Heart is wrapped in pericardium located in the mediastinum, between the two lungs.

Within the mediastinum are two compartments:

- Superior mediastinum (above heart): Aorta, Vena Cava, oesophagus, trachea
- Inferior mediastinum:
  - Anterior mediastinum: Thymus
  - Medial mediastinum: Heart encapsulated in pericardium
  - Posterior mediastinum: Oesophagus, azygous vein, thoracic duct,

- Pericardium
  - Fibrous pericardium encapsulating the heart
  - Heart lined by serous pericardium - parietal and visceral pericardium, with serum in pericardial space in between.
  - Inferior surface of pericardium is fused with the central tendon of the diaphragm.
  - Under which is the myocardium
  - Then endocardium

- Heart structure
  - The atrium wall derive from two origins: the embryonic atrium and the fused sinus venosus. Emrbyonic atrium have rough surfaces made of pectinate muscles while sinus venosus is smooth, border marked by crista terminalis.
  - Ventricle wall have trabeculae carnae, provide contractile forces. Papillary muscle and chordae tendonae holds the cusps of atrioventribular valve in place. Moderator band (enlarged trabeculae carnae) transmit signal to papillary muscle to contract before systole.
  - Fibrous skeleton annulus fibrosus insulate atrium from ventricles, provide structural support. Derived from the invading epicardial and endocardial cells.
  - L/R Coronary artery branch from the Aorta
    - L circumflex branch: around L atrium
    - L marginal branch from circumflex branch: along the left marginal border
    - L anterior interventricular branch: between two ventricles
    - R sinuatrial nodal branch: around the R atrium to the posterior side
    - R marginal branch: along the right marginal border.
    - R Posterior interventricular branch: from marginal branch, down the posterior side, between ventricles
  - Cardiac veins: drains into the coronary sinus, drains into the right atrium

- Nerve supply to the heart: moderation of heart rate
  - Phrenic nerve runs along the pericardium besides L/R atrium and ventricles.
  - Vagus nerve runs anterior to the aortic arch.
  - Superficial and deep cardiac plexus
    - Superficial plexus located on aortic arch between vagus and phrenic nerve
    - Deep plexus located near ligamentum arteriosum, inferior+medial to aortic arch
  - Sympathetic nervous system postganglionic neuron innervates SA node, originate from cervical ganglionic chain
  - Parasympathetic nervous system preganglionic neuron branching from cervical vagus nerve synapse in cardiac plexus, postsynaptic neurons innervate SA and AV nodes.

- Heart conducting system
  - Pacemaker: SA node located on the R atrium close to superior vena cava (modulated by SYM and PARA), induce

atrial systole

- Current insulated by the fibrous layer between atrium and ventricles.
- Current relayed by the AV node close to coronary sinus opening in R atrium.
- Current spread down bundle of his to the apex, then spread upwards induce ventricular systole.
- Before spreading up, signal relay via modulator band to induce papillary muscle contraction.

Vertebral artery: branch from subclavian artery, into the vertebral column, travel via foramina tranversaria, into the skull via foramen magnum, form anastomosis with internal carotid artery

Mediastinum structure

Pericardium layer

Heart structure, atrium and ventricles

Cardiac circulation

Heart nerve supplies, influences

Heart conduction