

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**WALL OF THE HEART
AND
CARDIAC VALVES**

WALL OF THE HEART AND CARDIAC VALVES

By the end of the lecture, the student should be able to describe the microscopic structure of:

1. Wall of the heart:

- Endocardium.**
- Myocardium.**
- Epicardium.**

2. Cardiac valves.

WALL OF THE HEART

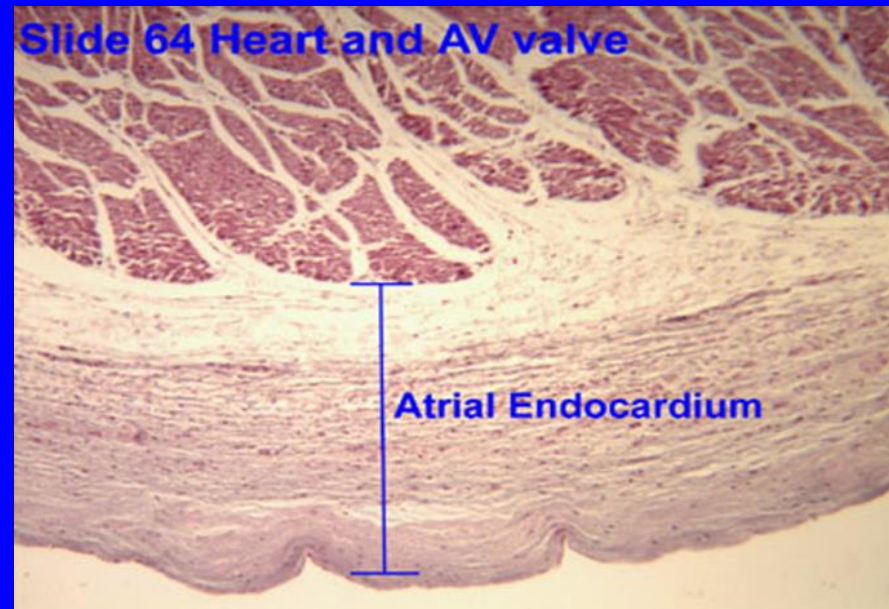
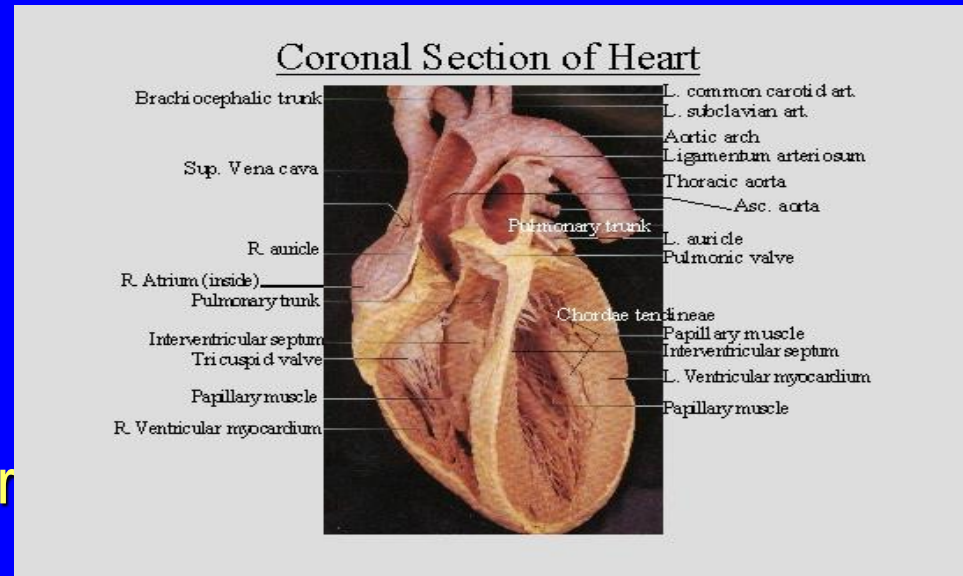
(A) Endocardium:

- 1- Endothelium
- 2- Subendothelial C.T.
- 3- Dense C.T. layer
- 4- Subendocardial layer

(B) Myocardium

(C) Epicardium:

- 1- Mesothelium
- 2- C.T. layer



ENDOCARDIUM

1- Endothelium: simple squamous epithelium.

