

Give an account of the diaphragm

Pass 40-50%

Good 50 -70%

Introduction The diaphragm is a deeply convex domed muscle sheet and is the major muscle of respiration

Occludes the thoracic outlet
Is particularly important during quiet breathing.

Structure Muscle fibres arise from 4 discrete locations
anterior fibres - xiphisternum
lateral fibres - costal margin and lower 6 ribs
posterior fibres - lumbar vertebrae and lower free ribs via crus

The posterior fibres are longest and are constituted by two pillars of muscle or crus. Right is longer than left (L1-3 cf L1-2).
Arcuate ligaments
- median arches over aorta
- medial from a condensation on psoas (transverse process of L1 to crus)
- lateral from a condensation on quadratus (transverse process of L1 and rib 12)

	All fibres attach to the tri-lobed central tendon which lies inferior to the heart	Serves to stabilise the heart during respiratory movements
<i>Apertures</i>	Aorta at T12 Oesophagus at T10 Inferior vena cava at T8	Passes <u>posterior</u> to median arcuate lig. Passes <u>through</u> hiatus Passes <u>through</u> central tendon
<i>Innervation</i>	Each hemidiaphragm receives motor supply from a phrenic nerve (C3-5)	Sensory fibres travel in the phrenic and lower intercostal nerves.
<i>Blood supply</i>		Pericardiophrenic and musculophrenic branches of the internal thoracic artery. Also the lower posterior intercostal, superior and inferior phrenic arteries
<i>Relations</i>	Heart and lungs lie superior, medially and laterally Liver and stomach lie inferiorly, right and left	Parietal pleura lies on the superior surface laterally, fibrous pericardium medially. Inferiorly the surface is covered by parietal peritoneum, except for a bare area mainly on the right side.

Action

During breathing, activity in the phrenic nerves leads to flattening of the muscle sheet and a decrease in intrathoracic pressure.

Opening of the costodiaphragmatic recesses as the diaphragm flattens, is a major initiator of inspiration.

Clinical

Paralysed hemidiaphragm is permanently domed on the side of nerve injury.

Spinal fracture above C3 leads to paraplegia, and necessitates mechanical ventilation.