

# **LOWER LIMB CLINICAL ORIENTED MCQs**

## Section # 02

1. skin sensation and paralysis of muscles on the plantar aspect of the medial side of the foot. Which of the following nerves is most likely damaged?

- (A) Common peroneal
- (B) Tibial
- (C) Superficial peroneal
- (D) Deep peroneal
- (E) Sural

The Answer is **B**. The common peroneal nerve divides into the deep peroneal nerve, which innervates the anterior muscles of the leg and supplies the adjacent skin of the first and second toes, and the superficial peroneal nerve, which innervates the lateral muscles of the leg and supplies the skin on the side of the lower leg and the dorsum of the ankle and foot. The sural nerve supplies the lateral aspect of the foot and the little toe.

2. A patient with a deep knife wound in the buttock walks with a waddling gait that is characterized by the pelvis falling toward one side at each step. Which of the following nerves is damaged?

- (A) Obturator nerve
- (B) Nerve to obturator internus
- (C) Superior gluteal nerve
- (D) Inferior gluteal nerve
- (E) Femoral nerve

The Answer is **C**. The superior gluteal nerve innervates the gluteus medius muscle. Paralysis of this muscle causes gluteal gait, a waddling gait characterized by a falling of the pelvis toward the unaffected side at each step. The gluteus medius muscle normally functions to stabilize the pelvis when the opposite foot is off the ground. The inferior gluteal nerve innervates the gluteus maximus, and the nerve to the obturator internus supplies the obturator internus and superior gemellus muscles. The obturator nerve innervates the adductor muscles of the thigh, and the femoral nerve supplies the flexors of the thigh.

3. A patient is unable to prevent anterior displacement of the femur on the tibia when the knee is flexed. Which of the following ligaments is most likely damaged?

- (A) Anterior cruciate
- (B) Fibular collateral
- (C) Patellar
- (D) Posterior cruciate
- (E) Tibial collateral

The Answer is **D**. The posterior cruciate ligament is important because it prevents forward displacement of the femur on the tibia when the knee is flexed. The anterior cruciate ligament prevents backward displacement of the femur on the tibia.

4. A 41-year-old man was involved in a fight and felt weakness in extending the knee joint. On examination, he was diagnosed with a lesion of the femoral nerve. Which of the following symptoms would be a result of this nerve damage?

- (A) Paralysis of the psoas major muscle
- (B) Loss of skin sensation on the lateral side of the foot

- (C) Loss of skin sensation over the greater trochanter
- (D) Paralysis of the vastus lateralis muscle
- (E) Paralysis of the tensor fasciae latae

The answer is **D**. The femoral nerve innervates the quadratus femoris, sartorius, and vastus muscles. Therefore, damage to this nerve results in paralysis of these muscles. The second and third lumbar nerves innervate the psoas major muscle, the sural nerve innervates the skin on the lateral side of the foot, the iliohypogastric nerve and superior gluteal nerves supply the skin over the greater trochanter, and the superior gluteal nerve innervates the tensor fasciae latae.

5. A 47-year-old woman is unable to invert her foot after she stumbled on her driveway. Which of the following nerves are most likely injured?
- (A) Superficial and deep peroneal
  - (B) Deep peroneal and tibial
  - (C) Superficial peroneal and tibial
  - (D) Medial and lateral plantar
  - (E) tibial

The Answer is **B**. The deep peroneal and tibial nerves innervate the chief evertors of the foot, which are the tibialis anterior, tibialis posterior, triceps surae, and extensor hallucis longus muscles. The tibialis anterior and extensor hallucis longus muscles are innervated by the deep peroneal nerve, and the tibialis posterior and triceps surae are innervated by the tibial nerve.

