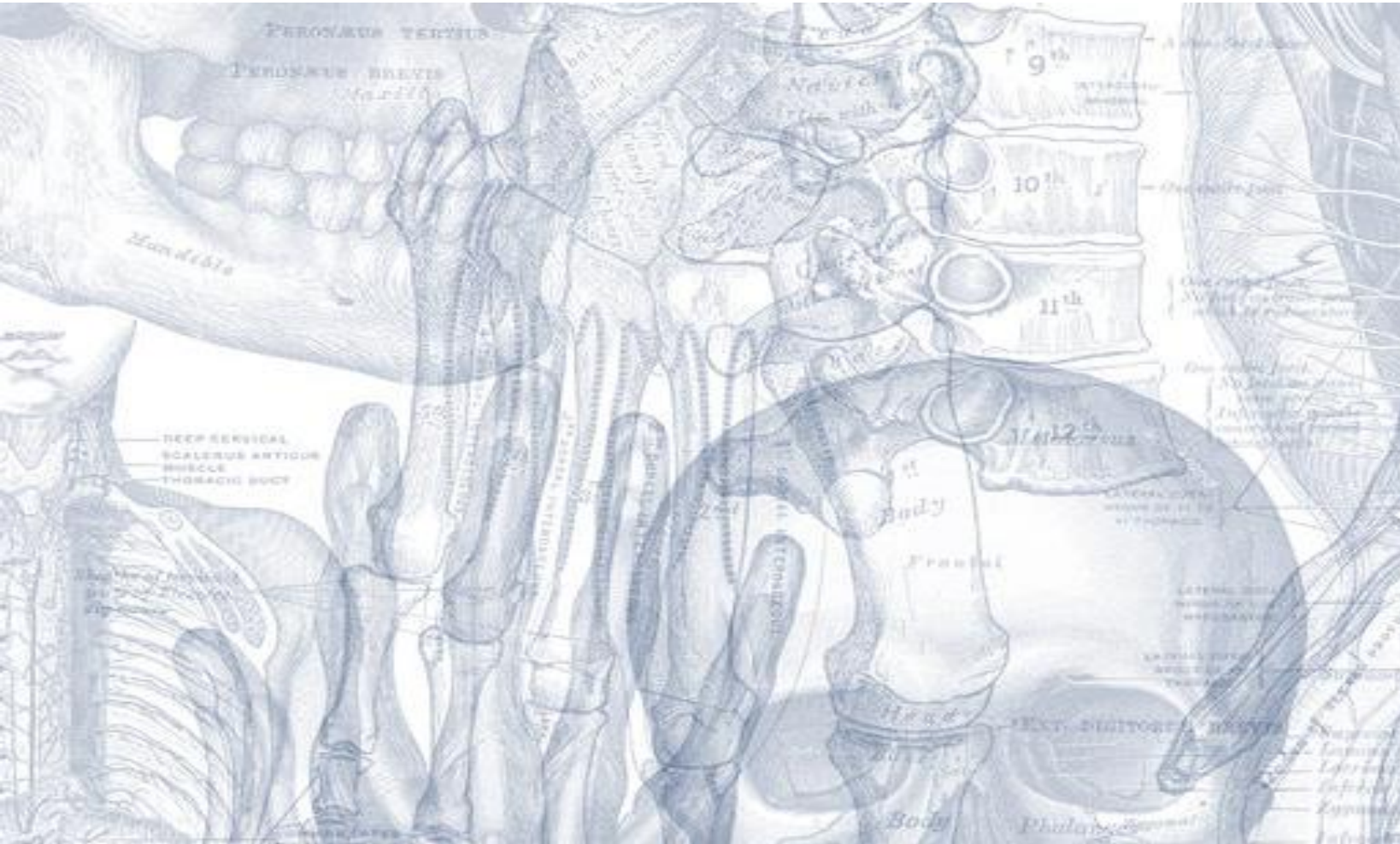


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MEDICINE
KING SAUD UNIVERSITY



Sciatic Nerve

[Editing File](#)

Color Code

- **Important**
- **Doctors Notes**
- **Notes/Extra explanation**

Objectives

- ✓ 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.

Sciatic nerve

- It is the **largest branch of the plexus** & the **largest nerve of the body**.

- **Origin :**

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

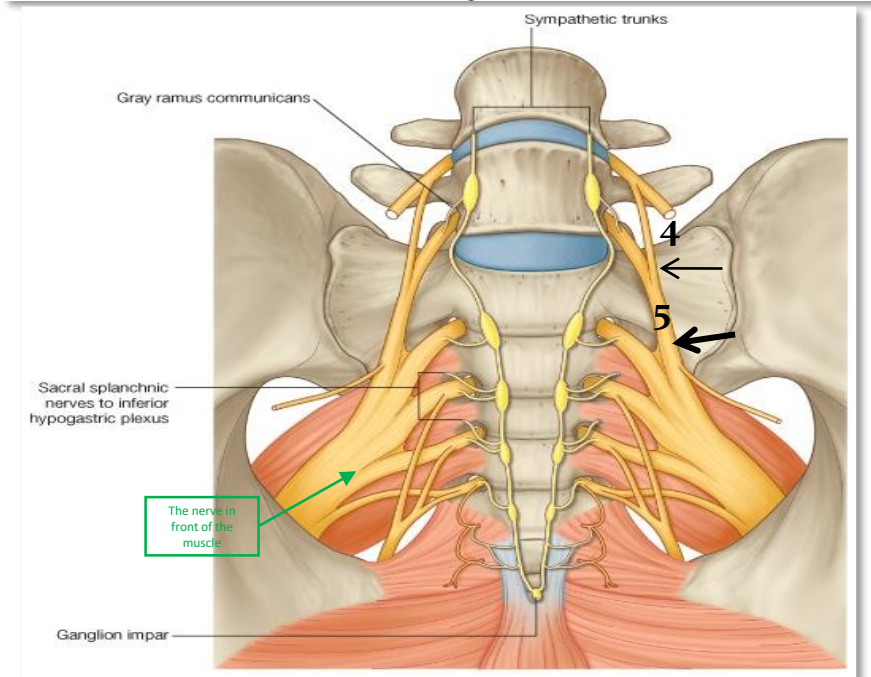
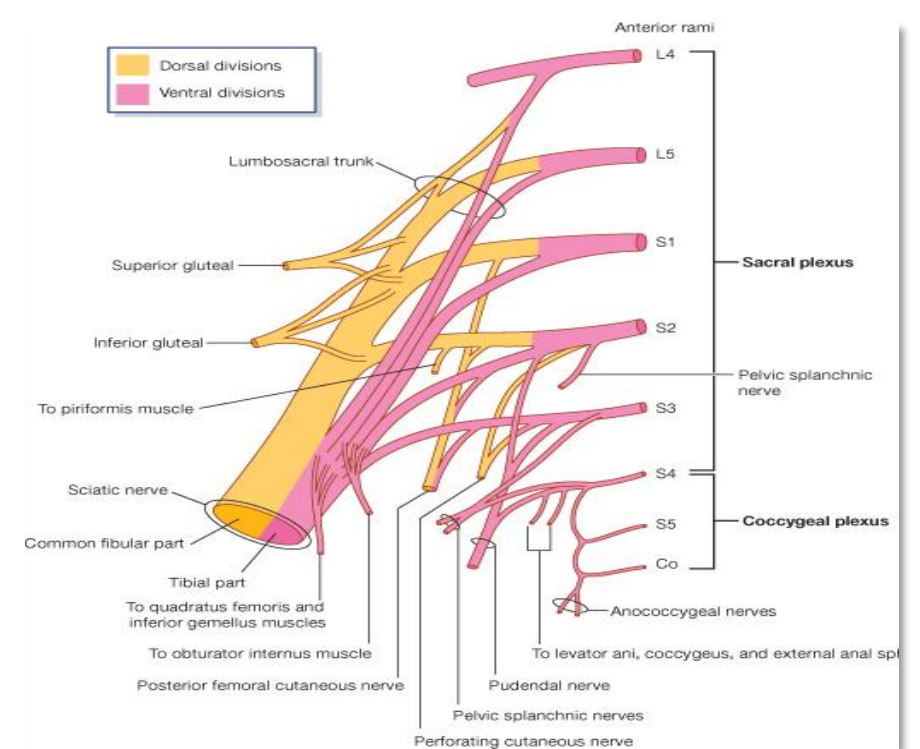
Sacral Plexus

