MED437
KING SAUD UNIVERSITY

ANATOMY
Team 437

Sciatic Nerve

Lecture 21

غيـــداء آل مصـمـع
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Revised by

Please check our Editing File.

هذا العمل لا يغني عن المصدر الأساسي للمذاكرة

{وَمَنْ يَتَوَكَّلْ عَلَى اللَّهِ فَهُوَ حَسْبُهُ}

Objectives

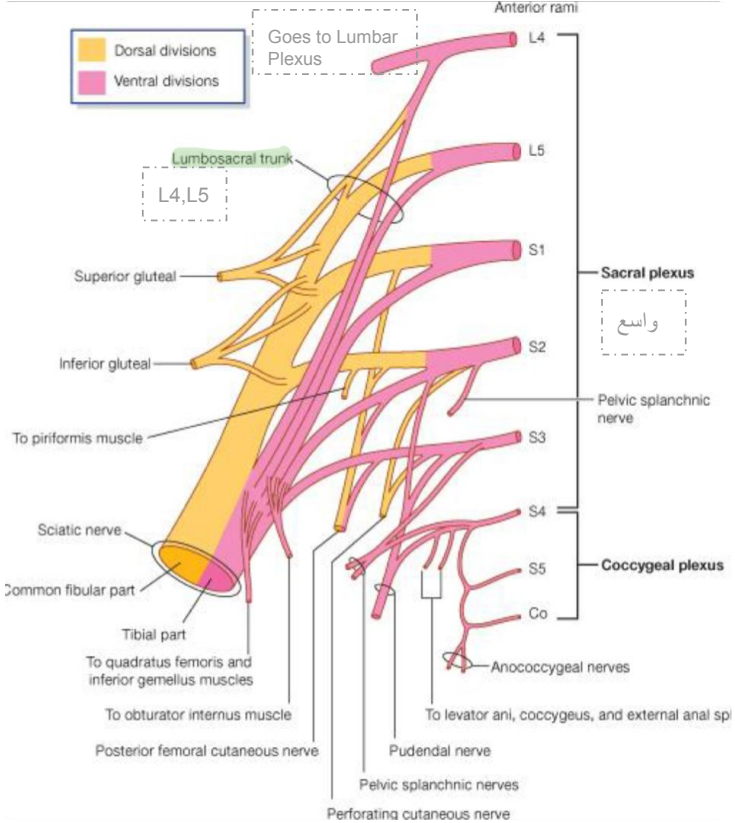
- Describe the anatomy (origin, course & distribution) of the sciatic nerve.
- List the branches of the sciatic nerve.
- Describe briefly the main motor and sensory manifestations in case of injury of the sciatic nerve or its main branches.

- **Text in BLUE was found only in the boys' slides**
- **Text in PINK was found only in the girls' slides**
- **Text in RED is considered important**
- Text in GREY is considered extra notes

Origin

- From Sacral to Plexus
- (L4,L5,S1,S2,S3)
- Largest branch of the plexus
- Largest nerve in the body

نلاحظ ان ال
sciatic nerve
ياخذ كل الروتس حقت ال
sacral plexus
ما عدا S4



Sacral plexus

Formation:

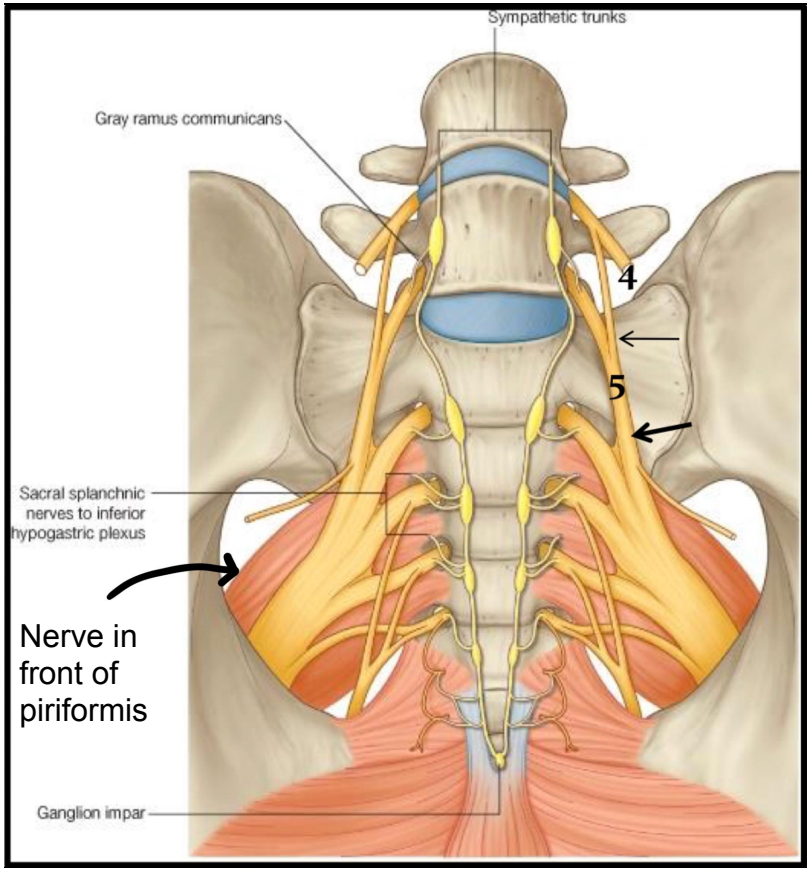
-Ventral (anterior) rami of a part of L4 and whole L5 (Lumbosacral trunk) + S1, S2, S3 and most of S4

-Ventral (anterior) rami of (L4,5,S1,2,3,& 4)

Site:

-On the posterior wall of pelvis

- In front of piriformis muscle

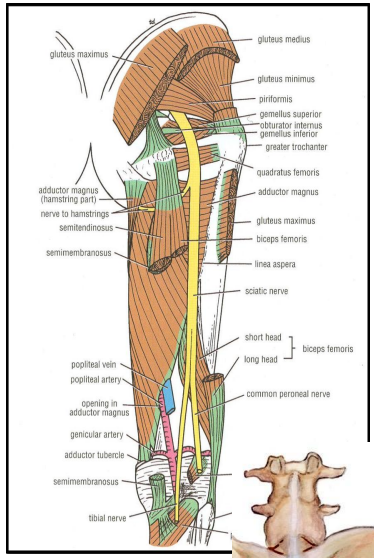


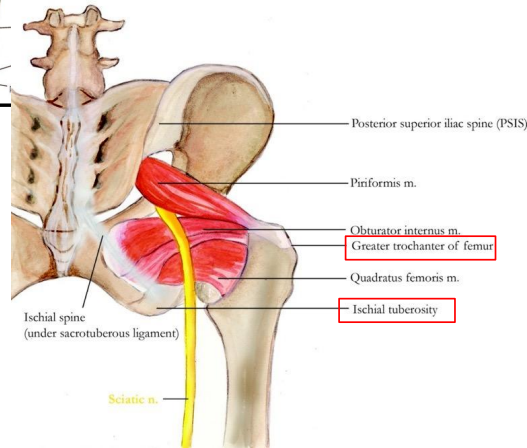
Course and distribution:

It leaves the pelvis through greater sciatic foramen, below the piriformis & passes in the gluteal region (between ischial tuberosity & greater trochanter) then to posterior compartment of thigh.

Termination:

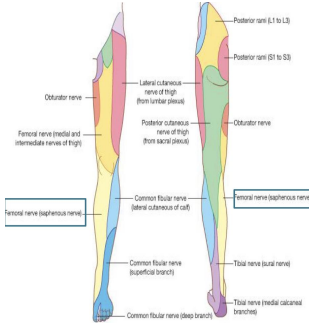
In the middle of the back of the thigh It divides into 2 branches:
- Tibial (medial popliteal)
- Common Peroneal (Fibular) (lateral popliteal)





Branches of Sciatic Nerve

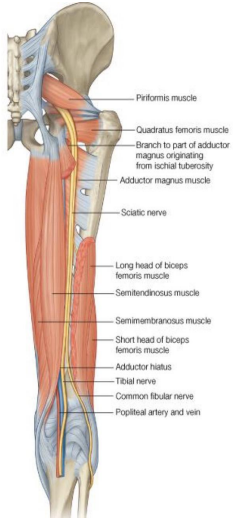
Cutaneous: To all <u>leg and foot</u> EXCEPT areas supplied by the saphenous nerve (branch of femoral nerve)



