Anatomy
434

Sciatic Nerve

Anatomy Team 434

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- Important Points
- Helping notes
- Explanation

If you have any complaint or suggestion please don't hesitate to contact us on:
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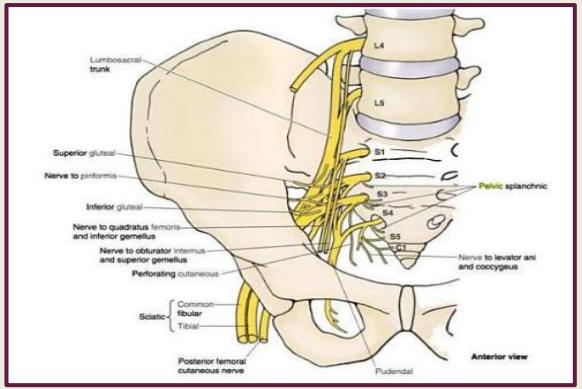
OBJECTIVES

- 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.

Origin

- From Sacral the Plexus, (L4,5, S1, 2,3).
- It is the largest branch of the sacral plexus & the largest nerve



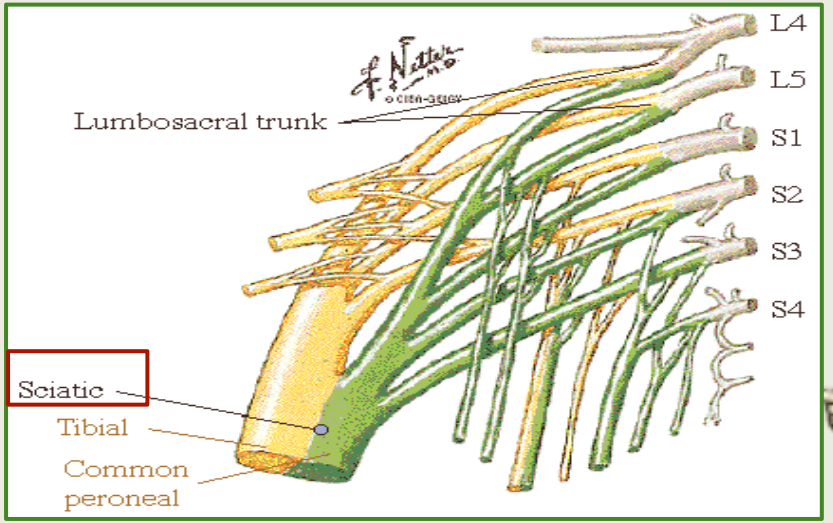
sacral plexus ;

Formation:

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

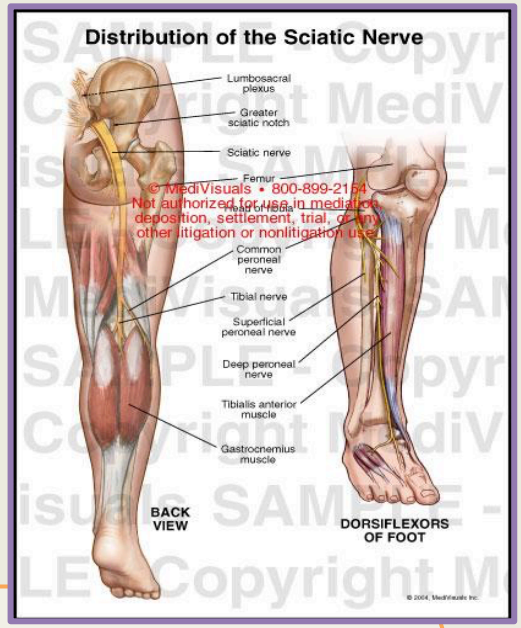
Site:

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 & 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 & Common Peroneal (Fibular).