- **Formation:**

Ventral (anterior)(**lower division**) rami of a part of L4 & whole L5 (**lumbosacral trunk**) + S1,2,3 and most of S4.

- **Site:**

On the posterior wall of the pelvis, In front of Piriformis muscle.



Course & Distribution

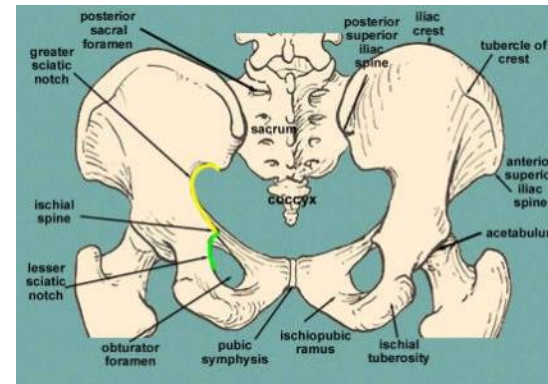
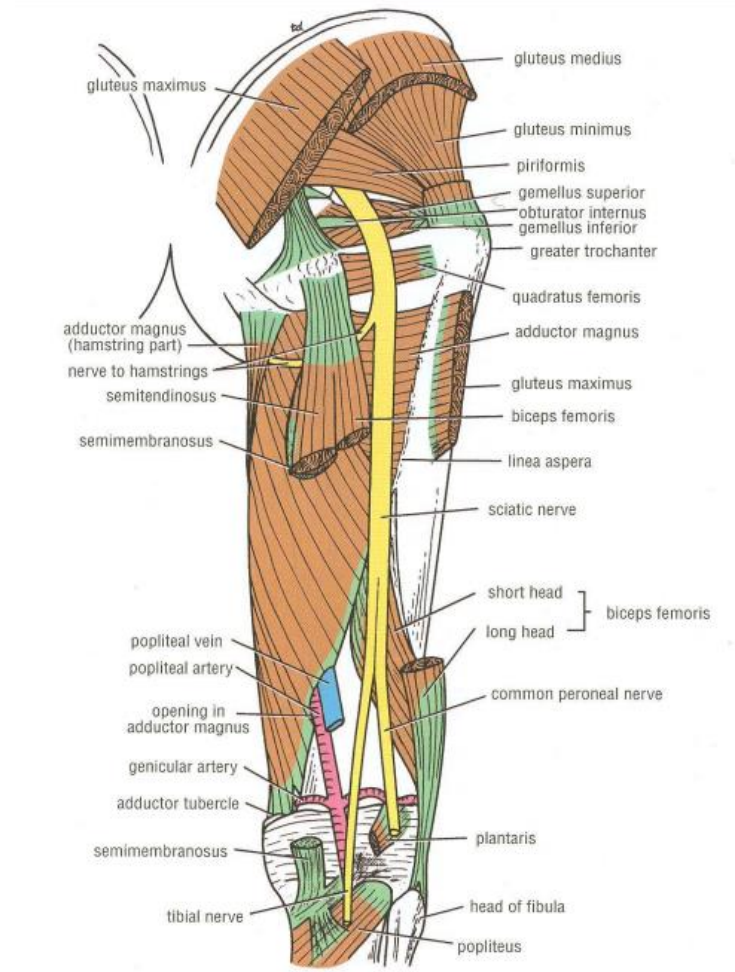
- It leaves the pelvis through **greater sciatic foramen**, **below the piriformis**
- then passes (**between 2 bones**) in the gluteal region (ischial tuberosity & greater trochanter)
- then to **posterior** compartment of thigh.

➤ Termination:

