

# Digestive System

University of Jordan

Faculty of Medicine

Batch of 2013-2019



Slide  Sheet  Handout  Other

Anatomy

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Microbiology

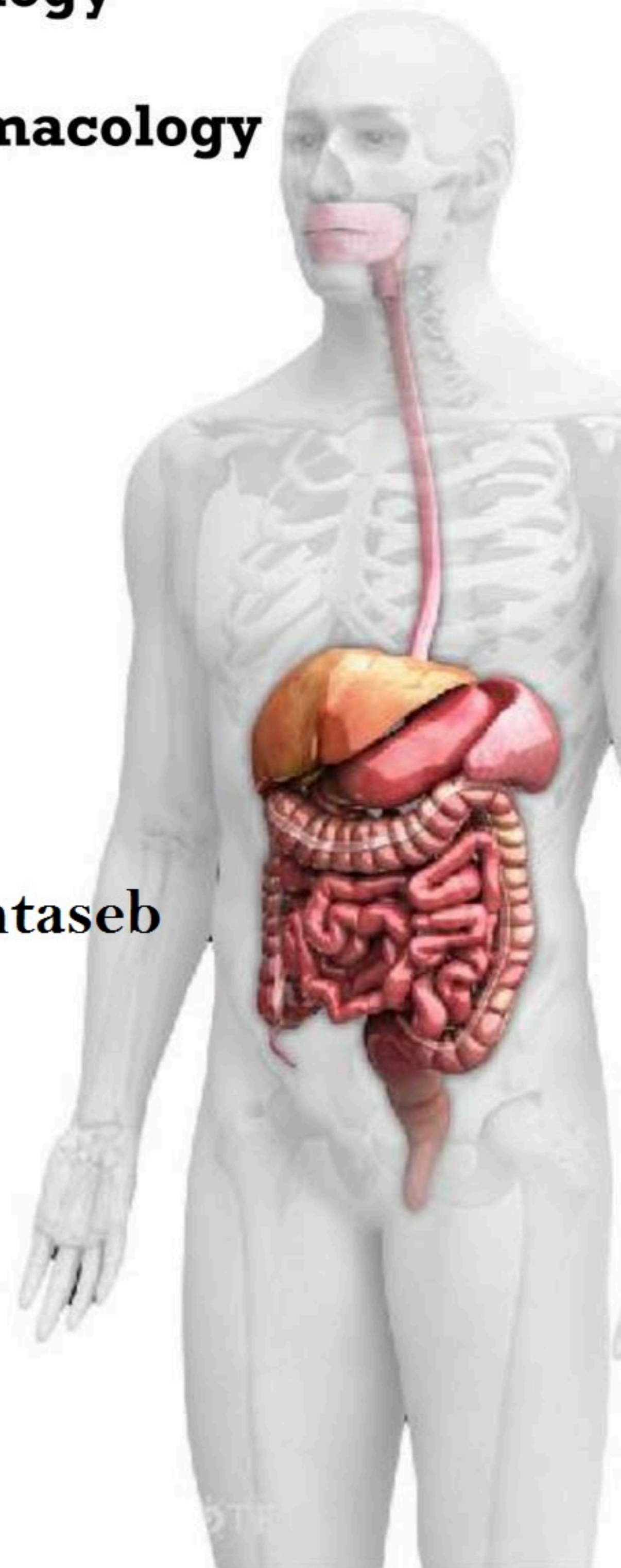
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**Slide #:** 7

**Doctor:** Mohammad Al-Mohtaseb

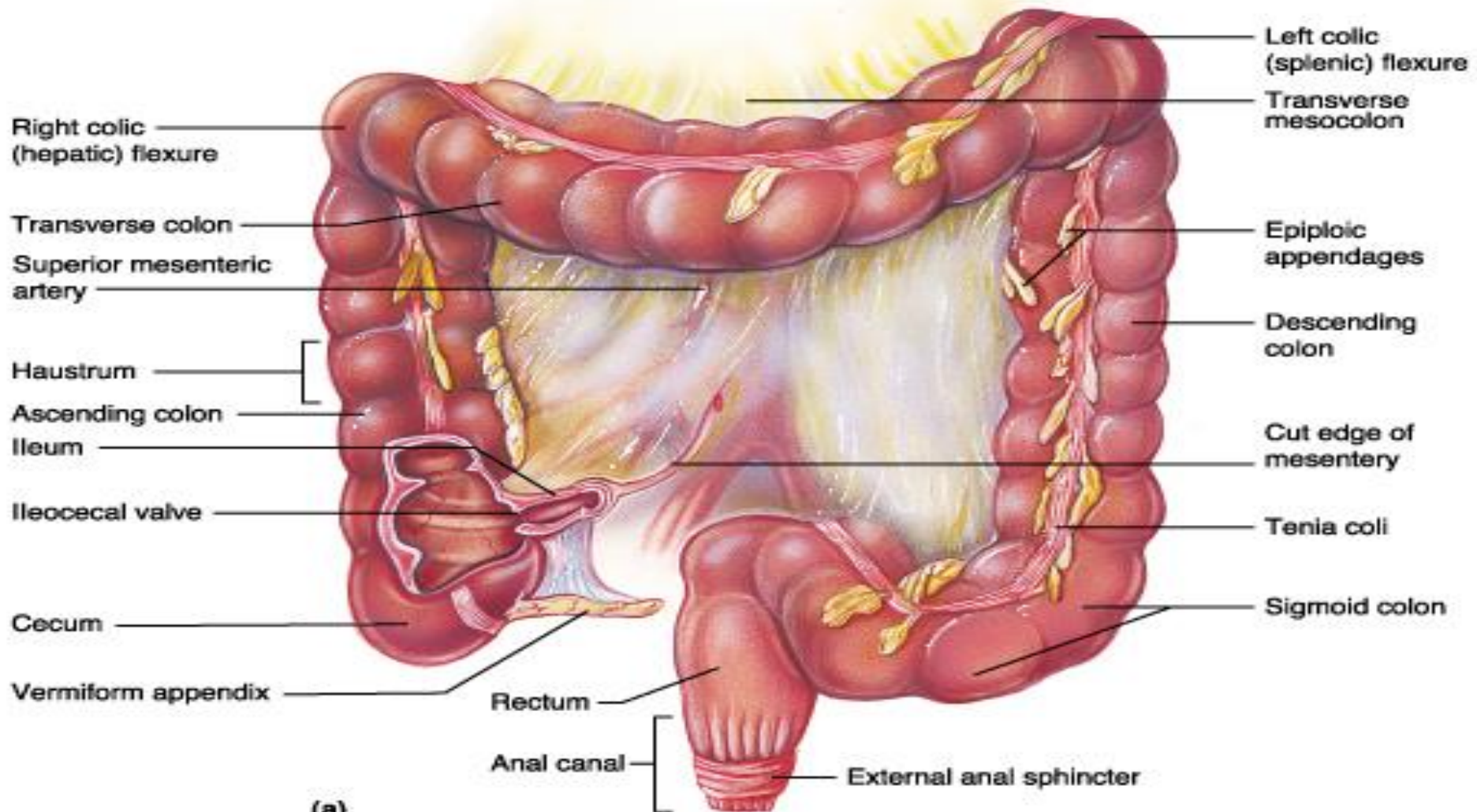
**Date:** 23-3-2015

**Price:**



*Large intestine*

# Anatomy of the Large Intestine



# Large Intestine

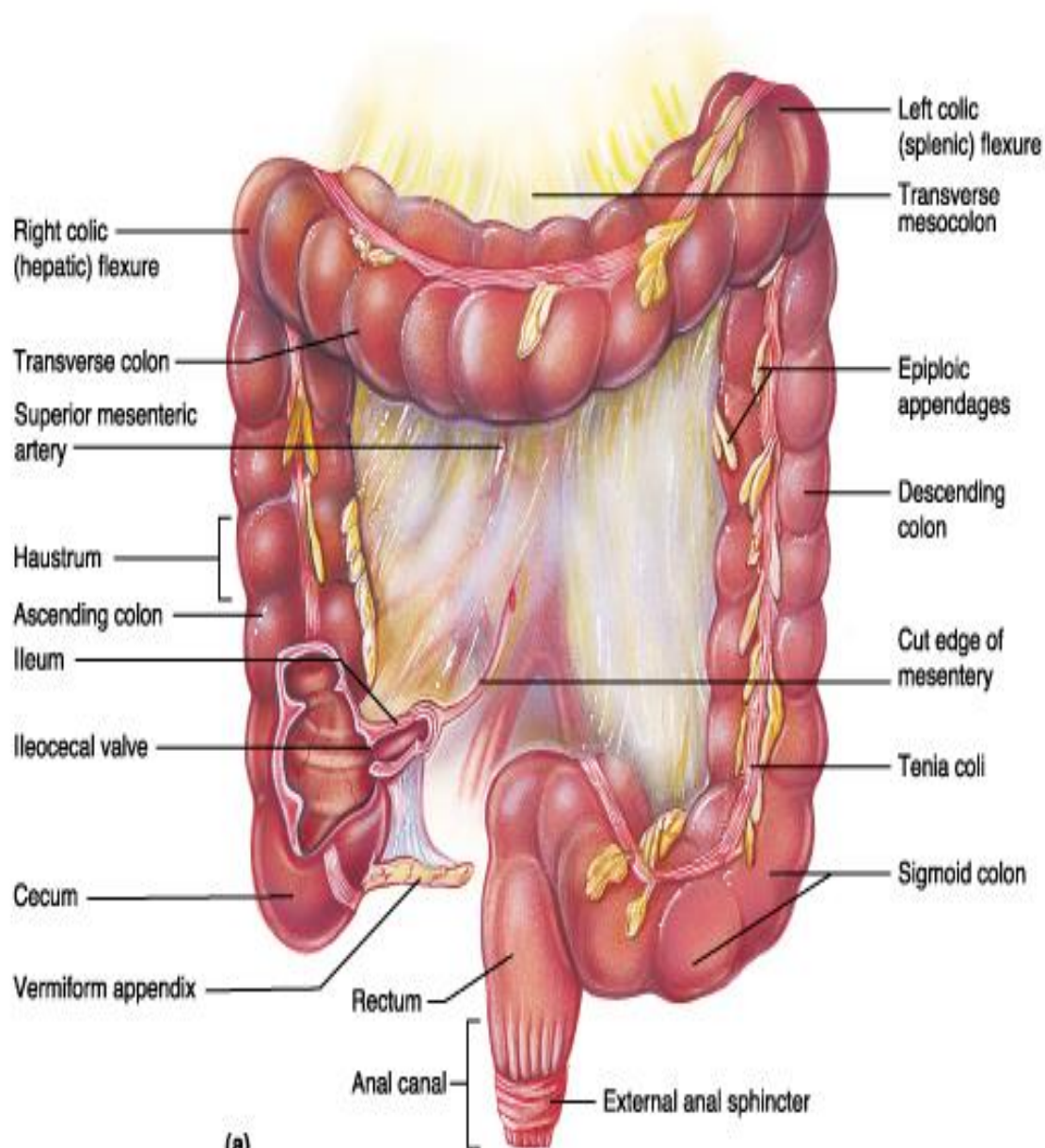
- Extends from ileocecal valve to anus
- Length = 1.5- 2.5m = 5 feet
- Regions
  - Cecum = 2.5- 3 inch
  - Appendix= 3-5 inch
  - Colon
    - Ascending= 5 inch
    - Transverse= 15 inch
    - Descending= 10 inch
    - Sigmoid colon = 10 – 15 inch
  - Rectum= 5 inch
  - Anal canal= 4 cm

