
بسم الله الرحمن الرحيم
Way2Raed

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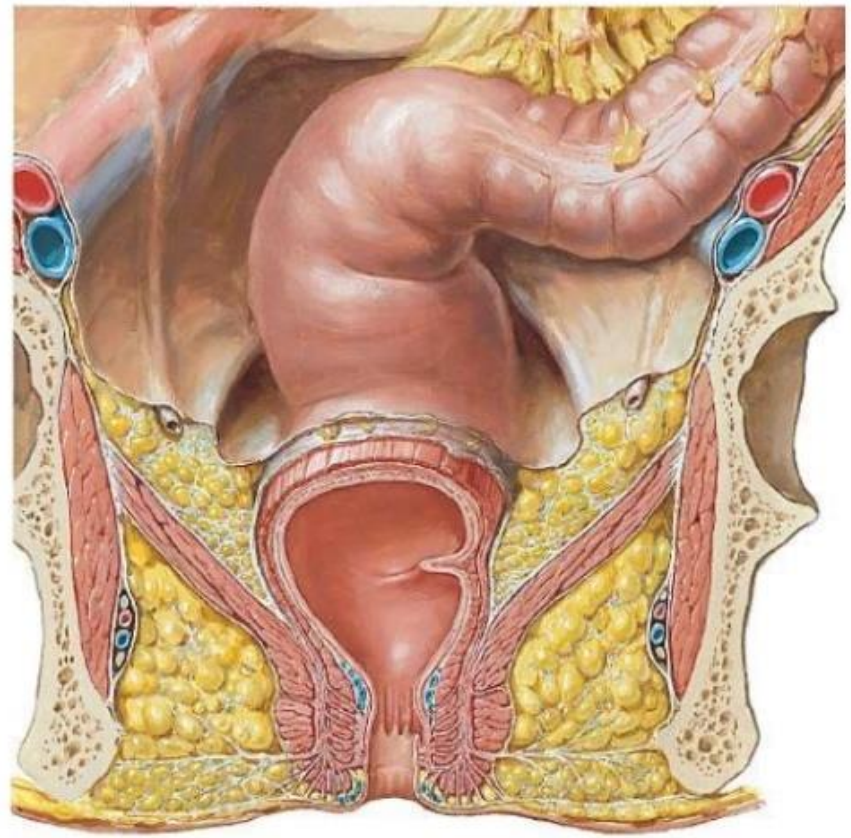
Objectives

- **Rectum**
  - Introduction
  - Course
  - Measurements
  - Curvatures
  - Relations
  - Structure
  - Blood supply
  - Nerve supply
  - Applied

Rectum

- Lower dilated part of large gut lies in pelvis
- B/w Sigmoid colon and Anal canal
- Devoid of taenia coli, sacculations, appendices epiploicae and mesentery



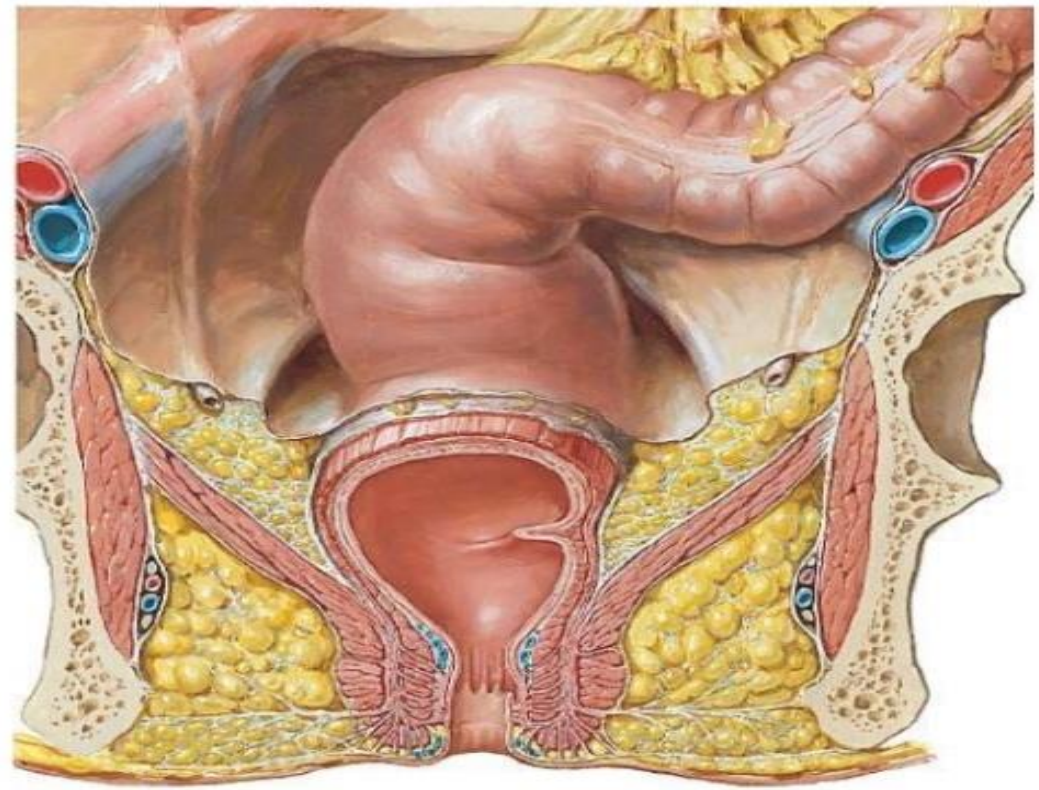
RECTUM

Location and Description

- The rectum is about 5 in. (13 cm) long and begins in front of the third sacral vertebra as a continuation of the sigmoidcolon. It passes downward, following the curve of the sacrum and coccyx, and ends in front of the tip of the coccyx by piercing the pelvic diaphragm and becoming continuous with the anal canal. The lower part of the rectum is dilated to form the **rectal ampulla.**

Rectum - Measurements

- Length = 12cm
- Breadth = 4cm
- Lower dilated part – Ampulla
- When empty – Transverse slit



RECTUM

Location and Description

The rectum deviates to the left, but it quickly returns to the median plane . On lateral view, the rectum follows the anterior concavity of the sacrum before bending downward and backward at its junction with the anal canal

The puborectalis portion of the levator ani muscles forms a sling . at the junction of the rectum with the anal canal and pulls this part of the bowel forward, producing the anorectal angle.

Rectum – Extent & Course

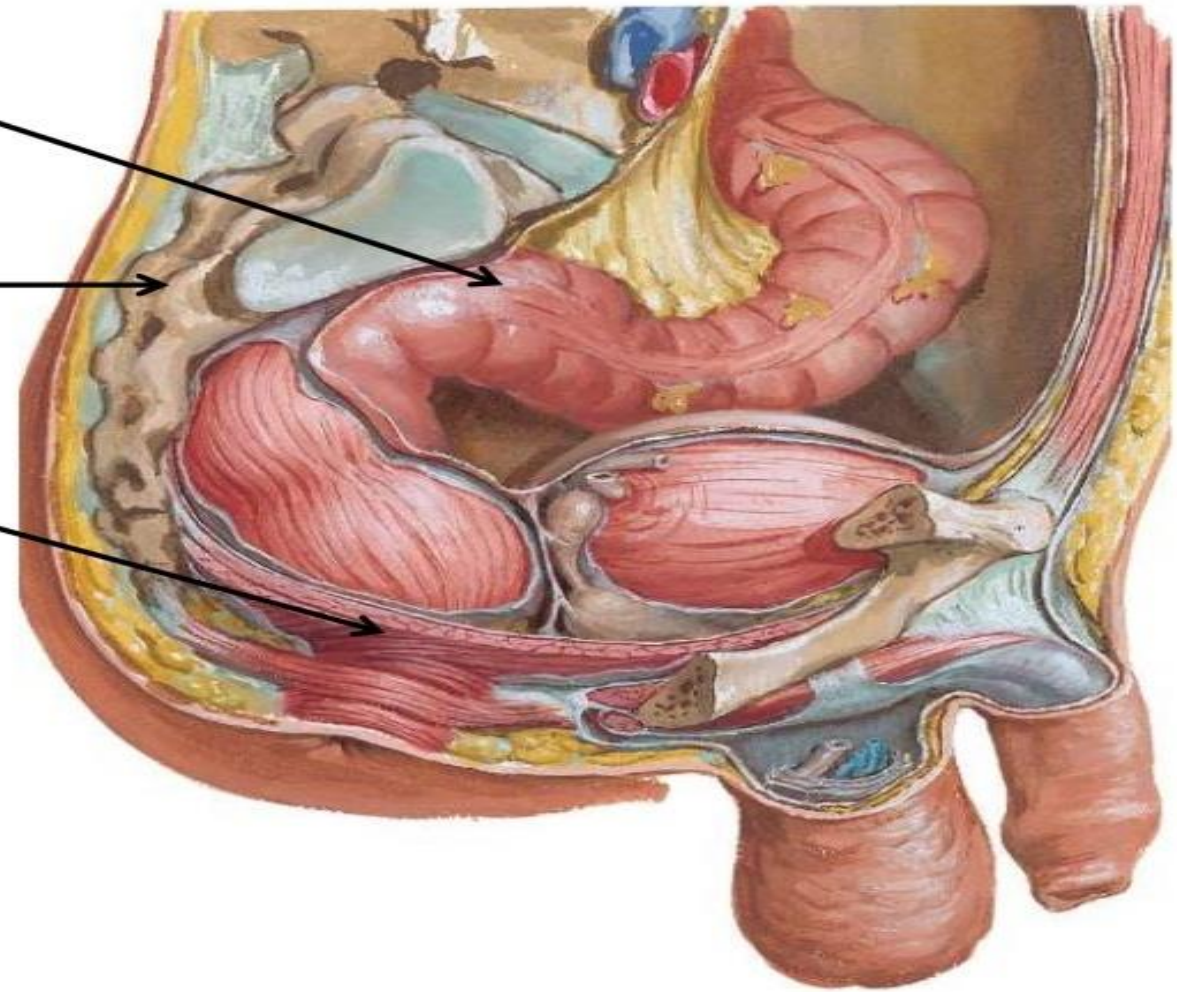
Begins as continuation of sigmoid colon

Opposite S3

Ends at a point: 2-3cm in front & little below tip of coccyx

Ano-rectal Junction

Lies at level of apex of prostate




Rectum
S3
Sacral flexure
Anorectal flexure
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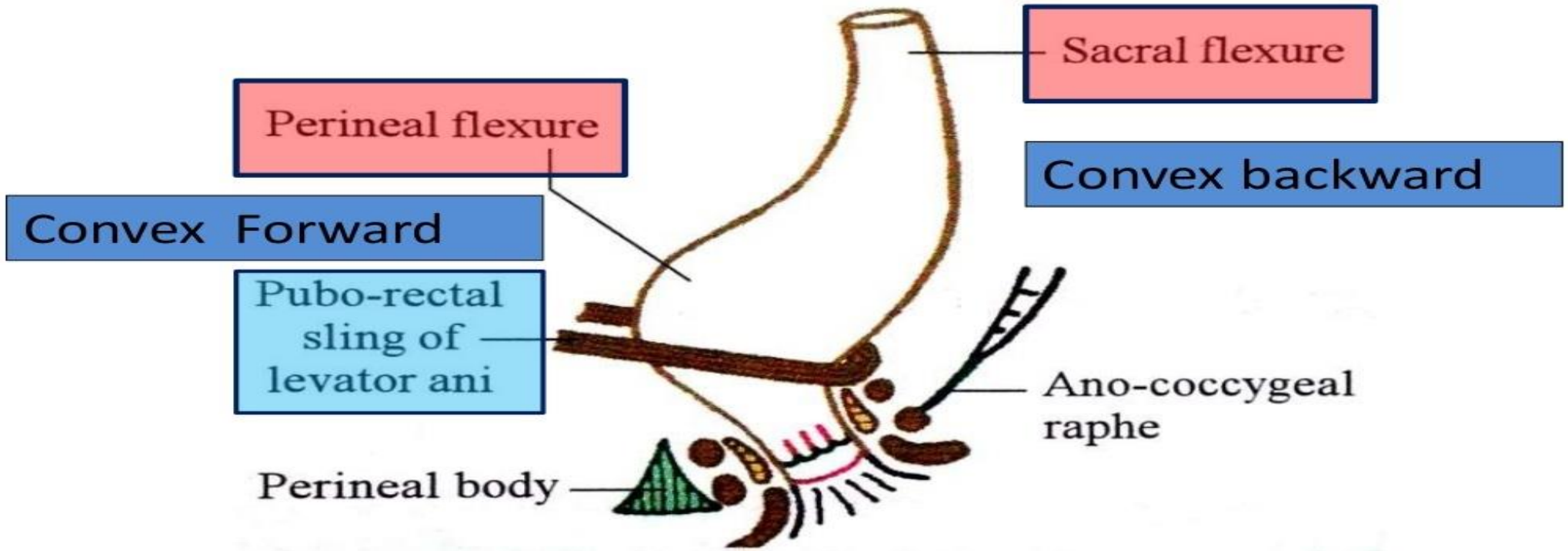
Rectum - Curvatures

