

Rory Marples

▶ **GSSE anatomy:  
Abdomen, pelvis,  
retroperitoneum**



# Key points for anatomy

- Exam technique
- Bank
- Last's – read chapter 1!
- Spot tests – Rohens atlas

## Key areas

- Sciatic foramen
- Inguinal canal
- Lumbosacral plexus (Psoas Major and relations)



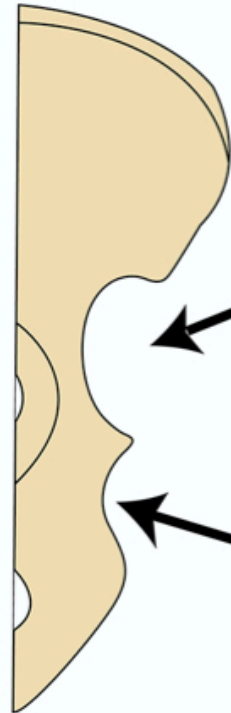
# Sciatic foramen





- Two foramina
- Greater
  - Above
  - Formed by sacrotuberous, sacrospinous ligament
  - PIRIFORMIS – occupies majority of space, divides it further
  - Relations become ABOVE and BELOW Piriformis
- Lesser
  - Below
  - Sacrotuberous, sacrospinous ligament

## SCIATIC FORAMINA STRUCTURES ENTERING & LEAVING

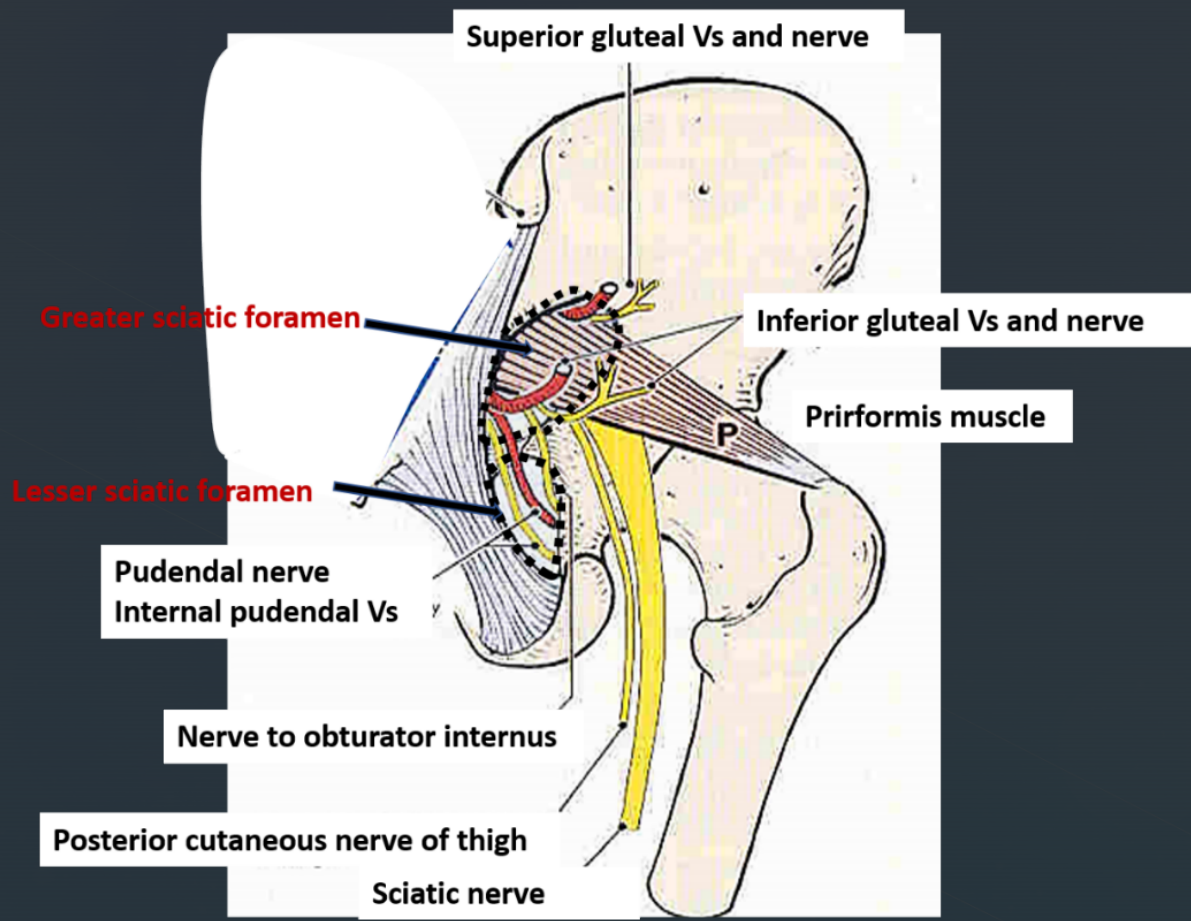


### VIA GREATER SCIATIC FORAMEN

- Superior gluteal vessels
- Superior gluteal nerve (L4,5,S1)
- **PIRIFORMIS** (S1,2)
- Inferior gluteal vessels
- Inferior gluteal nerve (L5,S1,2)
- Sciatic nerve (L4,5,S1,2,3)
- Perforating cutaneous nerve (S2,3)
- Posterior femoral cutaneous nerve (S1,2,3)
- Nerve to quadratus femoris (L4,5,S1)
- Nerve to obturator internus (L5,S1,2)