# General features of large intestine

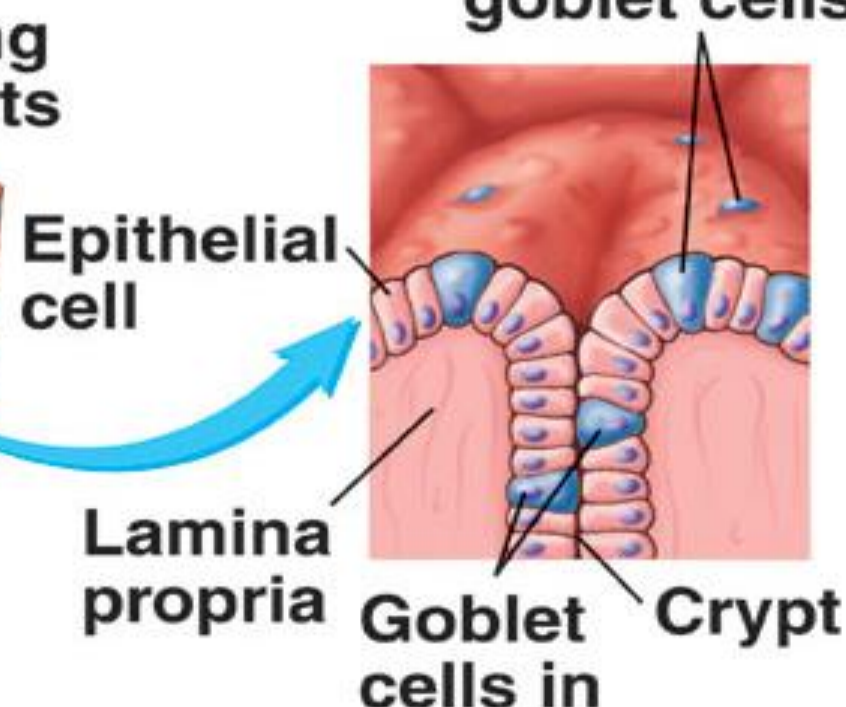
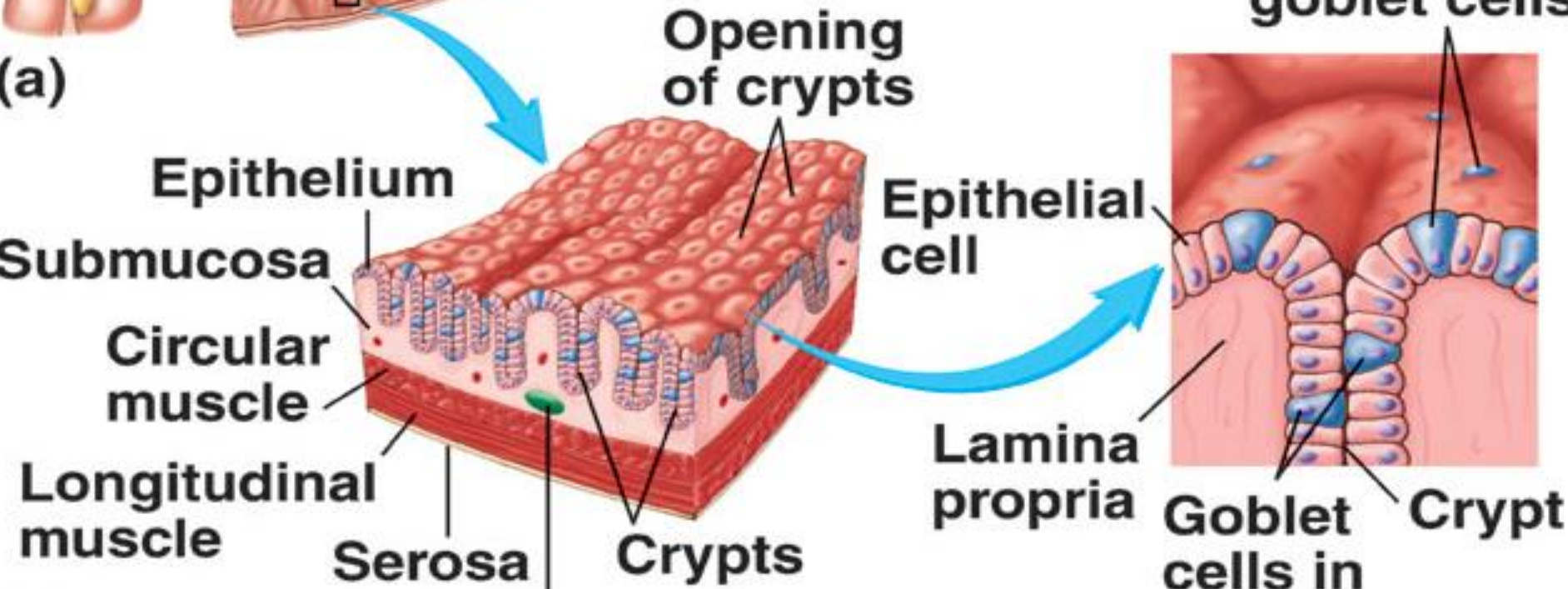
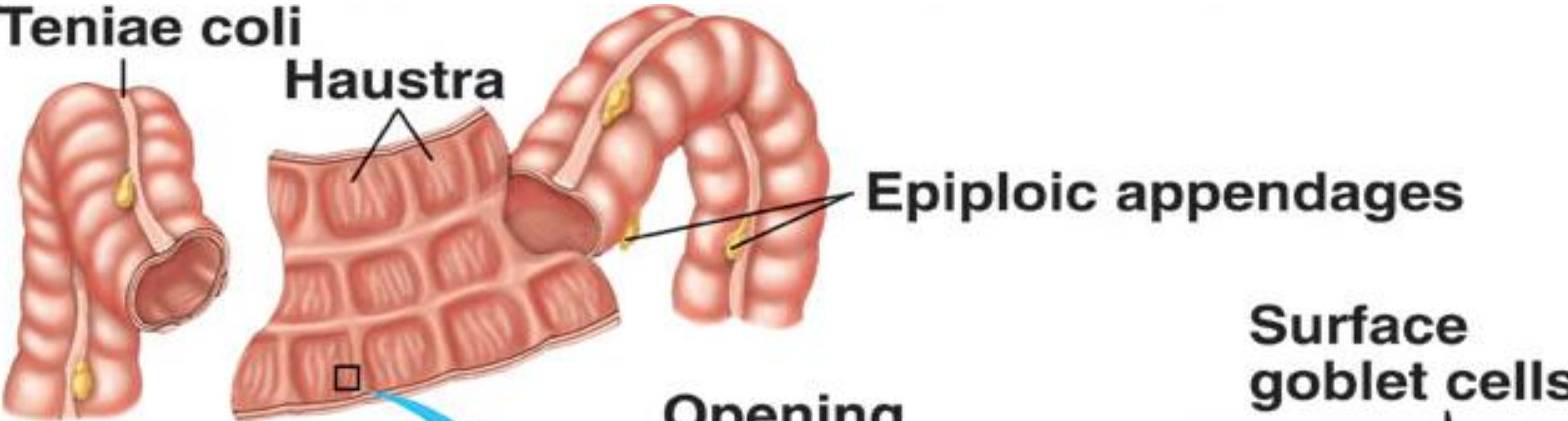
**1- Sacculations= Haustra**

**2- Tenia coli**(three separate longitudinal ribbons of smooth muscle) → **except appendix and rectum**

**3- Appendices epiploica**( adipose structures protruding from the serosal surface of the colon ) → **except appendix , Cecum and rectum**

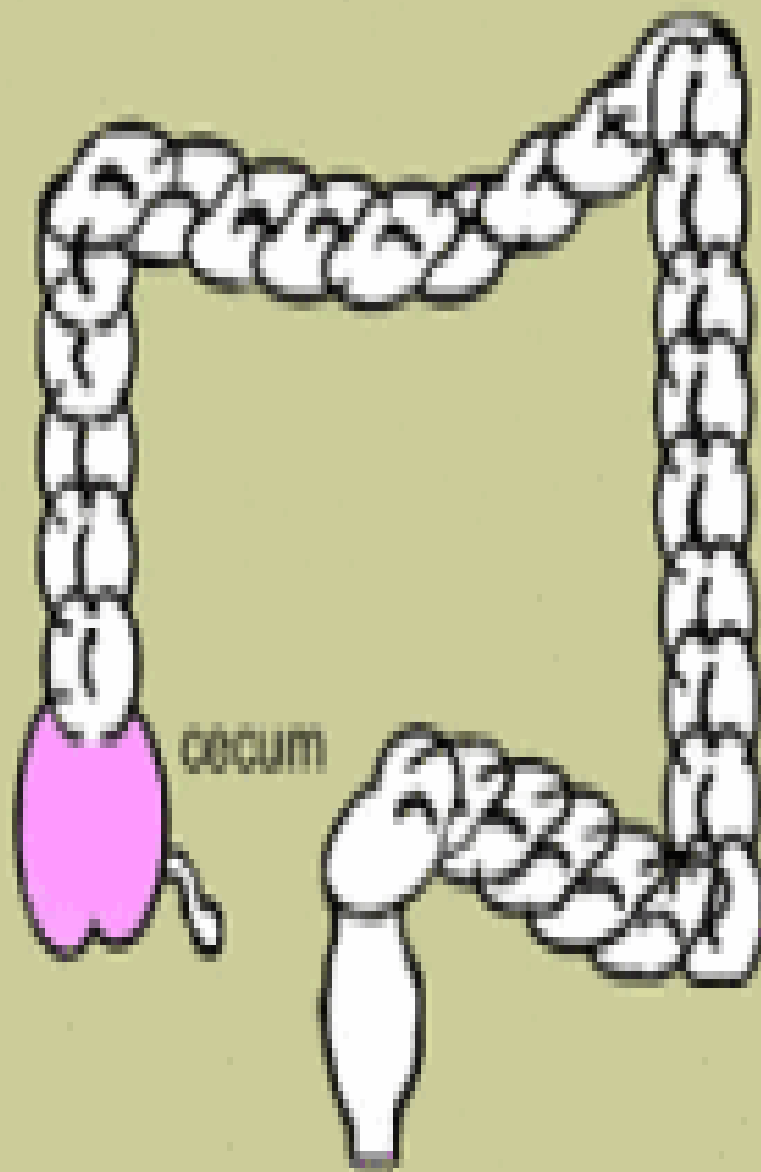
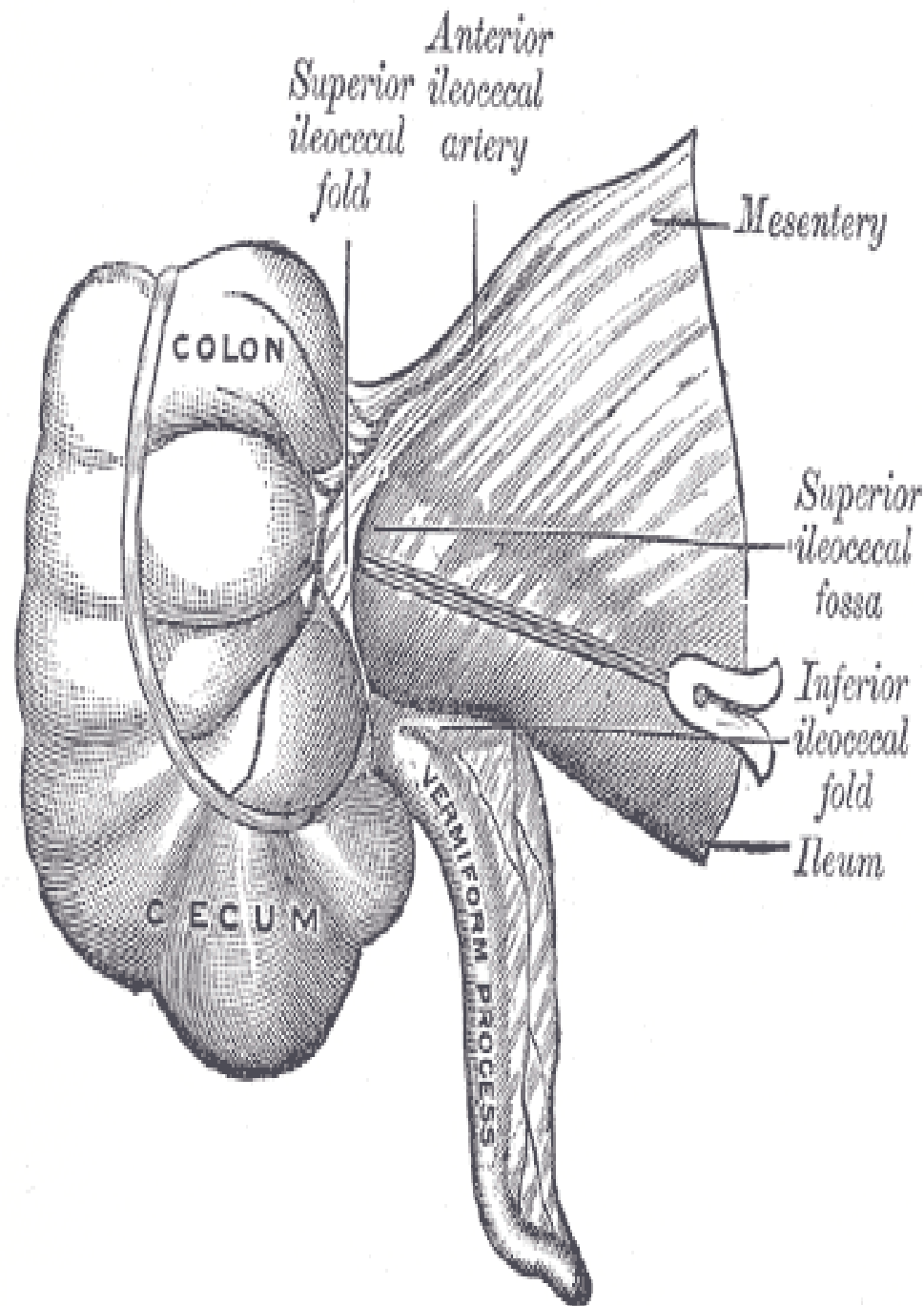