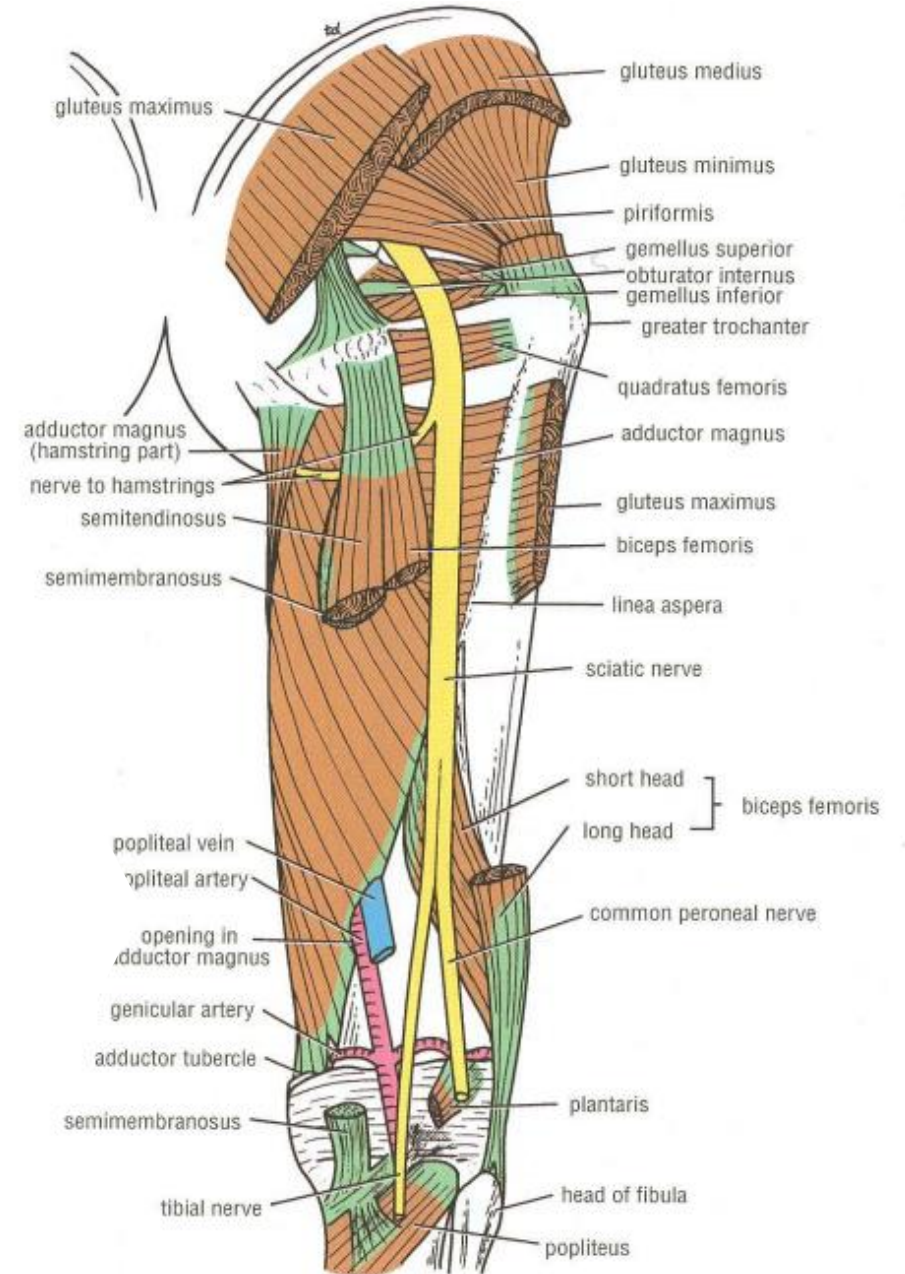
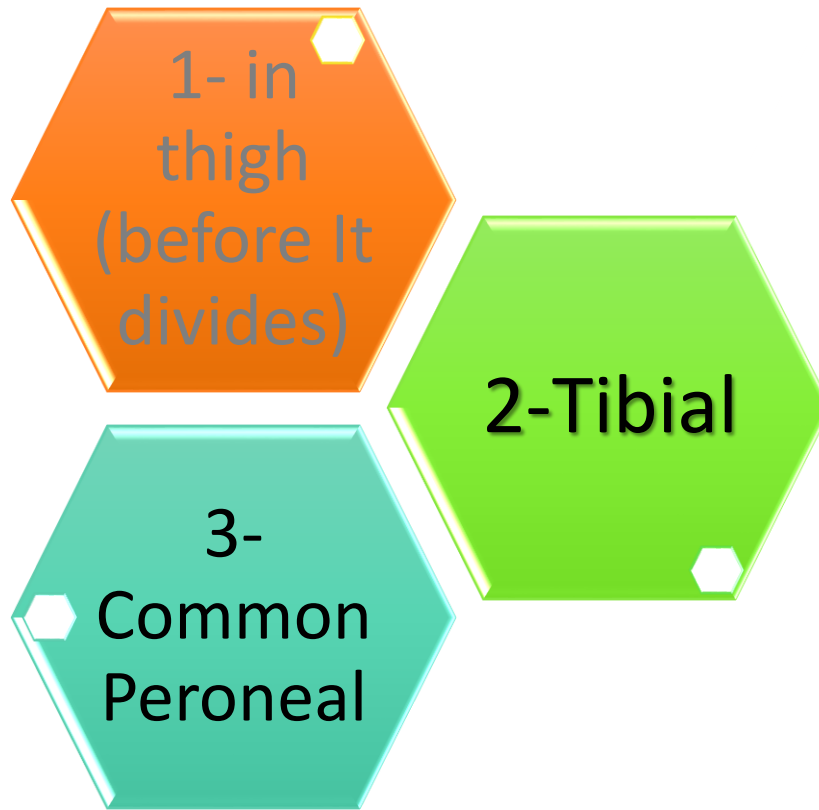
In the middle of the back of the thigh* It divides into 2 branches:

1. Tibial (medial popliteal) **enter the popliteal fossa**
2. Common Peroneal or lateral popliteal or (Fibular). **Outside popliteal fossa**

