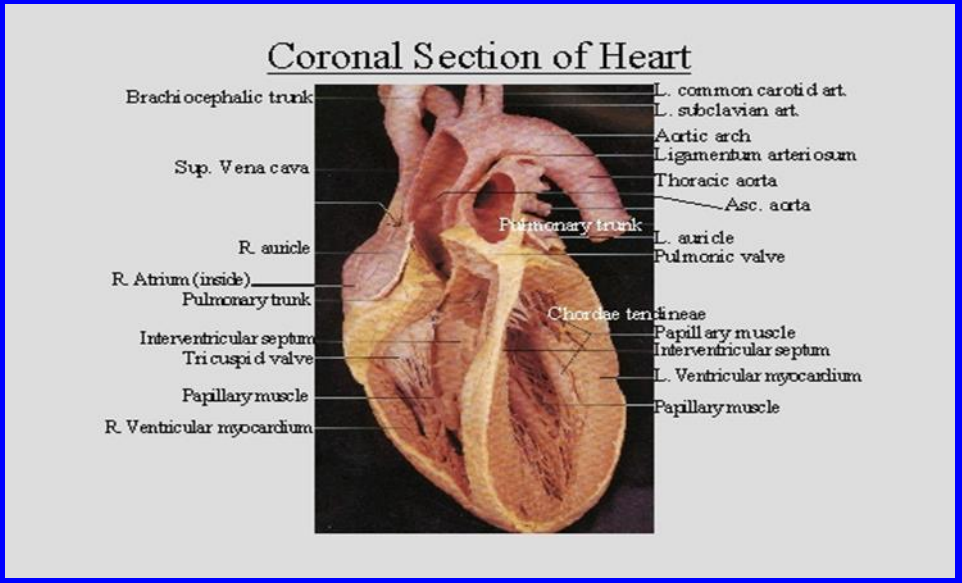
بسم الله الرحمن الرحيم

WALL OF THE HEART AND CARDIAC VALVES

WALL OF THE HEART AND CARDIAC VALVES

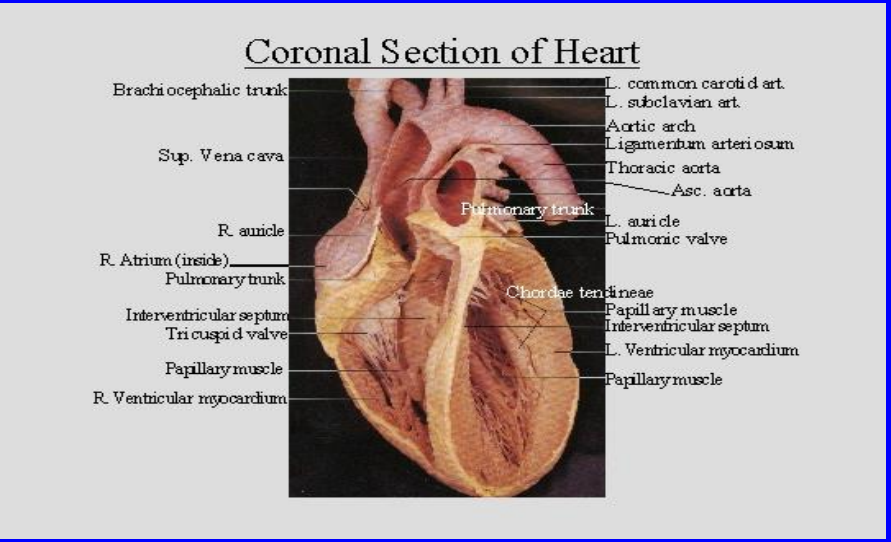
By the end of the lecture, the student should be able to describe the microscopic structure of:

