MED437
KING SAUD UNIVERSITY

ANATOMY
Team 437

Large Intestines

Lecture (6)

- **Important**
- **Doctors Notes**
- **Notes/Extra explanation**

{وَمَنْ يَتَوَكَّلْ عَلَى اللَّهِ فَهُوَ حَسْبُهُ}

Please check our Editing File

هذا العمل مبني بشكل أساسي على عمل دفعة ٤٣٦ مع المراجعة والتدقيق وإضافة الملاحظات ولا يغني عن المصدر الأساسي للمذاكرة

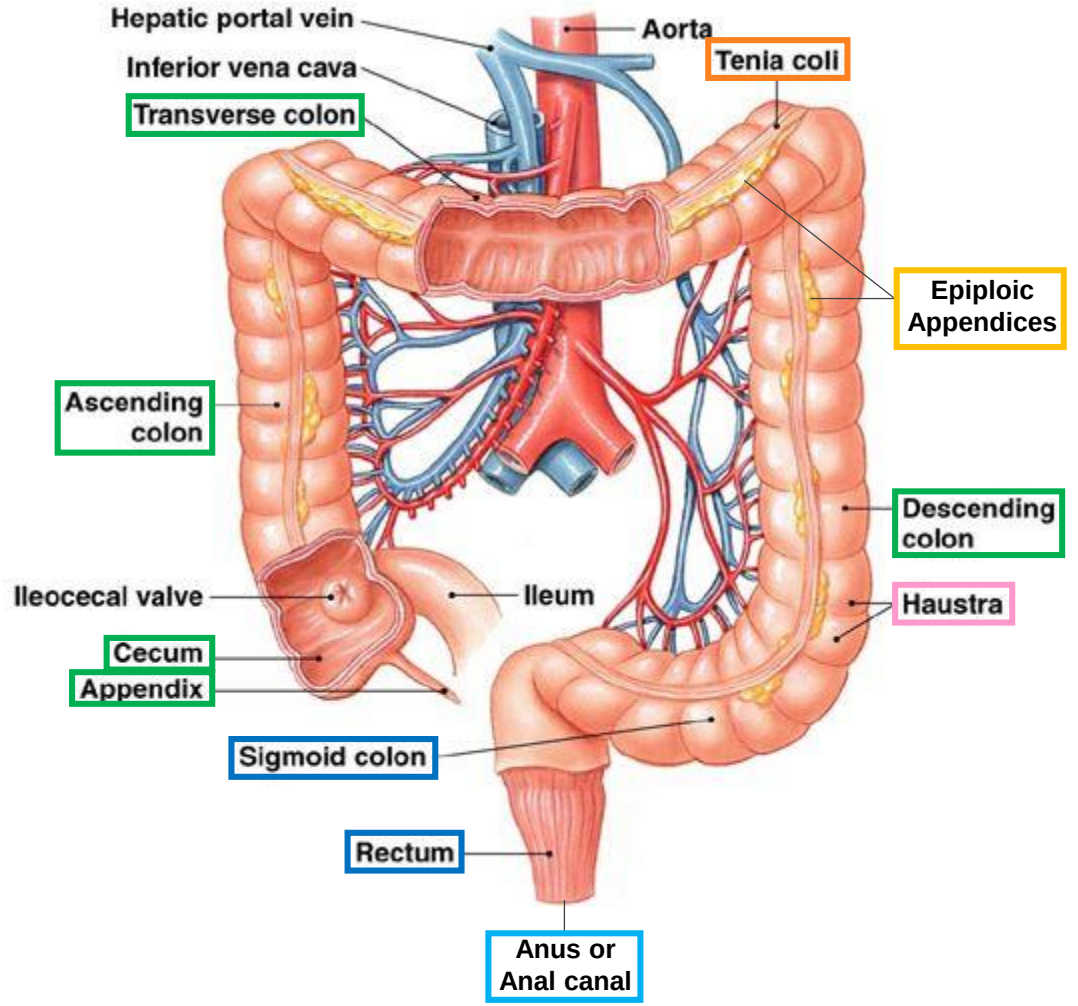
Objectives

At the end of the lecture, students should be able to:

- ✓ List the different parts of **large intestine**.
- ✓ List the characteristic features of **colon**.
- ✓ Describe the anatomy of **different parts** of **large intestine** regarding: the **surface anatomy**, **peritoneal covering**, **relations**, **arterial** & **nerve supply**.