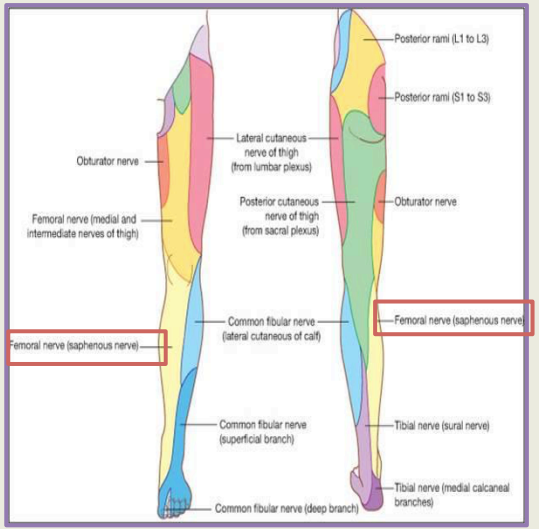
Notes:

- The sciatic nerve supplies all lower limbs areas except for those supplied by the saphenous nerve
- The sciatic nerve usually branches to tibial and fibula nerves at the middle back of the thigh, but sometimes it might branch near the hip and the tibial nerve will take the sciatic nerve jorney to the popliteal fossa .

Branches of Sciatic Nerve

1. Cutaneous:

To all leg & foot EXCEPT: Areas supplied by the saphenous nerve (branch of femoral nerve).
(base of big toe+medial part of leg are supplied by saphenous nerve which is a branch of femoral nerve) .



2. Muscular:

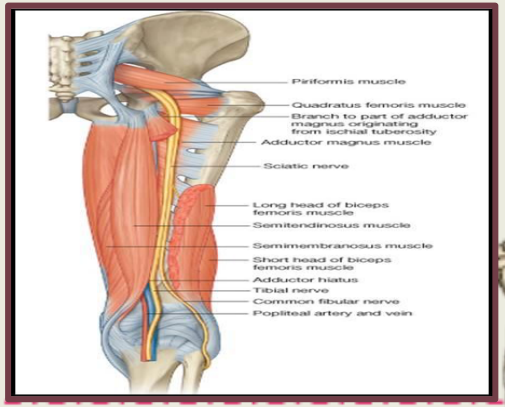
- To Hamstrings: (flexors of knee & extensors of the hip).

(through tibial part) to:

1-Hamstring part of Adductor Magnus (hamstring muscles(called ham (خنزيرية))because they are fleshy) ..

2-Long head of Biceps Femoris, 3-semitendinosus , 4-Semimembranosus.

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



Tibial Nerve

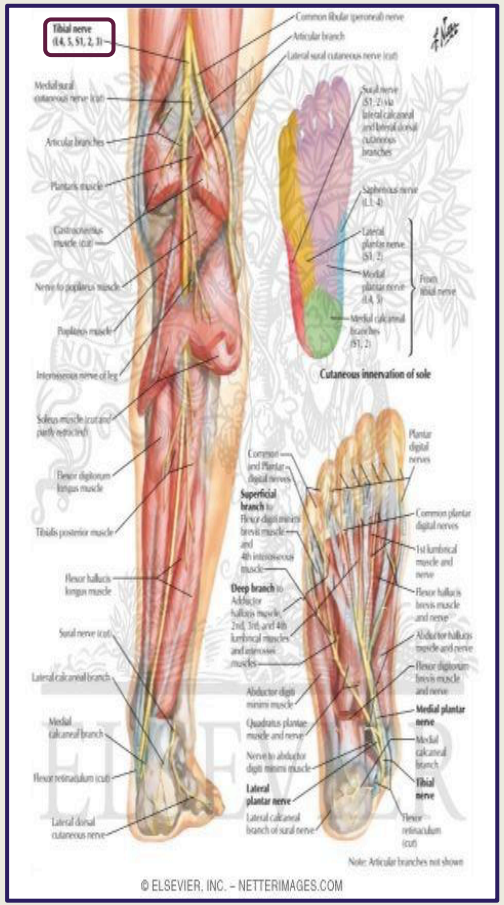
Muscular Branches

the tibial nerve is the largest branch of the sciatic nerve and the most superficial in the popliteal fossa .

course :

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)** .

