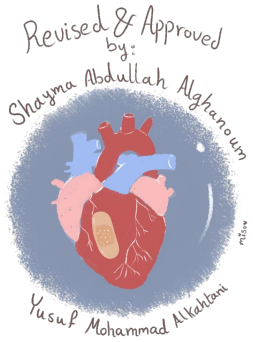
MED439
KING SAUD UNIVERSITY

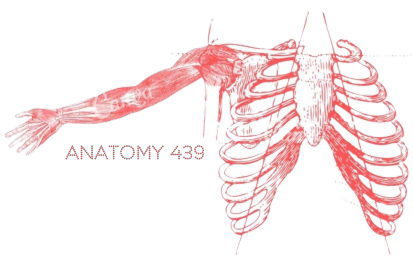
Sciatic nerve

Musculoskeletal Block - Lecture 17

Objective:
✓Describe the anatomy (origin, course and distribution) of the sciatic nerve.
✓List the branches of the sciatic nerve.
✓Describe briefly the main motor and sensory manifestations in case of injury of the sciatic nerve or its main branches.

Color index:
Important
In male's slides only
In female's slides only
Extra information, explanation





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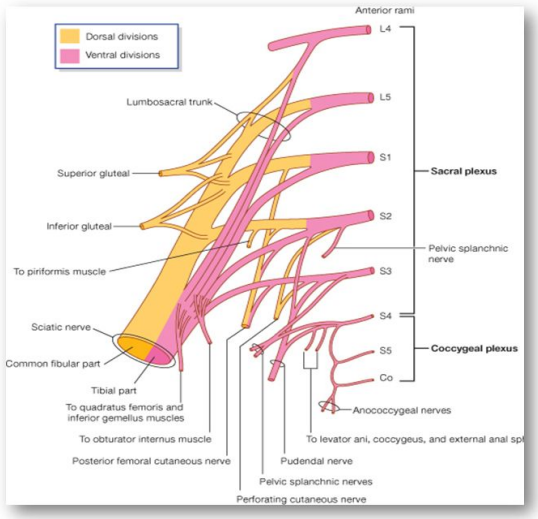
Sacral Plexus

Formation:

★ Ventral (anterior) rami of (L4, L5 S1, S2, S3 & S4)

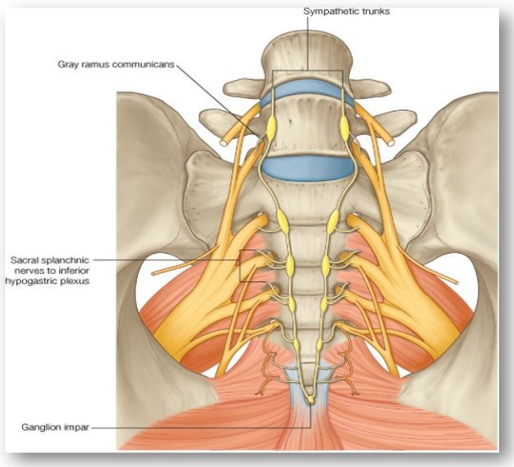
★ Part of L4 & whole L5 (lumbosacral trunk & S1,S2,S3 and most of S4)



Site:

★ On the posterior pelvic wall.

★ In front of Piriformis muscle



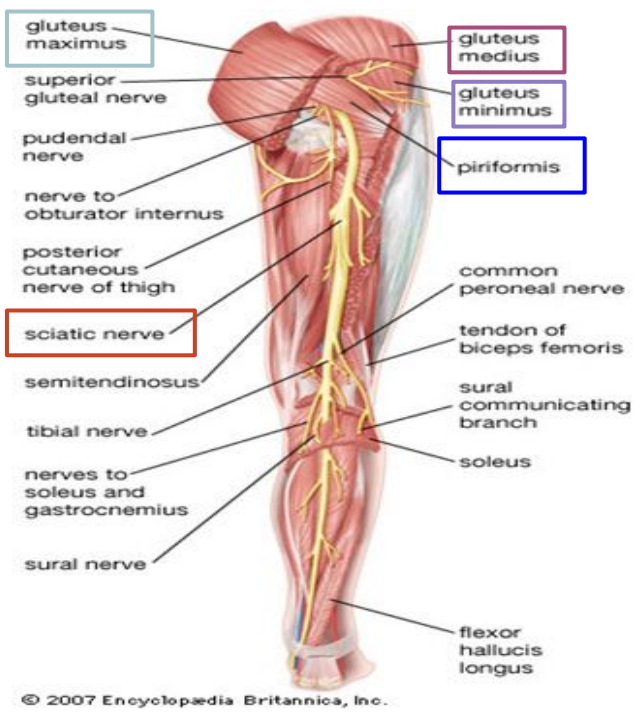
Sciatic Nerve

Origin

★ From the Sacral to the Plexus (L4,L5,S1,S2,S3)

★ It is the largest branch of the plexus.

★ It is the largest nerve of the body.