Parts of the Large Intestine

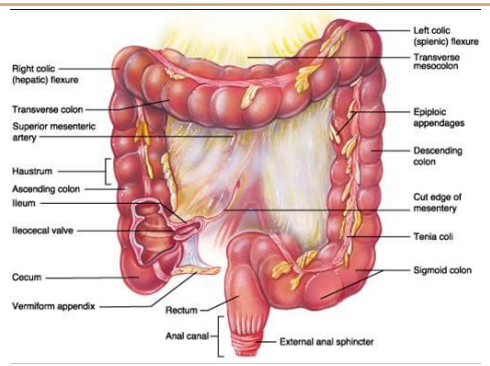
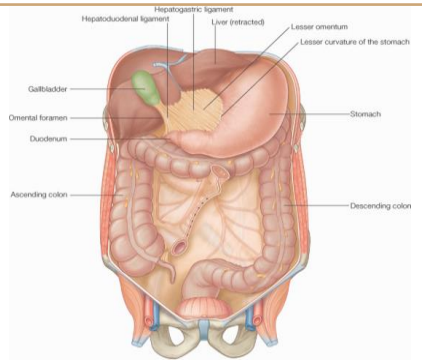
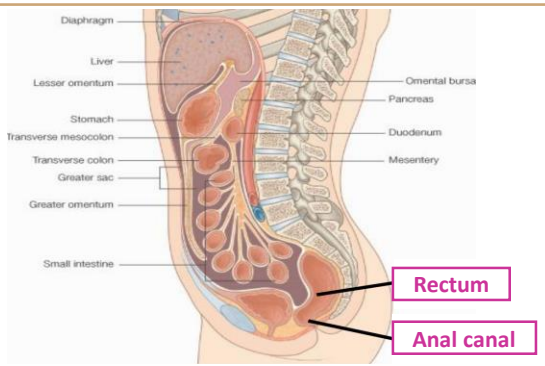
- (1,2,3,4,5) are found in the **abdomen**
- (6,7) are found in the **pelvis**
- (8) is found in the **perineum**



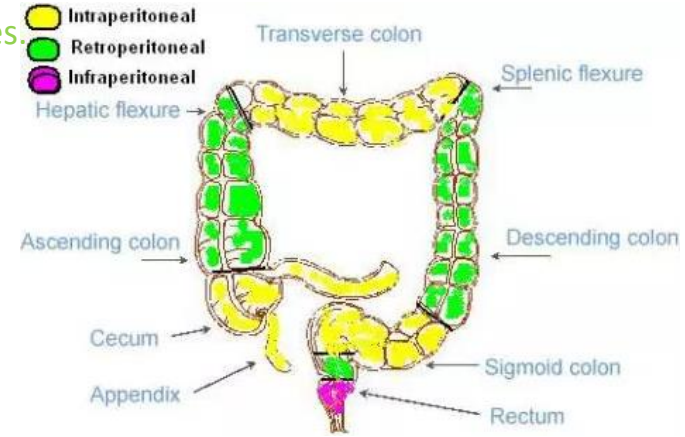
Characteristics of Colon

- NOT found in rectum & anal canal ONLY colon
- **Taeniae coli**:
  Three longitudinal muscle bands
- Sacculations (**Haustra**)=تكيّسات:
  Because the Taeniae coli are **shorter** than large intestine
- **Epiploic Appendices**=زوائد:
  Short peritoneal folds filled with fat (Yellowish color)

Peritoneal Covering

Parts with mesentery[1]	Parts with Retroperitoneal[2]	Parts devoid of (without) peritoneal covering
1. Transverse colon[3] 2. Sigmoid colon 3. Appendix 4.Cecum	1. Ascending colon 2. Descending colon 3. Upper 2/3 of rectum	1. Lower 1/3 of rectum 2. Anal canal
		