- Pudendal nerve (S2,3,4)
- Internal pudendal vessels

### VIA LESSER SCIATIC FORAMEN

- Tendon of obturator internus
- Nerve to obturator internus
- Internal pudendal vessels
- Pudendal nerve



There are six nerves that arise from the roots of the sacral plexus that have the letter "P"

Piriformis, nerve to :	S1,2	Remains in pelvis to supply this muscle
Posterior femoral cutaneous nerve:	S1,2,3	Leaves pelvis via greater sciatic foramen
Perforating cutaneous nerve:	S2,3	Leaves pelvis via greater sciatic foramen
Pudendal nerve:	S2,3,4	Leaves pelvis via greater sciatic foramen
Pelvic splanchnic (parasympathetic) nerves:	S2,3,4	Remains in pelvis to supply pelvic organs
Perineal branch of S4:	S4	Remains in pelvis to supply levator ani

3 nerves remain in the pelvis & 3 exit via the greater sciatic foramen



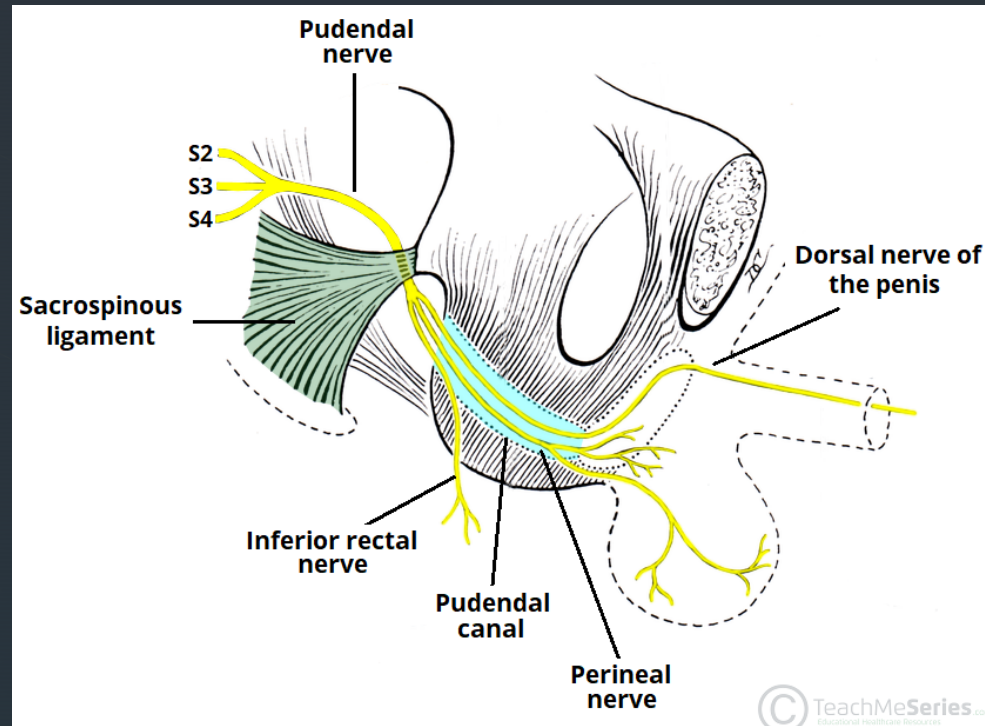
Q

- The greater sciatic foramen transmits: (T/F)
  - The piriformis muscle
  - The inferior gluteal vessels
  - The superior gluteal vessels
  - The posterior cutaneous nerve of the thigh