Muscular:
To hamstrings (flexors of the knee and extensors of the hip)

Through tibial part
1- Hamstring part of Adductor Magnus
2-Long head of biceps femoris
3-Semitendinosus
4-Semimembranosus

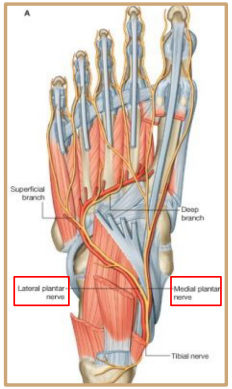
Except: Short head of biceps femoris receives its branch from the lateral popliteal (common peroneal) nerve



Tibial Nerve

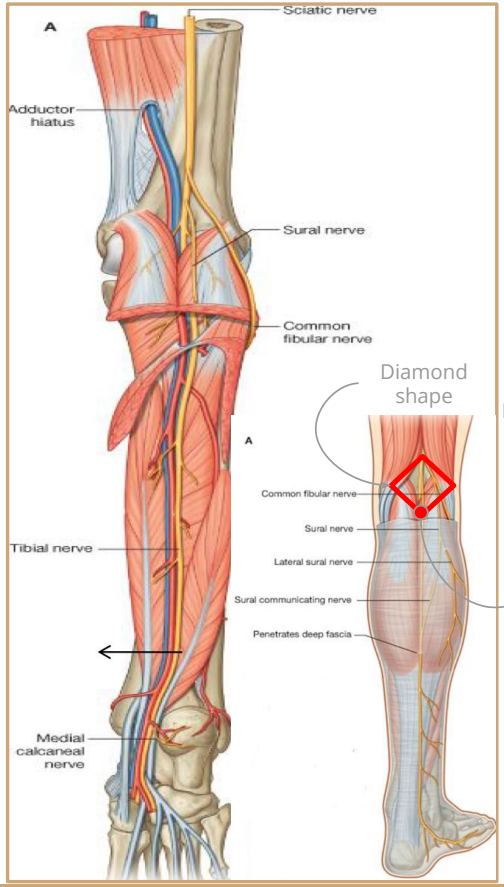
- Course:

1- Bisect the popliteal fossa. *most superficial structure



2- Descends through popliteal fossa to posterior compartment of leg, accompanied with posterior tibial vessels.

3- Passes deep to flexor retinaculum (through the tarsal tunnel, behind medial malleolus) to reach the sole of foot where it divides into 2 terminal branches (Medial & Lateral planter nerves.) With joints



Muscular Branches

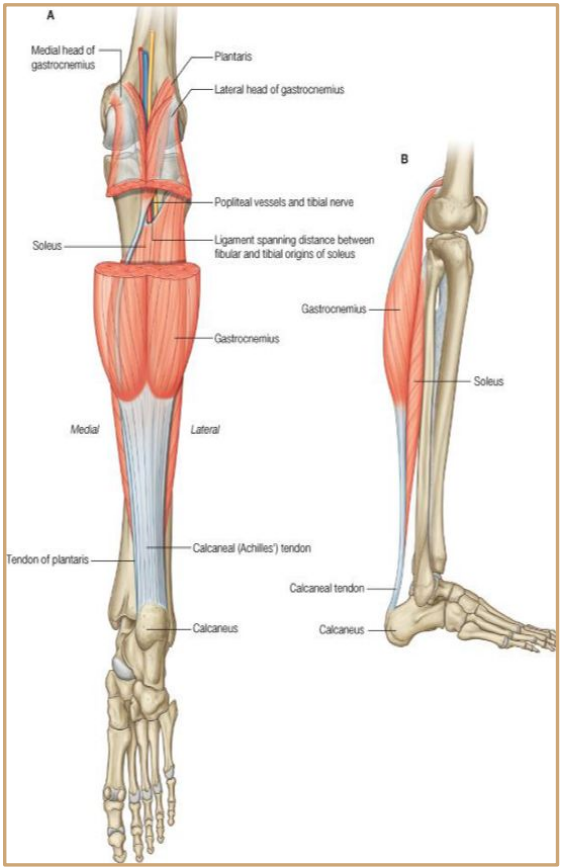
1- Muscles of posterior compartment of leg

Planter flexors of ankle, Flexors of toes.