1- The peritoneum covers the anterior and posterior surfaces.
2- The peritoneum only covers the anterior surface
3- First 2 inches WITHOUT mesentery

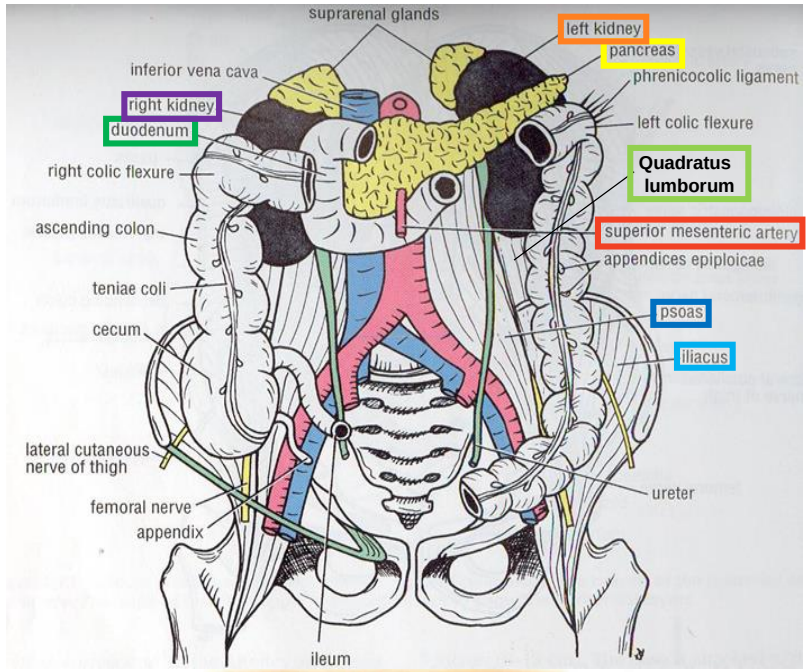


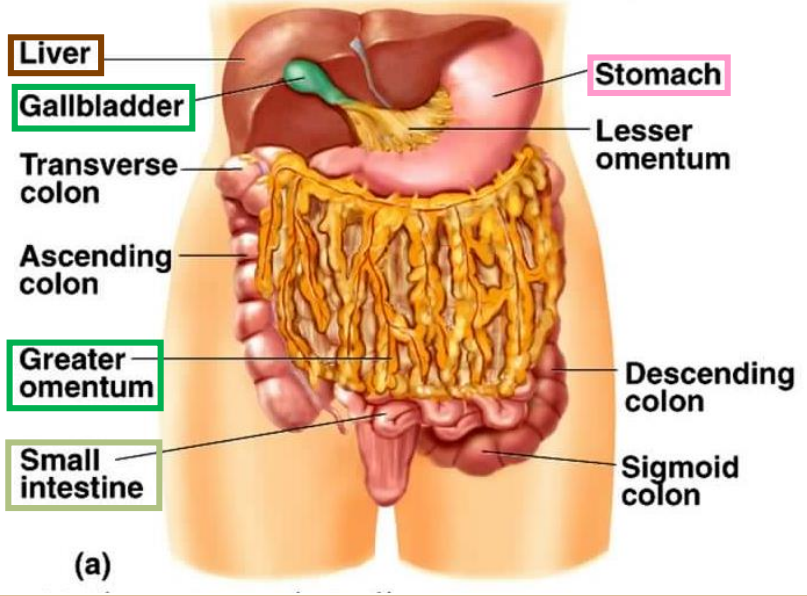
Parts of the Large Intestine

Relation

*Transverse colon **full** → **Stomach** will be **Anterior**
*Transverse colon **empty** → **Stomach** will be **Superior**