6. A 22-year-old patient is unable to unlock the knee joint to permit flexion of the leg. Which of the following muscles is most likely damaged?
- (A) Rectus femoris
  - (B) Semimembranosus
  - (C) Popliteus
  - (D) Gastrocnemius
  - (E) Biceps femoris

The Answer is **C**. The popliteus muscle rotates the femur laterally ('unlocks the knee) or rotates the tibia medially, depending on which bone is fixed. This action results in unlocking of the knee joint to initiate flexion of the leg at the joint. The rectus femoris flexes the thigh and extends the knee. The gastrocnemius flexes the knee and plantar flexes the foot. The semimembranosus extends the thigh and flexes and rotates the leg medially. The biceps femoris extends the thigh and flexes and rotates the leg laterally.

7. A patient presents with sensory loss on adjacent sides of the great and second toes and impaired dorsiflexion of the foot. These signs probably indicate damage to which of the following nerves?
- (A) Superficial peroneal
  - (B) Lateral plantar
  - (C) Deep peroneal
  - (D) Sural
  - (E) Tibial

The Answer is **C**. The deep peroneal nerve supplies the anterior muscles of the leg, including the tibialis anterior, extensor hallucis longus, extensor digitorum longus, and peroneus tertius muscles, which dorsiflex the foot. The medial branch of the deep peroneal nerve supplies the skin of adjacent sides of the great and second toes, whereas the lateral branch supplies the extensor digitorum brevis and

extensor hallucis brevis. The superficial peroneal nerve innervates the peroneus longus and brevis, which plantar flexes the foot, and supplies the skin on the side of the lower leg and the dorsum of the ankle and foot. The tibial nerve innervates the muscles of the posterior compartment that plantar flexes and supplies the skin on the heel and plantar aspect of the foot. The lateral plantar nerve innervates muscles and skin of the lateral plantar aspect of the foot. The sural nerve supplies the skin on the posterolateral aspect of the leg and the lateral aspect of the foot and the little toe.

8. A motorcyclist falls from his bike in an accident and gets a deep gash that severs the superficial peroneal nerve near its origin. Which of the following muscles is paralyzed?

- (A) Peroneus longus
- (B) Extensor hallucis longus
- (C) Extensor digitorum longus
- (D) Peroneus tertius
- (E) Extensor digitorum brevis

The Answer is **A**. The superficial peroneal nerve supplies the peroneus longus and brevis muscles. Other muscles are innervated by the deep peroneal nerve

9. A 67-year-old patient has been given a course of antibiotics by gluteal intramuscular injections after a major abdominal surgery. To avoid damaging the sciatic nerve during an injection, the needle should be inserted into which of the following areas?

- (A) Over the sacrospinous ligament
- (B) Midway between the ischial tuberosity and the lesser trochanter
- (C) Midpoint of the gemelli muscles
- (D) Upper lateral quadrant of the gluteal region
- (E) Lower medial quadrant of the gluteal region

The Answer is **D**. To avoid damaging the sciatic nerve during an intramuscular injection, the clinician should insert the needle in the upper lateral quadrant of the gluteal region. The inserted needle in the lower medial quadrant may damage the pudendal and sciatic nerves. The inserted needle midway between the ischial tuberosity and the lesser trochanter may damage the sciatic and posterior femoral cutaneous nerves on the quadratus femoris. The inserted needle over the sacrospinous ligament may damage the pudendal nerve and vessels.

10. A 20-year-old patient cannot flex and medially rotate the thigh while running and climbing. Which of the following muscles is most likely damaged?

- (A) Semimembranosus
- (B) Sartorius
- (C) Rectus femoris
- (D) Vastus intermedius
- (E) Tensor fasciae latae

The Answer is **E**. The tensor fasciae latae can flex and medially rotate the thigh, so this is the muscle most likely damaged. The hamstring muscles (semitendinosus, semimembranosus, and biceps femoris) can extend the thigh and flex the leg. The sartorius can flex the thigh and leg. The rectus femoris can flex the thigh and extend the leg. The vastus intermedius can extend the leg.

