Anatomy I Lab . 2

(UOMU013033)

“Joints ”

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Second Stage

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Lecture objectives

- Meaning of cartilage
- Types of cartilages
- Meaning of joint
- Types of joints
- Meaning of Ligament
- Types of Ligaments
- Meaning of Blood Vessel
- Types of Blood Vesseles
- Meaning of Lymphatic System

What is cartilage?

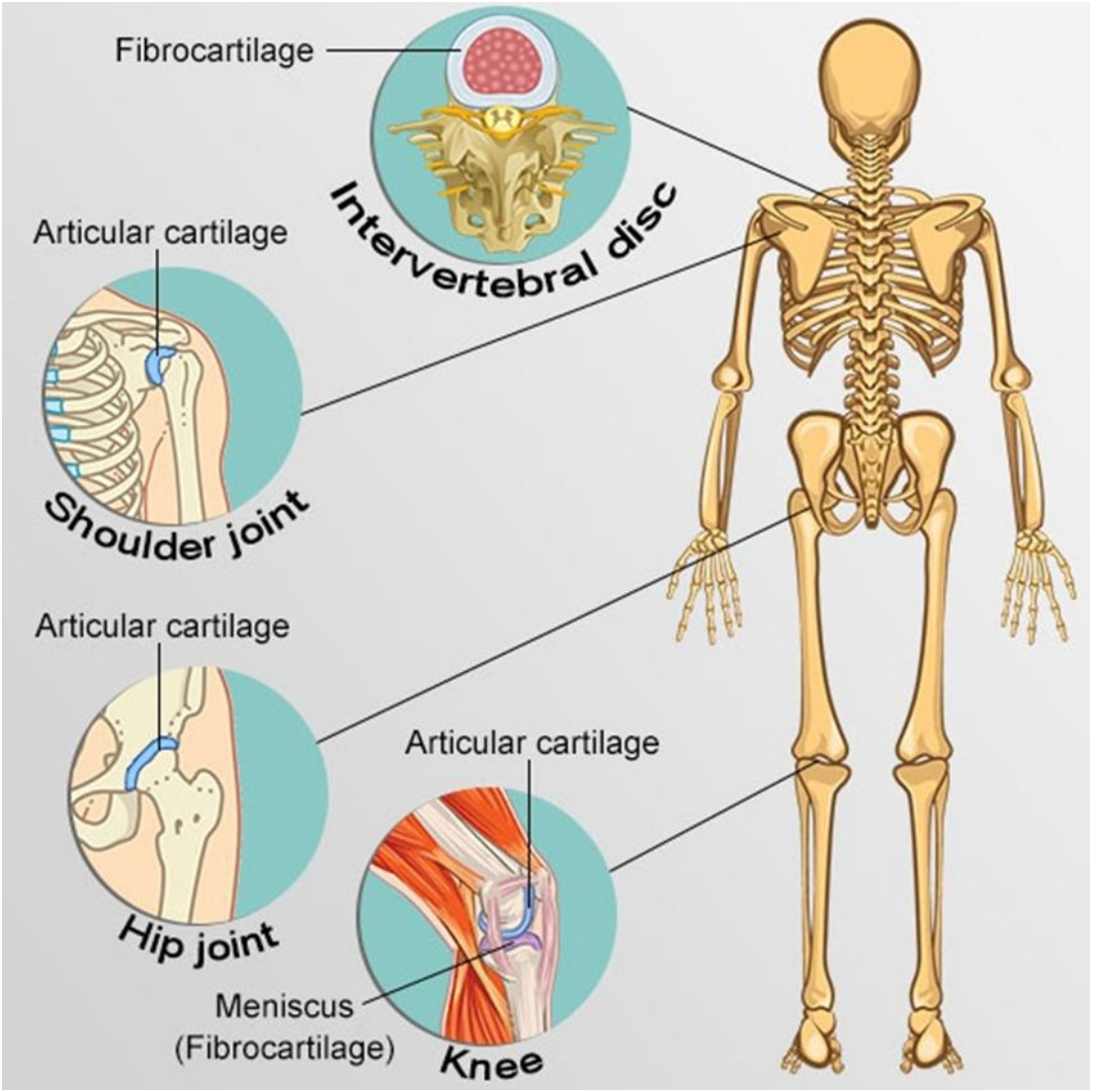
Cartilage is a strong, flexible connective tissue that protects your joints and bones. It acts as a shock absorber throughout your body.