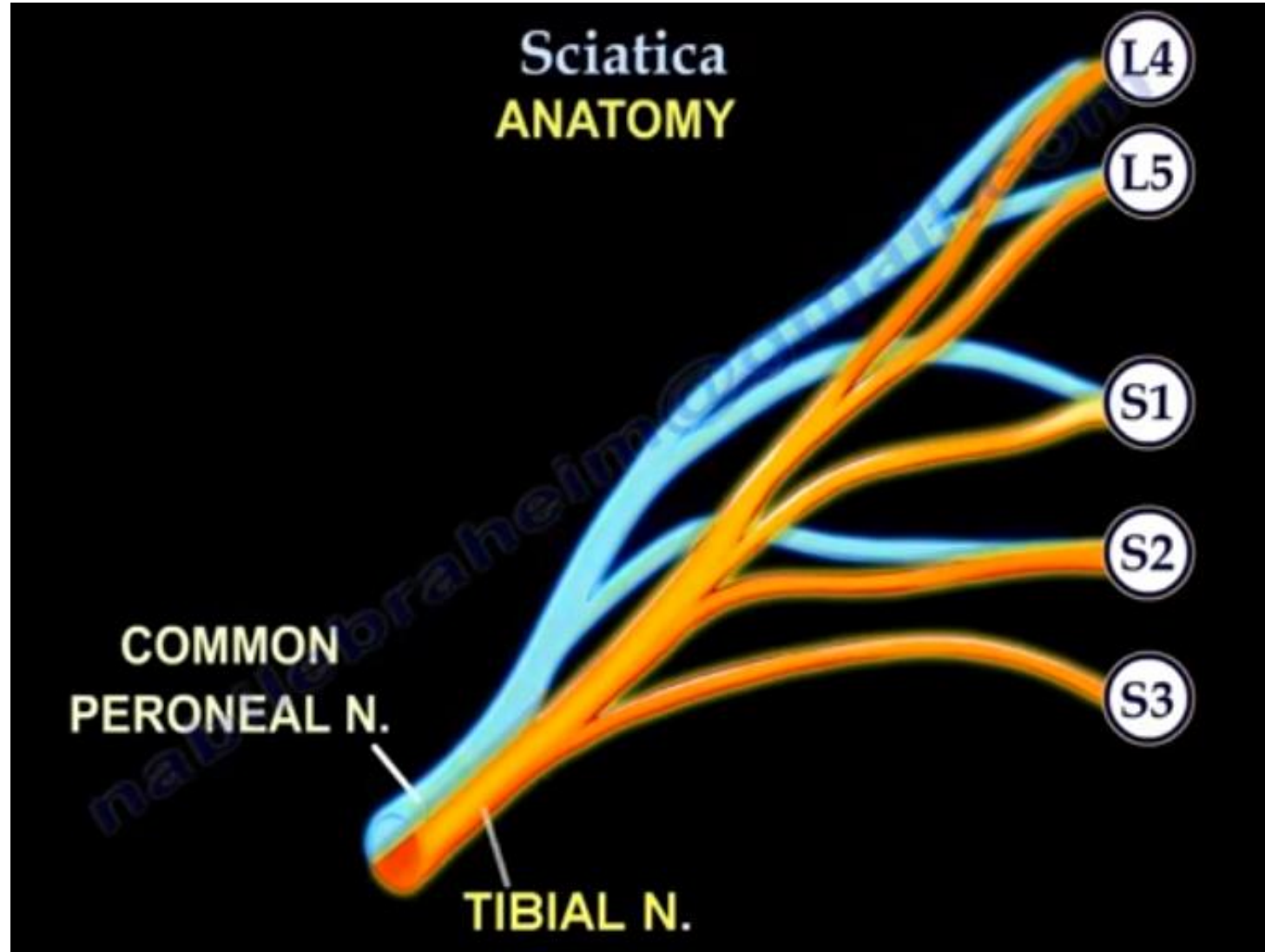
*يختلف مكان التفرع من شخص لآخر



Branches of Sciatic Nerve



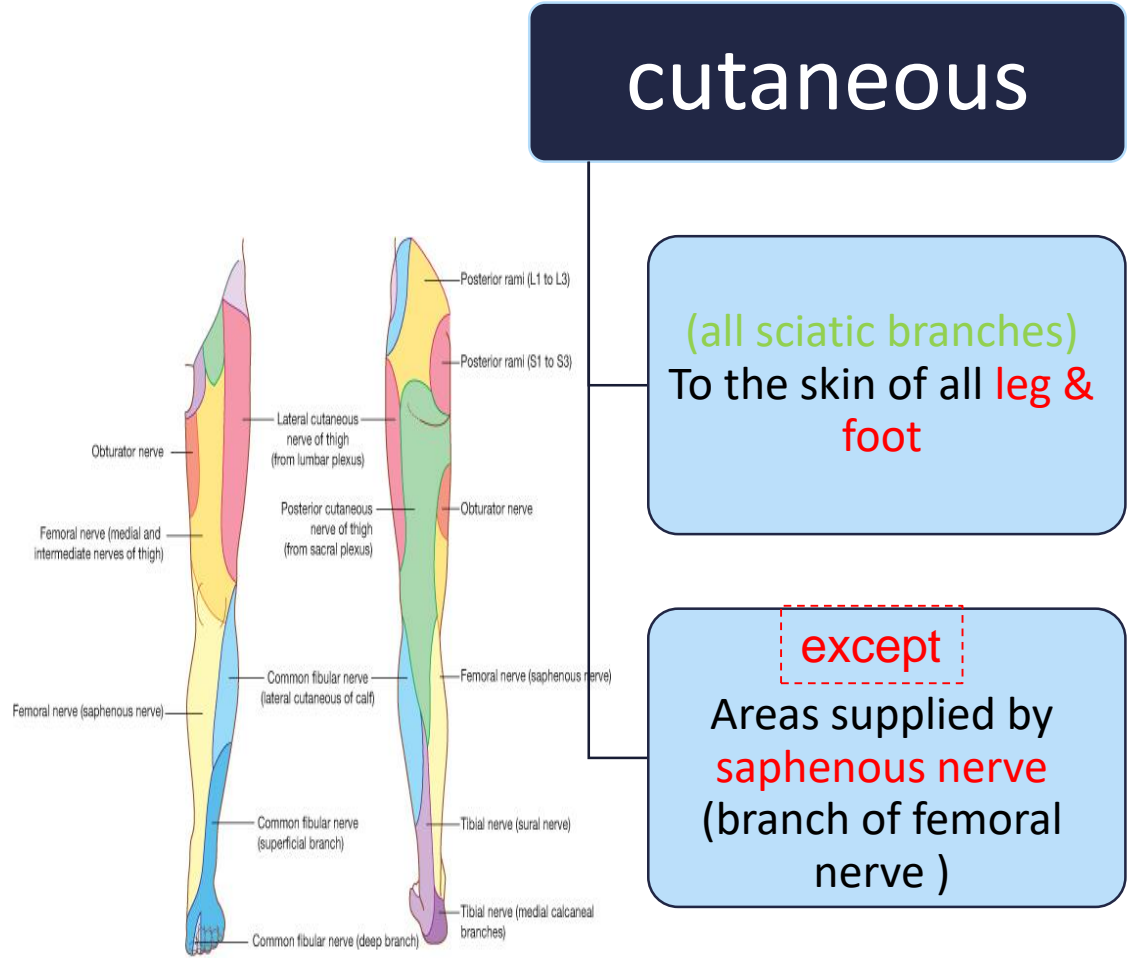
Extra:



في الشريحة القادمة لما نقول التيبال
بارت فاحنا نقصد هذا مو اذا تفرع
وصار مستقل ونفس الشيء للكومن
بيرونيل

Branches of Sciatic Nerve

1- in thigh (before It divides)



cutaneous

(all sciatic branches)
To the skin of all **leg & foot**

except
Areas supplied by **saphenous nerve** (branch of femoral nerve)

Muscular

To Hamstrings
(Flexors of knee & extensors of hip)

except
The **short head of biceps** receives its branch from lateral popliteal (**common peroneal part**)

(through **tibial** part) it gives:
 1- Hamstring(**Ischial**) part of Adductor Magnus
 2- Long head of Biceps Femoris
 3- Semitendinosus
 4- Semimembranosus

: الحفظ Hambi skies on the same sea

Branches of Sciatic Nerve

2- Tibial nerve

- Course: Bisect the popliteal fossa. **it is the most superficial structure in the popliteal fossa.** عشان كذا هي أكثر شيء ممكن ينقطع.

