*The full story of each nerve:

[1] Femoral nerve:
① arise from L2, L3, L4 (anterior rami).
② Emerge from lateral border of psoas major
③ under the inguinal ligament → lateral to femoral artery (in Δ).
④ It gives of branches immediately (protection)
↳ from the anterior division we have → saphenous nerve.

*saphenous nerve:
"The only cutaneous nerve that starts deep, hidden under muscles"
① run downward and medially (Hidden)
② Emerge between tendons of sartorius + gracilis muscle
③ in the leg → it runs with the great saphenous vein
④ pass in front of medial malleolus
⑤ medial border of the foot
⑥ terminates in the region of the ball of big toe.
*Imp notes: the saphenous nerve only become cutaneous in the leg (or lower part of thigh)
so any operation of saphenous vein should be done in the thigh. (safer).

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[2] Ilioinguinal nerve:
*mostly dangerous in hernia → could be cut
① enters the inguinal canal (pierces it's posterior surface).
② exits through inguinal ring (with spermatic cord)
↳ innervate sensory: ① upper & medial thigh, ② root of the penis, ③ anterior surface of scrotum in men.
in females: mons pubis and labium majus.

3] Ilio hypogastric:
① supplies posterior lateral.
② above superficial inguinal ring.
③ pierces the aponeurosis of external oblique
④ supplies the skin of pubic region.
*Ilio hypogastric and Ilio-inguinal → arise as single trunk (from L1)
*either before or after emerging from lateral border of psoas major
the trunk divides to give → iliohypogastric → (larger)
→ Ilioinguinal → (smaller).

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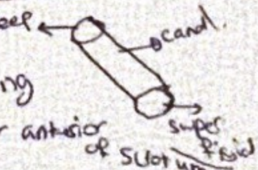
[4] Genito femoral nerve.
Inguinal canal ([illegible])
→ femoral branch: ① decends on lateral side of external iliac artery.
*② pass posterior to inguinal ligament
*③ lateral to femoral artery in femoral sheath
④ pierces the anterior layer of femoral sheath and fascia lata
⑤ supply skin of upper anterior thigh.