Functions of cartilage:

- **Absorbing shock**
- **Reducing friction**
- **Supporting structures in your body**

Where is cartilage located?

Almost any place where two bones meet in your body is cushioned by cartilage. It's also at the ends of all your bones that form joints.



Types of cartilage

There are three types of cartilage in your body:

- ❖ Hyaline cartilage.
- ❖ Elastic cartilage.
- ❖ Fibrocartilage.

Hyaline cartilage is slippery and smooth, which

- helps your bones move smoothly past each other in your joints.
- It's flexible but strong enough to help your joints hold their shape.

The locations of Hyaline cartilage in the body include:

- At the ends of bones that form joints.
- Between your ribs.
- In your nasal passages.

Hyaline Cartilage

Locations in the body:

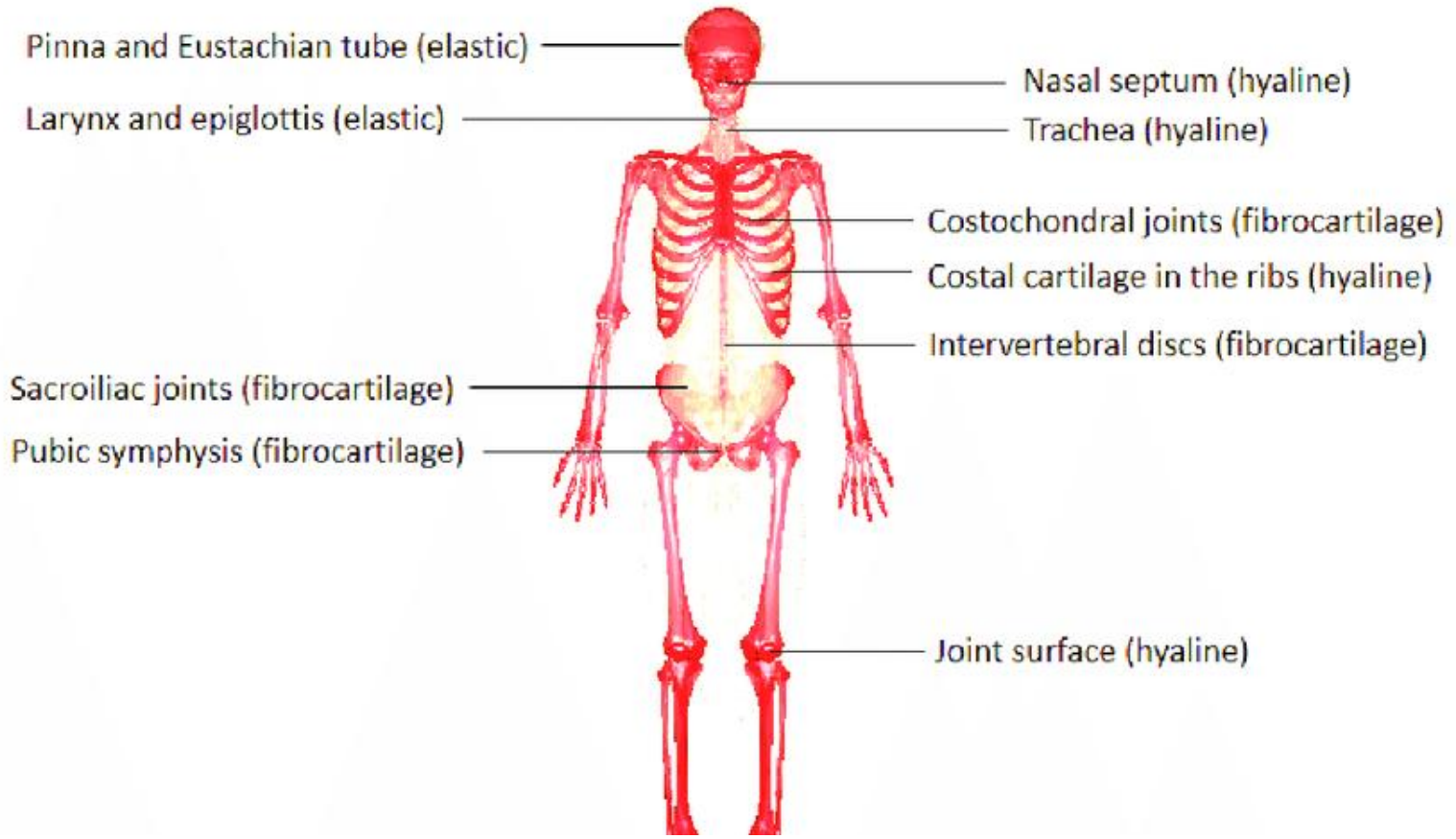
- Nose – cartilaginous portion
- Tracheal and bronchial rings
- Laryngeal cartilages
- Costal cartilages
- Articular surfaces of long bones
- Epiphyseal growth plate
- Fetal skeleton

Normal hip joint

Fibrocartilage:

The Shock Absorbing Cartilage

Fibrocartilage is uniquely designed to handle pressure and compression, making it a key component in high-stress areas. Its dense structure sets it apart from other types of cartilage.



