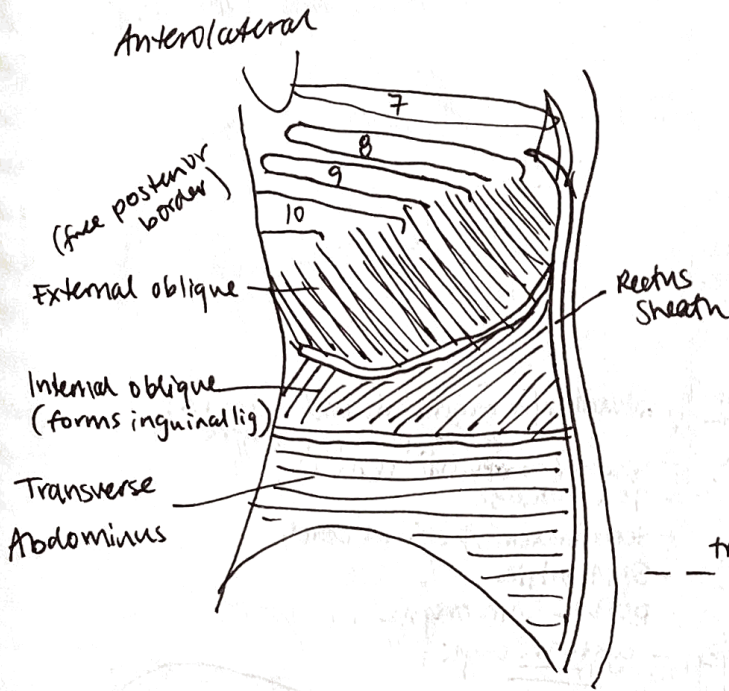
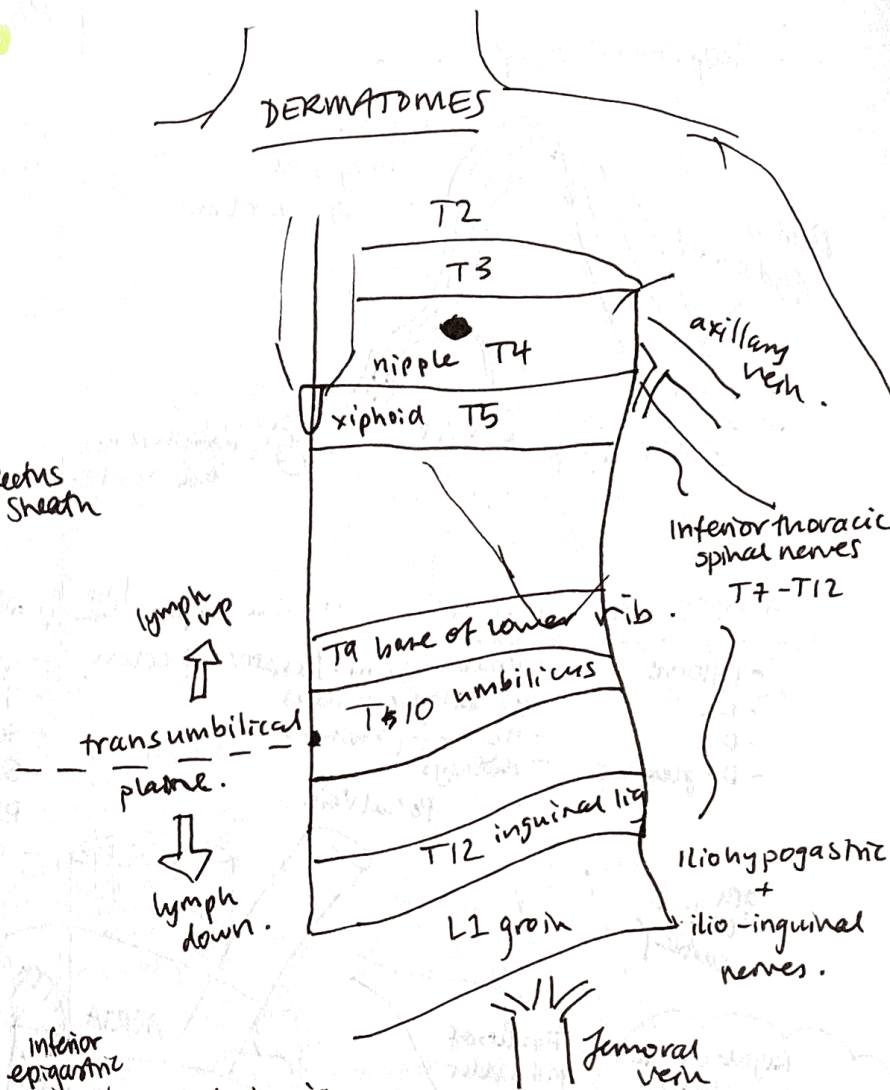


ABDOMINAL ANATOMY (WK 18) + (WK 19)

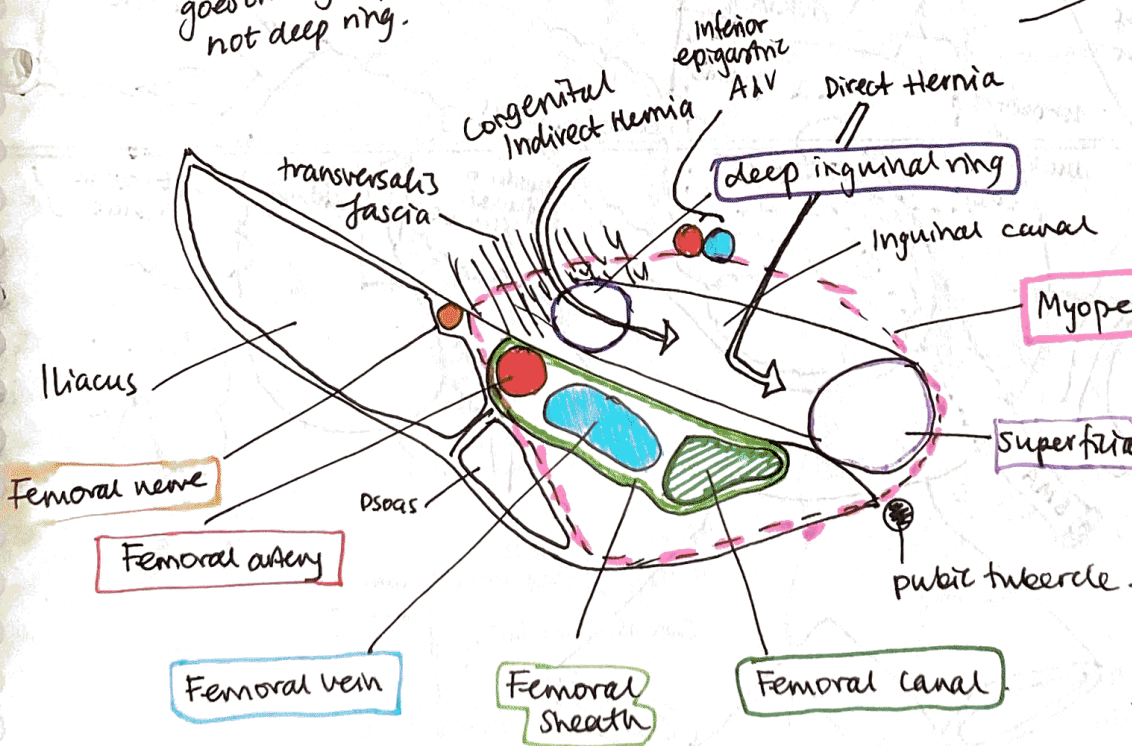
ABDOMINAL WALL



DERMATOMES



Ilioinguinal nerve (L1) goes through superficial but not deep ring.