# LARGE INTESTINE ANATOMY



# Cecum

- It is a blind-ended pouch
- **Site:** situated in the right iliac fossa , above the lat  $\frac{1}{2}$  of inguinal ligament
- **Size:** It is about 3 inch in diameter
- Completely covered with peritoneum.
- It possesses a considerable amount of mobility, although it does not have a mesentery.
- Attached to :
  - Ascending colon
  - posteromedially surface is the appendix , 1 inch below ileocoecal valve
  - medially → Ileum
- The presence of peritoneal folds in the vicinity of the cecum creates
  - The superior ileocecal recesses
  - The inferior ileocecal recesses
  - The retrocecal recesses .





# Cecum....cont

- The longitudinal muscle is restricted to three flat bands, the **taenia coli**, which converge on the base of the appendix and provide for it a complete longitudinal muscle coat .

# Relations of cecum

- Anteriorly:
  - Coils of small intestine
  - the greater omentum
  - the anterior abdominal wall in the right iliac region
- Posteriorly:
  - The psoas and the iliacus muscles
  - the femoral nerve
  - and the lateral cutaneous nerve of the thigh .
  - Postero- medially → The appendix is commonly → retrocecal common.
- Medially:
  - **Small intestine( ileum)**

# Blood Supply of cecum

## Arteries

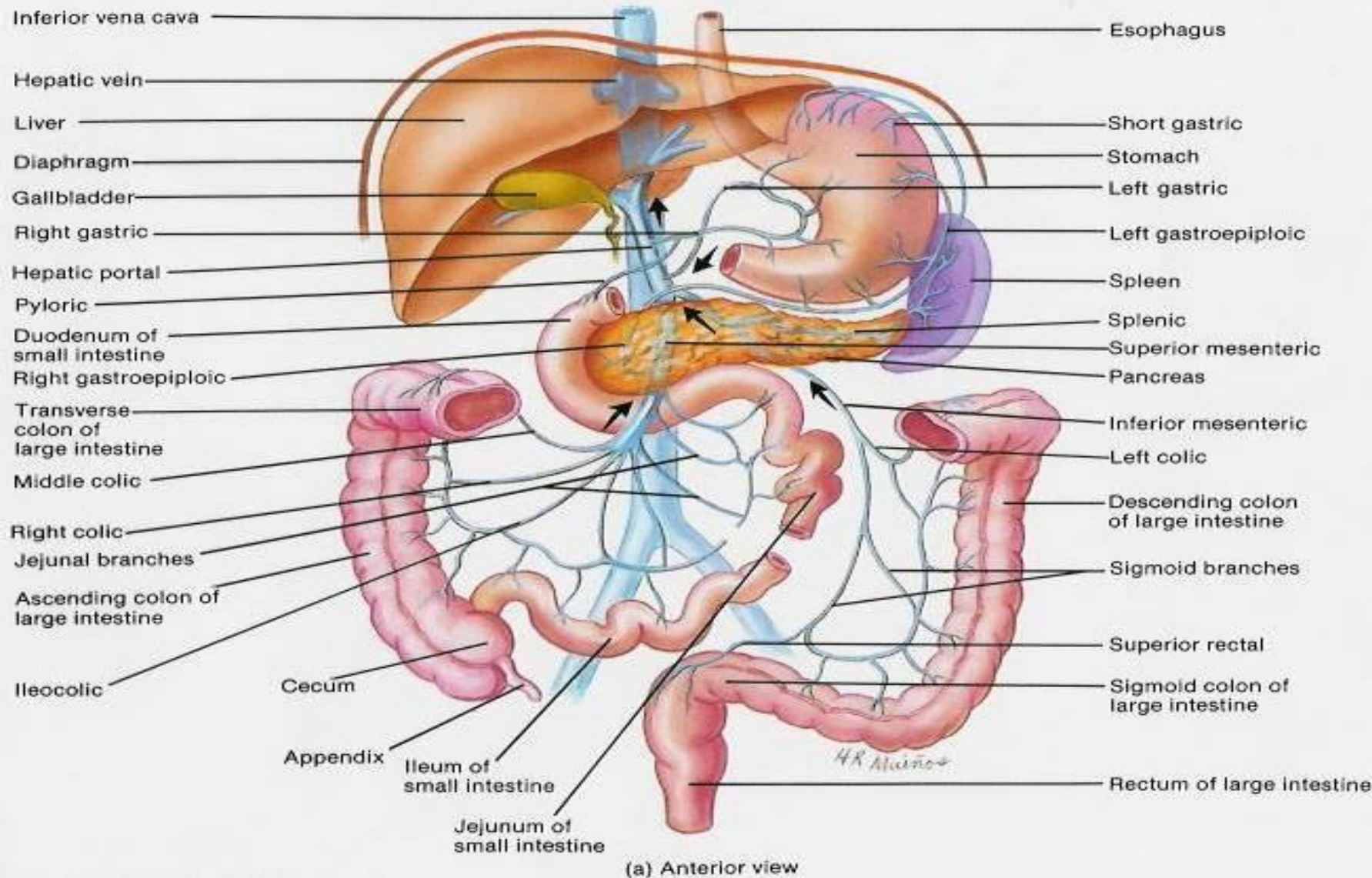
- Anterior and posterior cecal arteries → a branch of Superior mesenteric artery

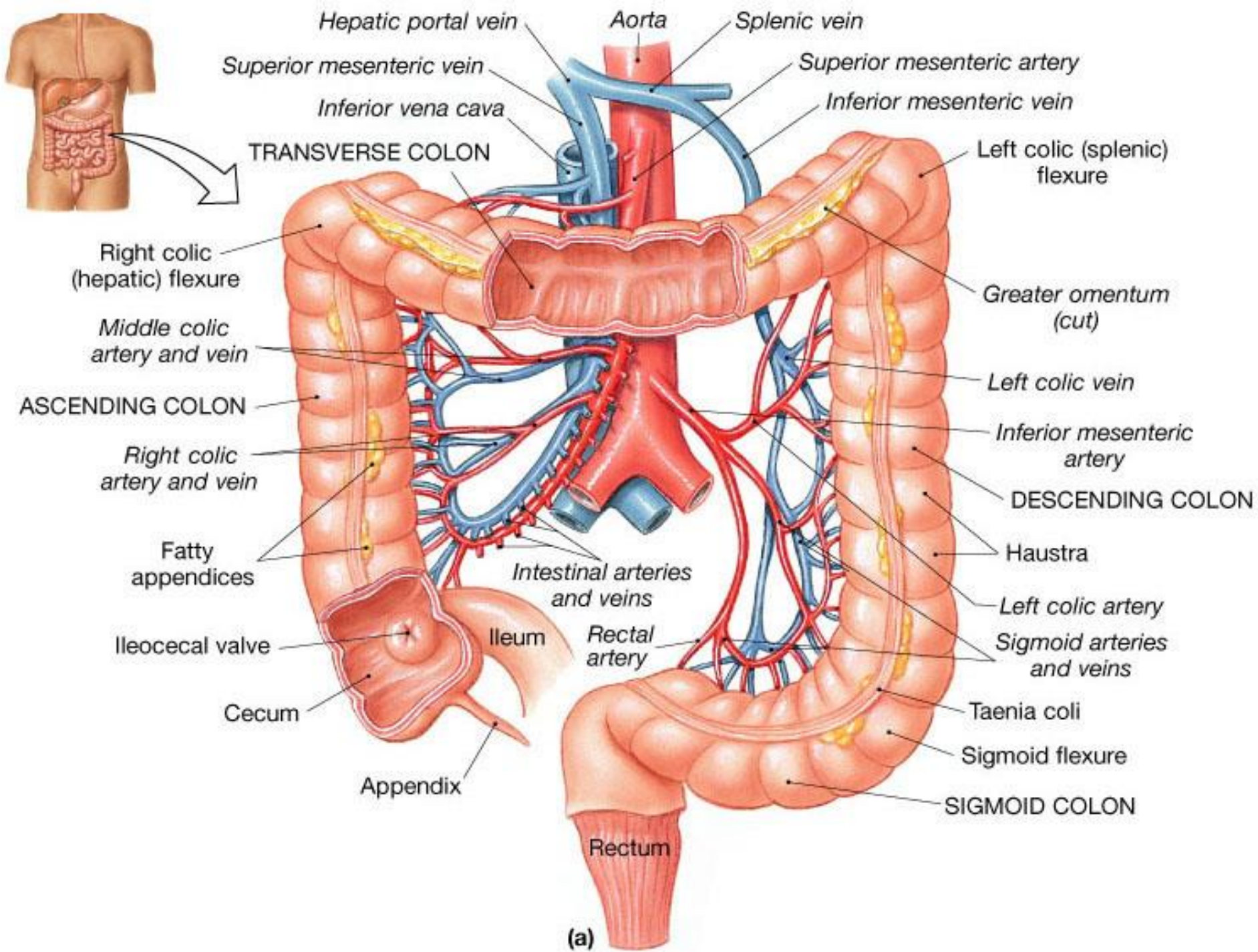
The veins correspond to the arteries and drain into the superior mesenteric vein.

# Blood supply of cecum



# Venous drainage of cecum





# Lymphatic Drainage of cecum

- The lymph vessels pass through several mesenteric nodes → finally reach the superior mesenteric nodes.

# Nerve Supply of cecum

- Branches from the sympathetic and parasympathetic (vagus) nerves form the superior mesenteric plexus.