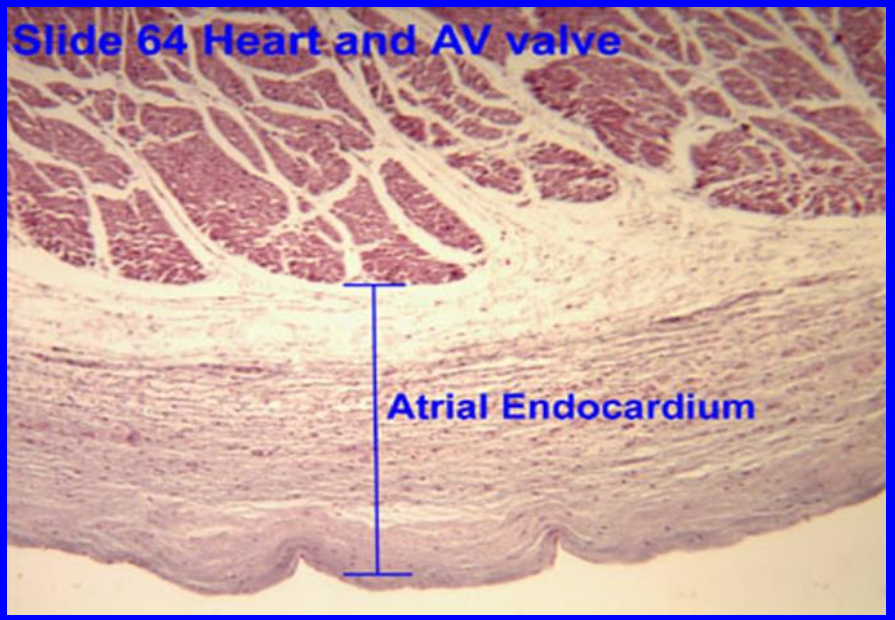
1. Wall of the heart:
   - Endocardium.
   - Myocardium.
   - Epicardium.
2. Cardiac valves.



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





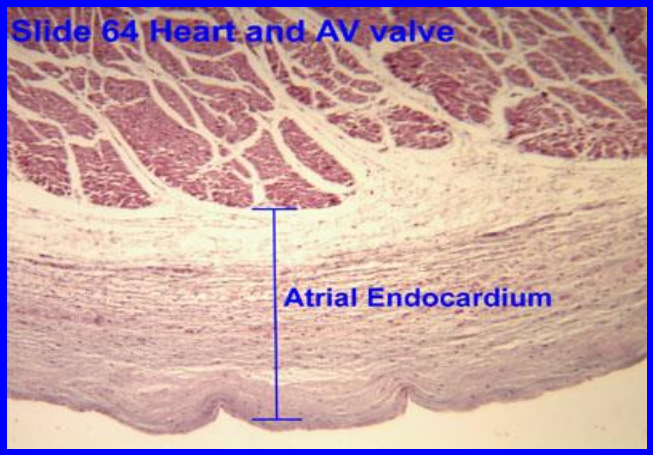
ENDOCARDIUM

1- Endothelium: simple squamous epithelium.

2- Subendothelial C.T. layer

3- Dense C.T. layer

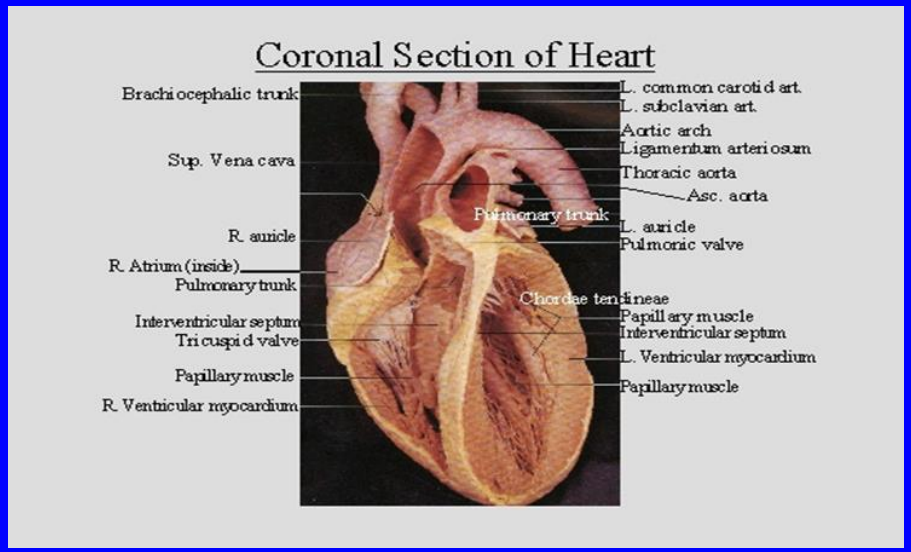
4- Subendocardial layer:

