A capsule of fat surrounds the heart and helps isolate it from the rest of the body. There are several epicardial blood vessels that supply and drain the heart, including the left and right coronary arteries.

The heart has two sides, called the right heart and the left heart, and it has four chambers, called the right atrium, the right ventricle, the left atrium, and the left ventricle.

- Apex of the heart:
  - Formed from anteriolateral part of the left ventricle
  - Lies posterior to left 5th intercostals space in adults
  - Motionless throughout cardiac cycle
  - Sounds of mitral valve closure are maximal (apex beat)

- Base of heart:
  - Posterior aspect; opposite the apex
  - Formed mainly from left atrium, a bit of right atrium
Faces posteriorly towards vertebrae T6-T9, separated from them by pericardium, oblique pericardial sinus, oesophagus, and aorta.

Extends superiorly to bifurcation of pulmonary trunk and inferiorly to the coronary sulcus.

Receives pulmonary vein on right and left sides of left atrial portion, superior and inferior vena cavae at the superior and inferior ends of its right atrial portion.

- Four surfaces of the heart
  - Anterior (sternocostal), formed by right ventricle
  - Diaphragmatic (inferior), mainly left ventricle and bit of right ventricle
  - Right pulmonary, mainly right atrium
  - Left pulmonary, mainly left ventricle; forms cardiac impression in left lung

- Four borders of the heart
  - Right border (slightly convex); right atrium, extends between superior vena cava and inferior vena cava
  - Inferior border (almost horizontal); formed mainly by right ventricle, slightly by left ventricle
  - Left border (oblique, nearly vertical); mainly left ventricle, bit of right ventricle
  - Superior border; right and left atria and auricles in anterior view

- Pulmonary trunk: arterial continuation of the right ventricle and divides into right and left pulmonary arteries
  - Low oxygen blood delivered to lungs for oxygenation

Taken from Studyblue.com, (13) CVS Heart at University of Michigan Ann Arbor, available at https://www.studyblue.com/notes/note/n/-13-cvs-heart/deck/9917613
Right ventricle

- Forms largest part of **anterior surface**, small part of diaphragmatic surface and entire inferior border
- **Right atrioventricular orifice (tricuspid)**: where blood enters from atria
  - Surrounded by fibrous rings of the fibrous skeleton
  - Fibrous rings keep constant calibre of the orifices, resist dilation
- **Tricuspid valve** guards right atrioventricular orifice,
  - Bases of valve cusps are attached to the **fibrous ring** around the orifice
  - 3 cusps – anterior, posterior and septal
- **Tendinous cords** attach to the free edges and ventricular surfaces of the anterior, posterior and septal cusps; arise from apices of papillary muscles
- **Papillary muscles**: conical muscular projections with bases attached to the ventricular wall
  - **Anterior papillary** muscle – largest and most prominent, arises from anterior wall, attach to anterior and posterior cusps of tricuspid valve
  - **Posterior papillary** muscle – can consist of several parts; arises from inferior wall, tendinous cords attach to posterior and septal cusps of the tricuspid valve
  - **Septal papillary** muscle – arises from intraventricular septum, tendinous cords attach to anterior and septal cusps of the tricuspid valve
    - Sometimes absent
- **Cordae tendinae and papillary muscles** prevent eversion of tricuspid valves when ventricle contracts; no backflow of blood
- **Trabeculae carneae**: muscular elevations interior; can be fixed along length, or bridge formation; found in inflow tract
- **Conus arteriosus/infundibulum**: tapering of right ventricle into arterial cone; outflow tract
- **Supraventricular crest**: thick muscular ridge separating the ridged muscular wall of the inflow part of the chamber from the conus arteriosus
- **Interventricular septum**: strong partition between right and left ventricles, composed of muscular and membranous parts
  - **Upper posterior part** is thin and fibrous
  - **Bottom half** is thick muscle
- **Septomarginal trabecula (moderator band)**: curved muscular bundle that traverses the right ventricular chamber from the inferior part of the interventricular septum to the base of the anterior papillary muscle
  - Carries the right branch of the **AV bundle**
- **Supraventricular crest**: deflects incoming blood flow from atria into the ventricle and outgoing flow into the conus arteriosus toward the pulmonary orifice
- **Pulmonary valve**: at apex of conus arteriosus; entry to pulmonary trunk
  - Edges project into lumen of pulmonary trunk
  - Three – **left right and anterior**; pockets known as **pulmonary sinuses**
  - Lunule: thickened edge of each cusp where they contact each other
Medical application

Septal defects
- Atrial septal defects
- Ventricular septal defects

Stroke/cerebrovascular accident
- Thrombi form on walls of right atrium in certain types of heart disease
- If the thrombi detach or pieces break off, they can pass into systemic circulation and occlude arteries
- Occlusion of artery supplying the brain results in stroke/cerebrovascular accident
  - Can affect vision, cognition, motor function

Valvular heart disease
- Congenital or acquired
- Stenosis (narrowing) or insufficiency of valves
- Stenosis: failure to open fully, slow blood exit from the chamber
  - Insufficiency/regurgitation is failure to close completely
    - Nodule formation or scarring of cusps; edges don’t meet
    - Some blood flows back into chamber; increased workload for the heart
- Both result in turbulence of blood flow, which can be heard as murmurs
  - Mitral valve insufficiency (mitral valve prolapsed)
  - Pulmonary valve stenosis
  - Pulmonary valve incompetence
  - Aortic valve stenosis
  - Aortic valve insufficiency

Coronary artery disease
- Many causes, all result in reduced blood supply to myocardial tissue
- Myocardial infarction – occlusion of major artery by an embolus
- Coronary atherosclerosis – lipid deposits in intima
- Slowly progressive coronary artery disease
  - Slow occlusion