

RECTU M

Dr. Bhavana

COMPETENCIES AND SLOS

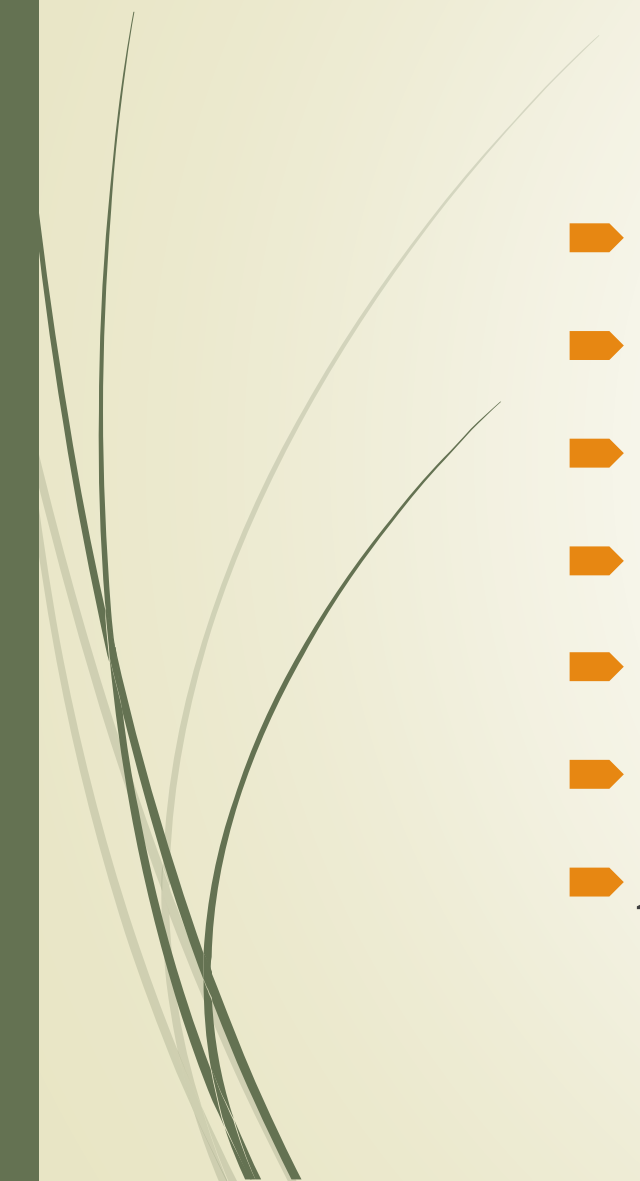
AN 48.2		Describe and demonstrate the position, features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and clinical aspects of important male and female pelvic viscera.
	48.2.12	at the end of the session the Phase I student shall be able to Describe the position, extent, features, peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and clinical aspects of rectum .

COMPETENCIES AND SLOS

AN48.8		Mention the structures palpable during vaginal & rectal examination
	48.8.1	at the end of the session the Phase I student shall be able to Mention the structures palpable during rectal examination

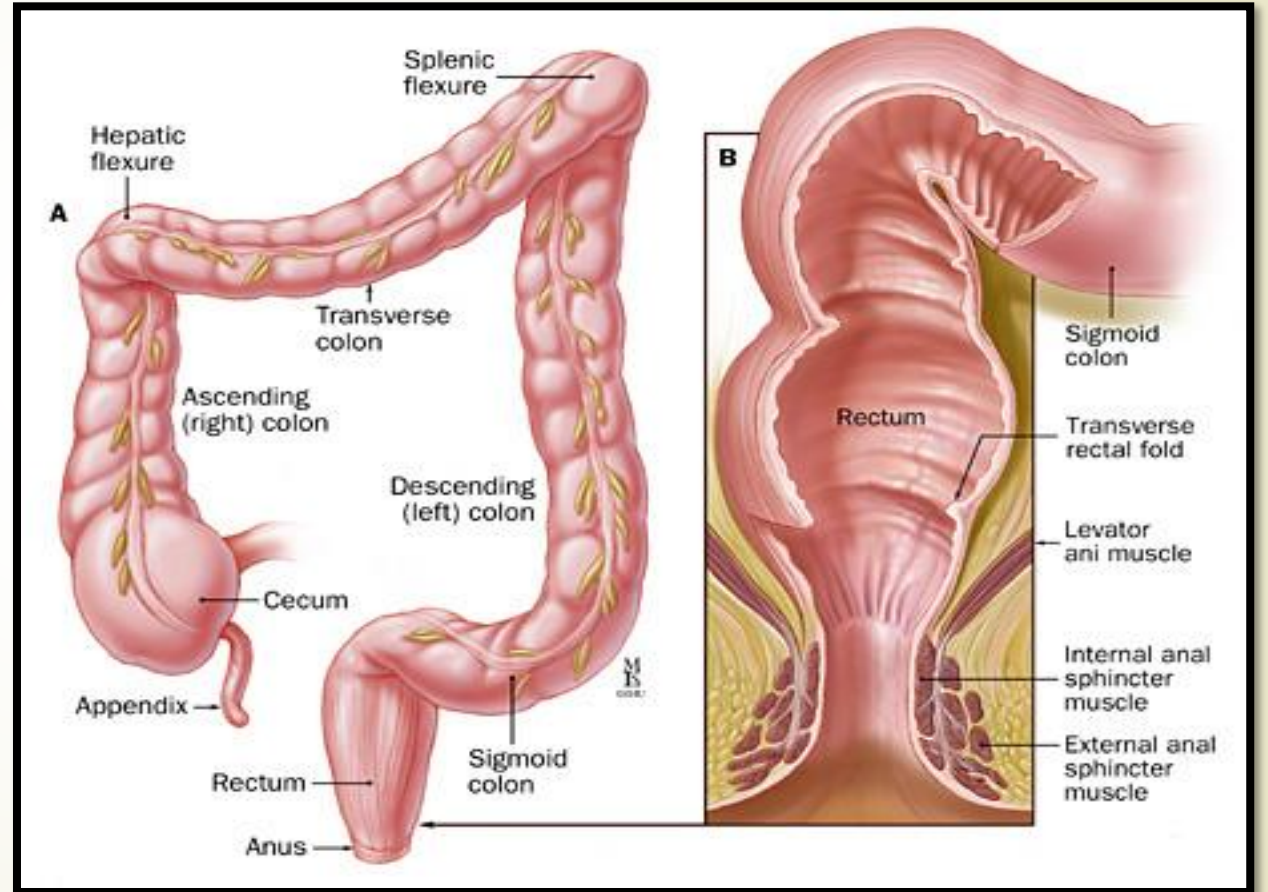


CONTENTS

- Introduction
 - Curvatures
 - Relations
 - Structure
 - Interior
 - Blood supply and lymphatic drainage
 - Applied anatomy
- 

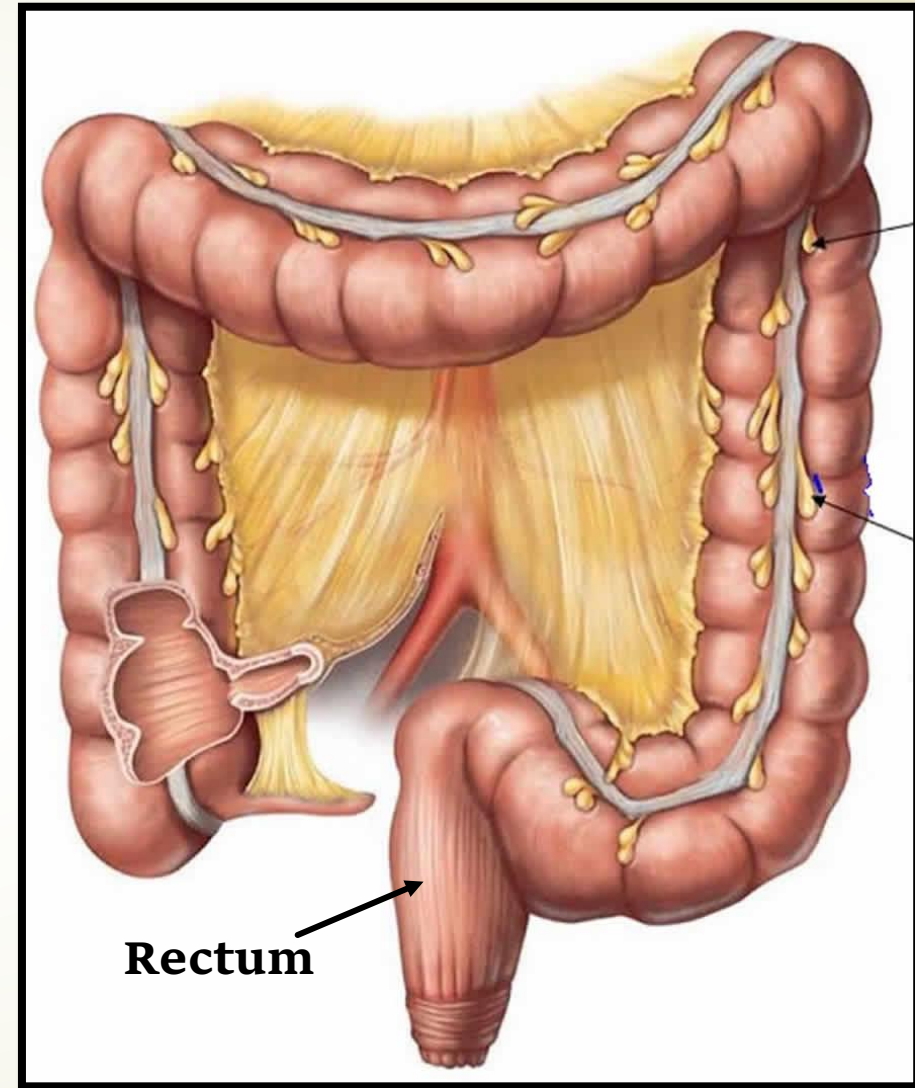
INTRODUCTION

- Means **straight** tube
- **Misnomer** in human
- **Lower dilated part of colon** – between sigmoid colon and anal canal
- **Site** – in pelvis
- **Size** – 12 cm – length



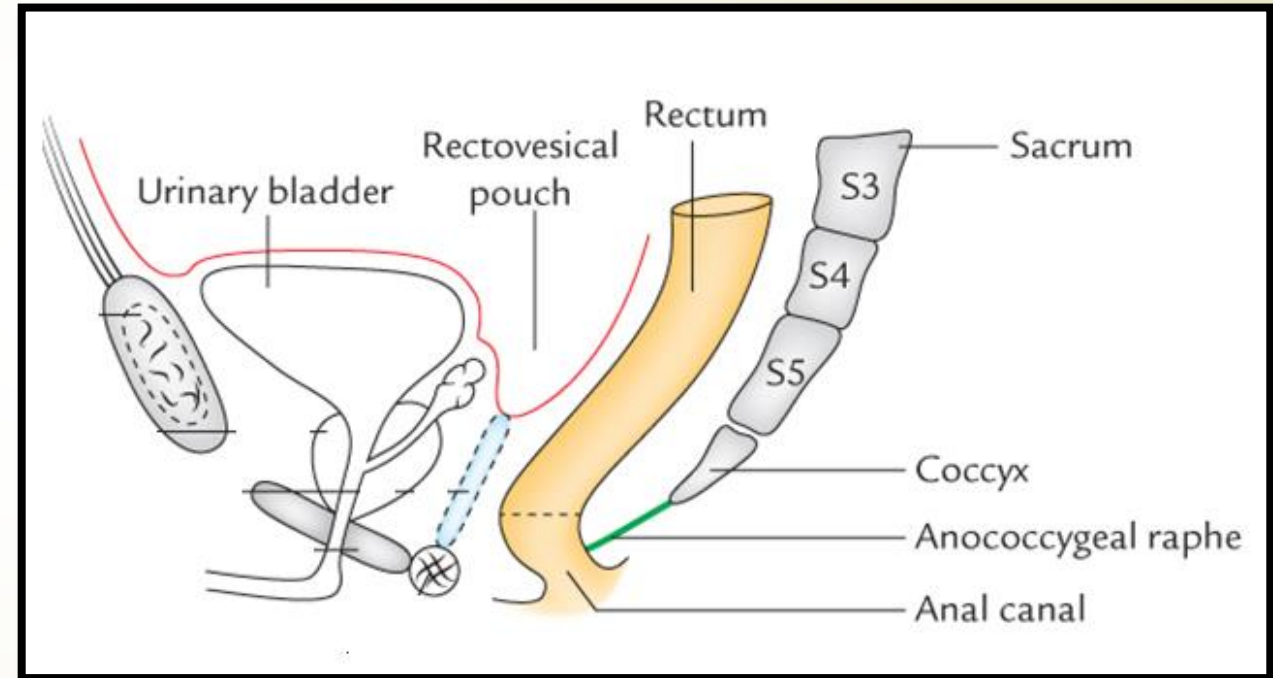
INTRODUCTION

- No characteristic features of large intestine – **NO**
- **Taenia coli**
- **Sacculations**
- **Appendices epiploicae**