11. A 21-year-old man was involved in a motorcycle accident resulting in destruction of the groove in the lower surface of the cuboid bone. Which of the following muscle tendons is most likely damaged?

- (A) Flexor hallucis longus

- (B) Peroneus brevis
- (C) Peroneus longus
- (D) Tibialis anterior
- (E) Tibialis posterior

The Answer is **C**. The groove in the lower surface of the cuboid bone is occupied by the tendon of the peroneus longus muscle. The flexor hallucis longus tendon occupies a groove on the posterior surface of the body of the talus and a groove on the inferior surface of the calcaneus during its course. The tibialis posterior muscle tendon occupies the medial malleolar groove of the tibia. Other muscle tendons are not in the groove of the tarsal bones.

12. A construction worker falls feet first from a roof. He sustains a fracture of the groove on the undersurface of the sustentaculum tali of the calcaneus bone. Which of the following muscle tendons is most likely torn?

- A Flexor digitorum brevis
- (B) Flexor digitorum longus
- (C) Flexor hallucis brevis
- (D) Flexor hallucis longus
- (E) Tibialis posterior

The Answer is **D**. The tendon of the flexor hallucis longus muscle occupies first the groove on the posterior surface of the talus and then the groove on the undersurface of the sustentaculum tali. None of the other tendons would have been affected in such an injury.

13. A thoracic surgeon is going to collect a portion of the greater saphenous vein for coronary bypass surgery. He has observed that this vein runs:

- (A) Posterior to the medial malleolus
- (B) Into the popliteal vein
- (C) Anterior to the medial condyles of the tibia and femur
- (D) Superficial to the fascia lata of the thigh
- (E) Along with the femoral artery

The Answer is **D**. The greater saphenous vein ascends superficial to the fascia lata and courses anterior to the medial malleolus and posterior to the medial condyles of the tibia and femur and terminates in the femoral vein by passing through the saphenous opening. The small saphenous vein drains into the popliteal vein. The greater saphenous vein does not run along with the femoral artery.

14. A 52-year-old woman slipped and fell and now complains of being unable to extend her leg at the knee joint. Which of the following muscles was paralyzed as a result of this accident?

- (A) Semitendinosus
- (B) Sartorius
- (C) Gracilis
- (D) Quadriceps femoris
- (E) Biceps femoris

The Answer is **D**. The quadriceps femoris muscle includes the rectus femoris muscle and the vastus medialis, intermedialis, and lateralis muscles. They extend the leg at the knee joint. The semitendinosus, semimembranosus, and biceps femoris muscles (the hamstrings) extend the thigh and flex the leg. The sartorius and gracilis muscles can flex the thigh and the leg.

15. A patient experiences weakness in dorsiflexing and inverting the foot. Which of the following muscles is damaged?

- (A) Peroneus longus
- (B) Peroneus brevis
- (C) Tibialis anterior
- (D) Extensor digitorum longus
- (E) Peroneus tertius

The Answer is **C**. The tibialis anterior can dorsiflex and invert the foot. The peroneus longus and brevis muscles can plantar flex and evert the foot, the peroneus tertius can dorsiflex and evert the foot, and the extensor digitorum longus can dorsiflex the foot and extend the toes.

**Questions 16-20:** A 62-year-old woman slips and falls on the bathroom floor. As a result, she has a posterior dislocation of the hip joint and a fracture of the neck of the femur.

16. Rupture of the ligamentum teres capitis femoris may lead to damage to a branch of which of the following arteries?

- (A) Medial circumflex femoral
- (B) Lateral circumflex femoral
- (C) Obturator
- (D) Superior gluteal
- (E) Inferior gluteal

The Answer is **C**. The obturator artery gives rise to an acetabular branch that runs in the round ligament of the head of the femur.

