
THE MARROW TIMES

The Functions of the Skeletal System

There are many functions of the Skeletal System, one of the first being support. The Skeleton supports the body with structure, like our internal architecture. Between our bone, to absorb shock and friction is a cushion called cartilage. Protection is provided by our bones for our internal organs such as the the skull encases the brain and the ribs encase the heart and lungs. During fetal maturation there is a process called Endochondral Ossification and that is when the cartilage is being replaced by bone; therefore, the Skeletal System helps with development. Stabilization from our Skeletal System comes from our ligaments which connect bones to other bones and reinforces the joints. Movement transmission is permitted when force is released and muscles are contracted. Along with transmission there is also movement control where the body has a range of motion for each part and the ligaments are responsible for holding that. Force distribution is when force is exerted through muscles across bone that gives smooth movements. Last but not least, our Skeletal System facilitates all of our movement and our joints are what allow our bones that meet through cartilage to have motion.

The Purpose of the Skeletal System

The Skeletal System supports your body, gives movement, makes blood cells, protects organs and stores minerals. It supports the weight of our body and acts as a framework under our skin. The structure holds us up and allows us to move freely within our self-regulated range of motion. The joints, connective tissue and muscles drive this movement whenever our brain gets the message. Protection for internal organs such as the skull protecting the brain and the ribs protecting the heart. Bones are made of minerals such as flouride, phosphorus, calcium, magnesium, and manganese. These minerals are released into the bloodstream when the body is in need. Blood cell production happens in the bone marrow in bones such as the skull, spinal bones, pelvic bones, femur, etc. Bones also store energy in lipids within the bone marrow and can be used as an energy reserve. Hormone regulation is also assisted by bones through osteocalcin which regulates blood sugar and fat deposition to help balance the body.

Some of the Bones in the Skeletal System

Long Bones :
Femur, Humerus, Tibia, Fibula, and Radius.

Short Bones :
Carpals, Tarsals, and the Patella.

Flat Bones :
Skull bones, Scapula, Sternum, and Ribs.

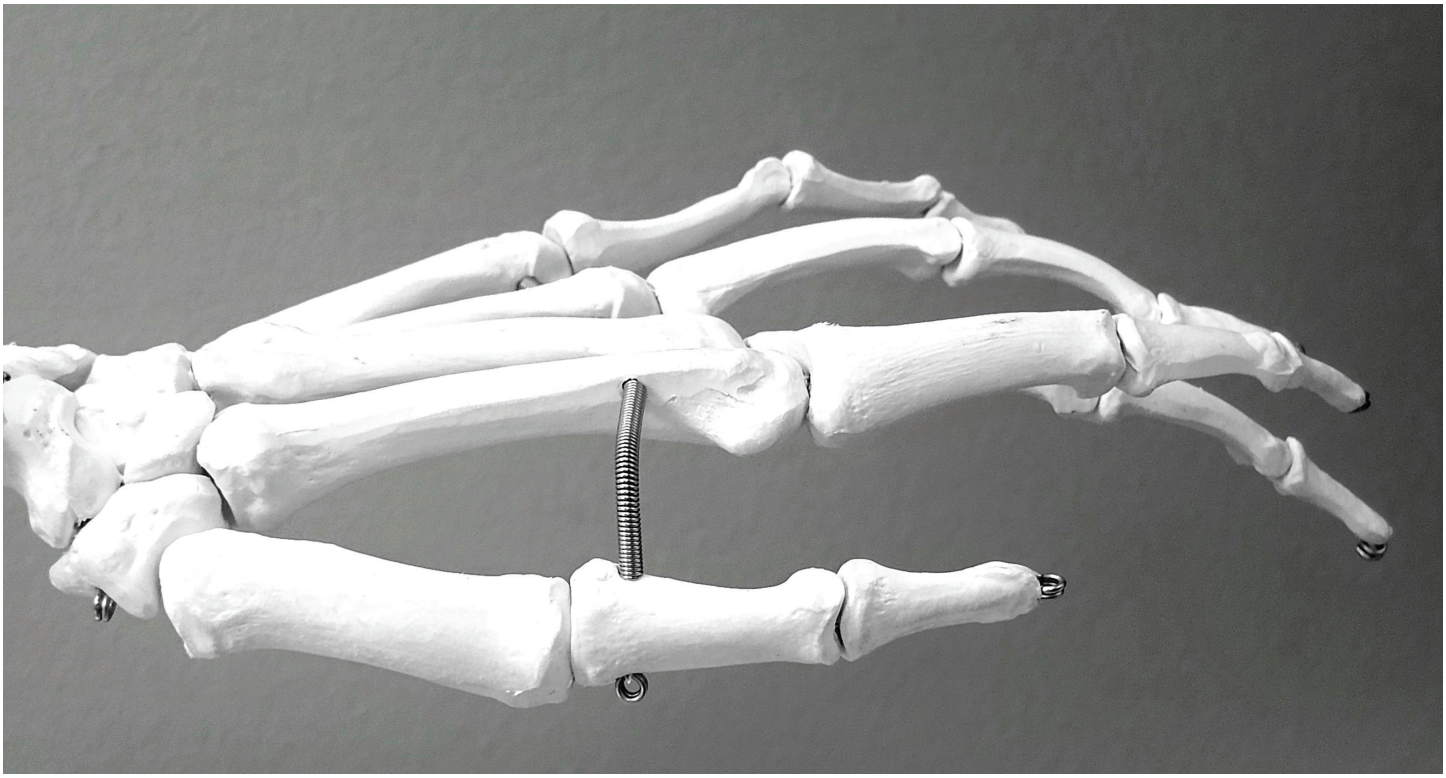
Irregular Bones :
Vertebrae, Pelvis, and Facial bones.

