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 ANA 204 ASSIGNMENT

**MICROANATOMY OF THE SMALL INTESTINE.**

The small intestine is the longest part of the digestive system. It extends from the stomach (pylorus) to the large intestine and it consist of three parts: Duodenum, jejunum and ileum.

 1. DUODENUM :It is the first section of the small intestine and it is the shortest part the small intestine. **Segments**:

* The superior part lies intraperitoneally and is enlarged proximally (duodenal bulb). It is connected to the liver by the hepatoduodenal ligament. The superior part ends at the superior duodenal flexure.
* The descending part and the rest of the duodenum lie retroperitoneally.
* The horizontal part runs from right to left ventrally from the abdominal aorta and inferior vena cava.
* The ascending part runs cranially along the left side of the vertebral column. This last part of the duodenum joins the intraperitoneally lying jejunum at the duodenojejunal flexure. **Layers**:
* Mucosa( lamina epithelialis, lamina propria, lamina muscularis)
* Submucosa
* Muscularis( inner circular and outer longitudinal).

 **Functions**:

* neutralization of the acidic gastric juice through production of alkaline secrets
* mechanical processing and digestion of chyme
* mixing bile and pancreatic enzymes
* absorption of water, electrolytes and nutrients (especially water-soluble substances such as monosaccharides).

 **Features**:

* Brunner’s gland, embedded in the submucosa.
* Paneth cells.

2. JEJUNUM: Is the second part of the small intestine in humans and most higher vertebrates, including mammals, reptiles, and birds. Its lining is specialized for the absorption by enterocytes of small nutrient molecules which have been previously digested by enzymes in the duodenum.

**Functions:**

* cleavage of nutrients (e.g. by amylase, proteinase)
* absorption of lipophilic nutrients (proteins, fats, cholesterol and the fat-soluble vitamins A, D, E and K)
* absorption of water (about 90% of the secreted water, 6 to 8 liters/day). This induces an osmotic gradient leading to a paracellular transport of electrolytes, carbohydrates and amino acids.

**Layers**:

Mucosa, Submucosa, Tunica muscularis externa, Tunica Serosa.

**Epithelium**:

* Mucosa - simple columnar epithelium; contains crypts of Lieberkuhn and intestinal villi
* Submucosa - loose connective tissue containing neurovasculature
* Tunica muscularis - an inner circular and outer longitudinal smooth muscle layer
* Tunica serosa - simple squamous epithelium.

 **Features**:

* Circular folds;
* Villi;
* Microvilli.

3. ILEUM:

 The last part of the small intestine. It connects to the cecum (first part of the large intestine). The ileum helps to further digest food coming from the stomach and other parts of the small intestine.

**Functions**:

* enzymatic cleavage of nutrients
* absorption of vitamin B12 (with intrinsic factor from the stomach), fats (especially fatty acids and glycerol) and bile salts
* immunological function (access and transfer of antigens).

**Layers**:

* Mucosa
* Submucosa
* Tunica muscularis
* Tunica serosa

**Epithelium**:

* Simple columnar epithelium
* Simple squamous epithelium

**Features**:

* Peyers patches

**MICROANATOMY OF THE LARGE INTESTINE**

 The large intestine, also known as the large bowel, is the last part of the gastrointestinal tract and of the digestive system in vertebrates. Water is absorbed here and the remaining waste material is stored as feces before being removed by defecation.

**Segments**: Cecum, the colon and the rectum.

Colon: ascending colon, transverse colon, descending colon, sigmoid colon.

**Features:**

* Epiploic appendages
* Haustra (Sacculation)
* Tenia coli
* Semilunar folds

**Layers**:

* Mucosa
* Submucosa
* Muscularis
* Serosa

**Epithelium**:

* Simple columnar epithelium (mucosa)
* Simple squamous epithelial tissue (serosa)
* Stratified squamous non-keratinized( rectum/ anal transitional zone).

CECUM:

The cecum is the first part of the large intestine, lying in the right iliac fossa of the abdomen. The cecum is intraperitoneal with various folds and pockets (retrocecal peritoneal recesses) surrounding it.

ASCENDING COLON:

The portion of the large intestine located between the cecum and rectum is termed the colon. It consists of four parts; ascending, transverse, descending, and sigmoid. The main functions of the colon include fluid and electrolyte reabsorption. In addition, the microflora generates energy through a process called fermentation.The ascending colon travels through the right iliac fossa, right flank, and right hypochondriac region. It ends at the right colic (hepatic) flexure.

TRANSVERSE COLON:

The transverse colon is the second major part of the colon. It extends between the right and left colic (splenic) flexures, spanning the right hypochondriac, epigastric and left hypochondriac regions of the abdomen. The greater curvature of the stomach and gastrocolic ligament are superior to the transverse colon, while the greater omentum hangs over and extends inferiorly to it. The transverse colon is intraperitoneal.

DESCENDING COLON:

The descending colon extends between the left colic flexure and sigmoid colon. It travels through the left hypochondriac region, left flank and left iliac fossa. The left paracolic gutter is located between the descending colon and the lateral abdominal wall. This part of the colon is retroperitoneal.

SIGMOID COLON:

The S-shaped sigmoid colon travels from the left iliac fossa until the third sacral vertebra (rectosigmoid junction). This part of the colon is intraperitoneal. It is connected to the pelvic wall by the sigmoid mesocolon.

RECTUM:

The rectum stretches between the rectosigmoid junction and the anal canal. The typical characteristics of the large intestine (taenia coli, haustra, epiploic appendages) change or even terminate at the rectum. The roles of the rectum include temporary storage of fecal matter and defecation.