Located in the intervertebral discs, pubic symphysis, and menisci of the knee.

Acts as a shock absorber, distributing loads evenly during movement.
Resists deformation, making it ideal for weight-bearing joints.
Has a limited regenerative capacity due to its avascular nature.

Elastic Cartilage: Flexibility and Resilience

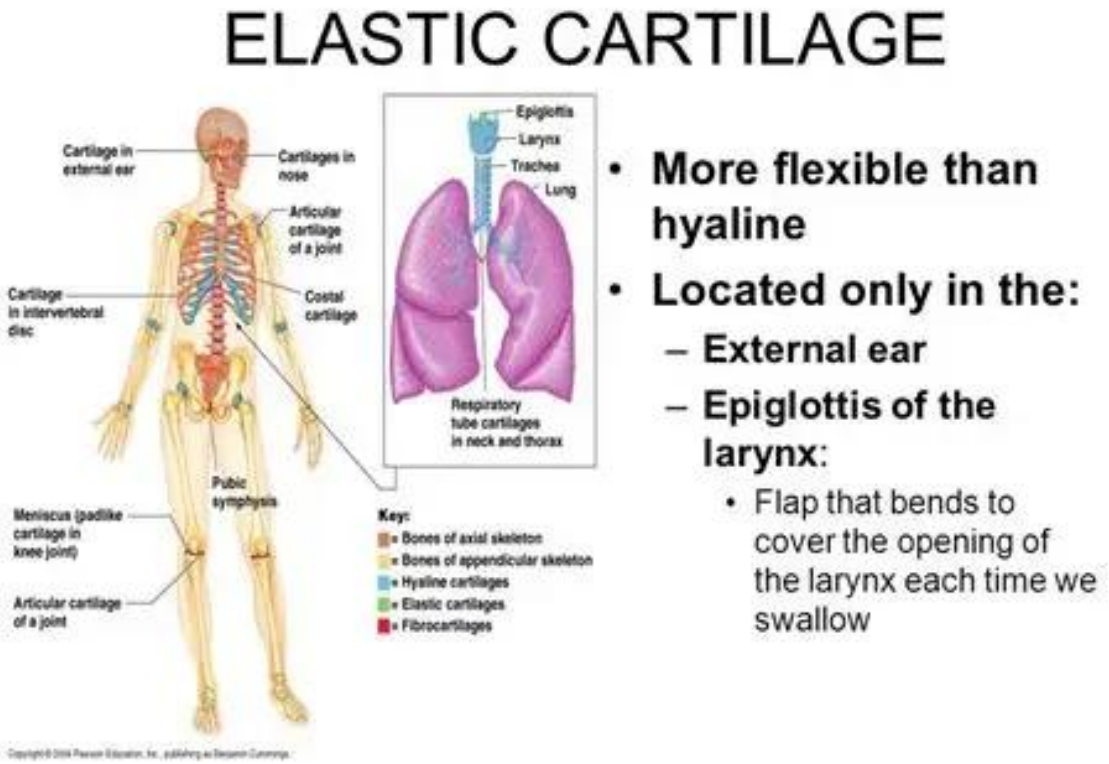
Elastic cartilage provides firm yet elastic support, allowing structures to maintain shape while adapting to movement. Its unique composition enables it to stretch and recoil effectively.

Found in the external ear, epiglottis, and Eustachian tubes

•Provides structural support while allowing bending and stretching.

•Resistant to wear, ensuring longevity in areas subject to repeated deformation.

•Its elasticity is critical for functions like sound transmission in the ear and swallowing in the epiglottis.



joints

joint, in anatomy, a structure that separates two or more adjacent elements of the skeletal system.

Types of joints

Joints can be classified in two ways:

- temporally (temporal) TMJ
- structurally

Each classification is associated with joint function.