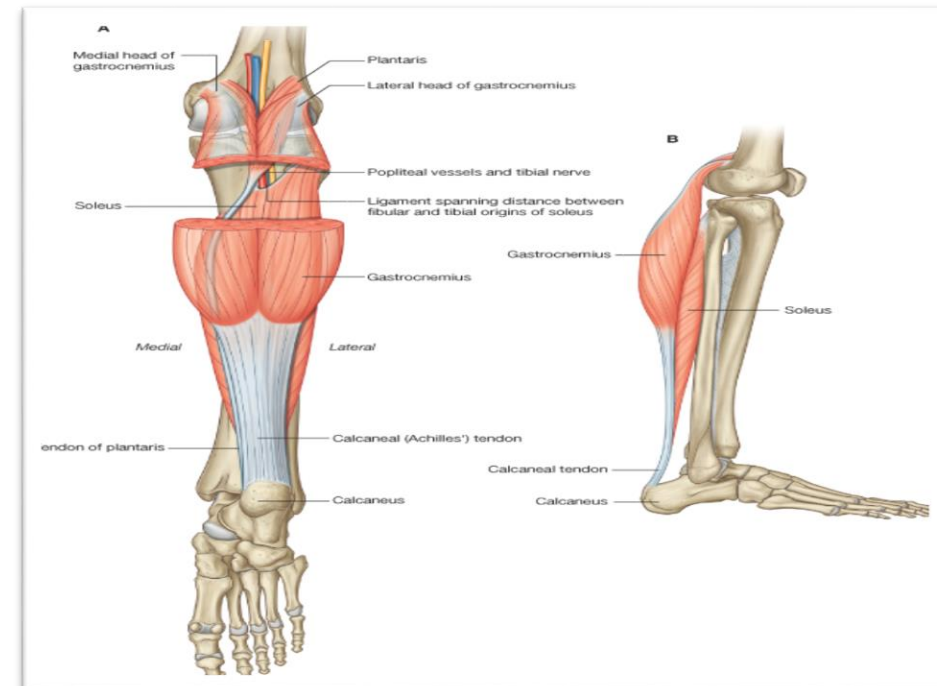
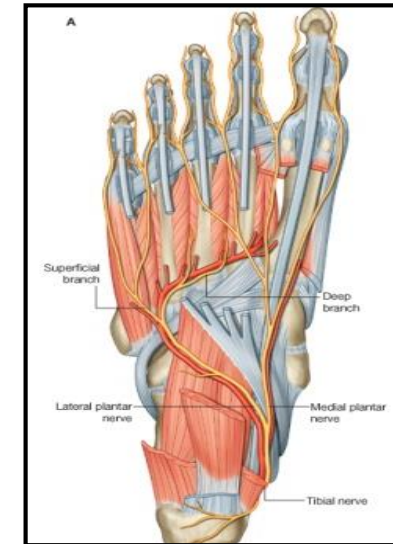
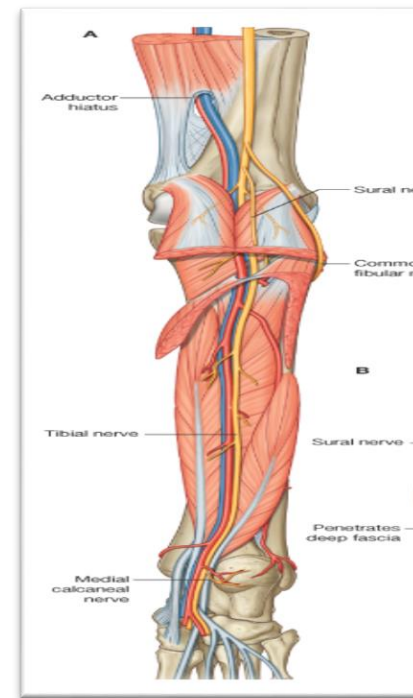
recall: ^while the deepest structure is the artery

- Descends through popliteal fossa to **posterior compartment** of leg, accompanied with **posterior tibial vessels**.
- 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**).
- **Muscular Branches: (in leg) + Hamstrings in thigh**

Muscles of **posterior compartment of leg**:

- 1- Planter flexors of ankle
- 2- Flexors of toes
- 3- ONE Invertor of foot (tibialis posterior).

+ All Intrinsic muscles of **sole**. (by medial & lateral branches)



Branches of Sciatic Nerve

3- Common Peroneal (Fibular) Nerve

➤ Course:

- Leaves the lateral angle of popliteal fossa & turns around the lateral aspect of **neck of fibula**, (**Dangerous Position**) لأن هذا المكان غير متغطى بعضلات!

- Then divides into:

1- **Superficial peroneal** or (*Musculocutaneous*) :

to supply the **Lateral** compartment of the leg.

