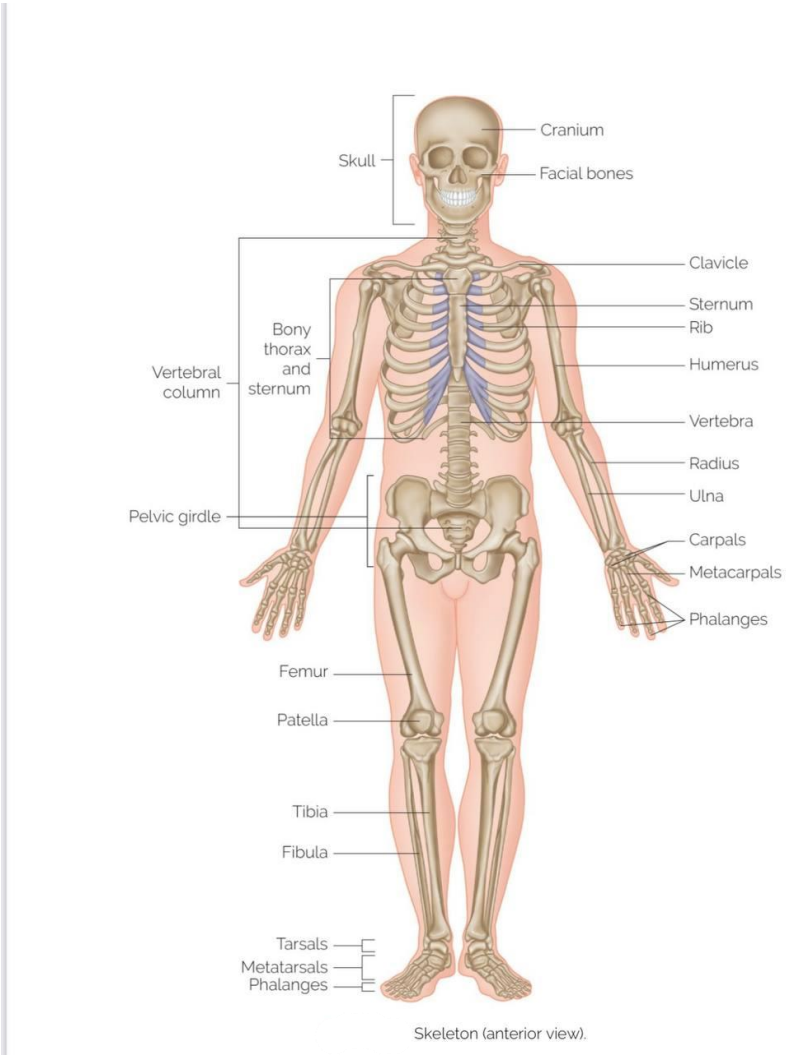
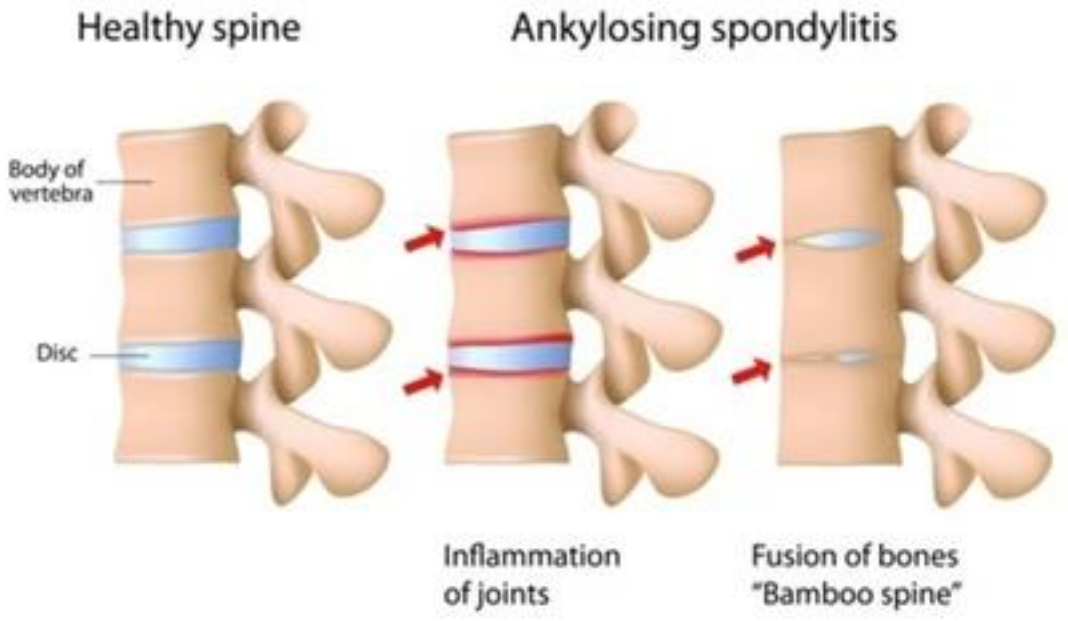
BONES: bones are highly specialized connective tissues that can remodel based on exogenous demand. The cell primarily responsible for building bones is the osteoblast, which secretes a collagen-rich fluid known as osteoid. Ground substance, composed primarily of osteocalcin and chondroitin sulfate, is also present in osteoid.



