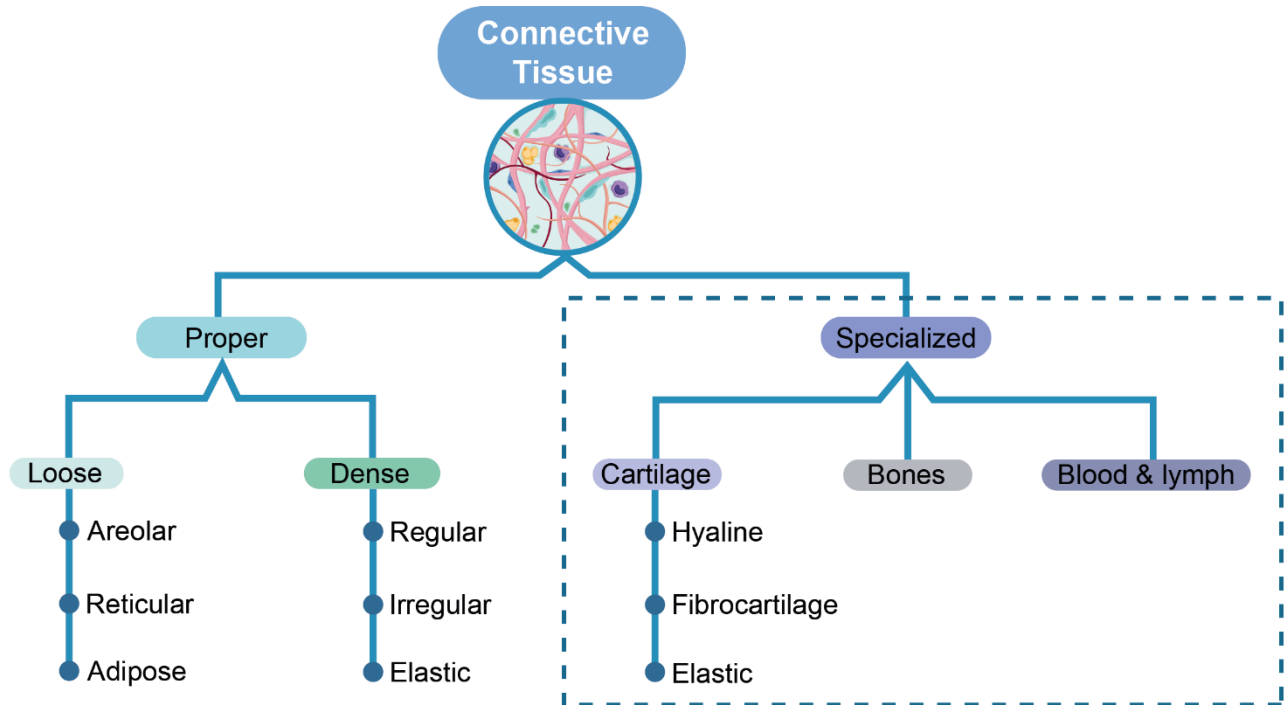


TOPIC: SPECIALIZED CONNECTIVE TISSUE: CARTILAGE

- **Specialized Connective Tissue:** optimized for _____ roles with solid or liquid ground substance.
- There are _____ types: 1. Cartilage 2. Bone 3. Blood & Lymph



1. Overview of Cartilage

Characteristics:

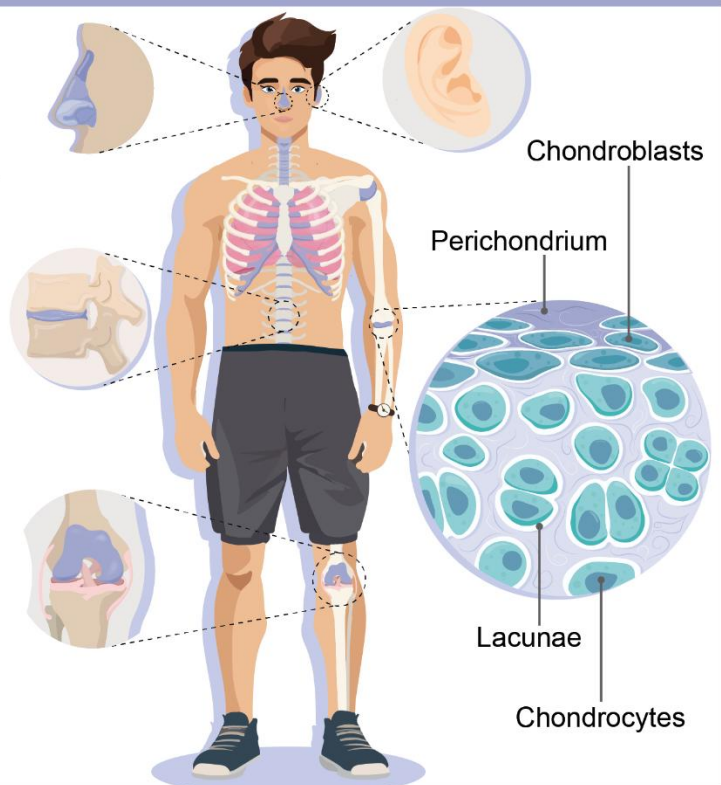
- Tough yet _____.
- Resists tension & compression.
- Avascular: _____ blood vessels (causes slow healing).
- A firm but flexible, rubbery matrix.