17. Fracture of the neck of the femur results in avascular necrosis of the femoral head, probably resulting from lack of blood supply from which of the following

- (A) Obturator
- (B) Superior gluteal
- (C) Inferior gluteal
- (D) Medial femoral circumflex
- (E) Lateral femoral circumflex

The Answer is **D**. In adults, the chief arterial supply to the head of the femur is from the branches of the medial femoral circumflex artery. The lateral femoral circumflex artery may supply the femoral head by anastomosing with the medial femoral circumflex artery. The posterior branch of the obturator artery gives rise to the artery of the head of the femur, which runs in the round ligament of the femoral head and is usually insufficient to supply the head of the femur in adults but is an important source of blood to the femoral head in children. The superior and inferior gluteal arteries do not supply the head of the femur.

18. If the acetabulum is fractured at its posterosuperior margin by dislocation of the hip joint, which of the following bones could be involved ?

- (A) Pubis
- (B) Ischium
- (C) Ilium
- (D) Sacrum
- (E) Head of the femur

The Answer is **C**. The acetabulum is a cup-shaped cavity on the lateral side of the hip bone and is formed superiorly by the ilium, posteroinferiorly by the ischium, and anteromedially by the pubis. The sacrum and the head of the femur do not participate in the formation of the acetabulum.

19. The woman experiences weakness when abducting and medially rotating the thigh after this accident. Which of the following muscles is most likely damaged?

- (A) Piriformis
- (B) Obturator internus
- (C) Quadratus femoris
- (D) Gluteus maximus
- (E) Gluteus minimus

The Answer is **E**. The gluteus medius or minimus abducts and rotates the thigh medially. The piriformis, obturator internus, quadratus femoris, and gluteus maximus muscles can rotate the thigh laterally.

20. The woman undergoes hip surgery. If all of the arteries that are part of the cruciate anastomosis of the upper thigh are ligated, which of the following arteries maintains blood flow?

- (A) Medial femoral circumflex
- (B) Lateral femoral circumflex
- (C) Superior gluteal
- (D) Inferior gluteal
- (E) First perforating

The Answer is **C**. The superior gluteal artery does not participate in the cruciate anastomosis of the thigh. The inferior gluteal artery, transverse branches of the medial and lateral femoral circumflex arteries, and an ascending branch of the first perforating artery form the cruciate anastomosis of the thigh.

21. A 34-year-old woman sustains a deep cut on the dorsum of the foot just distal to her ankle joint by a falling kitchen knife. A physician in the emergency department has ligated the dorsalis pedis artery proximal to the injured area. Which of the following conditions most likely occurs as a result of the injury?

- (A) Ischemia in the peroneus longus muscle
- (B) Aneurysm in the plantar arterial arch
- (C) Reduction of blood flow in the medial tarsal artery
- (D) Low blood pressure in the anterior tibial artery
- (E) High blood pressure in the arcuate artery

The Answer is **C**. Reduction of blood flow in the medial tarsal artery occurs because it is a branch of the dorsalis pedis artery, which begins at the ankle joint as the continuation of the anterior tibial artery. The anterior tibial and peroneal arteries supply the peroneus longus muscle. The deep plantar arterial arch is formed mainly by the lateral plantar artery. Blood pressure in the anterior tibial artery should be higher than normal. The arcuate artery should have a low blood pressure because it is a terminal branch of the dorsalis pedis artery.

22. A patient experiences paralysis of the muscle that originates from the femur and contributes directly to the stability of the knee joint. Which of the following muscles is involved?

- (A) Vastus lateralis
- (B) Semimembranosus
- (C) Sartorius
- (D) Biceps femoris (long head)
- (E) Rectus femoris

The Answer is **A**. The vastus lateralis muscles arise from the femur and all the other muscles originate from the hip (coxal) bone. The biceps femoris inserts on the fibula, and other muscles insert on

the tibia; thus, all of them contribute to the stability of the knee joint.

23. A patient is involved in a motorcycle wreck that results in avulsion of the skin over the anterolateral leg and ankle. Which of the following structures is most likely destroyed with this type of injury?