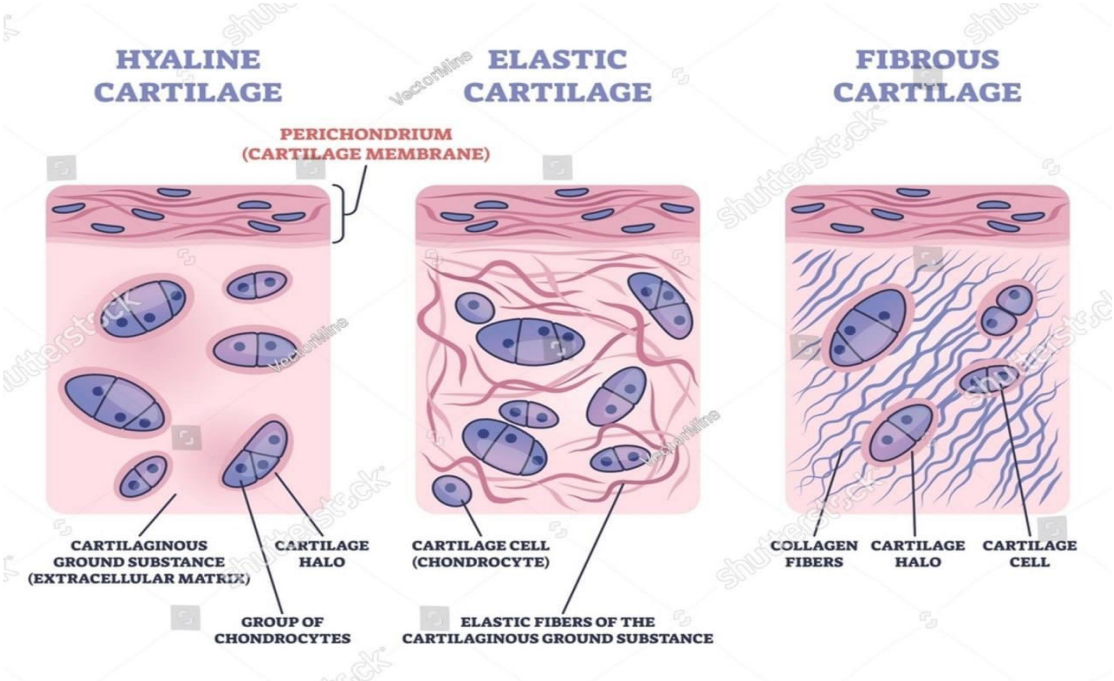
Skeleton (anterior view).

Bone hardening requires mineralization, making bones the body's main calcium and phosphate reservoir. These ions are typically obtained from the diet, et, dairy products. However, calcium and phosphate can easily deplete if not stored in bones. Mineralization transforms the osteoblast into the mature bone cell, the osteocyte.

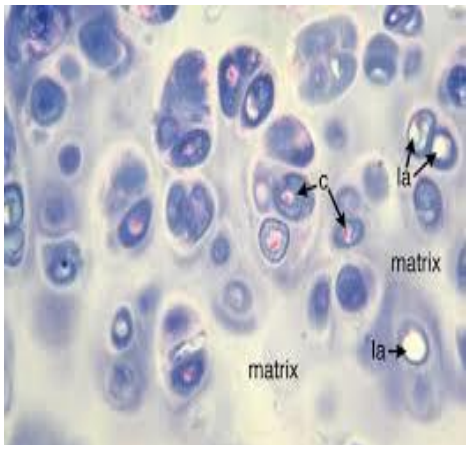
CARTILAGES: Cartilage has many functions, including the ability to resist compressive forces, enhance bone resilience, and provide support in bony areas where flexibility is needed (see **Image.** Cartilage and Bone Illustration). The primary cell that makes cartilage is the chondrocyte, which resides within the lacunae.