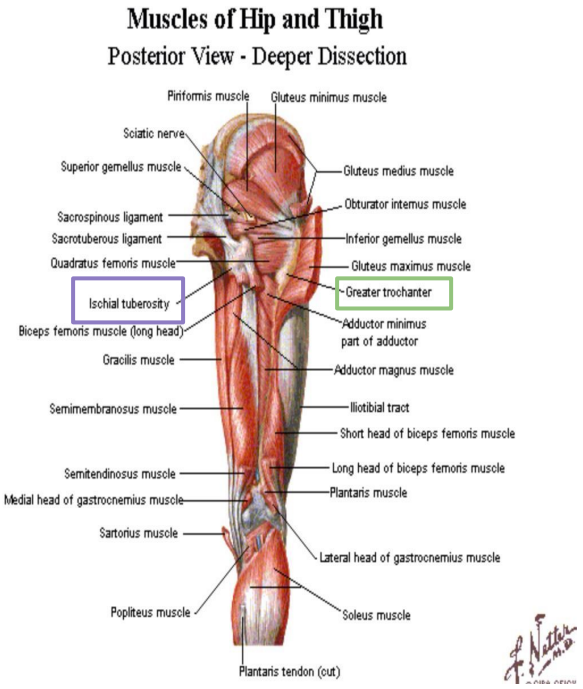


Course & Distribution

★ The sciatic nerve leaves the pelvis through greater sciatic foramen, below the piriformis muscle.

★ It passes in the gluteal region midway (between ischial tuberosity & greater trochanter)

★ Then it enters the posterior compartment of the thigh.



Termination

★ In the middle of the back of the thigh it divides into 2 terminal branches:

1. **Tibial** (medial popliteal)
2. **Common Peroneal**, or lateral popliteal(Fibular).

Branches of Sciatic Nerve

Cutaneous (a)

To all leg & foot

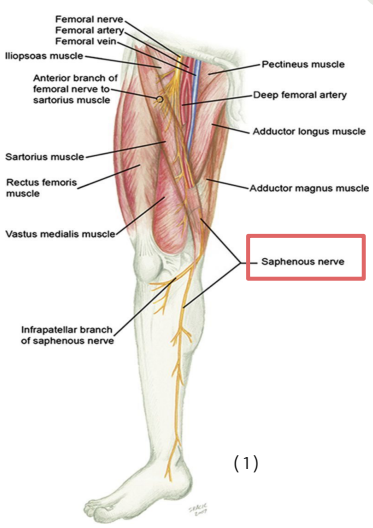
EXCEPT: Areas supplied by the saphenous nerve(1) (branch of femoral nerve).
Note:saphenous nerve supplies the medial part of the leg and medial foot

Muscular (b) (To Hamstring)

(flexors of knee & extensors of the hip).

(through tibial part) to:
Long head of Biceps Femoris, Semitendinosus , Semimembranosus, Hamstring part of Adductor Magnus

The short head of biceps receives its branch from the lateral popliteal(2)(common peroneal) nerve.



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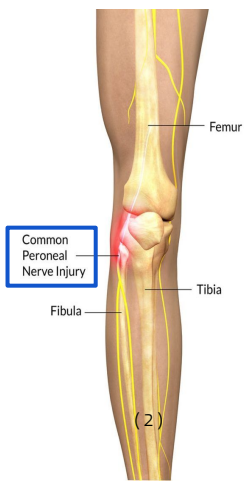