COURSE

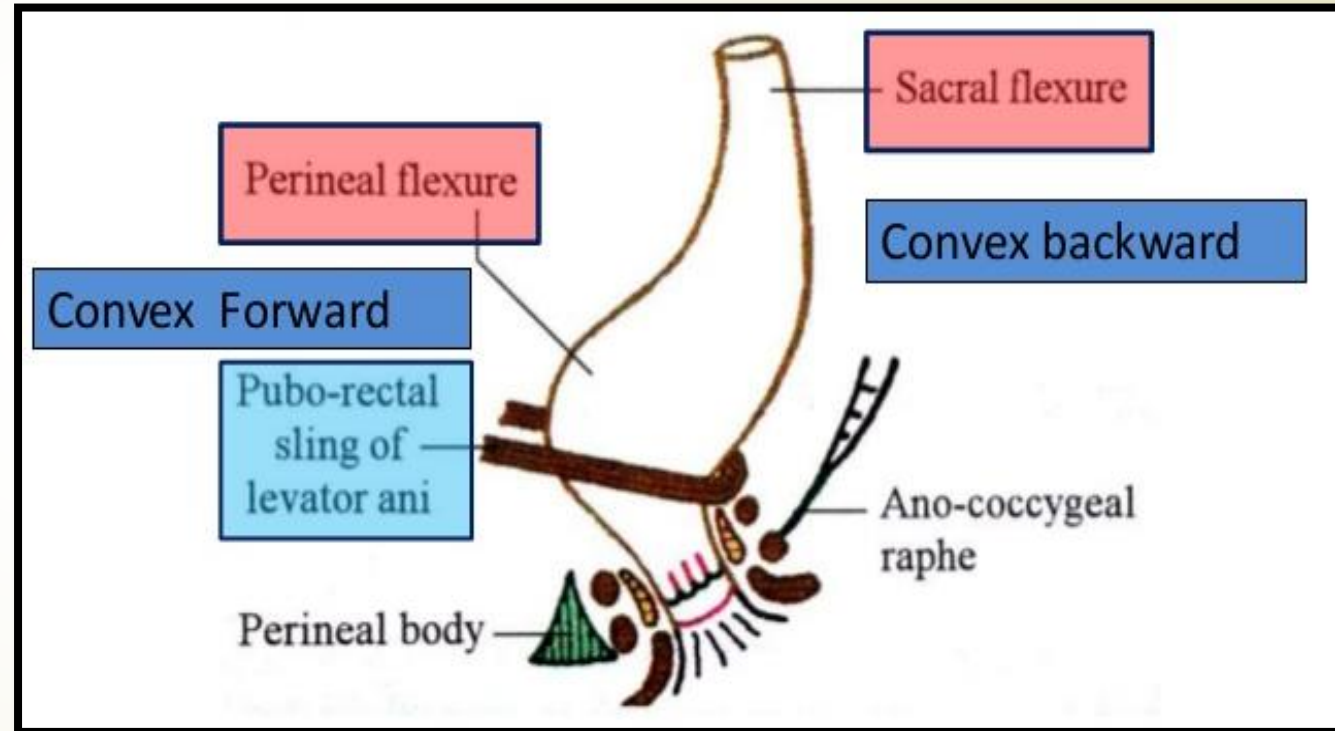
- ▶ **Begins** – S3 vertebra
- ▶ **Ends** – 2-3 cm below and in front of tip of coccyx
- ▶ In males anorectal junction is at the level of apex of prostate
- ▶ Lower part presents a dilatation called **ampulla**



CURVATURES

Antero-posterior –

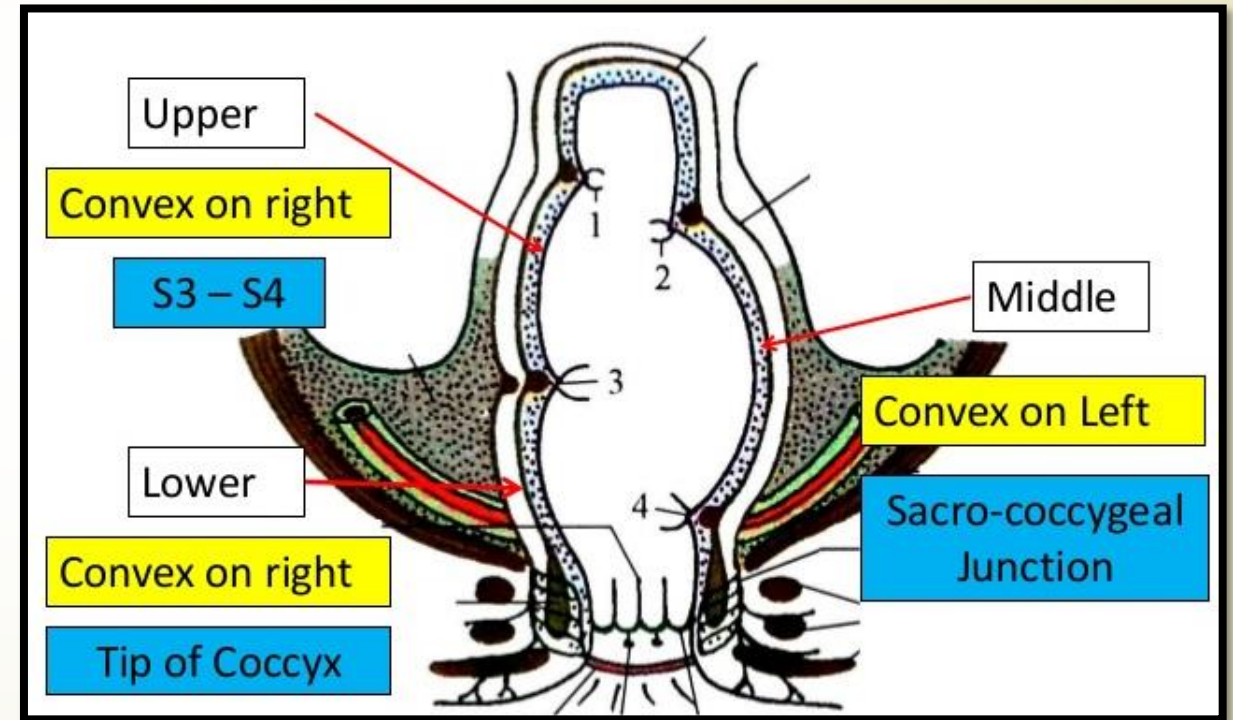
- **Sacral curve** – concave forwards
- **Perineal curve** – at anorectal junction – convex forwards
 - Maintained by **pubo-rectal sling**



CURVATURES

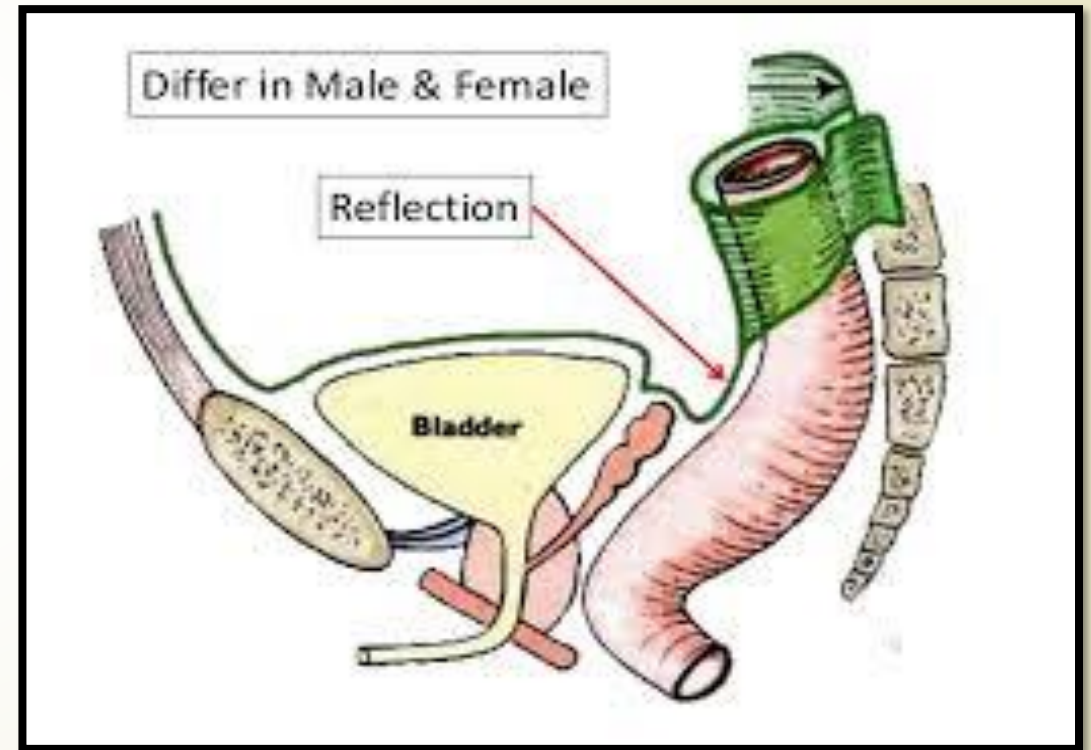
Lateral –

- **Upper** – S3-4, convex to right
- **Middle** – S5-Cx, convex to left
- **Lower** – tip of coccyx, convex to right
- At the concavities of the curves inside are **horizontal rectal valves** – for support



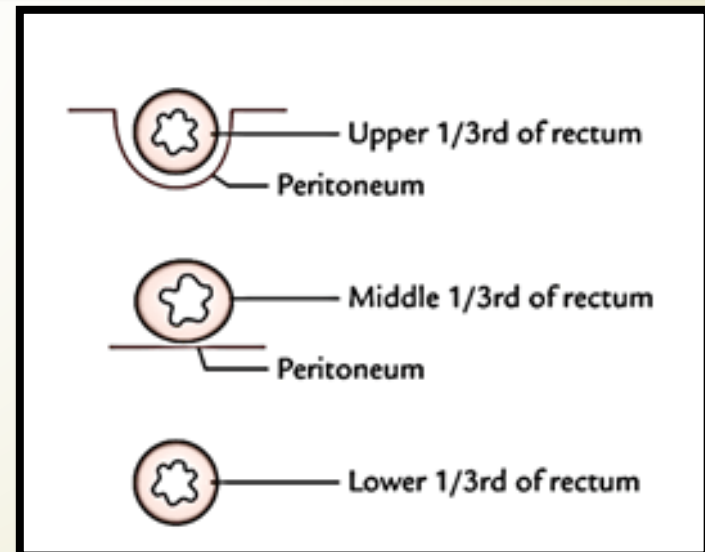
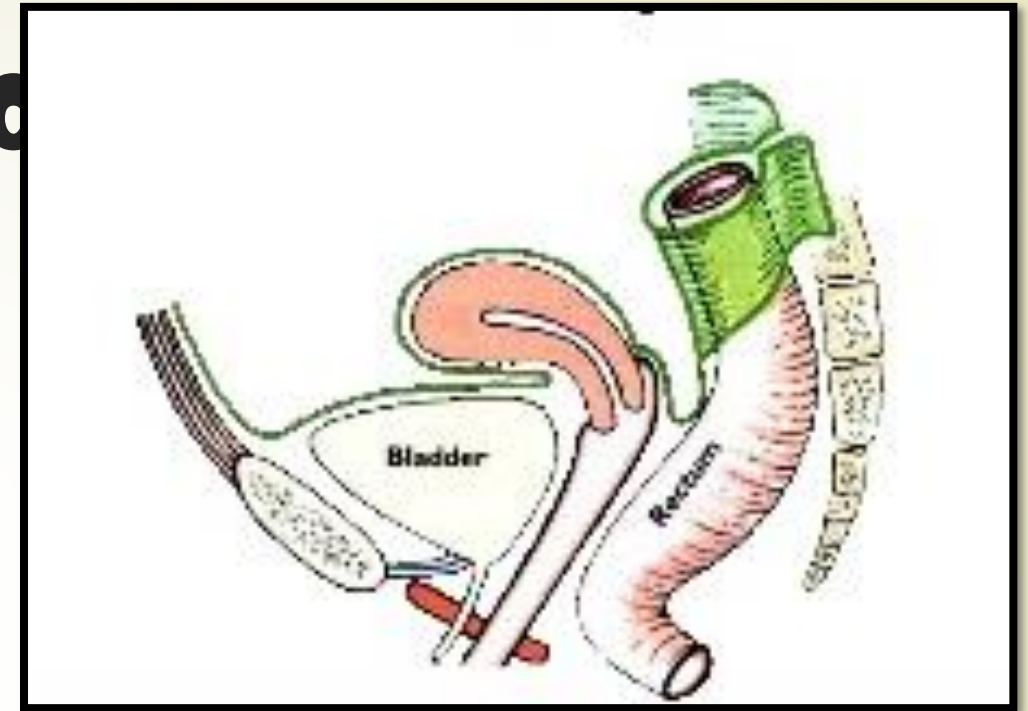
RELATIONS - PERITONEAL

- Posterior – non peritoneal
- Anterior – upper 2/3rd covered by peritoneum
- Sides – upper 1/3rd covered by peritoneum
- Pararectal fossae – reflection of peritoneum on lateral pelvic wall



RELATIONS - PERITONEUM

- ▶ Rectovesical pouch – in male, reflects on bladder
- ▶ Rectouterine pouch of Douglas – in female, reflects on uterus