Several types of cartilage are found in the human body, and their structure and relevant function depend on this variation.



Hyaline Cartilage

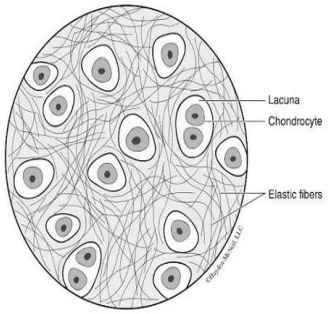


Hyaline cartilage is the most copious type of cartilage in the human body. It is pale blue-white and smooth to the touch. It is primarily composed of type II collagen and proteoglycans. The surface is usually moist, but the cartilage becomes dry, thinner, and more yellow with age. Hyaline cartilage is usually found in the trachea, nose, epiphyseal growth plate, sternum, and ventral segments of the ribs. Hyaline cartilage produces a resilient surface with minimal friction. It also has an excellent ability to resist compressive forces at sites of bone articulation.

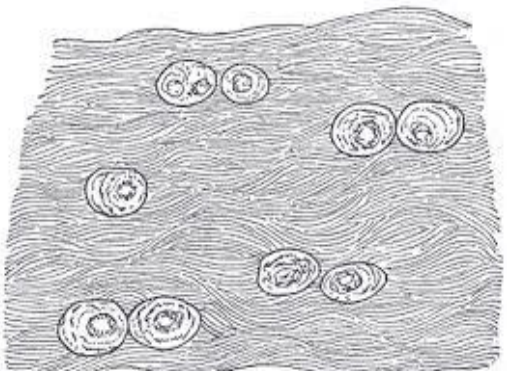
Elastic Cartilage

This cartilage appears a dull yellow and is most commonly found in the larynx, ear, epiglottis, and eustachian tube. A perichondrium-like layer also surrounds it. It provides flexibility and is resilient to pressure.

