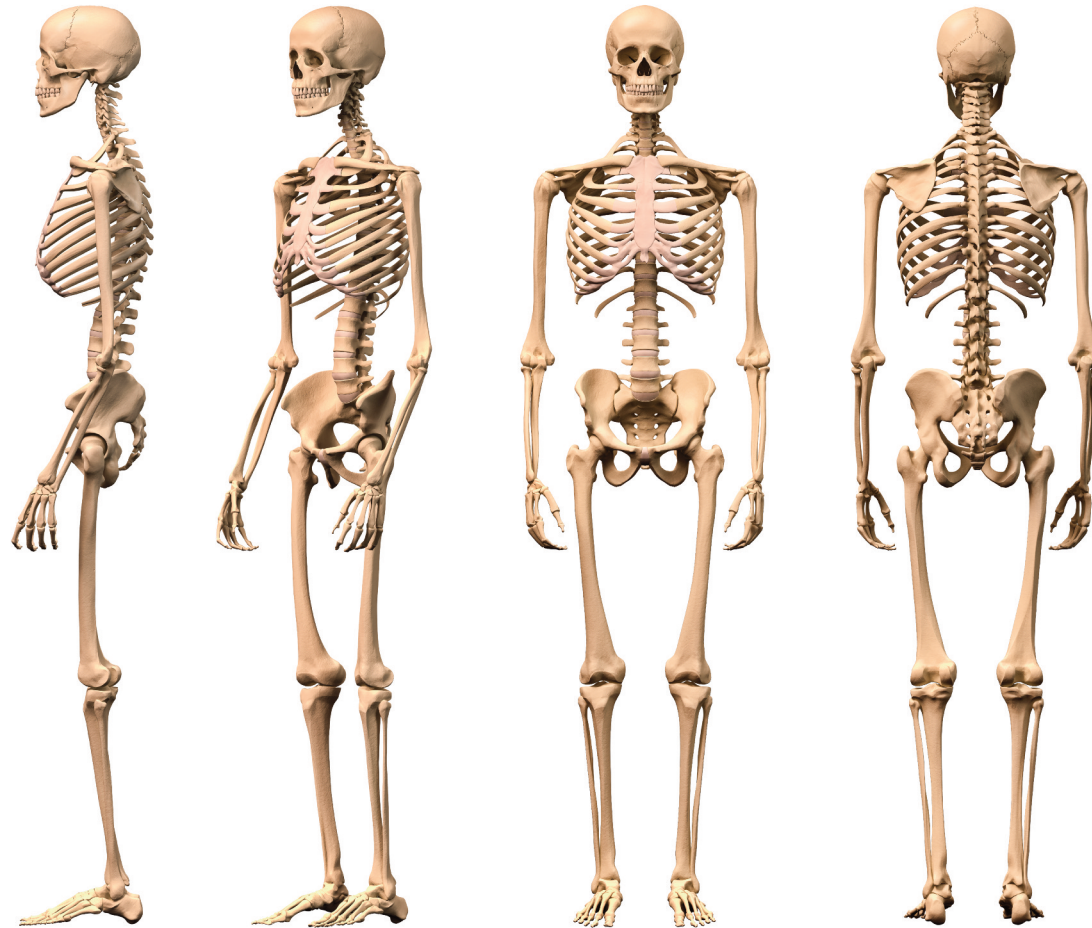




The Skeletal System



SKELETAL SYSTEM

Overview

The human skeleton consists of both fused and individual bones supported and supplemented by ligaments, tendons, muscles and cartilage. It serves as a scaffold which supports organs, anchors muscles, and protects organs such as the brain, lungs and heart.

The biggest bone in the body is the thigh bone and the smallest is the stapes bone in the middle ear. Several factors contribute to the bone density and average mass of the human skeleton including: gender, race, hormonal factors, nutrition, physical activity and lifestyle behaviors. Because of these and other factors affecting an individual's weight, the human skeleton may comprise between 12 and 20 percent of a person's total body weight with the average being 15 percent.