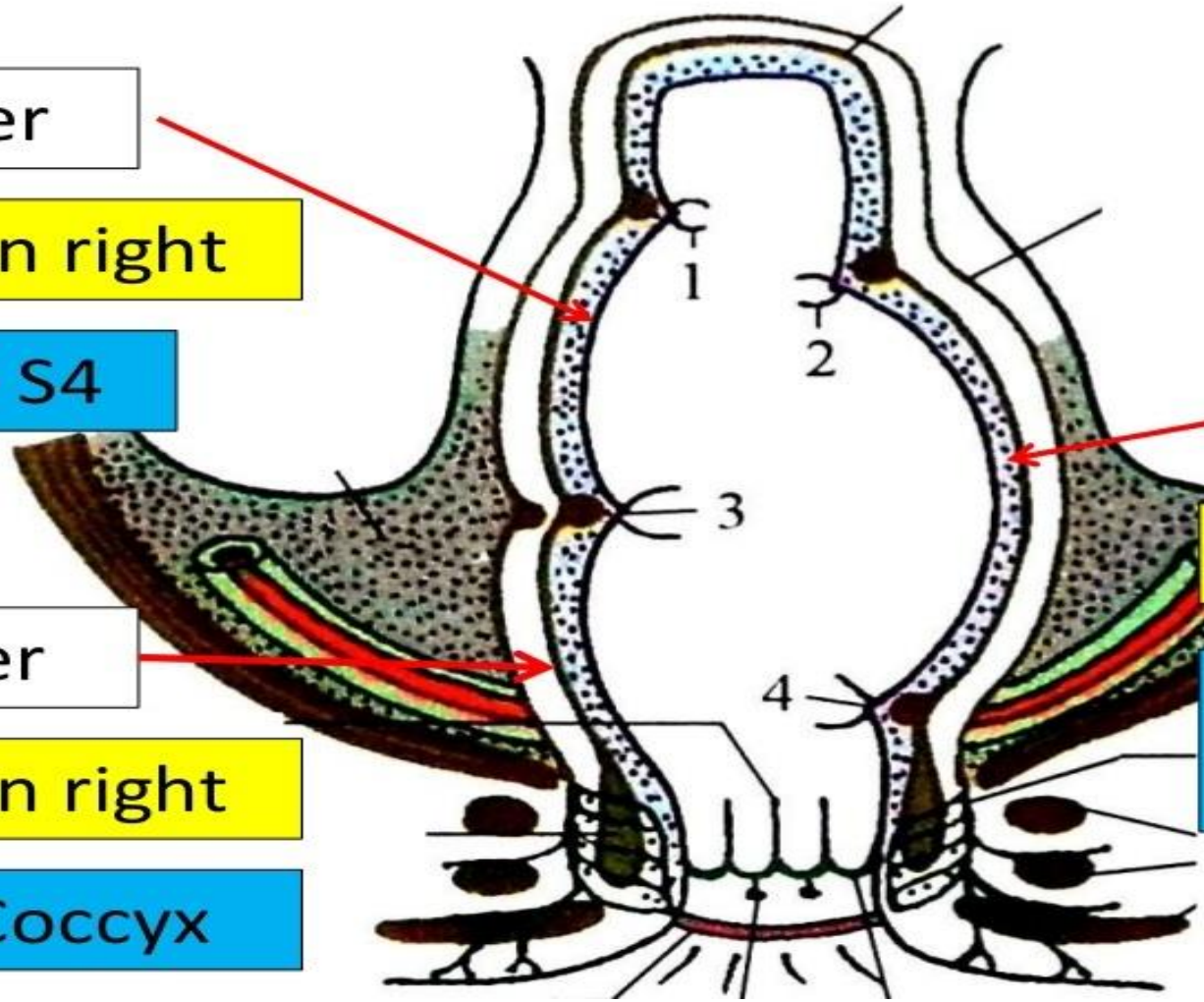
- 2 types :- Antero-posterior & Lateral

Antero-posterior Curves



Rectum - Curvatures

Lateral Curves



Upper

Convex on right

S3 – S4

Middle

Convex on Left

Sacro-coccygeal Junction

Lower

Convex on right

Tip of Coccyx

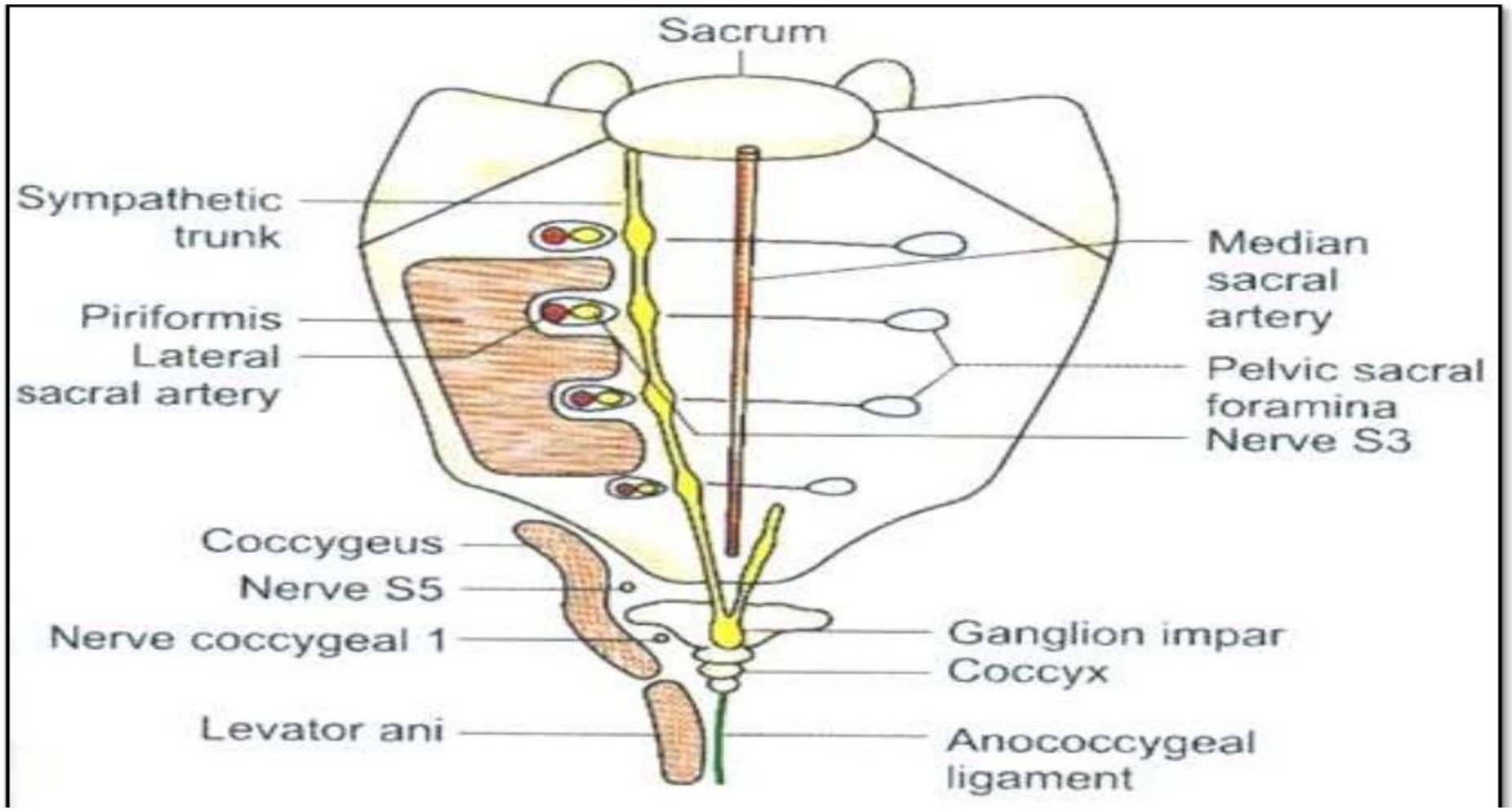
RELATIONS

Relations

- **■■ Posteriorly:**
- The rectum is in contact with the sacrum and
- coccyx;
- the piriformis, coccygeus,
- levator ani muscles;
- the sacral plexus;
-
- the sympathetic trunks.

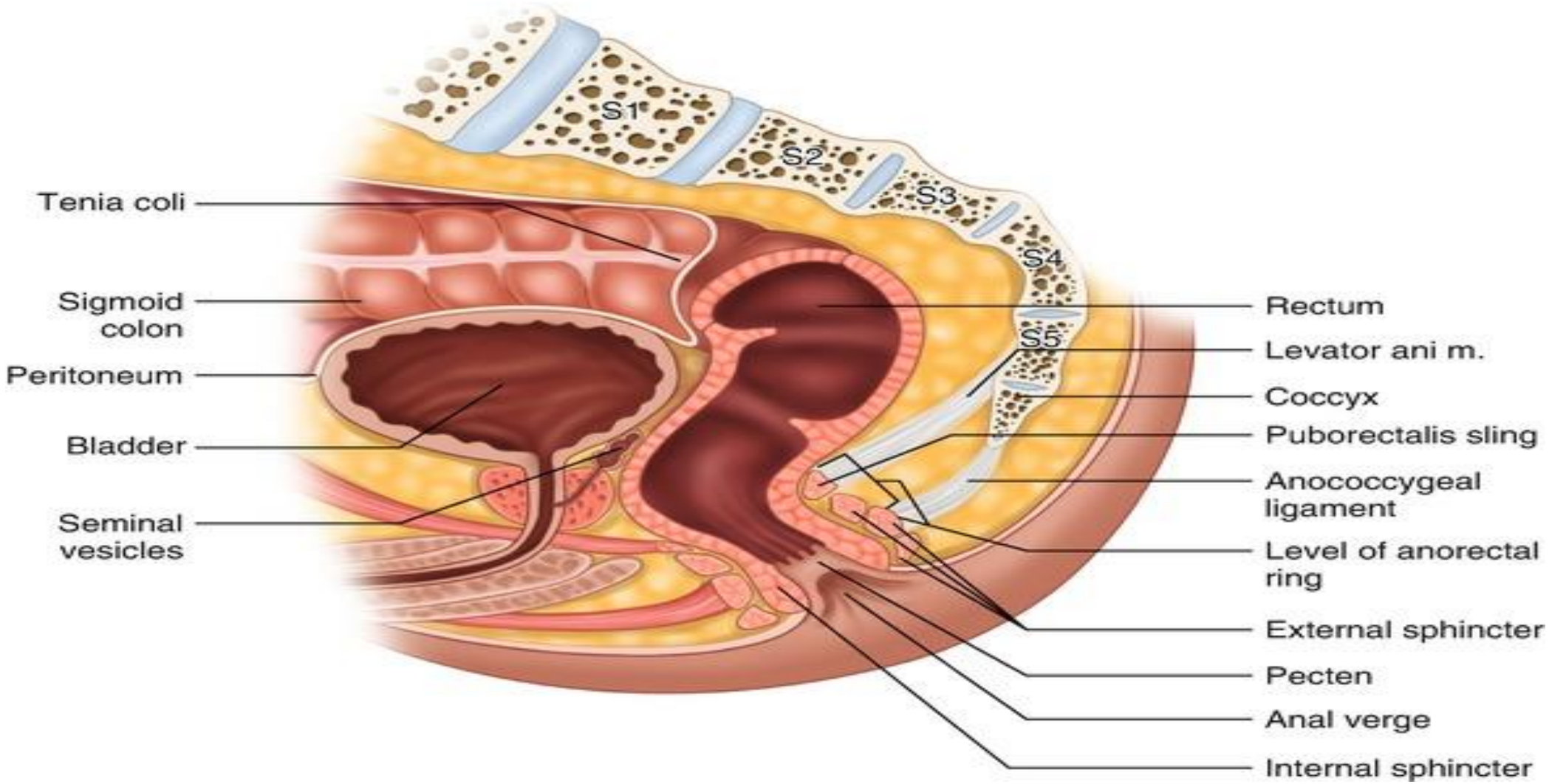
Relations

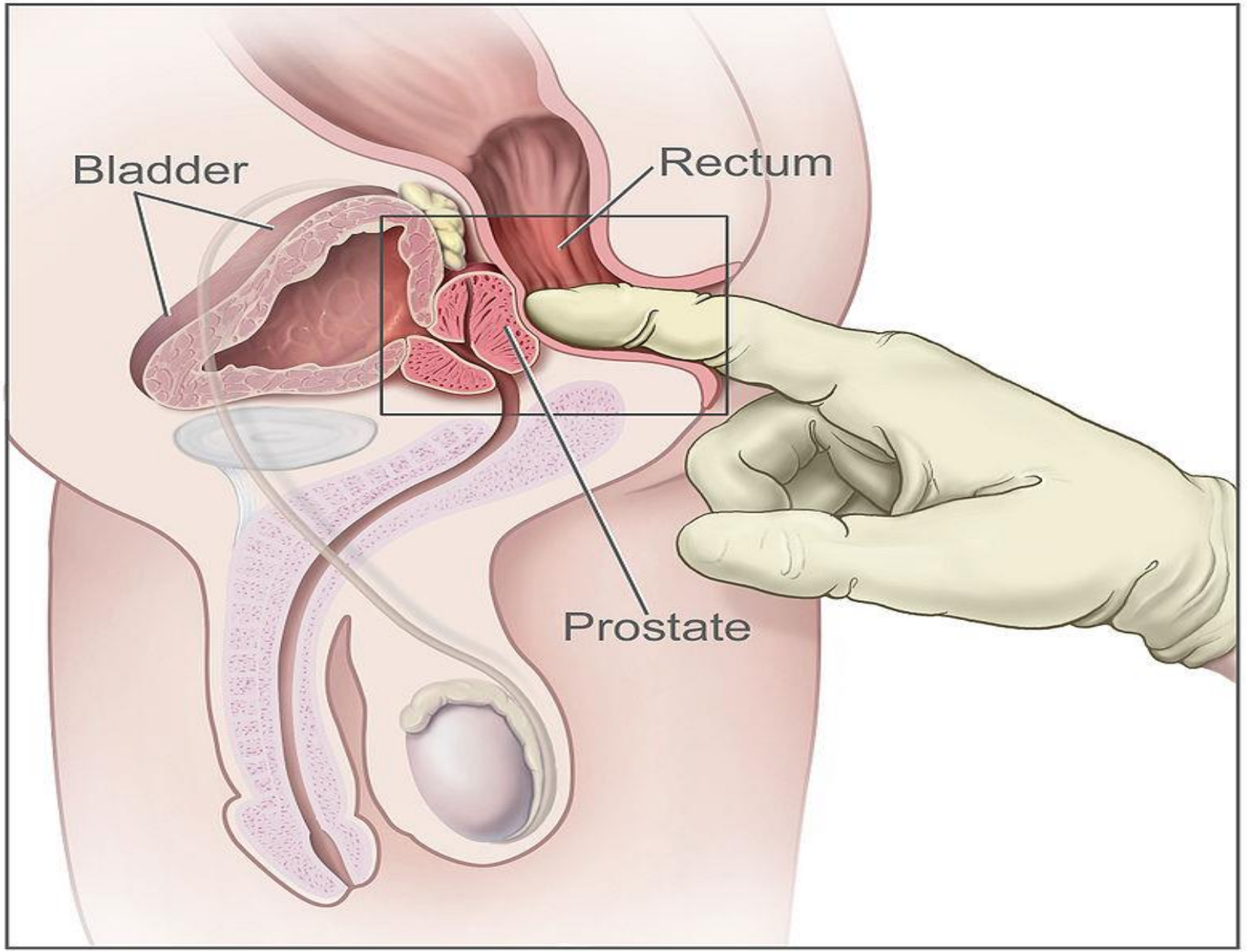
General Relations - Posterior

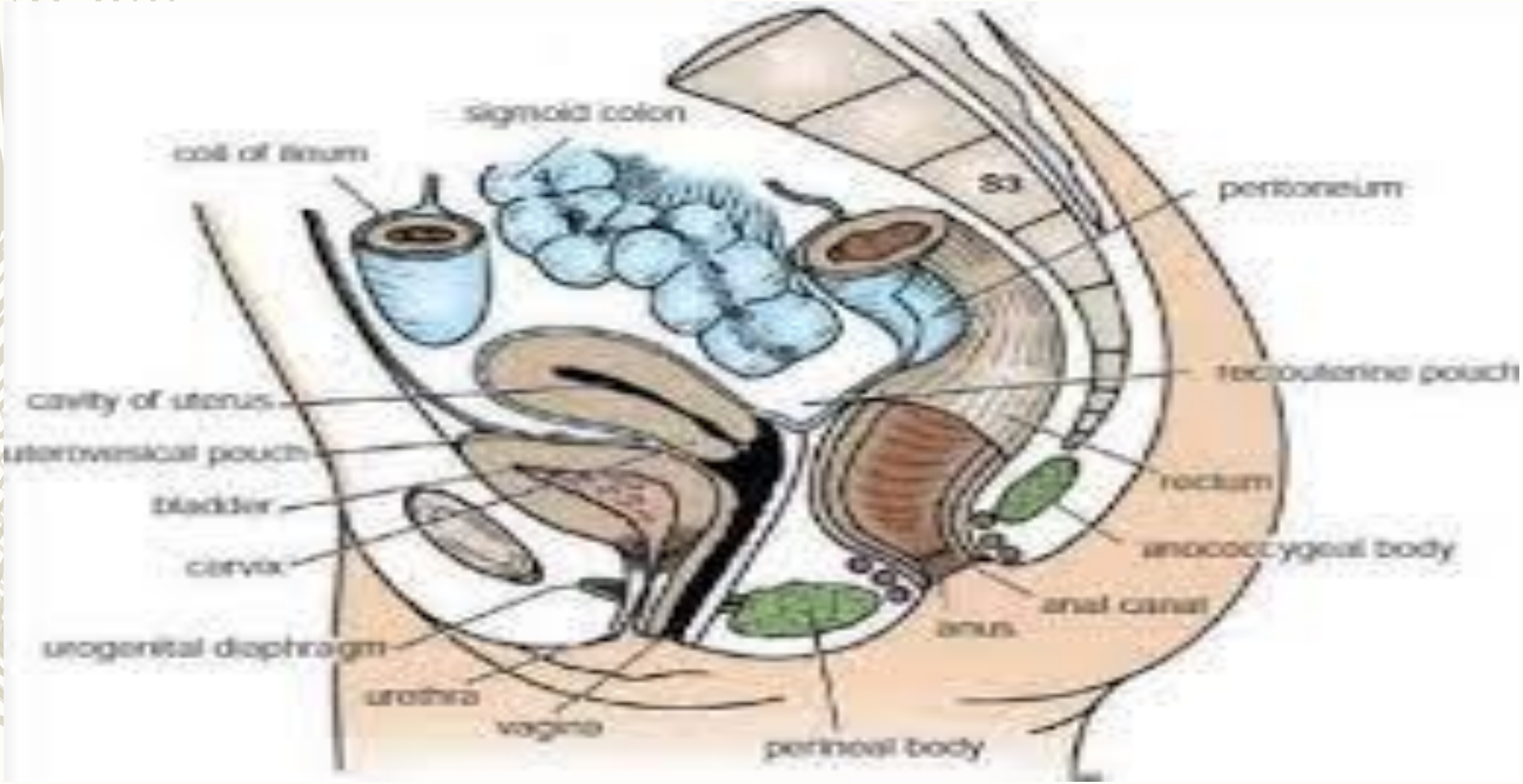


RELATIONS

- ■■ **Anteriorly: In the male,** the upper two thirds of the rectum, which is covered by peritoneum, is related to the sigmoid colon and coils of ileum that occupy the rectovesical pouch. The lower third of the rectum, which is devoid of peritoneum, is related to the posterior surface of the bladder, to the termination of the vas deferens and the seminal vesicles on each side, and to the prostate
- .**In the female,** the upper two thirds of the rectum, which is covered by peritoneum, is related to the sigmoid colon and coils of ileum that occupy the rectouterine pouch (pouch of Douglas). The lower third of the rectum, which is devoid of peritoneum, is related to the posterior surface of the vagina


S1
S2
S3
S4
S5
Tenia coli
Sigmoid colon
Peritoneum
Bladder
Seminal vesicles
Rectum
Levator ani m.
Coccyx
Puborectalis sling
Anococcygeal ligament
Level of anorectal ring
External sphincter
Pecten
Anal verge
Internal sphincter


Bladder
Rectum
Prostate


sigmoid colon
coil of ileum
S3
peritoneum
rectouterine pouch
cavity of uterus
uterovesical pouch
bladder
cervix
rectum
anococcygeal body
anal canal
anus
urogenital diaphragm
urethra
vagina
perineal body

RECTUM

Location and Description

The **peritoneum** covers the anterior and lateral surfaces of the first third of the rectum and only the anterior surface of the middle third, leaving the lower third devoid of peritoneum . The **muscular coat** of the rectum is arranged in the usual outer longitudinal and inner circular layers of smooth muscle. The three teniae coli of the sigmoid colon, however, come together so that the longitudinal fibers form a broad band on the anterior and posterior surfaces of the rectum.