# Ileocecal Valve

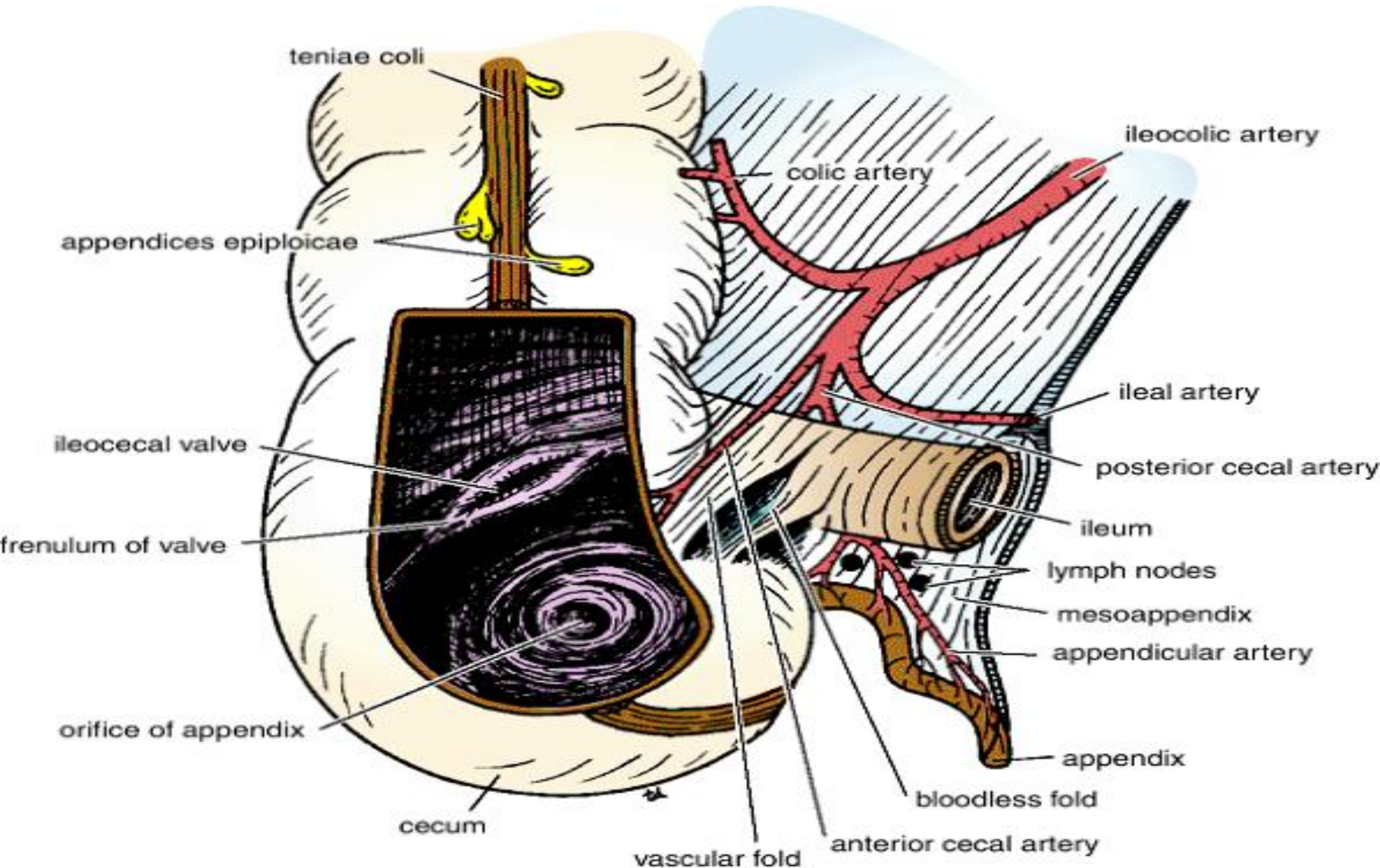
- A rudimentary structure
- consists of two horizontal folds of mucous membrane
- Project around the orifice of the ileum.
- The valve plays little or no part in the prevention of reflux of Cecal contents into the ileum.
- The circular muscle of the lower end of the ileum (called the ileocecal sphincter by physiologists) serves as a sphincter and controls the flow of contents from the ileum into the colon.
- The smooth muscle tone is reflexly increased when the cecum is distended; the **gastrin hormone**, which is produced by the stomach, causes relaxation of the muscle tone.

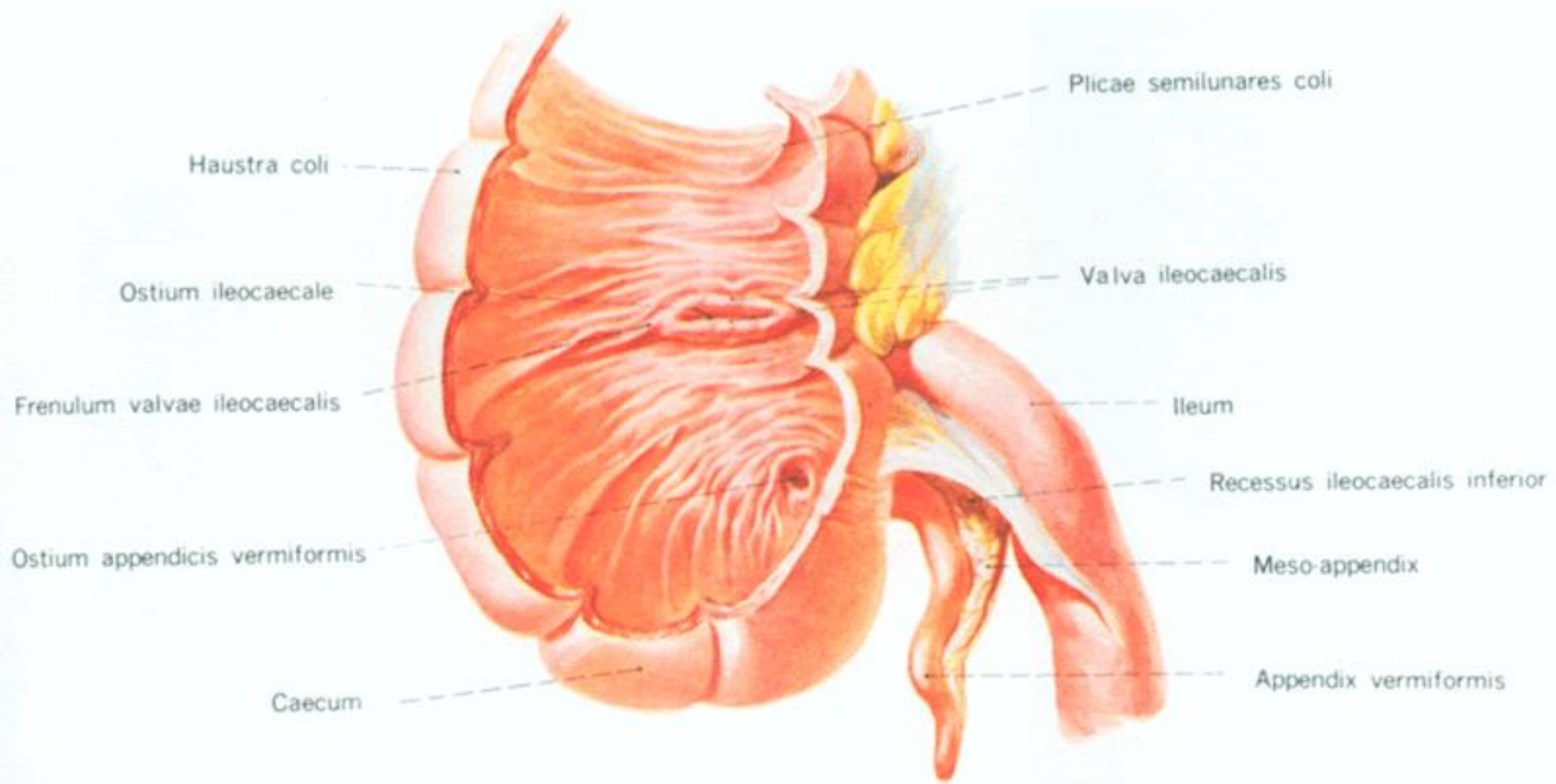
# Appendix

## Location and Description:

- It is a narrow, muscular tube
- containing a large amount of lymphoid tissue.
- It varies in length from 3 to 5 inch. (2 -22 cm).
- The base is attached to the posteromedial surface of the cecum about 1 inch. (2.5 cm) below the ileocecal junction .
- The remainder of the appendix is free.
- **Peritoneum:**
  - It has a complete peritoneal covering, which is attached to the mesentery of the small intestine by a short mesentery of its own, **the mesoappendix.**
  - The mesoappendix contains the appendicular vessels and nerves.

# APPENIX





# Appendix....cont

- **Position**

- The appendix lies in the right iliac fossa, and in relation to the anterior abdominal wall
  - 1- Retrocecal in retrocaecal recess behind cecum → in 74% of people
  - 2- pelvic: in pelvis related to Rt. Ovary and uterine tube → in 21% of people
  - 3- Subcaecal: below cecum → in 3.5%
  - 4- Preileal: in front of ileum → 1%
  - 5- Postileal: behind the ileum → 0.5%

- **Surface anatomy of appendix= McBurney's point**

- Its base is situated one third of the way up the line joining the right anterior superior iliac spine to the umbilicus
- To reach the appendix during operation follow the taenia coli which converge toward the appendix

# Blood Supply of appendix

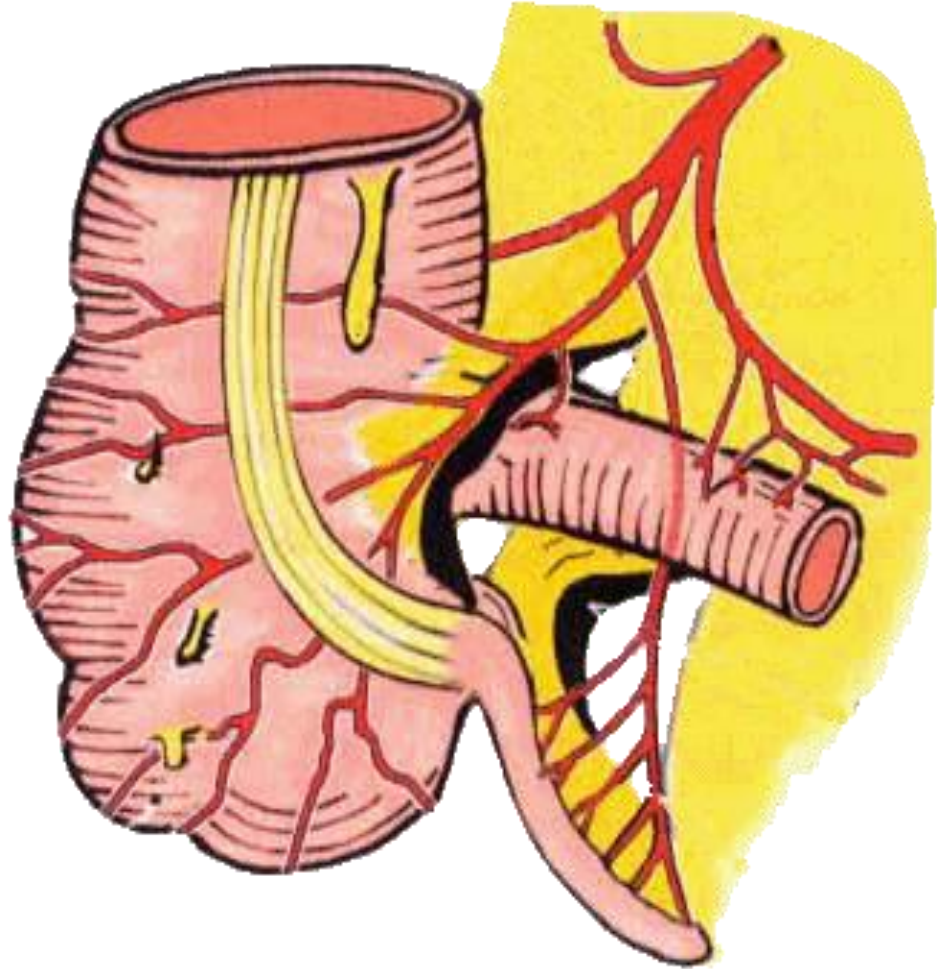
## Arteries

- The appendicular artery is a branch of the posterior cecal artery (ilio-cecal.a) which descends behind the ileum.

## Veins

- The appendicular vein drains into the posterior cecal vein.

- **Appendicular artery** runs in free margin of the mesoappendix



# Lymphatic Drainage of appendix

- The lymph vessels drain into one or two nodes lying in the mesoappendix → eventually into the superior mesenteric nodes.



