissue called marrow. Bone marrow is where red and white blood cells are produced along with platelets.

Red blood cells carry oxygen to body tissues and carbon dioxide waste back to the lungs to be exhaled. White blood cells help fight infection and give protection from foreign bodies that enter the blood, like viruses. Platelets, which are much smaller than the other blood cells, enable blood to clot.

Bones are also important for storing minerals that are essential for our bodies to function. Nearly all of the body's calcium and most of the body's phosphorus is stored in bones. Muscles, including our heart, rely on a good supply of calcium ions to make them contract. If calcium levels in the blood get too low, the body takes calcium from the bones to compensate. Phosphorus is used in the formation of bones and teeth. It's also needed for other vital functions, including protein production for cells and tissues and producing ATP molecules, which the body uses to store energy.

Our bones provide shape, enable movement, provide protection, produce blood cells and store essential minerals. So without a skeleton, we simply couldn't survive.