Relations

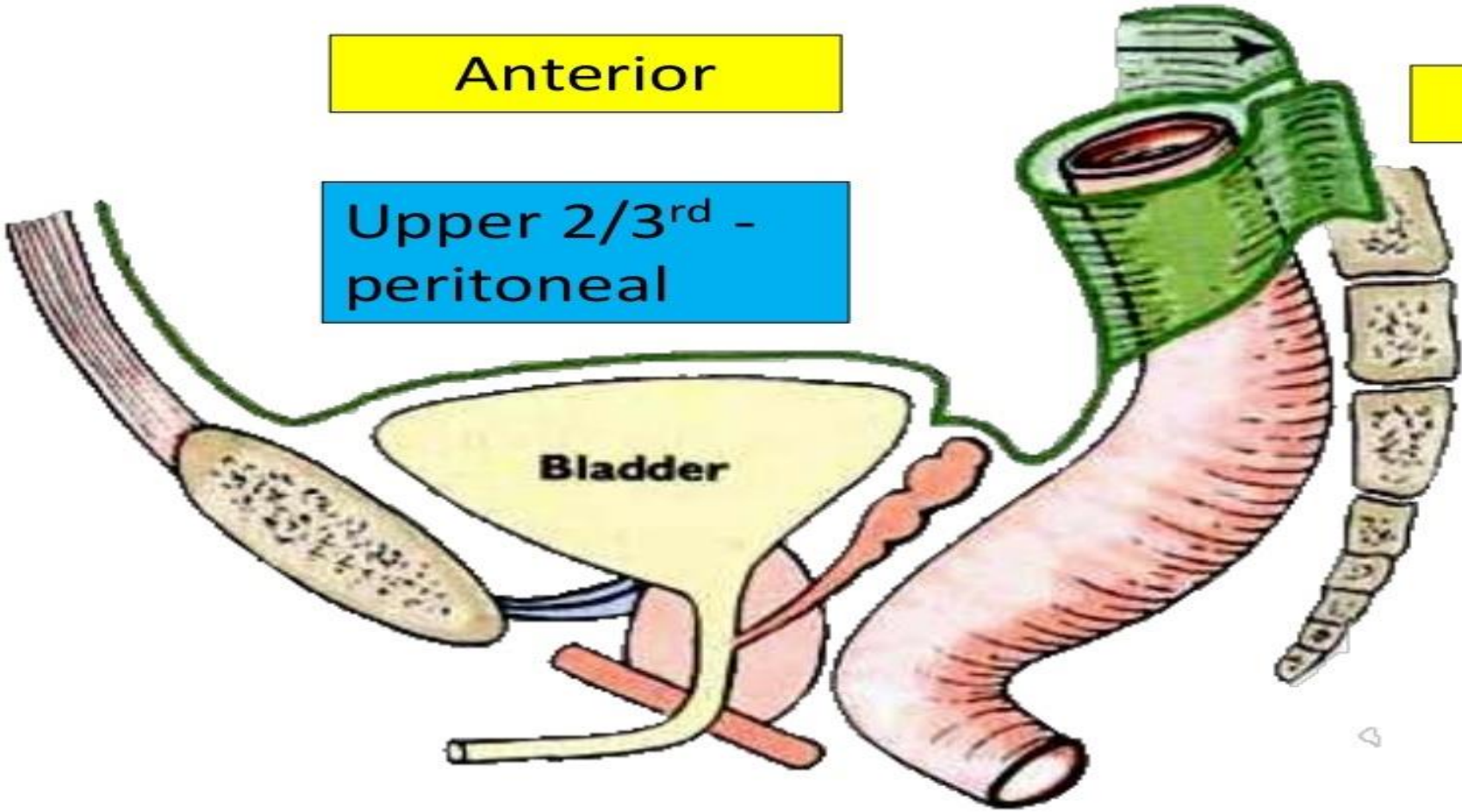
Peritoneal Relations

Anterior

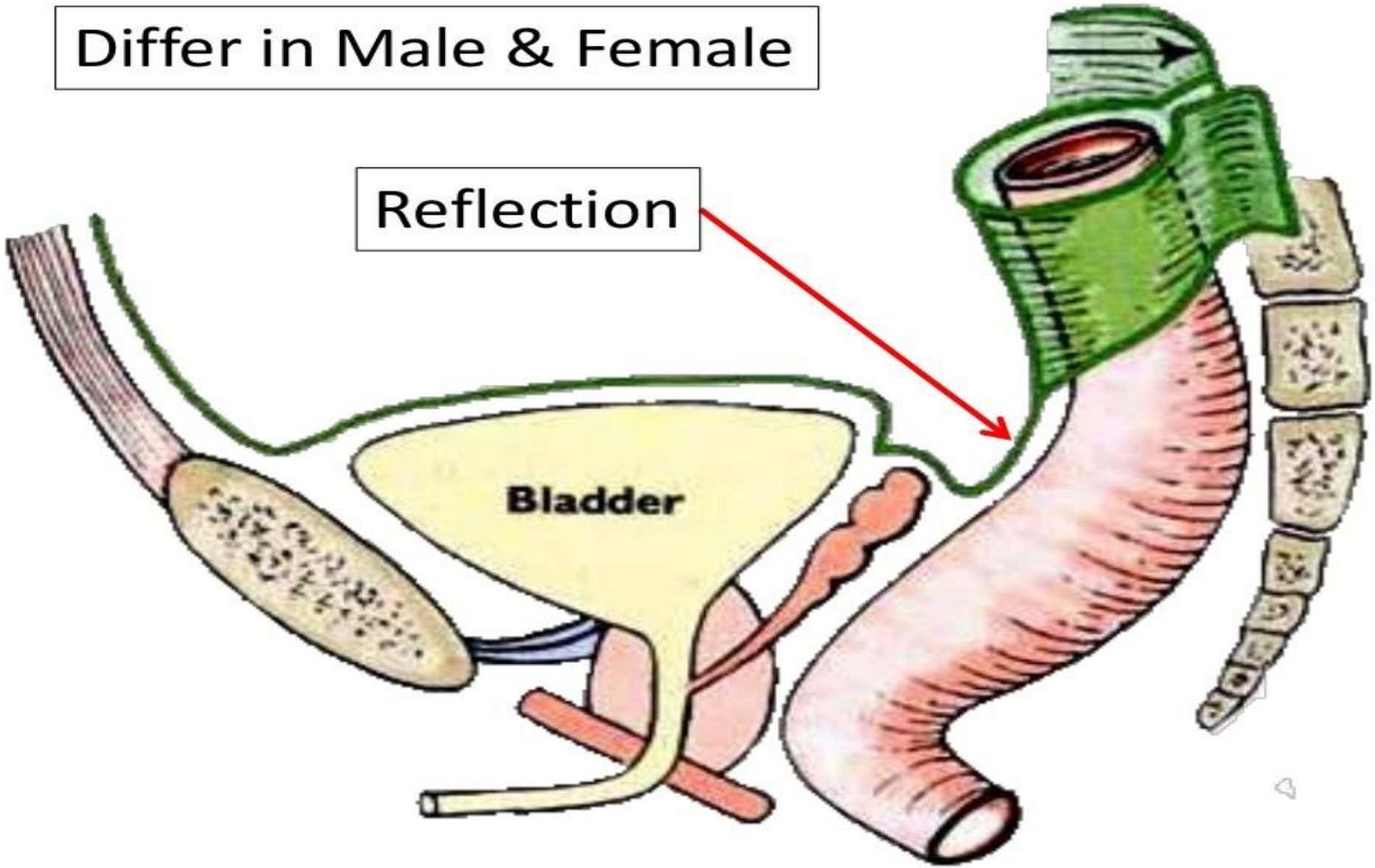
Posterior

Upper 2/3rd - peritoneal

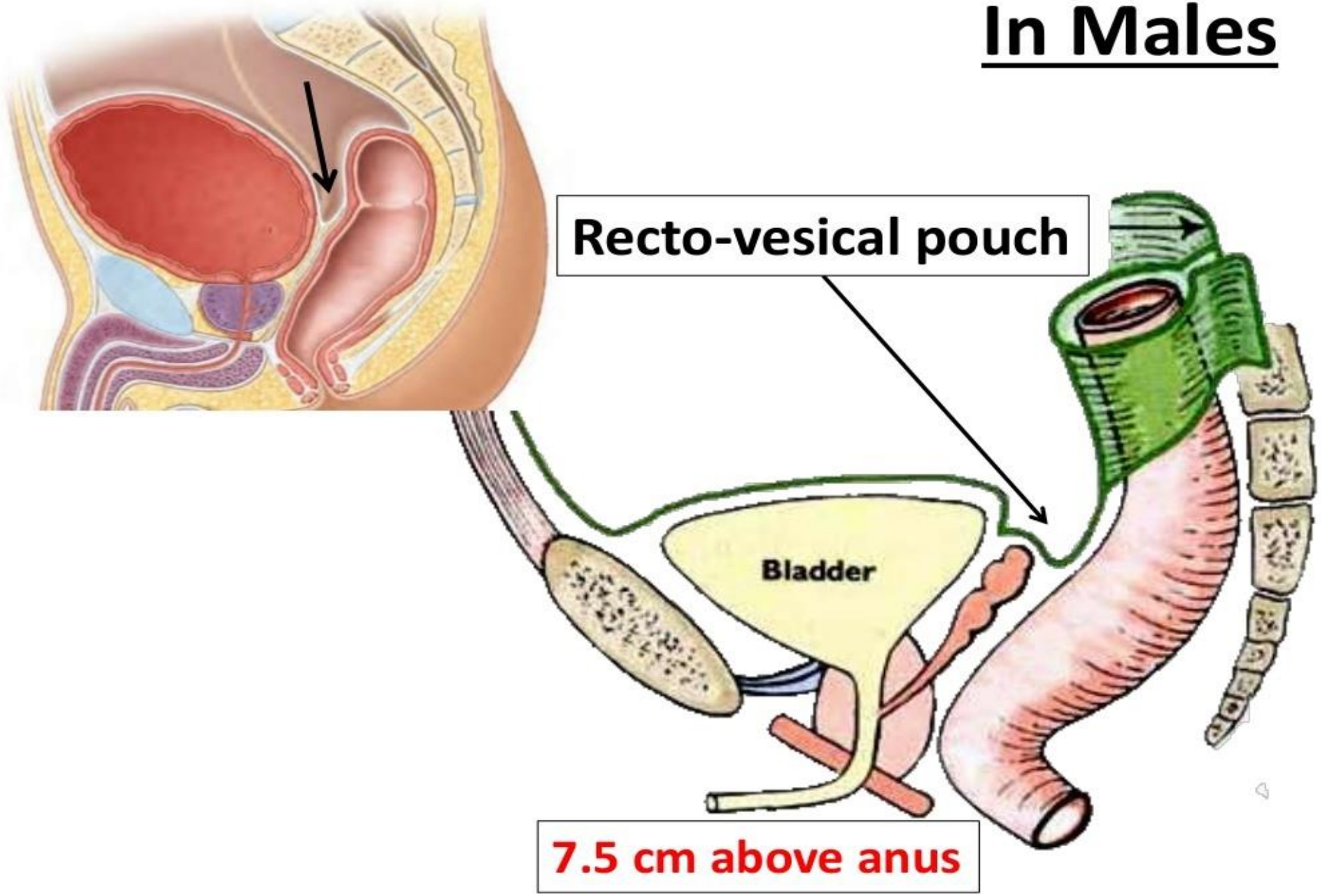
Non-peritoneal



Differ in Male & Female



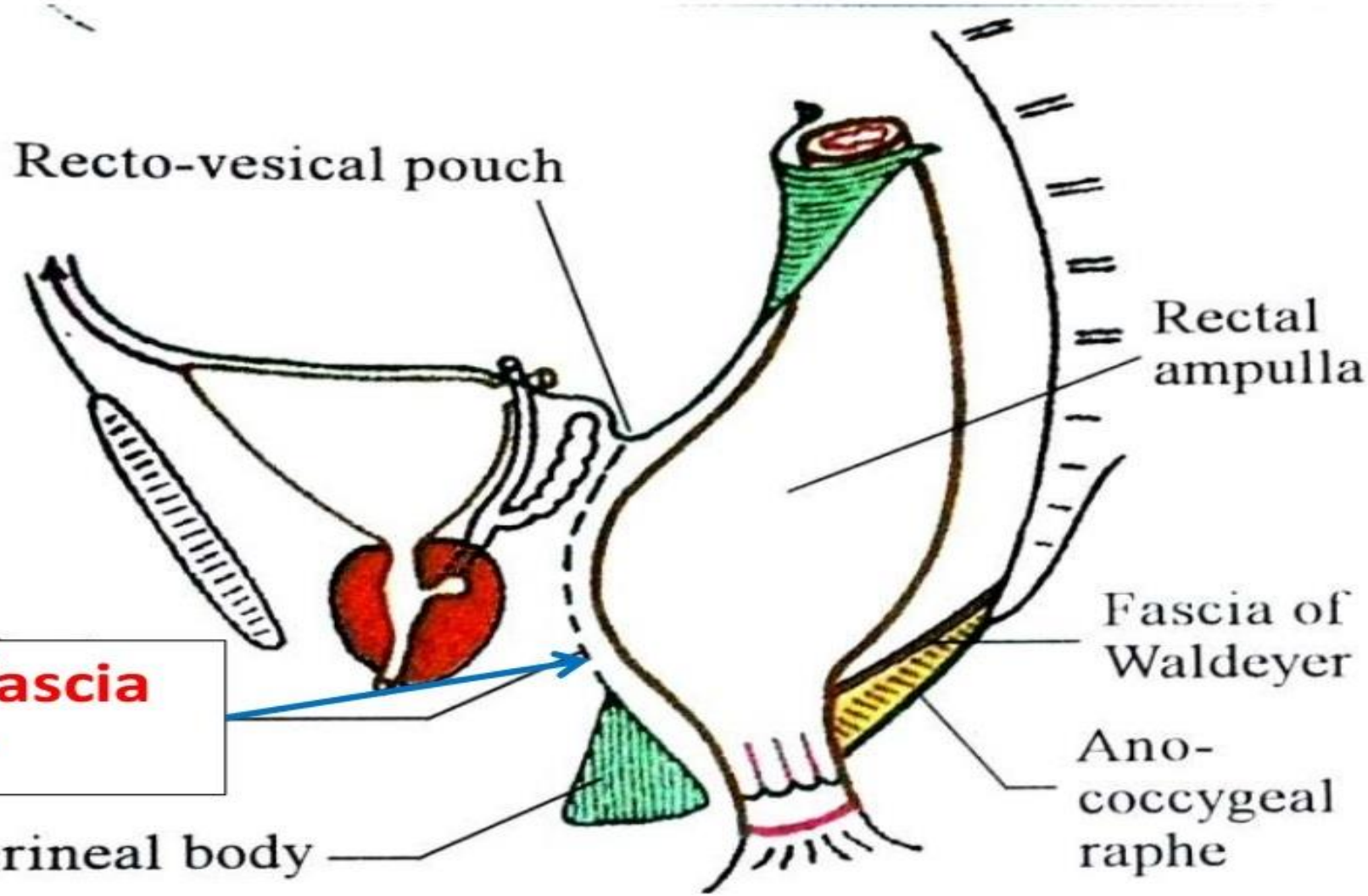
In Males



Relations

General Relations - Male

In Front

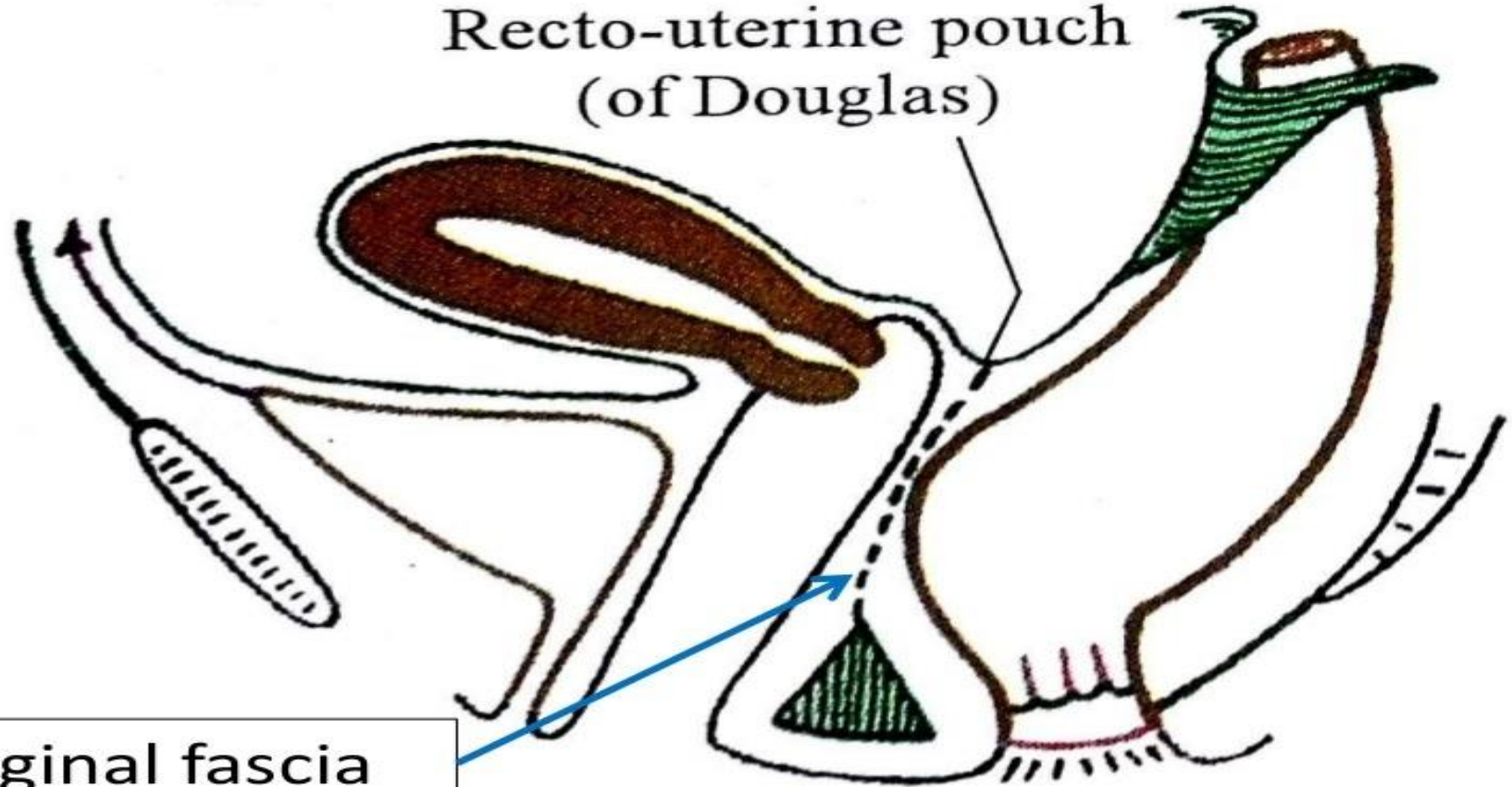


Recto-vesical fascia of Denonviller

Relations

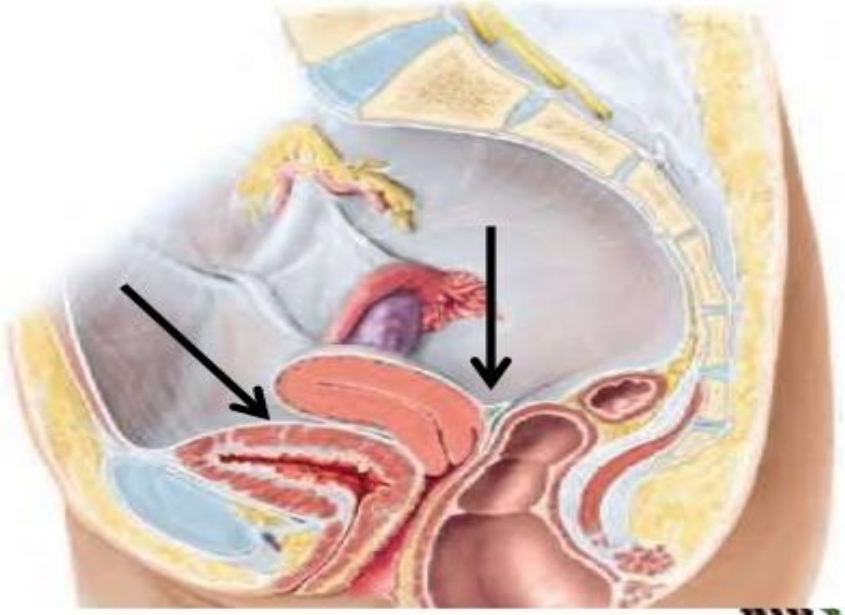
General Relations - Female

In Front



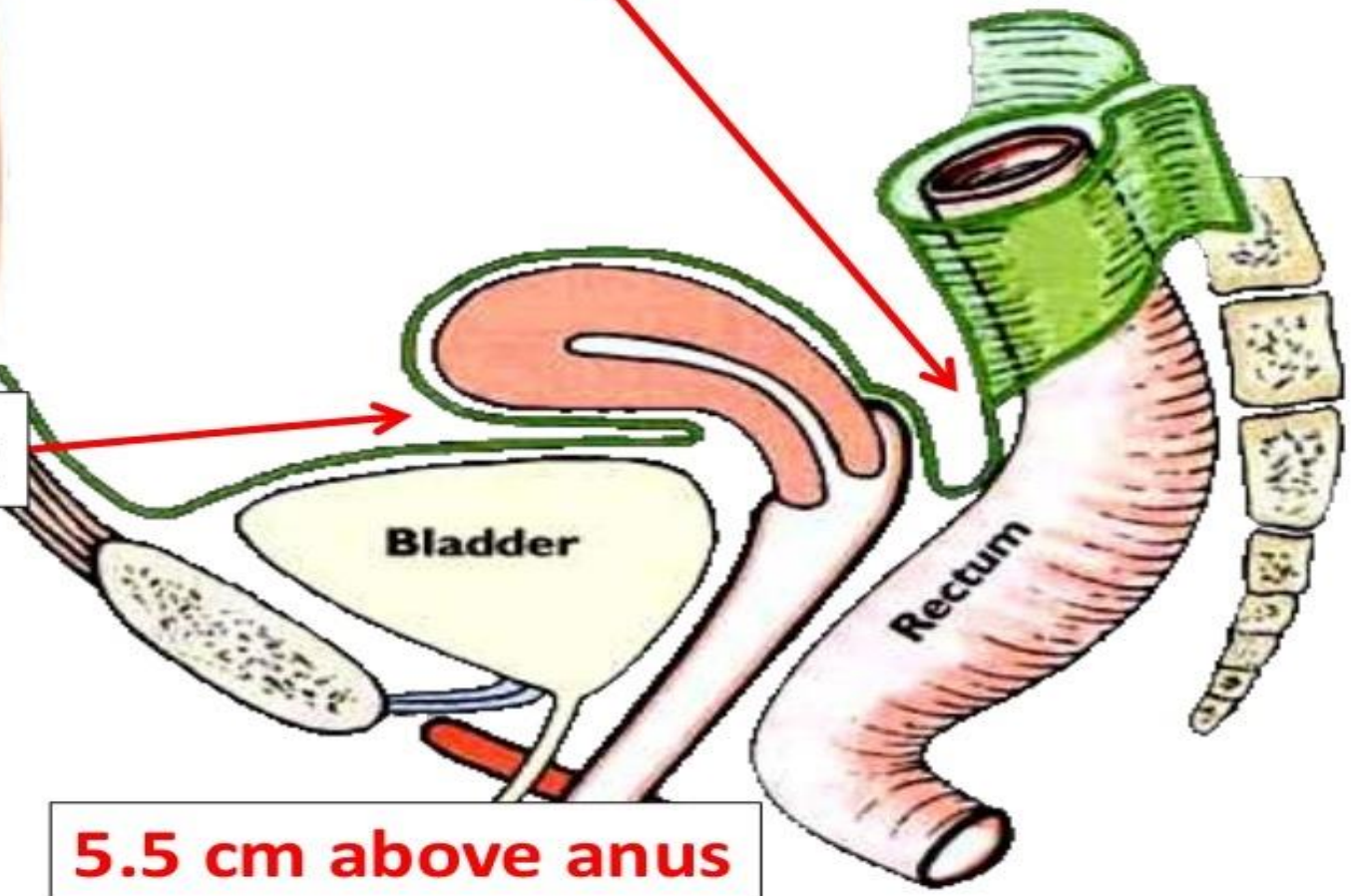
Recto-vaginal fascia

In Females



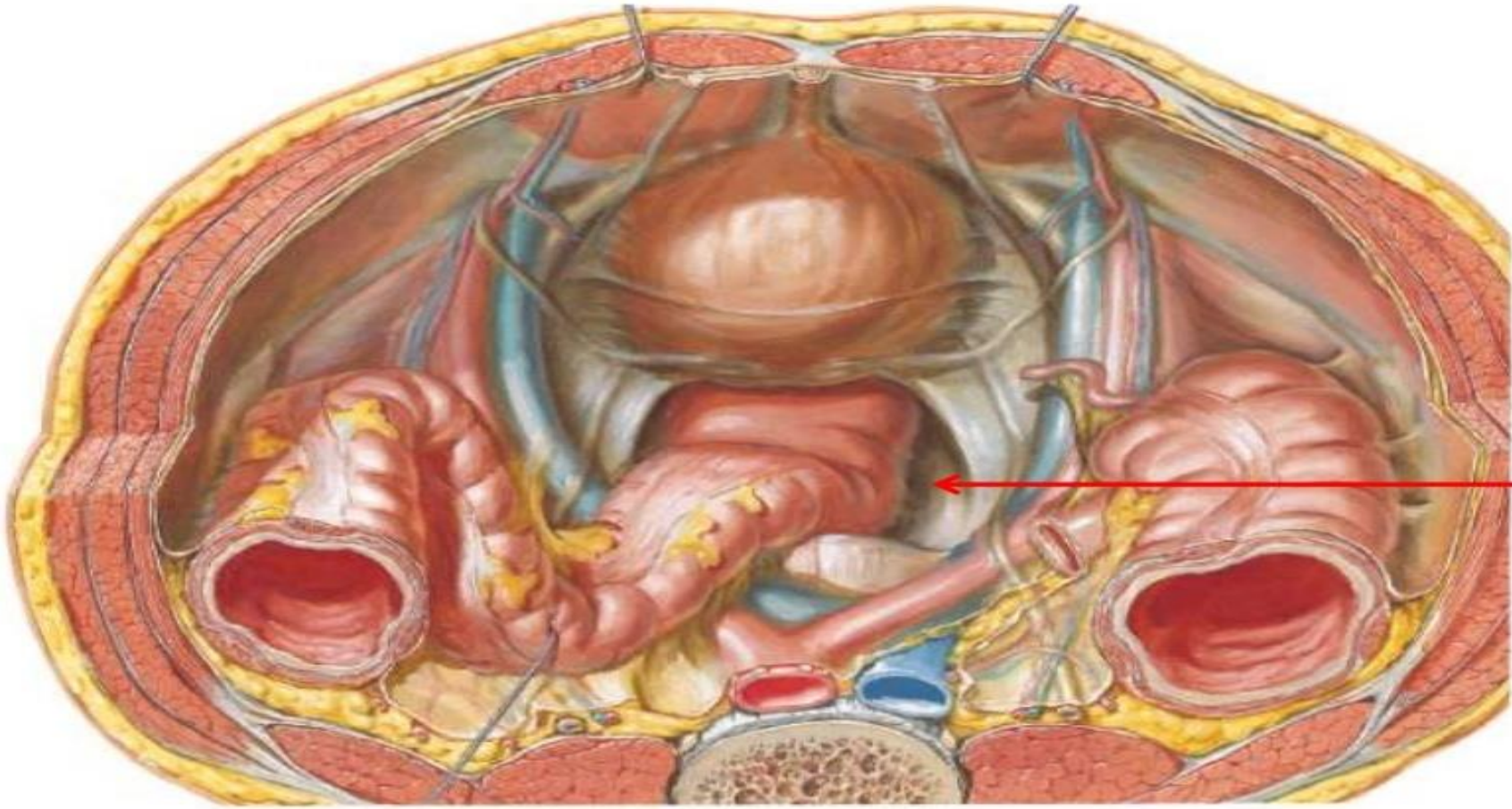
Recto-uterine pouch of Douglas

Utero-vesical pouch

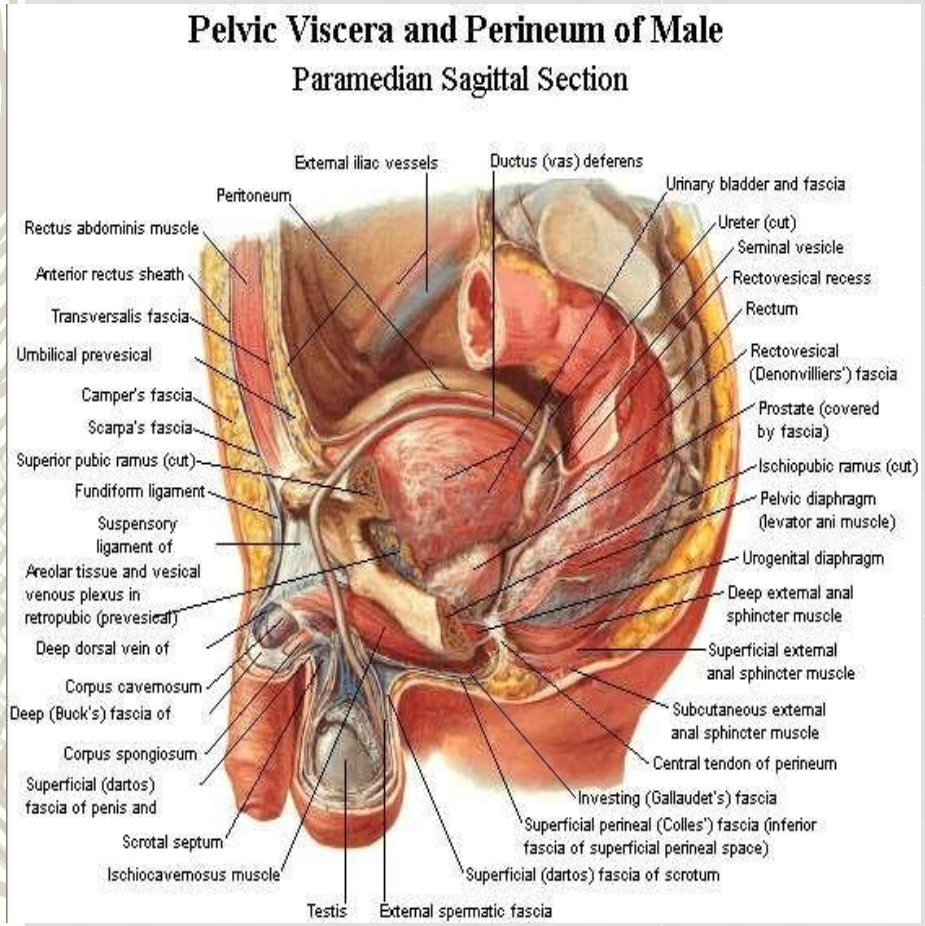


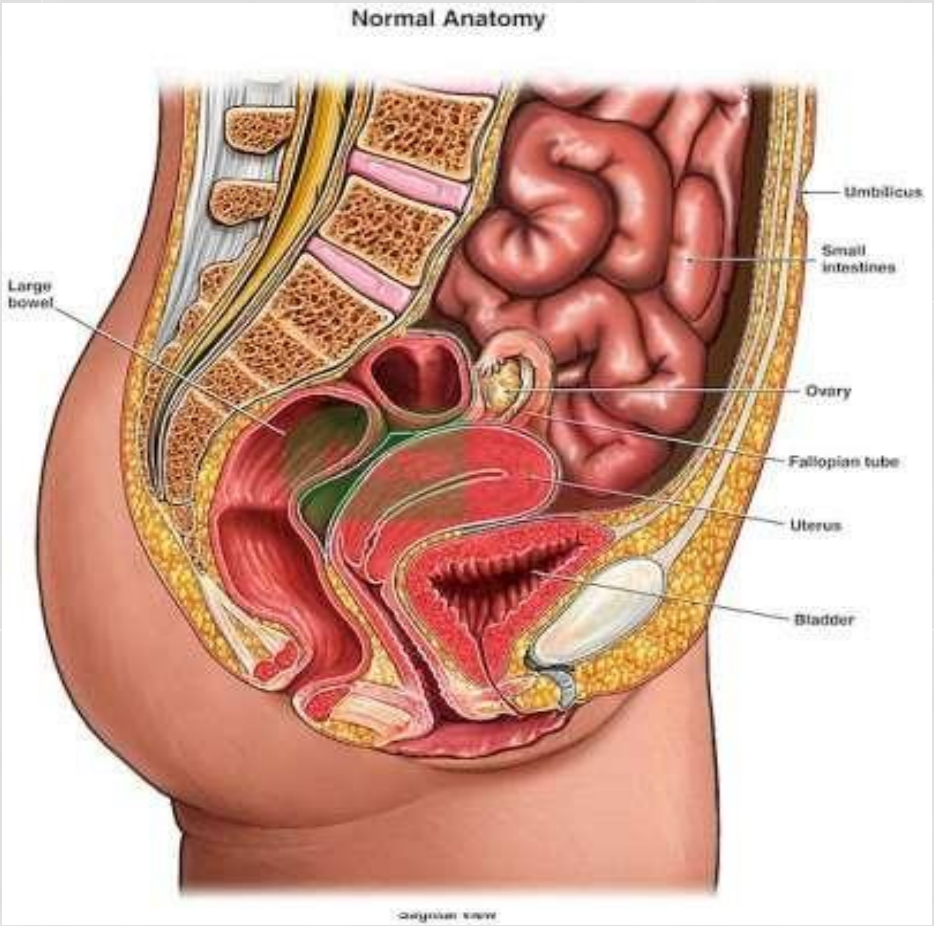
5.5 cm above anus

On each Side



Para-rectal Fossa


Pelvic Viscera and Perineum of Male
Paramedian Sagittal Section
External iliac vessels
Ductus (vas) deferens