- Spermatic cord ♂
- Ilio inguinal nerve
- round ligament ♀

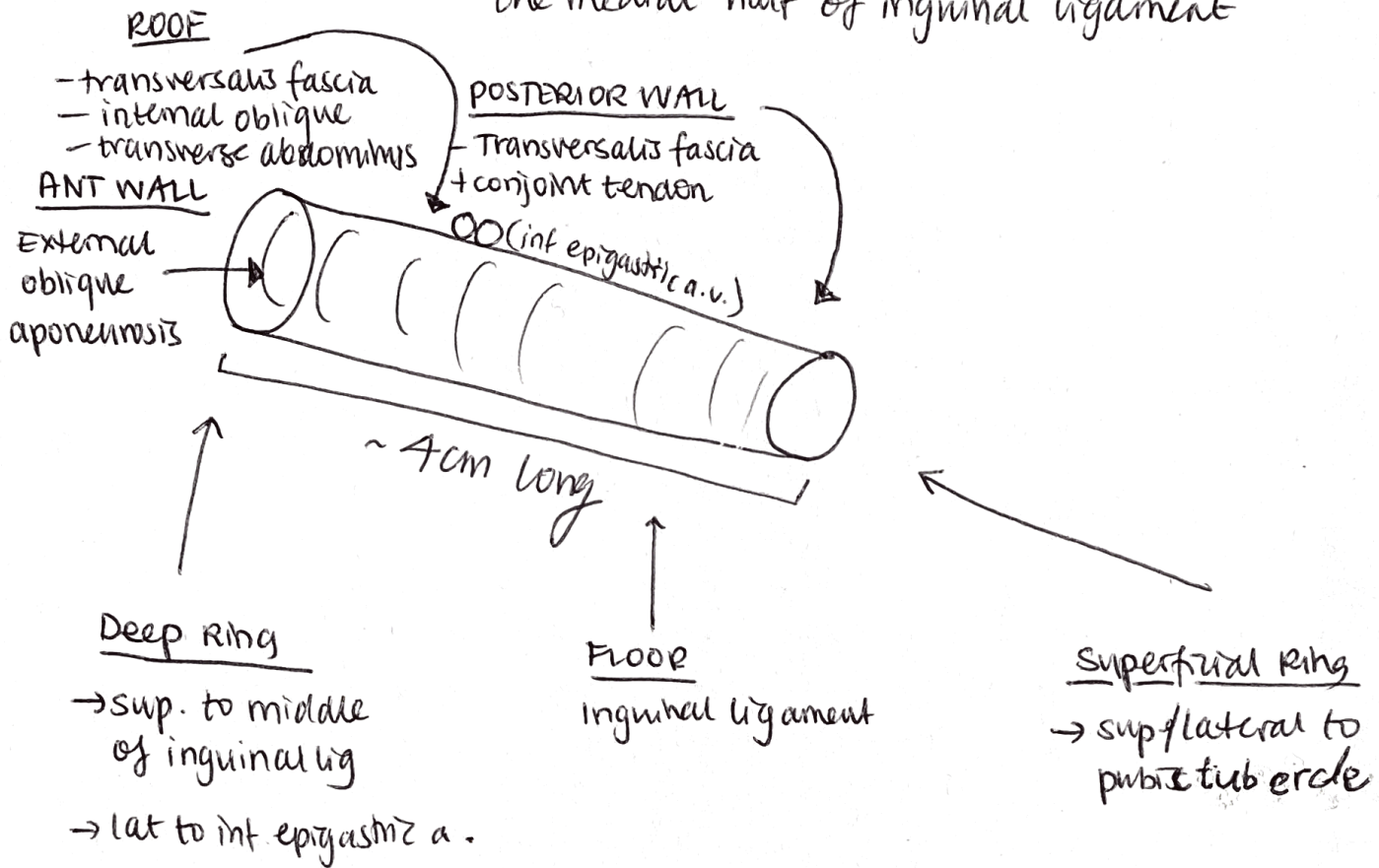
CONTENTS OF SPERMATIC CORD

- testicular artery
- cremasteric a/v
- artery to vas deferens
- pampiniform plexus
- genital b. of genitofem n.
- autonomic nerves - lymph.
- vas deferens - proc. vaginalis

Inguinal Hernias (75%)

> 2/3 rds indirect / congenital - within spermatic cord, into scrotum, in process vaginalis

Inguinal canal → oblique, inferomedial passage, superior to the medial half of inguinal ligament



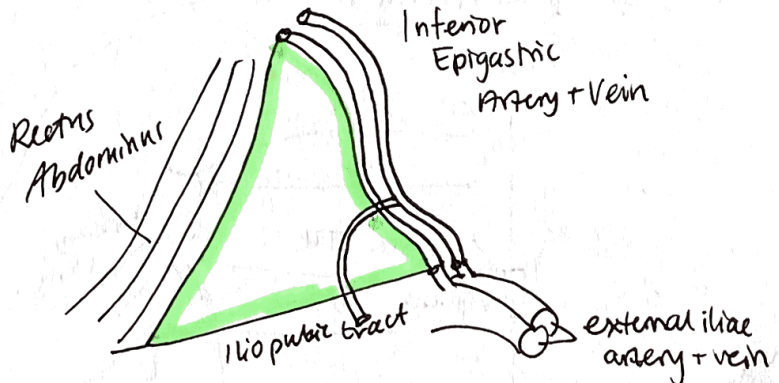
Direct Hernia (acquired)

- weak ant. abdominal wall
- traverses medial $\frac{1}{3}$ of canal
- exits superficial ring lateral to cord.
- rarely enters scrotum

Indirect Hernia (congenital)

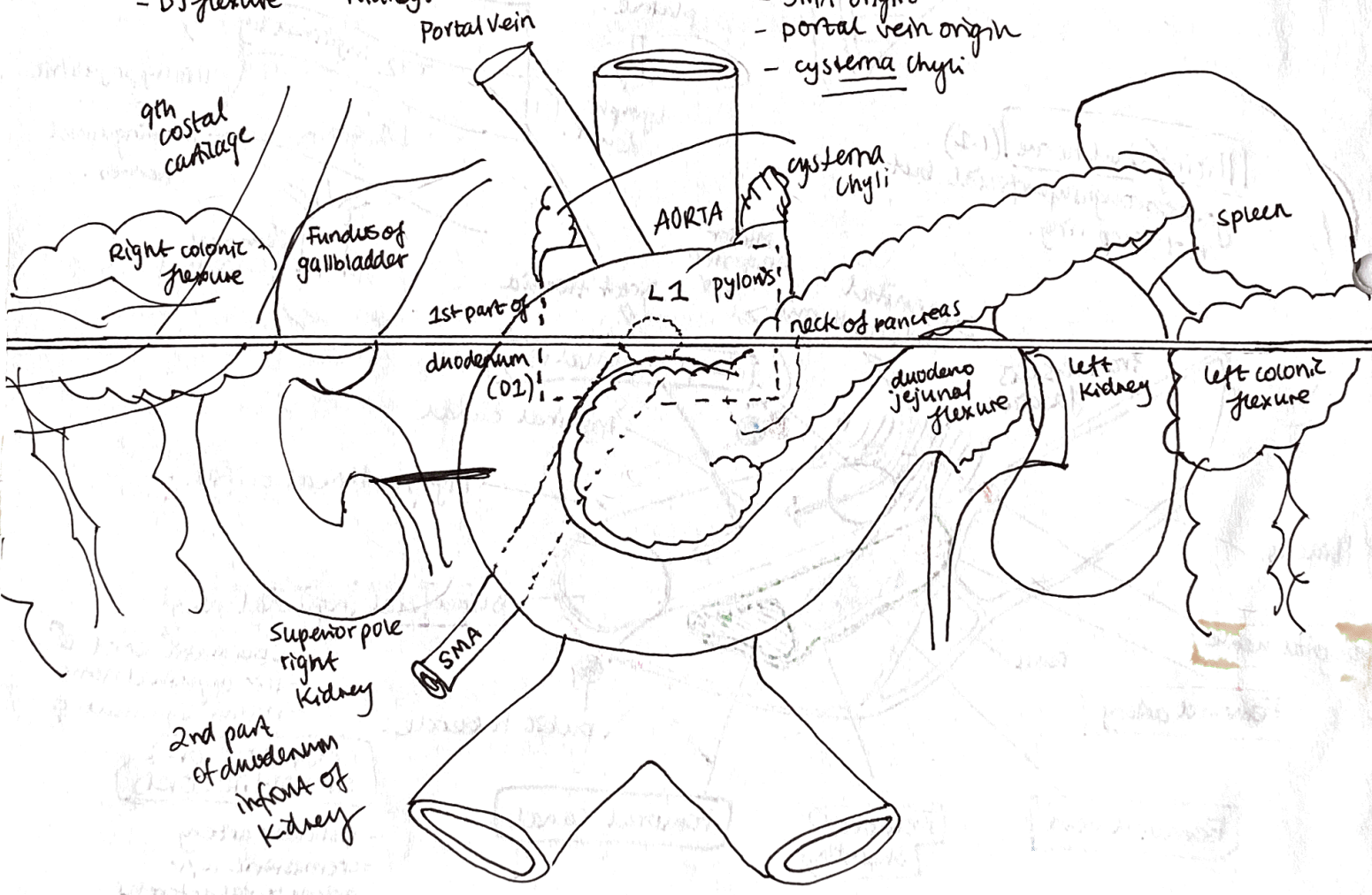
- Traverses entire canal
- patent processus vaginalis
- goes from internal to external ring
- travels inside the cord
- goes into scrotum/labium majus.