2- Subendothelial C.T. layer

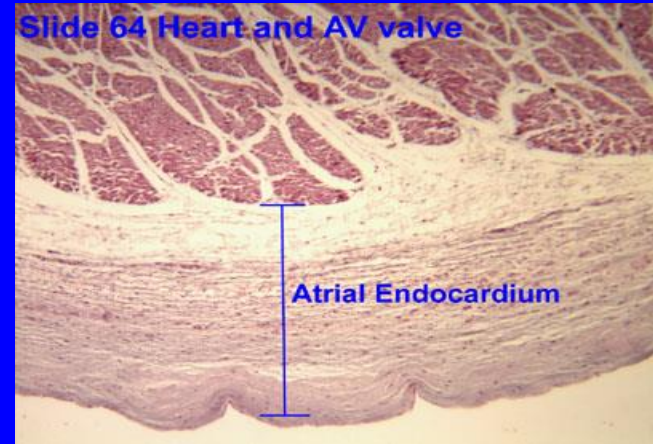
3- Dense C.T. layer

4- Subendocardial layer:

❖ Loose C.T. layer that

contains **Purkinje fibers**, small blood vessels & nerves.

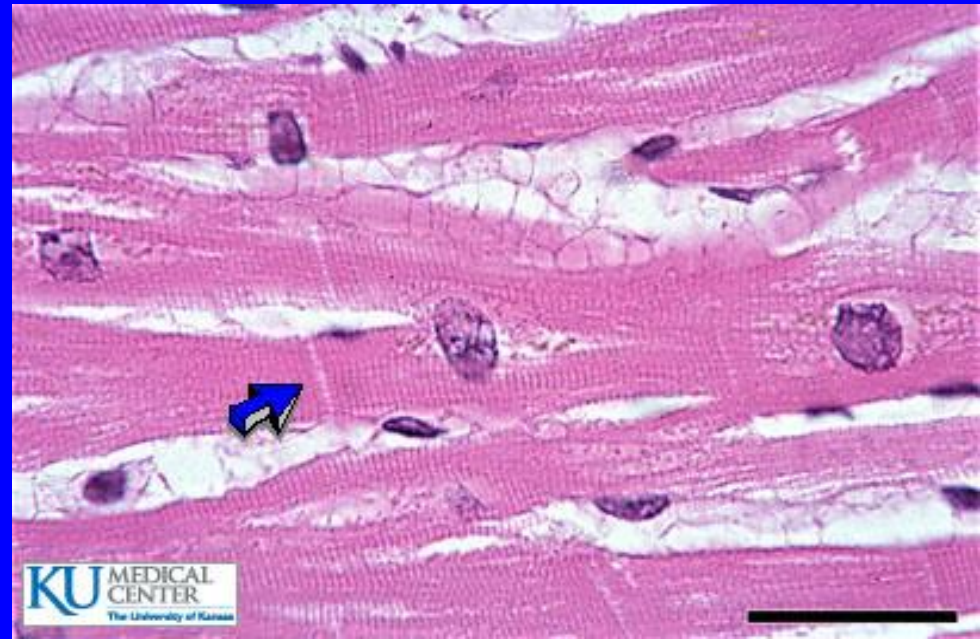
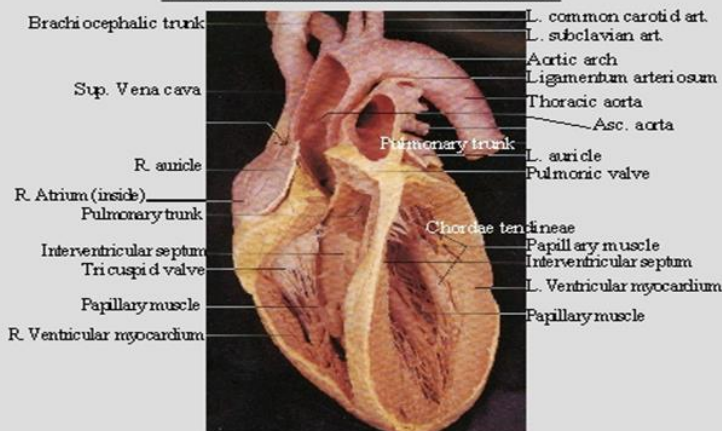
❖ It attaches to the endomysium of the cardiac muscle.