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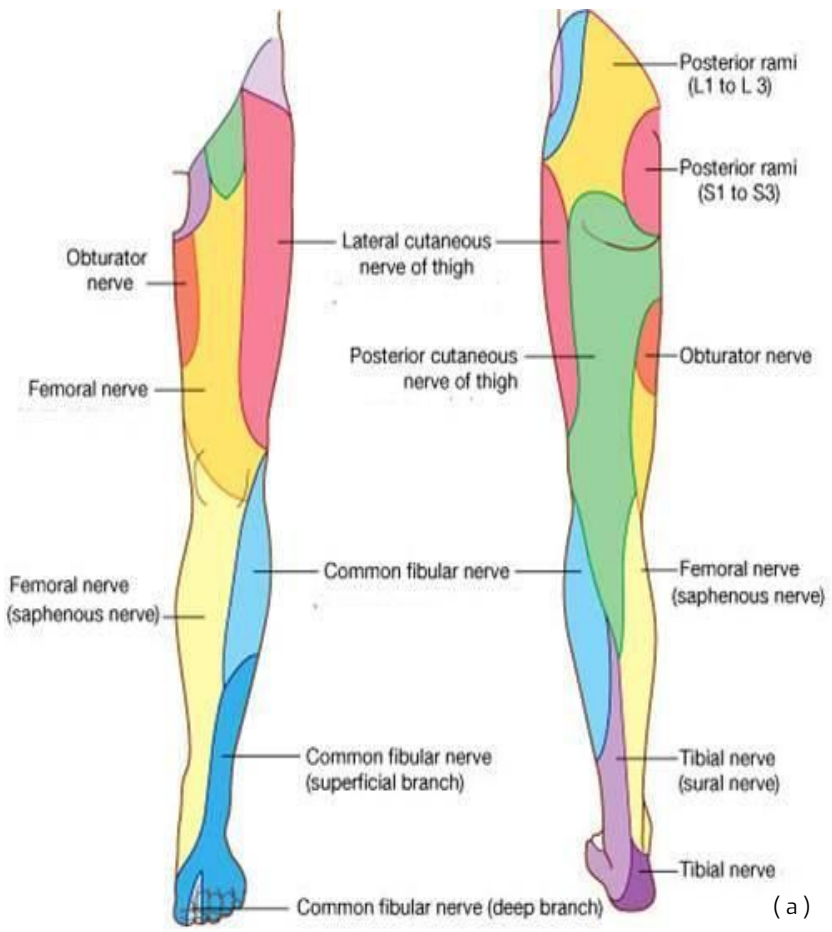
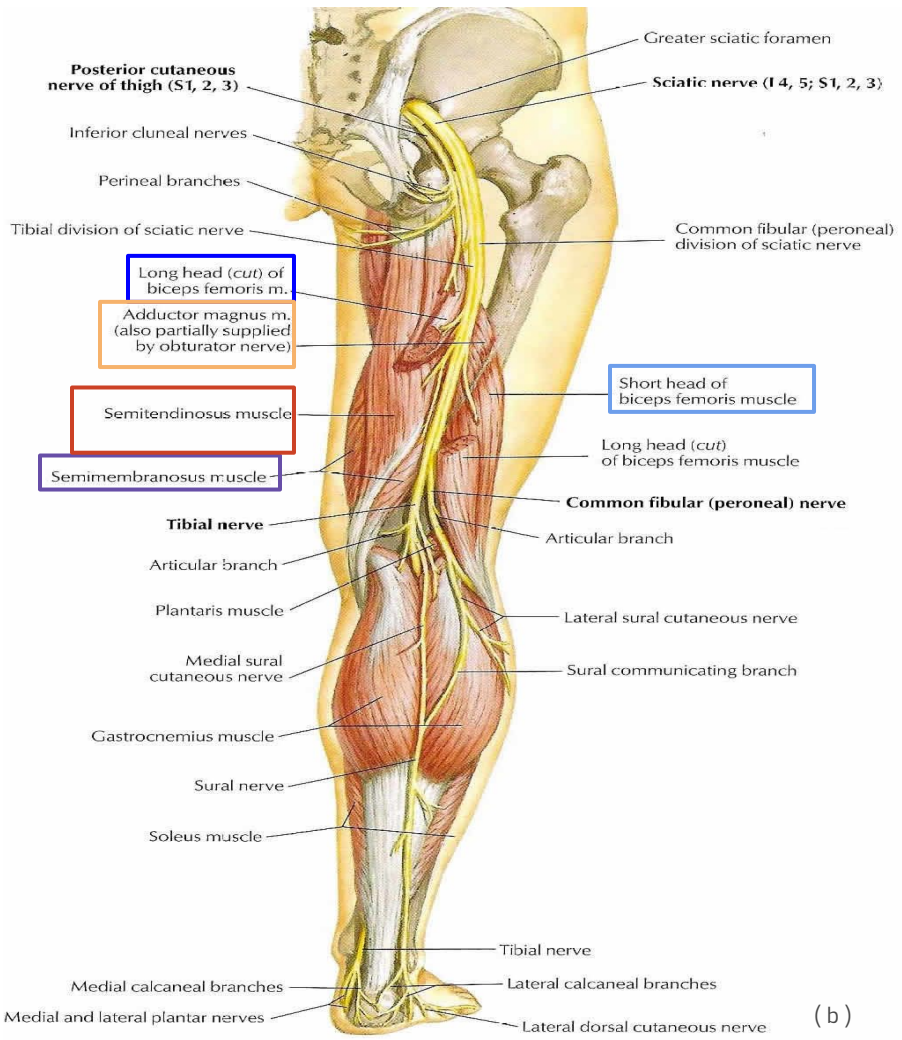


(a)



(b)

Tibial Nerve

01

Course:

- Bisect the popliteal fossa.
- Then descends through the posterior compartment of leg.
- Descends through popliteal fossa to posterior compartment of leg

02

Accompanied with posterior tibial vessels.

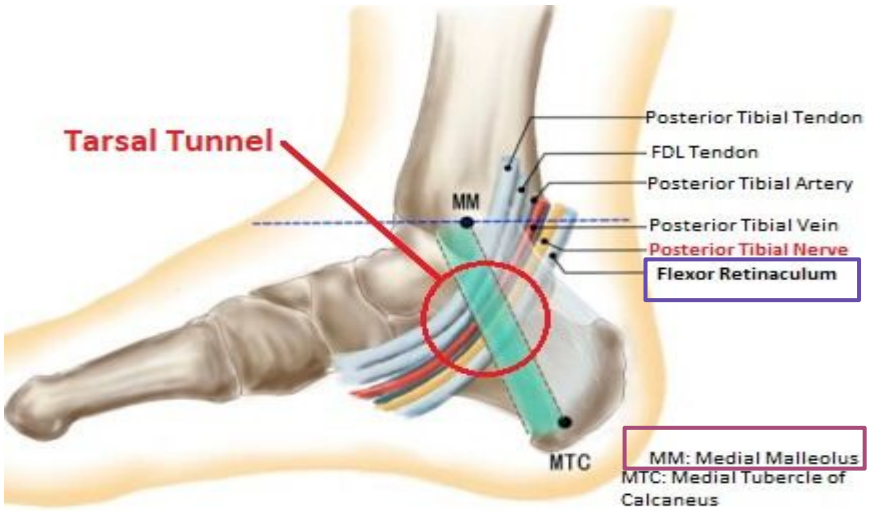
03

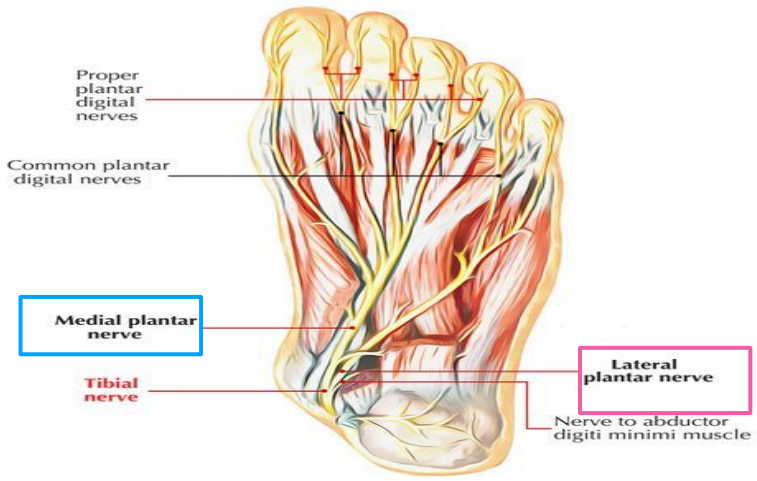
Passes deep to flexor retinaculum (through the tarsal tunnel, behind medial malleolus) to reach the sole of foot.