Fused bones include those of the pelvis and the cranium. Not all bones are interconnected directly: there are three bones in each middle ear called the ossicles that articulate only with each other. The hyoid bone, which is located in the neck and serves as the point of attachment for the tongue, does not articulate with any other bones in the body, being supported by muscles and ligaments.

Function

The skeleton serves six major functions.

1. Support

The skeleton provides the framework which supports the body and maintains its shape. The pelvis, associated ligaments and muscles provide a floor for the pelvic structures. Without the ribs, costal cartilages, and intercostal muscles, the heart would collapse.

2. Movement

The joints between bones permit movement, some allowing a wider range of

movement than others, e.g. the ball and socket joint allows a greater range of movement than the pivot joint at the neck. Movement is powered by skeletal muscles, which are attached to the skeleton at various sites on bones. Muscles, bones, and joints provide the principal mechanics for movement, all coordinated by the nervous system.

3. Protection

- The skeleton protects many vital organs:
- The skull protects the brain, the eyes, and the middle and inner ears.
- The vertebrae protect the spinal cord.
- The rib cage, spine, and sternum protect the lungs, heart and blood vessels.
- The clavicle and scapula protect the shoulder.
- The ilium and spine protect the hip, digestive and urogenital systems.
- The patella and the ulna protect the knee and the elbow respectively.
- The carpals and tarsals protect the wrist and ankle respectively.

4. Blood cell production

The skeleton is the site of haematopoiesis, which takes place in red bone marrow.

5. Storage

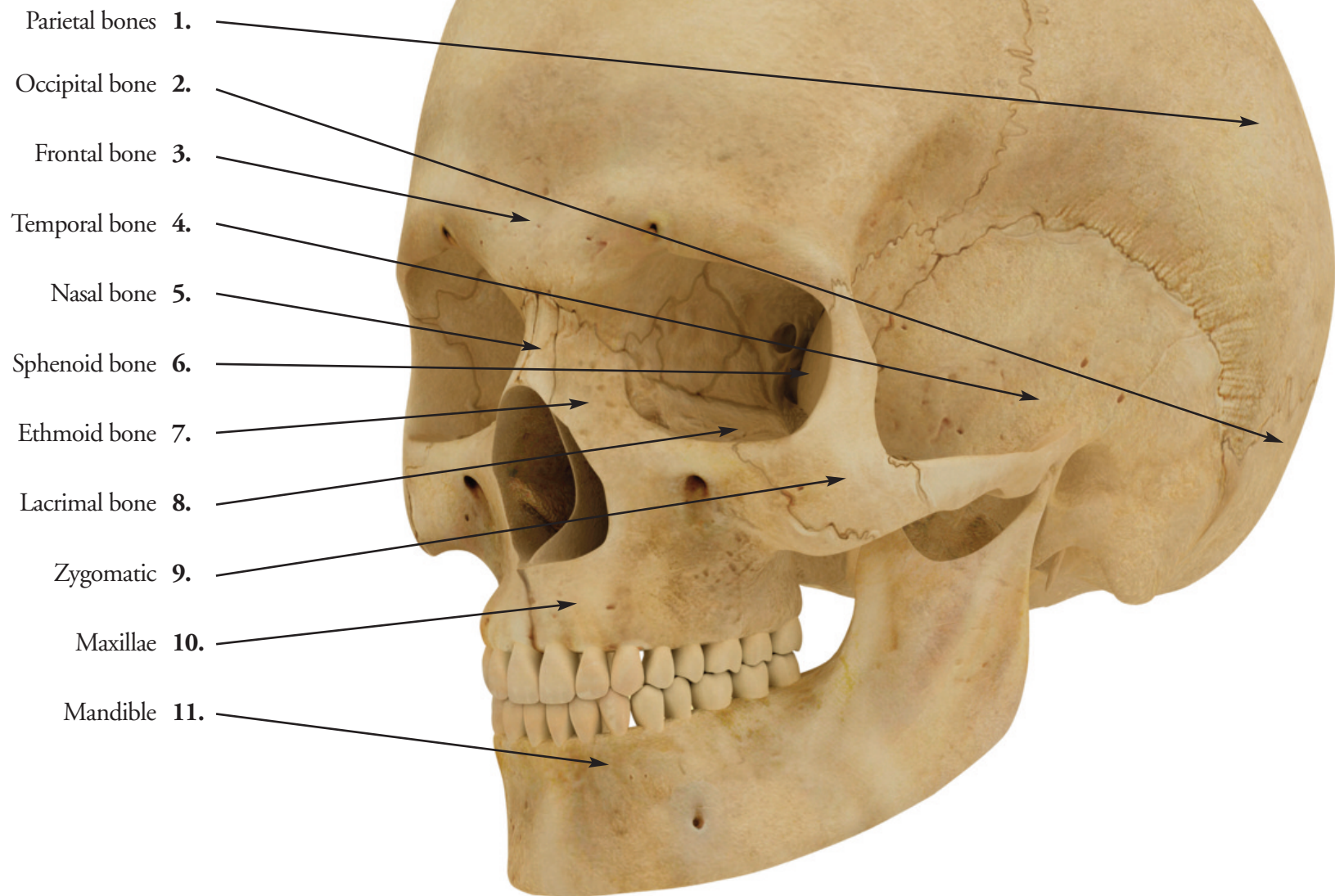
Bone matrix can store calcium and is involved in calcium metabolism, and bone marrow can store iron and is involved in iron metabolism. However, bones are not entirely made of calcium, but a mixture of chondroitin sulfate and hydroxyapatite, the latter making up 70% of a bone.