Peritoneum
Urinary bladder and fascia
Rectus abdominis muscle
Ureter (cut)
Seminal vesicle
Anterior rectus sheath
Rectovesical recess
Transversalis fascia
Rectum
Umbilical prevesical
Rectovesical (Denonvilliers') fascia
Camper's fascia
Prostate (covered by fascia)
Scarpa's fascia
Superior pubic ramus (cut)
Ischiopubic ramus (cut)
Fundiform ligament
Pelvic diaphragm (levator ani muscle)
Suspensory ligament of
Urogenital diaphragm
Areolar tissue and vesical venous plexus in retropubic (prevesical)
Deep external anal sphincter muscle
Deep dorsal vein of
Superficial external anal sphincter muscle
Corpus cavernosum
Subcutaneous external anal sphincter muscle
Deep (Buck's) fascia of
Corpus spongiosum
Central tendon of perineum
Superficial (dartos) fascia of penis and
Investing (Gallaudet's) fascia
Superficial perineal (Colles') fascia (inferior fascia of superficial perineal space)
Scrotal septum
Ischiocavernosus muscle
Superficial (dartos) fascia of scrotum
Testis
External spermatic fascia


Normal Anatomy
Umbilicus
Small intestines
Large bowel
Ovary
Fallopian tube
Uterus
Bladder

RECTUM

- The **mucous membrane** of the rectum, together with the circular muscle layer, forms two or three semicircular permanent folds called the **transverse folds of the rectum** they vary in position.

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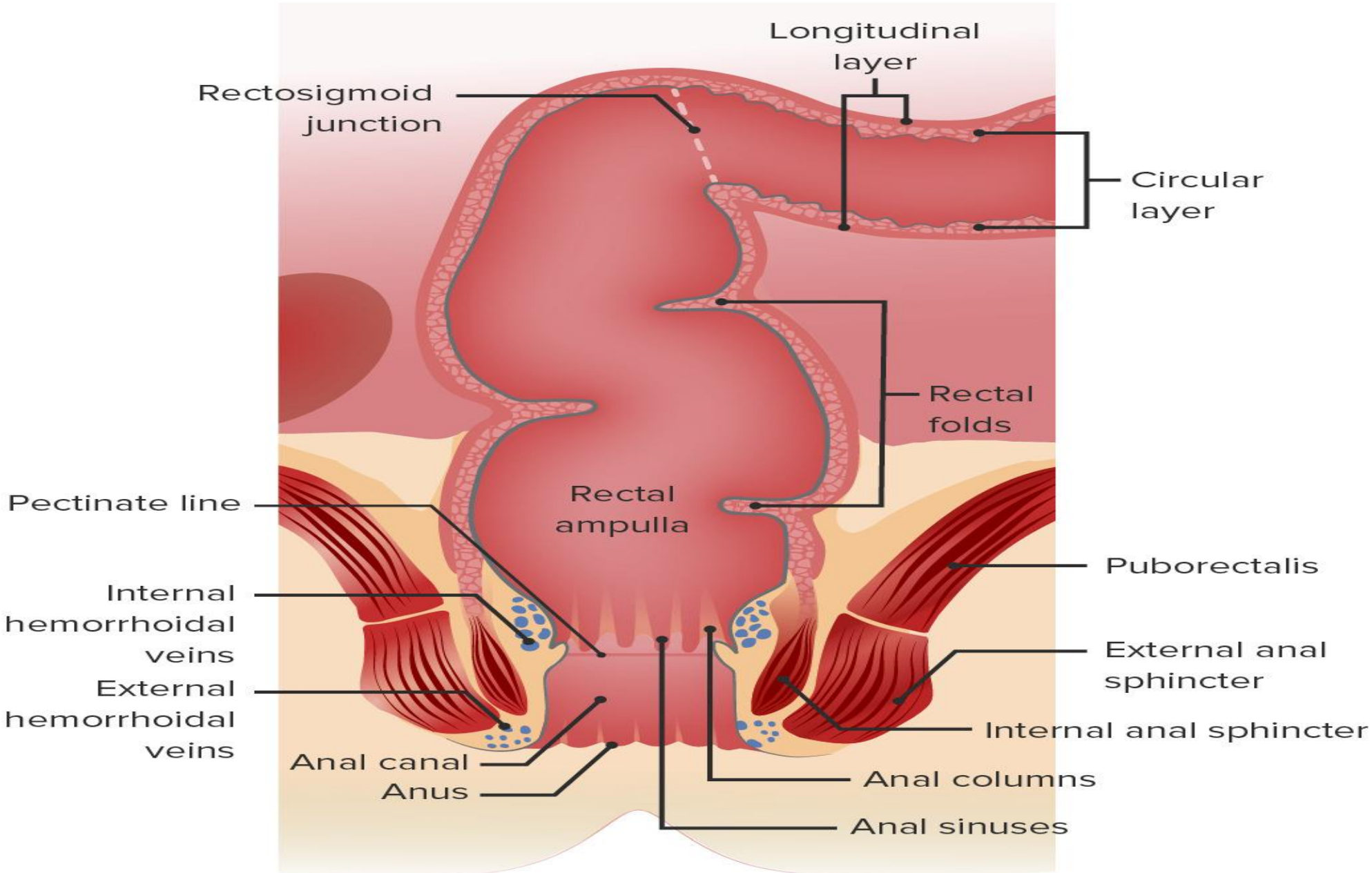
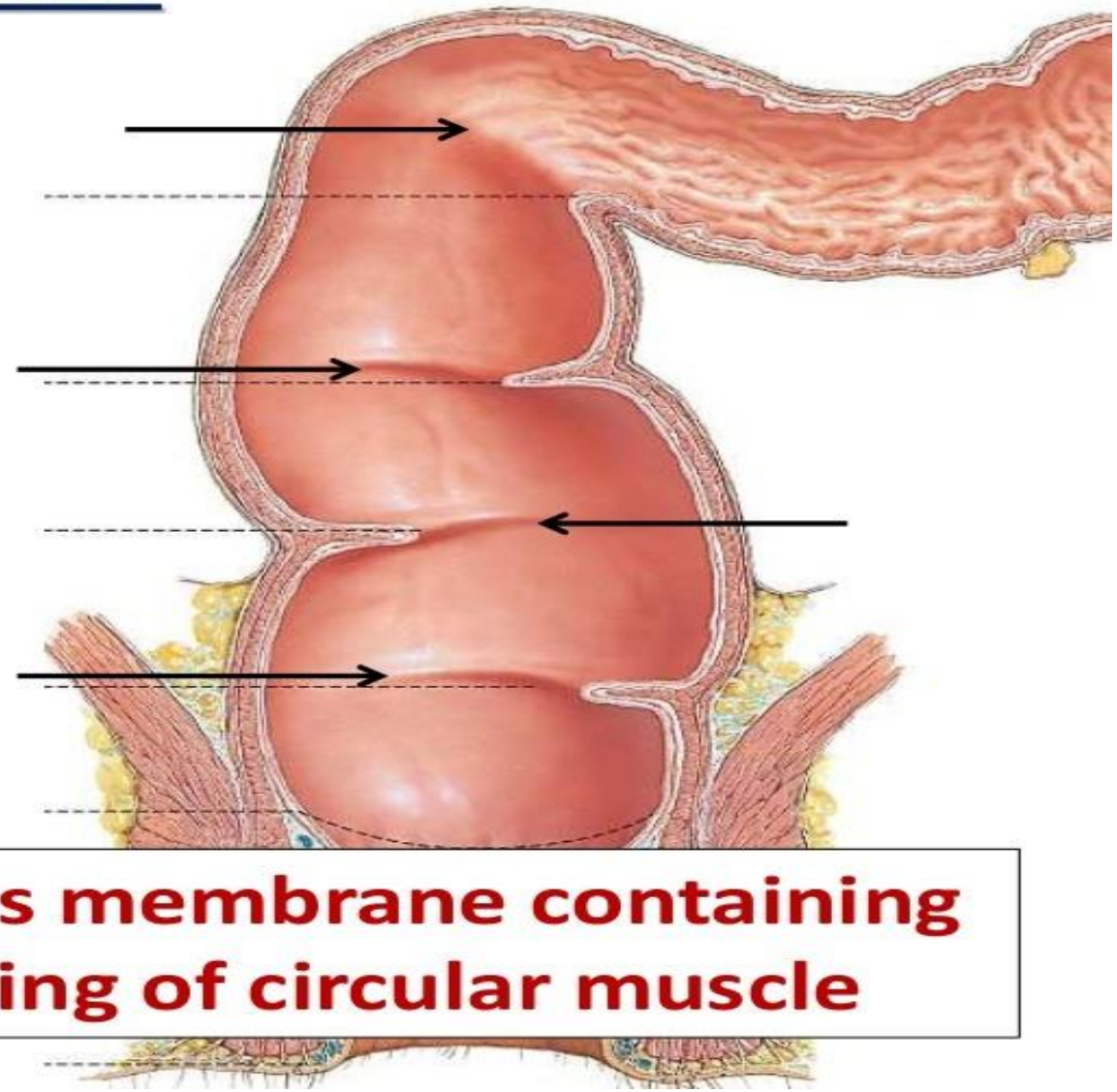

Longitudinal layer
Rectosigmoid junction
Circular layer
Rectal folds
Rectal ampulla
Pectinate line
Puborectalis
Internal hemorrhoidal veins
External anal sphincter
External hemorrhoidal veins
Internal anal sphincter
Anal canal
Anal columns
Anus
Anal sinuses

Permanent Mucous folds

Houston's Valves

- Horizontal
- Semilunar
- Along Concavity of lateral curves



Reduplication of mucous membrane containing submucosa & thickening of circular muscle