There are two basic structural types of joint:

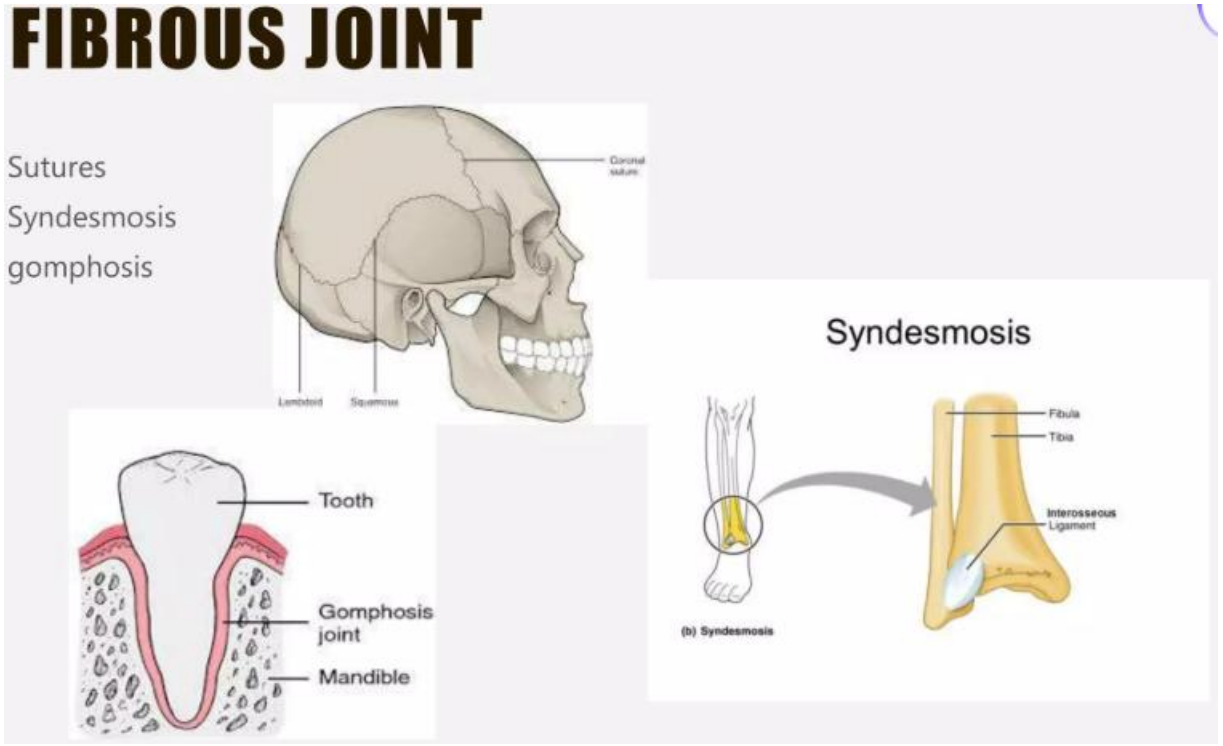
- diarthrosis, in which fluid is present,
- synarthrosis, in which there is no fluid. All the diarthroses (commonly called synovial joints) are permanent. Some synarthroses are transient, while others are permanent.