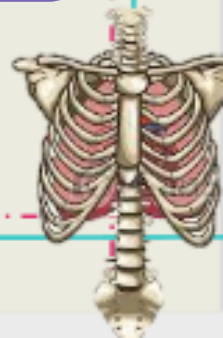


1.**Muscles of posterior compartment of leg:** Planter flexors of ankle, Flexors of toes

ONE Invertor of foot (tibialis posterior).

2. Intrinsic muscles of sole

muscles of the back of leg cause plantar flexion.



tibial nerve supplies muscles of posterior compartment of leg + intrinsic muscles of sole.

- **The tibial nerve cuts through the popliteal fossa from superior to inferior**

Common Peroneal (Fibular) Nerve

Muscular Branches

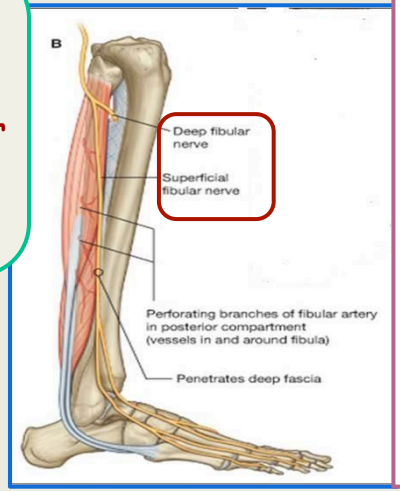
Course:

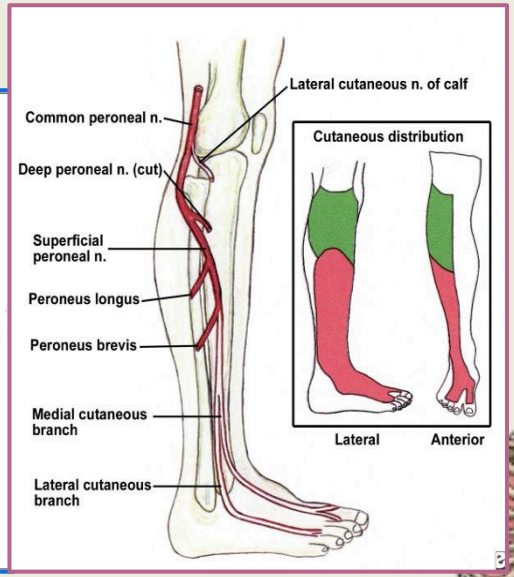
Leaves popliteal fossa & turns around the lateral aspect of neck of fibula, (Dangerous Position). which makes it exposed to direct damage . Then divides into:

- 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.

Muscles of anterior & lateral compartments of leg:

- Dorsi flexors of ankle
- Evertors of foot.
- Extensors of toes





the common peroneal nerve goes through the popliteal fossa from superior to lateral , and there it goes around the neck of the fibula laterally .

CAUSES OF SCIATIC NERVE INJURY

The sciatic nerve is most frequently injured by:-

I- 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 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. Why?

- because The common peroneal nerve fibers lie superficial in the sciatic nerve

II-Posterior dislocation of the hip joint.

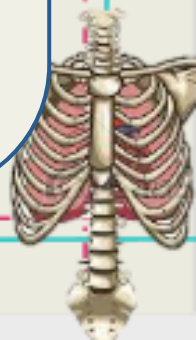
Sometimes when the sciatic is injured while (IM) injections the common peroneal nerve is affected; because before the sciatic nerve branches it appears in two layers. The outer layer is the origin for the common peroneal nerve and the inner layer is for the tibial nerve

EFFECTS OF SCIATIC NERVE INJURY

motor effects :

- Marked wasting 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.
- (High Steppage Gait)

ننزلها (plantar flexion and dorsi flexion) patient who has sciatic nerve injury all the time plantar flexion . لا يجي ينزل المريض رجله تنزل بسرعة فتخبط بالارض بقوة بسبب الجاذبية"مثل لصق الطوابع " لأنه مو حاسس بالعضلات



plantar flexion position is under gravity effect.
vit B deficiency can cause inflammation of sciatic nerve.

