

A Brief Note on Musculoskeletal System of Our Human Body

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Editorial Note

The Human Skeletal System consists of a set of 206 bones that support and protect the body. They also work with the muscles to provide movement. The skeleton is divided into two parts: the Axial and the Appendicular Skeleton. The Axial System is made up with the Skull bones, the Vertebrae, the Ribs and the Sternum. The spine is divided into several sections. The cervical vertebrae make up the neck. The thoracic vertebrae comprise the chest section and have ribs attached. The lumbar vertebrae are the remaining vertebrae below the last thoracic bone and the top of the sacrum. The sacral vertebrae are caged within the bones of the pelvis, and the coccyx represents the terminal vertebrae or vestigial tail. The appendicular system is formed by the bones of pectoral girdle, pelvic girdle and upper and lower limb.

The Upper and Lower Limb Bones

Structure of Bones: There are two types of bone tissue: Compact and Spongy. Compact bone is hard outer layer of bones is composed of Compact bone tissue, so-called due to its minimal gaps and spaces. This tissue gives bones their smooth, white, and solid appearance, and accounts for 80% of the total bone mass of an adult skeleton. Spongy Bone fills the interior of the bone which is composed of a network of rod and plate like elements that make the overall organ lighter and allowing room for blood vessels and marrow. Spongy bone accounts for the remaining 20% of total bone mass, but has nearly ten times the surface area of compact bone.

Classification of bones

The bones of the body come in a variety of sizes and shapes. The four principal types of bones are long, short, flat and irregular.

Long bones are longer than they are wide. They consist of a long shaft with two bulky ends or extremities. They are primarily compact bone. Example: Long bones include bones of the thigh, leg, arm, and forearm. Short bones consist primarily of spongy bone, which is covered by a thin

layer of compact bone. Example: Short bones include the bones of the wrist and ankle. Flat bones are thin, flattened, and usually curved. Example: Flat bones include most of the bones of the cranium and sternum. Irregular bones are not in any of the above three categories. They are primarily spongy bone that is covered with a thin layer of compact bone. The vertebrae and some of the bones in the skull are irregular bones. Osteoblasts, osteocytes and osteoclasts are the three cell types involved in the development, growth and remodeling of bones. Osteoblasts are bone-forming cells, Osteocytes are mature bone cells and Osteoclasts break down and reabsorb bone.

The Joints

A Joint is the point where two or more bones meet. There are three main types, Fibrous eg: Skull Joint; Cartilagenous joint. Examples include intervertebral disc of spinal column and synovial joint. Fibrous Joint is held together by only a ligament. Synovial Joint are of six types: Pivot joint, Ball-and-socket joint, Hinge joint, Condylod joint, Saddle joint, Gliding joint.

Pivot joint Enables rotation around a lengthwise axis: the cylindrical terminal part of a bone is encased in a hollow cylinder. Examples include the tibia and the fibula.

- Ball-and-socket joint Allows movement along three axes, such as in the shoulder: flexion and extension, rotation, and adduction (arm drawing near the trunk) and abduction (arm drawing away from the trunk). Examples include Shoulder and Hip Joint.

- Hinge joint Enables flexion and extension along a single axis. Examples include elbow, knee, and ankle joint.

- Condylod joint an example is the wrist, which the hand can move on two axes: flexion and extension; it can also be tilted sideways

- Saddle joint resembles the condylod joint but allows a wider range of motion; this type of joint is rare.

- Gliding joint Surfaces of these joints are relatively flat and not very mobile; they allow only a narrow gliding range. Examples include Vertebrae, certain bones of the wrist and ankle.

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