2 Main Cell Types: _____ = Cartilage

- Chondroblasts: secrete matrix.
- Chondrocytes: maintains matrix.
 - Lacunae: Chambers that house chondrocytes.

Supporting Tissue

- Perichondrium (_____ = around)
 - Dense irregular connective tissue.
 - Provides blood flow & nutrients.



TOPIC: SPECIALIZED CONNECTIVE TISSUE: CARTILAGE

EXAMPLE: The primary cells of cartilage reside in _____.

- a) Lacunae b) Gap Junctions c) Osteons d) A-C are correct

1a. Hyaline Cartilage

Characteristics:

- _____ abundant & weakest form of cartilage.
- Glassy appearance (_____ = glass).

Composition:

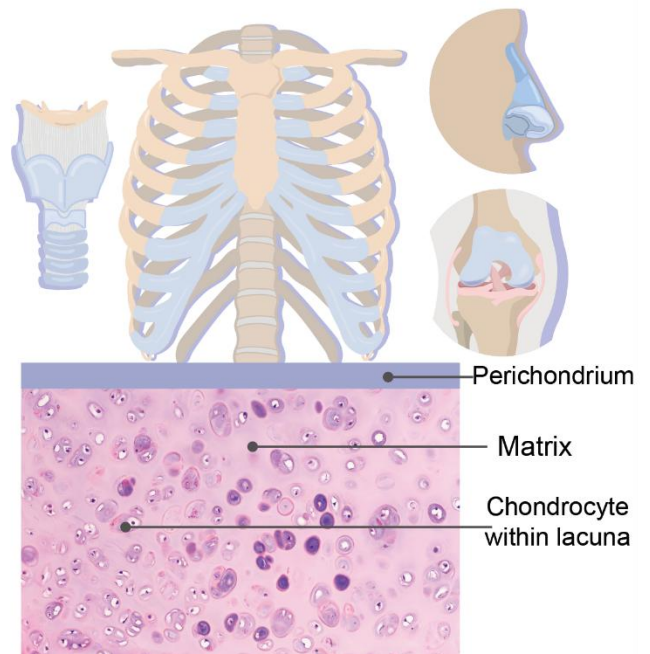
- _____ bundles of _____ fibers.

Function:

- Reduces _____ between bones.
- Strong & flexible structural support.
- Precursor to bone in fetus.

Locations:

- Nose.
- Larynx & trachea.
- Ends of bones.
- Developing bones.



EXAMPLE: How does the appearance of hyaline cartilage help you remember its function?

- a) Smooth appearance—transports nutrients c) Smooth appearance— reduces friction
b) Webbed appearance—insulates body d) Webbed appearance—resists compression

TOPIC: SPECIALIZED CONNECTIVE TISSUE: CARTILAGE

1b. Fibrocartilage

Characteristics:

- Blend of hyaline cartilage & dense regular connective tissue.

Composition:

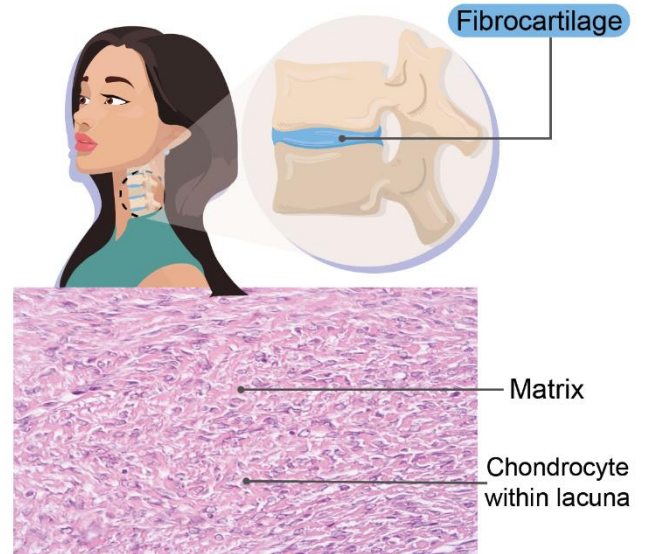
- NO perichondrium but some fibroblasts.
- Dense bundles of collagen fibers with _____ ground substance.

Function:

- Resists _____ & tension.

Locations:

- Intervertebral disc.
- Menisci of knee.



1c. Elastic Cartilage

Characteristics:

- Similar to hyaline cartilage, but more elastic fibers.