Inguinal Triangle



TRANSPYLORIC (ADDISON'S) PLANE - Approx L1 (midway b/w manubrium of sternum & the pubic symphysis)

- pylorus
- L1
- D1
- DJ flexure
- hepatic + splenic flexures of colon
- gallbladder fundus
- neck of pancreas
- Kidneys
- Spleen? → splenic vein
- 9th cartilage
- termination of spinal cord
- SMA origin
- portal vein origin
- cysterna chyli

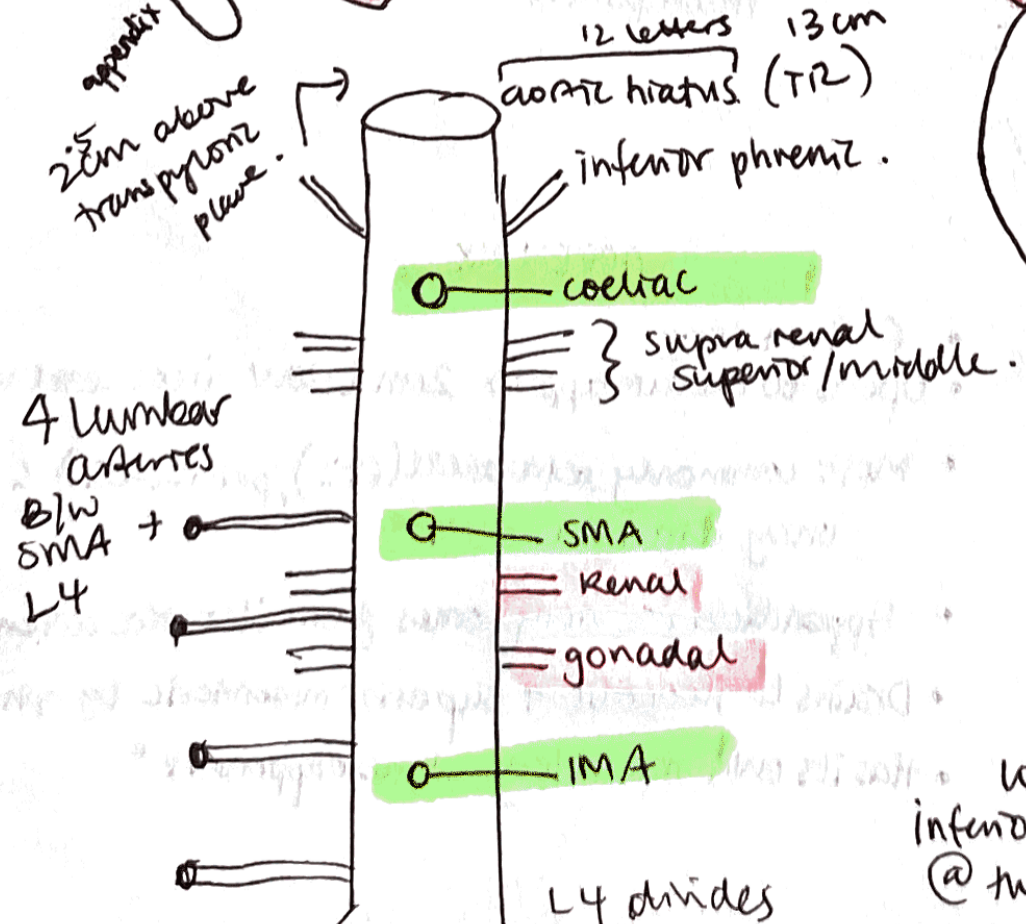
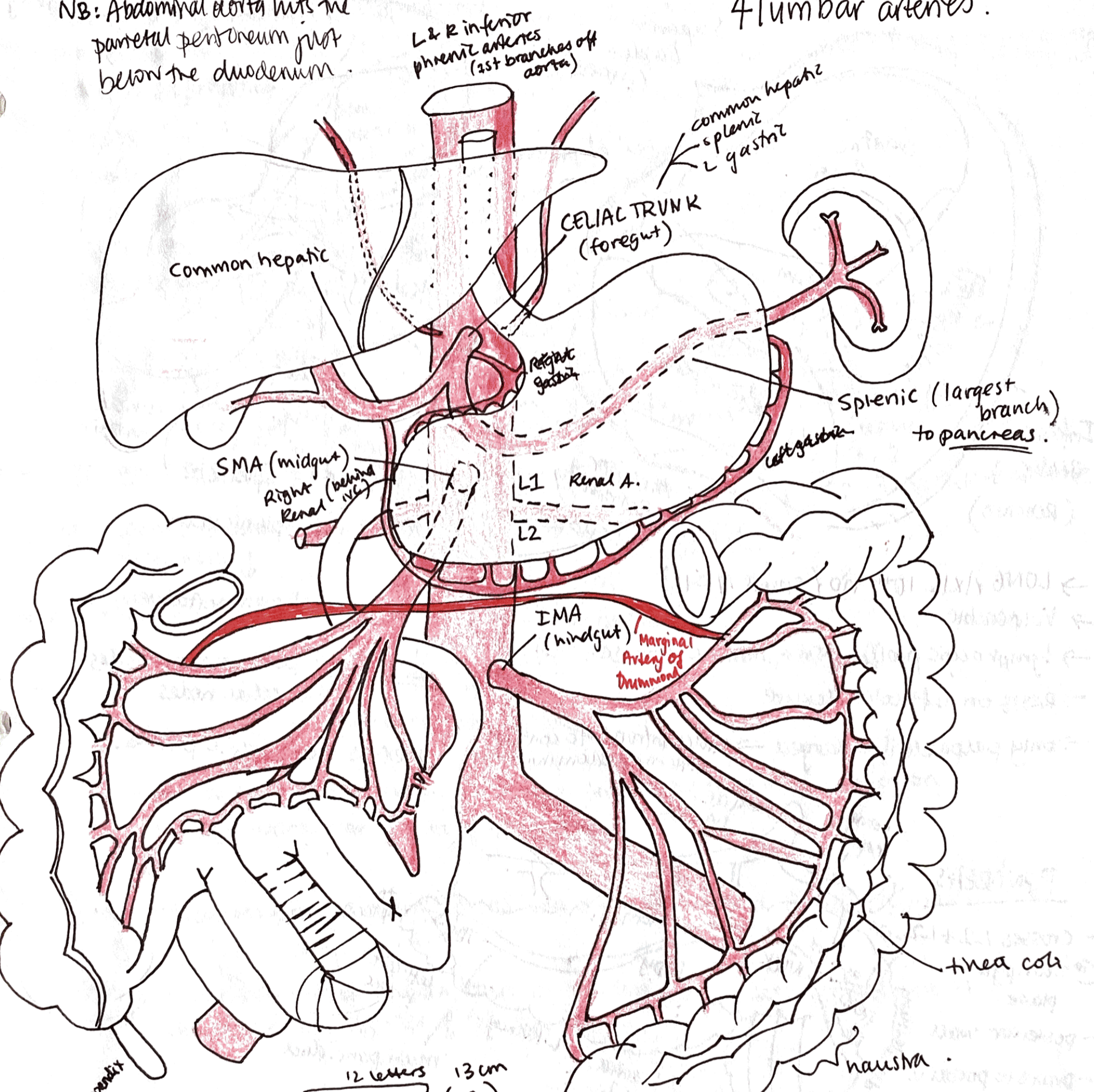


NB: Renal arteries @ L1

Blood supply to abdominal viscera.