2- Intrinsic muscles of sole

3- ONE Invertor of foot (tibialis posterior).

It is a tendon



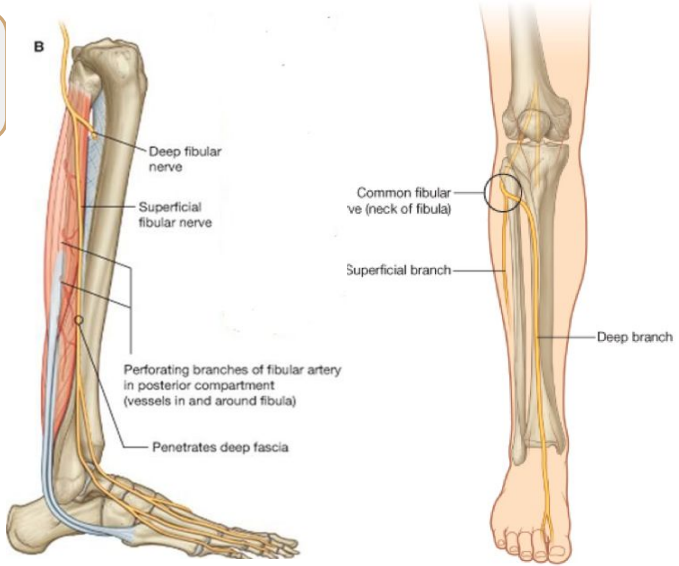
Common Peroneal (Fibular) Nerve

- Course:

Leaves the lateral angle of the popliteal fossa & turns around the lateral aspect of neck of fibula, (Dangerous Position)

➔ Then divides into :

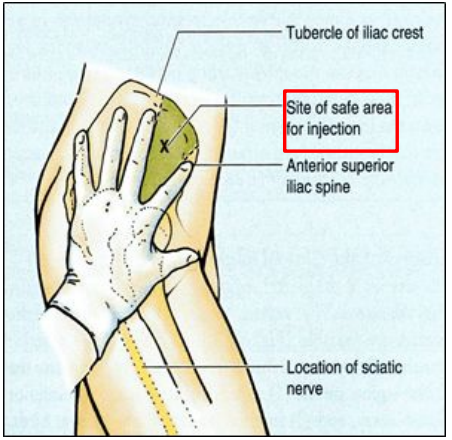
➢ **Superficial peroneal** or (Musculocutaneous) :
to supply the Lateral compartment of the leg.
➢ **Deep peroneal** or (Anterior Tibial):
to supply the Anterior compartment of the leg.



- Muscular Branches: (+ short head of biceps)

Muscles of anterior & lateral compartments of leg:
1. **Dorsi flexors of ankle**
2. **Extensors of toes,**
3. **Evertors of foot.**

Causes of Sciatic nerve injury



The sciatic nerve is most frequently injured by:

1- Badly placed intramuscular injections in the gluteal region. To avoid this, injections should be done into the gluteus maximus or medius (into the upper outer(lateral)quadrant of the buttock).

* Most nerve lesions are incomplete, and in 90% of injuries, the common peroneal (part of the nerve) is the most affected. **Because** The common peroneal nerve fibers lie superficial in the sciatic nerve.

2- Posterior dislocation of the hip joint. (في حوادث السيارات)

فتضغط عليه فيصير له Compression and injury Sciatic nerve إلى الخلف و وراها ال hip ترجع

Effects of Sciatic nerve injury

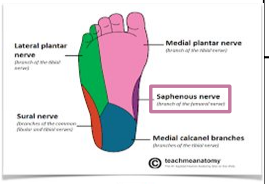
MOTOR EFFECT:

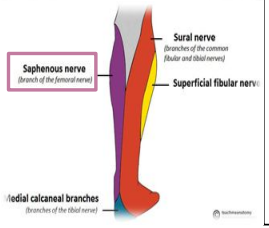
- Marked wasting (Atrophy) of the muscles below the knee.
- Weak flexion of the knee (sartorius & gracilis are intact).
- Weak extension of hip (gluteus maximus is intact).
- All the muscles below the knee are paralyzed, and the weight of the foot causes it to assume the plantar-flexed position, or **Foot Drop**.
- Stamping gait (high steppage gait). مثل تلزيق الطوابع يكون بسرعة

Videos from team 436: Stamping gait video Foot drop video

SENSORY EFFECT:

Sensation is lost below the knee, except for a narrow area down the medial side of the lower part of the leg (purple) and along the medial border of the foot as far as the ball of the big toe, which is supplied by the saphenous nerve (femoral nerve).