- (A) Deep peroneal nerve
- (B) Extensor digitorum longus muscle tendon
- (C) Dorsalis pedis artery
- (D) Great saphenous vein
- (E) Superficial peroneal nerve

The Answer is E. The superficial peroneal nerve emerges between the peroneus longus and peroneus brevis muscles and descends superficial to the extensor retinaculum of the ankle on the anterolateral side of the leg and ankle, innervating the skin of the lower leg and foot. The great saphenous vein begins at the medial end of the dorsal venous arch of the foot and ascends in front of the medial malleolus and along the medial side of the tibia along with the saphenous nerve. Other structures pass deep to the extensor retinaculum.

24. A knife wound penetrates the superficial vein that terminates in the popliteal vein. Bleeding occurs from which of the following vessels?

- (A) Posterior tibial vein
- (B) Anterior tibial vein
- (C) Peroneal vein
- (D) Great saphenous vein
- (E) Lesser saphenous vein

The Answer is E. The lesser (small) saphenous vein ascends on the back of the leg in company with the sural nerve and terminates in the popliteal vein. The peroneal vein empties into the posterior tibial vein. The anterior and posterior tibial veins are deep veins and join to form the popliteal vein. The great saphenous vein drains into the femoral vein.

25. A 10-year-old boy falls from a tree house. The resultant heavy compression of the sole of his foot against the ground caused a fracture of the head of the talus. Which of the following structures is unable to function normally?

- (A) Transverse arch
- (B) Medial longitudinal arch
- (C) Lateral longitudinal arch
- (D) Tendon of the peroneus longus
- (E) Long plantar ligament

The Answer is B. The keystone of the medial longitudinal arch of the foot is the head of the talus, which is located at the summit between the sustentaculum tali and the navicular bone. The medial longitudinal arch is supported by the spring ligament and the tendon of the flexor hallucis longus muscle. The cuboid bone serves as the keystone of the lateral longitudinal arch, which is supported by the peroneus longus tendon and the long and short plantar ligaments. The transverse arch is formed by the navicular, three cuneiform, the cuboid, and five metatarsal bones and is supported by the peroneus longus tendon and the transverse head of the adductor hallucis.

26. A 24-year-old woman complains of weakness when she extends her thigh and rotates it laterally. Which of the following muscles is paralyzed?

- (A) Obturator externus
- (B) Sartorius

- (C) Tensor fasciae latae
- (D) Gluteus maximus
- (E) Semitendinosus

The Answer is **D**. The gluteus maximus can extend and rotate the thigh laterally. The obturator externus rotates the thigh laterally. The sartorius can flex both the hip and knee joints. The tensor fasciae latae can flex and medially rotate the thigh. The semitendinosus can extend the thigh and medially rotate the

27. A patient with hereditary blood clotting problems presents with pain in the back of her knee. An arteriogram reveals a blood clot in the popliteal artery at its proximal end Which of the following arteries will allow blood to reach the foot ?

- (A) Anterior tibial
- (B) Posterior tibial
- (C) Peroneal
- (D) Lateral circumflex femoral
- (E) Superior medial genicular

The Answer is **D**. If the proximal end of the popliteal artery is blocked, blood may reach the foot by way of the descending branch of the lateral circumflex femoral artery, which participates in the anastomosis around the knee joint. Other blood vessels are direct or indirect branches of the popliteal artery.

28. A 72-year-old woman complains of a cramp-like pain in her thigh and leg She was diagnosed as having a severe intermittent claudication. Following surgery, an infection was found in the adductor canal, damaging the enclosed structures. Which of the following structures remains intact?

- (A) Femoral artery
- (B) Femoral vein
- (C) Saphenous nerve
- (D) Great saphenous vein
- (E) Nerve to the vastus medialis

The Answer is **D**. The great saphenous nerve remains intact because it is not in the adductor canal. The adductor canal contains the femoral vessels, the saphenous nerve, and the nerve to the vastus medialis.