	Anterior	Posterior
Cecum (Right)	1. Greater omentum 2. Anterior abdominal wall 3. Coils of small intestine (jejunum & ilum)	1. Psoas major 2. Iliacus
Ascending colon (Right)		1. **Right** kidney 2. Iliacus 3. Quadratus lumborum
Descending colons (Left)		1. Psoas major 2. Iliacus 3. Quadratus lumborum 4. **Left** kidney
Transverse colon	1. Greater omentum 2. Anterior abdominal wall 3. Stomach*	1. Superior mesenteric vessels 2. 2nd part of duodenum 3. Pancreas (head)
	Superior	**Inferior**
	1. Gallbladder 2. Stomach 3. Liver	1. Coils of small intestine (jejunum & ilum)

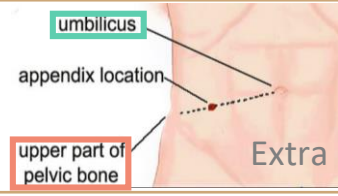




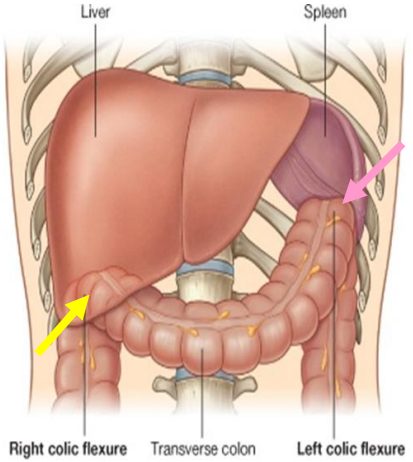
Colic flexures & Appendix

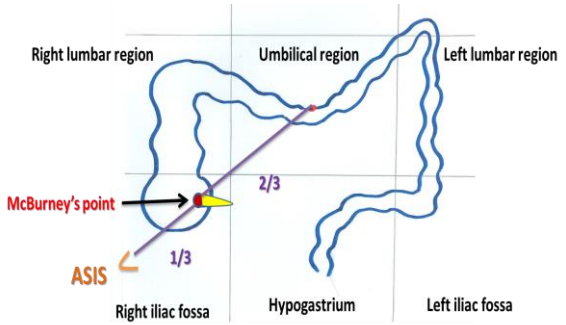
Colic flexures	
Splenic flexure (Left)	**Hepatic flexure** (Right)
Between Transverse colon & Spleen Position: **higher** | Angle: more **acute**	Between Ascending colon & Liver Wider angle

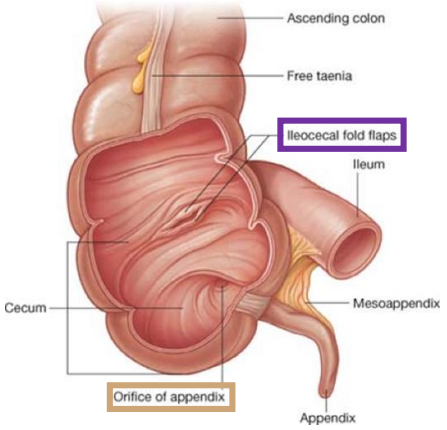
Appendix (Anatomically related to large intestine BUT Functionally related to immunity "Lymphatic system")

Surface Anatomy	The **base** of appendix is marked by **McBurney's point*:** A point at the junction of **lateral 1/3** & **medial 2/3** of a line traced from right anterior **superior iliac spine** to **umbilicus.** 
Opening	At posteromedial aspect of cecum, 1 inch below **ileocecal junction**
Positions	1. Retrocecal **(most common)** 2. Pelvic 3. Subcecal** 4. Preiliea 5. Postileal **(least common)** (REMEMBER! The position of base not change) ****Its original position but with development of the cecum, the position could change depend on equality of the developing sites of cecum, usually inequality causing shifting of appendix position**

*In case of **appendicitis** this area will have **rebound tenderness** (It refers to **pain upon removal** of **pressure rather than** application of **pressure** to **the abdomen**)







