5 layers of the thoracic wall

- Skin
- Superficial fascia (surface fat)
    - Glandular tissue of the chest is within superficial fascia.
- Muscles (Serratus, Pectoralis major, Latissimus dorsi)
    - Serratus anterior (rib - medial scapula), connect scapula to ribs, lift the rib
    - Pectoralis major (sternum - humerus), connect upper arm to sternum
    - Latissimus dorsi (vertebrae - humerus), connect arm to the spine
    - Scalenes (cervical spine to first rib), elevates the first rib
    - Sternocleidomastoid muscle (manubrium - clavicle - temporal/occipital), lift the chest wall when breathing.
- Ribs and intercostal muscle
- Parietal and Visceral pleura

Breasts: 50% glandular tissue in non-lactating women 67% in lactating women

Cooper's ligament provides structural suppport.

Drained by lymph vessels, to auxillary nodes, other breasts and deep thoracic nodes.

Thoracic cage

- Clavicles
- 12 pairs of ribs
    - 1-7 true ribs joined by synovial joints separately to the sternum
    - 8-10 are false ribs joined to the sternum via a shared cartilage tissue with 7th rib
    - 11&12 are free-floating ribs without attaching to the sternum
- Sternum (Manubrium, body and xyphoid) body and xyphoid joined by cartilogenious joint, allow flexion during inspiration.

Between ribs are intercostal muscles:

- External intercostal: Lateral to medial from top to bottom, become membranous anteriorly
- Internal intercostal: medial to lateral from top to bottom, become membreanous posteriorly
- Innermost intercostal, connect between ribs, not a continuous layer

Below each rib is the VAN (vein, artery, nerves): Runs between inner intercostal & innermost intercostal

- Veins join the azygous vein right of the descending aorta, which goes up to join the superior vena cava.
    - Hemiazygous vein left of the descending aorta, joins the azygous vein at T8 level
- Intercostal artery branch from aorta, branch into posterior (back&side) and anterior(inner wall & organs), form anastomosis with anterior thoracic arteries branchin from subclavian artery.
- Nerves: spinal nerve form posterior and anterior rami, innervate back / side, front, parietal pleura

Diaphragm:

- Phrenic nerve: enter thorax originate from C3-C5, down the thorax in front the hilum (root of branching)
    - Run besides the pericardium, sensory innervation to the heart
    - Motor innervation to all of the diaphragm, sensory innervation to central part
    - Peripheral diaphragm sensory innervated by intercostal nerves.

Diaphragm structure: Dome shaped skeletal muscle

- Central tendon
- Muscular crura from lumbar segment
- Posterior lower edge joins to arcuate ligament
- Costal slip joins laterally to the ribs
- Sternal slip joins anteriorly to the sternum

Openings in the diaphragm:

- T8 central tendon: Inferior Vena Cava, right phrenic nerve
- T10 diaphragmatic crura: oesophagus, vagus nerves
- T12 between lumbar crura: Aorta, azygous vein, thoracic duct.
- Diaphragmatic crura seprately innervted, relax when vomiting or swallowing, innervated by a separate phrenic nerve.
  - Stomach push through diaphragmatic crura - Hiatus Hernia
  - Intestines push through diaphragmatic crura during development - fetal diaphragmatic hernia

Diaphragm development:

- Septum transversum between heart and liver - fibrous tissue form central tendon (Ventral)
- Pleuroperitoneal fold (pleura in thorax, peritoneum in abdomen) close in joins the septum transversum (lateral)
- oesophageal mesentery joins dorsally
- Myotome from cervical somites migrate down to septum transversum and pleuroperitoneal fold, brings phrenic nerve with it.

5 layers of thorax

5 important muscles

Breast

Thoracic cage top to bottom

Intercostal bundle

Diaphragm, structure, innervation, supply

Diaphragm opening

Diaphragm development