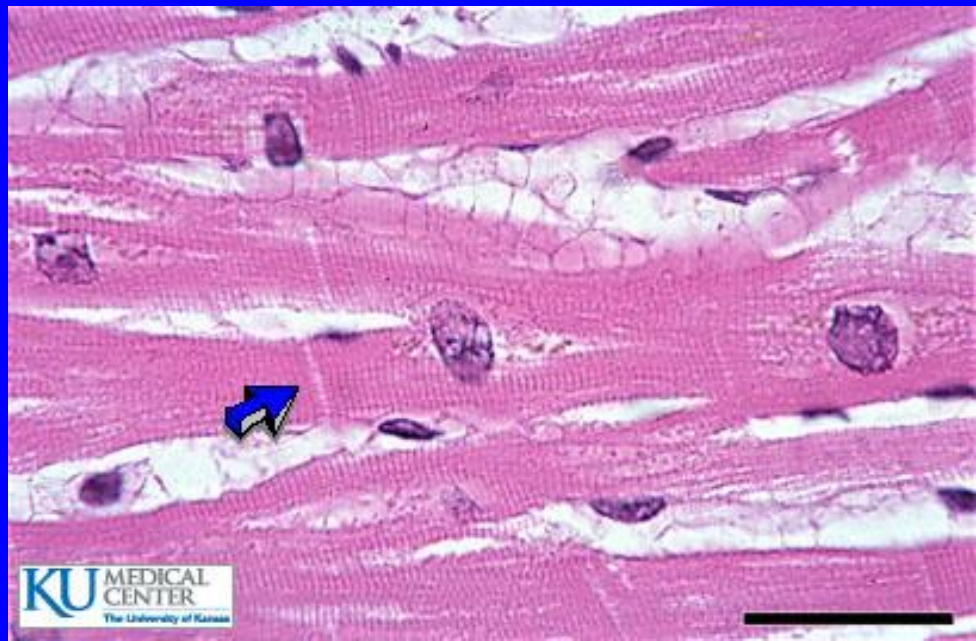


- Loose C.T. layer that contains **Purkinje fibers**, small blood vessels & nerves.
- It attaches to the endomysium of the cardiac muscle.

MYOCARDIUM

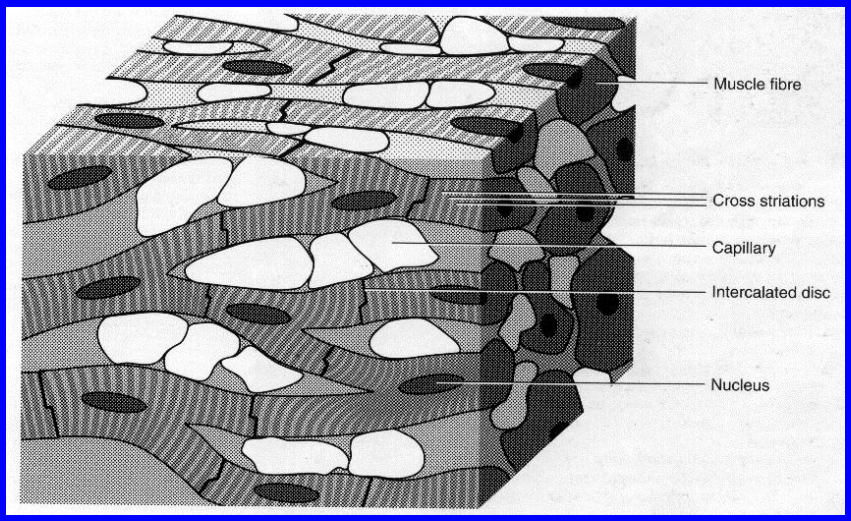
- It is the middle layer
- It is the most thick layer
- It contains cardiac muscle cells with endomysium (loose C.T.)