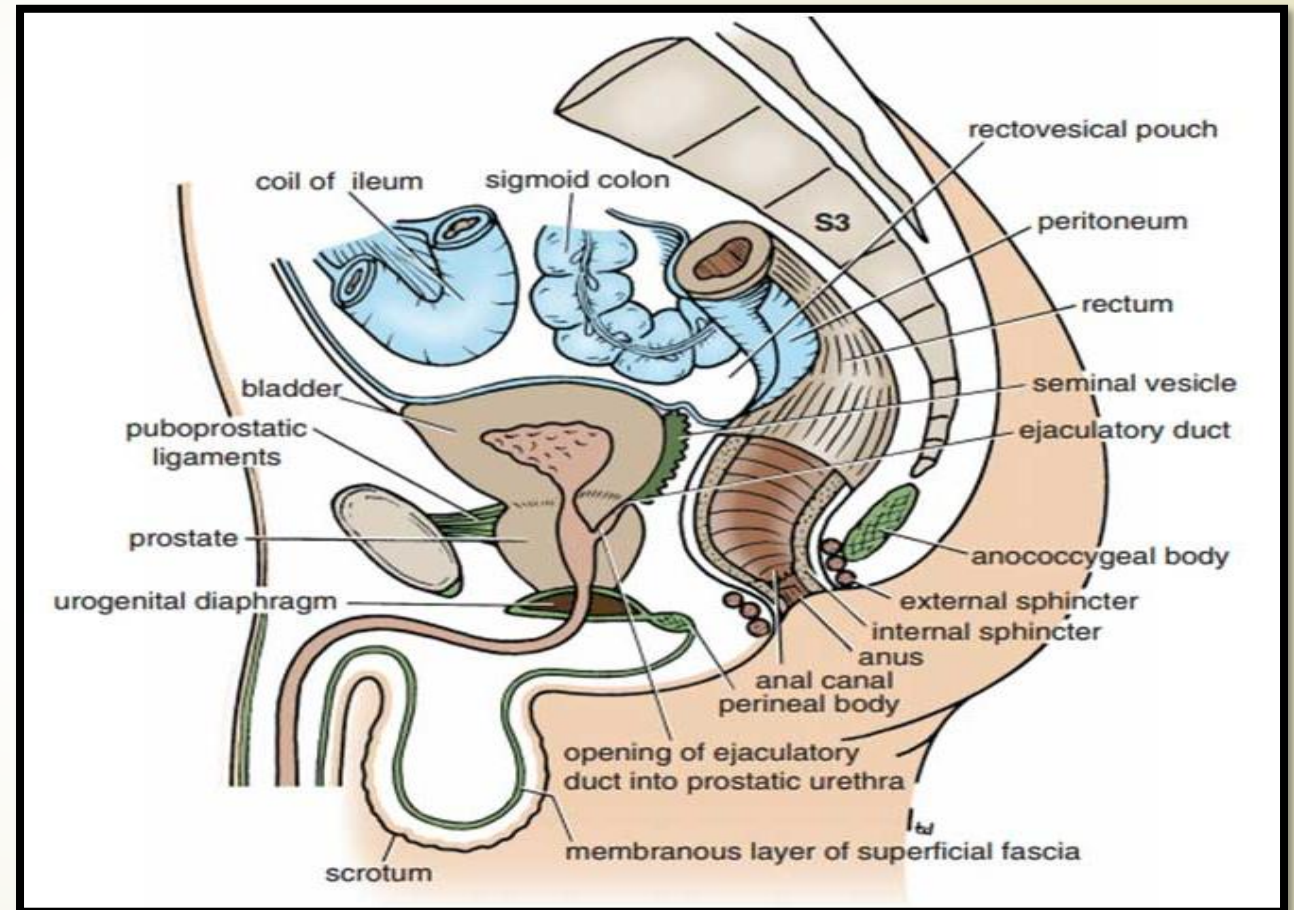
RELATIONS

Anterior –

Upper part – sigmoid colon, small intestine

Lower part –

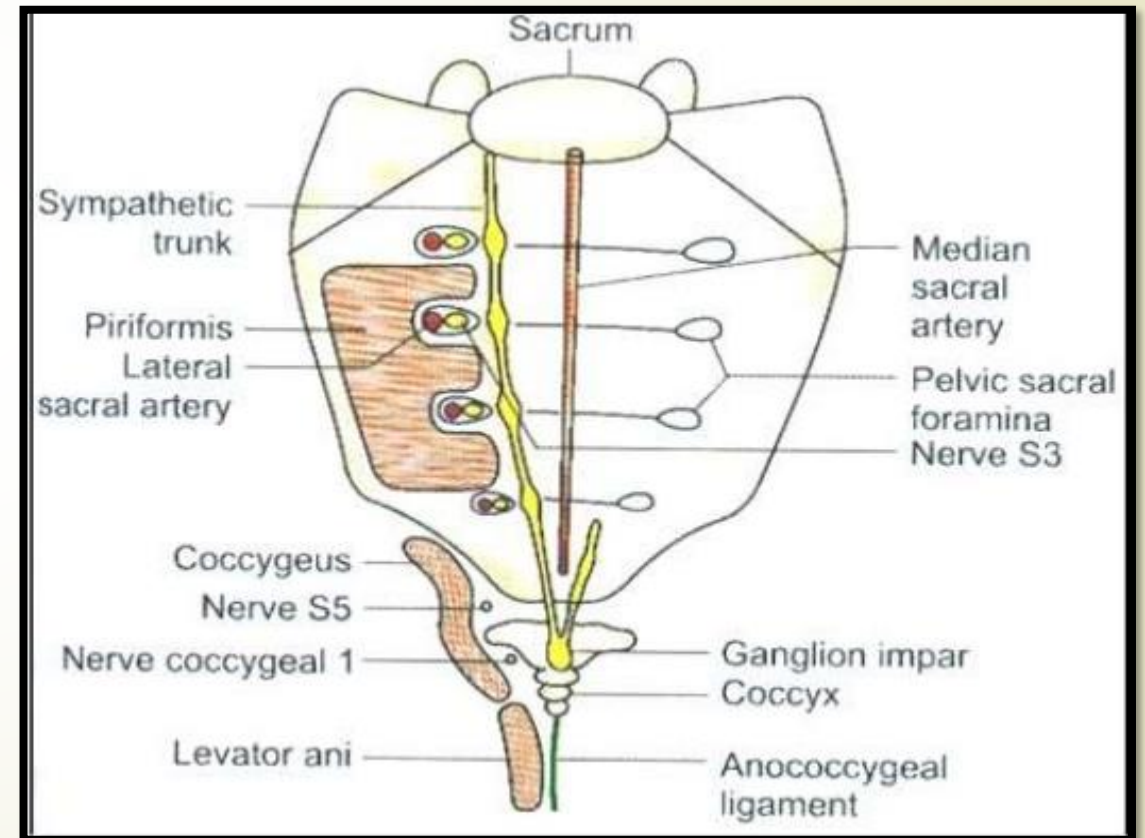
- In male – base of bladder, seminal vesicles, vas deferens and prostate
- In female – posterior wall of vagina (Diag. in slide no.11)



RELATIONS

Posterior –

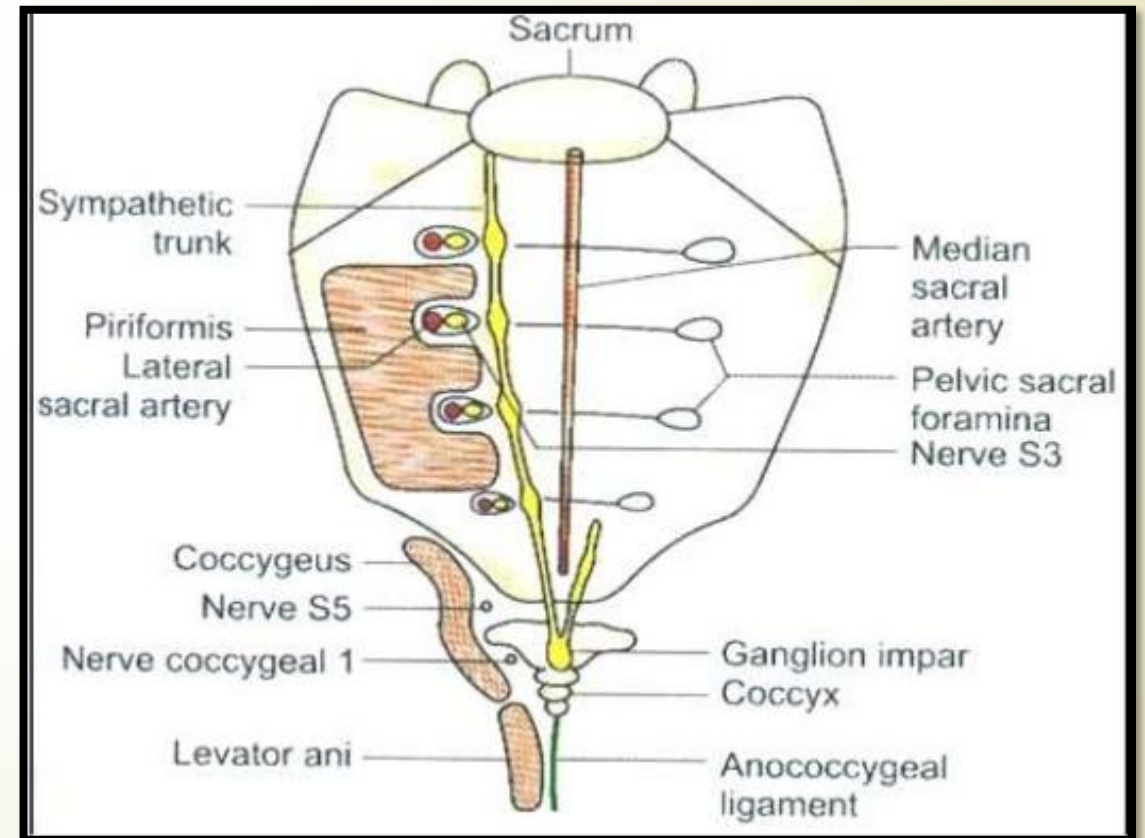
- Midline –
- Sacrum, coccyx
- Anococcygeal raphae
- Ganglion impar
- Median sacral vessels
- Superior rectal artery



RELATIONS

Posterior –

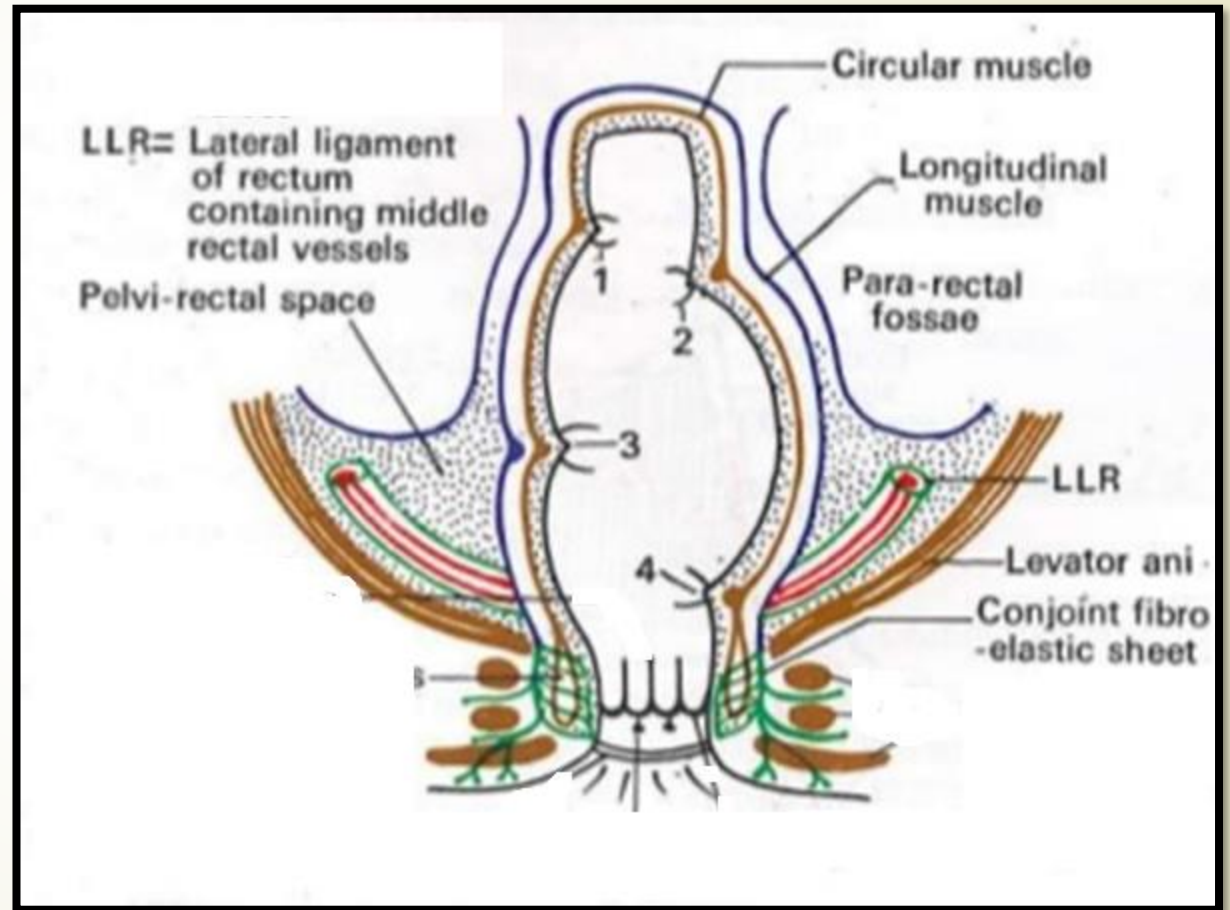
- On each side –
- Piriformis, coccygeus, levator ani
- Sympathetic trunks, sacral plexus, pelvic splanchnic nerves
- Lateral sacral vessels