# Nerve Supply of appendix

- The appendix is supplied by the sympathetic and parasympathetic (vagus) nerves from the superior mesenteric plexus.
- Afferent nerve fibers concerned with the conduction of visceral pain from the appendix accompany the sympathetic nerves and enter the spinal cord at the level of the 10th thoracic segment.
- The peritoneum over the appendix is innervated by the 10<sup>th</sup> intercostal nerve= **skin of umbilicus**

# Clinical notes

- Acute appendicitis → uncommon in the two extremes of life
- Thrombosis of appendicular .a → gangrene (just one artery for appendix) → perforation → Lt. paracolic gutter while in
- Acute cholecystitis → no gangrene (more than one artery supply the gallbladder)
- Appendectomy

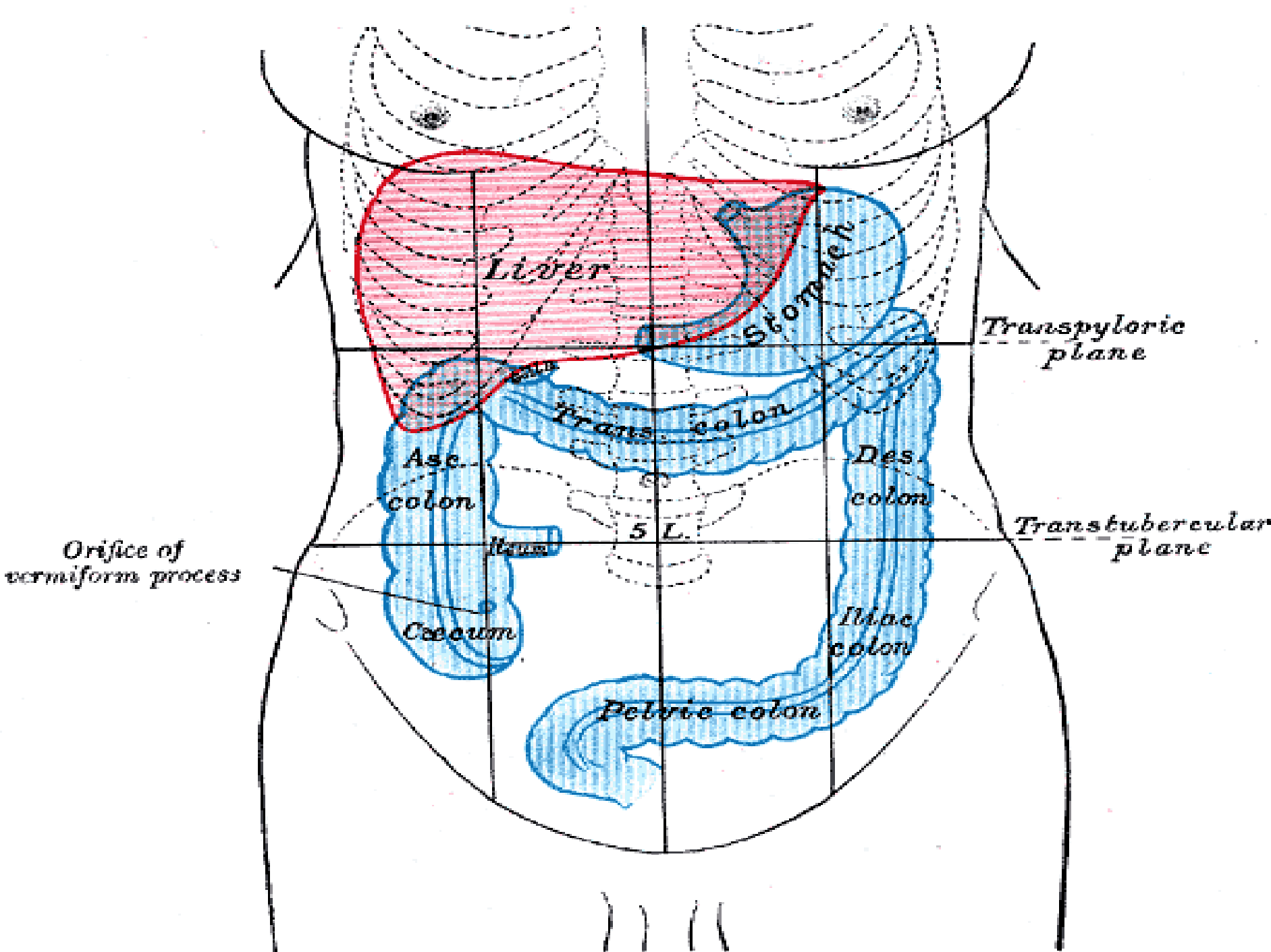
# Ascending Colon

## Location and Description:

- The ascending colon is about 5 inch. (13 cm) long
- lies in the right lower quadrant.
- It extends upward from the cecum to the inferior surface of the right lobe of the liver, where it turns to the left, **forming the right colic flexure**
- Then becomes continuous with the transverse colon.
- **Taenia coli, sacculation & appendices epiploica are present**

## The peritoneum

- Covers the front and the sides of the ascending colon
- Binding it to the posterior abdominal wall.



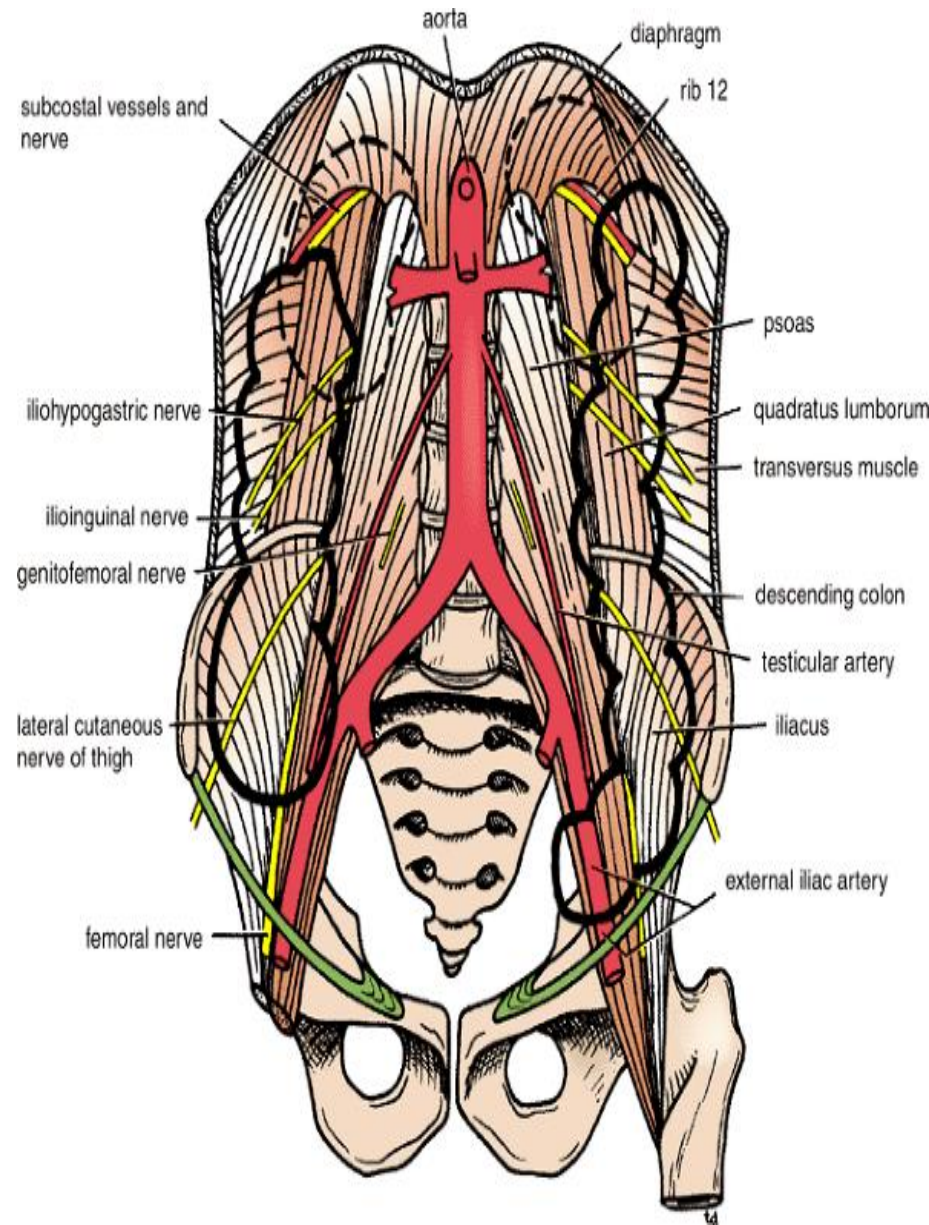
# Relations of ascending colon

- **Anteriorly:**

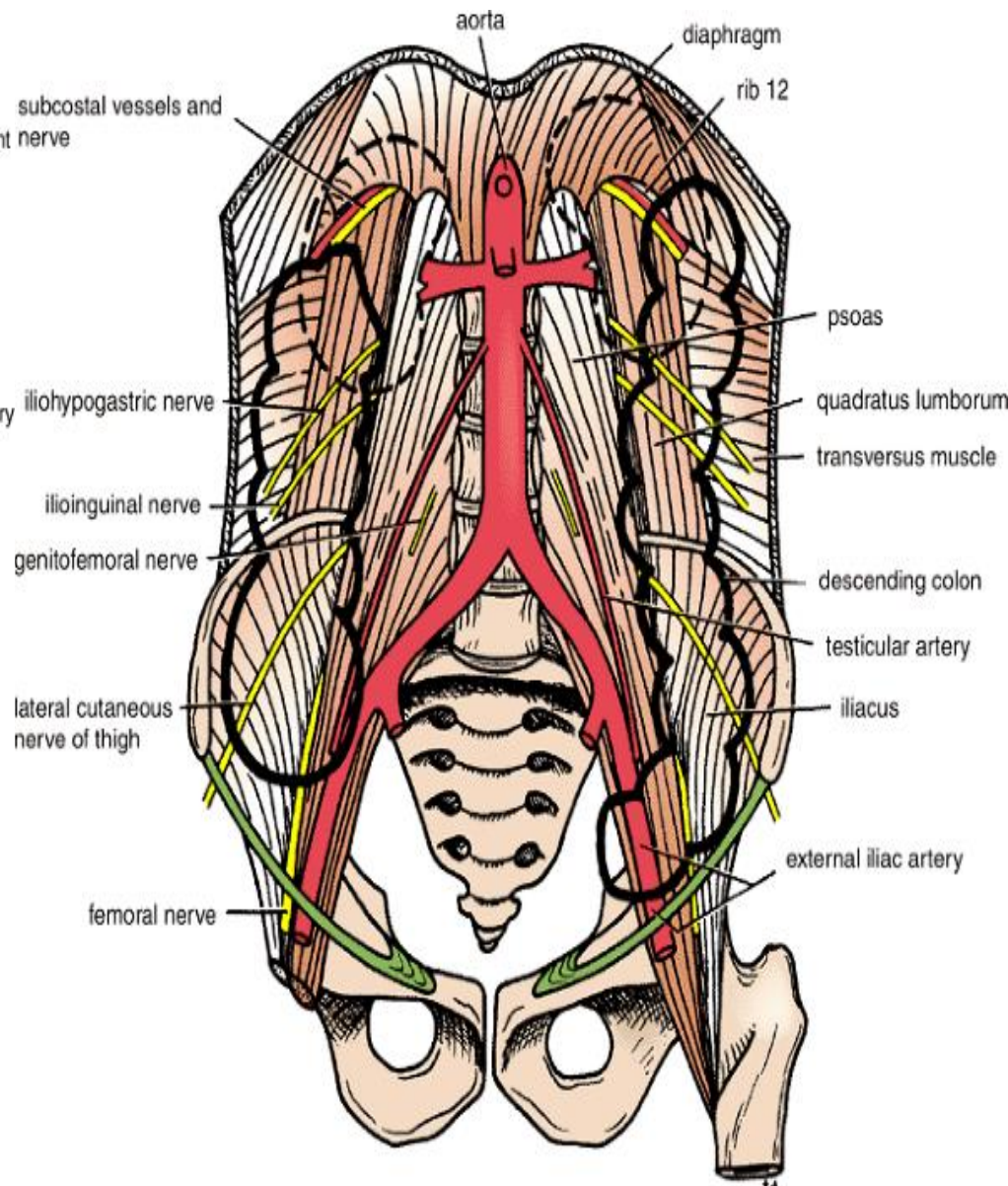
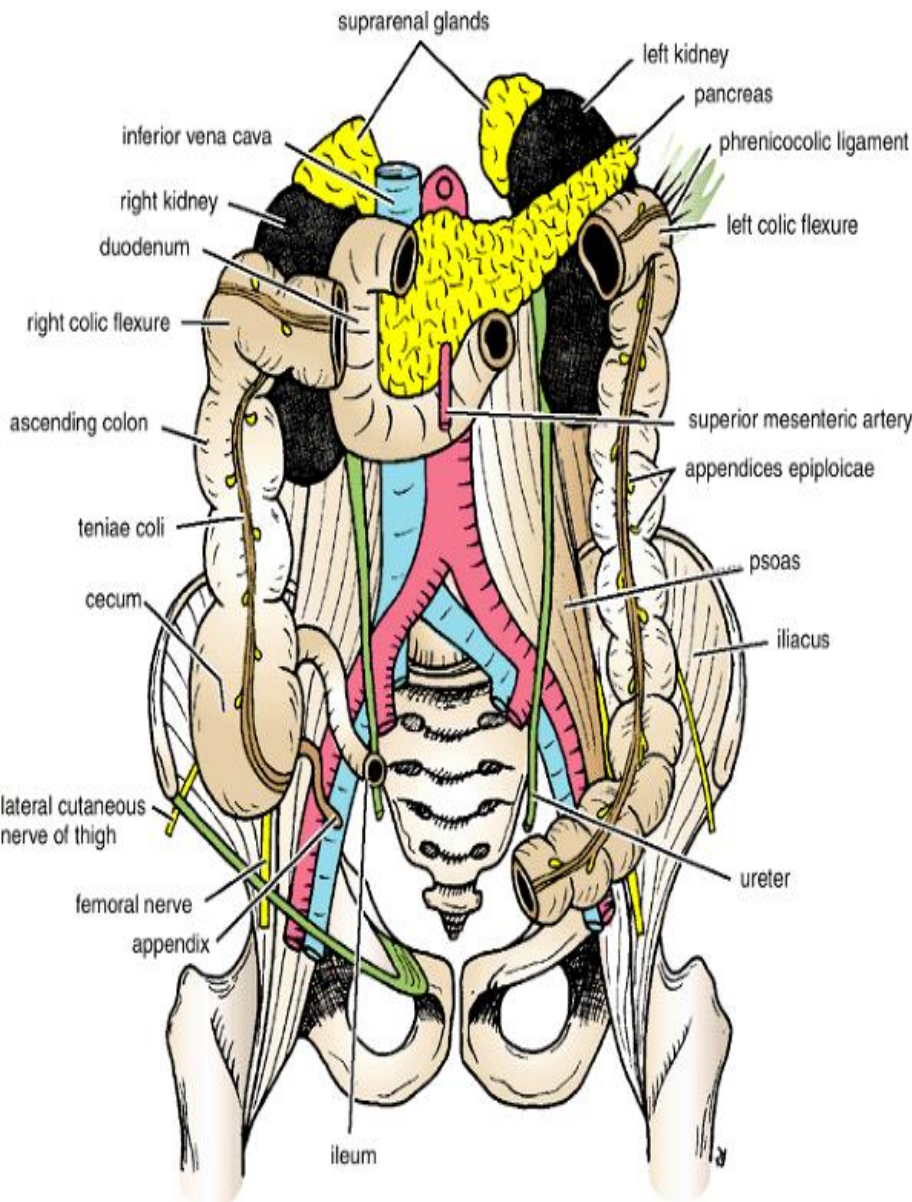
- Coils of small intestine
- The greater omentum
- The anterior abdominal wall