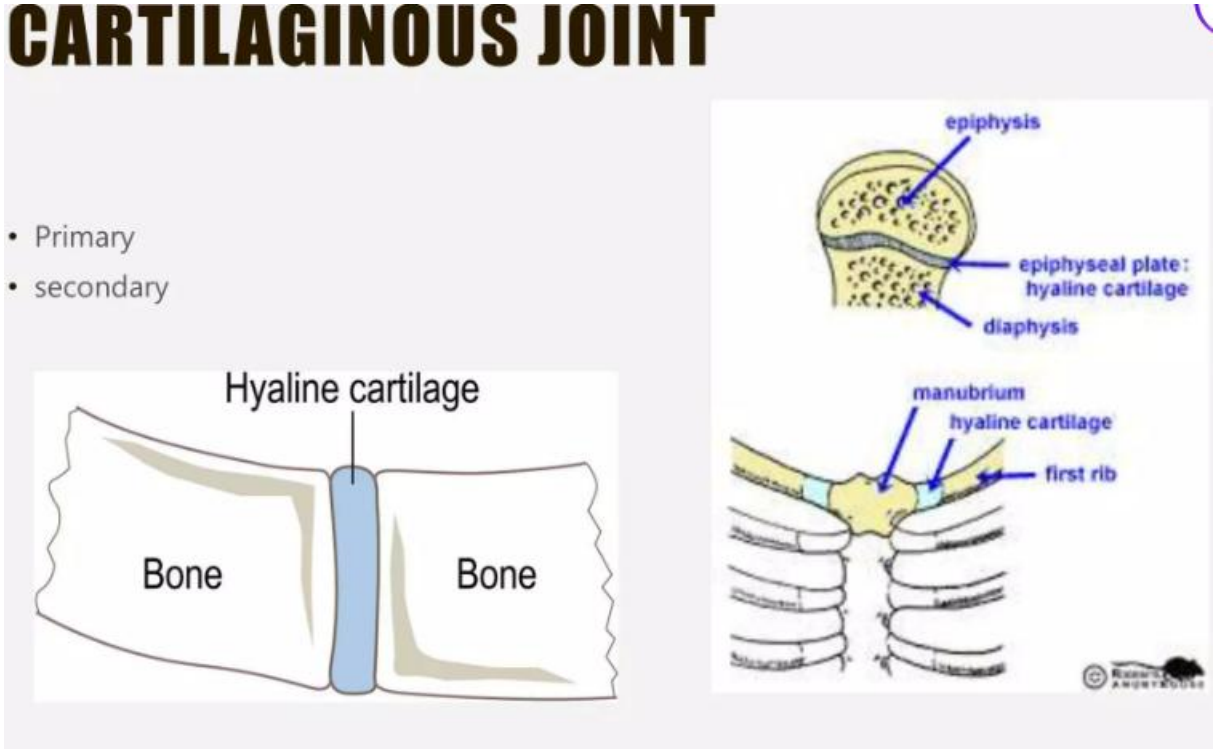
Synarthroses are divided into three classes:

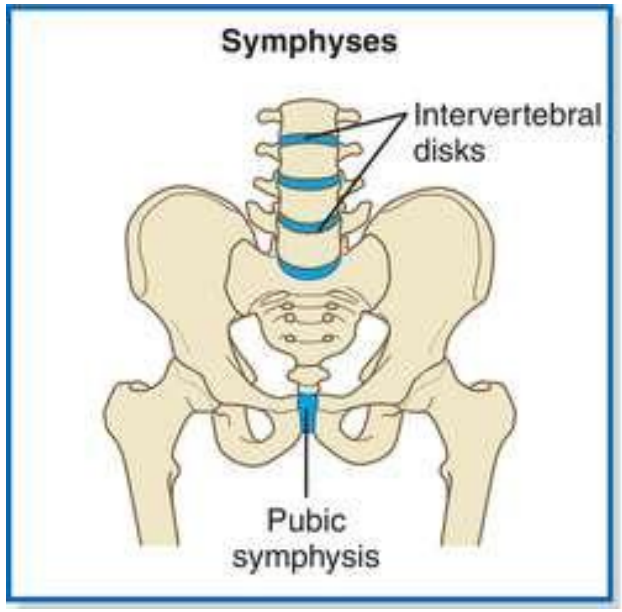
- **Fibrous joints**
- **Symphyses**

A symphysis (fibrocartilaginous joint)