RELATIONS

Lateral –

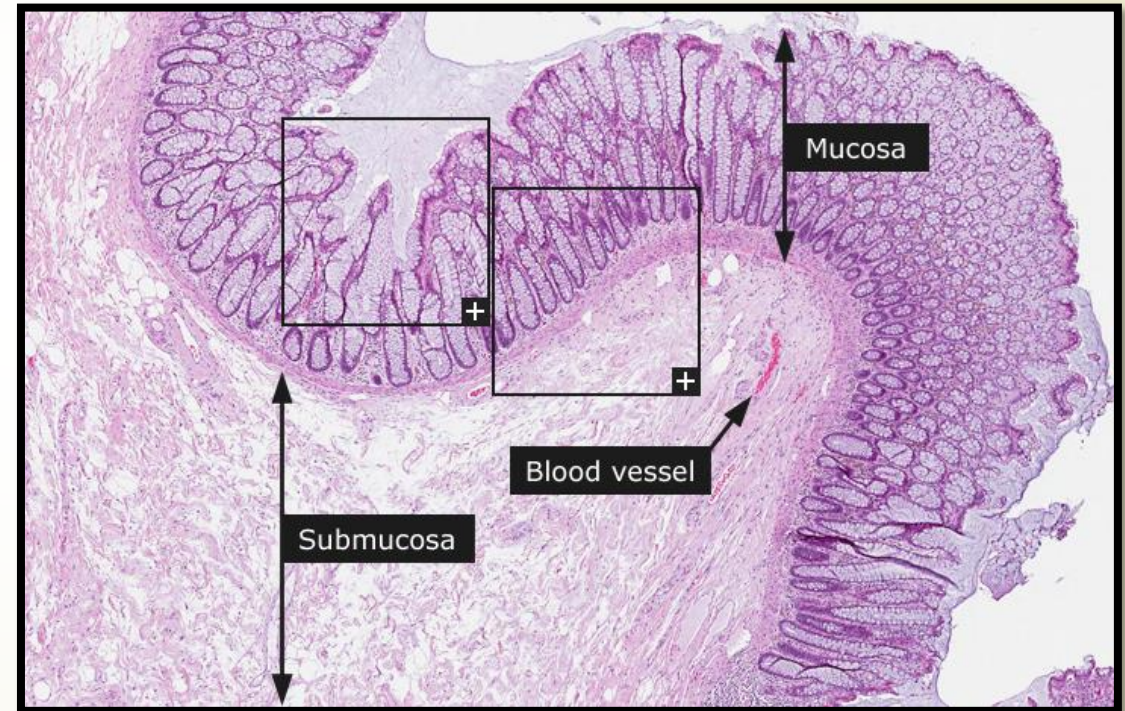
- ▶ Upper part – Sigmoid colon, small intestine
- ▶ Lower part – levator ani muscle, lateral rectal ligament with middle rectal vessels



STRUCTURE OF RECTUM

4 layers – like GIT

- Outside in –
- **Serosa/ adventitia** – peritoneum &/or connective tissue
- Muscularis externa
- Submucosa
- Mucosa

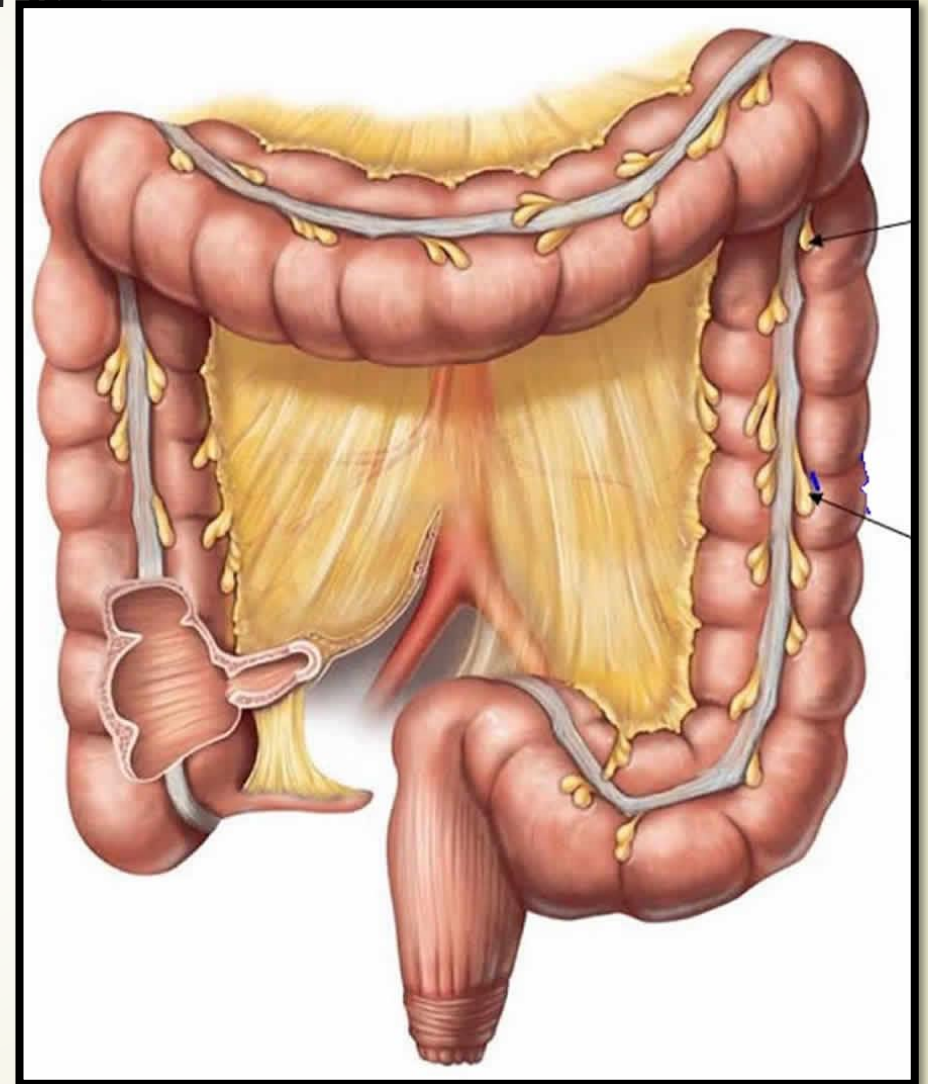


MUSCULARIS EXTERNA

Outer longitudinal and inner circular

Longitudinal –

- No taenia
- Thicker in anterior and posterior walls compared to lateral part
- Blends below with puborectalis (levator ani) at anorectal junction



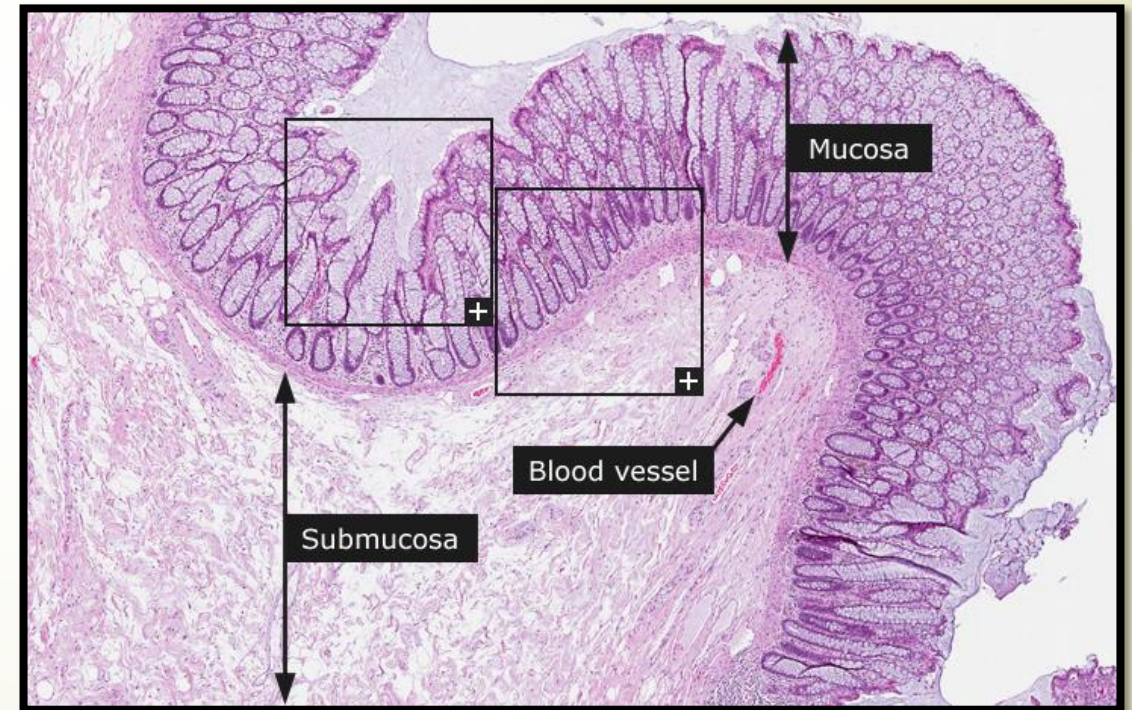
STRUCTURE

Submucosa –

- Loose areolar connective tissue with blood vessels, nerves and lymphatics

Mucosa –

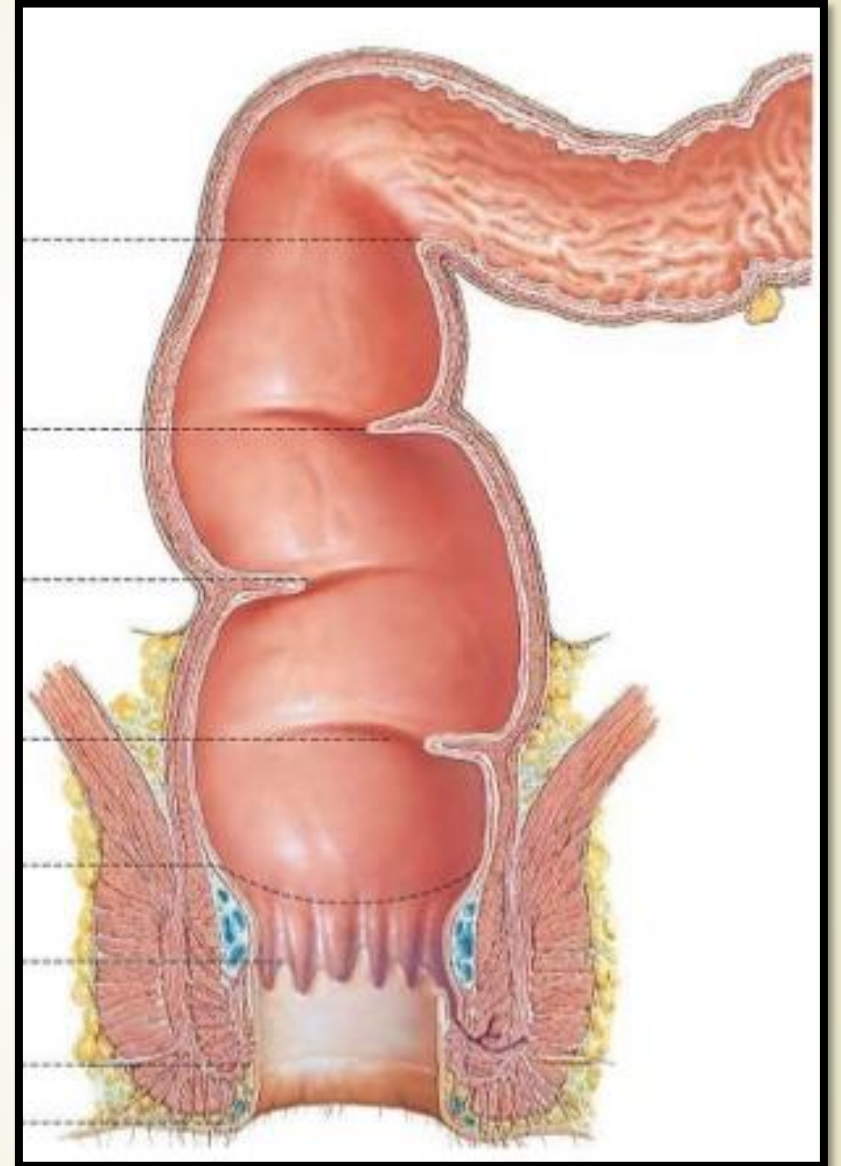
- **Epithelium** – simple columnar with goblet cells
- **Lamina propria** - Loose areolar connective tissue
- **Muscularis mucosae**



INTERIOR

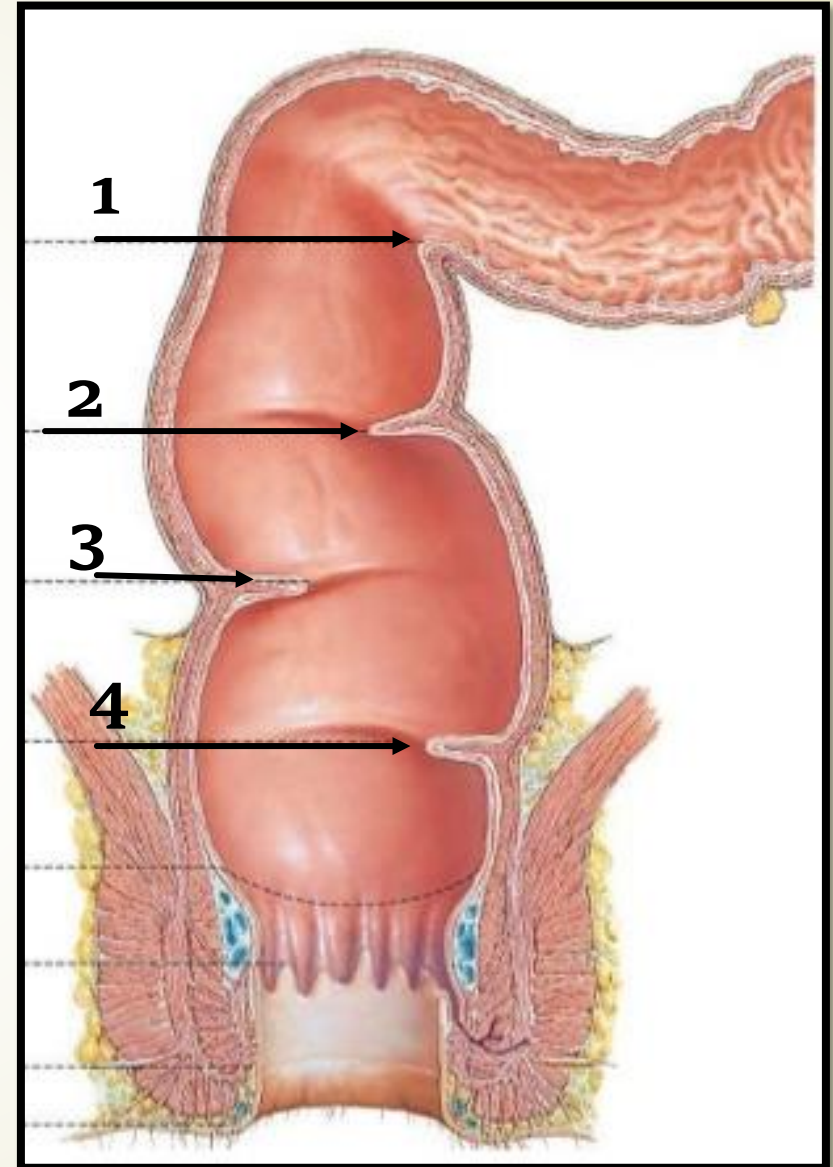
Mucosa presents 2 types of folds

- ▶ Temporary –
 - ▶ longitudinal, in lower part
- ▶ Permanent –
 - ▶ Houston's valves
 - ▶ Horizontal folds