6. Endocrine regulation

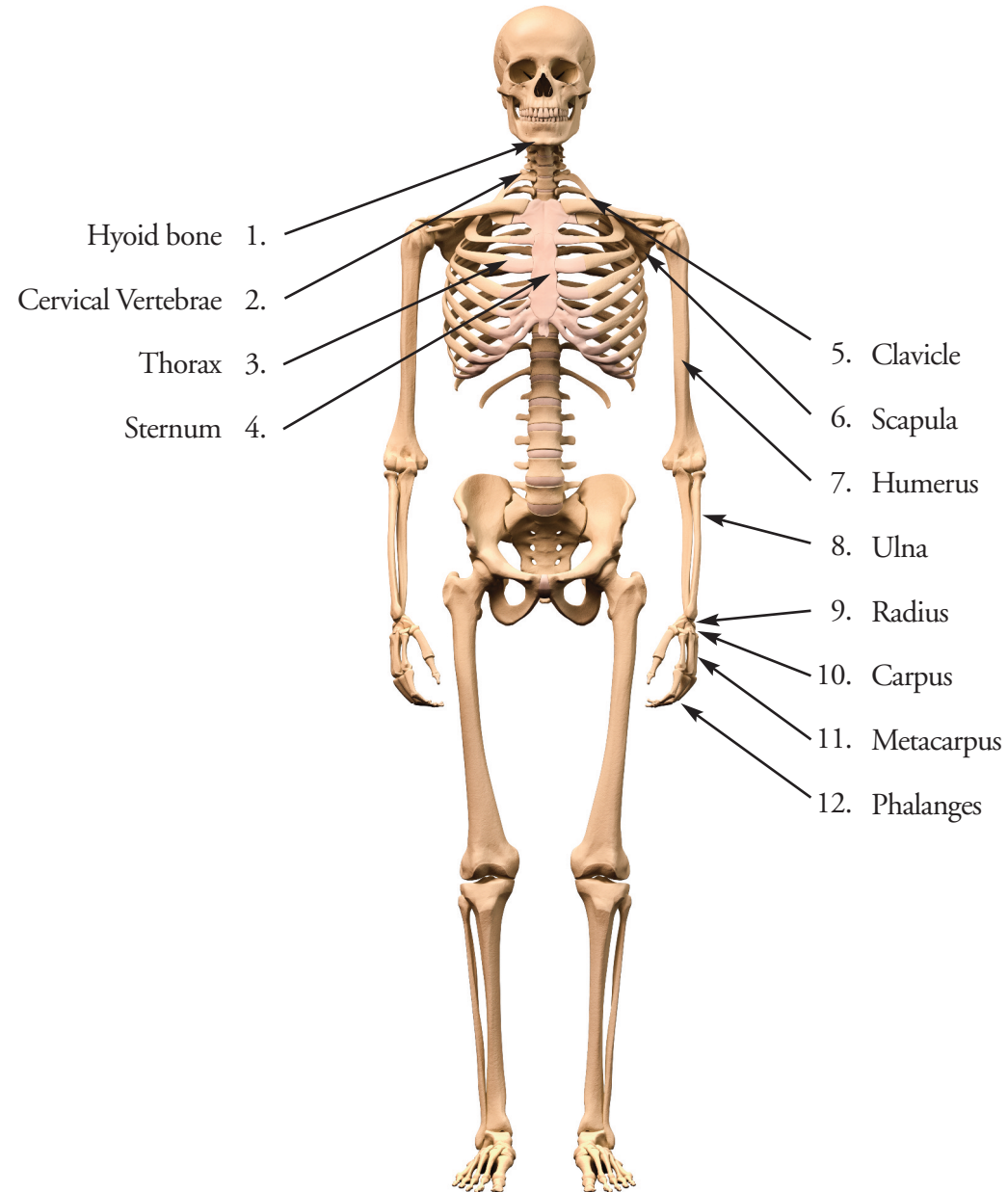
Bone cells release a hormone called osteocalcin, which contributes to the regulation of blood sugar (glucose) and fat deposition. Osteocalcin increases both the insulin secretion and sensitivity, in addition to boosting the number of insulin-producing cells and reducing stores of fat.



