CIRCULATORY SYSTEM

- Fx =
  1. Transport system: Series organs designed to distribute materials to/from cells/tissues
  2. Protection: Circul's WBC's & Ab's (lymph)
  3. Thermoregulation: directs bl to/from body surface
     - bl less to surface in cold to prevent Δ loss
- Endothelium = lines entire CS; simple sq. epith. cells
  - Permeability barrier
  - Synthesizes extracell & memb. bound (localization) rec's & ligands
  - Regul's immunity/inflamm. → produces cytokines, IFNs...
  - Elab's anticoag., antithromb & prothromb. molec's
    → von Willibrand factor (marker/clot form.)
  - Modulates bl flow & vasc activity:
    → Vasoconst's (Endothelin) & vasodil's (NO_2)
  - Basement memb & ECM = collagen 2, 4, 5/fibronectin/laminin

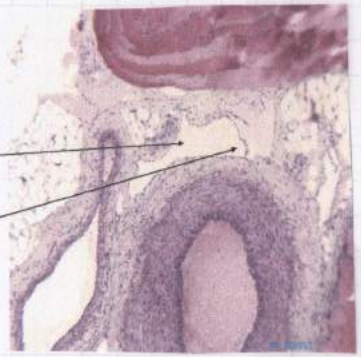
CARDIOVASCULAR

- Closed
- Arteries, Capillaries, Veins, ♥
- Continuous tissue w/Δing morphology (bc Δ fx)

- ♥, Pulm. Circuit, Systemic Circuit
- Blood = Exchange = 1° Fv
- A's/Vent's = pump away from ♥
- Vn's/Atrium = pump toward ♥

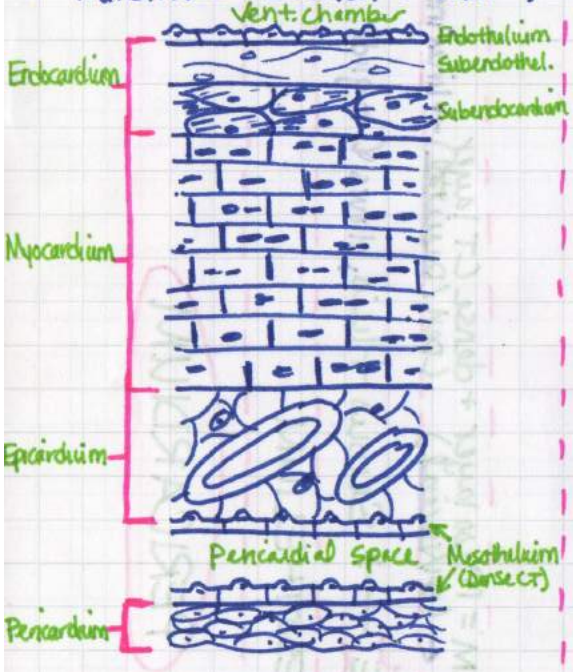
LYMPHATIC

- Deals w/ tissue fl.
- Unidirectional / discontinuous
- Capills, vessels, ducts
- Collects lymph & returns to CVS
- Removes excess tissue fl from interstitial space → blind sac
- Drains anatomical regions of body
- Lymph nodes = filter
- Valves
- Not in CNS, bone, cartil, placenta
- LM =
  - lg diameter
  - irregular / angular
- EM =
  - endothelium w/ no pores
  - no intercell. Jxs = lg molecs can enter
  - patchy / absent basal lamina
  - anchor filaments keep lumen open
- Wall of lymph vessel varies from endothel. cells in capill to thin wall w/ endothelium + elastin layer, sm. m, & collagen
- Most reabs into venous end of capill.
  - ~10% enters lymph capill.



WALL

- Transmural Section (thru vent. wall)