- **Posteriorly:**

- The iliacus
- The iliac crest
- The quadratus lumborum
- The origin of the transversus abdominis muscle,
- The lower pole of the right kidney.
- The iliohypogastric n.
- The ilioinguinal nerves cross behind it .



# Relations of ascending colon



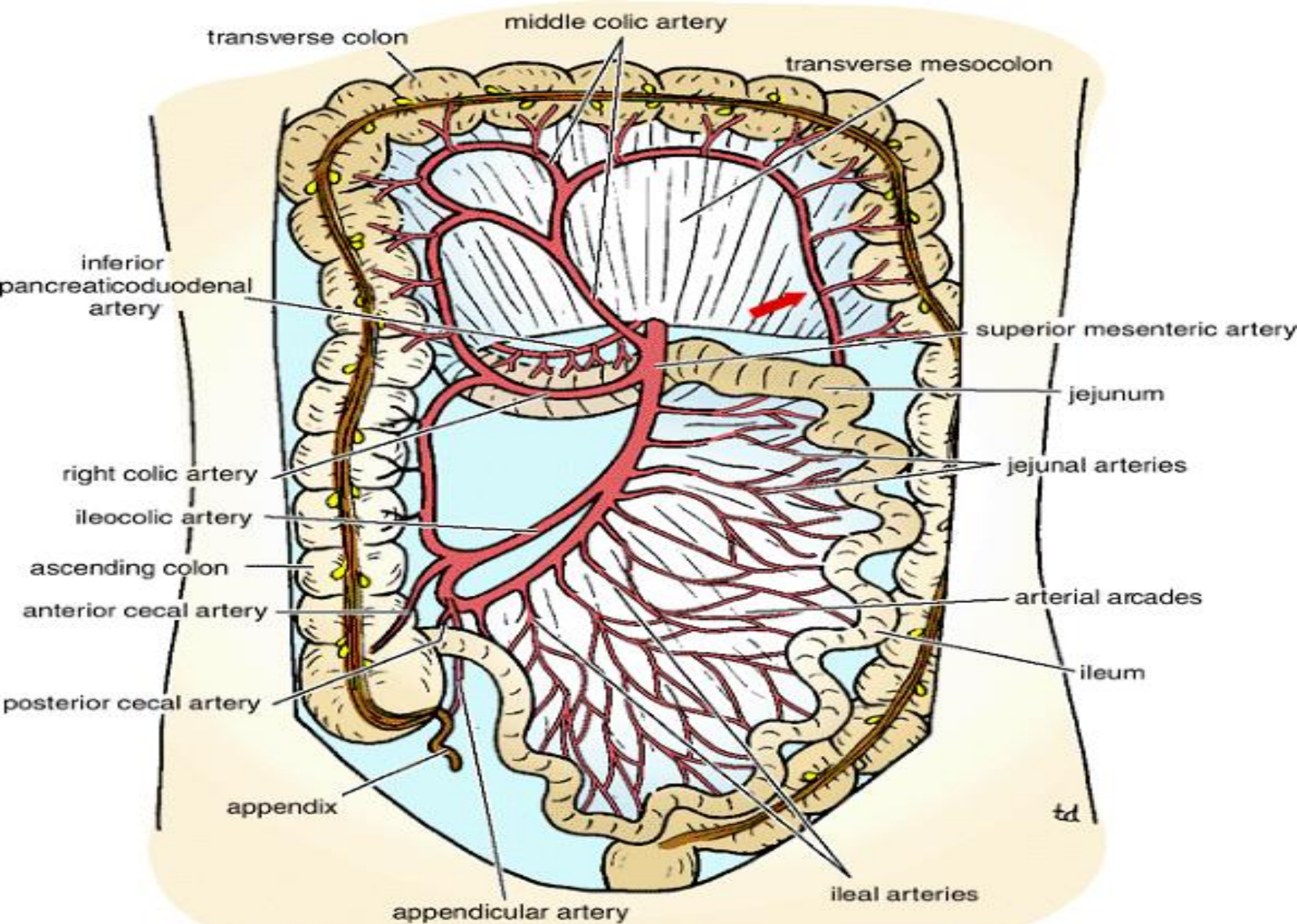
# Blood Supply of Ascending colon

## Arteries

- The ileocolic & right colic branches of the **superior mesenteric artery** supply this area.

## Veins

- The veins correspond to the arteries and drain into the superior mesenteric vein.

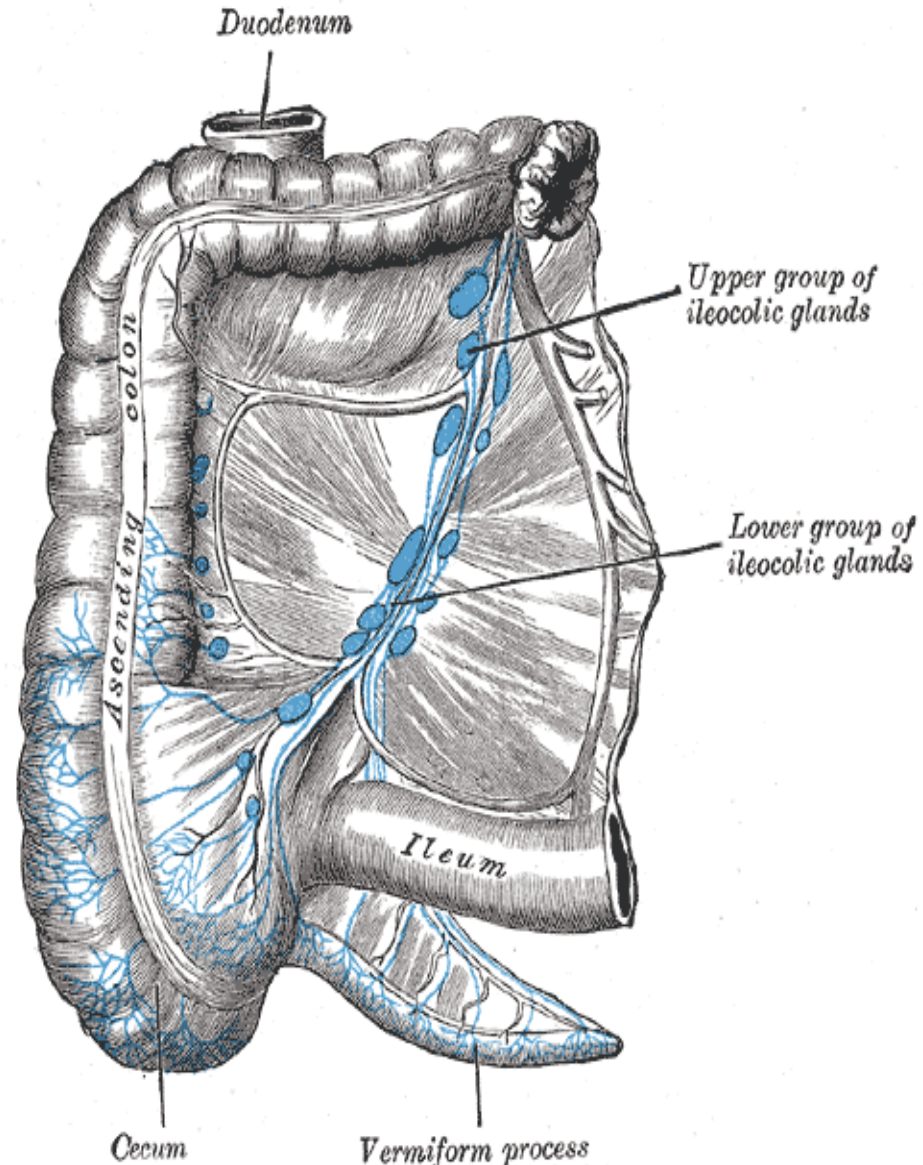
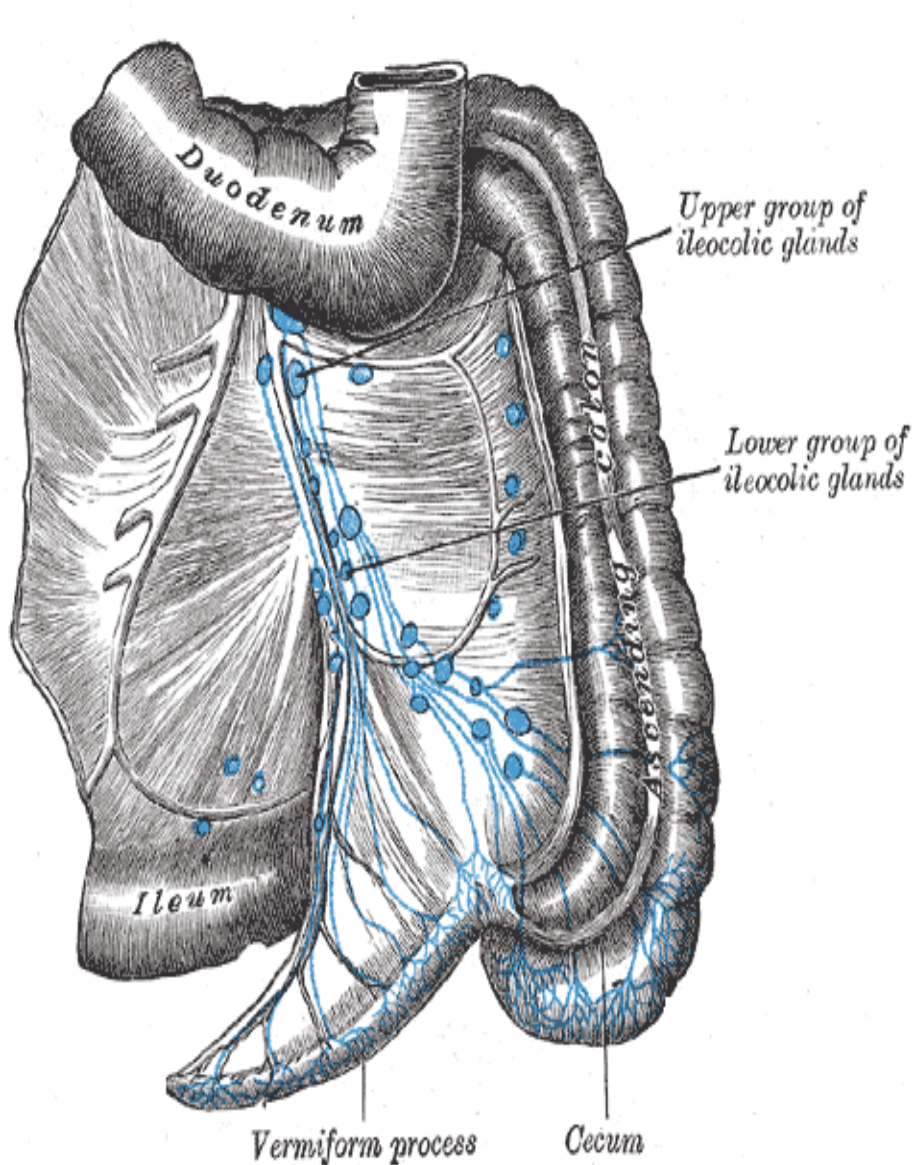