BONES OF THE CRANIUM



SKELETAL SYSTEM



BONE OVERVIEW

Name of Bone	Position	Purpose
Cranium (KRAY-nee-um)	Skull	Protects brain
Occipital bone (ohk-SIP-ih-tul)	Back of skull	Forms back of skull
Parietal bones (puh-RY-i-tul)	Top of cranium	Form roof and sides of cranium
Frontal bone (FRUNT-ul)	Forehead	Gives shape to forehead
Temporal bone (TEM-por-al)	Side of skull	Supports the temple
Ethmoid bone (ETH-moyd)	Between eye sockets	Forms nasal cavity
Sphenoid bone (SFEEN-oyd)	Behind eye	Joins all bones of cranium
Nasal bone (NAY-zul)	Nose	Bridge of nose, sides of eye sockets
Lacrima bone (LAK-ruh-mul)	Eye	Eye sockets
Zygomatic (zy-goh-MAT-ik)	cheekbones	Forms cheekbones
Maxillae (maxilla) bone (mak-sil-ee)	Upper jaw	Forms upper jaw
Mandible (MAN-du-bul)	Lower jaw	Only moveable bone of skull
Hyoid bone (HY-oyd)	U-shape bone base of tongue	Adam's Apple
Cervical Vertebrae (SUR-vih-Kul)	7 bones of the neck	Hold head on your shoulders
Thorax (Thor-aks)	Chest	
Sternum	Breastbone	Protects your heart and lungs, etc.
Clavicle	Collarbone	
Scapula	Shoulder blade	
Humerus (HYOO-muh-ris)	Elbow to shoulder	
Ulna	Large forearm bone (wrist to lower finger)	
Radius (RAY-dee-us)	Small forearm bone (side to thumb)	
Carpus (Kar-pus)	Wrist	8 small bones
Metacarpus (met-uh-KAR-pus)	Palm	5 long bones
Phalanges	Fingers	14 bones