Team 436 notes:

لما نمشي الحركات اللي نسويها هي Dorsiflexion & plantarflexion و العضلات المسؤولة عن الحركتين تغذيها تفرعات من Sciatic nerve

فلما يصير لها إصابة ما تصير ولا حركة من الثنتين فإيش يصير بالرجل ؟ يصير للرجل drop بسبب الجاذبية

NS:

* Sartorius : Femoral nerve

*Gracilis : Obturator nerve

*gluteus maximus : Inferior gluteal nerve

Sciatica

Sciatica describes the condition in which patients have pain along the sensory distribution of the sciatic nerve. Only pain (no muscle loss)

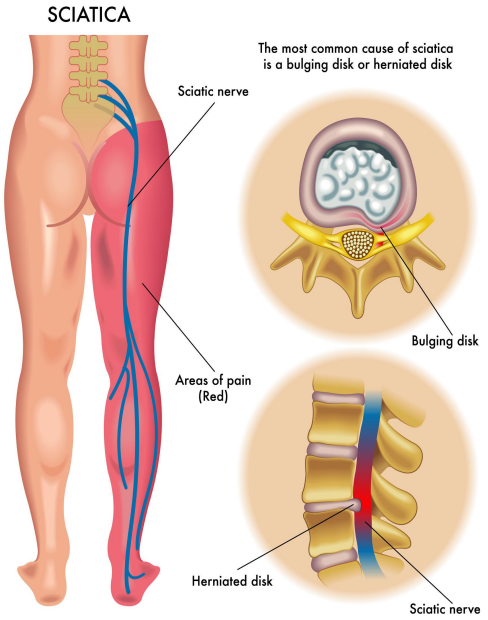
Thus the pain is experienced in the posterior aspect of the thigh, the posterior and lateral sides of the leg, and the lateral part of the foot

Causes of sciatica:

-Prolapse of an intervertebral disc, which pressure on one or more roots of the lower lumbar and sacral spinal nerves.

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

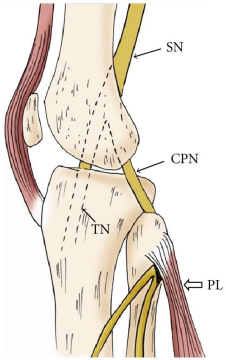
-Inflammation of the sciatic nerve or its terminal branches



Common Peroneal Nerve Injury

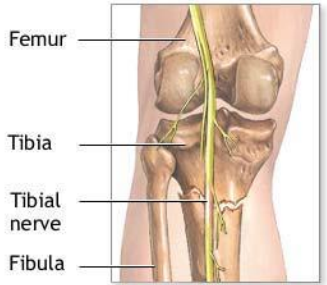
- The common peroneal nerve is in an exposed position as it leaves the popliteal fossa through its lateral angle .
- Then it winds around neck of the fibula to enter peroneus longus muscle, (Dangerous Position).

- commonly injured In Fractures of the neck of the fibula and By pressure from casts or splints.

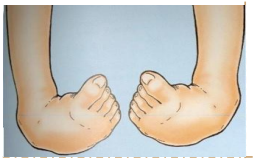
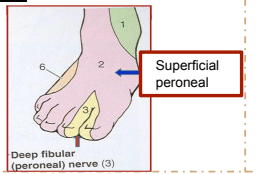
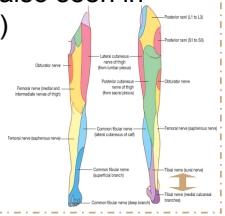


Tibial Nerve Injury

- Because of its deep and protected position, the tibial nerve is rarely injured.
- Complete division results in clinical feature, (mentioned in next slide).