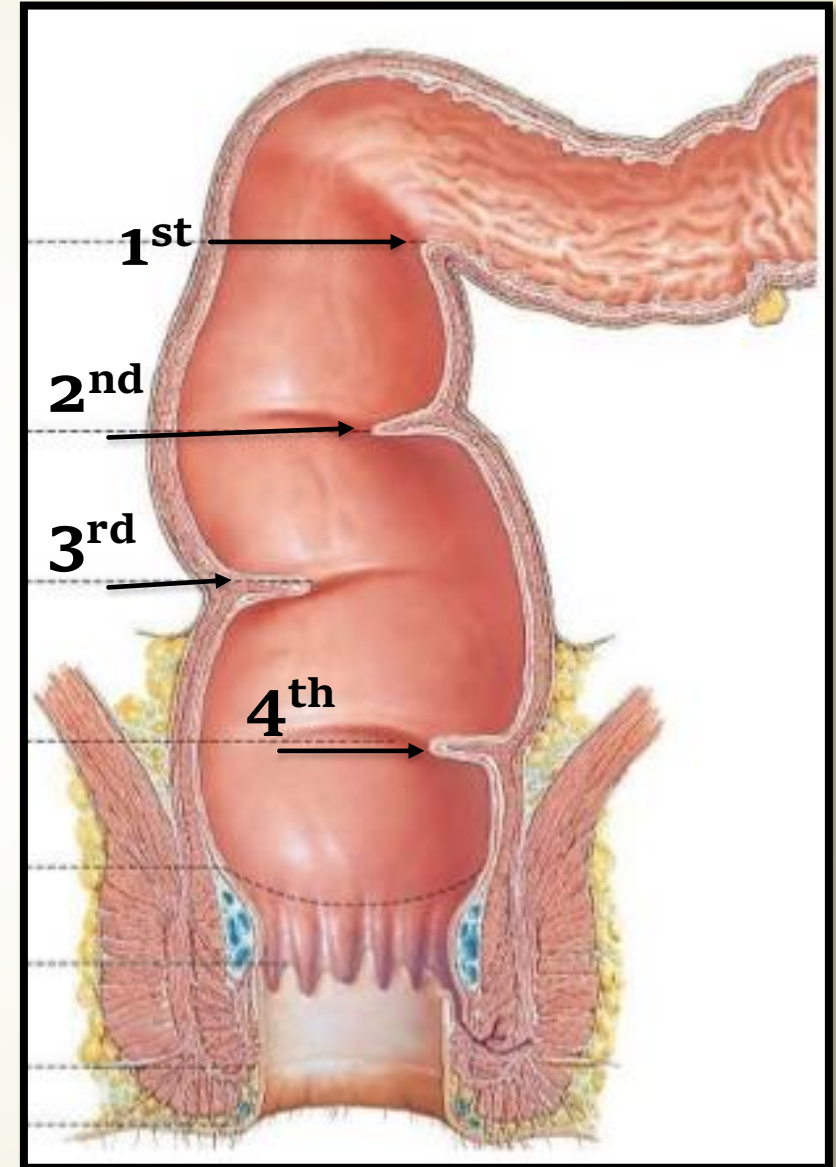
HOUSTAN'S VALVES

- Semilunar folds, along concavities of lateral curvatures
- **Total 4** – numbered from above downwards
- **Structure** – fold of mucous membrane containing connective tissue and some circular and longitudinal muscle
- **1st and 3rd valve are most constant**



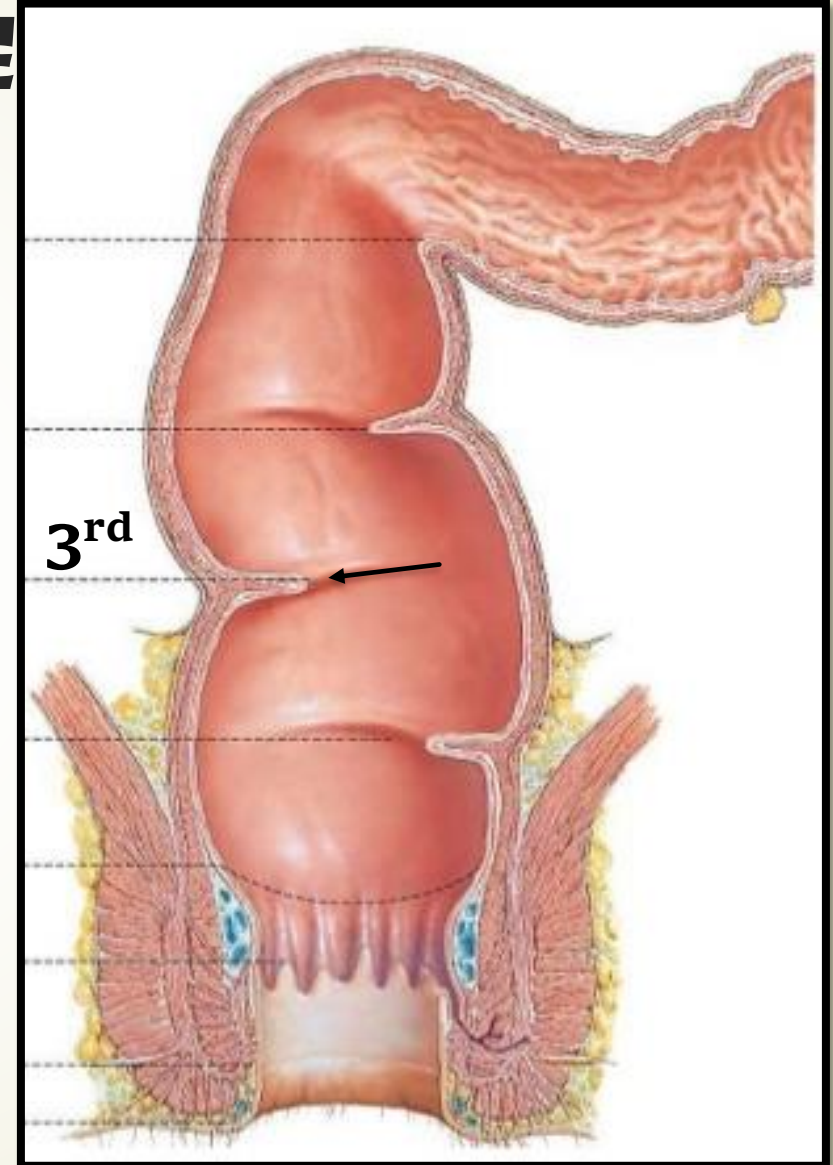
HOUSTAN'S VALVES

- ▶ **1st** – S3 , at rectosigmoid junction, 12-14 cm above anal canal. On right/ left side
- ▶ **2nd** – from left side, 7.5 cm above anal canal
- ▶ **3rd** – most important
- ▶ **4th** – from left side, 2.5 cm above anal canal



HOUSTAN'S 3RD VALVE

- ▶ **3rd – S5**, just above rectal ampulla, **5 cm** above anus. On anterior and right wall along concavity of middle lateral curve
- ▶ **Nelaton's sphincter** –
 - ▶ When 3rd valve completely encircles rectum



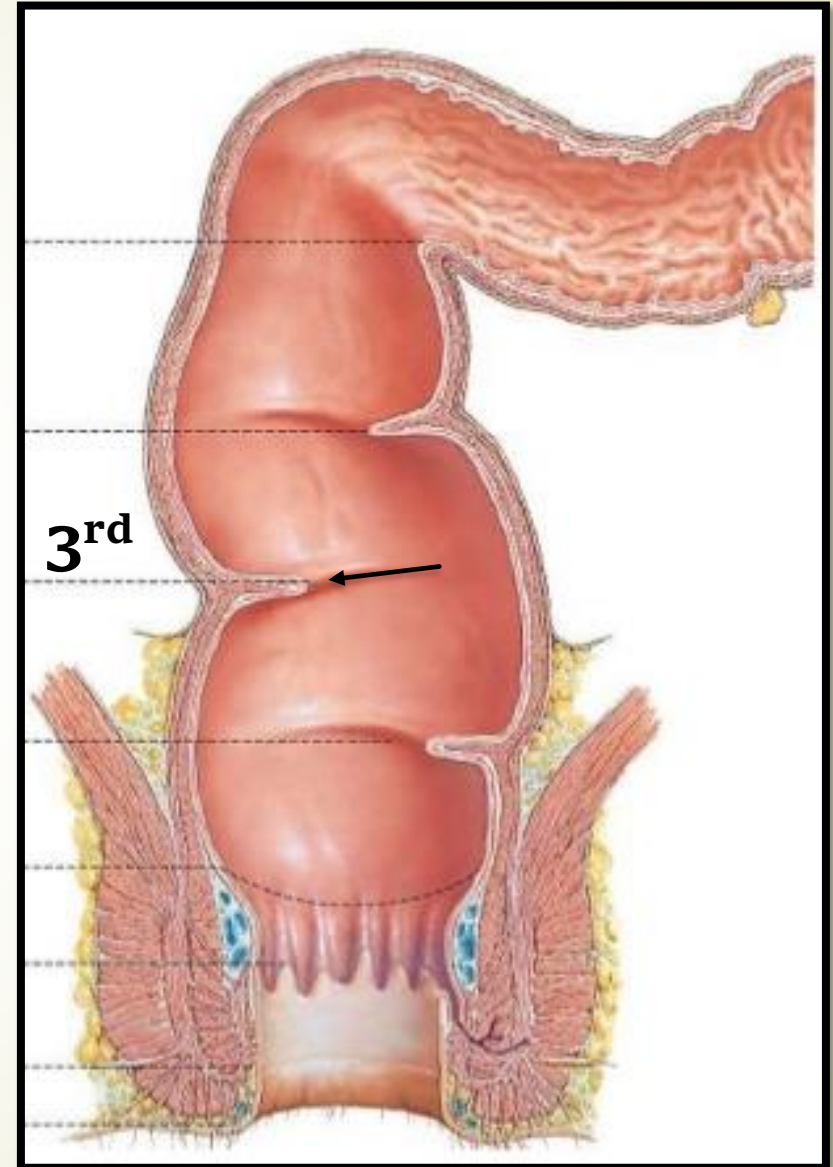
HOUSTAN'S VALVES

3rd Divides rectum in 2 parts

- ▶ Upper part – develops from hind gut, does not generate defaecation reflex
- ▶ Lower part – develops from cloaca, generates defaecation reflex