# Lymphatic drainage of Ascending colon

- The lymphatic vessels → lymph nodes lying along the course of the colic blood vessels → the superior mesenteric nodes.

# Lymphatic drainage



# Nerve Supply of ascending colon

- Sympathetic and parasympathetic (vagus) nerves from the superior mesenteric plexus .

*Transverse colon*

# Transverse Colon

## Location and Description

- The transverse colon is about 15 in. (38 cm) long
- extends across the abdomen
- occupying the umbilical region.
- It begins at the right colic flexure below the right lobe of the liver
- Hangs downward
- Suspended by the transverse mesocolon from the pancreas
- It then ascends to the left colic flexure below the spleen.
- The left colic flexure is higher than the right colic flexure and is suspended from the diaphragm by **the phrenicocolic ligament** .
- **Taenia coli, sacculation & appendices epiploica are present**

## **The transverse mesocolon**= mesentery of the transverse colon

- suspends the transverse colon from the anterior border of the pancreas .
- The mesentery is attached to the superior border of the transverse colon
- The posterior layers of the greater omentum are attached to the inferior border .
- The position of the transverse colon is extremely variable and may sometimes reach down as far as the pelvis.

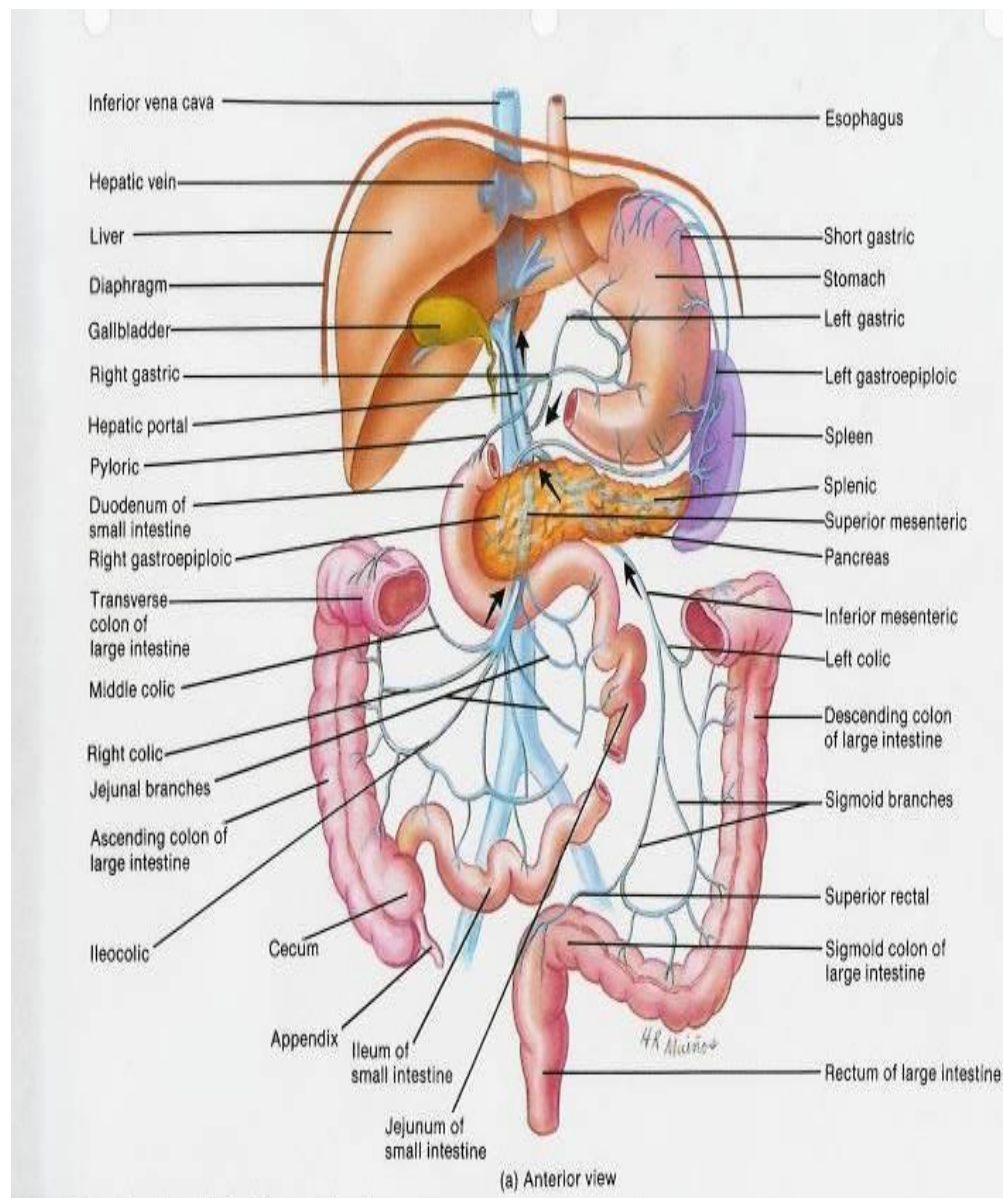
# Relations of Transverse colon

- **Anteriorly:**

- The greater omentum
- The anterior abdominal wall (umbilical and hypogastric regions)

- **Posteriorly:**

- The second part of the duodenum
- The head of the pancreas
- The coils of the jejunum and ileum



# Blood Supply of transverse colon

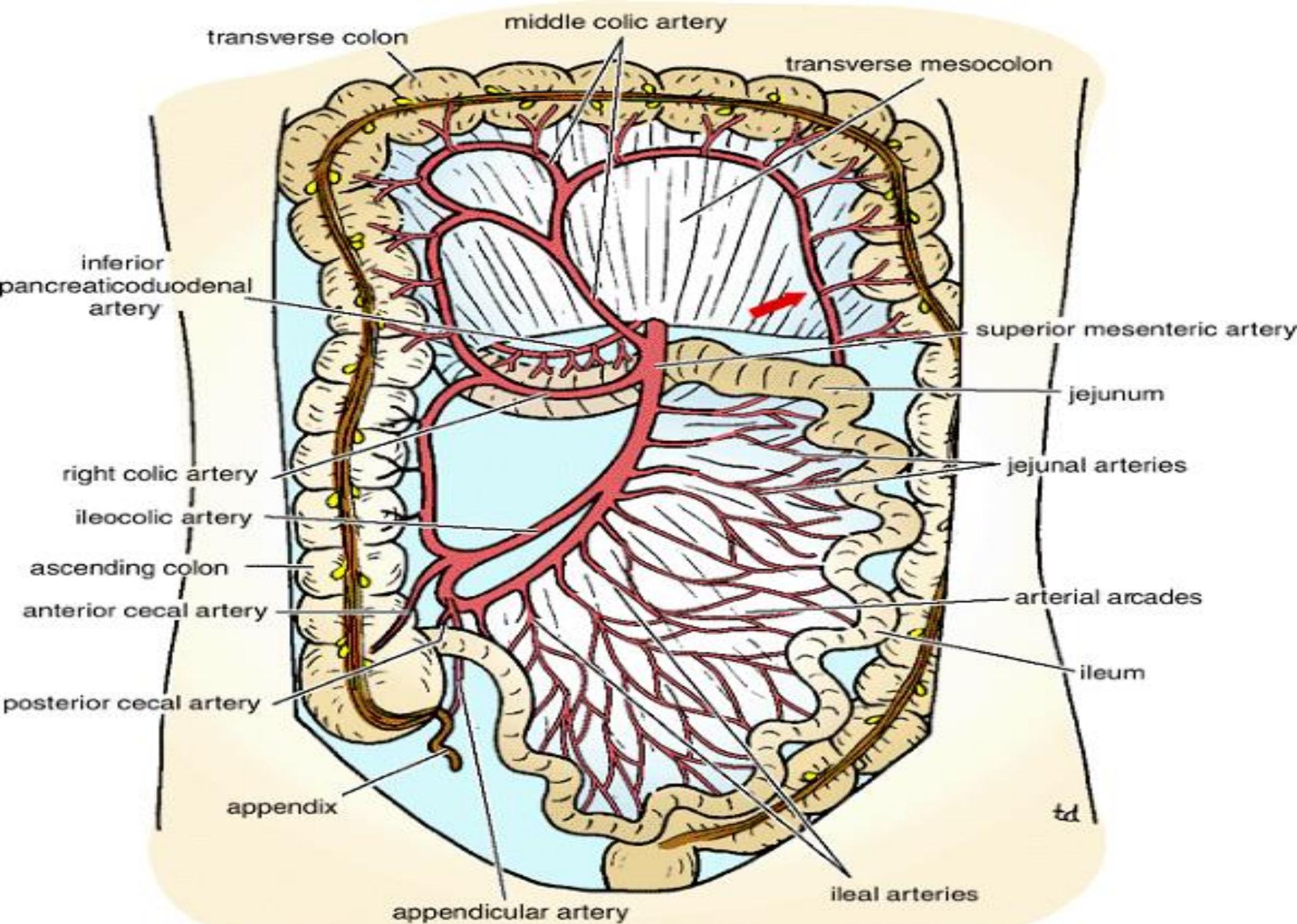
- **Arteries:**

- The proximal two thirds are supplied by the middle colic artery → a branch of the superior mesenteric artery.
- The distal third is supplied by the left colic artery → a branch of the inferior mesenteric artery .

## **Veins**

- The veins correspond to the arteries and drain into the superior & inferior mesenteric veins.





# Lymphatic Drainage of transverse colon

- The proximal two thirds drain → the colic nodes and then into the superior mesenteric nodes
- The distal third drains → the colic nodes → the inferior mesenteric nodes.