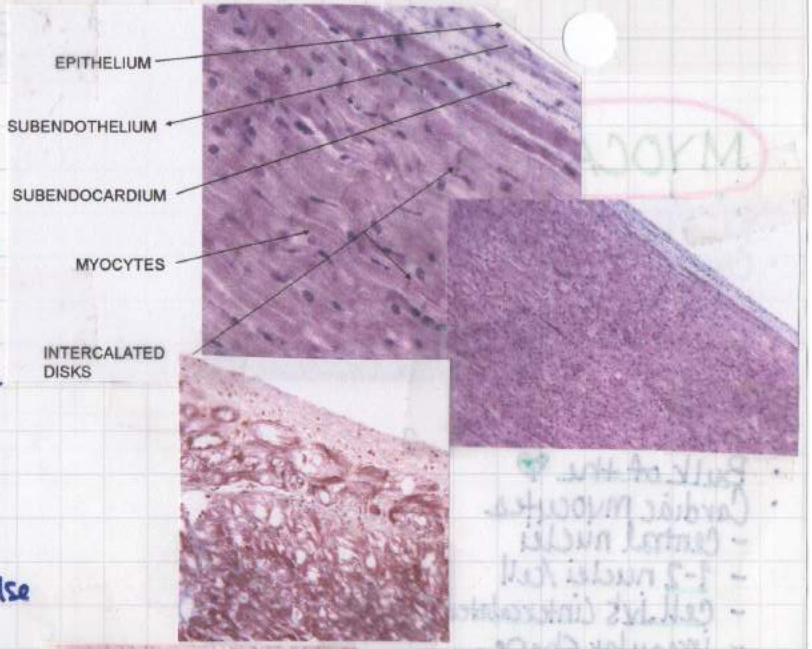


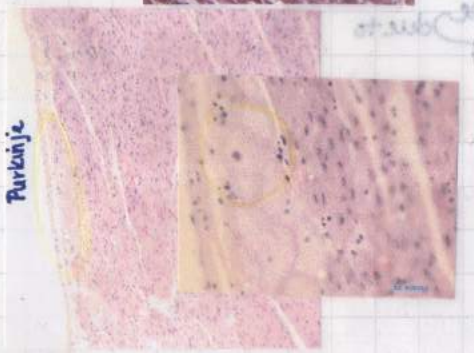
- Atria = thin walls for receiving bl.
- Lt Vent = Body Pump; thick for ↑ BP
- Rt Vent = Lung Pump; thin for ↓ BP

ENDOCARDIUM

(Borders lumen of ♡)

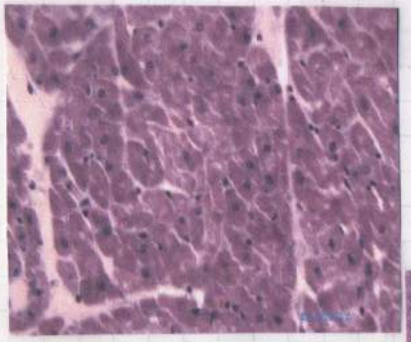
- Innermost; more prominent in atria
- Contains =
  1. endothelium
  2. Subendothelium → collagen, elastic fibers, fibroblasts, smooth m.
  3. Subendocardium → loose CT, B.V, nerves, Purkinje cells
- Purkinje cells = modified m. cells
  - conducting cells of ♡; spread impulse of contraction thru the ♡
  - lg/pale staining/central nuclei
  - make up Lt; Rt bundle br's
- Papillary m. = attaches to Chordae tendineae to leaflets of ♡
  - Can ID endothel cells on periphery; Purkinje on inside
- Semilunar valves = contain dense CT surrounded by endothel.
  - can ID from AV valve bc contain elastic a's

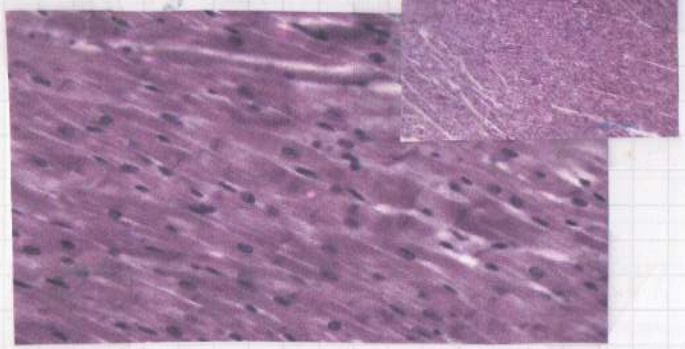




MYOCARDIUM

- Middle
- Contains =
  1. Myocytes (most)
  2. Capillaries (vascularized)
  3. Small nerves
- Thickness =
  LV > RV > Atria
- Bulk of the ♥
- Cardiac myocytes
  - Central nuclei
  - 1-2 nuclei / cell
  - cell jx's (intercalated disks)
  - irregular shape due to
  - branching





EPICARDIUM

- Outermost
- Contains =
  1. fat cells
  2. Coronary blood vessels
  3. nerves & ganglia
- Visceral pericardium covers epicardium

MESOTHELIUM = Meso layer + dense CT layer
lines ♡ surface ← (Lamina propria) (Peri / Pericardium) → lines inside of fibrous pericardium

PERICARDIAL SPACE → Serous fluid, allows ♡ to glide

MESOTHELIUM

PERICARDIUM