Q

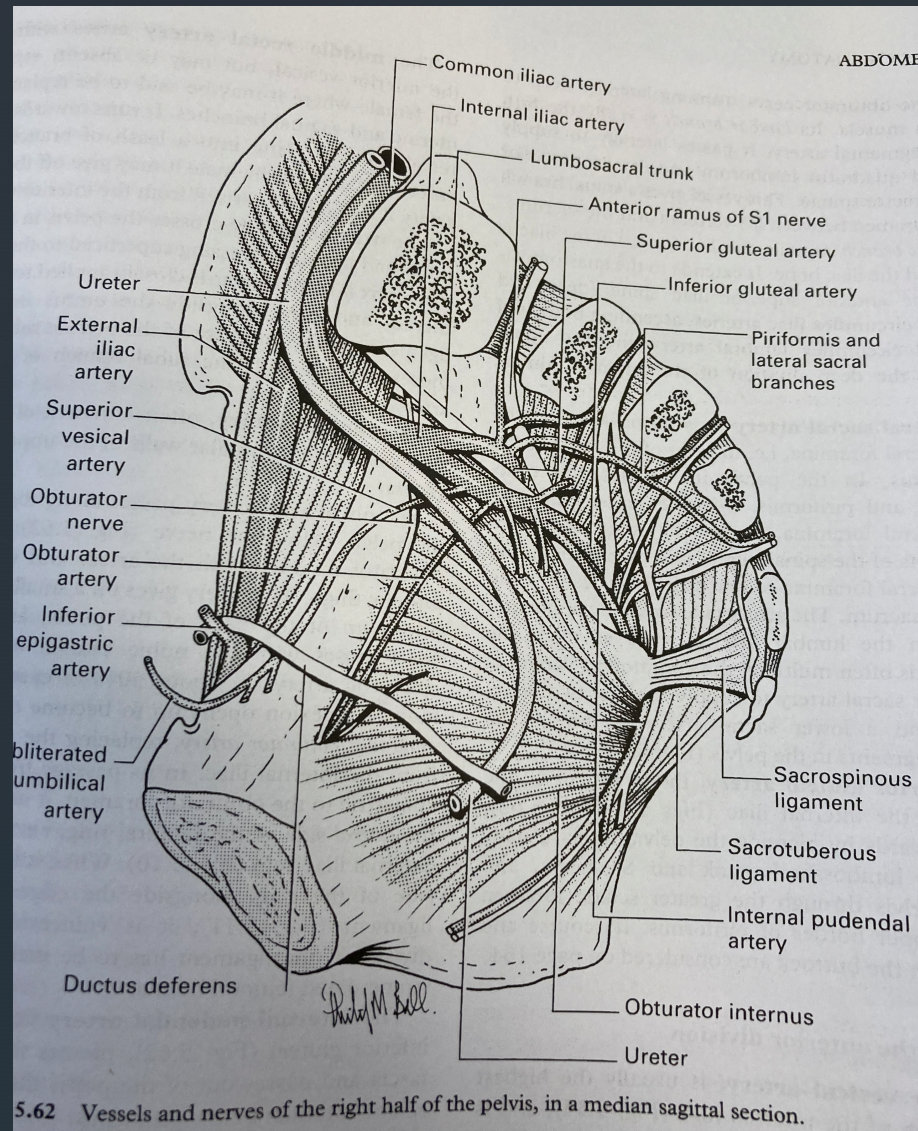
- A structure leaving the pelvis through the greater sciatic notch above the piriformis muscle is:
  - A: The inferior gluteal nerve
  - B: the nerve to quadratus femoris
  - C: the superior gluteal nerve
  - D: the posterior femoral cutaneous nerve
  - E: the pudendal nerve

# Pudendal nerve



Q

- Structures passing through the lesser sciatic foramen include:
  - The pudendal nerve
  - The inferior gluteal vessels
  - The tendon of obturator internus muscle
  - The posterior cutaneous nerve of the thigh