Upper Chamber

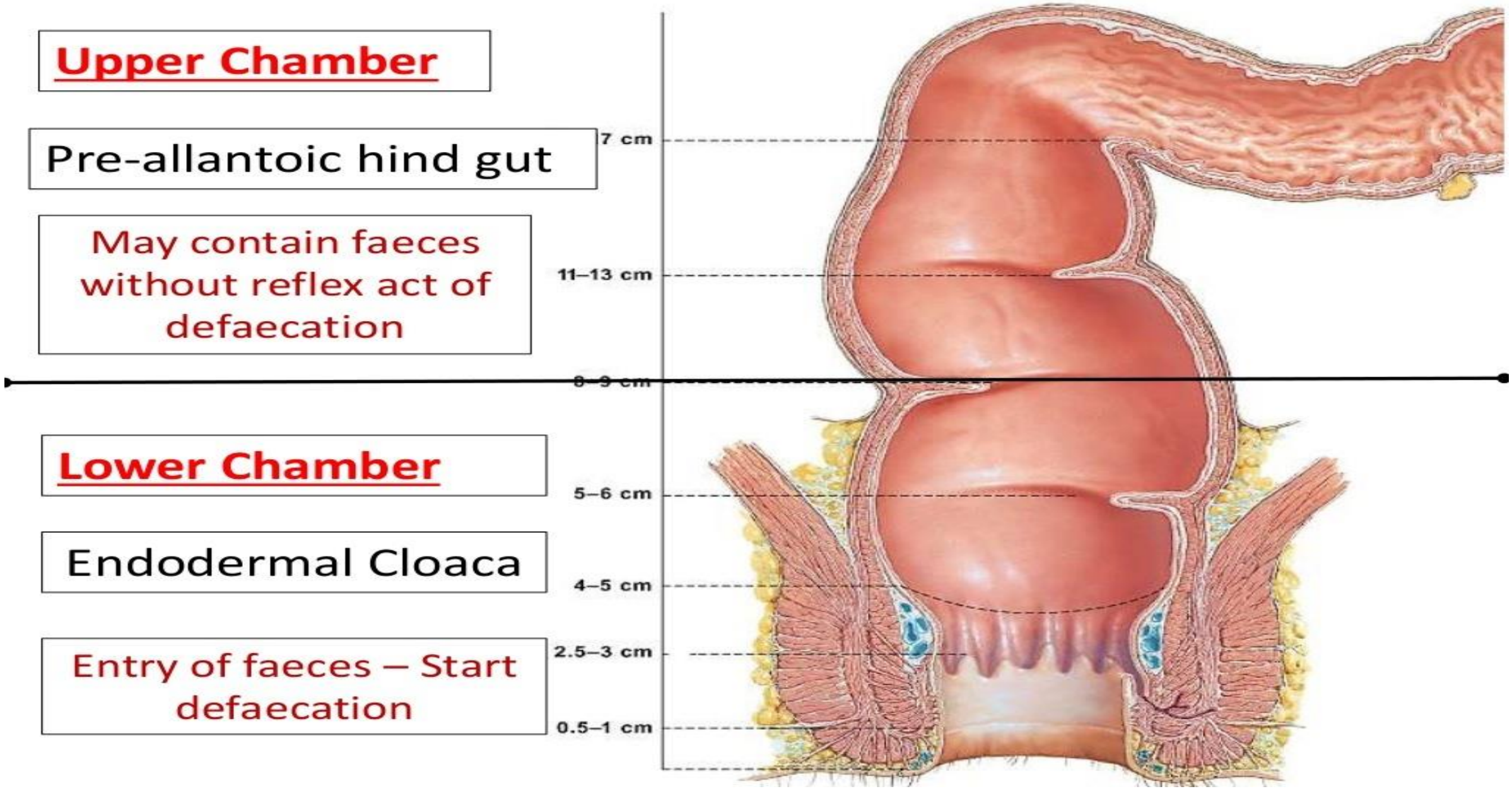
Pre-allantoic hind gut

May contain faeces without reflex act of defaecation

Lower Chamber

Endodermal Cloaca

Entry of faeces – Start defaecation



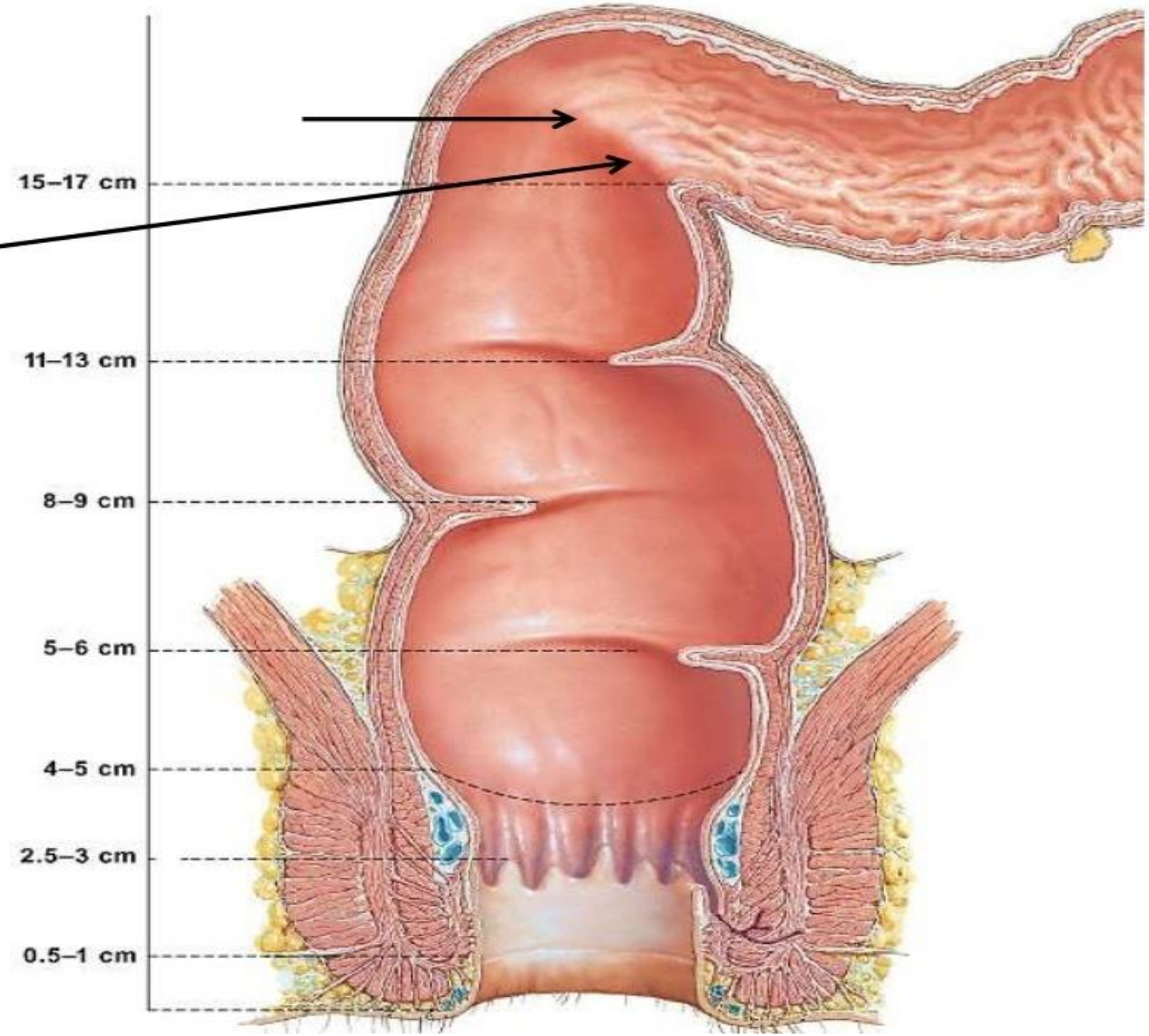
1st Valve

Recto-Sigmoid Jn

S3

12 – 14 cm above Anus

Right / Left wall

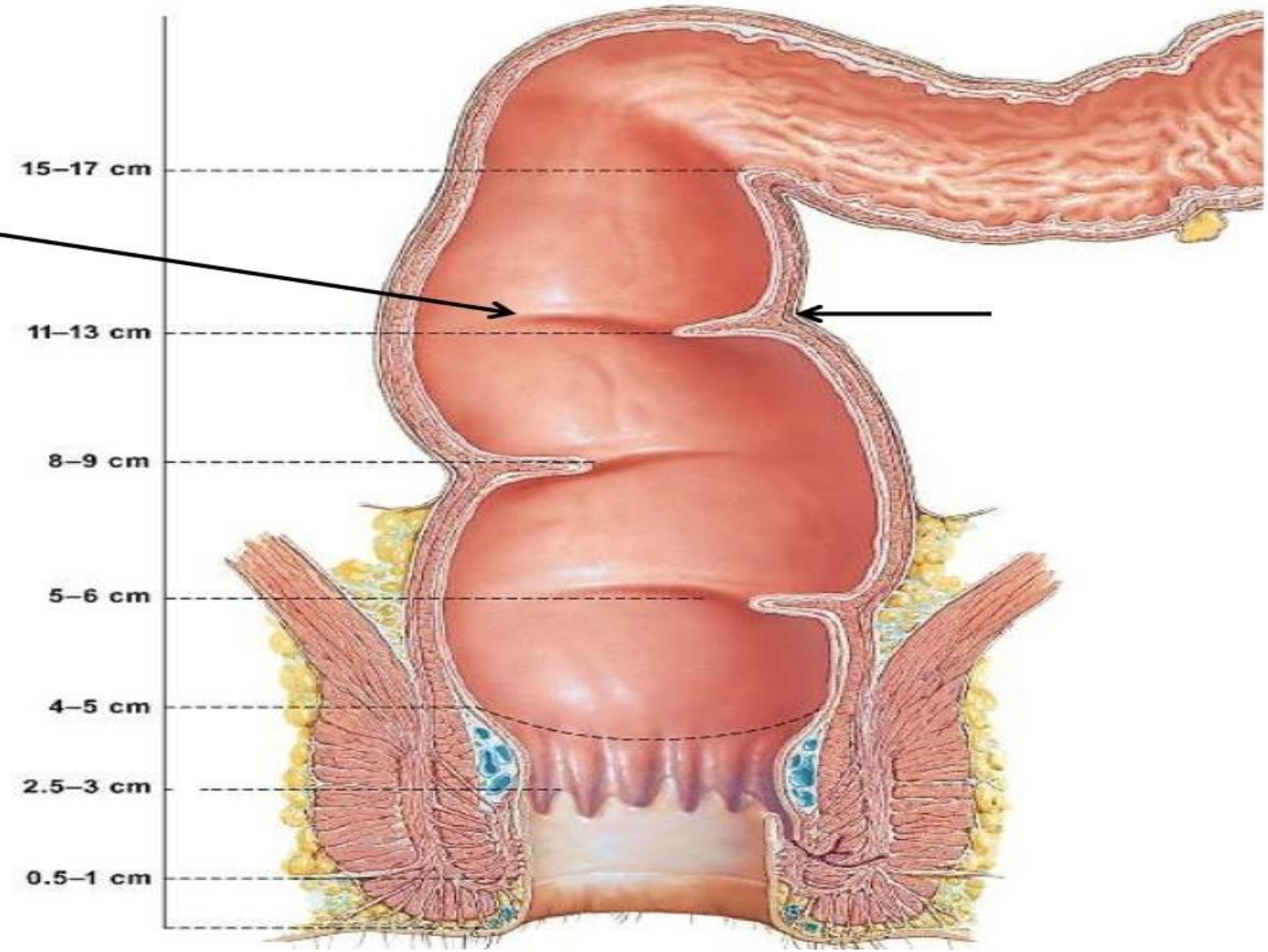


2nd Valve

2.5cm above 3rd

Left wall

Along concavity of upper lateral curve



3rd Valve

Most important & constant

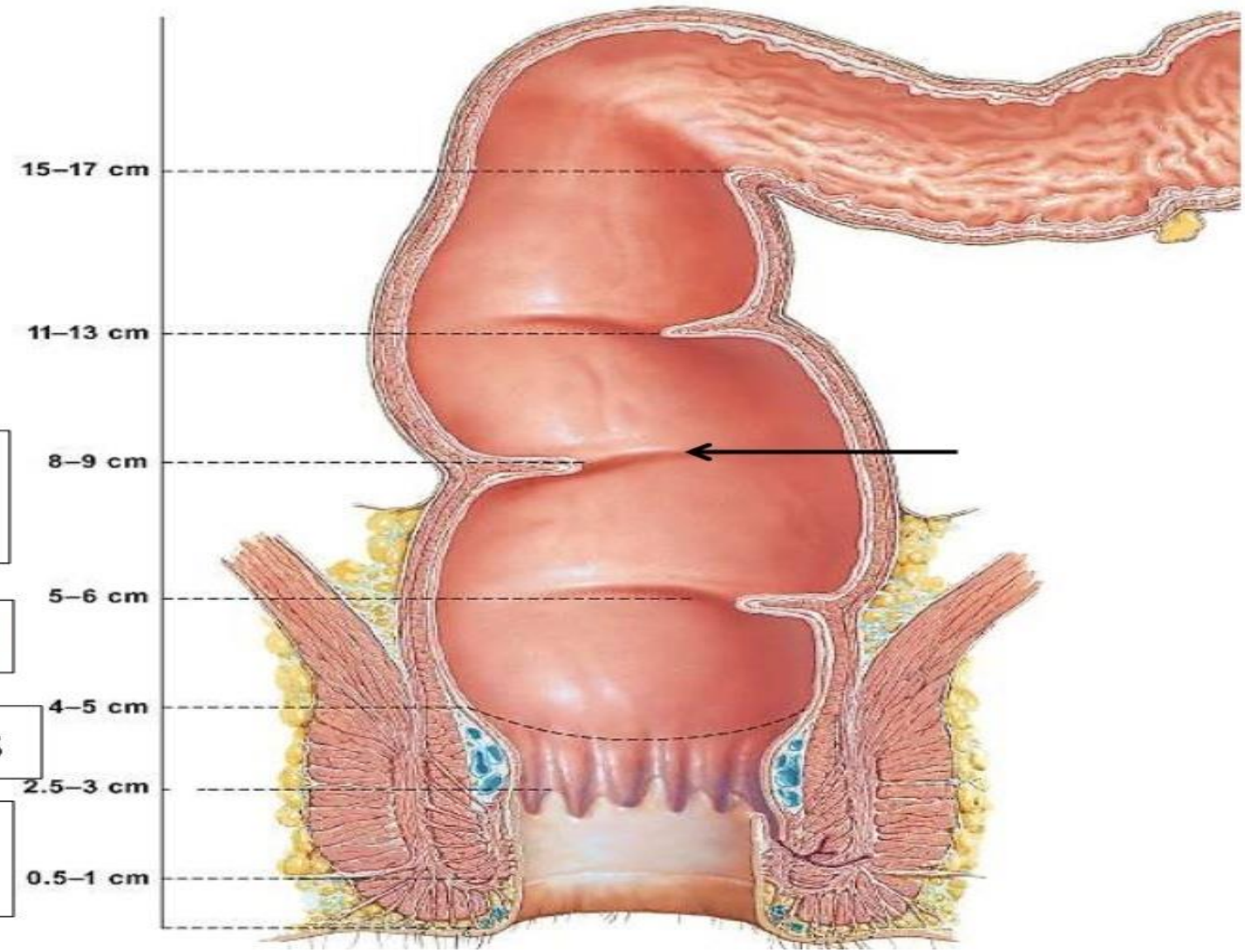
Anterior & Right wall

Along concavity of middle lateral curve

Nelaton's Sphincter

S5, 5cm above Anus

Divide rectum in to upper & lower part

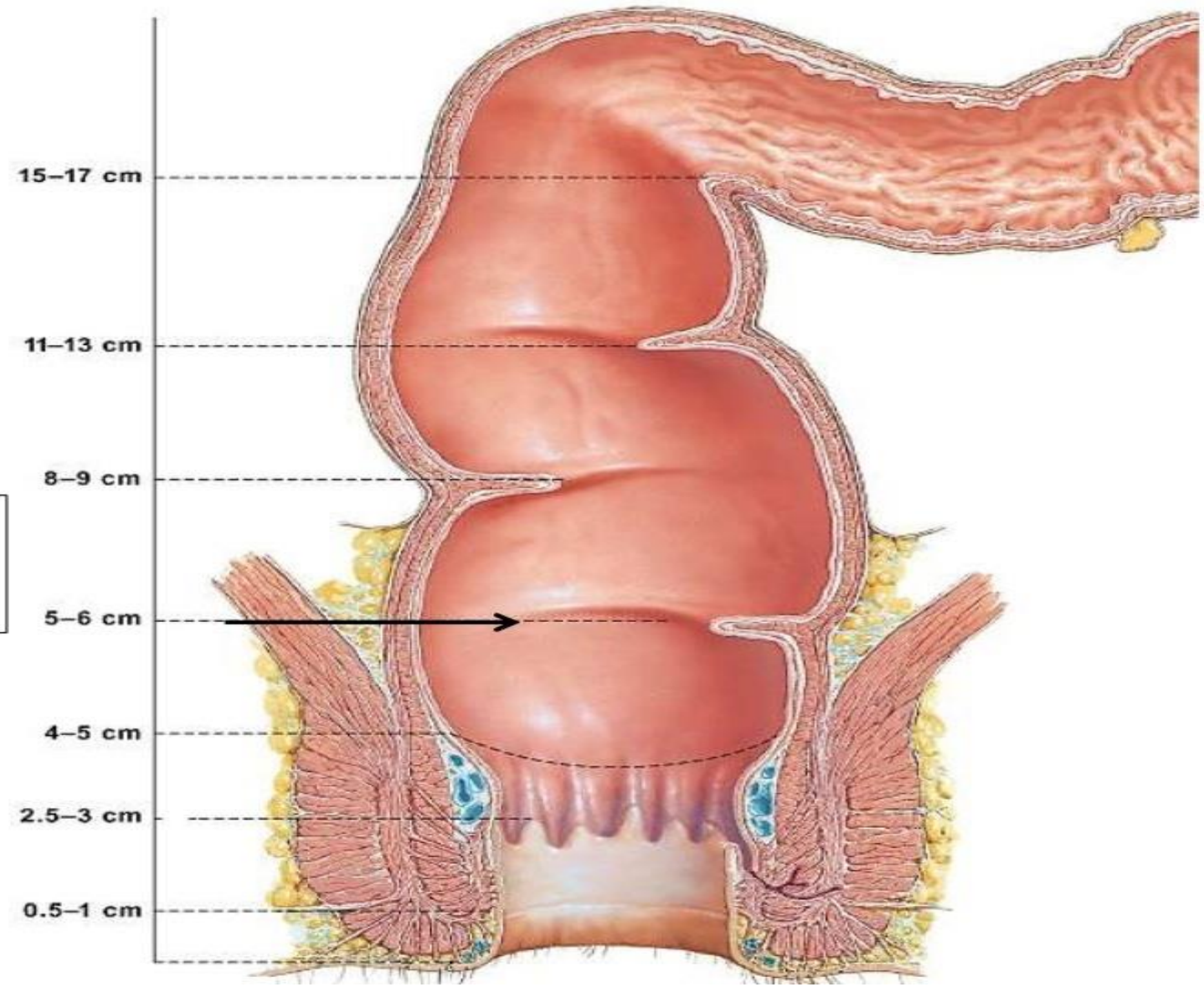


4th Valve

2.5cm below 3rd valve

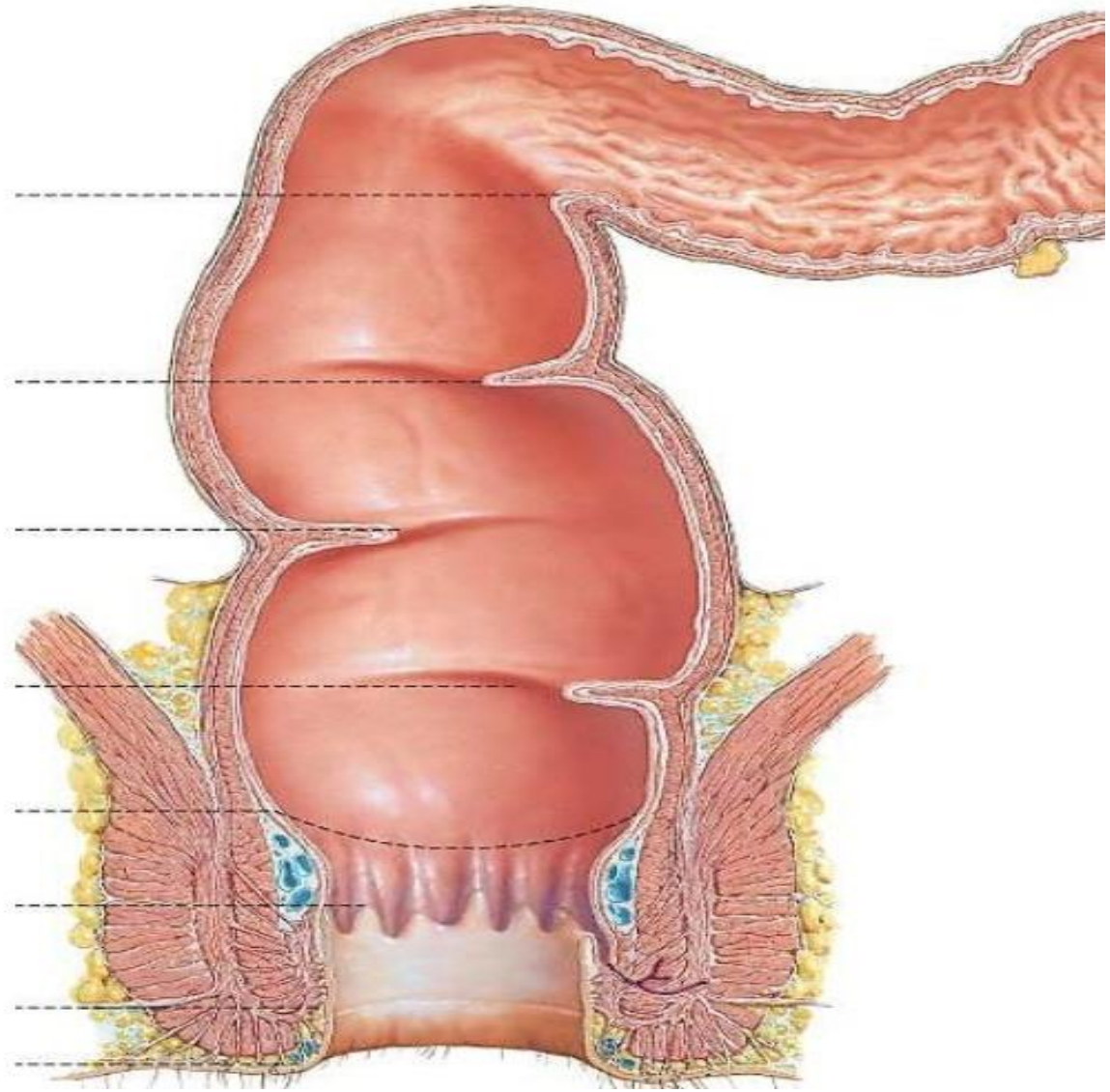
Left wall

Along concavity of lower lateral curve



Importance of Valves

- Support weight of faeces
- Prevent passage of instrument