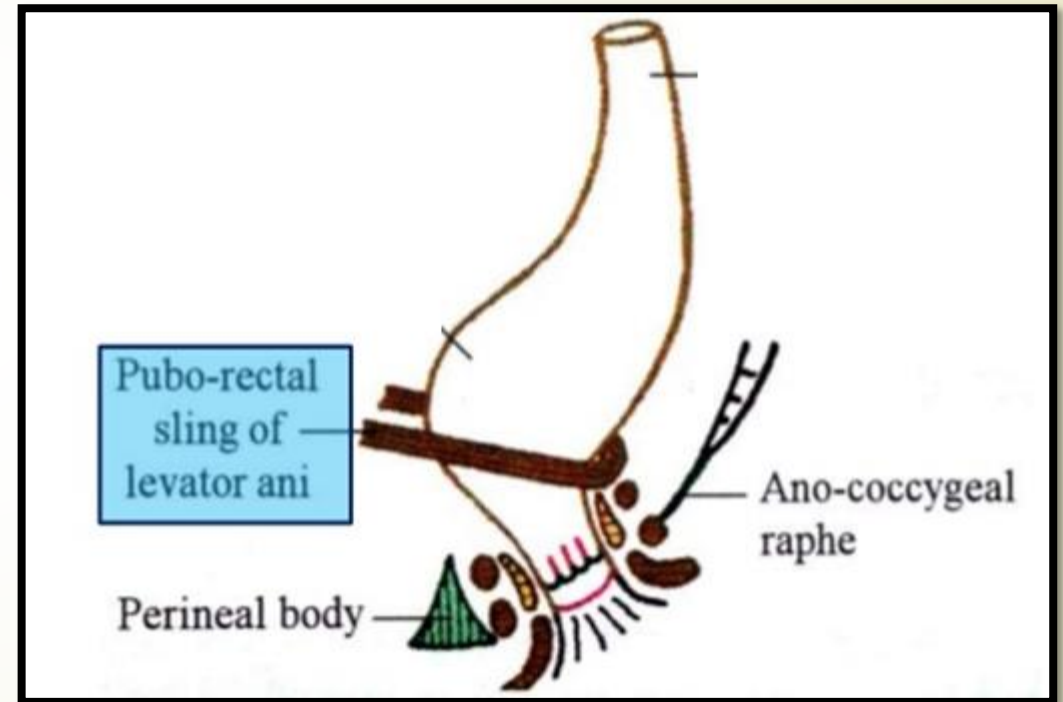
Importance of valves –

- ▶ Needed to support weight of faeces in humans



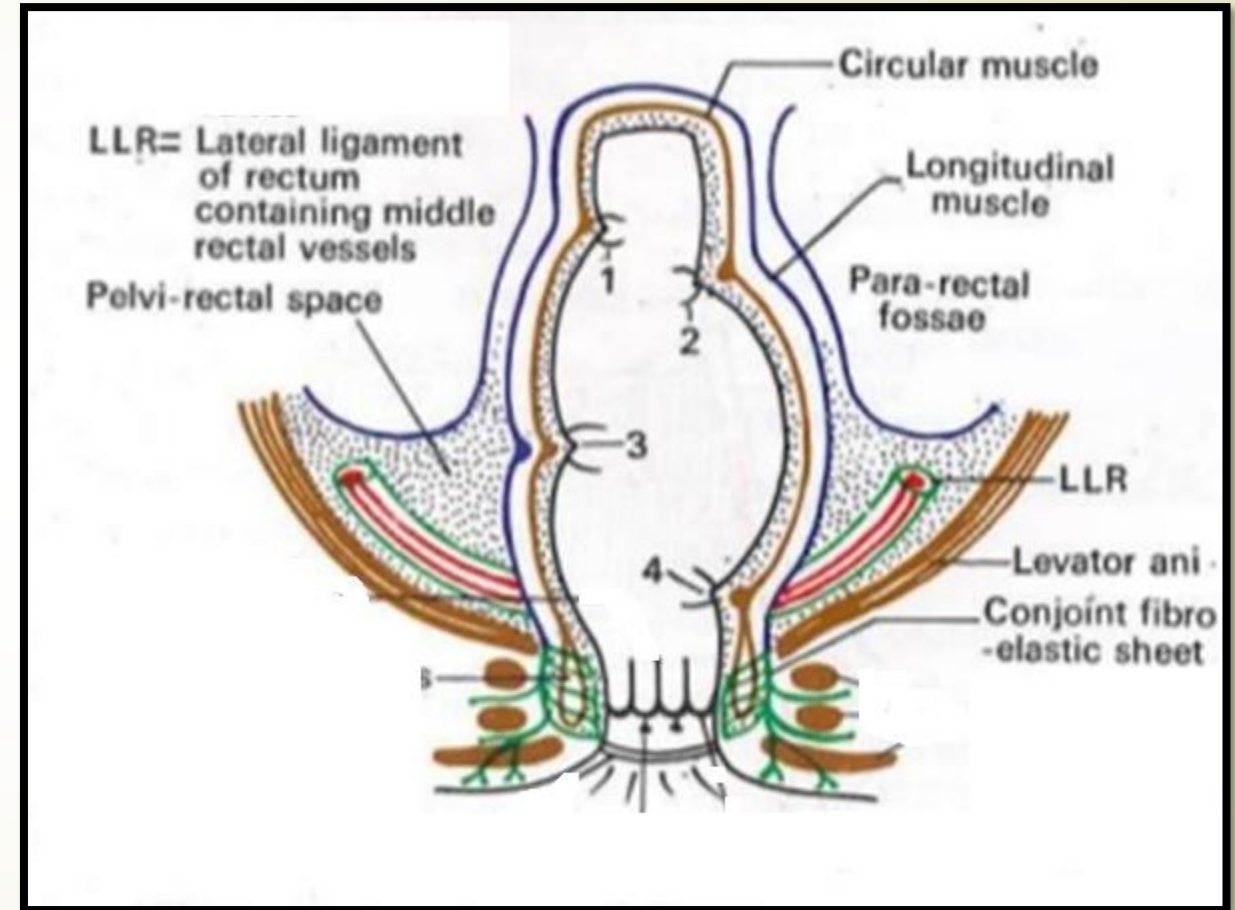
SUPPORTS OF RECTUM

- ▶ Puborectal sling – from levator ani muscle
- ▶ At anorectal junction



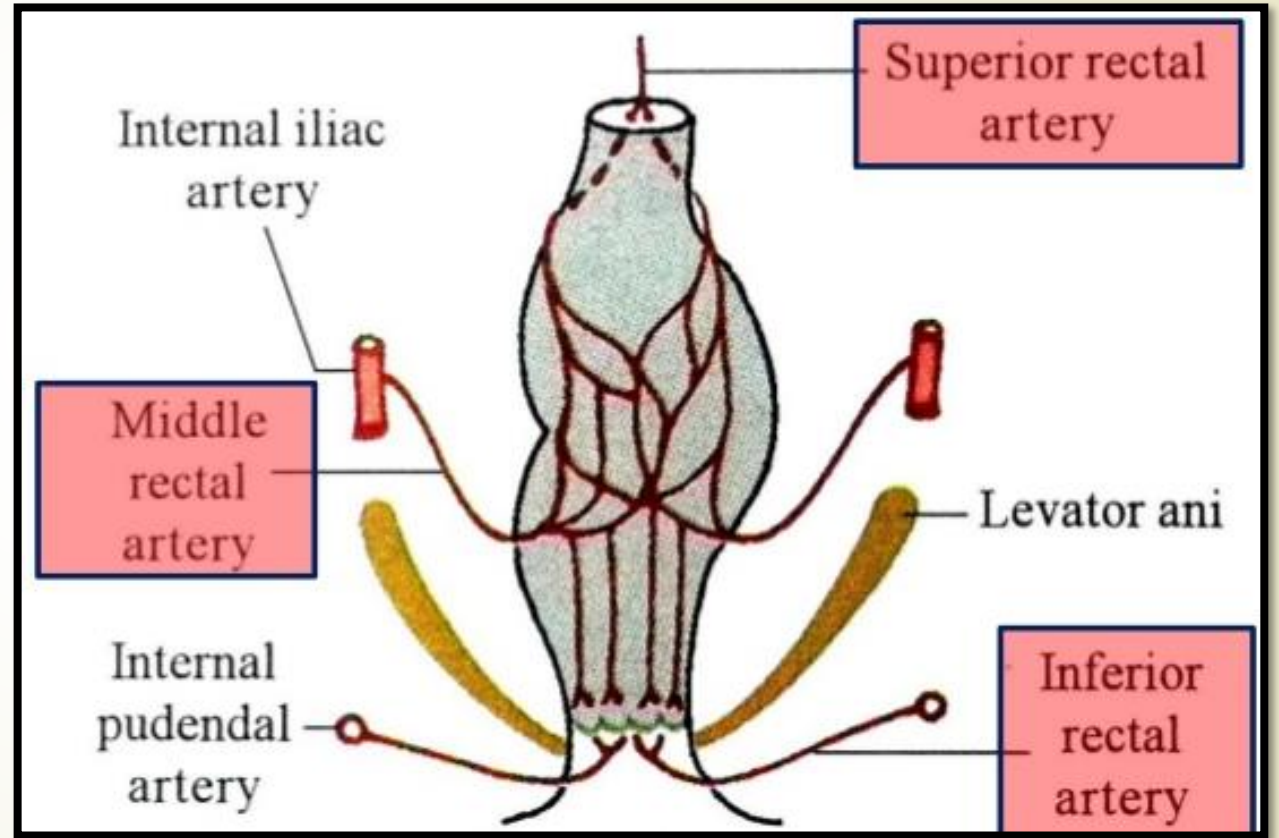
SUPPORTS OF RECTUM

- ▶ Lateral ligaments of rectum – from pelvic fascia
- ▶ Pelvi-rectal fat – as packing material



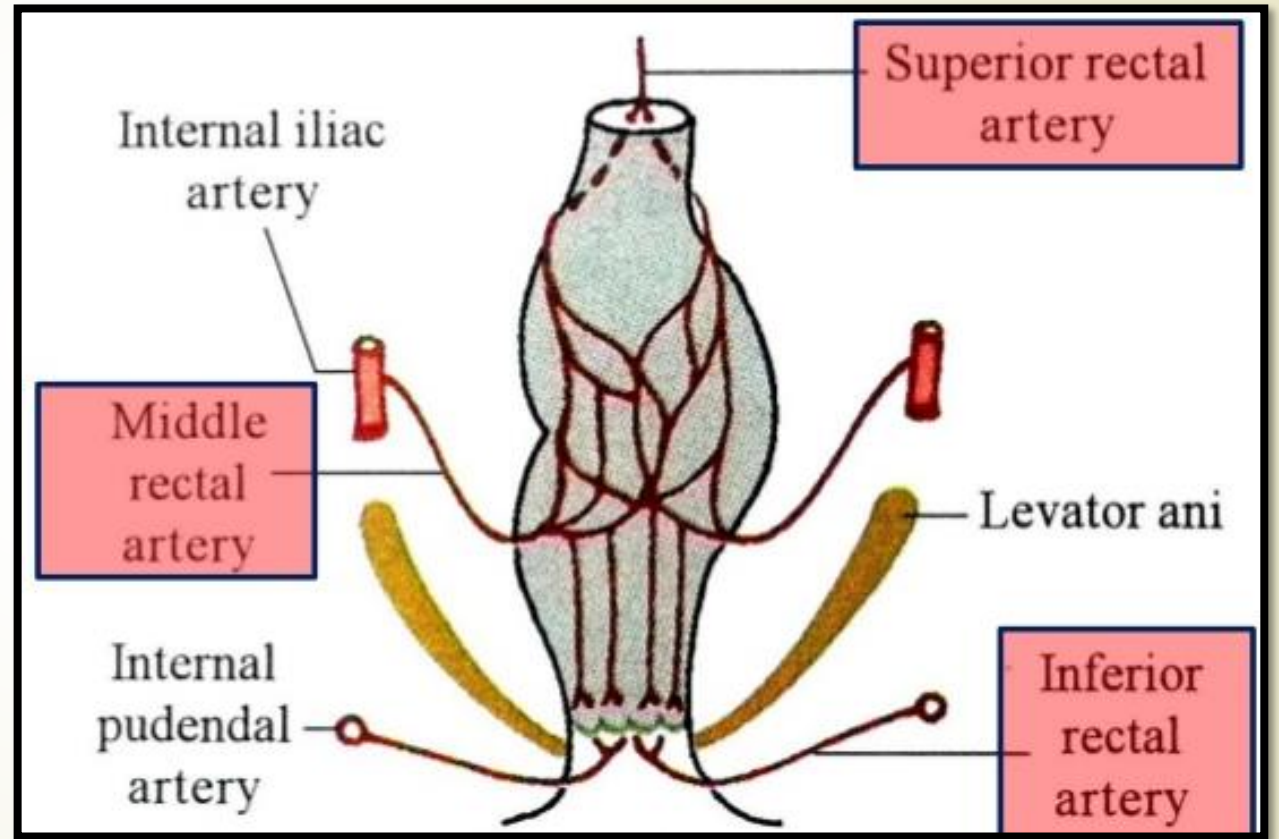
ARTERIAL SUPPLY

- Arteries –
- Upper part – **Superior rectal artery** – continuation of inferior mesenteric artery
- Lower part – **Middle rectal artery** – branch of internal iliac artery
- Anorectal junction – **inferior rectal artery** – branch of internal pudendal artery



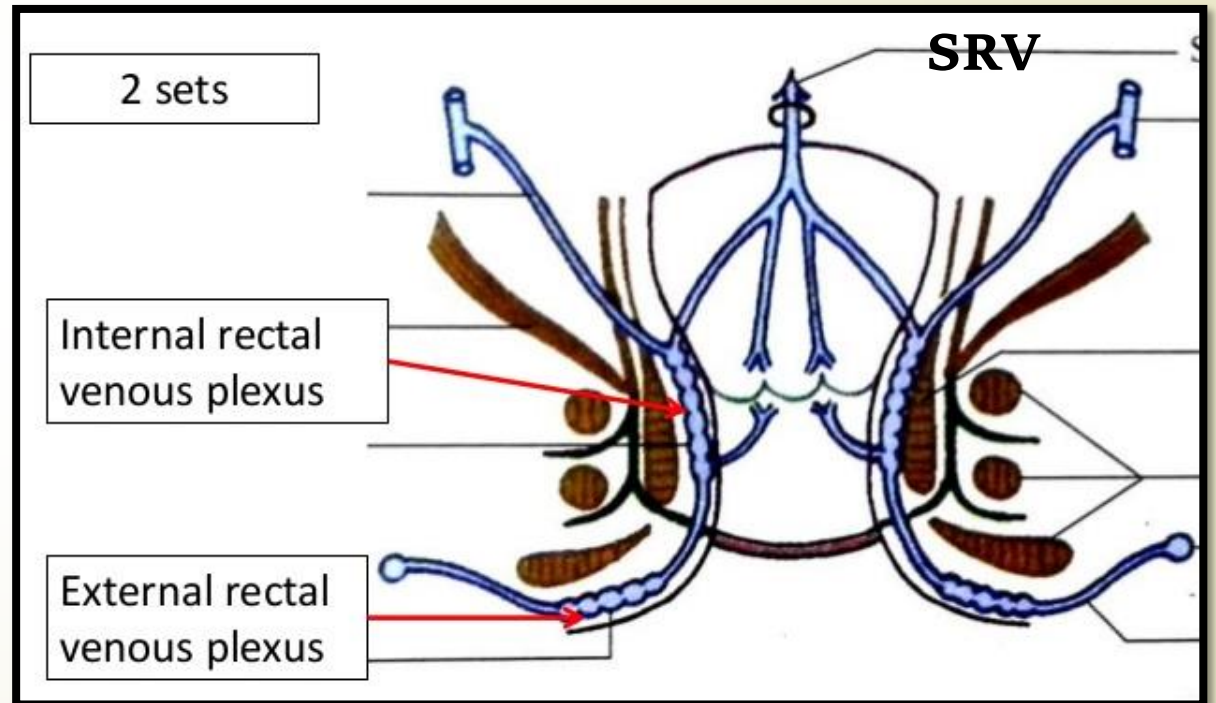
ARTERIAL SUPPLY

- Superior rectal artery
–Principal artery
- Divides in to right and left branches, forms plexus in submucous coat
- From these plexus straight arteries of anal columns arise