Break in tibia causes damage to tibial nerve

Manifestations	Common Peroneal Nerve	Tibial Nerve
Motor	- The muscles of the anterior and lateral compartments of the leg are paralyzed. - 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. 	- All the muscles in the back of the leg, and the sole of the foot are paralyzed. - The opposing muscles dorsiflex the foot at ankle joint, and evert the foot at the subtalar joint. An attitude. referred to as Talipes Calcaneovalgus 
Sensory	- 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. 	- Sensation is lost: on the **lateral** side of the leg and foot and trophic ulcers of the sole. (also seen in case of sciatic nerve injury)  Zoom in to see 

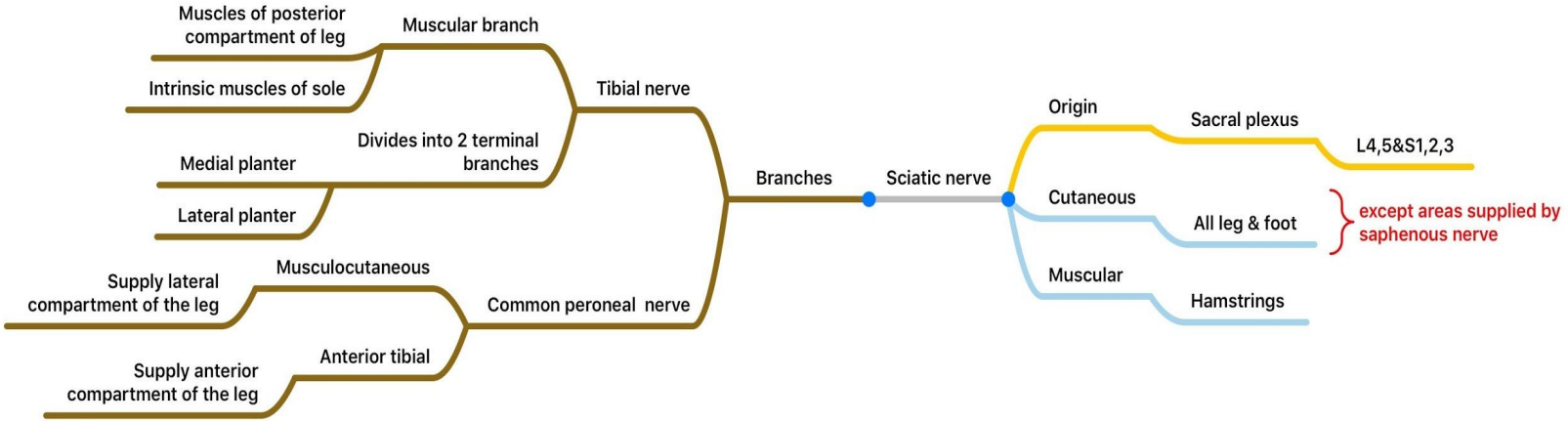
EFFECT OF SCIATIC NERVE INJURY Summary

	Paralysis	Movement affected
Motor effect	Hamstrings	Flexion of the knee & Extension of hip
	All muscles of leg and foot	All movements of leg and foot

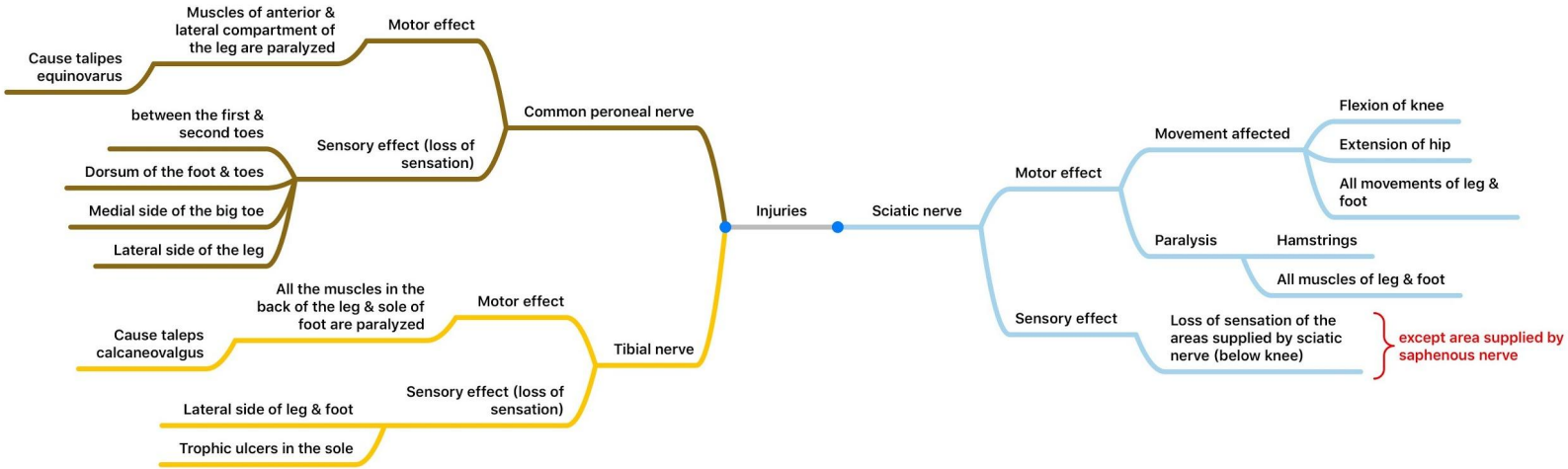
Sensory effect: Loss of sensation of the areas supplied by sciatic nerve (below knee).