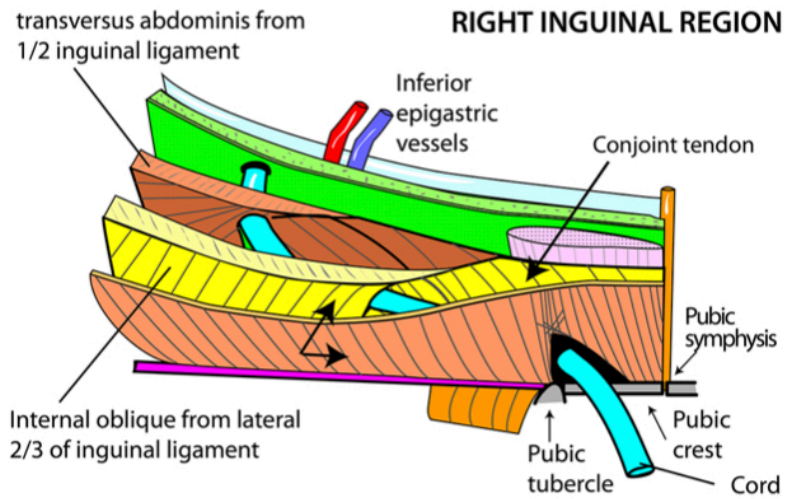


5.62 Vessels and nerves of the right half of the pelvis, in a median sagittal section.

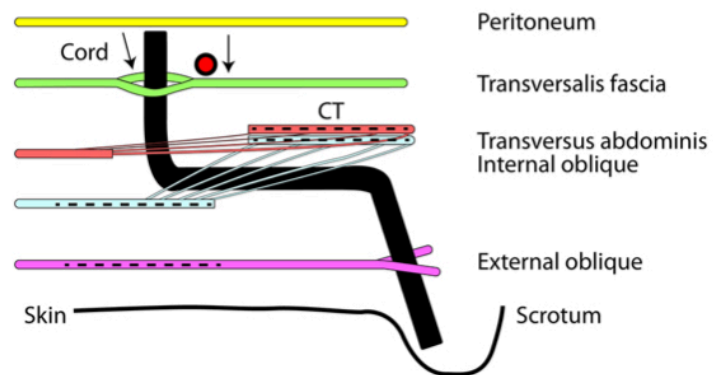


# Inguinal canal





Arrows show 2 areas of "reinforcement" for superficial and deep ring



#### EXPLODED INGUINAL CANAL

- Arrows indicate sites of weakness at deep ring (indirect hernia) and at transversalis fascia lateral to conjoint tendon (direct hernia).
- Dotted lines indicate the 2 layers that support both the deep and superficial inguinal rings.



## Q

- The inguinal canal
  - A: has the internal oblique muscle in the lateral part of its posterior wall
  - B: Is situated inferior to the inguinal ligament
  - C: Has the transversus abdominis in the medial part of its anterior wall
  - D: has the internal oblique muscle in the lateral part of its anterior wall
  - E: has an external ring directly lateral to the pubic tubercle

