Digestive tract

Abdominal viscera and digestive tract

- Abdominal viscera comprise majority of the alimentary system
  - Terminal oesophagus, stomach, pancreas, spleen, liver, gallbladder, kidneys, suprarenal glands
- Liver, stomach and spleen almost fill the domes of the diaphragm, and receive some protection from the lower thoracic cage
- Falciform ligament divides liver into right and left lobes
- Greater omentum conceals most of the small intestine
- Gallbladder projects inferior of the sharp border of the liver
- Food passes from the mouth and pharynx, to the oesophagus and stomach, where it mixes with gastric secretions
- Digestion mostly occurs in the stomach and duodenum
- Peristalsis begins in the middle of the stomach and moves toward the pylorus; mixes masticated food with digestive juices and empties into duodenum
- Absorption occurs in the small intestine, which comprises the duodenum, jejunum, and ilium
- Stomach is continuous with the duodenum. It also receives openings of ducts from the pancreas and liver
- Peristalsis occurs in jejunum and ilium
- Large intestine comprises
  - Cecum: receives terminal part of ilium
  - Appendix
  - Colon (ascending, transverse, descending and sigmoid)
  - Rectum
  - Anal canal
- Most reabsorption of water occurs in the ascending colon
- Faeces form in the descending and sigmoid colon and accumulate in the rectum before defecation
- GI tract comprises the oesophagus, stomach, small and large intestines
- Arterial supply from the abdominal aorta
  - Major branches are coeliac trunk and superior and inferior mesenteric arteries
- Superior mesenteric and splenic veins unite to form the hepatic portal vein (main channel of the portal venous system)
  - Drains from abdominal alimentary tract, pancreas, spleen and most of the gallbladder, and carries to the liver
Relations of the stomach

- Covered by visceral peritoneum
- Two layers of the lesser omentum extend around the stomach and leave the greater surface as the greater omentum
- Anterior relation to the diaphragm, left lobe of liver, anterior abdominal wall
- Posterior relation to the omental bursa and the pancreas
- Inferolateral relation to the transverse colon
Nerve supply

- Parasympathetic supply from the anterior (left vagus) and posterior (right vagus) vagal trunks and their branches; enter abdomen via oesophageal hiatus
- Sympathetic nerve supply from T6-9 passes to the coeliac plexus via greater splanchnic nerve

Small intestine

- Comprises duodenum, jejunum, and ilium
- Primary site for nutrient absorption
- Extends from pylorus to the ileocecal junction (joins the cecum)

Duodenum

- First, shortest, widest and most fixed part
- C-shaped course around the head of the pancreas
- Begins at pylorus and ends at the duodenojejunal flexure (L2 level)
  - Flexure/junction is an acute angle
- Most of the duodenum is fixed by peritoneum to structures on the posterior abdominal wall; considered partially retroperitoneal
- 4 parts of the duodenum
  - Superior/first part: short, anterolateral to L1 body
  - Descending/second part: longer, descends along right side L1-L3
  - Inferior/third part: medium, crosses L3
  - Ascending/fourth part: short, begins left of L3 and rises to superior border of L2
- The ampulla is the first 2cm of the superior part of the duodenum; has a mesentery and is mobile; remainder of duodenum has no mesentery and is immobile (retroperitoneal)

Superior part

- Ascends from pylorus
- Overlapped by liver and gallbladder
- Covered by peritoneum on anterior surface and posterior ampulla
- Hepatoduodenal ligament attaches superiorly and greater omentum inferiorly
- Relationships
  - Level: anterolateral to L1
  - Anterior: peritoneum, gallbladder, liver
  - Posterior: bile duct, gastroduodenal artery, hepatic portal vein, IVC
Rectum and anal canal

Rectum

- Rectum is the pelvic part of the digestive tract, continuous proximally with the sigmoid colon and distally with the anal canal.
- Rectosigmoid junction is at L3 level.
- Teniae coli spread to form continuous longitudinal layer of smooth muscle, and omenta l appendices are discontinued.
- Follows the curve of the sacrum and coccyx, forming the sacral flexure.
- Ends anteriorly to the tip of the coccyx, prior to the anorectal junction; the anal canal (occurs as gut perforates pelvic diaphragm).
- 80° anorectal flexure is important for continence; maintained during resting state by tone of the puborectalis muscle.
- Three sharp lateral flexures – superior, inferior and intermediate, formed in relation to three internal infoldings (transverse rectal folds), which overlie thickened muscle of the rectal wall.
- Ampulla of the rectum is the dilated terminal part; supported by levator ani and the anococcygeal ligament.
  - Holds accumulating faecal mass until defaecation; relaxes to accommodate increasing amounts.
- Peritoneum coverage:
  - Superior 1/3: anterior and lateral covered.
  - Middle 1/3: anterior only.
  - Inferior 1/3: no coverage (subperitoneal).
- In both sexes, lateral reflection of peritoneum from the superior 1/3 of the rectum form pararectal fossae, allowing distension as it fills.
- Also recto-uterine pouch in females and recto-vesical pouch in males.