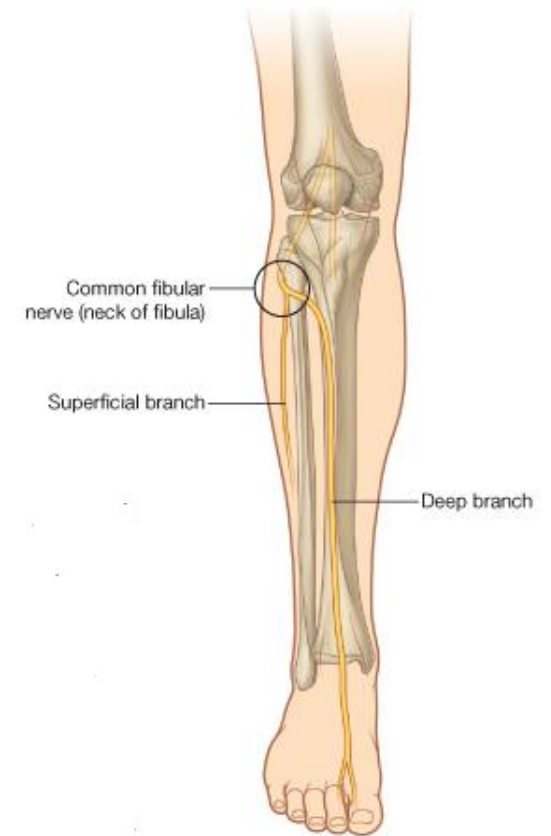
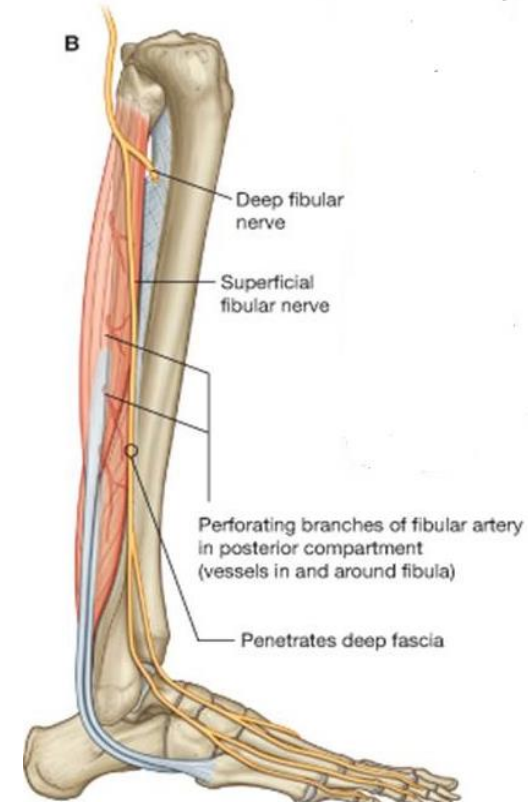
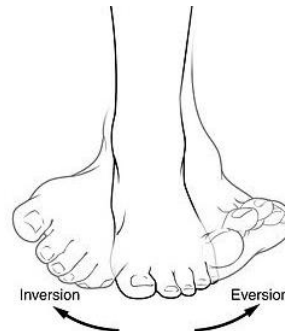
2- **Deep peroneal** or (*Anterior Tibial*):

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.



Sciatic Nerve Injury

-Causes

The sciatic nerve is 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)

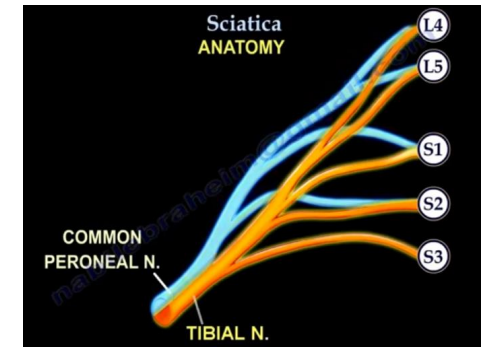
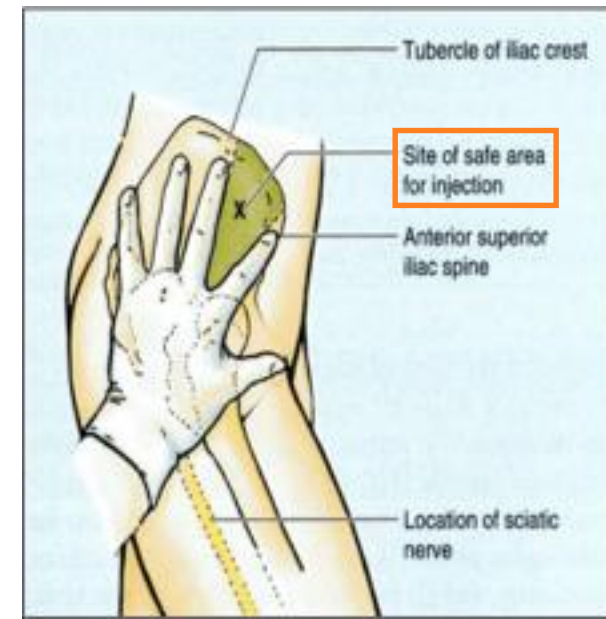
*Most nerve lesions are incomplete, in 90% of injuries, the common peroneal (part of the nerve) is the most affected.

Because: The common peroneal nerve fibers lie **superficial** in the sciatic nerve.

2-- Posterior **dislocation** of the hip joint

بسبب حادث سيارة مثلاً

Posterior = Head of femur يرجع للخلف
فيضغط على الشيء اللي موجود خلفه اللي هو
sciatic nerve !



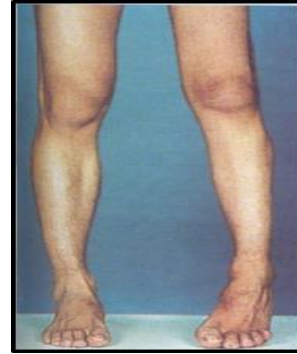
Sciatic Nerve Injury -Effects

Dorsiflexion & plantarflexion لما نمشي الحركات اللي نسويها هي العضلات المسؤولة عن هذه الحركتين تغذيها تفرعات من sciatic nerve فلما يصير لها انجري ما تصير ولا حركة من التنتين فايش يصير بالرجل؟ يصير لها drop بسبب الجاذبية

NS:
Sartorius : Femoral nerve
Gracilis : Obturator nerve
gluteus maximus : Inferior gluteal nerve

