18/MHS06/013

The small intestine is divided into the duodenum, jejunum and the ileum

**Duodenum**:

Functions

The duodenum's most important function is to digest nutrients and pass them into the blood vessel located in the intestinal wall for absorption of the nutrients into the bloodstream.

- It is where most chemical digestion using enzymes take place.

Segments

- It is the initial C-shaped segment of the small intesine and is a continuation of the pylorus

Layers

- The wall of the duodenum has the same four layers of the stomach; mucosa, submucosa, muscularis and serosa

General features

-The duodenum is the first section of the small intestine and is the shortest part of the small intestine.

- It is where most chemical digestion using enzymes takes place.

-A characteristic feature is the Brunner's glands embedded in the submucosa that produce mucus secret containing bicarbornate which serves to neutralize the gastric acid.

-Crypts of Lieberkhun that lie between the villi.

Epithelium

-Histologically the duodenum is similar to all the other hollow organs of the gastrointestinal tract: mucosa, submucosa and muscularis. The mucosa consists of simple columnar epithelium (lamina epithelialis), a connective tissue layer (lamina propria) and a smooth muscle layer (lamina muscularis).

**Jejunum:**

Functions

- The jejunum primary function is absorption, where sugars, amino acids, and fatty acids are absorbed.

Segments

- The jejunum is the middle portion of the small intestine, connecting the first portion of the small intestine (duodenum) with the last section (ileum).

Layers

-The jejunum is the middle portion of the small intestine, connecting the first portion of the small intestine (duodenum) with the last section (ileum).

General features

-The jejunum is the middle section of the small intestine.

-It has a lining which is designed to absorb carbohydrates and proteins.

-The inner surface of the jejunum, its mucous membrane, is covered in projections called villi, which increase the surface area of tissue available to absorb nutrients from the gut contents

Epithelium

-The entire jejunum is covered by serosa from the outside which consists of simple squamous epithelium and a connective tissue layer underneath (lamina propria serosae).

**Ileum**

Function

-The main function of the ileum is to absorb vitamin B12, bile salts, and whatever products of digestion were not absorbed by the jejunum

Segments

-Ileum is the final and longest segment of the small intestine

Layers

-Histologically, the ileum has the same basic structure as the jejunum: mucosa, submucosa, muscularis and serosa

General features

-The ileum is the final portion of the small intestine

-The wall itself is made up of folds, each of which has many tiny finger-like projections known as villi on its surface.

-The ileum has an extremely large surface area both for the adsorption of enzyme molecules and for the absorption of products of digestion.

Epithelium

-The ileum is entirely covered by serosa from the outside. It is made up of simple squamous epithelium and a connective tissue layer underneath (lamina propria serosae).

The large intestine consists of the cecum, colon, rectum and anal canal

**Cecum**

Function

-The main functions of the cecum are to absorb fluids and salts that remain after completion of intestinal digestion and absorption and to mix its contents with a lubricating substance, mucus.

- It also plays an important role in the digestive system by assisting in the formation of feces.

Segments

-The cecum or caecum is a pouch within the peritoneum that is considered to be the beginning segment of the large intestine

Layers

-The cecum consists of four distinct layers; the mucosa, submucosa, muscularis and serosa

General features

- It is typically located on the right side of the body

-The internal wall of the cecum is composed of a thick mucous membrane, through which water and salts are absorbed.

- It is separated from the ileum by the ileocecal valve (ICV) or Bauhin's valve.

-It is also separated from the colon by the cecocolic junction

Epithelium

-

**Colon**

Function

- The colon reabsorbs fluids and processes waste products from the body and prepare for its elimination

Segments

- Segments of the colon include:

The ascending colon including the cecum and appendix.

The transverse colon including the colic flexures and transverse mesocolon.

The descending colon.

The sigmoid colon – the s-shaped region of the large intestine.

The rectum.

Layers

- The colon is made of several layers of tissue. The innermost layer is called the mucosa. The next layers are the submucosa and muscularis propria. The next layer is the subserosa, and the final outermost layer is called the serosa.

Features

The colon is only 6 feet (1.8 m) long. This 6 feet of dense muscle is divided into four parts: the ascending colon, the transverse colon, the descending colon and the sigmoid colon. Each part represents a location in the broken rectangle shape that the colon makes in the body.

Epithelium

-The mucosa of the colon is lined by a simple columnar epithelium

**Rectum**

Function

-The rectum acts as a temporary storage site for feces.

-It receives faecal material from the descending colon, transmitted through regular muscle contractions called peristalsis.

Segments

-It may be subdivided into three parts: the upper third lies intraperitoneally, the middle third retroperitoneally and the lower third under the pelvic diaphragm and therefore extraperitoneally.

Layers

-The rectal wall consists of five distinct layers, namely the mucosa (lined by columnar epithelium), deep mucosa (lamina propria and muscularis mucosae), submucosa, muscularis propria (inner circular and outer longitudinal layers), and serosa (perirectal fat).

Features

-The rectum is the last part of the large intestine and connects the sigmoid colon to the anal canal.

Epithelium

-Intestinal epithelium (simple columnar epithelium)

-at the anal transitional zone - stratified squamous non-keratinized

**Anal Canal**

Functions

- It has an important role in defecation and maintaining faecal continence.

Segments

-It is the final segment of the gastrointestinal tract, around 4cm in length.

Layers

-The involuntary autonomous internal anal sphincter is the lowermost continuation of the inner, circular smooth muscle layer of the rectum. The external longitudinal muscle layer continues as the corrugator cutis ani. The external anal sphincter has 3 parts: subcutaneous, superficial, and deep.

Features

-The anal canal is an important part of the continence organ. It is the final segment of the gastrointestinal tract surrounded by a muscular sphincter system which tightly closes the lumen. The internal anal sphincter is permanently contracted through the sympathetic tonus and relaxes under parasympathetic influence.

-The anal canal is the terminal segment of the large intestine between the rectum and anus

Epithelium

-three types of epithelium were observed in the anal canal: simple columnar epithelium, stratified squamous epithelium, and stratified columnar epithelium. The lower rectum was composed of simple columnar epithelium.

18/MHS06/013