MYOCARDIUM

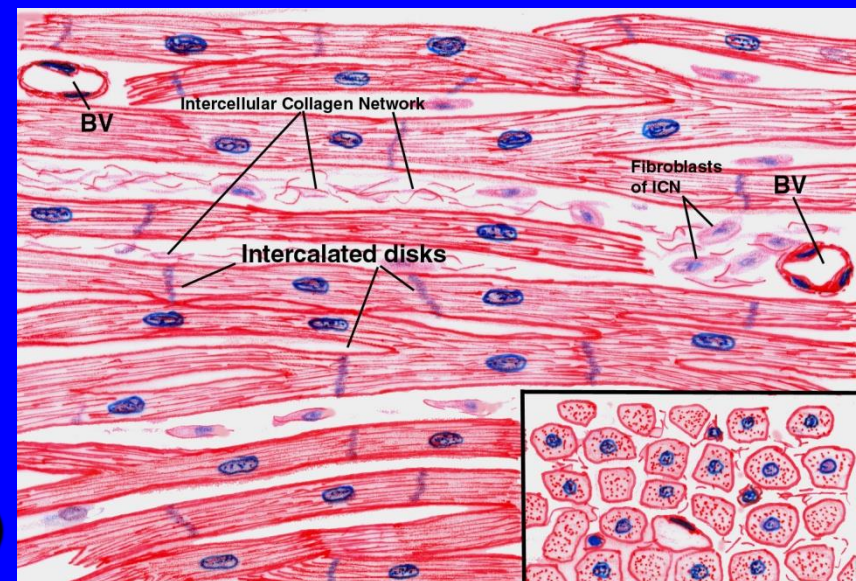
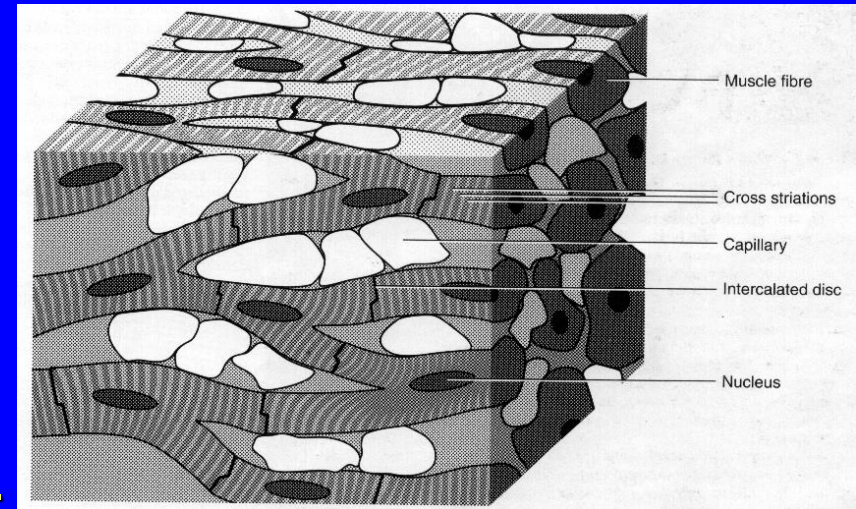
- It is the middle layer
- It is the most thick layer
- It contains cardiac muscle cells with endomysium (loose C.T.)

Coronal Section of Heart



CARDIAC MUSCLE

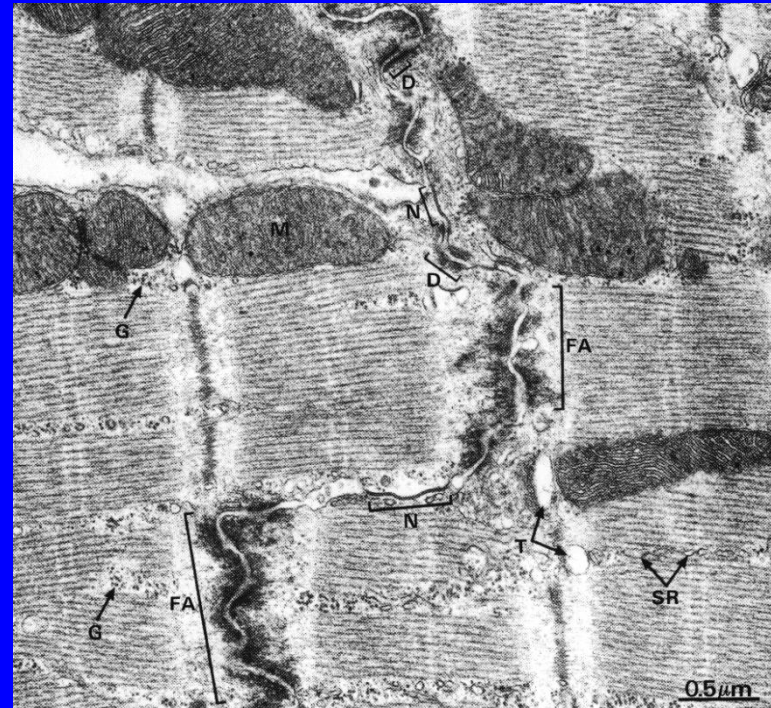
- Found in the myocardium.
- Striated and involuntary.
- L.M. Picture of Cardiac Muscle Fibers:
 - Cylindrical in shape.
 - Intermediate in diameter between skeletal and smooth muscle fibers.
 - Branch and anastomose.
 - Covered by a thin sarcolemma.
 - Mononucleated. Nuclei are oval and central.
 - Sarcoplasm is **acidophilic** and shows non-clear striations (fewer myofibrils).
 - Divided into short segments (cells) by the intercalated discs.