NB: Abdominal aorta hits the parietal peritoneum just below the duodenum.

4 lumbar arteries.

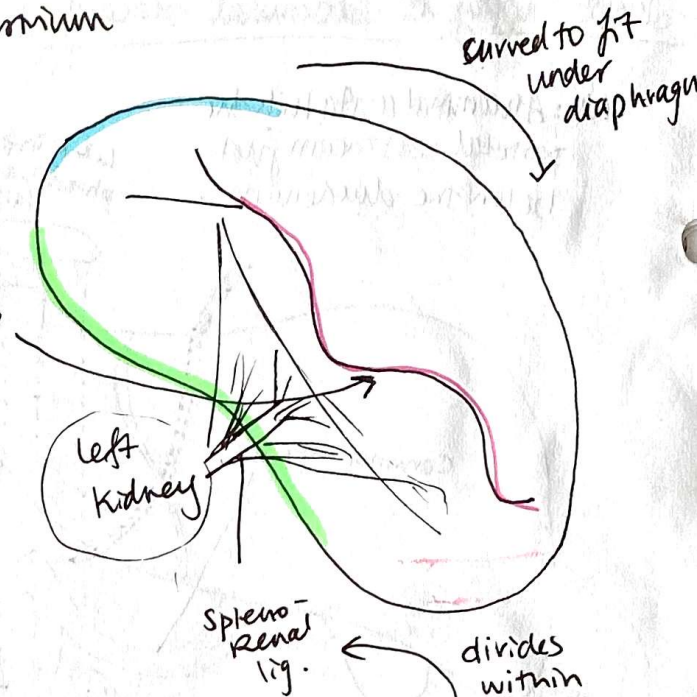
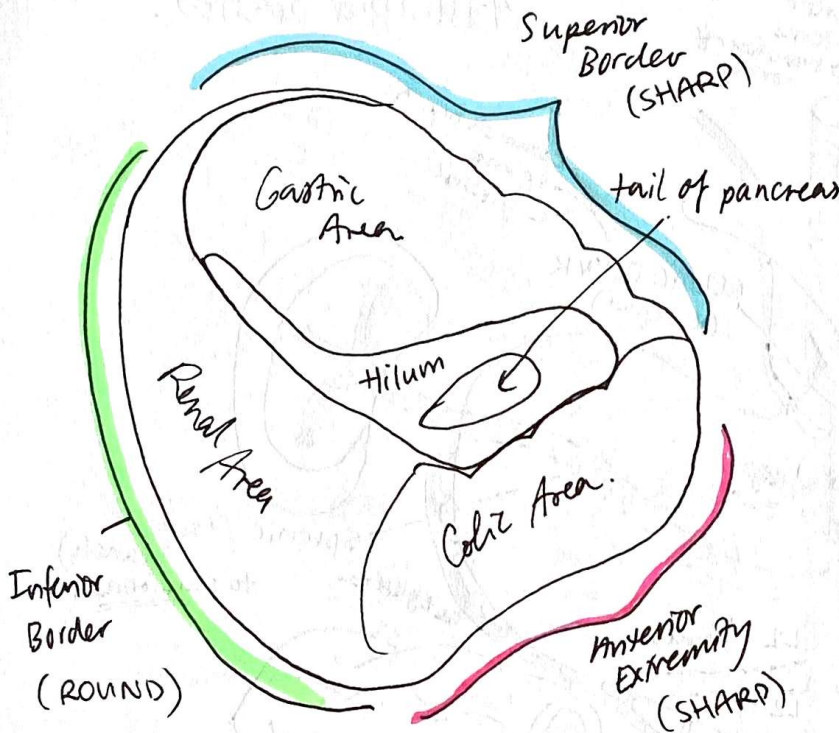


Small bowel: valvulae conniventes or plicae circulares = all around.

Large bowel: Haustra - partial encircling
Tinea coli = longitudinal ribbons

lower part - inferior + left of umbilicus @ the supracostal plane.

The Spleen - develops from the dorsal mesogastrium



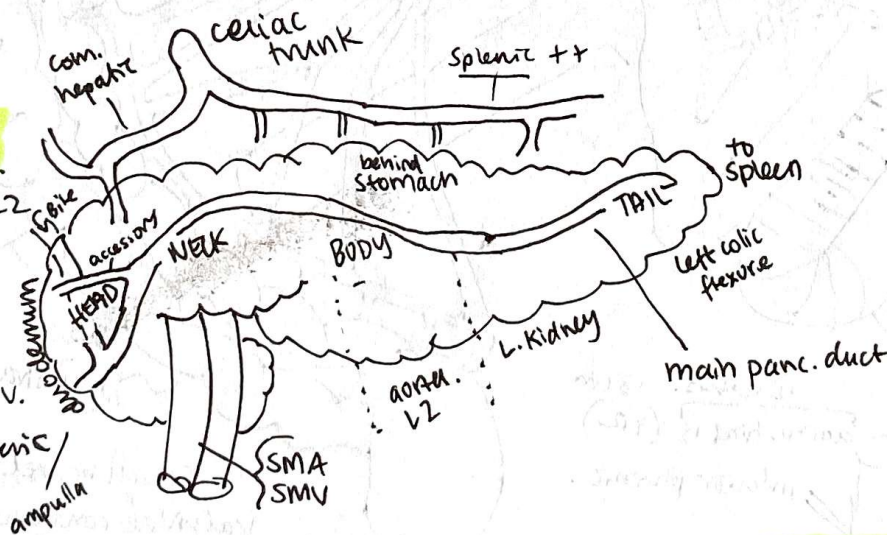
Supplied by splenic a.
Drains via splenic vein
↓
hepatic portal vein

Lymph → pancosplenic nodes
→ celiac nodes
Nerves from celiac plexus.