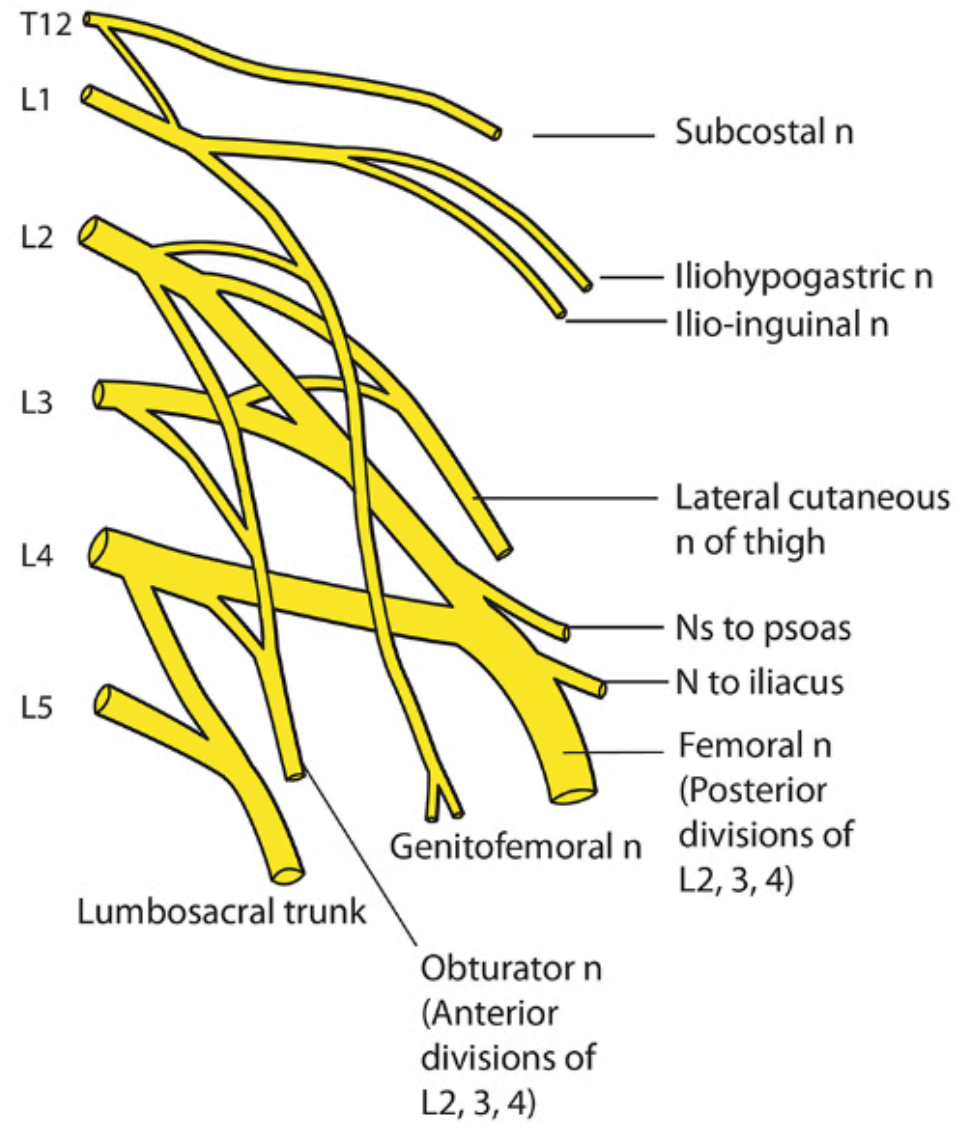


- The inguinal canal
  - Has an internal ring lying 1.5cm lateral to the midpoint of the inguinal ligament
  - Has the fascia transversalis as a posterior relation
  - Is about 1.5cm long in the adult
  - Has the lacunar ligament in the medial part of its floor

- In direct inguinal hernia, the hernia sac
  - Passes through the internal inguinal ring
  - Passes through the posterior wall of the inguinal canal
  - Passes through the external inguinal ring
  - Lies within the internal spermatic fascia
  - May contain urinary bladder

