

Notes on the Skeletal System

The skeleton is made up of several types of bone, cartilage, and connective tissue. The bones are the body's most solid structures. Bones give shape, rigid support, and form to the body creating internal spaces. The entire skeleton is renewed over the course of two years. They are strong and resilient composed of minerals and calcium salts primarily (2/3) and organic compounds (1/3) of connective tissue, blood vessels, nerves, and other ground substances. Unlike Halloween caricatures, bones curve and spiral, as do the muscles and tendons attached to them that engage to leverage the bones through space in movement.

As living tissue, they are responsive to the way they are used. For example, they will become denser as force is continuously sent through them in weight bearing. In older age. Both calcium in the diet and weight bearing use or exercise are needed for optimal bone health. While they are dense they are also light in weight as many bones have hollow sections, often containing marrow, and have spongy or cancellous tissues, which are mesh-like, latticework sections that give bones shape and volume without adding much weight.

Bones serve as levers for muscle actions and so are subject to mechanical strain. Gravity is responsible for much of the strain in that bones support the body's weight, and are involved in levering whatever must be lifted by muscular action. Bones act as levers at points of muscular attachment in working against any form of resistance, such as in pushing an object that is stuck.

Bones can be sorted into three basic shapes: long bones such as the femur, short bones such as the talus, and flat bones such as the scapula.

Bone is covered by the periosteum (*peri*-around, enclosing) a connective tissue sheath on the surface; within this surface bone is covered as well by an inner sheath called the endosteum (*endo*- inside). These coverings provide important nourishment to the bone and interconnect with other connective tissues, i.e. ligaments, tendons, joint capsules.

Bones have many functions other than structural, they produce blood cells, store calcium and phosphorus for blood, and protect the organs.

While the skeleton provides the framework of the body's form, the connective tissues provide tensile strength, stability and support. This allows for both stability and mobility, enabling us to rise from the earth and balance on various numbers of limbs.

The bones of the skeleton also give protection to the soft tissues of the internal organs. The skull cradles the brain and sensory organs of the head, the vertebrae protect the spinal cord, and nerve fibers that run from the brain to the sacral area. The sacrum acts as a keystone to the pelvic arch, as through the sacrum weight is distributed between the two pelvic halves and down the bones of the legs and feet and into the earth. Misalignment in any area of the skeletal system will affect alignment and balanced use of the whole.

Yet it is important to realize the skeleton doesn't support weight in the same way as a pile of bricks. It is not entirely a compressional system at all! There are no stacks or piles of bones anywhere in our skeletal system. Rather over 600 bones act as a dynamic set of levers and spacers through which the muscular system interacts with gravity to produce both stability and mobility in space.

If the body's weight is held up "out of the ground" instead of being released into and bonded with gravity, the feet do not articulate with the surface of the ground. This will affect balance and will require some strain in a higher location where the weight, instead of releasing into gravity will be held.