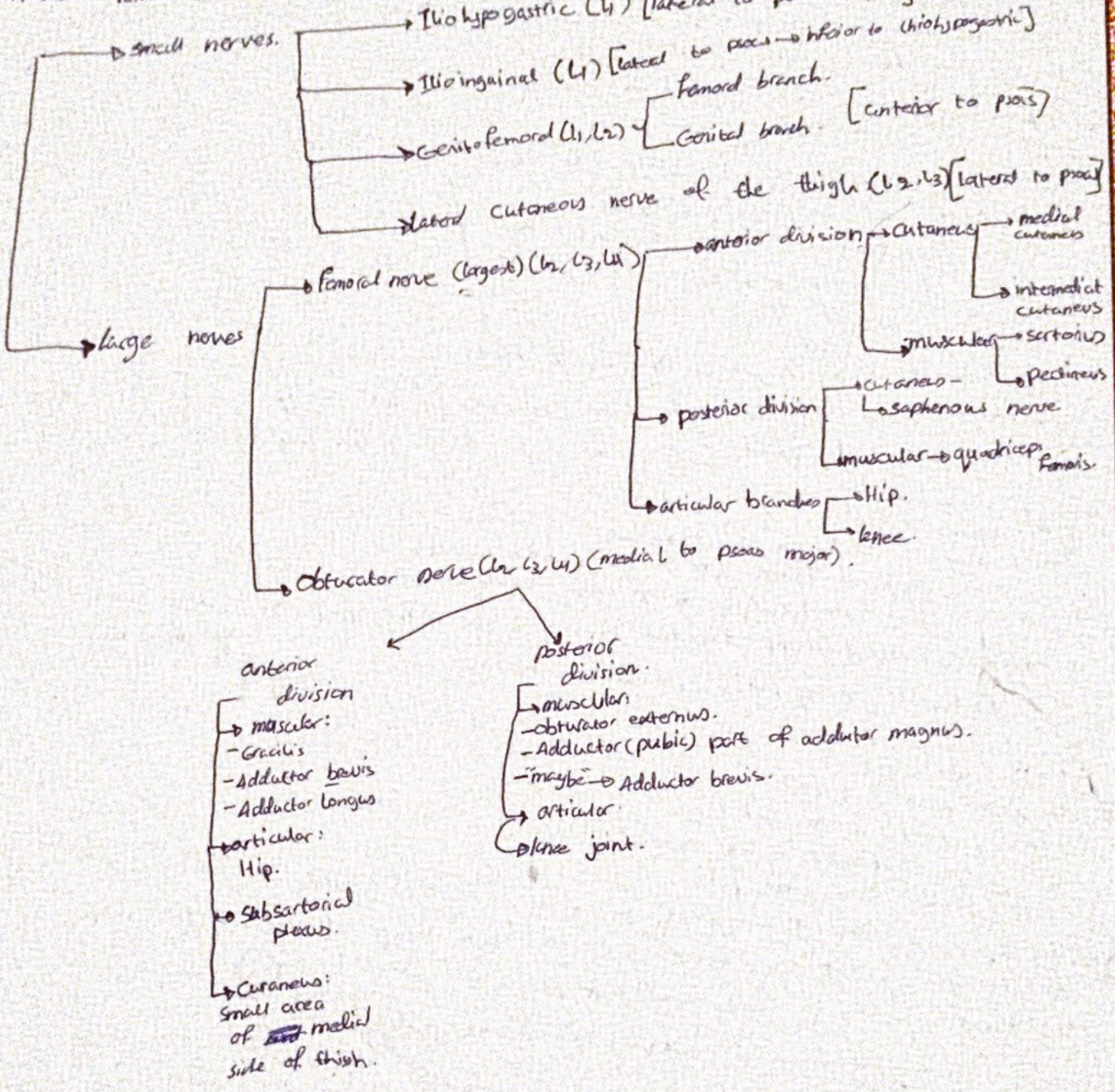


→ Genital branch: ① Enter the canal ([illegible]) through the deep inguinal ring
② continues through the canal
③ men: Innervate → cremastric muscle, terminate on skin of upper anterior of scrotum
④ women: accompanies the round ligament of uterus, terminate on skin of mons pubis & labium majus.

The lumbar plexus

General:

- anterior rami of L1–L4 → plexus (in the substance of psoas major) / also receive T12.
- posterior rami → supply the back.



(3) Common peroneal nerve:
① arise in the lower third of thigh
② runs downward through the popliteal fossa.
③ leaves the fossa by crossing superficially → to lateral head of gastrocnimius (exposed to injury).
④ passes behind the head of fibula
⑤ winds laterally around the neck of bone (subcutaneus nerve)
⑥ pierces peroneus longus muscle.

terminal branches:
- superficial peroneal nerve: → muscular → lateral compartment of leg
  (musculocutaneus nerve. the becomes → cutaneus to skin of leg.
- Deep peroneal nerve: anterior compartment of leg.

* The nerve befor dividing into the previose division, gives off two branches, what does that mean? → any injury to the two terminal parts (superficial, deep) won't affect areas supplies by the following branches.

① sural communicating branch.
↳ lateral cutaneus nerve of the calf → supplies the skin on lateral side of the back of leg.
② muscular branch: to the short head of biceps femoris (arise high up in popliteal fossa)
③ articular branch to knee joint

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[4] posterior cutaneous nerve of the thigh (S1, S2, S3)
① Enters the gluteal region through the lower part of greater sciatic foramen below peri formis
② passes downward on the posterior surface of sciatic nerve
③ runs down the back of the thigh beneath the deep fascia.
*④ in the popliteal fossa it supplies the skin over the back of the thigh and upper part of the leg.

*considered sometimes either → roof of popliteal fossa.
→ content of popliteal fossa.

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⑤ superior gluteal nerve (L4–S1)
① leaves the pelvis through greater sciatic foramen
② above peri formis
- → superior branch → supply gluteus medius
- → inferior branch → supply gluteus medius, minimus, tensor fasciae latae

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⑥ inferior gluteal nerve (L5–S2)
① leave pelvis through ↓ sciatic foramen
② below peri formis muscle
③ supply gluteus maximus

[5] lateral cutaneous nerve of the thigh. (L_2, L_3)
① emerge from lateral border of psoas major.
② posterior to the inguinal ligament and enter the thigh.
③ supply lateral and anterolateral of skin of thigh (to the level of the knee).