- Rectal washing should be done in left lateral position
- To prevent injury to 3rd valve



BLOOD SUPPLY

Blood Supply

- **Arteries**

The superior, middle, and inferior rectal arteries supply the rectum.

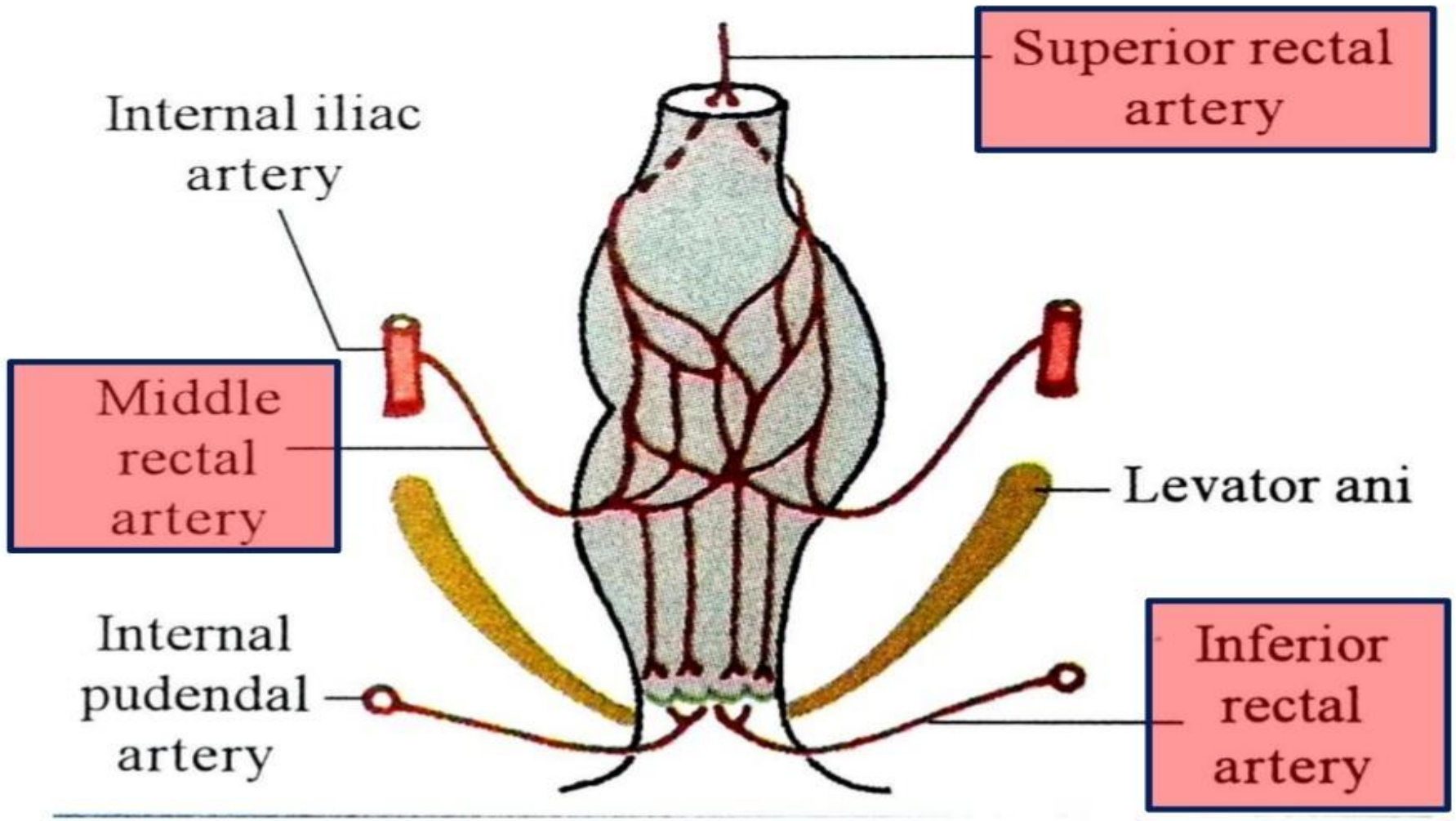
The **superior rectal artery** is a direct continuation of the inferior mesenteric artery and is the chief artery supplying the mucous membrane. It enters the pelvis by descending in the root of the sigmoid mesocolon and divides into right and left branches, which pierce the muscular coat and supply the mucous membrane. They anastomose with one another and with the middle and inferior rectal arteries.

The **middle rectal artery** is a small branch of the internal iliac artery and is distributed mainly to the muscular coat.

The **inferior rectal artery** is a branch of the internal pudendal artery in the perineum. It anastomoses with the middle rectal artery at the anorectal junction.