View the diagram of elastic cartilage

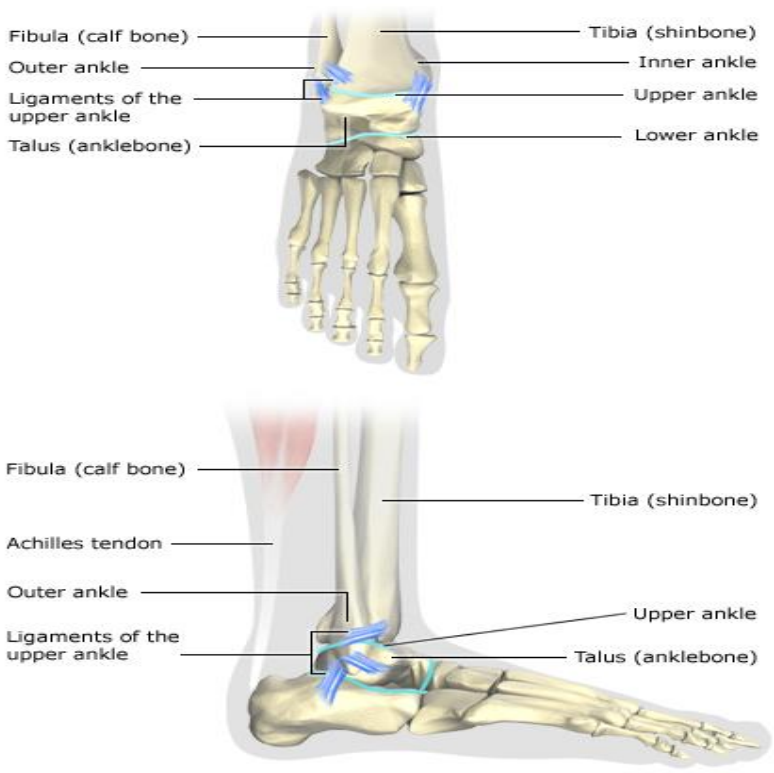


Fibrocartilage



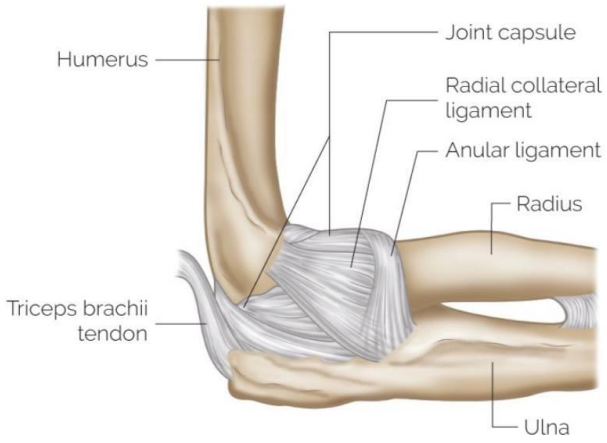
This is abundant in type 1 collagen and contains significantly less proteoglycan than hyaline cartilage. It can resist high degrees of tension and compression. It is commonly found in tendons, ligaments, intervertebral discs, some bones' articular surfaces, and menisci (see **Image**. Triangular Fibrocartilage Complex). Unlike other cartilages, it has no perichondrium).

ASSOCIATED LIGAMENTS: The human body has more than 900 ligaments that help connect bones, joints and organs and hold them in place. A ligament can be overstretched or torn, called a sprain. Sprains are a common injury, but you can take several steps to keep your ligaments healthier and safer.



What are ligaments made of?

Ligaments are like cords made of connective tissue, elastic fibers that are somewhat stretchy, and collagen, a protein that binds tissues in animals.



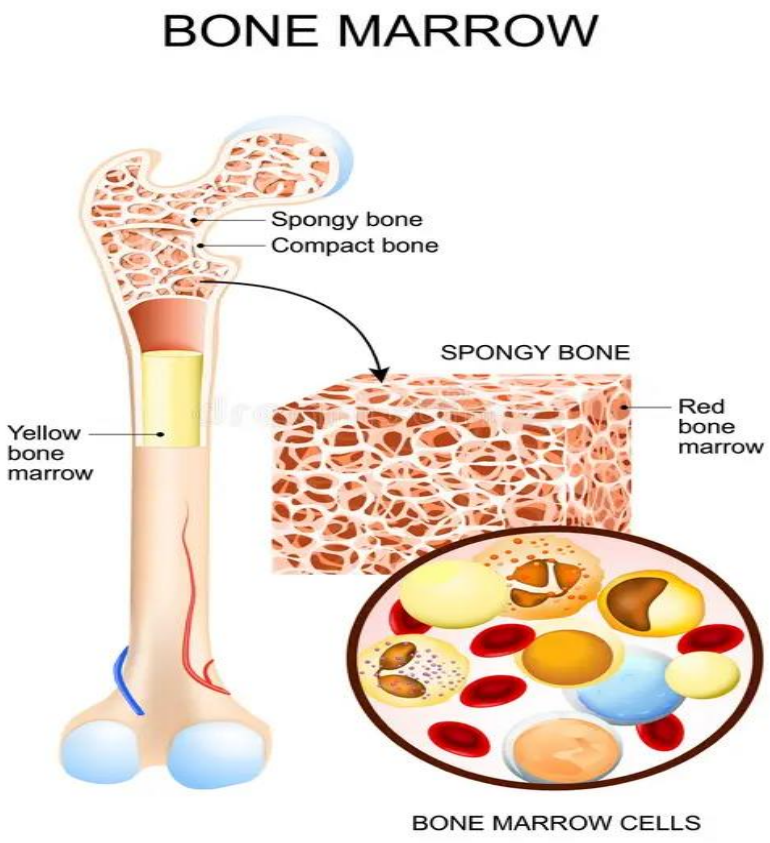
(continued)

What do ligaments look like?

Ligaments come in different shapes and sizes. Most like ropes, cords or bands. Some are thin, like a piece of string, but others are wider. Some are even shaped in an arch. They can be pink, yellow or white.

BONE MARROW

Bone marrow: is a spongy organ that fills the center of various bones of your body. It is where stem cells produce red and white blood cells and platelets. Without bone marrow, you couldn't move oxygen through your body or fight infections, and blood wouldn't clot.



Red Bone Marrow: Red bone marrow, also called myeloid tissue, is made up of fibrous tissue that contain hematopoietic cells, or blood-forming stem cells. All red blood cells and platelets in adults are formed within red bone marrow, as well as 60% to 70% of white blood cells.

Yellow Bone Marrow: Yellow bone marrow is fattier and is home to mesenchymal or marrow stromal cells. These are the stem cells that produce the body's connective tissues like fat, cartilage, muscle, and bone cells.

Yellow bone marrow also stores fat and nutrients for red bone marrow to use and to maintain body functions. If the body is stressed, like during an infection or severe blood loss, yellow bone marrow can transform into red bone marrow and take over its function.