---

*lumbosacral plexus: *thick nerve formed by union of lower parts of anterior rami of L4 + L5).

- Anterior division
  - obturator nerve ($L_2, 3, 4$)
  - tibial nerve (L_4, L_5, S_1, S_2, S_3)
- posterior division
  - Femoral nerve (L_2-L_4)
  - Common fibular nerve (L_4-S_2)
  - superior gluteal nerve → L_4-S_1
  - inferior gluteal nerve → L_5-S_2

The sacral plexus is located on the posterior wall of pelvis on the anterior surface of piriformis
- formed by: lumbosacral trunk + ventral (anterior) rami of S_1 – S_4.

↓
supply: lower limb, perineum, pelvic floor.
* most branches go throug greater sciatic foramen

Sacral plexus: (L_4-S_4)

- Sciatic nerve (L_4–S_3)
  - Tibial (L_4-S_3) (larger)
  - common peroneal (L_4-S_2) (smaller)
- gluteal region
  - superior gluteal nerve (L_4-S_1)
  - inferior gluteal nerve (L_5-S_2)
- posterior cutaneous nerve of the thigh (S_1-S_3)
- pudendal nerve (S_2, S_3, S_4).

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[1] Sciatic nerve:
*branch of sacral plexus (L_4–S_3).
① Emerges from lower part of greater sciatic foramen.
② below piriformis muscle
③ the largest nerve in the body
↳ consists of tibial and peroneal nerves that are bound together with fascia.
④ at level of middle of the thigh it terminates by dividing into [tibial, common peroneal]

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[2] Tibial nerve:
① arise in the lower third of the thigh.
② runs downward to popliteal fossa (content)
③ Enters the posterior compartment of leg → by passing beneath (soleus muscle)

Branches:
- Cutaneous → sural nerve
  - ① descends between two heads of gastrocnemius.
  - ② supply skin of calf and back of leg.
  - ③ accompanies small saphenous vein
  - ④ pass behind lateral malleolus → supply lateral border of foot, lateral of little toe.
- muscular → ① both heads of gastrocnemius, ② plantaris, ③ soleus, ④ popliteus.
- articular → knee joint.

* Muscles of the lower limb "I'll mention them as their relation to the joints"

1. muscles acting on the Hip joint:

A. Flexors of the Hip joint "general".

1. psoas major + Iliacus muscle → Flex thigh on trunk / also flex when trunk is fixed → sitting up from lying down
2. sartorius muscle [also abduct + laterally rotate at hip].
3. pectineus → also adduct *
4. rectus femoris head..
5. adductor muscles can also help. "small role"

B. Extensors of the hip joint:

1. G. maximus → main extensor + can Laterally rotate, help in cycling, climbing stairs
2. Long head of biceps femoris.
3. semitendinosus muscle.
4. semimembranosus.
5. hamstring portion of adductor magnus

C. lateral rotators of the Hip:

1. sartorius / 3. G. maximus. - • adductors muscles in medial compartment.
3. obturator externus → considered one of short rotators.
4. short lateral rotators:

- piriformis
- Quadratus femoris
- obturator internus
- Superior gamellus
- inferior gamellus.

D. Adductors:

1. pectineus.
2. adductor longus
3. adductor brevis
4. adductor magnus (pubic part).
5. Gracilis muscle.

E. abductors:

1. sartorius.
2. G. medius. [main].
3. G. minimus.