04

In the sole it divides into 2 terminal branches:

1. Medial planter nerve.
2. Lateral planter nerve.





Muscular Branches

- Muscles of posterior compartment of leg (Planter flexors of the ankle, Flexors of toes.)
- Intrinsic muscles of sole.
- ONE invertor of the foot (tibialis posterior)

Common peroneal (fibular) Nerve

Course

Leaves popliteal fossa & turns around lateral aspect of neck of fibula (dangerous position)(uncovered by muscle)

It enters the upper part of the substance of peroneus longus muscle where it divides into:

1

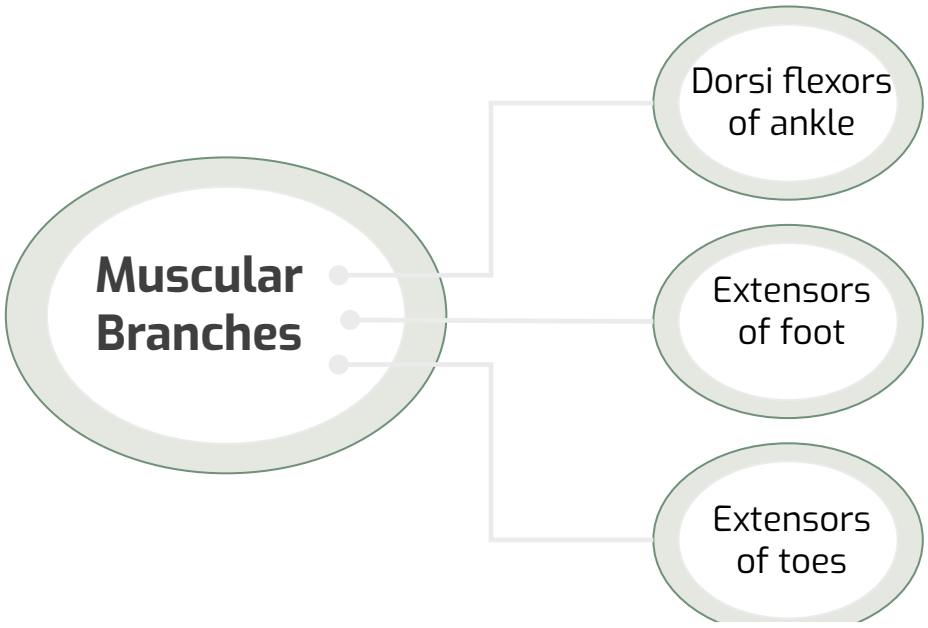
- **superficial peroneal** or (musculocutaneous):
  To supply lateral compartment of the leg

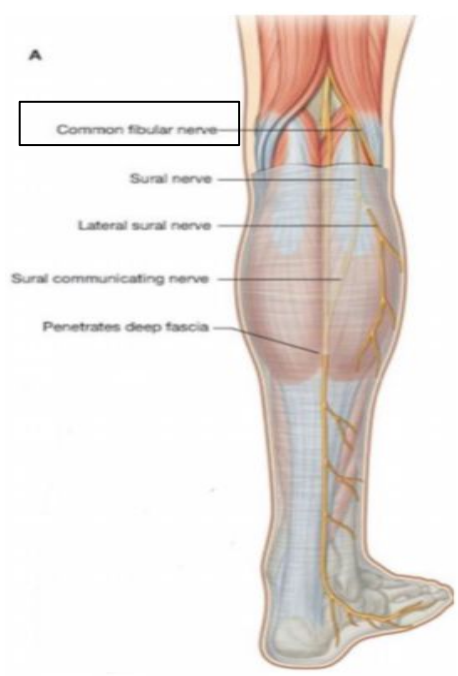
2

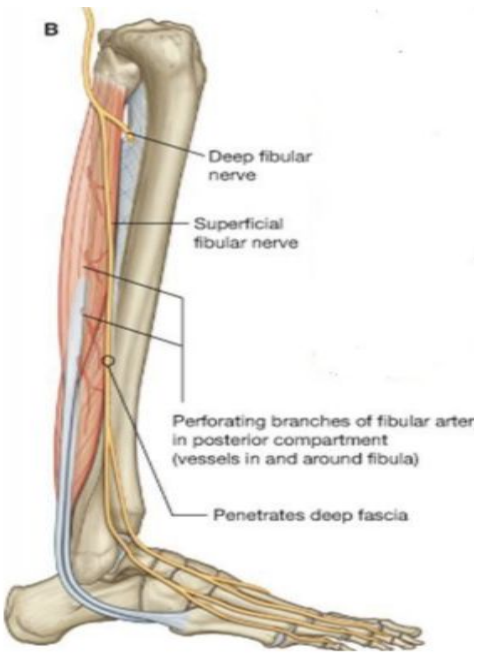
- **Deep peroneal** or(anterior tibial)
  To supply anterior compartment of the leg

Muscular branches

Muscles of anterior & lateral compartment of the leg.