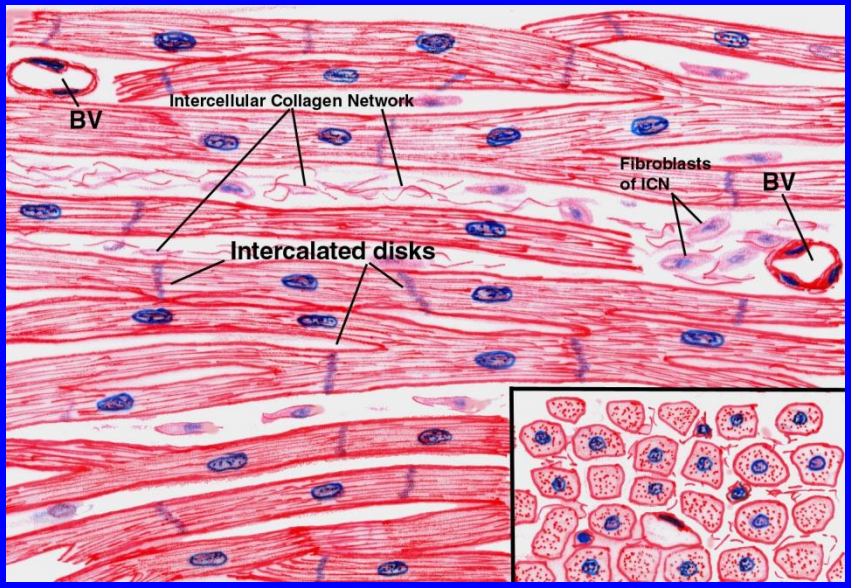




CARDIAC MUSCLE

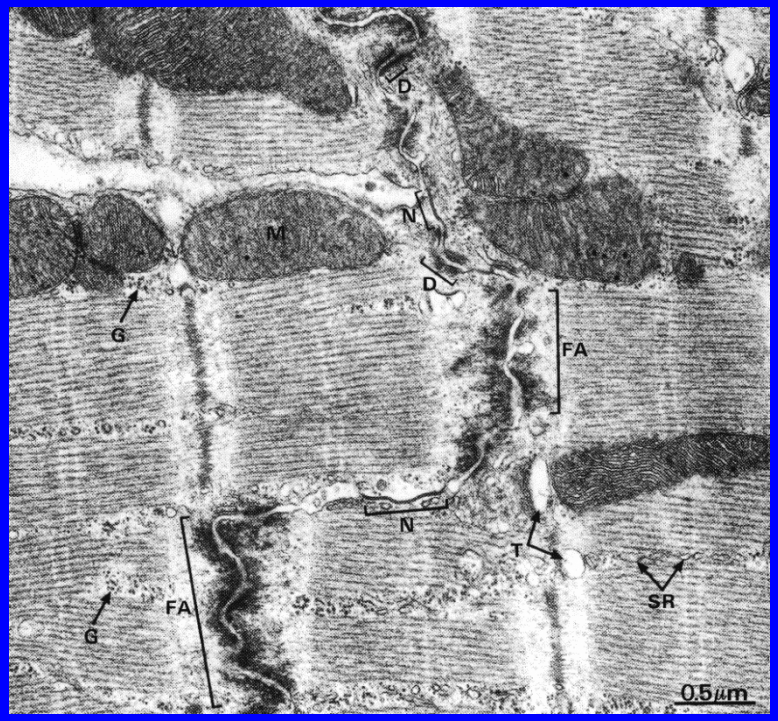
- Found in the myocardium.
- Striated and involuntary.
- **L.M. Picture of Cardiac Muscle Fibers:**
  - Cylindrical in shape.
  - Intermediate in diameter between skeletal and smooth muscle fibers.
  - Branch and anastomose.
  - Covered by a thin sarcolemma.
  - Mononucleated. Nuclei are oval and central.
  - 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).