- LONG AXIS 10th rib (spans 9-11)
- Vulnerable
- lymphocyte proliferation + immune response
- Rests on left colic flexure
- only palpable if enlarged → slides in front to contact anterior abdominal wall

PANCREAS

- Crosses L1 + L2 @ transpyloric plane.
- posterior wall
- Drains to portal v.
- superior mesenteric plexus
- vagus.
- Ref'd pain to T6-T10



Relations of the pancreas

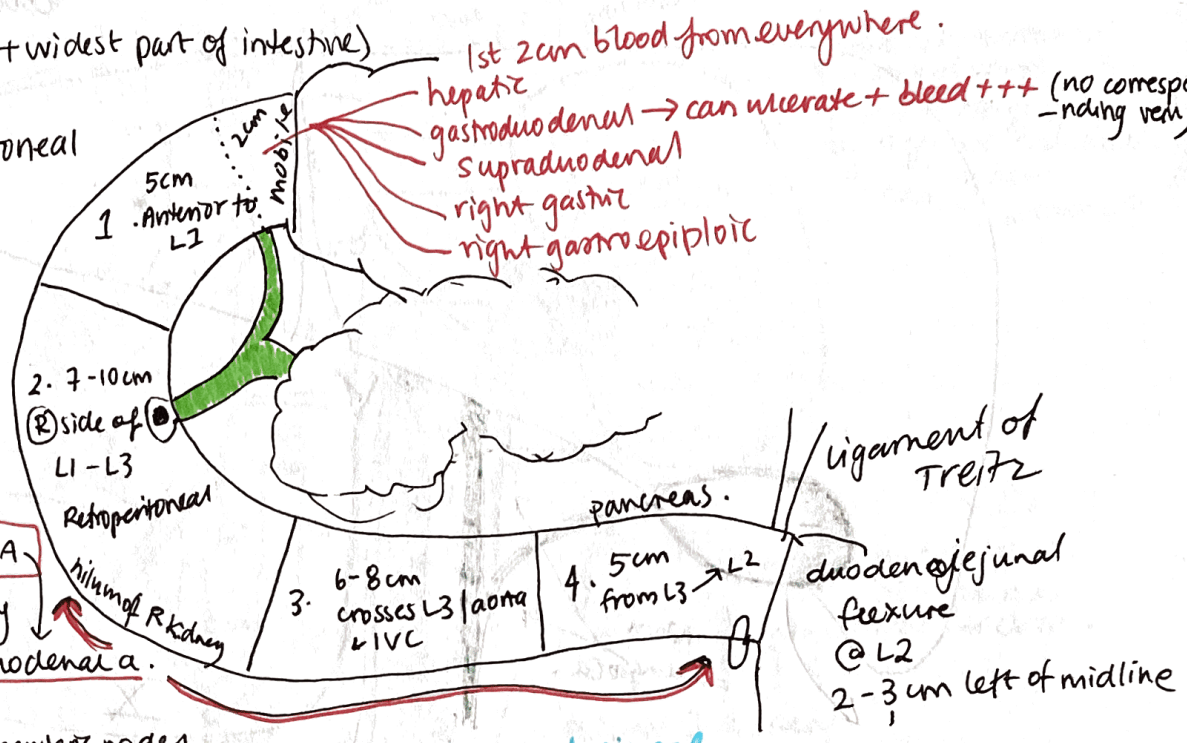
- posteriorly: IVC, portal vein, aorta, left kidney
- right: duodenum - 'c' shape around head.
- left: hilum of spleen
- anteriorly: stomach, peritoneum, bowel

APPENDIX

- 6-9 cm long
- Opens to caecum approx 2cm below ileocaecal valve
- Most commonly retrocaecal (64%), pelvic (20%) & only retroileal 0.5%.
- Appendicular artery comes from ileocolic artery
- Drains to ileocolic + superior mesenteric lymph nodes
- Has its own mesentery "mesoappendix"

DUODENUM

- 25 cm (shortest + widest part of intestine)
- most fixed part
- partly retroperitoneal
- 4 parts
 1. superior
 2. descending
 3. HORIZONTAL
 4. Ascending



1st 2cm blood from everywhere.
 hepatic
 gastroduodenal → can ulcerate + bleed +++ (no corresponding vein)
 supraduodenal
 right gastric
 right gastroepiploic

Blood supply from
 celiac trunk / SMA
 → gastroduodenal artery
 → inferior pancreaticoduodenal a.

Lymph: superior mesenteric nodes + celiac nodes.

Nerves: vagus + greater/lesser splanchnic

Venous drainage
 - sup. mesenteric
 - portal

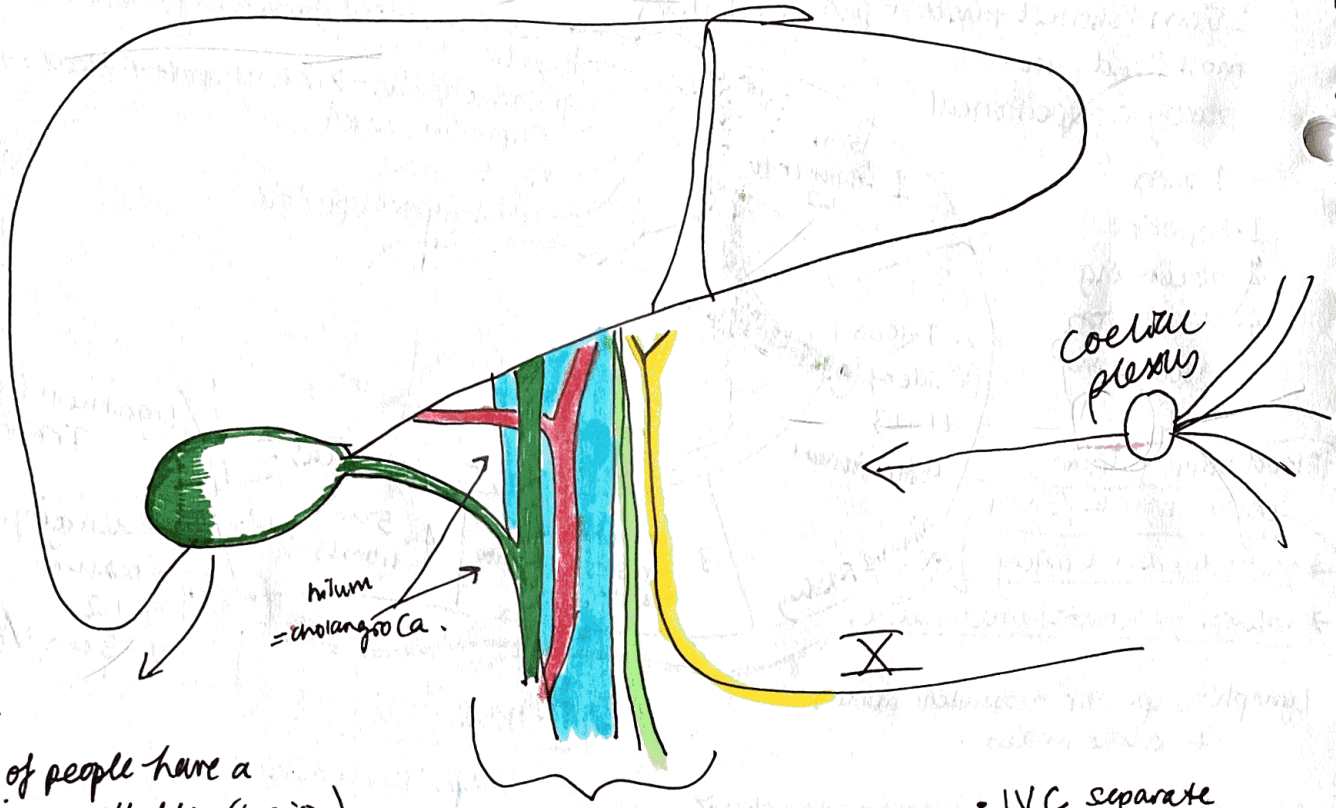
1st part runs (R) ↑ & posterior from pylorus

2nd part covered by peritoneum in front & crossed by transverse mesocolon
 crosses downward over hilum of (R) kidney

3rd part curves forwards over (R) psoas and over IVC + aorta to reach (L) psoas

4th part ascends to the left of aorta to lie on the left psoas + left sympathetic trunk.
 Reaches the lower border of the pancreas.

Caudate & Quadrate lobes



Gallbladder

- 4% of people have a mobile gallbladder (torion)
- usually holds 50ml of bile.

portal "triad" ant → post .