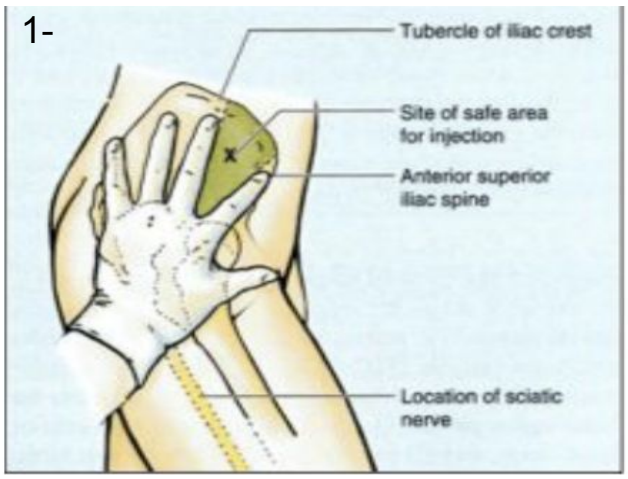




Sciatic nerve injury

Causes	Effects
The sciatic nerve is most frequently injured by.? 1- **Badly placed intramuscular injection in the gluteal region.** • To avoid this, injections should be done into the gluteal maximus or medius .(into the upper outer quadrant of the buttock). • Most nerve lesions are incomplete,and in 90% of injuries, the common peroneal (part of nerve) is most affected.Why? Because the common peroneal nerve fibers lies superficial in the sciatic nerve.	• **Motor effect**: 1. Marked wasting of the muscles below the knee. 2. Weak flexion of the knee (sartorius & gracilis are intact) because they have different nerve supply. 3. Weak extension of hip (gluteus Maximus is intact) 4. All muscles below the knee are paralyzed,the weight of the foot causes it to assume the **plantar-flexed** position or **foot drop** (due to gravity). 5. (Stamping gait)or(high steppage gait)
2- **posterior dislocation of hip joint.**	• **Sensory effect** : Sensation is lost below the knee, except for narrow area down the medial side of the lower part of the leg, and along the medial border of the foot as far as the ball of the big toe,which is supplied by saphenous nerve (femoral nerve)

1-



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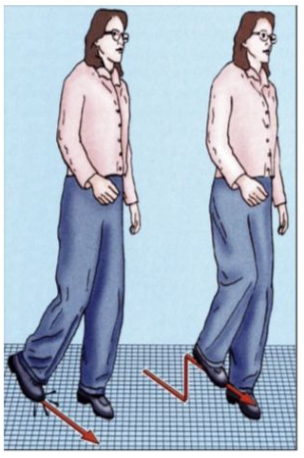
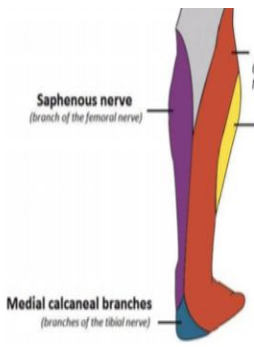
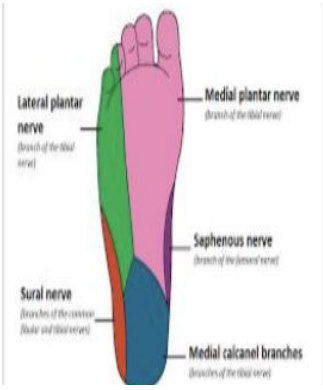




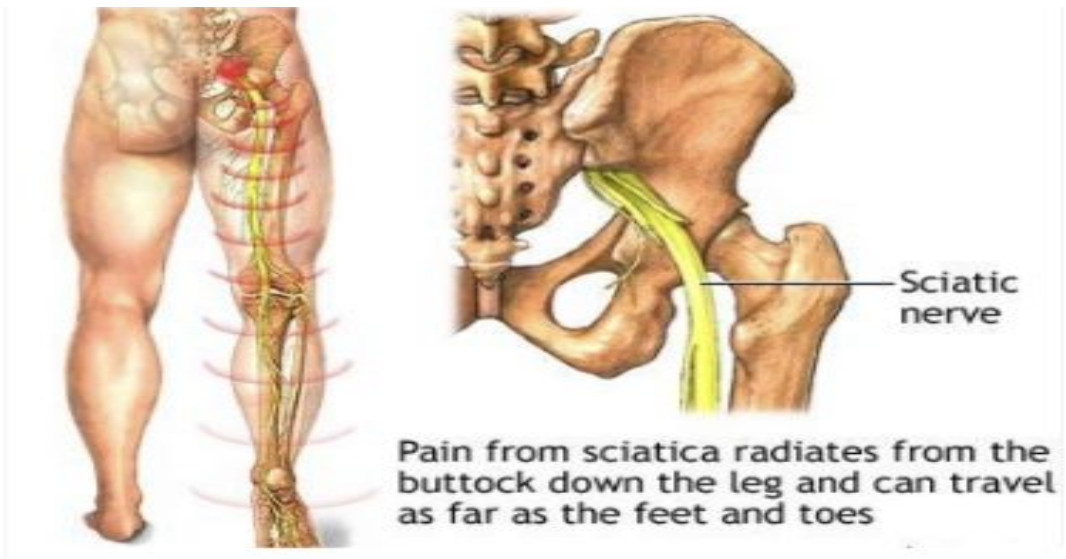


Effect of sciatic nerve injury

	Paralysis	Movement effected
Motor effect	Hamstrings	Flexion of the knee & extension of hip
	All muscles of leg & foot	All movements of the leg & foot
Sensory effect	Loss of sensation of the areas supplied by sciatic nerve (below knee)	EXCEPT area supplied by the (saphenous nerve)

Sciatica عرق النسّا

- Sciatica describes the condition in which patients have pain along the sensory distribution of the sciatic nerve.(motor work effectively)
- Thus, pain is experienced in the posterior aspect of the thigh,the posterior and lateral sides of the leg ,and the lateral part of the foot.