29. A basketball player was hit in the thigh by an opponent's knee. Which of the following arteries is likely to compress and cause ischemia because of the bruise and damage to the extensor muscles of the leg?

- (A) Popliteal
- (B) Deep femoral
- (C) Anterior tibial
- (D) Posterior tibial
- (E) Peroneal

The Answer is **C**. A muscular spasm or hypertrophy of the extensor muscles of the leg may compress the anterior tibial artery, causing ischemia. The popliteal artery supplies muscles of the popliteal fossa. The deep femoral artery supplies deep muscles of the thigh. The posterior tibial and peroneal arteries supply muscles of the posterior and lateral compartments of the leg

30. An elderly woman fell at home and fractured the greater trochanter of her femur. Which of the following muscles would continue to function normally?



- (A) Piriformis
- (B) Obturator internus
- (C) Gluteus medius
- (D) Gluteus maximus
- (E) Gluteus minimus

The Answer is **D**. The gluteus maximus is inserted into the gluteal tuberosity of the femur and the iliotibial tract. All of the other muscles insert on the greater trochanter of the femur, and their functions are impaired.

**Questions 31-35:** A 20-year-old college student receives a severe blow on the inferolateral side of the left knee joint while playing football. Radiographic examination reveals a fracture of the head and neck of the fibula

31. Which of the following nerves is damaged?

- (A) Sciatic
- (B) Tibial
- (C) Common peroneal
- (D) Deep peroneal
- (E) Superficial peroneal

The Answer is **C**. The common peroneal nerve is vulnerable to injury as it passes behind the head of the fibula and then winds around the neck of the fibula and pierces the peroneus longus muscle, where it divides into the deep and superficial peroneal nerves. In addition, the deep and superficial peroneal nerves pass superficial to the neck of the fibula in the substance of the peroneus longus muscle and are less susceptible to injury than the common peroneal nerve. Other nerves are not closely associated with the head and neck of the fibula.

32. After injury to this nerve, which of the following muscles could be paralyzed?

- (A) Gastrocnemius
- (B) Popliteus
- (C) Extensor hallucis longus
- (D) Flexor digitorum longus
- (E) Tibialis posterior

The Answer is **C**. The extensor hallucis longus is innervated by the deep peroneal nerve, whereas other muscles are innervated by the posterior tibial nerve.

33. If the lateral (fibular) collateral ligament is torn by this fracture, which of the following conditions may occur?

- (A) Abnormal passive abduction of the extended leg
- (B) Abnormal passive adduction of the extended leg
- (C) Anterior displacement of the femur on the tibia
- (D) Posterior displacement of the femur on the tibia
- (E) Maximal flexion of the leg

The Answer is **B**. The lateral (fibular) collateral ligament prevents adduction at the knee. Therefore, a torn lateral collateral ligament can be recognized by abnormal passive adduction of the extended leg. Abnormal passive abduction of the extended leg may occur when the medial (tibial) collateral ligament is torn. The anterior cruciate ligament prevents posterior displacement of the femur on the tibia; the posterior cruciate ligament prevents anterior displacement of the femur on the tibia. In addition, the posterior cruciate ligament is taut when the knee is fully flexed.

34. Which of the following arteries could also be damaged by this fracture?

- (A) Popliteal
- (B) Posterior tibial
- (C) Anterior tibial
- (D) Peroneal
- (E) Lateral inferior genicular

The Answer is **C**. The anterior tibial artery, which arises from the popliteal artery, enters the anterior compartment by passing through the gap between the fibula and tibia at the upper end of the interosseous membrane. The other arteries would not be affected because they are not closely associated with the head and neck of the fibula.