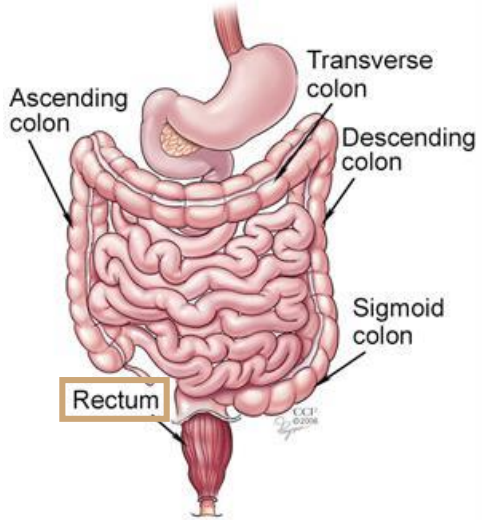
Rectum

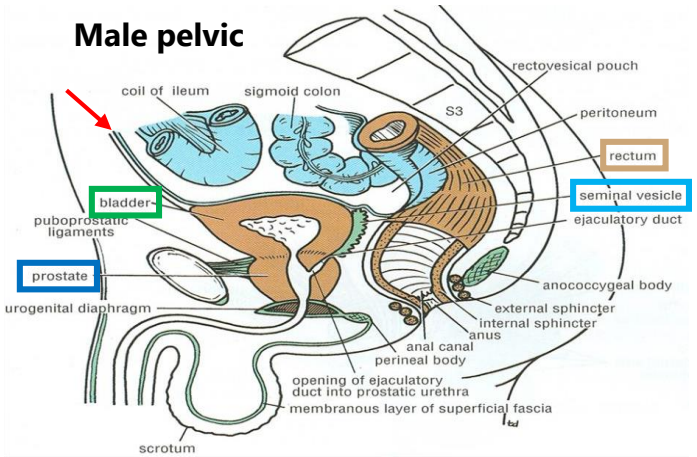
- Upper 1/3 of rectum is covered by peritoneum in front & side
- Middle 1/3 of rectum is covered by peritoneum in front ONLY
- Lower 1/3 of rectum & anal canal has no peritoneum cover

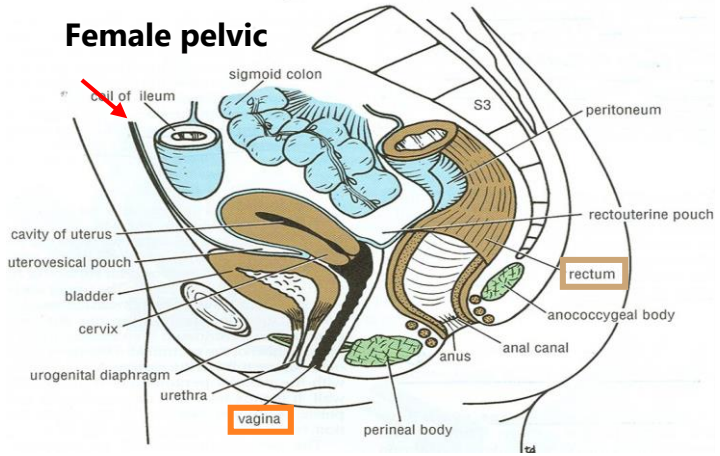
Beginning	as a **continuation** of **sigmoid colon** **at level of S3**
Termination	**Continues** as **anal canal**, **one inch below & in front of tip of coccyx** Its end is dilated to form the **rectal ampulla**
Length	13 cm (5 inches)

Relations of Rectum in Pelvis

	Male pelvic	Male pelvic
Anterior	1.Posterior surfaces of urinary bladder 2.Seminal vesicles 3.Prostate gland	1.posterior wall of vagina
Posterior	1.Sacral plexus 2.Sacrum 3.Coccyx	