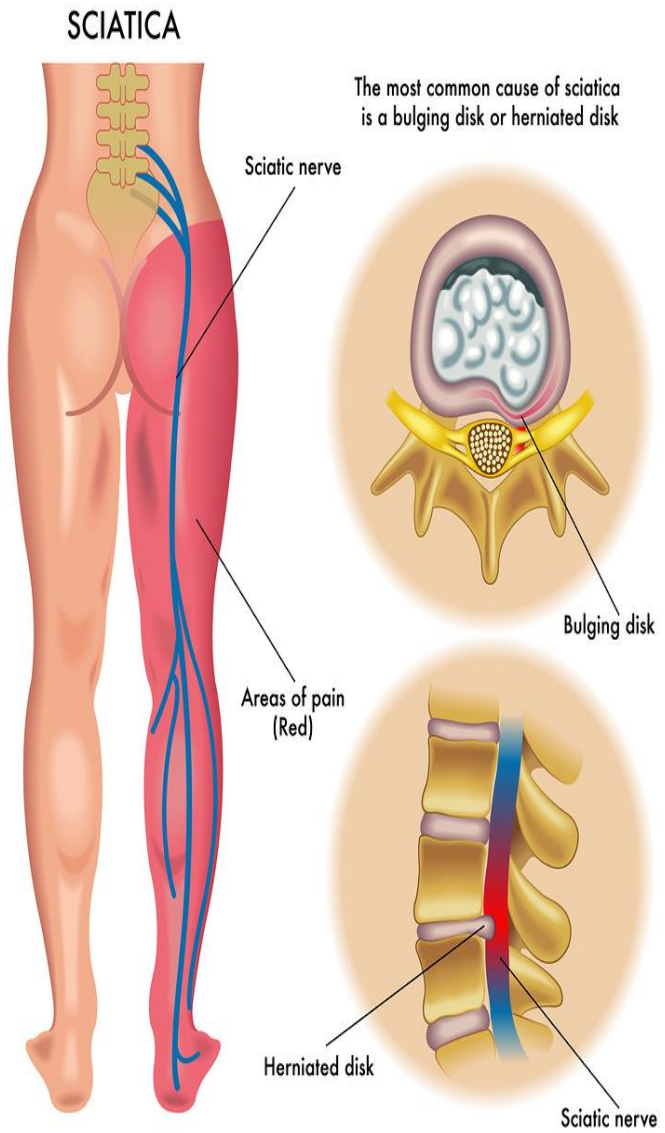


Causes of Sciatica:

➢ **Prolapse of an intervertebral disc**, with pressure on one or roots of the lower lumbar and sacral spinal nerves,

➢ **Pressure on** the sacral plexus or sciatic nerve by an intrapelvic **tumor**,

➢ **Inflammation** of the sciatic nerve or its terminal branches

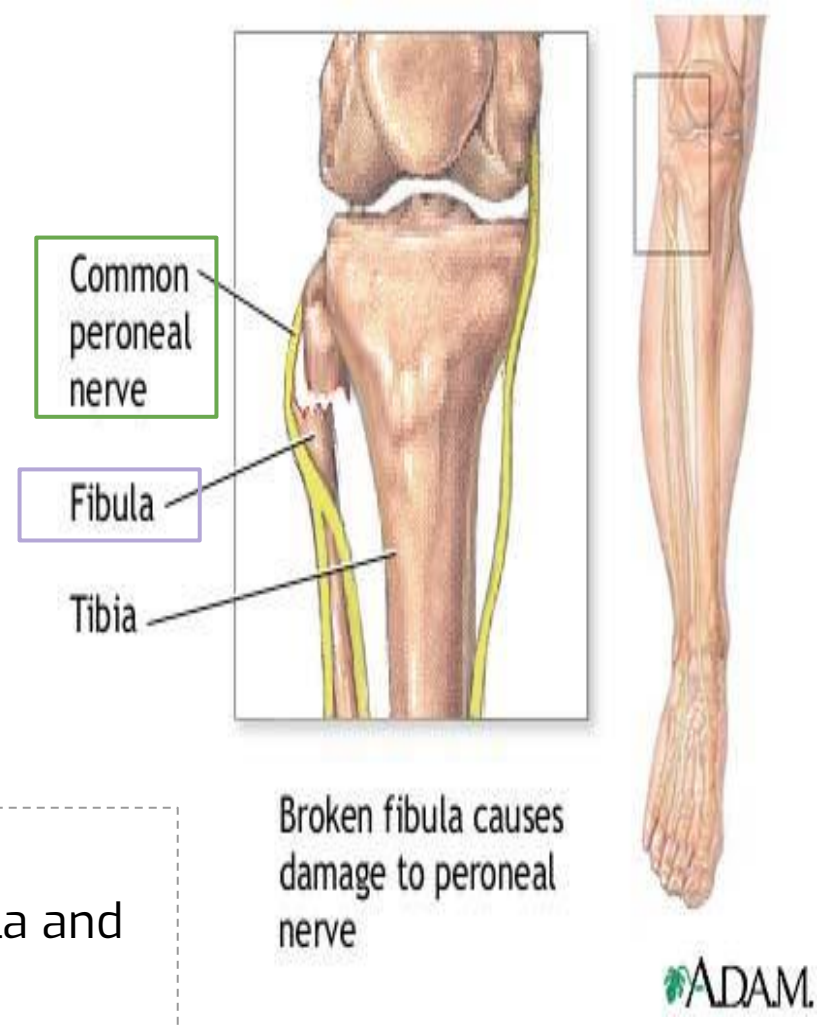


Common Peroneal Nerve Injury

The common peroneal nerve is in an exposed position as it leaves the popliteal fossa through its lateral angle.