Sesmoid Bones :
Patella and Pisiform.

Accessory Bones :
Sutural bones, and the Os trigonum found in the ankle.

Compact vs. Spongey Bone

One of the easiest differences to note between these types of Bone is their structure and texture. Compact Bone is solid and forms the outermost layer of the bone, it brings protection, support and strength while having enough density to take on force. It is made of Osteons that have a cylindrical shape to them and a valley in the middle that is surounded with osteocytes. Compact Bone is found mainly in the diaphysis of Long Bones and and on the exterior of all bones. As for Spongey Bone has a porous texture and because of its lighter weight it helps in support and structure. It is the hematopoiesis site within the bone marrow and it is made of trabeculae. In the epiphyses of long bone, the interior of short bones as well as irregular bones.



Diseases Related to the Skeletal System

The most common diseases and medical problems with the Skeletal System include a range of genetic disorders, autoimmune diseases, etc. Osteoperosis is reduced bone density that leads to an increase in fractures. Osteoarthritis is a disease where the cartilage of the body is broken down. Rheumatoid Arthritis is an autoimmue disorder that causes chronic inflammation and pain in the joints. Paget's Disease of the Bone disrupts normal bone and brings enlarged and deformed bones. Osteomyelitis is an infection of the bone that is often from bacteria. Bone Cancer includes osteosarcoma, metestatic bone cancer, etc. Scoliosis is an abnormal curvature of the spine. Rickets is a condition in children that is characterized by impaired bone mineralization due to a Vitamin D deficiency. Hyperparathyroidism is an overproduction of parathyroid hormone that leads to elevated Calcium levels. Achondroplasia is a genetic disorder that causes disproportionate short stature due to abnormal bone growth.

How the Skeletal System Helps with Homeostasis

The Skeletal System helps with Homeostasis through Calcium and Phosphorus because the bones store these minerals and are available to be released when the body is in need. Because the body uses the Skeletal System as internal schaffolding it gives the body posture and the ability to move. That is the main reason our body has stability and balance. Our internal organs are protected through our Skeletal System, and blood cell production happens in our Bone Marrow. The fat reserve within the yellow marrow stores energy which is needed in a caloric deficit.

The Effects of Old Age on the Skeletal System

Bone density is lost over time and that leads to a higher risk of fractures. Joint Degeneration and slower remodeling makes especially spongey bone thinner. Decreased muscle mass changes posture and gives a slouched appearance. Hormonal changes like lower estrogen and testosterone contribute to overall bone loss, but an animal products diet that is high in red meat and calcium, as well as resistance training are great ways to prevent and extend the lessened effects of aging.