- **Cartilaginous joints**





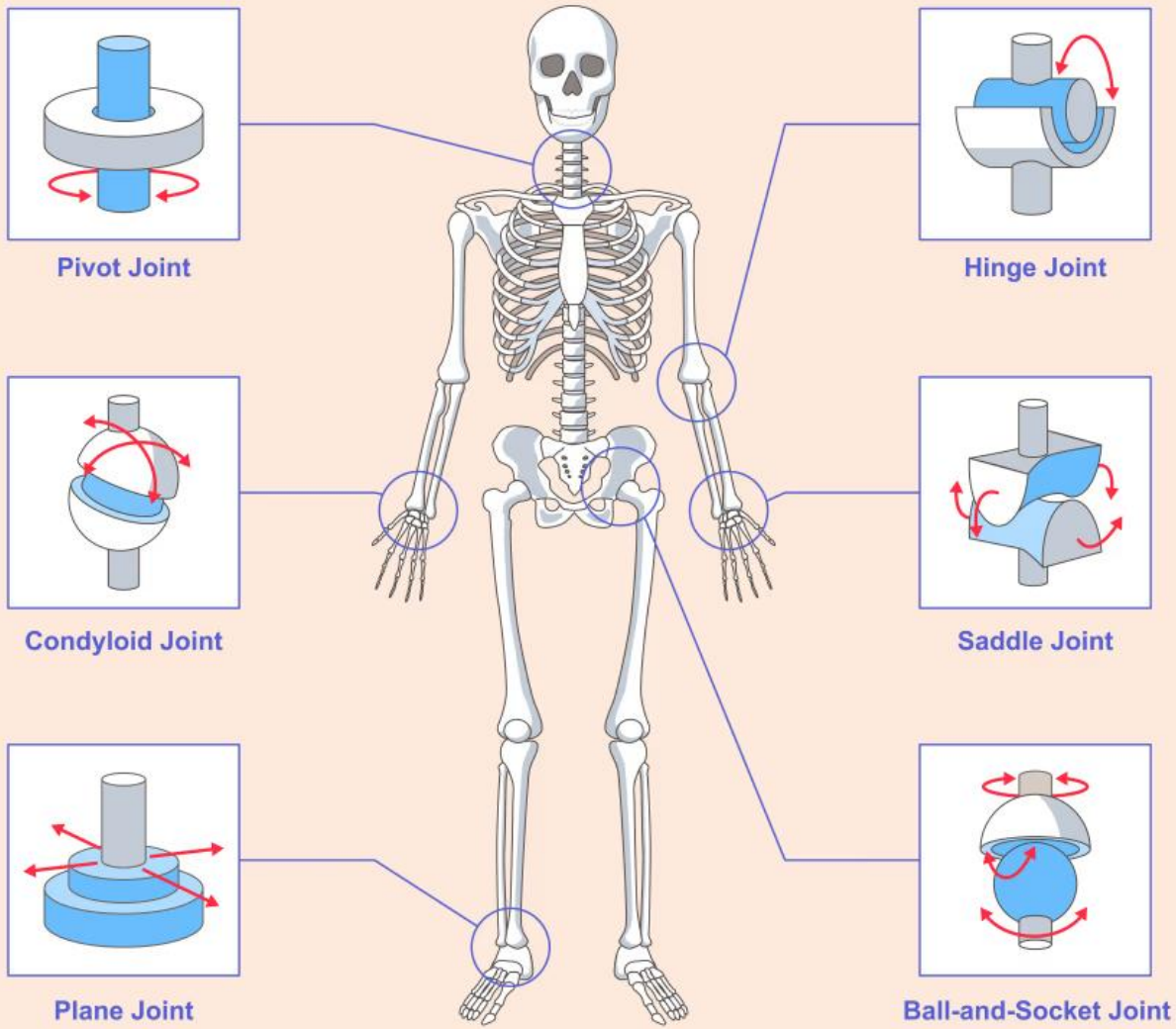


Diarthroses (also called **synovial joints**) are freely movable joints — the most common and flexible type of joint in the body.

Types of synovial joints:

1. Gliding (Plane) Joint	Intercarpal joints (between wrist bones), intertarsal joints (between ankle bones).
2. Hinge Joint	Elbow joint, knee joint, interphalangeal joints.
3. Pivot Joint	Atlantoaxial joint (between C1 and C2 vertebrae), proximal radioulnar joint.
4. Condyloid (Ellipsoidal) Joint	Wrist joint (radiocarpal joint), metacarpophalangeal joints (knuckles).
5. Saddle Joint	Carpometacarpal joint of the thumb.
6. Ball-and-Socket Joint	Shoulder joint, hip joint.