Then it winds around neck of the fibula to enter the peroneus longus muscle, (Dangerous Position)

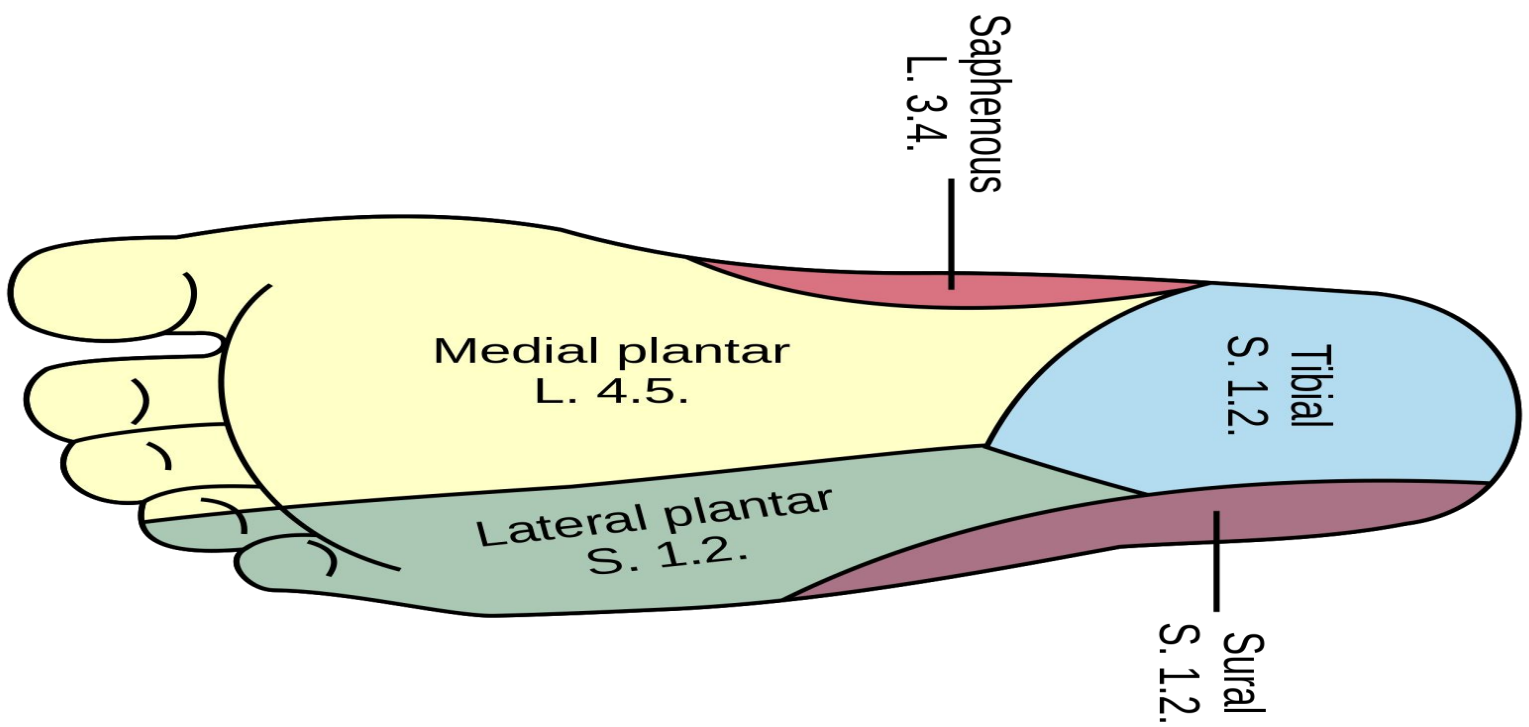
The common peroneal nerve is commonly injured In Fractures of the neck of the fibula and By pressure from low casts or splints.



Manifestations of Common Peroneal Nerve Injury

The following clinical features are present:

Motor	Sensory
The muscles of the anterior and lateral compartments of the leg are **paralyzed**. As a result, the opposing muscles, the plantar flexors of the ankle joint and the invertors of the subtalar joints, **cause the foot to be Plantar Flexed (Foot Drop) and Inverted,** an attitude referred to as **Talipes Equinovarus.**	Sensation is **lost:** -between the **first** and **second toes**. -Dorsum of the foot and toes. -Medial side of the big toe. Lateral side of the leg.



Tibial Nerve Injury

Because of its deep and protected position, the tibial nerve is **rarely injured**.