Cardiac Muscle Fibers

■ E.M. Picture:

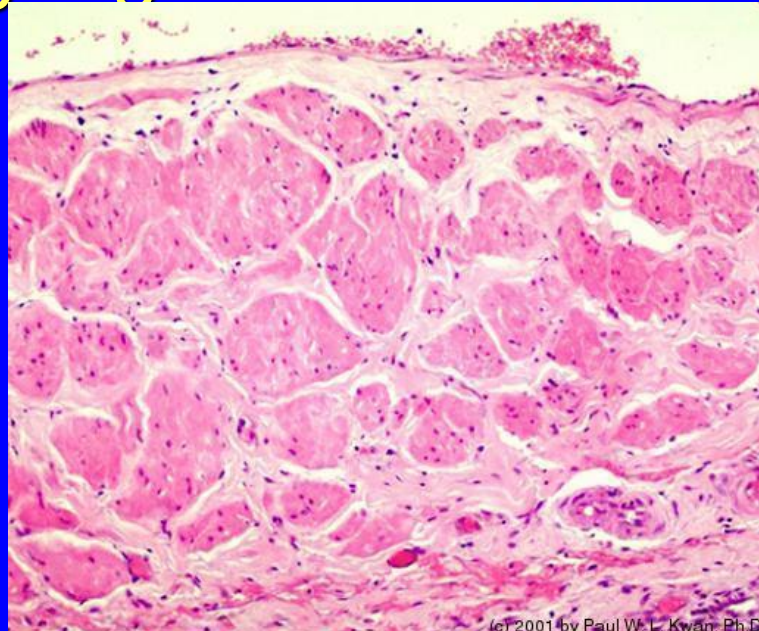
- Few myofibrils.
- Numerous mitochondria.
- Less abundant SR.
- T-tubules come in contact with only one cisterna of SR forming “Diads” (not triads).
- Glycogen & myoglobin.
- Intercalated discs: are formed of the two cell membranes of 2 successive cardiac muscle cells, connected together by junctional complexes (desmosomes and gap junctions).



