ABDOMINAL OESOPHAGUS, STOMACH

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Transpyloric plane

- An upper transverse line
- = Addison's Plane
- located halfway between the jugular notch and the upper border of the pubic symphysis
- It is also said to lie roughly a hand's breadth beneath the xiphoid process of the human sternum.
- (9th costal cartilages and the lower border of the L1)
**Structures crossed**

- the fundus of the gallbladder
- the origin of the superior mesenteric artery
- (termination of the superior mesenteric vein)
- hilum of the kidney
- the root of the transverse mesocolon
- duodenojejunal flexure
intertubercular plane (or transtubercular)

- lower transverse line
- midway between the upper transverse and the upper border of the pubic symphysis
- passing through the iliac tubercles
- L5
subcostal plane

- is a transverse plane
- which bisects the body at the level of the costal margin
- L3
• interspinous line
• Transumbilical line (L3- L4)
Deep surface of the anterior abdominal wall

- 3 ligament & peritoneal fold
- 3 peritoneal fossae
median umbilical ligament

- Remnant of the embryonic urachus.
- It extends from the apex of the bladder to the umbilicus.
- It is covered by the median umbilical fold.
medial umbilical ligament

- = cord of umbilical artery
- is a paired structure
- is covered by the **medial umbilical folds**
- It represents the remnant of the fetal umbilical arteries
- used as a landmark for surgeons exploring the **medial inguinal fossa** during laparoscopic inguinal hernia repair.
lateral umbilical fold

- overlies the inferior epigastric artery (a branch of the external iliac artery)
- remain functional after birth
- It originates just medial to the deep inguinal ring
• The lateral umbilical fold is an important reference site with regards to hernia classification.

• A direct hernia occurs medial to the lateral umbilical fold, whereas an indirect hernia originates lateral to the fold.
Supravesical fossae

- The **supravesical fossa** is a fossa bounded by the medial umbilical fold and median umbilical fold.
Medial inguinal fossae

- a fossa bounded by the median umbilical fold and lateral umbilical fold.
Lateral inguinal fossae

- **Inferior epigastric artery**
- **Umbilical artery (remnant)**
- **Urachus (remnant)**

External and internal inguinal rings

- a) lateral fossa
- b) medial fossa
- c) supravesical fossa

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Abdominal esophagus

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ANATOMY OF OESOPHAGUS

- Muscular tube of 25cm length
- Connects the pharynx to the stomach
- Flattened anterioposterioly
- Begins in the neck at lower border of cricoid cartilage (C6 vertebra)
- Pierces the diaphragm at T10
- Opens into the stomach at T11
CONSTRICTIONS OF THE OESOPHAGUS

• There are 4 constrictions

1) *At the beginning – pharyngeal oesophageal junction
2) Where it is crossed by the aortic arch
3) Where it is crossed by the left bronchus
4) Where it pierces the diaphragm
BLOOD SUPPLY

Arterial Supply
- Inferior thyroid artery
- Oesophageal branches of aorta
- Oesophageal branches of the left gastric artery

Venous drainage
- Upper part drains into brachiocephalic vein
- Middle part drains into azygous vein
- Lower part drains into the left gastric vein
LYMPHATIC DRAINAGE

- Cervical part drains into the deep cervical lymph nodes
- Posterior part into the posterior mediastinal lymph nodes
- Abdominal part into the left gastric nodes
NERVE SUPPLY

- Upper half is supplied by the recurrent laryngeal nerve
- Lower part by the oesophageal plexus but mainly by the vagus nerve
OESOPHAGUS - DIVISIONS

1. **Cervical part** – ends at the lower border of T1

2. **Thoracic part** – ends at T10 (where it pierces the diaphragm along with vagus nerve and oesophageal branches of the left gastric artery)

3. **Abdominal part** – ends at the cardiac end of the stomach
PHYSIOLOGY

- Upper oesophageal sphincter - (UOS)
- Lower oesophageal sphincter - physiological (LOS)
- LOS prevents gastric reflux
ACHALASIA

- Primarily a disorder of motility of the lower oesophageal (cardiac) sphincter.
- The smooth muscle layer of the oesophagus has impaired peristalsis and failure of the sphincter to relax causes functional stenosis or functional oesophageal stricture.
- Most cases – ideopathic but a small proportion of cases occur secondarily to other conditions e.g. oesophageal cancer.
HIATUS HERNIA

- **A hiatus hernia:** is when part of the stomach protrudes through the diaphragm.

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STOMACH
The stomach is a “J” shaped hollow, muscular organ suspended under the diaphragm.

The upper larger portion of the stomach or Fundus is situated in the upper left quadrant of the abdomen and entrance to the stomach is gained through the esophagus through the Gastroesophageal Juncture (GE juncture or sometimes called the cardiac sphincter).
The major portions of the stomach include: fundus (upper), body (middle), and antrum (lower).
The Stomach

- Cardiac Sphincter
- Fundus
- Gastroesophageal Opening
- Body
- Pyloric Sphincter
- Pylorus
- Duodenum
- Rugae
- Submucosa

from Thibodeau
VESSELS AND NERVES

Blood is supplied to the stomach via the gastric, pyloric and branches of the splenic arteries.

left side → gastric vein
right side → splenic vein and superior mesenteric vein.

The stomach is innervated by both sympathetic fibers of the celiac plexus and parasympathetic fibers of the gastric branch of the vagus nerve.
Blood supply

- The celiac artery, also known as the celiac trunk, is the first major branch of the abdominal aorta.
- It is 1.25 cm in length
- Branching from the aorta anterior to the upper border of L1 vertebra
- It is one of three anterior/midline branches of the abdominal aorta (the others are the superior and inferior mesenteric arteries).
Region supplied

- The celiac artery supplies oxygenated blood to the liver, stomach, abdominal esophagus, spleen and the superior half of both the duodenum and the pancreas.
- These structures correspond to the embryonic foregut. (Similarly, the superior mesenteric artery and inferior mesenteric artery feed structures arising from the embryonic midgut and hindgut respectively.
- Obstruction of the celiac artery will lead to necrosis of the structures it supplies.
## Branches

<table>
<thead>
<tr>
<th>Artery</th>
<th>Branches</th>
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</thead>
<tbody>
<tr>
<td>left gastric artery</td>
<td>esophageal branch, hepatic branch</td>
</tr>
<tr>
<td>common hepatic artery</td>
<td>proper hepatic artery, right gastric artery, gastroduodenal artery</td>
</tr>
<tr>
<td>splenic artery</td>
<td>dorsal pancreatic artery, short gastric arteries, left gastro-omental artery</td>
</tr>
</tbody>
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Suprardeodenal artery = gastroepiploic
vein drainage of stomach

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lymphatic drainage of stomach
GASTRIC INNERVATION

- The gastric sympathetic innervation is derived from preganglionic fibers arising predominantly from T6 to T8 spinal nerves, which synapse within the bilateral celiac ganglia to neurons whose postganglionic fibers course through the celiac plexus along the vascular supply of the stomach. Accompanying these sympathetic nerves are afferent pain-transmitting fibers from the stomach and motor fibers to the pyloric sphincter.

- The parasympathetic innervation is via the right and left vagus nerves, which form the distal esophageal plexus, and gives rise to the posterior and anterior vagal trunks near the gastric cardia.

- The trunks contain preganglionic parasympathetic fibers, as well as afferent fibers from the viscera. Both trunks give rise to celiac and hepatic branches before continuing on …