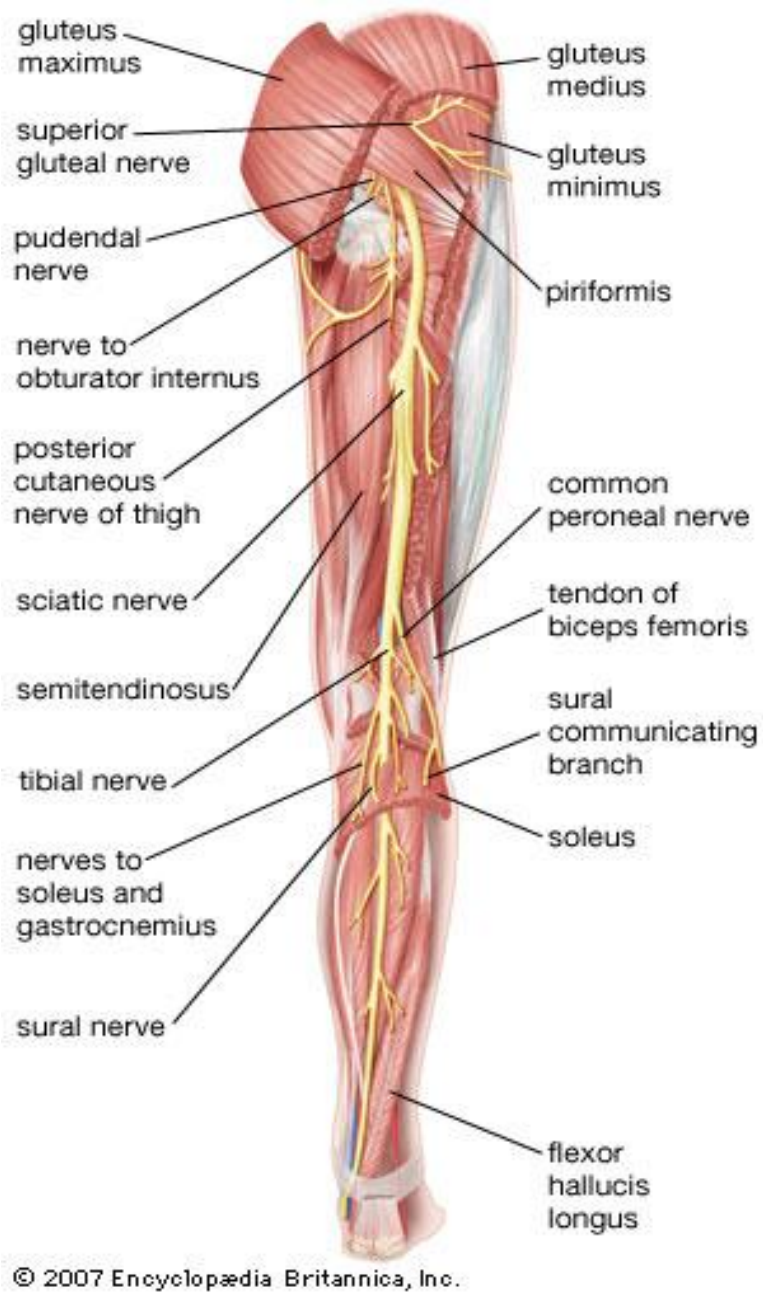
Complete division results in the following **clinical features:**

Motor:

All the muscles in the back of the leg and the sole of the foot are **paralyzed**.

The opposing muscles **Dorsiflex** the foot at the ankle joint and **Evert** the foot at the subtalar joint, an attitude referred to as **Talipes Calcaneovalgus**.

Sensory loss: On the Lateral side of the leg and foot & **trophic ulcers** in the sole. (Also seen in case of sciatic nerve injury)



MCQs

Q1: The sciatic nerve leaves the pelvis through

A.ischial tuberosity
B.piriformis muscle
C.greater sciatic foramen
D.greater trochanter

Q2: The action of the muscular branch of the sciatic nerve

A.extensor of knee,flexor of hip
B.flexor of knee,extensor of hip
C.flexor of knee,adductor of hip
D.flexor of knee,lateral rotation of hip

Q3: All the following muscles are included in the Hamstring **Execpt**:

A.long head of biceps femoris
B.semitendinosis
C.sartorius
D.semimembranosus

Q4: The tibial nerve passes deep to the

A.flexor hallucius longus
B.flexor digiturum longus
C.medial malleolus
D.flexor retinaculum

Q5:superficial peroneal or (musculocutaneous): supply

A.anterior comp of leg
B.lateral comp of leg
C.lateral comp of thigh
D.posterior comp of leg

Q6:what is the muscle supplied by peroneal nerve

A.flexors of the thigh
B.extensor of the leg
C.flexors of the leg
D.extensor of foot

Q7:the sciatic nerve injury is caused by :

A.dislocation of the tibia
B.posterior dislocated hip joint
C.cut in the femoral artery
D.pregnancy

Q8: sciatica symptoms are:

A.paralyzed foot
B.motor in activity
C.punching in the leg
D.pain in sensory of sciatic nerve along lower limb

Q9:The most frequent injuries of the sciatic nerve is:

A.Badly placed intramuscular injections in the gluteal region.
B.Posterior dislocation of hip joint.
C.Both a and b.
D.None of the above

Q10:Pressure on the sacral plexus or sciatic nerve by an intrapelvic tumor:

A.sciatica.
B.tibia nerve injury
C.common proneal injury
D.inflammation of sciatic nerve

Q11:which of the following can cause paralysis in back of the leg and the sole of the foot

A.sciatic.
B.tibia nerve injury
C.common proneal injury
D.inflammation of sciatic nerve.

Q12:The common peroneal nerve is commonly injured

A.In Fractures of the neck of the fibula.
B.By pressure from casts or splints.
C.both A and B
D.none of them

1	2	3	4	5	6	7	8	9	10	11	12
C	B	C	D	B	D	B	D	C	A	B	C

SAQs

1- What are the 2 terminal branches of the back of the thigh?
Answer:Tibial (medial popliteal) ,Common Peroneal, or lateral popliteal(Fibular).
2- What are the 2 terminal branches of the sole?
Answer: medial planter nerve and lateral planter nerve

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SPECIAL THANKS TO THE AMAZING
#MED438 ANATOMY TEAM