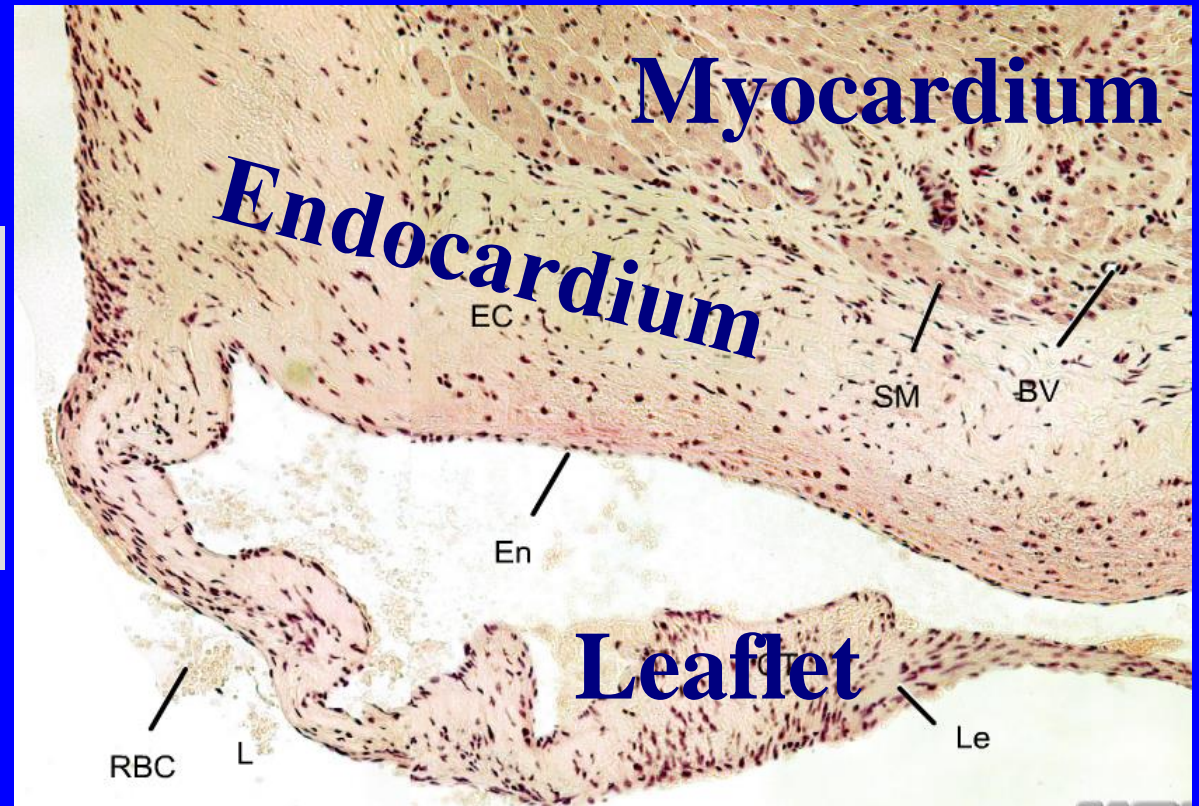
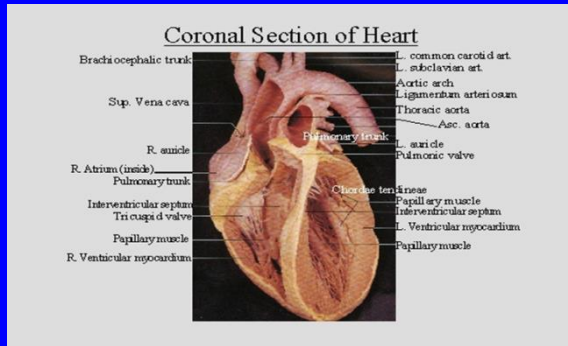
EPICARDIUM

(Visceral layer of pericardium)

- **Mesothelium:** simple squamous epithelium.
- **Subepicardial C.T. layer:**
Loose C.T. contains the coronary vessels, nerves, ganglia & fat cells.



LEAFLET (CUSP) OF HEART VALVE

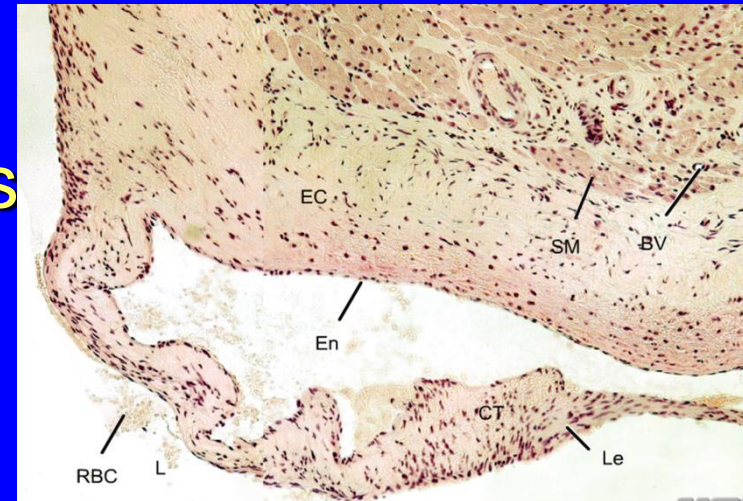


HEART VALVES (CARDIAC VALVES)

- Each leaflet (cusp) of heart valve is formed of:
 - (1) A core of Dense irregular C.T.
 - (2) This core is covered by: Endocardium.

- The leaflets of the heart valves are normally **AVASCULAR**.

- Blood capillaries can be found only in the base or root of the leaflet.



BEST WISHES