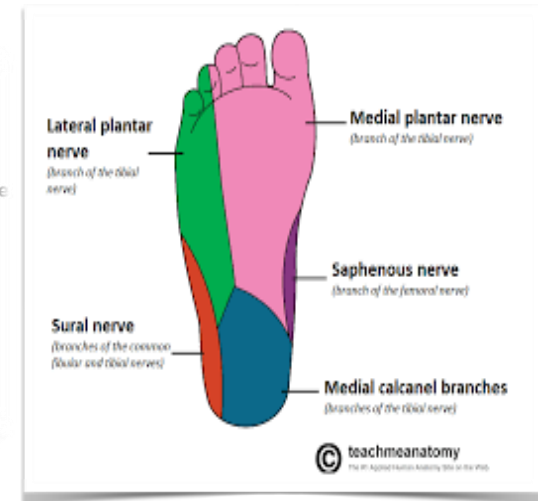
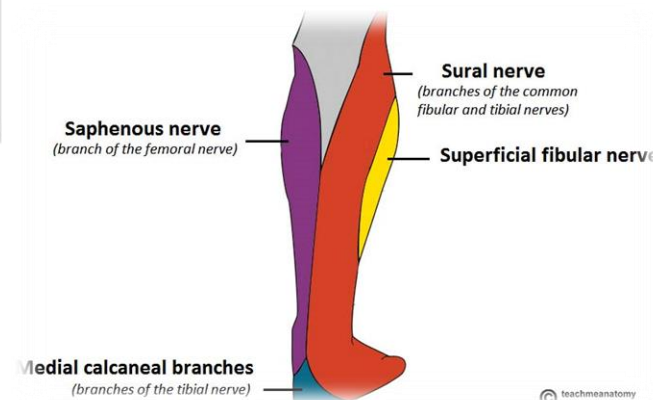
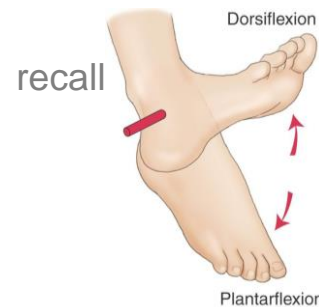
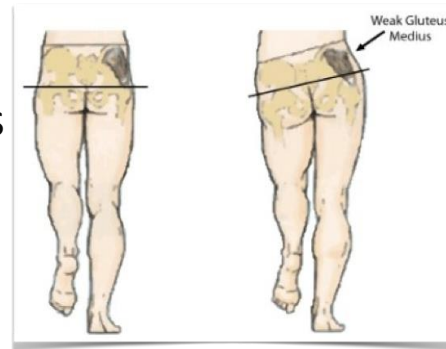
Motor :

- **Weak flexion of the knee** (*sartorius & gracilis are intact*).
- **Weak extension of hip** (*gluteus maximus is intact*).
- Marked **wasting (atrophy)** of the muscles **below the knee**.
- 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



Sensory :

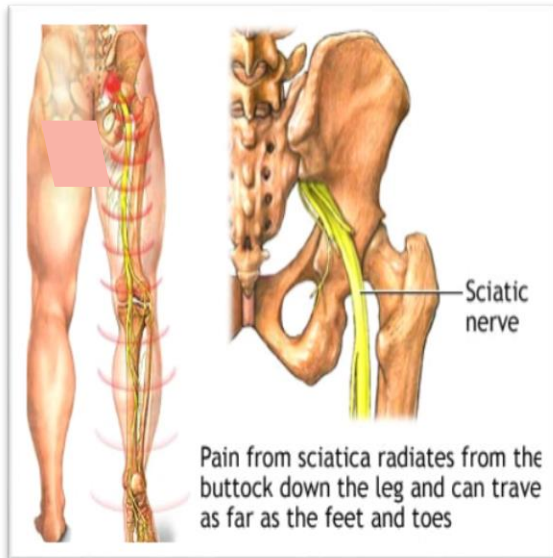
- Sensation is lost **below the knee**, except for a narrow area down the medial side of the lower part of the leg (**purple**) and along the medial border of the foot as far as the ball of the big toe, which is supplied by the saphenous nerve (branch of femoral nerve).



Sciatica

عرق النسا

- Sciatica describes the condition in which patients have pain along the sensory distribution of the sciatic nerve. فقط ألم العضلات تشغل تمام
- Thus the pain is experienced in:
 - 1-the posterior aspect of the thigh
 - 2-the posterior and lateral sides of the leg
 - 3-and the lateral part of the foot.



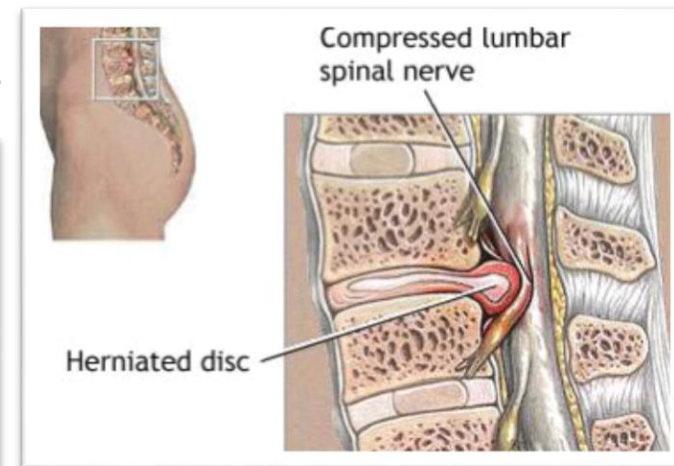
Vitamin B12 also promotes the regeneration and growth of nerve cells. Neuropathy, such as sciatic nerve pain, numbness or tingling, in some cases has been found to be caused and made worse by deficiencies of vitamin B12 in the body

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.



Treatment is according to the Cause.



Common Peroneal Nerve Injury: Causes

أكثر عرضة للإصابة من التيبيل

- The **common peroneal nerve** is in an ***exposed position*** as it leaves the popliteal fossa it **winds around neck of the fibula** to enter peroneus longus muscle, (**Dangerous Position**).
- The common peroneal nerve is commonly injured
 - 1- In **Fractures** of the neck of the fibula and
 - 2- By **pressure** from casts or splints.

جبس أو جبيرة



Common Peroneal Nerve Injury: Manifestations

1- Motor:

Dorsiflexion eversion

- The muscles of the anterior and lateral compartments of the leg are **paralyzed**,
- As a result, the opposing muscles (in the posterior compartment of the leg), the plantar flexors of the ankle joint & the invertors of the subtalar joints, cause the foot to be Plantar Flexed (**Foot Drop**) and Inverted, an attitude referred to as **Equinovarus**. if it is from birth it called **Talipes***
- Equinovarus** (تبقى كذا للأبد) & if it is from injury it called **Paralytic equinovarus** (تأخذ وقت على ما تتصلح)

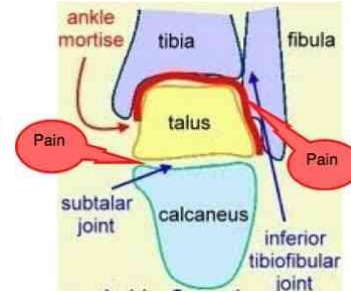
الإعاقة التي تتبع الإصابة لهذا العصب تكون بسبب ضعف العضلات التي يغذيها "anterior and lateral compartment" ولأن العضلات الخلفية ماتت وتشتغل لأن يتم تغذيتها من "Tibial nerve"

2- Sensory: على حسب البرانش التي تكون فيه الإصابة , إذا كل الاثنين فكل الأربعة التالية:

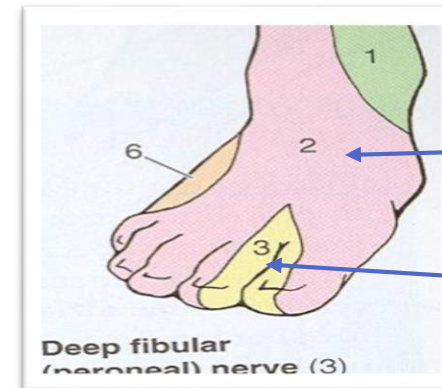
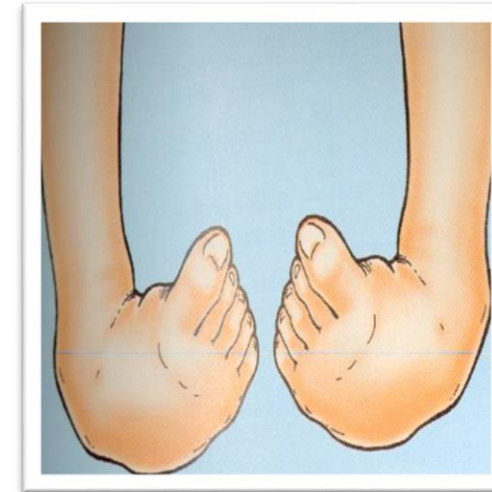
- Sensation is lost between the first and second toes. (**deep peroneal**)
- Dorsum of the foot and toes. (**Superficial peroneal**)
- Medial side of the big toe. (**Superficial peroneal**)
- Lateral side of the leg. (**Superficial peroneal**)

*Talipes = قدم مشوهة خلقة

ankle joint & subtalar joints



Equinovarus.



Superficial peroneal
Musculocutaneous

deep peroneal
Anterior Tibial

Deep fibular (peroneal) nerve (3)

Tibial Nerve Injury

- Because of its **deep** and protected position, the tibial nerve is **rarely injured**.
- Complete division results in the following clinical features:

1-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 **Calcaneovalgus**.

If congenital : **Taleps Calcaneovalgus**

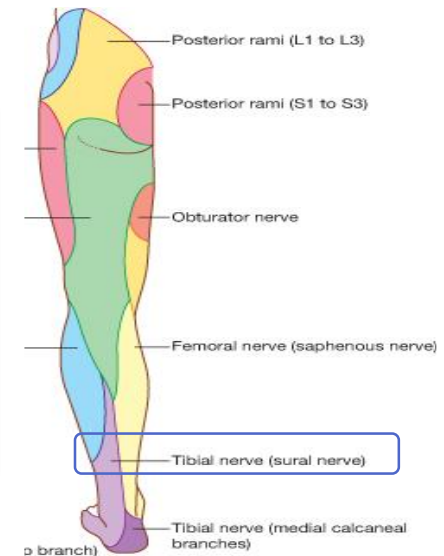
If acquired : **paralytic Calcaneovalgus**

Note: it is the opposite of foot drop

2-Sensory:

- Sensation is lost in the sole & on the Lateral side of the leg and foot
- **Trophic ulcers** in the sole. لأنه يمشي وما يحس باللي تحت فممکن تصير له إصابات ما يدري عنها

(also seen in case of **Sciatic nerve injury**)



Summary

- Origin of SCIATIC NERVE: from the sacral plexus (L4,L5, S1, S2,S3).
- **Effect of sciatic nerve injury:**

MOTOR EFFECT

Paralysis of :

1- Hamstrings

2- All muscles of Leg & Foot

Movements affected :

Flexion of knee

Extension of hip

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).

Summary

Equinovarus

Common Peroneal Nerve Injury

-The muscles of the anterior and lateral compartments of the leg are paralyzed

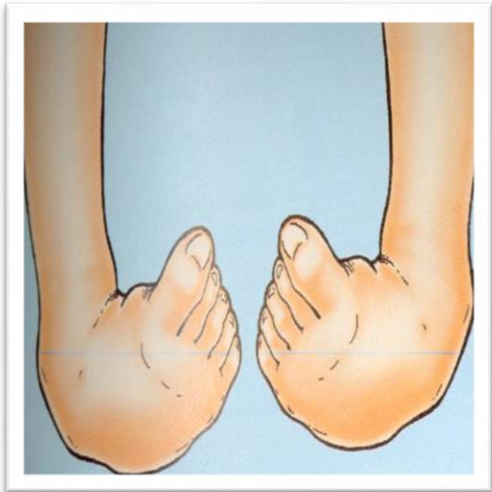
plantar flexors of the ankle joint
&
the invertors of the subtalar joints

Calcaneovalgus

Tibial Nerve Injury

The muscles of the posterior compartments of the leg and the sole are paralyzed

Dorsiflex the foot at the ankle joint
&
Evert the foot at the subtalar joint



{
If congenital : Taleps
If acquired : paralytic
}



Quiz

1: Which of the following nerve is the largest nerve of the body?

- A) Radial nerve.
- B) Ulnar nerve.
- C) Sciatic nerve.
- D) Peroneal nerve.

2: The site of sacral plexus:

- A) On the anterior wall of the pelvis, in front of piriformis muscle.
- B) On the posterior wall of the pelvis, in the back of piriformis muscle.
- C) On the posterior wall of the pelvis, in front of piriformis muscle.
- D) On the anterior wall of the pelvis, in the back of piriformis muscle.

3: Which one of these muscles is supplied by common peroneal nerve?

- A) Long head of biceps.
- B) Short head of biceps.
- C) Hamstring.
- D) Semitendinous.

4: 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

Quiz

5:When all muscles below the knee are paralyzed, the weight of the foot causes it to assume the:

- A)Plantar position.
- B)Foot drop.
- C)Stamping gait.
- D)All of the above.

6:In the tibial nerve's course, it descends through popliteal fossa to the:

- A)Anterior compartment of the leg.
- B)Posterior compartment of the leg.
- C)Posterior compartment of thigh.
- D)Anterior compartment of the thigh.

7:Muscles of posterior compartment of the leg: planter flexors of ankle, flexors of toes and one invertor of foot:

- A)Tibialis posterior.
- B)Peroneus teritus.
- C)Plantaris
- D)Calf muscle.

8:Which muscle of these is not one of the anterior and lateral compartments of leg?

- A)Dorsi flexors of ankle.
- B)Planter flexors of ankle.
- C)Evertors of foot.
- D)Extensors of toes.

5)D 6)B 7)A 8)B