• IVC separate

1. duct
2. artery
3. vein

(also lymph + vagus branch)

Relations of the left kidney:

Superior = diaphragm + 12th rib
 Superomedial = adrenals

Anterior = descending colon
 stomach
 spleen
 pancreas
 duodenum

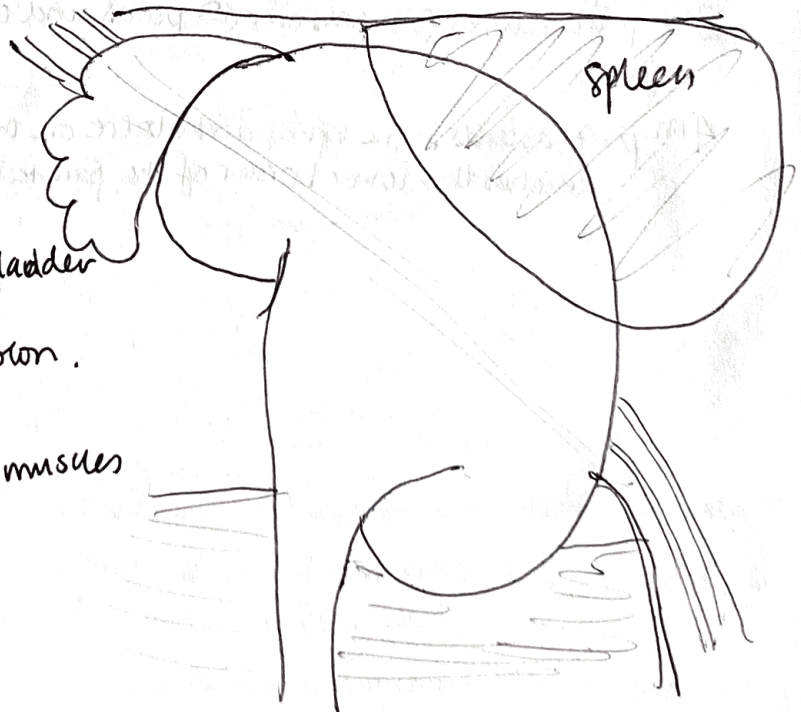
RIGHT KIDNEY

- liver / gallbladder
- duodenum
- ascending colon .

Posterior - iliolumbar n
 liohypogastric n
 subcostal n

12th rib
 abdo & back muscles

postero inferior - QL



COURSE OF THE URETER

3

ARROW POINTS:

JUNCTION OF URETERS + RENAL PELVIS

genitofemoral nerve
Psoas Major

CROSSING BRIM OF PELVIC INLET

SI joints

JOINING BLADDER

5cm cysterna chyli tips of transverse processes.

Lymph drainage mostly to cysterna chyli via the lumbar nodes

Ureter Blood supply Renal arteries upper part from L1 & L2 of aorta.

middle part common iliac arteries abdo aorta gonadal aa.

ureters overlie the tips of the transverse processes of lumbar vertebrae.

External iliac artery

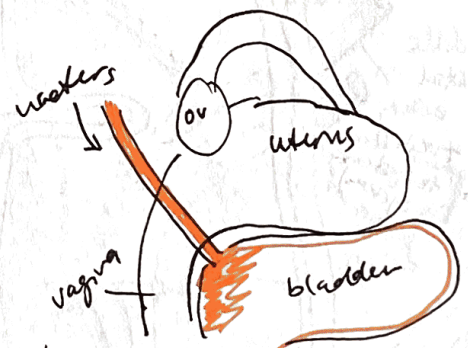
ovarian artery, uterine artery, gonadal vessels.

internal iliac aa. lower part.

uterine artery or vas deferens

(water under the bridge)

ischial spines



FUN FACTS ABOUT URETERS

- 25-30cm long
- Arterial supply:
 - abdominal \Rightarrow Renal artery | testicular | ovarian artery | ureteral branches of aorta
 - pelvic \Rightarrow superior | inferior vesicular aa.
- Venous drainage corresponds to arteries.
- Sensory fibres T11-L2 \therefore pain referred to those dermatomes
- Intact innervation not required for peristalsis (calyceal pacemakers)
- Females: passes close to lateral part of fornix of vagina

INNERVATION OF THE BLADDER:

RECTUM & ANAL CANAL

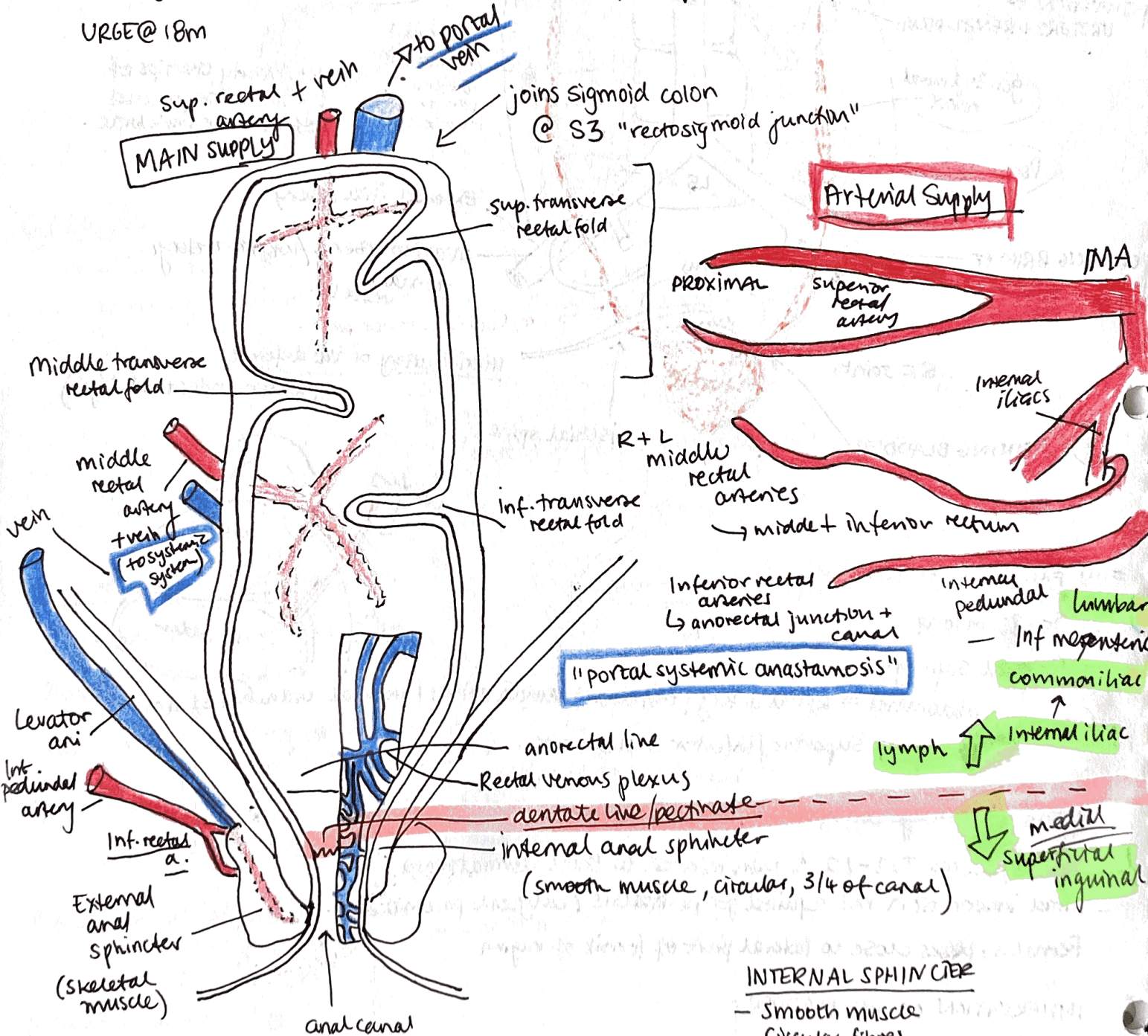
Parts of rectum:

- superior = intraperitoneal
- middle = retroperitoneal
- inferior = subperitoneal

Nerve supply:

Sympathetic fibres from lumbar segments (T12-L2) via hypogastric plexus + sup. rectal n.
 Also sacral plexus via peduncal nerve (somatic afferent + motor to sphincter)
 Parasympathetic via pelvic splanchnic n's via pelvic plexus (also visceral afferents)

URGE @ 18m



- INTERNAL SPHINCTER**
- Smooth muscle
 - Circular fibres
 - not attached to bone
 - 3/4 length of the canal

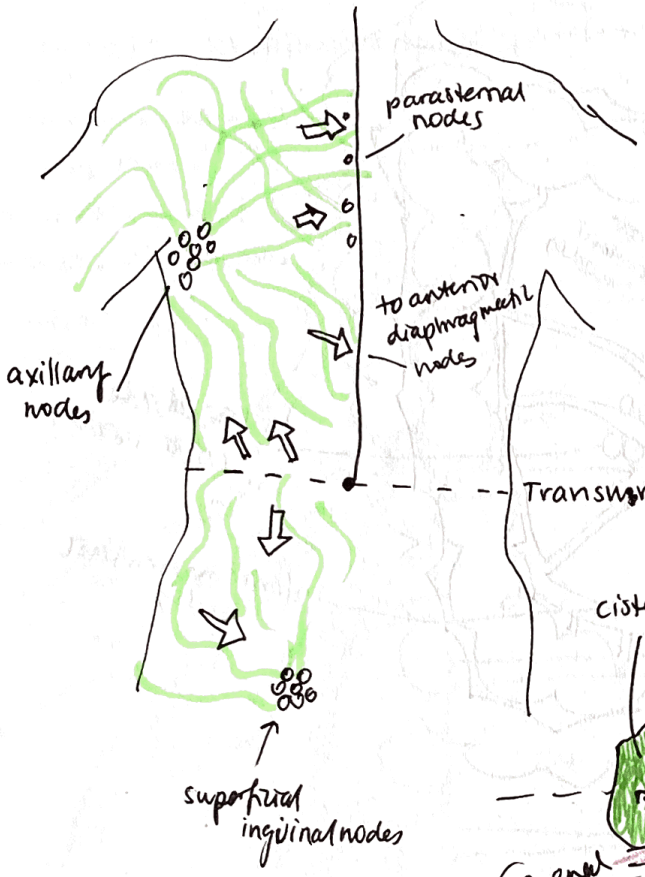
NB: Lymphatic drainage of the breast follows venous drainage

LYMPHATIC DRAINAGE

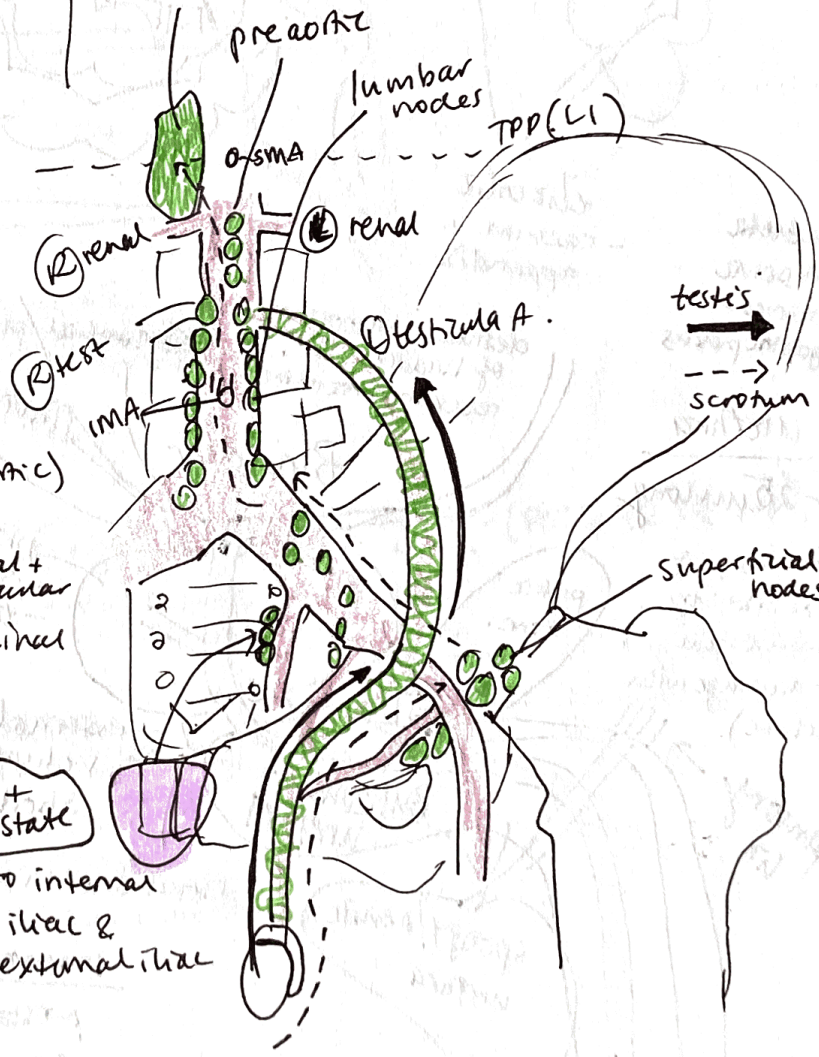
lymph
 Superficial vessels go w̄ subcutaneous veins.

Deep lymphatics go w̄ deep veins & drain to:

- external iliac nodes
- common iliac nodes.
- R + L lumbar (caval + aortic) nodes.



cisterna chyli (transpyloric plane) L1



* important for cancer mets * **GENITALIA**

Testes → follows testicular artery + vein. to R + L (caval + aortic) nodes & pre-aortic nodes.

* NB mets can also go to mediastinal + supraclavicular

Scrotum + vulva + lower limb → to superficial inguinal nodes.