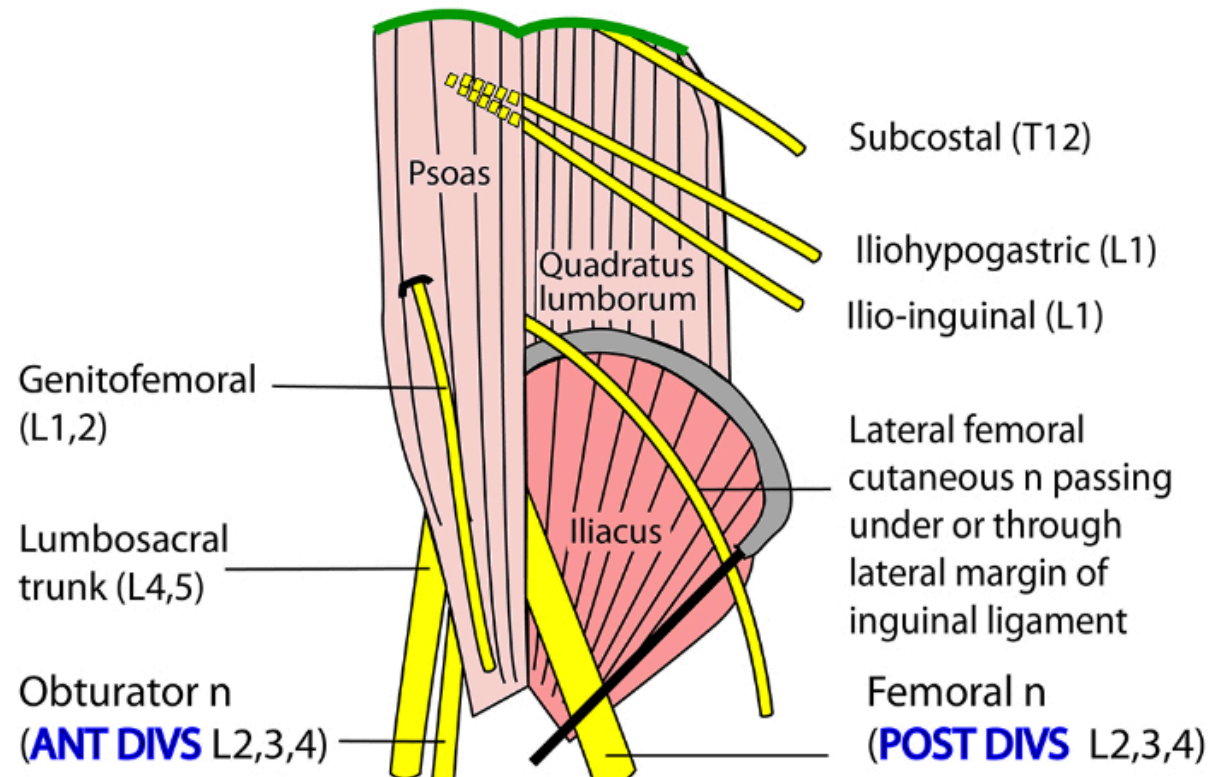
## Lumboscaral plexus (Psoas Major and relations)

- Last's 9<sup>th</sup> edition, p 414
  - After the anterior rami of the upper four lumbar nerves (L1-L4) have supplied psoas major and quadratus lumborum, they form the plexus in the substance of psoas major.
  - Branches
    - L1: iliohypogastric, ilioinguinal
    - L2: Genitofermoal
    - L2, 3: (post.) Lateral femoral cutaneous nerve
    - L2, 3, 4 (post) – femoral
    - L2, 3, 4 (post) – Obturator



# LUMBAR PLEXUS

L1,2,3,4,5



# Iliohypogastric, ilioinguinal

- L1 (Lasts 9<sup>th</sup> edn. P 363)
- Lie in front of QL, anterior ramus of L1
- “top two”
- IH
  - Sinks below iliac crest
  - Slopes downwardf in neurovascular plane
  - Pierces internal oblique
- IG
  - Pierces lower border of internal oblique
  - Runs medially, enters the inguinal canal
  - SIR, pierces external spermatic fascia to become subcutaneous
  - Transversus abdominus and internal oblique motor fibres

# Genitofemoral nerve

- “Femorogenital nerve”
- Two parts, two nerve roots (L1, L2)
- Forms within the substance of psoas major
- Emerges from ANTERIOR surface, runs deep to the psoas fascia
- Perforates psoas fascia above inguinal ligament and divides
- Genital branch
  - Runs within spermatic cord within inguinal canal
  - Therefore, sensory to tunica vaginalis, spermatic fasciae (remnants of abdominal wall), and MOTOR to cremaster muscle

## Side challenge: layers of the scrotum

- Some Dumb Englishman Called It The Testes
  - Skin
  - Dartos muscle and fascia (Campers/Scarpa's fascia)
  - External spermatic fascia (external oblique)
  - Cremasteric muscle and fascia (internal oblique)
  - Internal spermatic fascia (transversalis fascia)
  - Tunica Vaginalis (processus vaginalis - peritoneum)
  - Tunica Albuginea