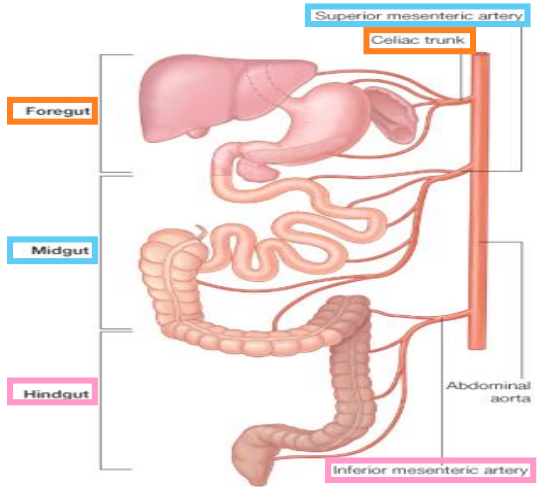


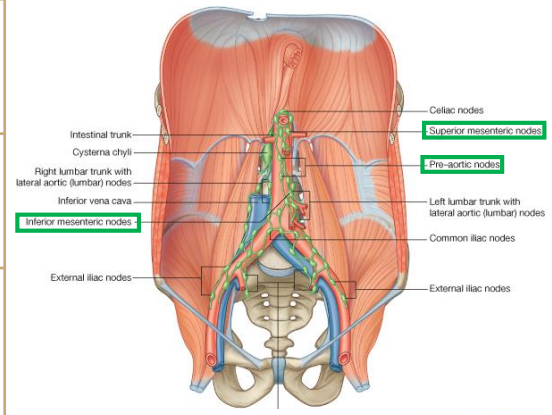


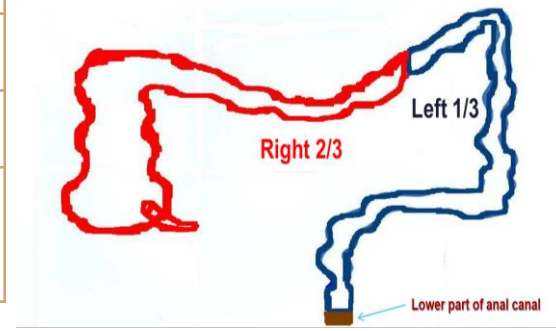
Relation between embryological origin of GIT & Supply

Arterial Supply	**Foregut**	from esophagus → proximal duodenum at major duodenal papilla **(Celiac trunk)**
	Midgut	from distal duodenum after opening → from cecum, appendix, ascending colon & **right 2/3** of transvers colon (**Superior mesenteric artery**)
	Hindgut	from **left 1/3** of transvers colon, Descending colon, Sigmoid colon & Upper 2/3 of anal canal (**Inferior mesenteric artery**)*
Venous Drainage	The veins of the gut form the tributaries of the portal vein which enters the liver and drains into the **portal circulation** (Portal vein → liver sinusoid → IVC)	
Lymph Drainage	The lymph vessels follow the arteries. Ultimately, all the lymph is collected at the **Preaortic lymph nodes** (**Superior** & **Inferior mesenteric**).	
Nerve Supply	**Ectoderm**	*lower 1/3 of anal canal | Somatic (**inferior rectal** from sacral plexus)
	Midgut*	*Endoderm | (Autonomic): **Sympathetic + Vagus**
	Hindgut*	*Endoderm | (Autonomic): **Sympathetic + pelvic splanchnic nerves (S2&S3)**

*It continues as the **superior rectal artery** in the root of the **sigmoid mesocolon (pelvic region).**