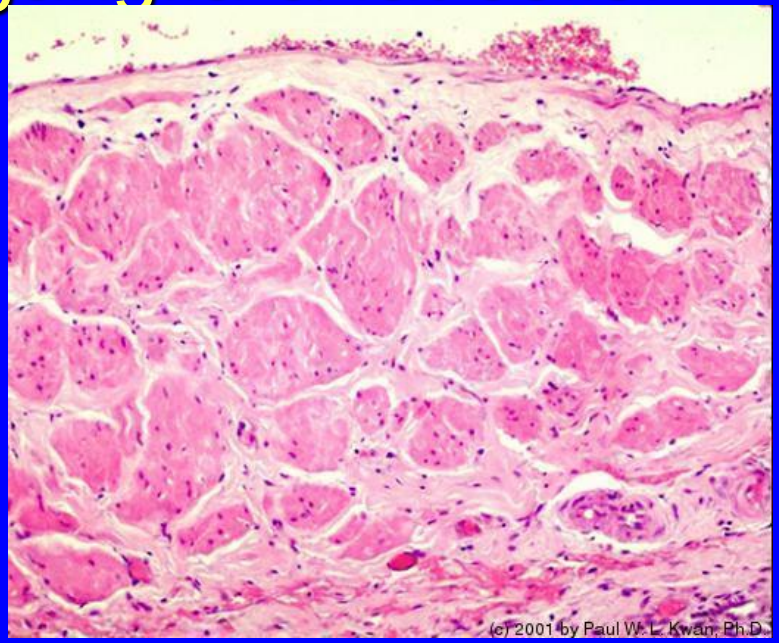


EPICARDIUM

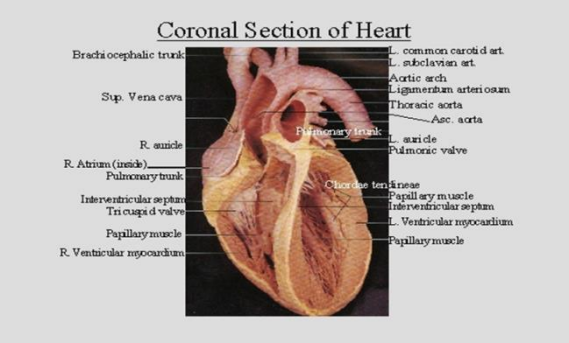
(Visceral layer of pericardium)