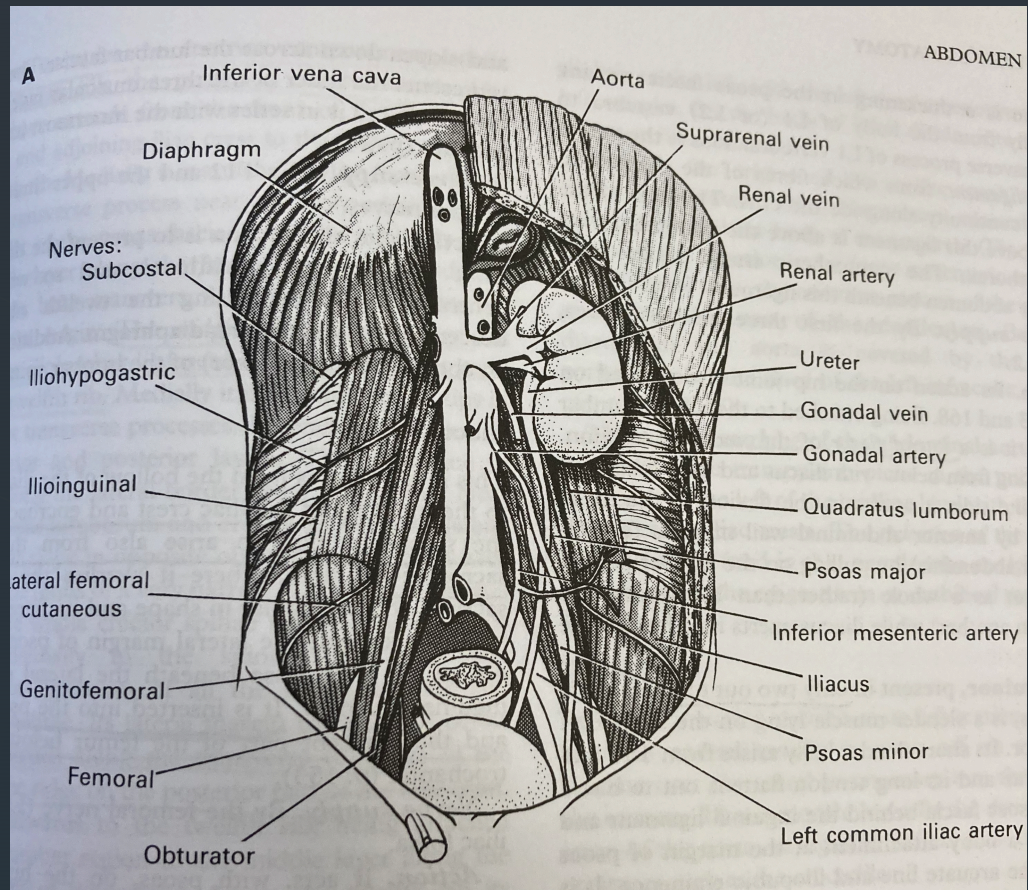


## Lateral femoral cutaneous nerve

- Supplies what it says...
- Emerges from LATERAL border of psoas major – easy to remember

# Femoral and Obturator nerves

- L2, L3, L4
- ANTERIOR RAMI (plexus..) (See Chapter 1 of Last's)
  - Anterior division is FLEXOR - Obturator
    - Medial border
  - Posterior division EXTENSOR - femoral
    - Lateral border



Q

- The branch of the lumbar plexus which appears at the medial border of the psoas major muscle is:
  - A: iliohypogastric nerve
  - B: sciatic nerve
  - C: femoral nerve
  - D: obturator nerve
  - E: genitofemoral nerve

Q

- Branches of the lumbar plexus which appear at the medial border of psoas major are
  - 1. Obturator nerve
  - 2. Ilio-hypogastric nerve
  - 3. lumbo-sacral trunk
  - 4. femoral nerve

Q

- The ilio-inguinal nerve
- A: Supplies the rectus abdominus muscle
- B: enters the deep inguinal ring
- C: supplies the cremasteric muscle
- D: Supplies urethra
- E: supplies skin over root of penis

- The obturator nerve often:
  - A: supplies the skin to the labium majus
  - B: divides into an anterior division which supplies the pectineus
  - C: may leave the pelvis through the greater sciatic foramen
  - D: arises from the anterior divisions of anterior rami of L2, 3, 4
  - E: emerges onto the sacrum to lie medial to the lumbosacral trunk

- The obturator nerve
  - Arises from the anterior divisions of the posterior rami of L2, L3, L4
  - Lies above the obturator vessels on the lateral wall of the pelvis
  - Supplies gracilis
  - Has no sensory branches



Q

- The right ureter:
  - Crosses posterior to the right colic artery
  - Crosses anterior to the right common iliac artery
  - Crosses anterior to the right gonadal vessels
  - Runs along the lateral margin of the right psoas major muscle

## Final notes

- Repetition
- Visualise with Rohen's, electronic atlas
- Flashcards
- Constant testing
- Look beyond bank
- (head and neck)