Works Cited

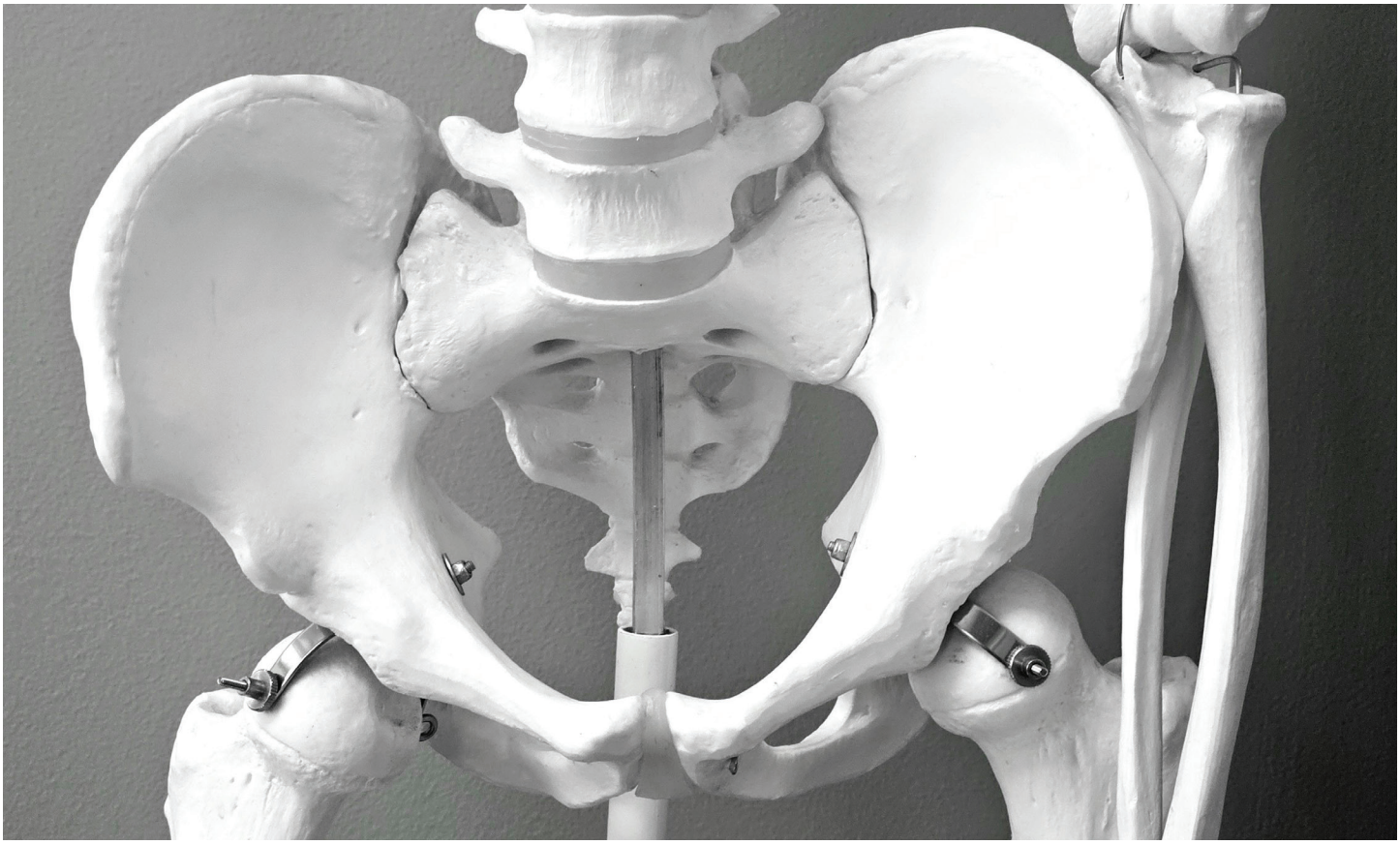
Encyclopædia Britannica, inc. (2024, September 14). Human skeleton. Encyclopædia Britannica. https://www.britannica.com/science/human-skeleton

Muscle, Bone & Skeletal Diseases | Niams. (n.d.). https://www.niams.nih.gov/health-topics/muscle-bone-diseases

Cleveland Clinic. (2024, September 5). How your bones change as you age. https://health.clevelandclinic.org/how-do-your-bones-change-over-time

Amazon.com: Anatomy & Physiology (mindtap course list): 9780357802212: Co, Elizabeth: Books. (n.d.). https://www.amazon.com/Anatomy-Physiology-Elizabeth-Co/dp/0357802217

Free stock photos. (n.d.-b). https://www.pexels.com/

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