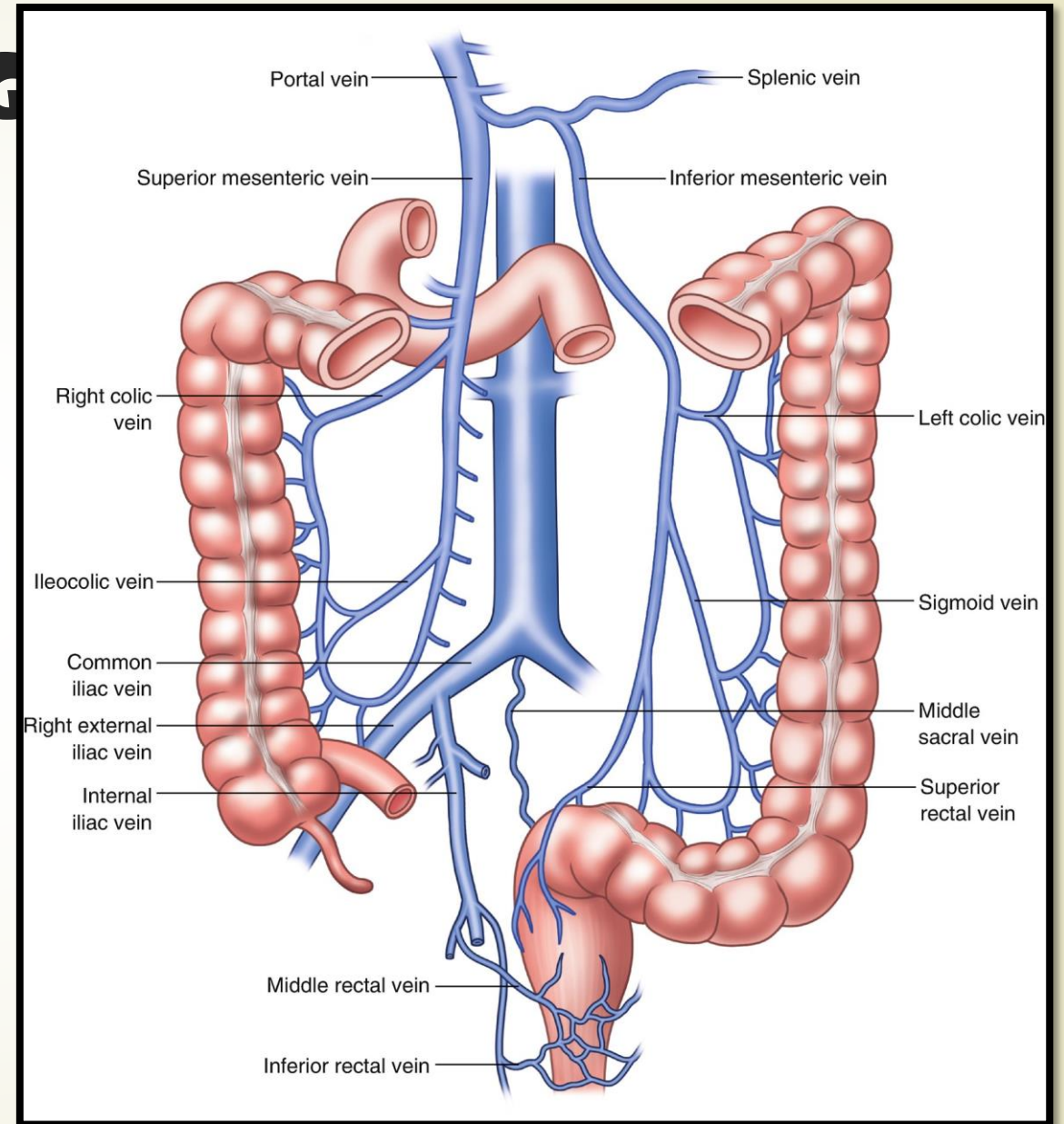
VENOUS DRAINAGE

- From internal venous plexus of anal canal six veins pass upwards through anal columns. These submucosal veins combine to form superior rectal vein



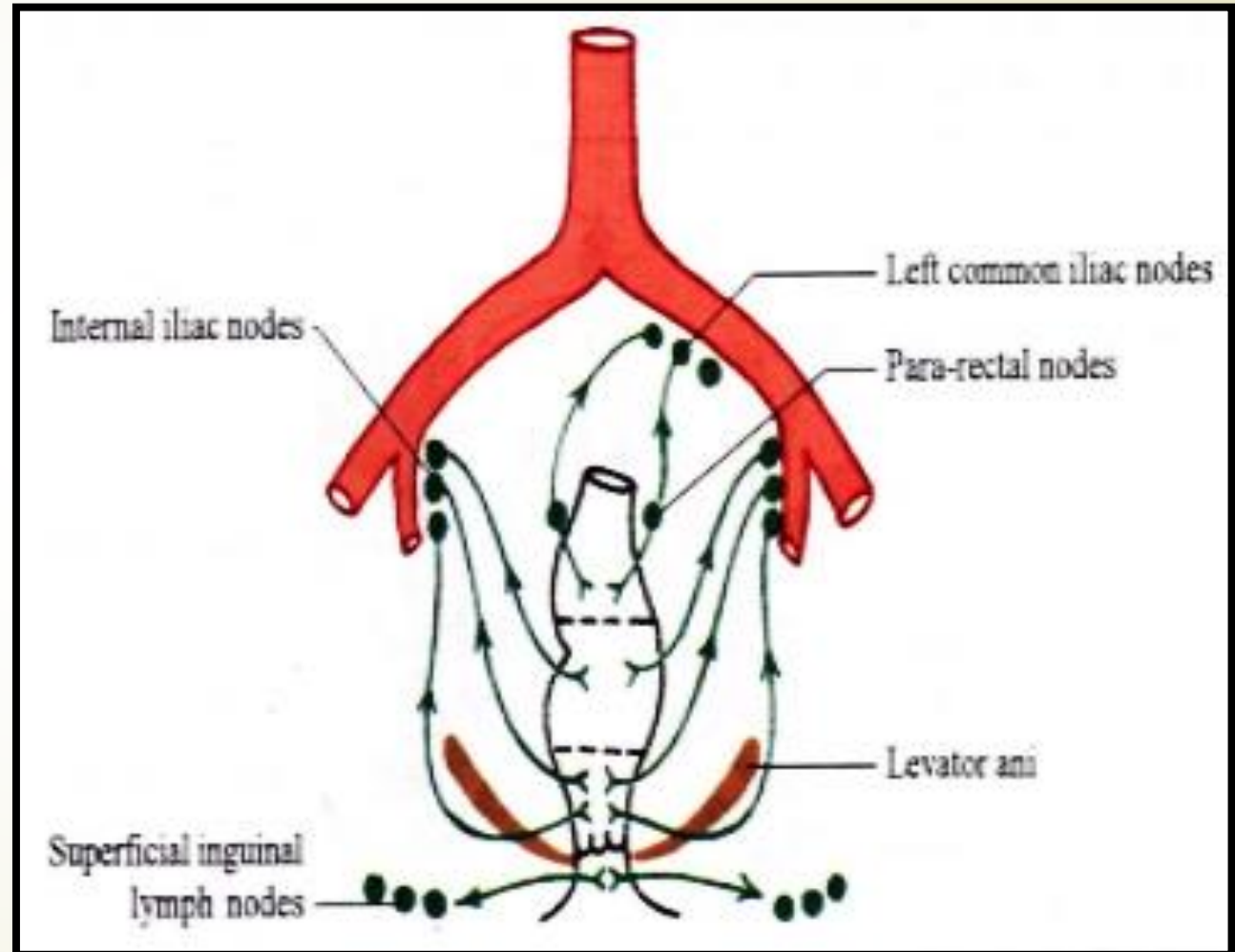
VENOUS DRAINAGE

- ▶ Pierces rectum 7.5cm above anus and **drains in to inferior mesenteric vein**
- ▶ Superior rectal vein radicles are **devoid of valves**



LYMPHATIC DRAINAGE

- Upper part – left common iliac lymph nodes, intercepted by pararectal lymph nodes
- Middle part – internal iliac lymph nodes
- Lower part – pass above or below levator ani in to internal iliac lymph nodes