F. medial rotators:

1. G. medius.
2. G. minimus.

muscle	origin	insertion	nerve supply
psoas major	*transverse processes, bodies, vertebral discs of T12 - L5	* Iliacopsoas tendon insert in lesser trochanter of femur	lumber plexus. *the dr also said it could be femoral nerve.
iliacus	Iliac fossa of Hip bone.	↓ lesser trochanter.	femoral nerve.
sartorius	anterior superior iliac spine.	SGS part = upper medial shaft of tibia.	femoral nerve.
pectineus	superior ramus of Pubis	upper end of linea aspera of femur	femoral nerve
rectus femoris.	two heads: ①straight from anterior inferior iliac spine. ②reflected - ilium above acetabulum	*tendon of quadriceps femoris red insertion - tibial tuberosity.	femoral nerve.
vastus lateralis	Linear origin from upper end of shaft of femur	//	femoral nerve
vastus medialis	//	//	femoral nerve.
vastus intermedius	anterior and lateral surfaces of shaft of femur	//	femoral nerve.
adductor longus	body of pubis (medial to pubic tubercle).	linea aspera. (posterior surface of femur)	obturator nerve.
adductor brevis	inferior ramus of pubis	//	obturator nerve.
Gracilis	inferior ramus of pubis + ramus of ischium	SGS = upper medial part of tibia.	obturator nerve.
obturator externus	outer surface of obturator membrane and pubic and ischial rami	medial surface of greater trochanter.	obturator nerve.
G. maximus	①Ilium - behind posterior gluteal line. ②sacrum and coccyx ③sacrotuberous ligament	①superficial 3/4 are inserted into ilio tibial tract ②deep part into gluteal tuberosity	inferior gluteal nerve (L5 - S2).
G. medius	between middle and inferior gluteal line	greater trochanter of femur.	superior gluteal nerve (L4-S1)
G. minimus	behind the inferior gluteal line.	greater trochanter of femur	superior gluteal nerve
piriformis		medial of greater trochanter	inferior gluteal nerve.
obturator internus		~	nerve to obturator internus
superior gamellus		~	↓
inferior gamellus		~	nerve to quadratus femoris.
Long head of biceps	ischial tuberosity.	head of fibula.	tibial nerve (portion of sciatic nerve).
Quadratus femoris.		medial of greater trochanter.	nerve to quadratus femoris
Adductor magnus	①pubic part: ischio-pubic ramus (adductor)	→ linea aspera, gluteal tuberosity and medial supracondylar line	→ obturator nerve.
	②Hamstring part: ischial tuberosity (extensor)	→ adductor tubercle of femur	→ tibial nerve.

*muscles acting on knee joint.

[1] Flexors:
① sartorius muscle.
② gracilis muscle.
③ Biceps femoris.
④ semitendinosus.
⑥ semimembranosus.
⑦ gastrocnemius.

[2] Extensors:
① quadriceps femoris. (main extensor).
② G. maximus stabilizes the extended knee through ilio tibial tract.
③ Tensor fasciae latae → assist G. max.

[3] medial rotators: (S3).
① sartorius.
② semitendinosus.
③ semi membranous.

[4] lateral rotators:
① biceps femoris.

muscle.	origin	insertion	innervation.
Biceps femoris	long head: ischial tuberosity short head: linea aspera, lateral supra condylar ridge	head of fibula.	long head: tibial nerve short head: common peroneal nerve.
semitendinosus	ischial tuberosity	SGS → upper medial shaft of Tibia	tibial nerve.
semimembranous	ischial tuberosity	medial condyl of tibia	tibial nerve.
Tensor fascia latae	Iliac crest	Iliotibial tract	Superior gluteal nerve.

*Muscle on ankle joint:

[1] Dorsi flextion (extention).
↳ what? does it mean? ① stand on your heels ② raise toes up.
① Tibialis anterior
② Extensor digitorum longus.
③ Extensor hallucis longus.
④ peroneus tertius.

[Tom has very nice dogs and pigs]
↳ their insertion from medial to lateral.

② plantar flexors: (flexors),
① superficial group of posterior compartment of leg :p.
① gastrocnemius
② plantaris (absent.)
③ soleus.
→ main propulsive force in walking and running.

② deep group of posterior compartment (Tom does very nice hats)
↳ obeying medial malleolus.
① popliteus
② flexor digitorum longus
③ flexor hallucis longus.
④ Tibialis posterior.

③ lateral compartment:
① peroneus longus.
② peroneus brevis.

*Muscles acting on subtalar and transverse joints:

① Inverters:
*anything starts with tibialis:
① Tibialis anterior
② Tibialis posterior

Everters:
*anything with peroneus:
① peroneus longus.
② peroneus brevis

*muscles of the sole of the foot:
they act on talo-metatarso joints, and metatarso-pharangial joints.

- first layer
  - Abductor hallucis
  - flexor digitorum brevis
  - Abductor digiti minimi
- second layer
  - muscles
    - quadratus plantae.
    - lumbricals.
  - tendons
    - flexor digitorum longus tendon
    - flexor hallucis longus tendon.
- 3rd layer
  - flexor hallucis brevis
  - adductor hallucis
  - flexor digiti minimi brevis.