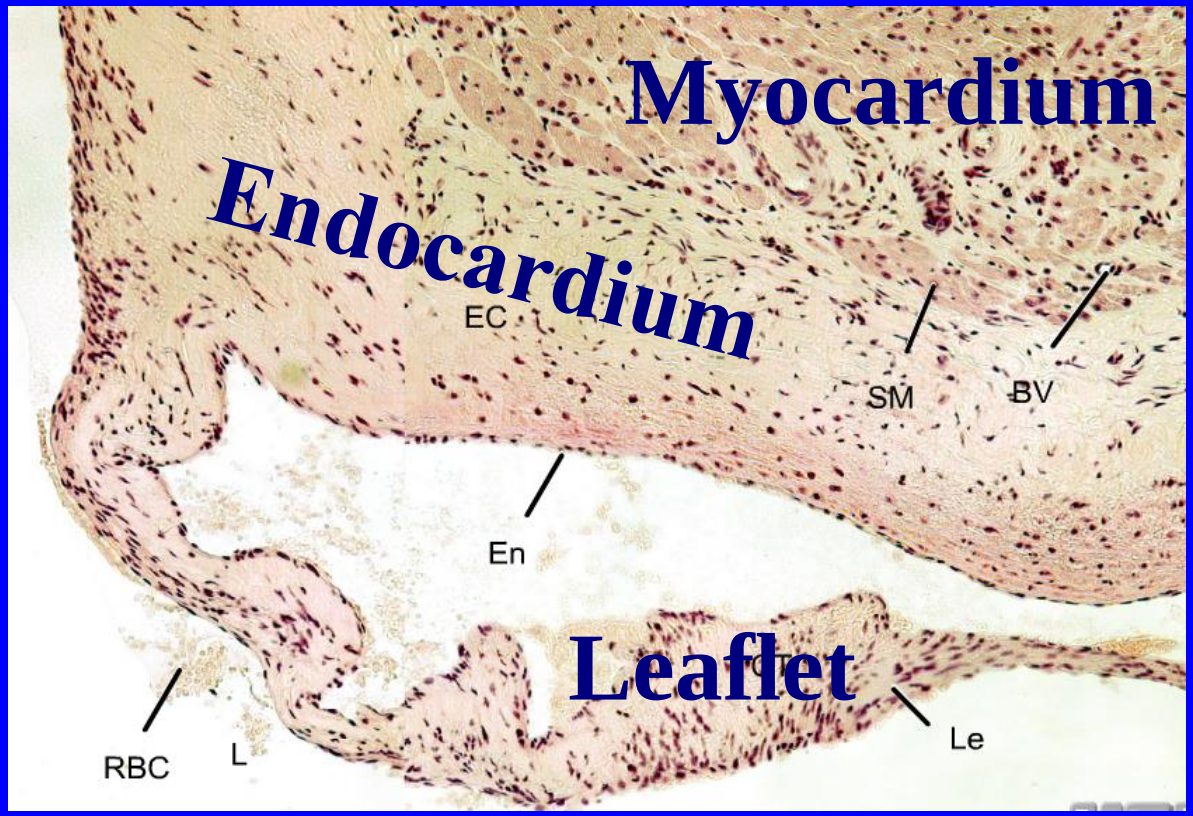
- **Mesothelium:** simple squamous epithelium.
- **Subepicardial C.T. layer:**

  Loose C.T. contains the coronary vessels, nerves, ganglia & fat cells.



LEAFLET (CUSP) OF HEART VALVE



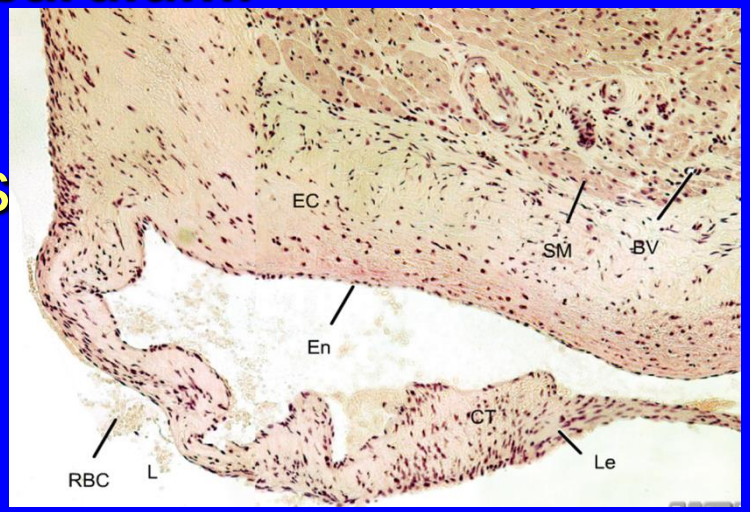


HEART VALVES (CARDIAC VALVES)

- 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