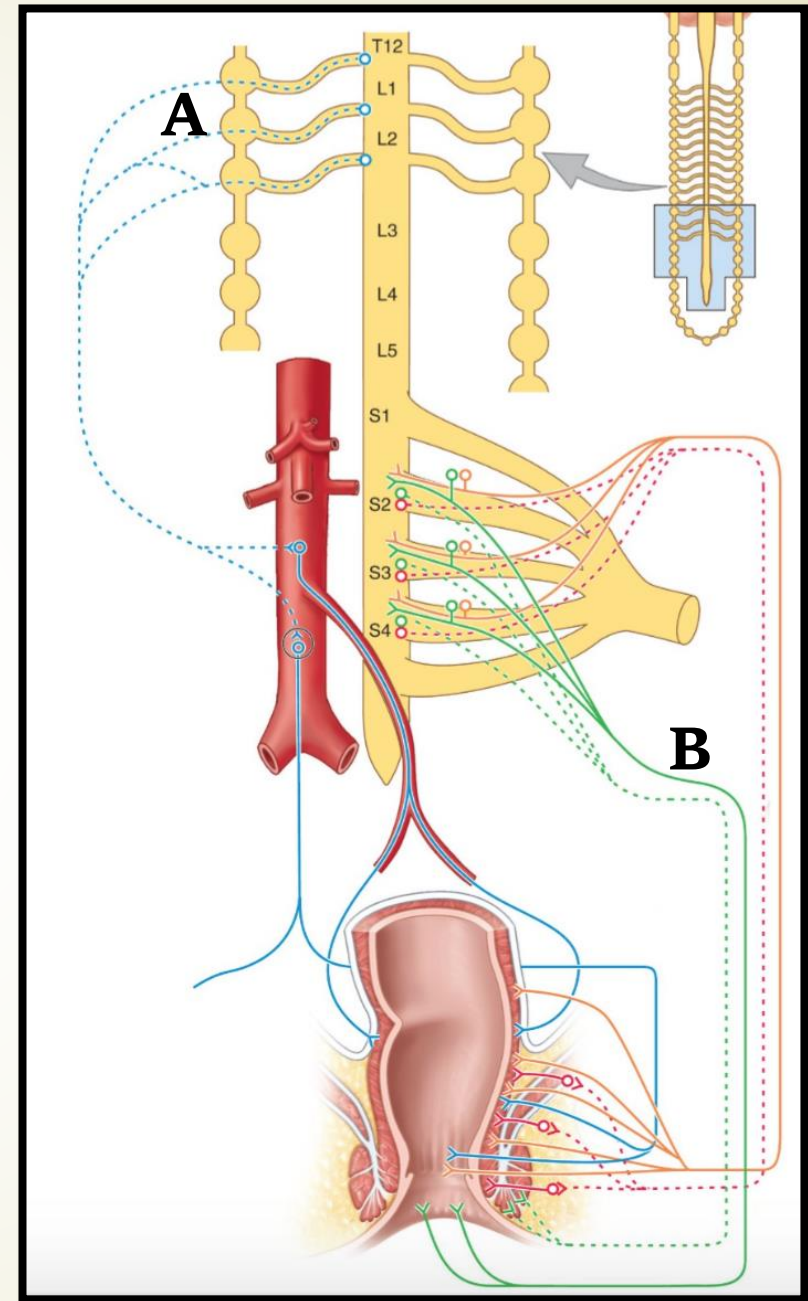
NERVE SUPPLY

A. Sympathetic –

- L1,2, superior hypogastric plexus
- Vasomotor, inhibitory to muscles

B. Parasympathetic –

- S2,3,4 pelvic splanchnic nerves
- Secretomotor, motor to muscles

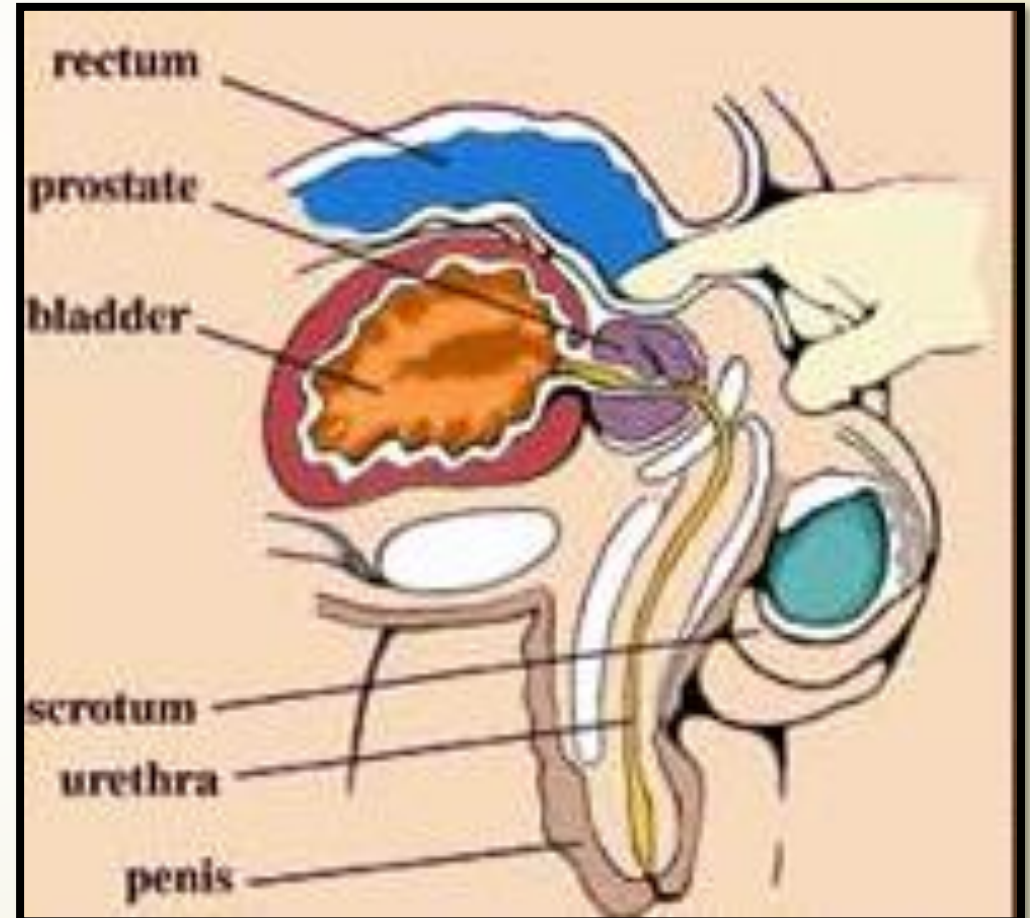


APPLIED ANATOMY

Per rectal examination –

For palpation of structures related to rectum

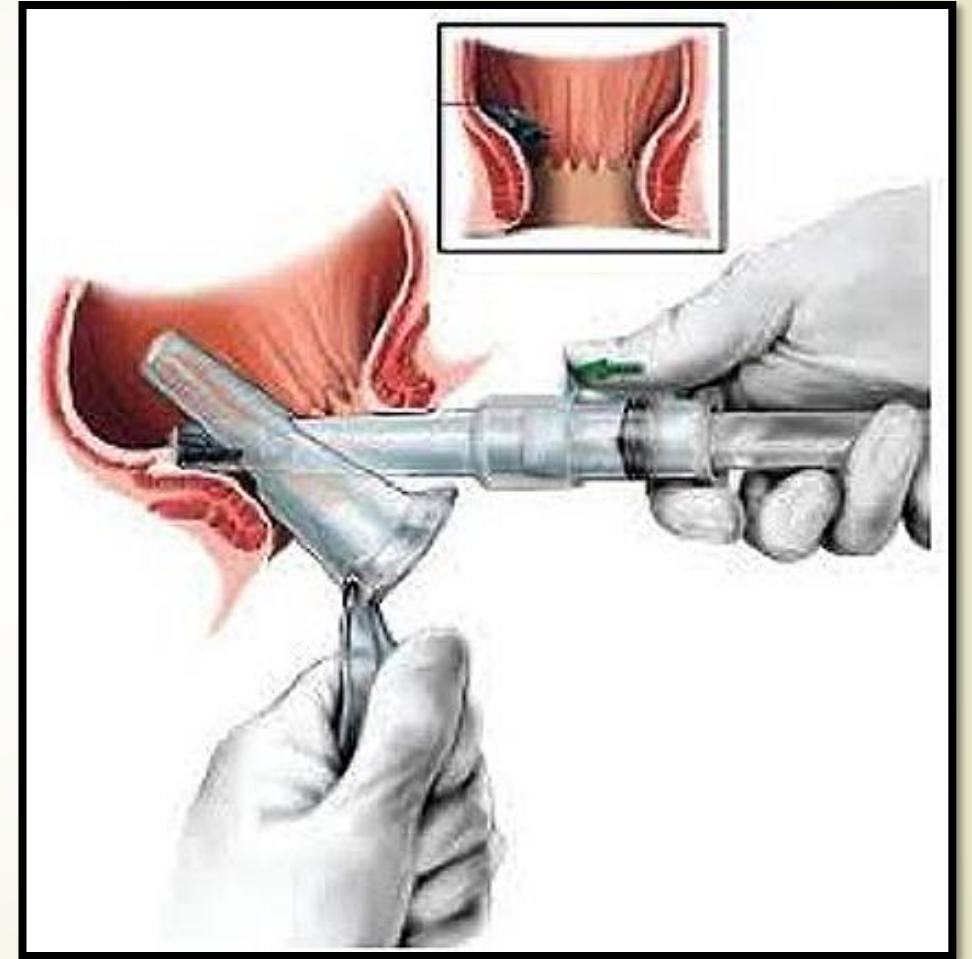
- In males – prostate, seminal vesicles, rectovesical pouch
- In female – cervix uteri, rectouterine pouch



APPLIED ANATOMY

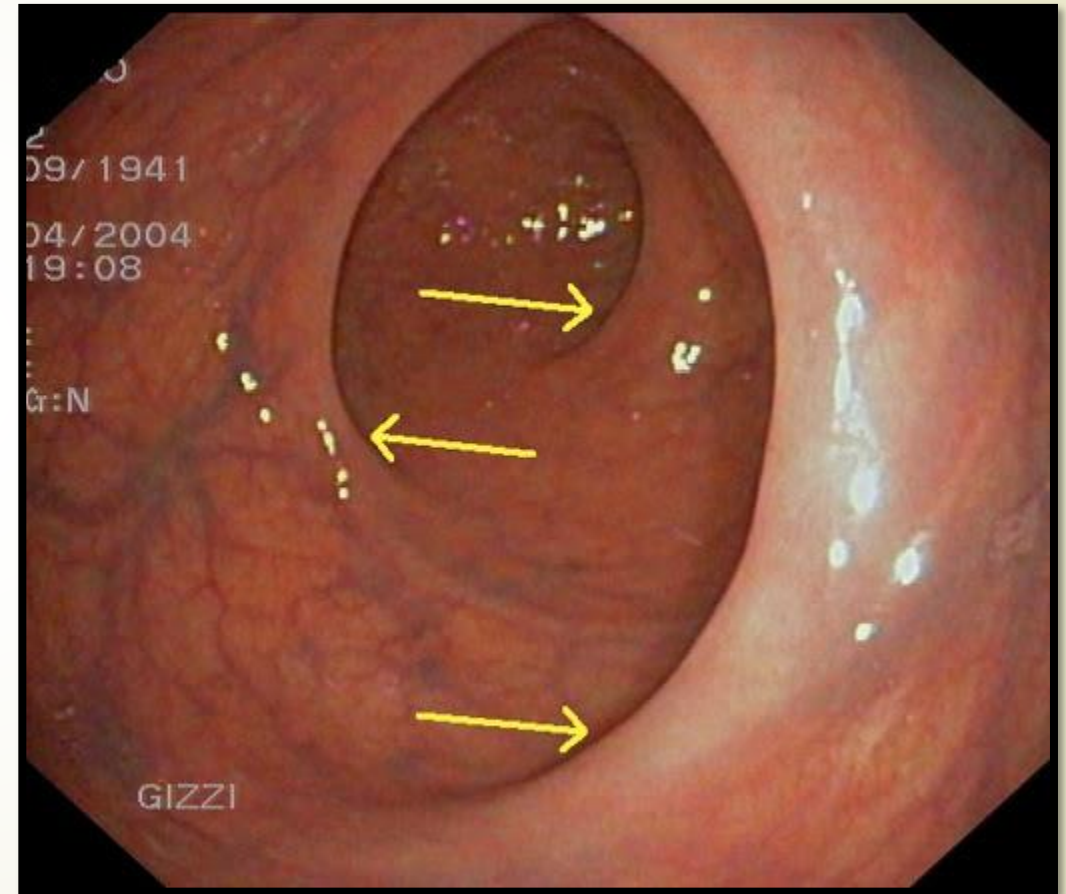
Proctoscopy –

- To view interior of rectum
- To take biopsy



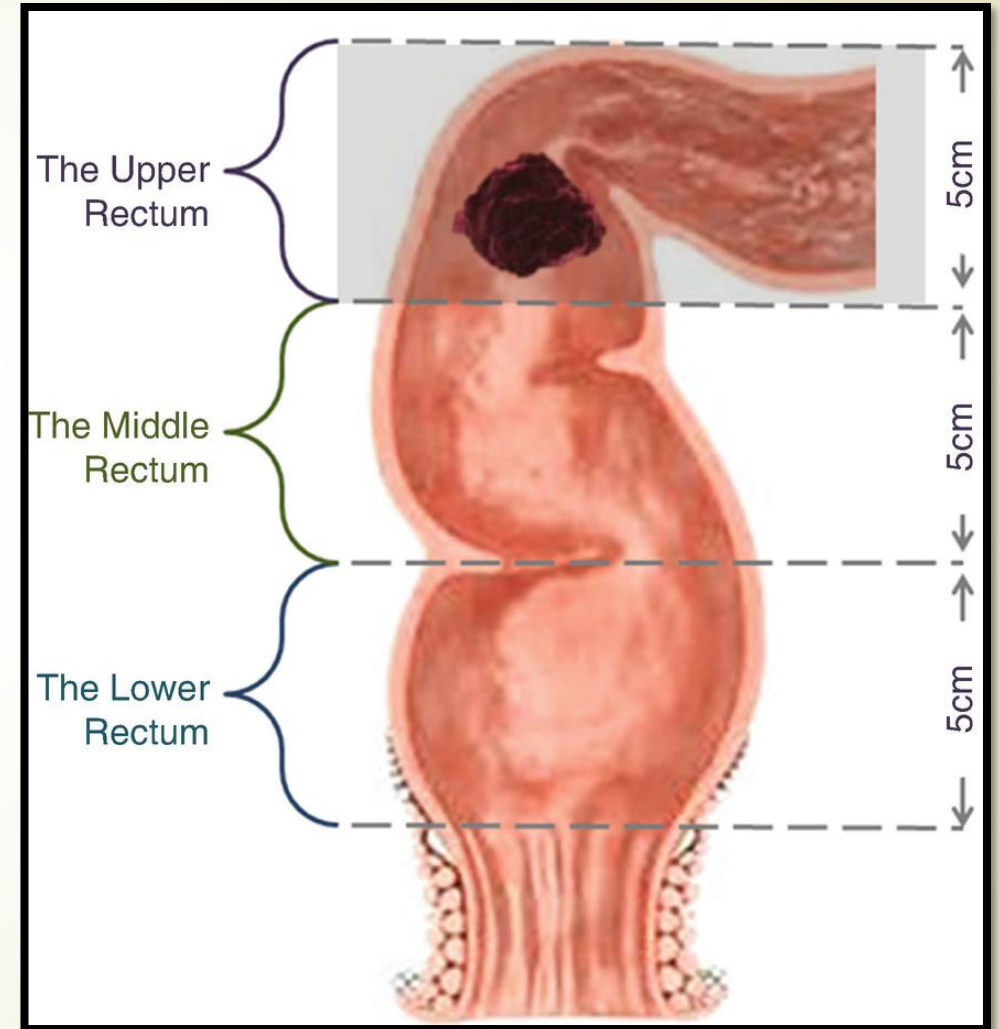
APPLIED ANATOMY

- ▶ In sigmoidoscopy, take care of Houston's valves while passing up the scope



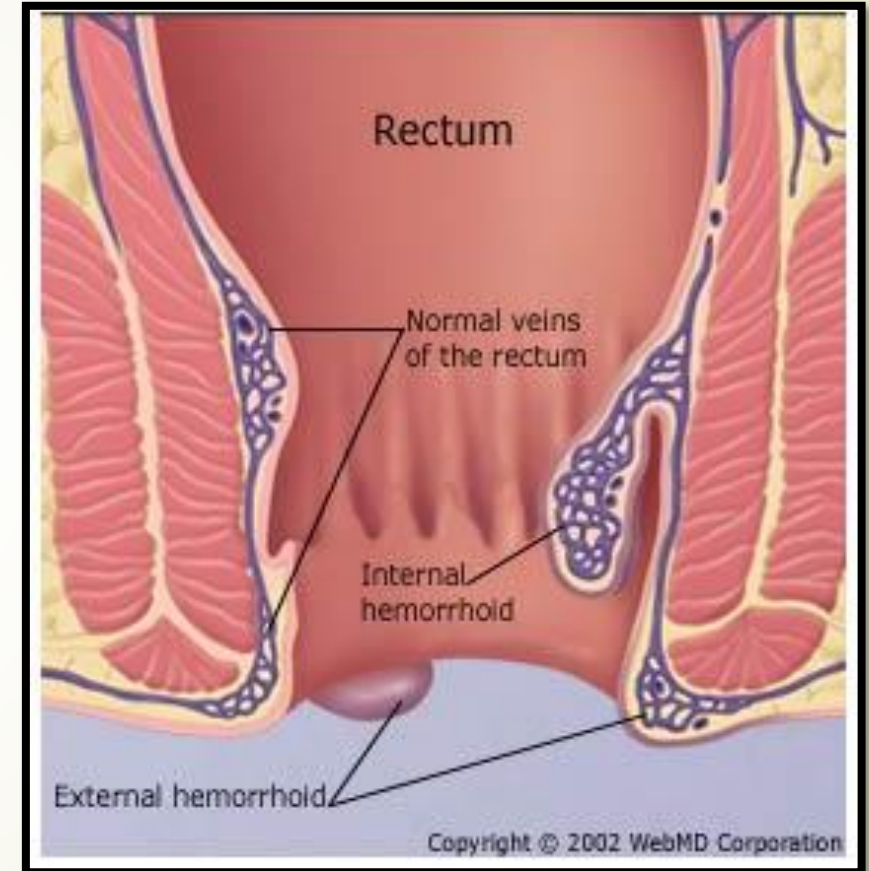
CA RECTUM

- ▶ In **rectal resection**, in males prostate and urethra to be taken care of with proper plane of resection



APPLIED ANATOMY

- ▶ Chronic constipation can compress Superior rectal vein and put strain on portal radicles, and be one of the causes of venous distension
- ▶ Superior rectal vein pierces wall of rectum to empty in to inferior mesenteric vein
- ▶ These portal radicles communicate with systemic veins via veins of anal canal



TAKE HOME POINTS

- Means **straight** tube
- **NO** – Taenia coli, Sacculations, Appendices epiploicae
- Lower part presents a dilatation called **ampulla**

Curvatures - Antero-posterior – Sacral curve, Perineal curve

- **Lateral** – **Upper** – S3-4, convex to right, **Middle** – S5-Cx, convex to left, **Lower** – tip of coccyx, convex to right
- **Permanent** – Horizontal folds- Houston's valves - 4



TAKE HOME POINTS

- ▶ Supports of rectum - **Puborectal sling, Lateral ligaments of rectum, Pelvi-rectal fat**
- ▶ Superior rectal vein - Pierces rectum 7.5cm above anus and **drains in to inferior mesenteric vein, no valves.**
- ▶ Can palpate certain structures by per rectal examination



ASSIGNMENT

SAQ - 3marks

- ▶ Houston's valves
- ▶ Peritoneal relations of rectum

BYE !!