EFFECT OF SCIATIC NERVE INJURY

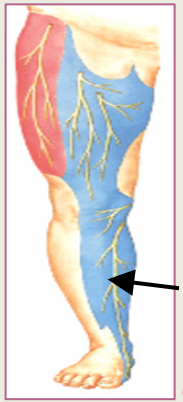
<u>sensory effect</u>

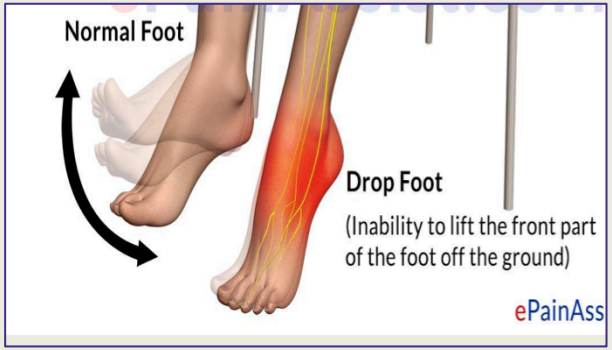
Sensation is lost below the knee.

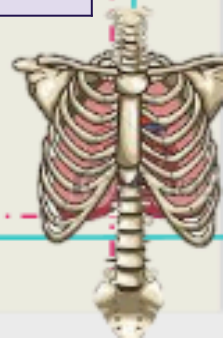
Except for:- (supplied by the saphenous nerve), femoral nerve .

- narrow area down the medial side of the lower part of the leg
- along the medial border of the foot as far as the ball of the big toe.
- Trophic ulcers in the sole.

	Paralysis	Movements affected
motor effect	Hamstrings , All muscles of Leg & Foot	Flexion of knee , Extension of hip & All movements of the <u>leg & Foot</u>
SENSORY EFFECT	Loss of sensation of the areas supplied by sciatic nerve (below knee).	EXCEPT area supplied by the (Saphenous nerve).







SCIATICA (عرق النَّسَا)

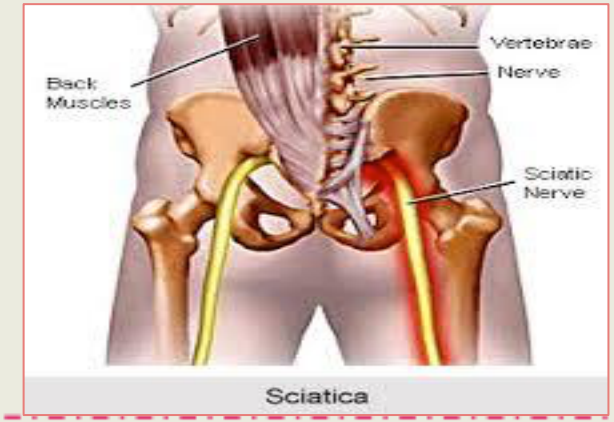
Causes of Sciatica

Sciatica describes the condition in which patients have pain along the sensory distribution of the sciatic nerve.

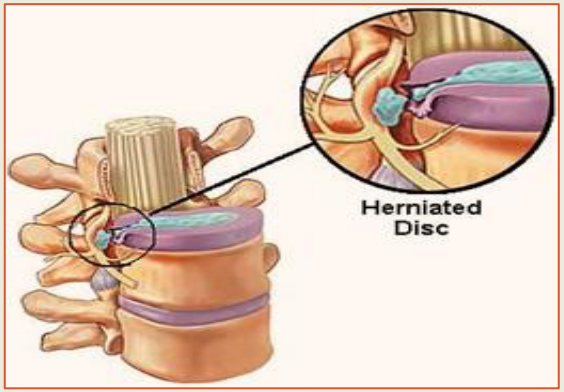
Thus the pain is experienced in the posterior aspect of the thigh, the posterior and lateral sides of the leg, and the lateral part of the foot.

Causes of Sciatica :

- Prolapse of an intervertebral disc, with 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.