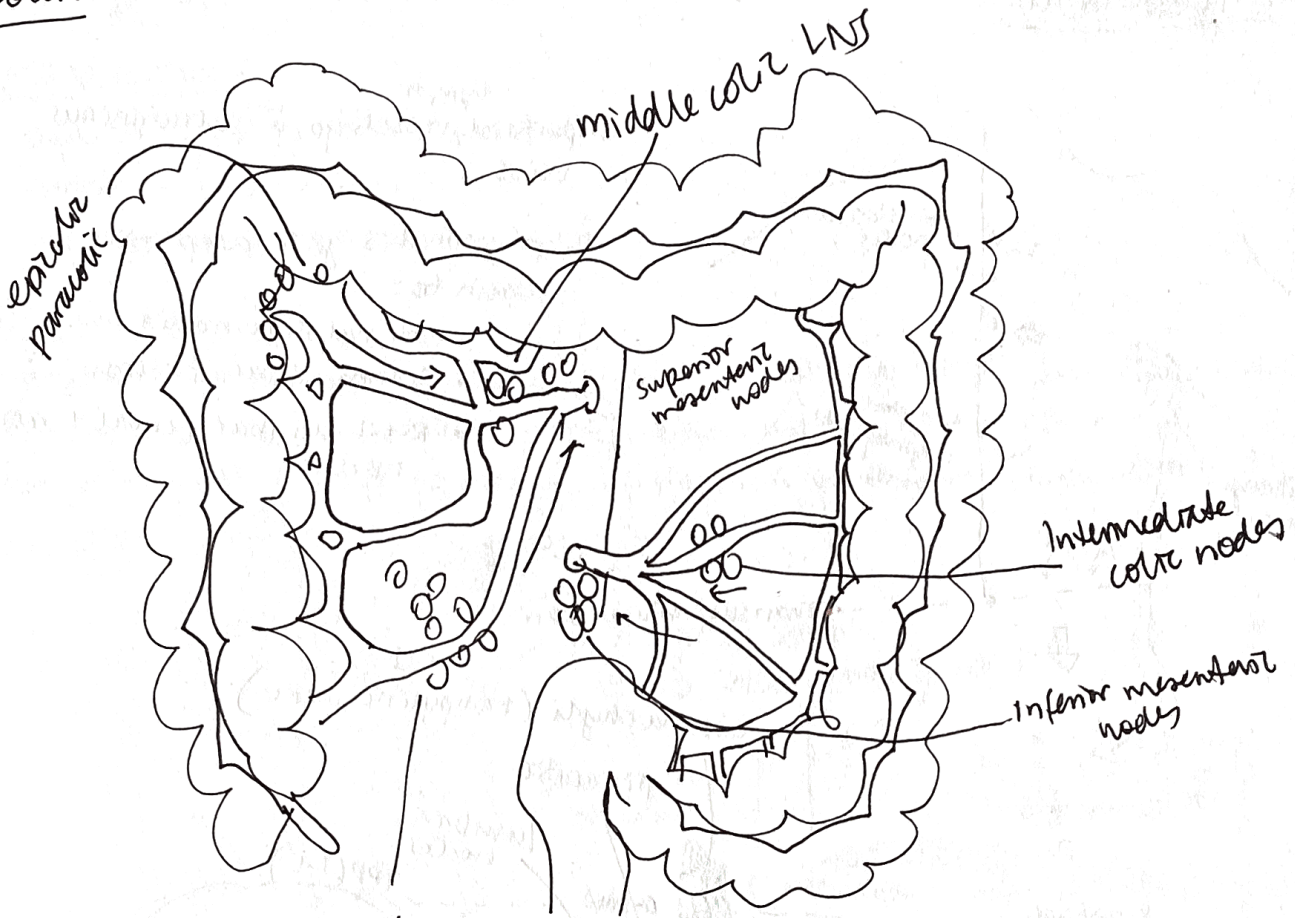
ovarian + uterine course ⇒ caval/aortic

cervix + prostate → to internal iliac & external iliac

testis →
 ---→ scrotum

superficial inguinal nodes

Colon



ilio colic
- caecum + appendix

Parasympathetic input from pelvic splanchnic nerves + inf. hypogastric plexus

Male Urethra

→ 15-25 cm long

→ membranous part of urethra is fixed to perineal membrane

(susceptible to damage with pelvic fracture)

suspensory lig

spongy/penile urethra

most narrow point

detrusor = smooth muscle of bladder wall. relax to store urine.

Bladder

intramural/preprostatic urethra

involuntary sphincter prevents retrograde

ejaculation + controls involuntary continence.

prostate
- 5 lobes
- thick capsule

external sphincter
voluntary muscle (voluntary continence)
Shortest + least distensible

membranous urethra (also narrow)

Innervation of the urethra.

prostatic nerve plexus to all parts except the spongy part which is the dorsal nerve of the penis (from pudendal nerve.)

Plexuses

LUMBAR - 1st 4 lumbar spinal nerves

- embedded in posterior

part of psoas

- anterior rami of lumbar spinal nerves

- lies anterior to the transverse processes

iliohypogastric

ilioinguinal

genitofemoral

lateral cutaneous nerve of the thigh

acromioclavicular

femoral nerve

Ant

obturator nerve
L2
L3
L4

to lumbosacral trunk.

posterior obturator to hip joint via quadratus femoris

adductors
obturator externus
cutaneous to medial thigh.

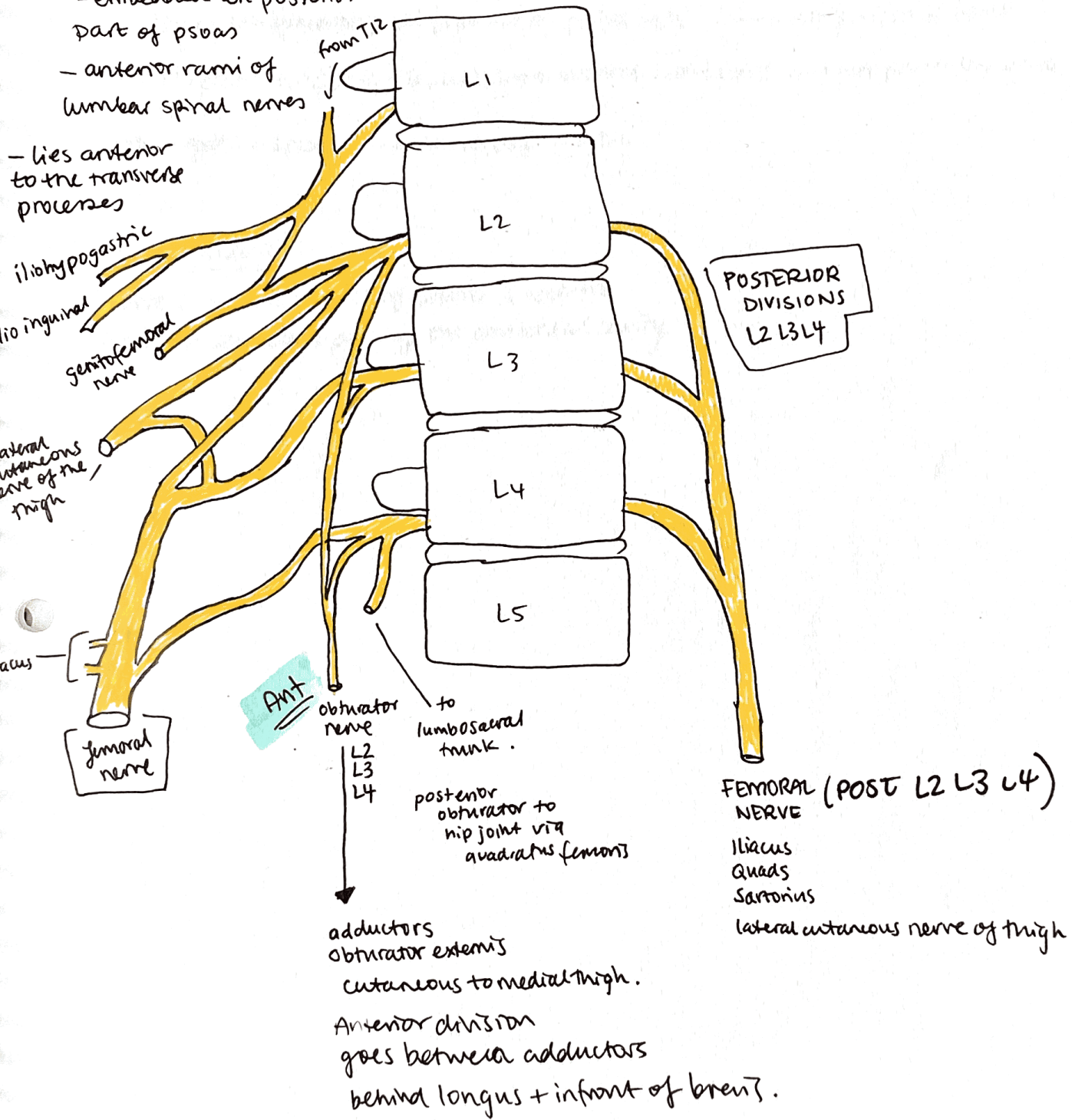
Anterior division goes between adductors behind longus + in front of brevis.

POSTERIOR DIVISIONS
L2 L3 L4

FEMORAL (POST L2 L3 L4)
NERVE

Iliacus
Quads
Sartorius

lateral cutaneous nerve of thigh



Porto~~venous~~^{systemic} anastomoses.

portal system & systemic systemic (5)

- lower oesophagus: left gastric veins → lower branches of oesophageal veins
- upper part of anal canal: superior rectal veins → inf/middle rectal veins.
- Liver: Intraparenchymal branches of portal vein → retroperitoneal veins.
- Hepatic + splenic flexures ~~to~~ omental + colic veins → retroperitoneal veins
- Hepatic + splenic: ductus venosus → IVC.

Pouch of Douglas:

Between posterior wall of uterus & rectum

The most dependent part of the peritoneal cavity