Composition:

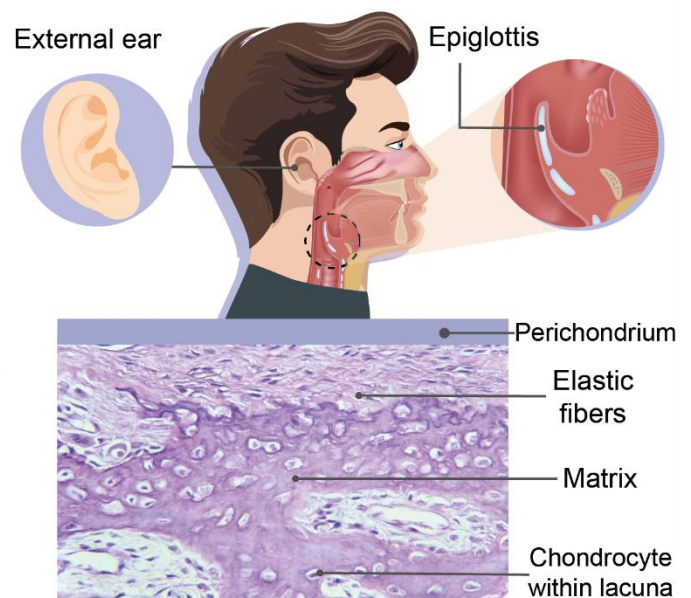
- ECM filled with _____ fibers.

Function:

- Maintains shape while providing great flexibility.

Locations:

- External ear.
- Epiglottis.

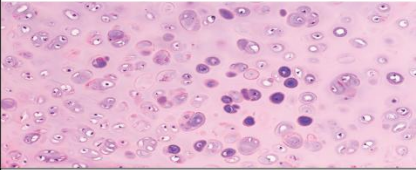
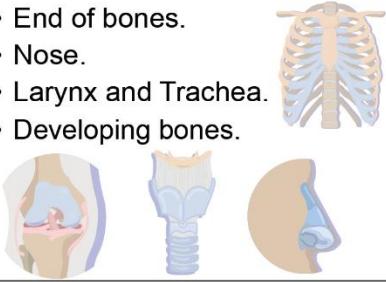
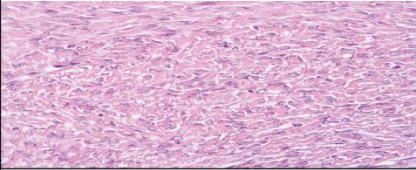
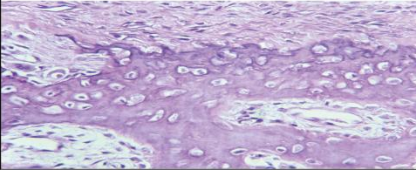
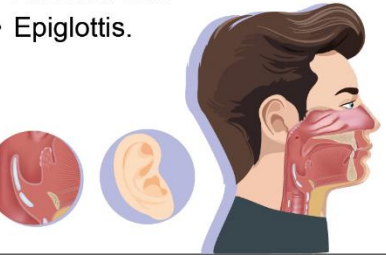


TOPIC: SPECIALIZED CONNECTIVE TISSUE: CARTILAGE

EXAMPLE: How does the structure of fibrocartilage benefit its function in intervertebral disks?

- Large amounts of collagen bundles resist compression but allow flexibility.
- Large amounts of elastic fiber resist compression but allow flexibility.
- Adipocytes provide shock absorption.
- Chondrocytes provide shock absorption.

Review of Types of Cartilage

Types of Cartilage			
Type	Characteristics	Function	Locations
<u>Cartilage</u>	- Most abundant & weakest. - Glassy appearance. - Small bundles of collagen fibers. 	_____ friction between bones. - Strong & flexible structural support. - Precursor to bone in fetus.	- End of bones. - Nose. - Larynx and Trachea. - Developing bones. 
<u>_____ cartilage</u>	_____ perichondrium. - Dense bundles of collagen fibers. - Minimal ground substance. 	Resists _____ & tension.	- Intervertebral disc. - Menisci of knee. 
<u>Cartilage</u>	- Similar to hyaline cartilage, but more elastic fibers. - ECM filled with elastic fibers. 	Maintains shape while providing great _____.	- External ear. - Epiglottis. 

TOPIC: SPECIALIZED CONNECTIVE TISSUE: CARTILAGE

PRACTICE: True or False: The nose and the ear are made of the same type of cartilage.

- a) True: they are both hyaline cartilage.
- c) False: the nose is elastic cartilage and the ear is hyaline cartilage.
- b) True: they are both elastic cartilage.
- d) False: the nose is hyaline cartilage and the ear is elastic cartilage.

PRACTICE: Janine fell off her bike, cutting her knee and tearing the hyaline cartilage of her knee joint. At the doctor's office, she is told the cuts will heal in a few weeks, but the cartilage will take months. Using what you know about tissues, why does the cartilage take longer to heal?

- a) Cartilage is unable to regenerate because it lacks -blasts cells but epithelial tissue can regenerate.
- b) Cartilage has limited blood supply while areolar tissue below the skin is vascular.
- c) Cartilage has a more complex structure than epithelial or connective tissue proper, so it takes longer to heal.
- d) The lacunae in cartilage make the healing process slower because the chondroblasts can't move.