# Nerve Supply of transverse colon

- The proximal two thirds are innervated by sympathetic and vagal nerves through the **superior mesenteric plexus**
- The distal third is innervated by sympathetic and parasympathetic pelvic splanchnic nerves through **the inferior mesenteric plexus.**

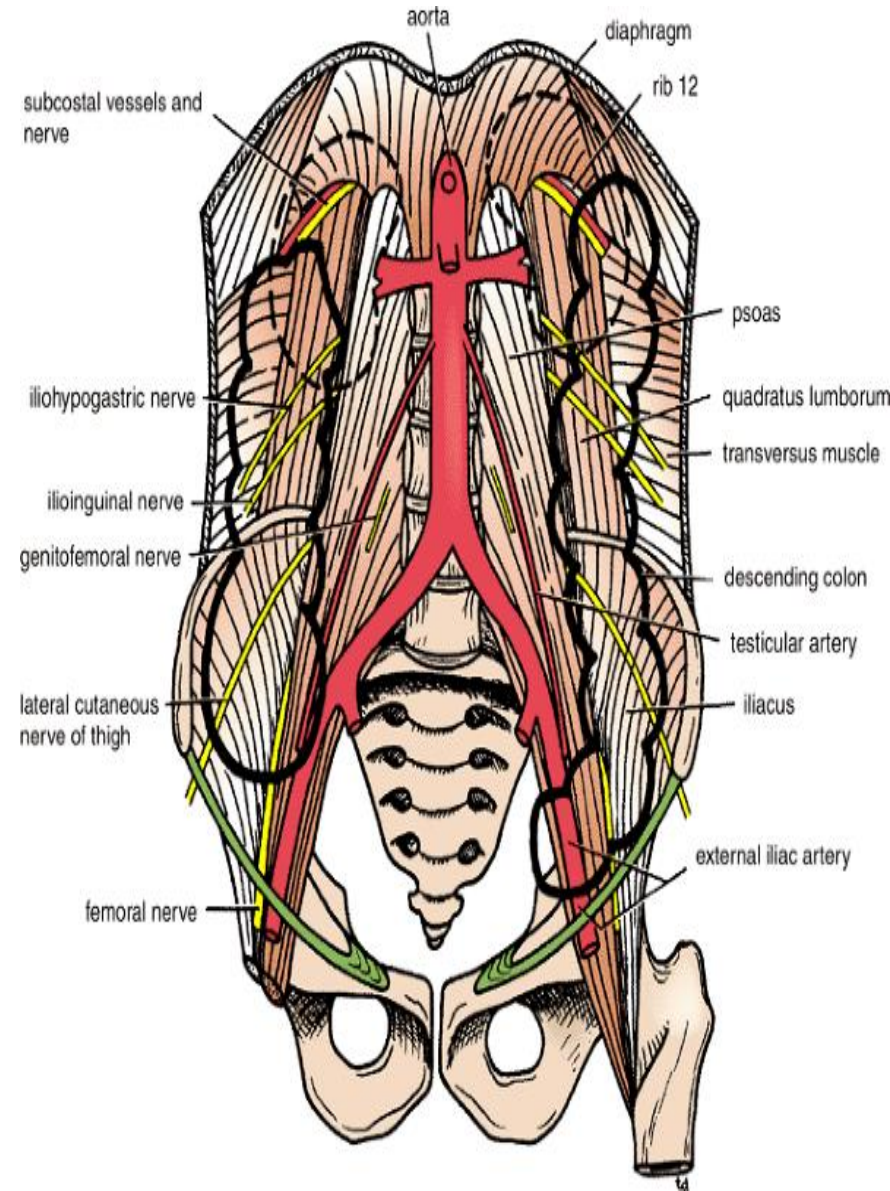
# Descending Colon

## Location and Description:

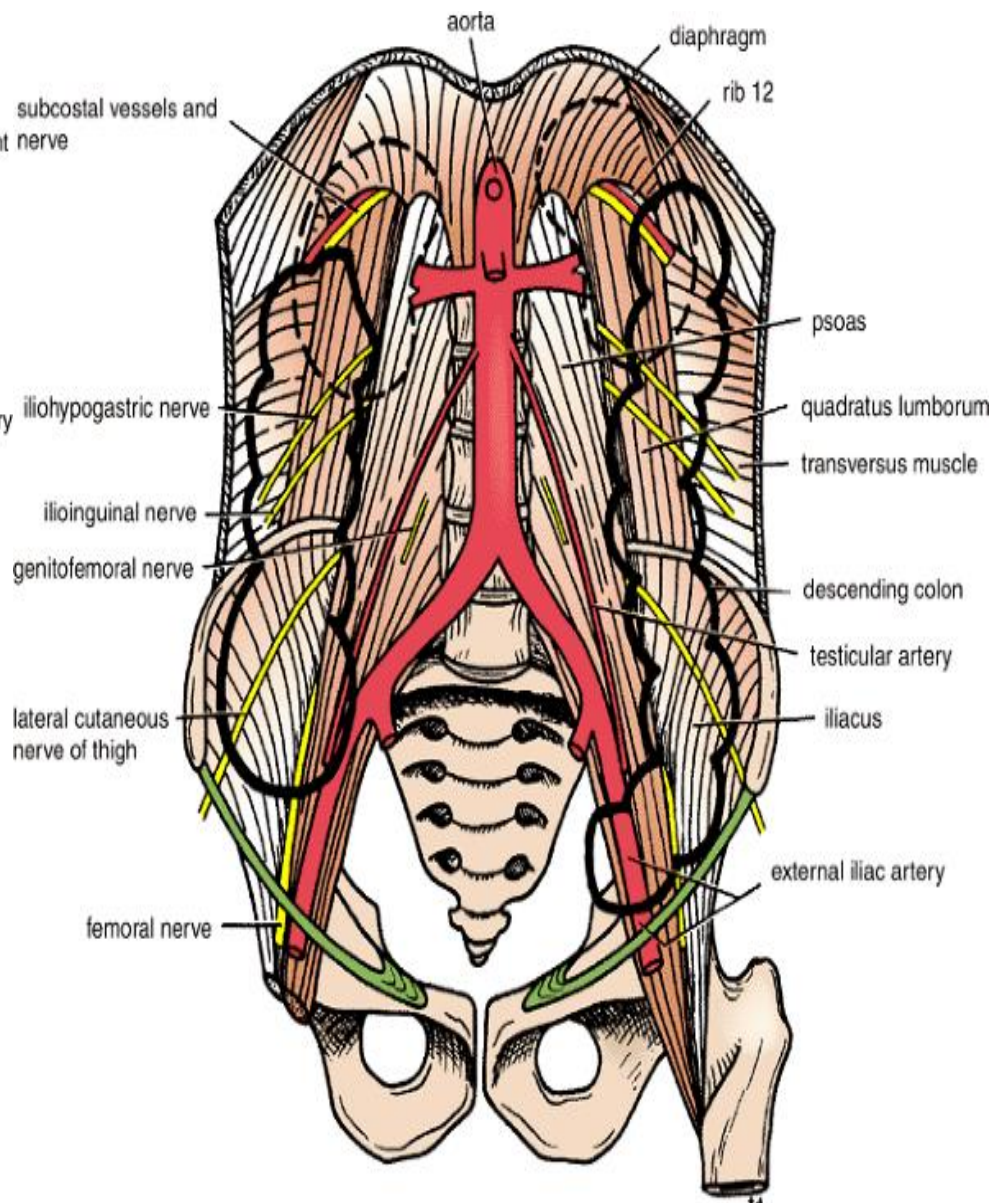
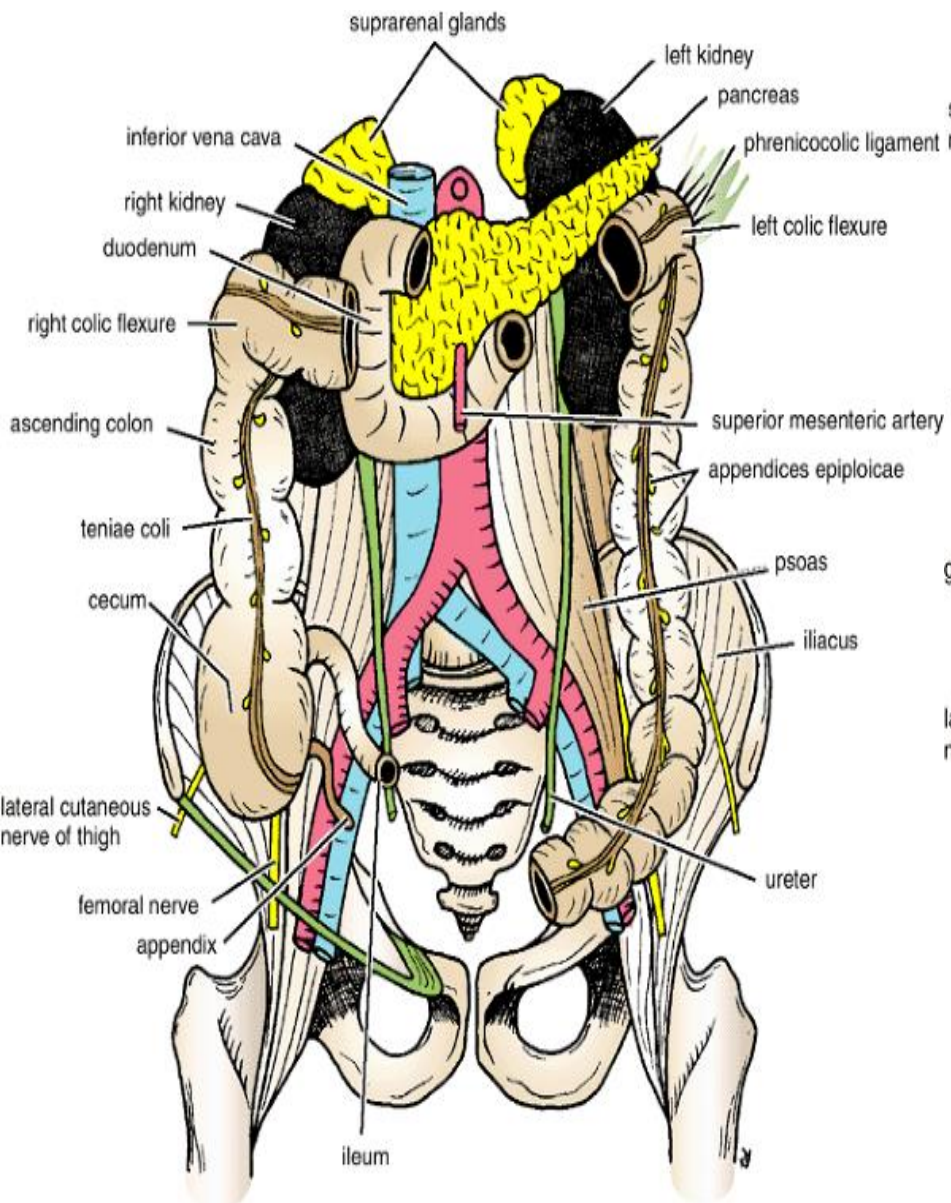
- The descending colon is about 10 in. (25 cm) long
- It extends downward from the left colic flexure, to the pelvic brim, where it becomes continuous with the sigmoid colon.
- Taenia coli, sacculations & appendices epiploica are present
- **The peritoneum**
  - Covers the front and the sides and binds it to the posterior abdominal wall.

# Relations of Descending colon

- **Anteriorly:**
  - Coils of small intestine
  - the greater omentum
  - the anterior abdominal wall
- **Posteriorly:**
  - The lateral border of the left kidney
  - the origin of the transversus abdominis muscle
  - the quadratus lumborum
  - the iliac crest
  - the iliacus
  - the left psoas
  - The iliohypogastric and the ilioinguinal nerves
  - the lateral cutaneous nerve of the thigh
  - the femoral nerve



# Relations of Descending colon



# Blood Supply of Descending colon

- **Arteries**

- The left colic and the sigmoid branches of the inferior mesenteric artery.

- **Veins**

- The veins correspond to the arteries → drain into the inferior mesenteric vein.

# Lymphatic Drainage of descending colon

- Lymphatic drains → the colic lymphatic nodes & the inferior mesenteric nodes around the origin of the inferior mesenteric artery.



# Nerve Supply of descending colon

- The nerve supply is the sympathetic and parasympathetic pelvic
- Splanchnic nerves through the inferior mesenteric plexus