35. Which of the following conditions would occur from this fracture ?

- (A) Ischemia in the gastrocnemius
- (B) Loss of plantar flexion
- (C) Trendelenburg's sign
- (D) Anterior tibial compartment syndrome
- (E) Flat foot

The Answer is **D**. Anterior tibial compartment syndrome is characterized by ischemic necrosis of the muscles of the anterior tibial compartment of the leg resulting from damage to the anterior tibial artery. The gastrocnemius receives blood from sural branches of the popliteal artery. Loss of plantar flexion is due to necrosis of the posterior muscles of the leg, which are supplied by the posterior tibial and peroneal arteries. Trendelenburg's sign is caused by weakness or paralysis of the gluteus medius and minimus muscles. Flat foot results from the collapse of the medial longitudinal arch of the foot

36. A construction worker is hit on the leg with a concrete block and is subsequently unable to plantarflex and invert his foot. Which of the following muscles is most likely damaged?

- (A) Extensor digitorum longus
- (B) Tibialis anterior
- (C) Tibialis posterior
- (D) Peroneus longus
- (E) Peroneus brevis

The Answer is **C**. The tibialis posterior can plantar flex and invert the foot. The extensor digitorum longus can dorsiflex and evert the foot, the tibialis anterior can dorsiflex and invert the foot, and the peroneus longus and brevis can plantar flex and evert the foot.

37. The obturator nerve and the sciatic (tibial portion) nerve of a 15-year-old boy are transected as a result of a motorcycle accident. This injury would result in complete paralysis of which of the following muscles?

- (A) Rectus femoris
- (B) Biceps femoris, short head
- (C) Pectineus
- (D) Adductor magnus
- (E) Sartorius

The Answer is **D**. The adductor magnus is innervated by both the obturator and sciatic (tibial portion) nerves. Hence, a lesion here could cause paralysis. The rectus femoris and sartorius are innervated by the femoral nerve. The biceps femoris long head is innervated by the tibial portion of the

sciatic nerve, whereas the short head is innervated by the common peroneal portion of the sciatic nerve. The pectineus is innervated by both the femoral and obturator nerves

38. A 24-year-old woman presents to her physician with weakness in flexing the hip joint and extending the knee joint. Which scenario?

- (A) Sartorius
- (B) Gracilis
- (C) Rectus femoris
- (D) Vastus medialis
- (E) Semimembranosus

The Answer is **C**. The rectus femoris flexes the thigh and extends the leg. The sartorius can flex both the hip and knee joints. The gracilis adducts and flexes the thigh and flexes the leg, the vastus medialis extends the knee joint, and the semimembranosus extends the hip joint and flexes the knee joint.

39. A 17-year-old boy was stabbed during a gang fight resulting in transection of the obturator nerve. Which of the following muscles is completely paralyzed?

- (A) Pectineus
- (B) Adductor magnus
- (C) Adductor longus
- (D) Biceps femoris
- (E) Semimembranosus

The Answer is **C**. The adductor longus is innervated by only the obturator nerve. Thus, injury here could completely paralyze the adductor longus. The pectineus is innervated by both the obturator and femoral nerves. The adductor magnus is innervated by both the obturator nerve and tibial part of the sciatic nerve. The biceps femoris is innervated by the tibial portion (long head) and common peroneal portion (short head) of the sciatic nerve. The semimembranosus is innervated by the tibial portion of the sciatic nerve.

40. A 32-year-old carpenter fell from the roof. The lateral longitudinal arch of his foot was flattened from fracture and displacement of the keystone for the arch. Which of the following bones is damaged?

- (A) Calcaneus
- (B) Cuboid bone
- (C) Head of the talus
- (D) Medial cuneiform
- (E) Navicular bone

The Answer is **B**. The keystone for the lateral longitudinal arch is the cuboid bone, whereas the keystone for the medial longitudinal arch is the head of the talus. The calcaneus, navicular, and medial cuneiform bones form a part of the medial longitudinal arch, but they are not keystones. The calcaneus also forms a part of the lateral longitudinal arch.