Arterial Supply

Five rectal arteries



Arterial Supply

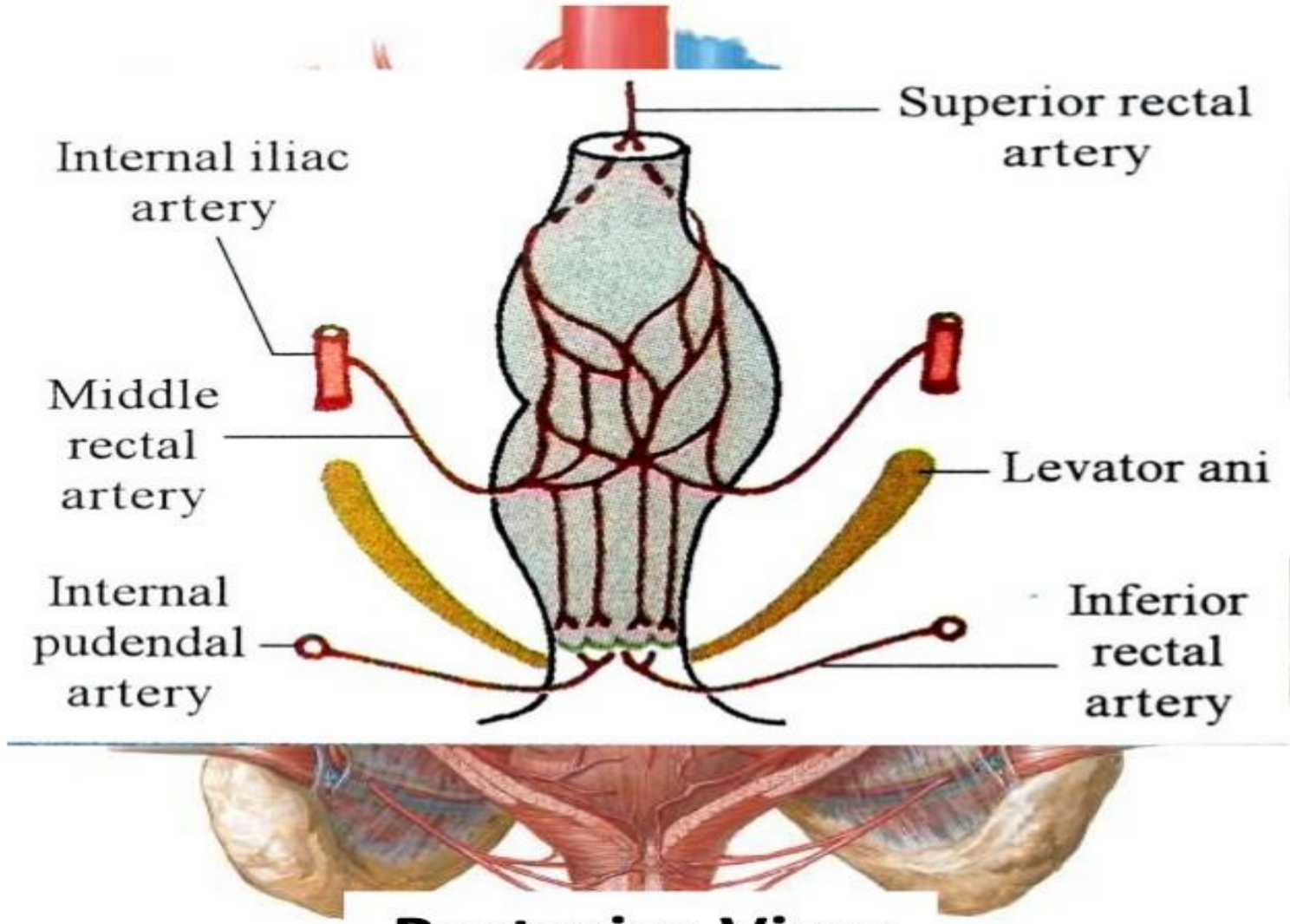
Superior rectal artery

Continuation of IMA

Principal artery of rectum

Entire mucosa and upper musculature

Straight vessels arise from plexus – anastomose with inferior rectal artery



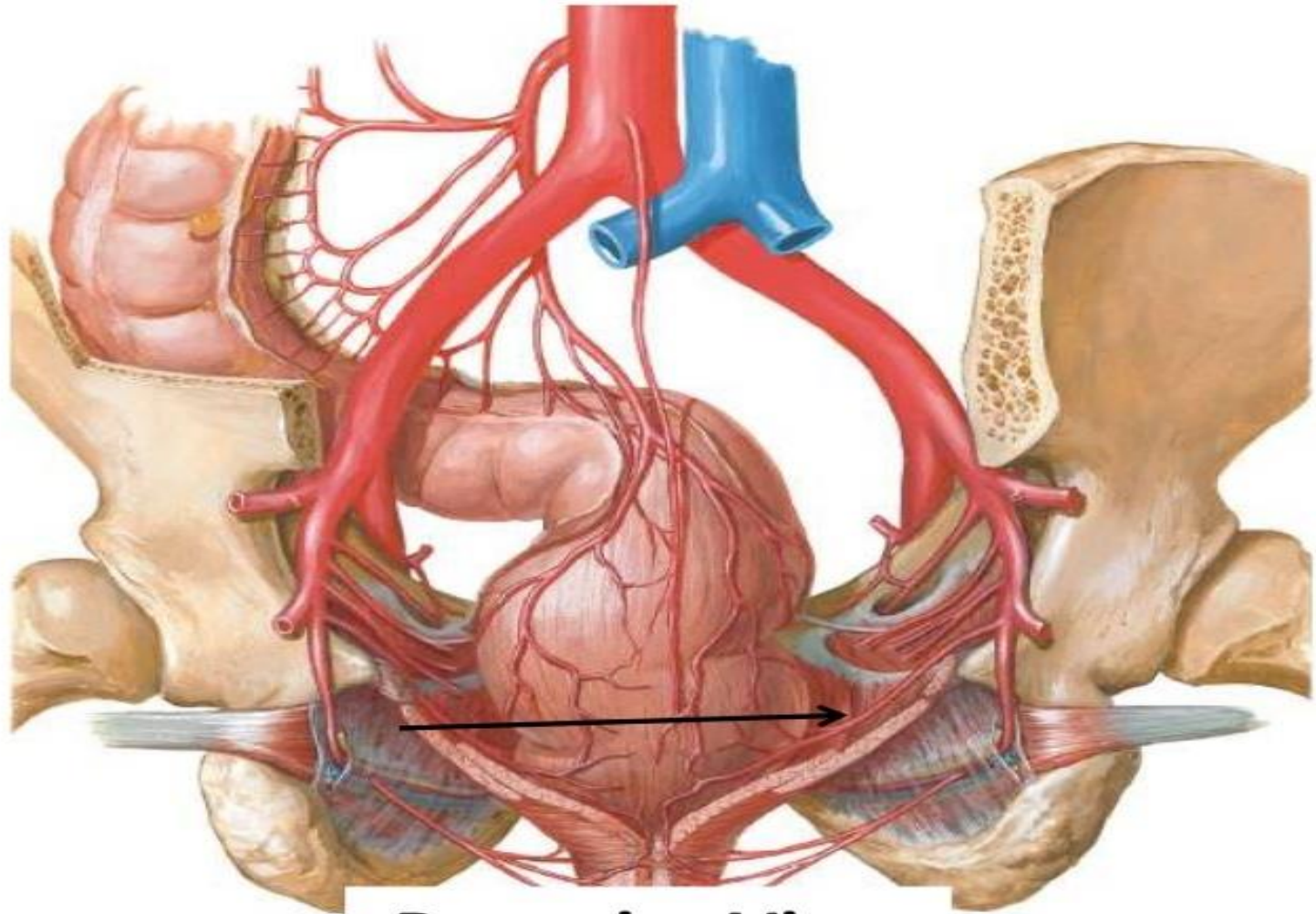
Posterior View

Arterial Supply

Middle rectal artery

Branch of Anterior division of Internal Iliac Artery

Supply lower part



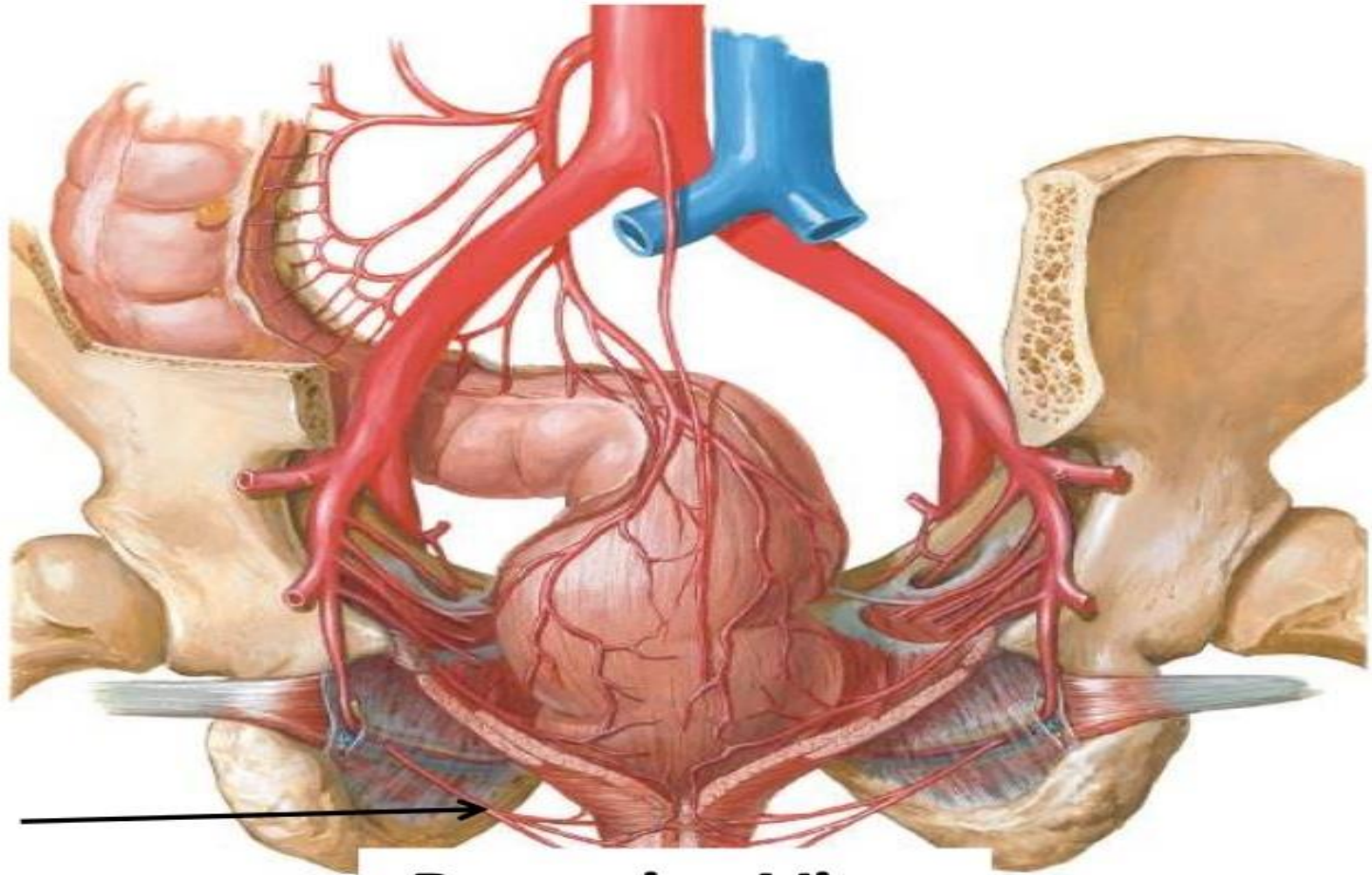
Posterior View

Arterial Supply

Inferior rectal artery

Branch of Internal Pudendal Artery

Supply peri-anal skin & Sphincter ani



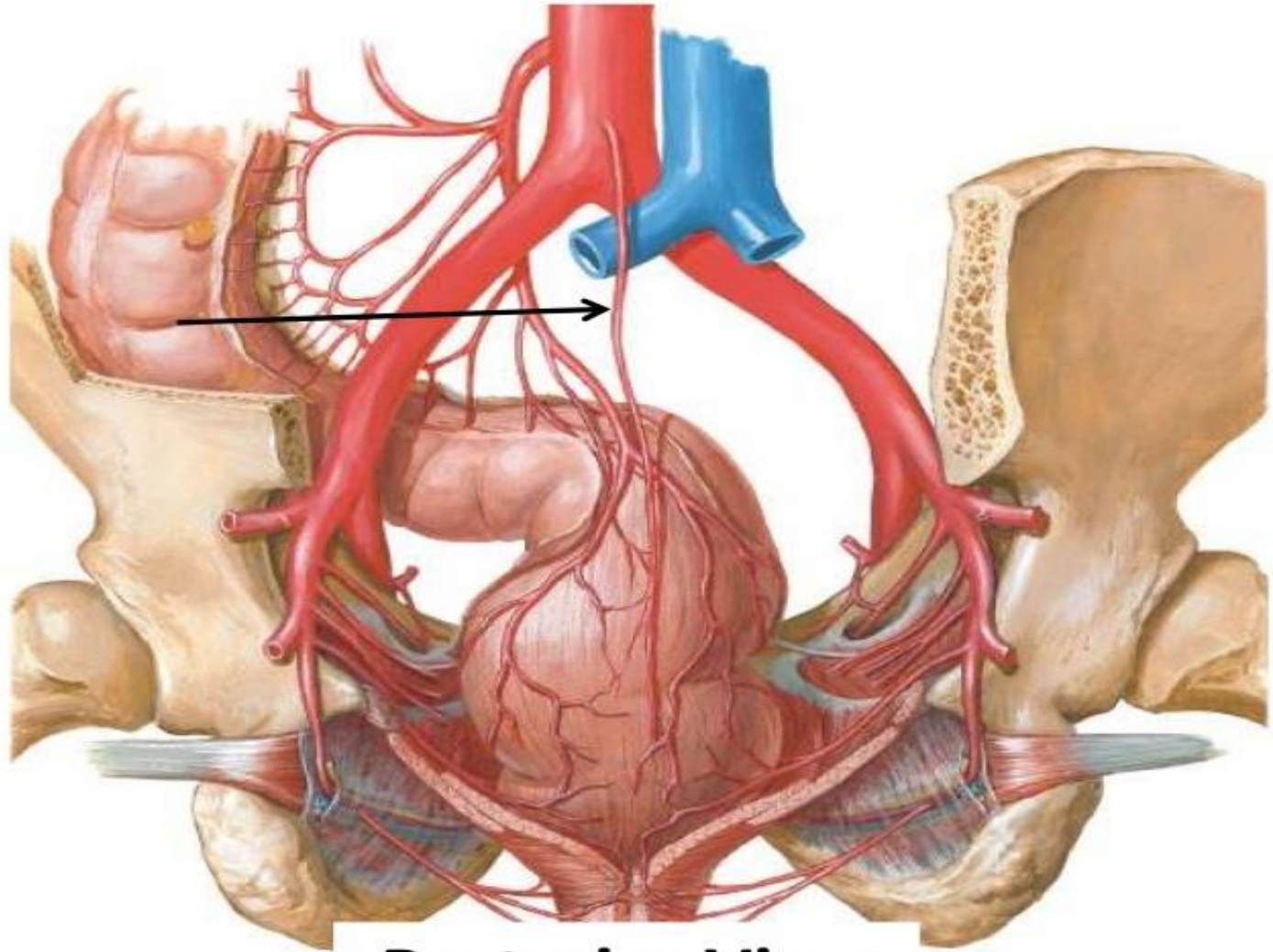
Posterior View

Arterial Supply

Median Sacral artery

Branch of Aorta

Supply posterior wall of Ano-rectal Junction



Posterior View

- **Veins**

The veins of the rectum correspond to the arteries.

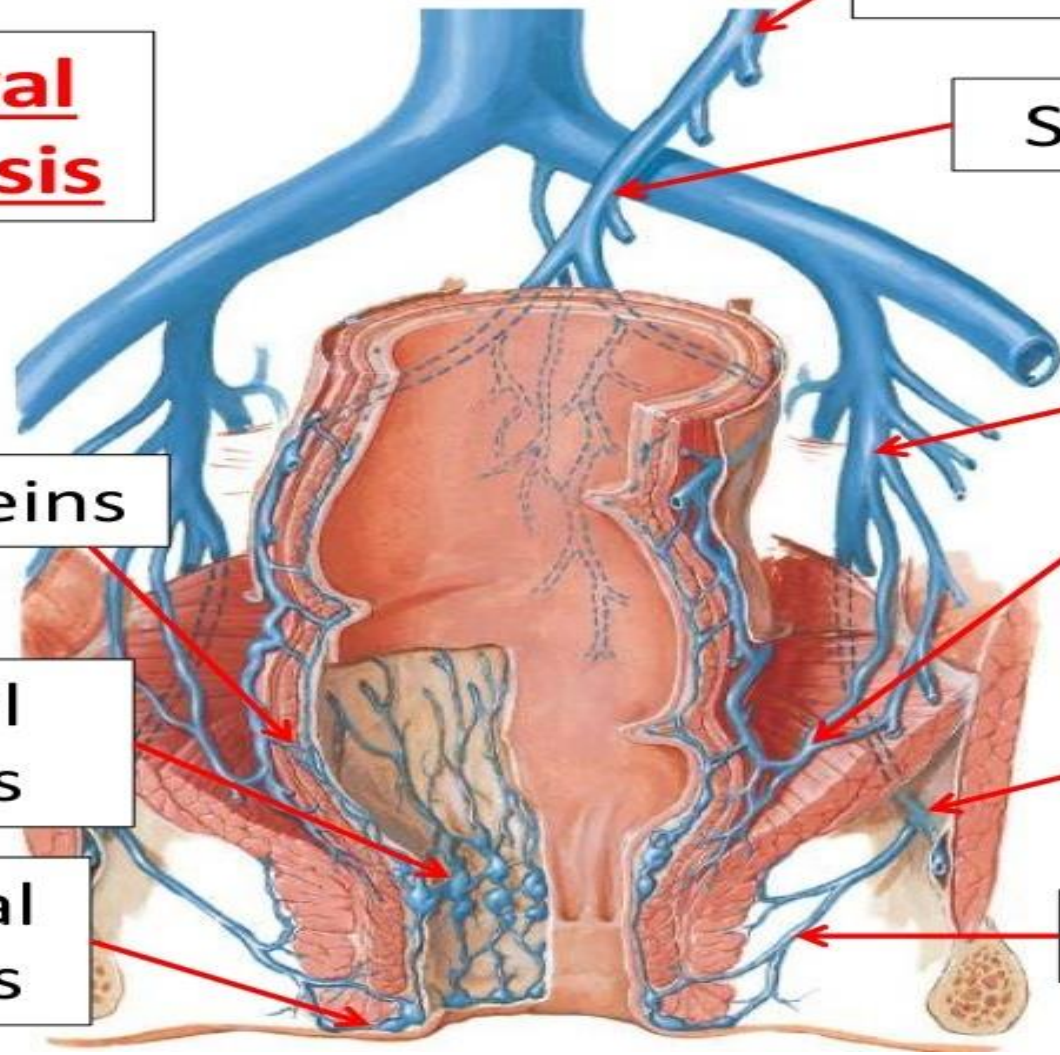
The **superior rectal vein** is a tributary of the portal circulation and drains into the inferior mesenteric vein.

The **middle** and **inferior rectal veins** drain into the internal iliac and internal pudendal veins, respectively.

The union between the rectal veins forms an important portal–systemic anastomosis).

Venous Drainage

Porto-Caval Anastomosis



Inferior Mesenteric Vein

Superior Rectal Vein

Internal iliac Vein

Middle Rectal Vein

Internal Pudendal Vein

Inferior Rectal Vein

Six Radical Veins

Internal rectal venous plexus

External rectal venous plexus

LYMPHATIC DRAINAGE & NERVE SUPPLY

Lymph Drainage

- The lymph vessels of the rectum drain first into the **pararectal nodes** and then into inferior mesenteric nodes.Lymph vessels from the lower part of the rectum follow the middle rectal artery to the internal iliac nodes.

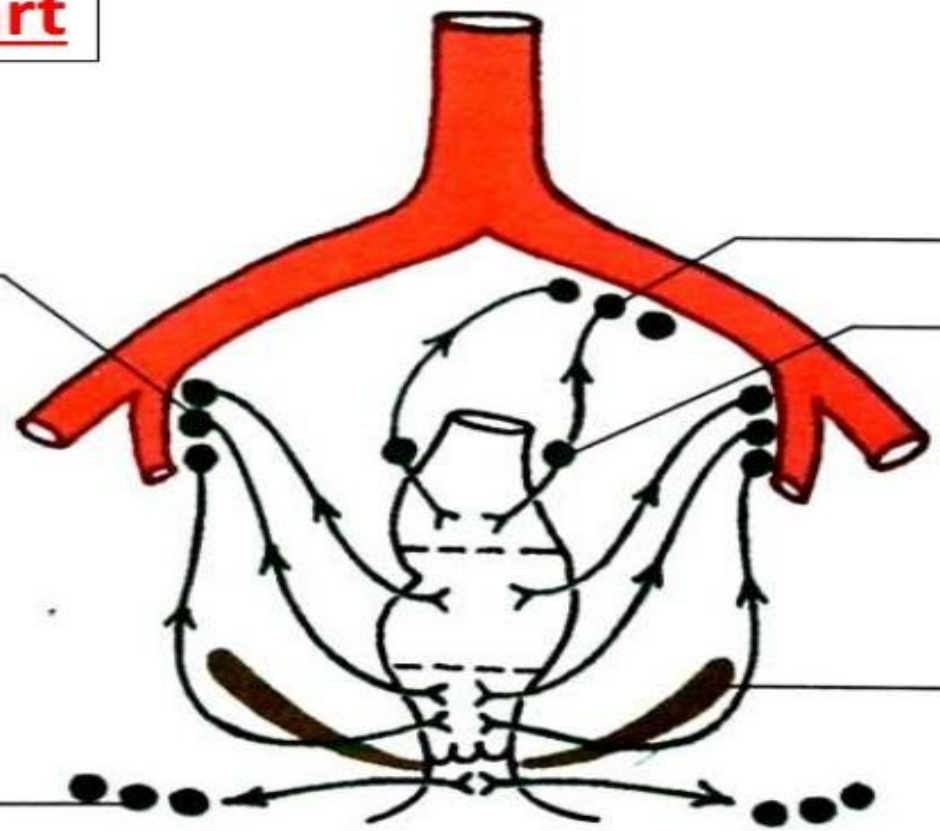
Nerve Supply

- The nerve supply isfrom the sympathetic and parasympathetic nerves from the inferior hypogastric plexuses. The rectum is sensitive **only** to stretch.

Lymphatic Drainage

From Middle Part

From Upper Part



From Lower Part

Nerve Supply

Sympathetic:

- Sup Hypogastric plexus **(L1 & L2)**
- Vasomotor
- Stimulate Sphincter & Inhibit musculature

Parasympathetic:

- Pelvic splanchnic nerves **(S2, S3 & S4)**
- Secreto-motor
- Stimulate peristalsis & Inhibit sphincter

Support of Rectum

- Pelvic floor by Levator ani muscles
- Fascia of Waldeyer
- Lateral ligaments of the Rectum
- Rectovesical fascia of Denonvillers
- Pelvic peritoneum
- Perineal body with its muscles
- Pelvi-rectal & Ischio-rectal fat

THANK YOU