TYPES OF JOINTS



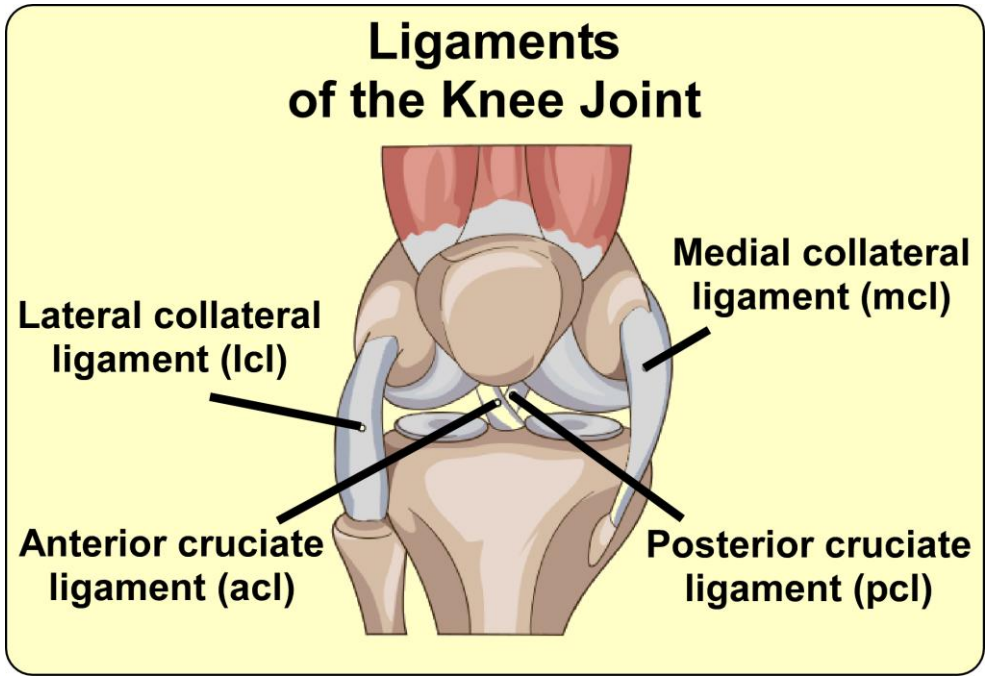
Ligaments

Ligaments are **strong bands of fibrous connective tissue** that connect **bone to bone**, helping stabilize joints and guide motion.

The main types of ligaments:

1. Based on Location

Type	
Articular ligaments	Connect bones at joints
Extra-articular ligaments	Found outside of a joint capsule
Intra-articular ligaments	Located inside the joint capsule
Visceral ligaments	Support internal organs

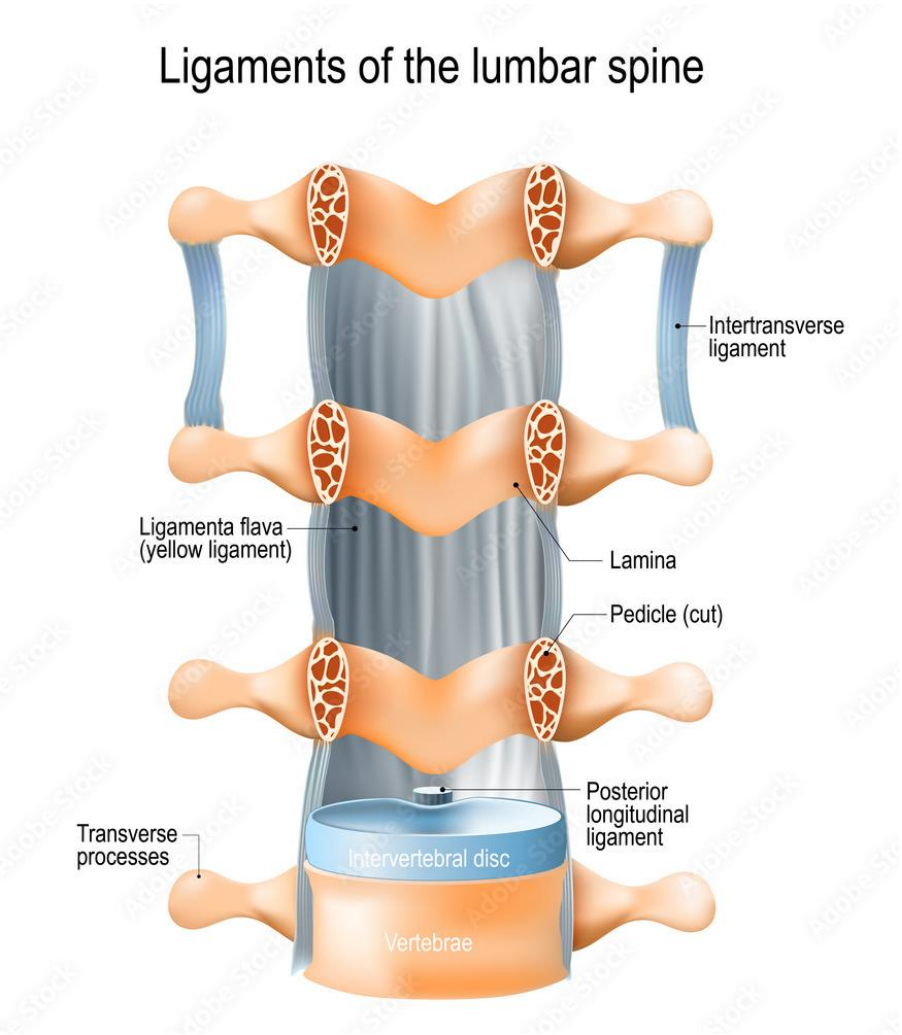


2. Based on Function

Type	
Stabilizing ligaments	Maintain joint stability
Limiting ligaments	Restrict excessive movement
Guiding ligaments	Direct normal movement

