Insight
Coronary artery disease
(Build your own heart at http://www.fpnotebook.com/_media/CvHeartBlock.jpg

Cardiovascular System – Heart (Ch. 20)
Human Anatomy lecture

I. Overview of circulation  Fig 20.1
A. The heart is a double pump

- **pulmonary** circuit -- sends O₂ poor blood to lungs
- **systemic** circuit -- sends O₂ rich blood to tissues

Right heart
↓
Lungs

Left heart
↓
aorta
↓
body organs

B. The heart is located in the mediastinum  (Fig. 20.2)
- broad superior base
- pointed inferior apex
-- angled to left & 2/3 is left of median plane

II. Pericardium & heart wall -- Fig. 20.4
A. Structure - Triple layer bag (although your text says “double”)
   pericardium = pericardial sac + epicardium (visceral serous pericardium)
   ← = fibrous pericardium + parietal serous pericardium

-- insert sketch--
B. Heart wall itself has 3 layers, one of which is the inner layer of the pericardium -- from outer to inner:
   - epicardium (serous membrane: visceral pericardium)
   - myocardium (cardiac muscle)
   - endocardium = endothelium + c.t. \( \rightarrow \) reduces friction of blood flow

C. Function – Why a triple layer bag?
   1. reduces friction from the heart beating (as with all serous membranes)
   2. protects (isolates from pathogens)
   3. holds in position
   4. prevents overexpansion

III. Chambers and external anatomy

   Fig. 20.3 -- KNOW! “front & back; top to bottom” -- practice sketching

   - apex-
   - base-
   - coronary (atrioventricular) sulcus -- complete circle around base
   - coronary sinus -- in posterior coronary sulcus
   - anterior & posterior interventricular sulci

<table>
<thead>
<tr>
<th>R. atrium</th>
<th>R. ventricle</th>
<th>L. atrium</th>
<th>L. ventricle</th>
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<tbody>
<tr>
<td>auricle</td>
<td>pulmonary trunk</td>
<td>auricle</td>
<td>ascending aorta</td>
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<td>ligamentum arteriosum</td>
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<td>descending aorta</td>
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IV. Internal anatomy and path of blood flow: KNOW FIG. 20.7! & 20.10

   A. Right atrium
      1. pectinate muscles - anteriorly
      2. interatrial septum = “fence”
         - fossa ovalis - depression, remnant of fetal hole
      3. receives blood from
         - superior vena cava
         - inferior vena cava
         - coronary sinus
4. outflow through the tricuspid valve (right atrioventricular [AV])

↓

B. Right ventricle
1. trabeculae carnae
   “beams” “fleshy”
2. interventricular septum
3. tendinous chords (chordae tendineae) anchor the valve to the papillary muscles
4. Blood pumped out to pulmonary trunk, then L. & R. pulmonary arteries through pulmonary semilunar valve

↓

lungs

↓

C. Left atrium
1. same internally as the right
2. receives blood from
   - right pulmonary veins (2)
   - left pulmonary veins (2)
3. outflow through the left atrioventricular [AV] (or mitral) valve

↓

D. Left ventricle
1. thicker walls than the right
2. pumps blood out to the body through the aortic semilunar valve into the ascending aorta

E. Fibrous skeleton (Fig. 20.8)
   - dense c.t. rings around & between 4 valves
   - anchor valves & muscle bundles
   - electrically insulate atria from ventricles

V. Blood supply: coronary (cardiac) circulation
   Fig. 20.11, but will get details in lab

   L. & R. coronary arteries from base of ascending aorta
   ↓
   multiple anastomoses (collateral circulation)
   ↓
   capillaries
   ↓
   cardiac veins
   ↓
   coronary sinus
   ↓
   R. atrium
VI. **Conduction system**
- specialized, non-contractile cardiac muscle fibers that form pacemaker and rapid conduction fibers throughout the heart
- insure proper timing and sequence of contraction

SKETCHES

V.

![Sketch of the heart's conduction system](image-url)