Sciatica

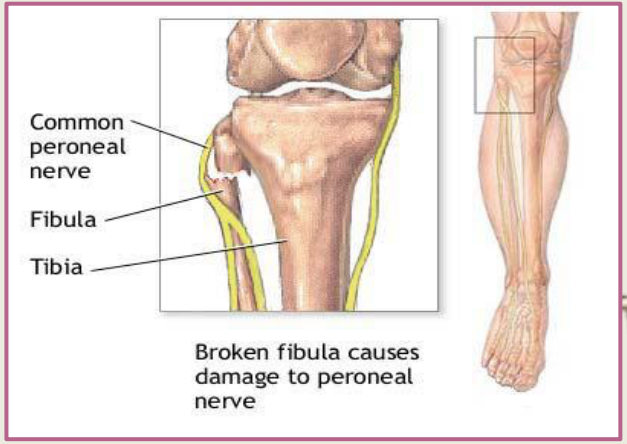


Common Peroneal Nerve Injury

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 in:

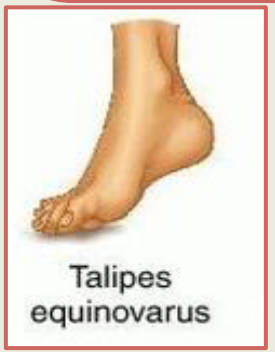
- Fractures of the neck of the fibula
- pressure from casts or splints.



Manifestations of Common Peroneal Nerve Injury

Motor:

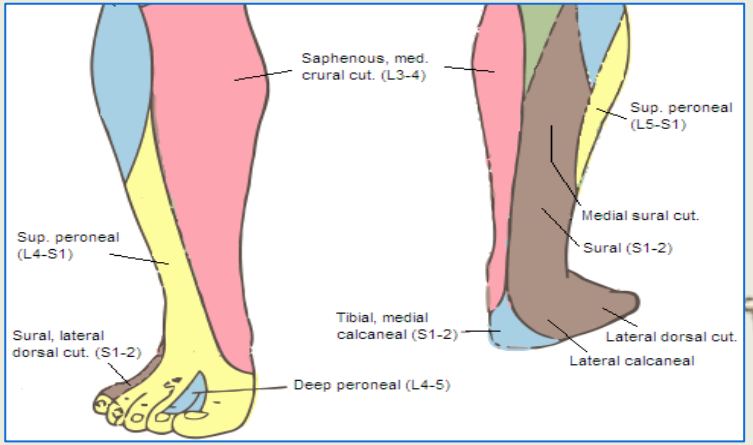
- The muscles of the anterior and lateral compartments of the leg are paralyzed.
  - result, the opposing muscles, the plantar flexors of the ankle joint and the invertors of the subtalar joints, cause the foot to be Plantar Flexed (Foot Drop) and Inverted, an attitude referred to as Talipes Equinovarus.



Sensory

Sensation is lost in:

- The space between the first and second toes. (supplied by deep fibular nerve)
- Dorsum of the foot and toes.
- Medial side of the big toe.
- Lateral side of the leg.



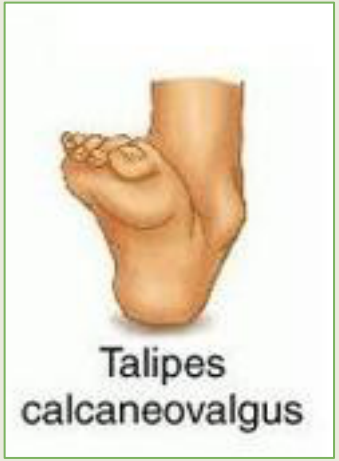
Tibial Nerve Injury

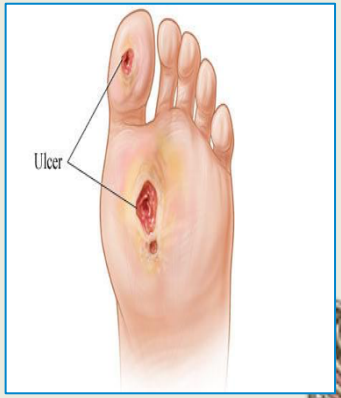
Because of its deep and protected position, the tibial nerve is rarely injured.
Complete division results in the following clinical features :

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 Taleps Calcaneovalgus.