3. Based on Composition

White fibrous ligaments
Yellow elastic ligaments



Blood vessels

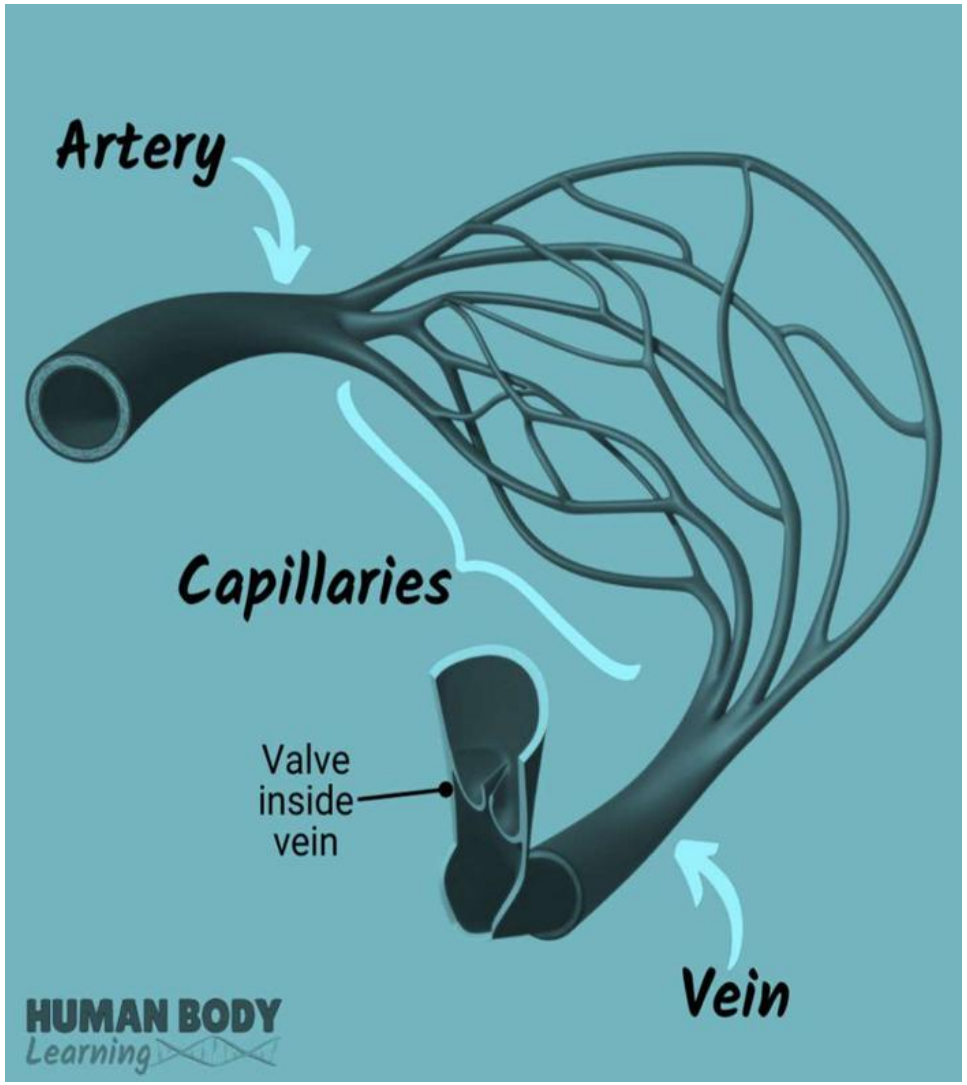
Blood vessels are the **tubes or pathways** that carry **blood throughout the body**.

The three main types of blood vessels in the human body

1. Arteries
•**Function:** Carry blood **away from the heart**.

2. Veins
Function: Carry blood **toward the heart**.

3. Capillaries
Function: Allow **exchange of gases, nutrients, and wastes** between blood and body tissues.



The lymphatic system

The lymphatic system is a part of the circulatory and immune systems that collects excess fluid (called **lymph**) from body tissues, filters it through **lymph nodes**, and returns it to the bloodstream.