EXCEPT area supplied by the (Saphenous nerve).

Summary


Sciatic nerve
Origin
Sacral plexus
L4,5&S1,2,3
Cutaneous
All leg & foot
except areas supplied by saphenous nerve
Muscular
Hamstrings
Branches
Tibial nerve
Muscular branch
Muscles of posterior compartment of leg
Intrinsic muscles of sole
Divides into 2 terminal branches
Medial planter
Lateral planter
Common peroneal nerve
Musculocutaneous
Supply lateral compartment of the leg
Anterior tibial
Supply anterior compartment of the leg

Summary


Injuries
Sciatic nerve
Motor effect
Movement affected
Flexion of knee
Extension of hip
All movements of leg & foot
Paralysis
Hamstrings
All muscles of leg & foot
Sensory effect
Loss of sensation of the areas supplied by sciatic nerve (below knee)
except area supplied by saphenous nerve
Common peroneal nerve
Motor effect
Muscles of anterior & lateral compartment of the leg are paralyzed
Cause talipes equinovarus
Sensory effect (loss of sensation)
between the first & second toes
Dorsum of the foot & toes
Medial side of the big toe
Lateral side of the leg
Tibial nerve
Motor effect
All the muscles in the back of the leg & sole of foot are paralyzed
Cause taleps calcaneovalgus
Sensory effect (loss of sensation)
Lateral side of leg & foot
Trophic ulcers in the sole

Questions

1. sciatic nerve leaves sacral plexus:
a) Through piriformis
b) Below piriformis
c) Above piriformis

2. Roots of sciatic nerve?
a) L4, L5, S1,S2
b) L4,S1,S2,S3
c) L4,S1,S2,S3,S4

3. Short head of biceps femoris innervated by:
a) saphenous nerve
b) Tibial nerve
c) lateral popliteal nerve

4. Common Peroneal Nerve turns around the:
a) Medial aspect of neck of fibula
b) Anterior aspect of neck of fibula
c) Lateral aspect of neck of fibula

5. Which of the following is true about the tibial nerve?
a) Passes superficial to flexor retinaculum to reach sole
b) At sole of foot it divides into 3 terminal branches
c) Innervates tibialis anterior

6. Name the most common causes of sciatic nerve injury

7. Give two causes of sciatica

8. Four motor effects of sciatic nerve injury

Answers: 1. B 2. B 3. C 4. C 5. C

6. Badly placed intramuscular injections in the gluteal region and Posterior dislocation of the hip joint
7. Prolapse of an intervertebral disc and Pressure on the sacral plexus or sciatic nerve by an intrapelvic tumor
8. Atrophy of the muscles below the knee, Foot Drop, stamping gait, weak extension of hip.

Team Members

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Ghada Almuhanna
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Khulood Alwehaibi
Layan Hassan Alwatban
Lojain Azizalrahman
Lujain Tariq AlZaid
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Abdulrahman Almotairi
Abdulelah Aldossari
Abdulrahman Alduhayyim
Hamdan Aldossari
Abdullah Alqarni
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Saud Alghufaily
Hassan Aloraini
Khalid Almutairi
Abdulmajeed
Alwardi
Abdulrahman Alageel
Rayyan Almousa
Sultan Alfuhaid
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Fayez Ghiyath
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Omar alyabis