Sensory

Sensation is lost on:
- the Lateral side of the (lower)leg and foot
- Trophic ulcers in the sole.(seen in Sciatic nerve injury).





MCQ

Q1: Sciatic nerve is formed by:

A. sacral plexus L4,5,S1,2,3
B. sacral plexus L3,4,5,S1,2
C. sacral plexus L4,5,S1,2,3,4
D. brachial plexus c5,6,7,8 T1

Q2: Sciatic nerve leaves the pelvis through:

A. above the piriformis
B. lesser sciatic foramen
C. greater sciatic foramen
D. transverse foramen

Q3: in the middle of the thigh sciatic nerve divides into:

A. 5 branches
B. 3 branches
C. 4 branches
D. 2 branches

Q4: the common peroneal gives branch to:

A. long head of biceps femoris
B. short head of biceps femoris
C. semitendinosus
D. semimembranosus

Q5: one of the muscular branches of tibial nerve is:

A. flexors of the toes
B. extensors of the toes
C. evertors of foot
D. dorsiflexors of ankle

Q6: the best region for IM injection of the buttock is:

A. lower lateral quadrant
B. upper lateral quadrant
C. lower medial quadrant
D. upper medial quadrant

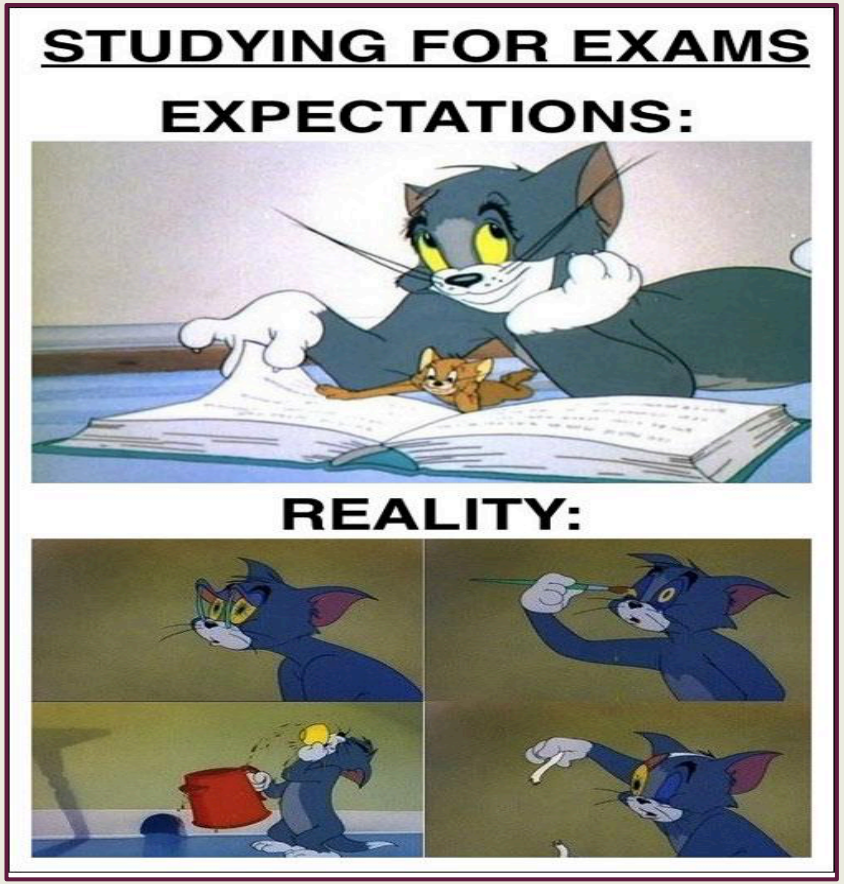
Q7: one of the movements is not affected on sciatic nerve injury:

A. flexion of the knee
B. extension of the knee
C. extension of hip
D. movement of feet

Q8: which one of the muscles below is intact during sciatic injury?

1. gluteus medius
2. gluteus minimus
3. semitendinosus
4. gluteus maximus

1.a
2.c
3.d
4.b
5.a
6.b
7.b
8.d



GOOD LUCK

Done By Anatomy Team 434 _