Peritoneal Covering	Cecum, Ascending & Descending Colons	Transverse Colon	Appendix	Rectum	Venous, Lymph & Nerve Supply
Parts with mesentery: 1. Transverse colon 2. Sigmoid colon 3. Appendix 4. Cecum **Retroperitoneal parts:** 1. Ascending colon 2. Descending colon 3. Upper 2/3 of rectum **Parts devoid of peritoneal covering:** 1. Lower 1/3 of rectum 2. Anal canal	**Anterior relations:** -Greater omentum -Coils of small intestine -Anterior abdominal wall **Posterior relations:** **Cecum**: 1. Psoas major 2. Iliacus **Ascending colon:** 1. Iliacus 2. Quadratus lumborum 3. Right kidney **Descending colon:** 1. Left kidney 2. Quadratus lumborum 3. Iliacus	**Colic flexures:** 1-Hepatic flexure 2-Splenic flexure: higher + more acute angle **Relations:** **Anterior**: -greater omentum -anterior abdominal wall **Posterior:** 2nd part of duodenm, pancreas & superior mesenteric vessels **Superior:** -liver -gall bladder -stomach **Inferior:** coils of small intestine	**Surface anatomy:** the base of appendix is marked by Mc'Burney'spoint **Opening:** At posteromedial aspect of cecum **Positions:** 1.Retrocecal most common 2.Pelvic 3.Subcecal 4.Preilieal 5.Postileal least common	**Beginning:** at level of S3 **Termination:** continues as anal canal, one inch below & in front of tip of coccyx **Length**: 13 cm (5 inches) **Relations:** **Posterior:** sacrum, sacral plexus & coccyx **Anterior:** **MALE** PELVIS: seminal vesicles, posterior surfaces of urinary bladder & prostate gland **FEMALE** PELVIS: posterior wall of vagina	**Venous drainage:** Portal circulation **Lymph drainage:** Preaortic lymph nodes **Nerve supply:** **Origin: Midgut** Nerve supply: (**Autonomic**): Sympathetic + Vagus **Origin: Hindgut** Nerve supply: (**Autonomic**): Sympathetic + pelvic splanchnic nerves **Origin: ectoderm** (lower 1/3 of anal canal) Nerve Supply: **Somatic** (inferior rectal)

MCQs

1. The taeniae coli found in which of the following structure?

A- Transverse colon
B- Small intestine
C- Rectum
D- Anal canal

2. Which of the following part is with mesentery?

A- Lower 1/3 of rectum
B- Appendix
C- Ascending colon
D- Upper 2/3 of rectum

3. Which of the following structure is an anterior relation of cecum?

A- Psoas major
B- lliacus
C- Quadratus lumborum
D- Coils of small intestine

4. The superior mesenteric vessels relate to Transverse colon?

A- Anteriorly
B- Posteriorly
C- Superiorly
D- Inferiorly

5. Which one of the following is the nerve supply of the Hindgut (endoderm):

A- Sympathetic + pelvic splanchnic nerves
B- Somatic (inferior rectal)
C- Sympathetic + Vagus
D- Non of them

6. All the lymph in the GIT is collected at the:

A- Preaorticlymph nodes (Superior & Inferior mesenteric)
B- Preaorticlymph nodes (anterior & Inferior mesenteric)
C- Postaorticlymph node
D- Non of them

7. The termination of the rectum is:

A- As a continuation of sigmoid colon at level of S3
B- Continues as anal canal, one inch below & in front of tip of coccyx
C- Sacral plexus & coccyx
D- A & C

8. Which one of the following parts of large intestine is found in the pelvis?

A- Transverse colon
B- Anal canal
C- Rectum
D- Cecum

9. Its surface anatomy is marked by Mc'Burney's point:

A- Rectum
B- Colon
C- Appendix
D- Pancreas

Answers

(1) A
(2) B
(3) D
(4) B
(5) A

(6) A
(7) B
(8) C
(9) C

SAQ

1. What are the characteristics of colon?

1) Taeniae coli
2) Sacculations
3) Epiploic appendices

2. What are the anterior relations of (Cecum – Ascending & Descending colons):

1) Anterior abdominal wall
2) Coils of small intestine
3) Greater omentum

3. What are the posterior relations (Cecum – Ascending & Descending colons):

- **Cecum**: 1. Psoas major 2. Iliacus
- **Ascending colon**: 1. Iliacus 2. Quadratus lumborum 3. Right kidney
- **Descending colon**: 1. Left kidney 2. Quadratus lumborum 3. Iliacus 4. Psoas major

Good luck
Special thank for team436 ❤

Team Leaders:

Faisal Fahad Alsaif
Rawan Mohammad Alharbi

Team Members:

Abdulaziz Aldukhayel
Abdulrahman Alduhayyim
Rinad Alghoraiby
Majd Albarrak

- References:
  1. Girls' & Boys' Slides
  2. Earthslab.com
  3. TeachMeAnatomy.com

Twitter.com/Anatomy437

Anatomyteam.437@gmail.com