Essential Anatomy for Finals and MRCS
300 SBAs

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Foreword by
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Chapter 2

Lower limb

Questions

1. A patient presents having fallen onto a sharp rock with a laceration on the lateral aspect of the posterior thigh. Which of the following muscles is most likely to have been injured?

A. Semimembranosus
B. Biceps femoris
C. Semitendinosus
D. Sartorius
E. Gracilis

2. The great saphenous vein travels:

A. Anterior to the lateral malleolus
B. Anterior to the medial malleolus
C. On the dorsal aspect of the foot and then ascends posterior to the lateral malleolus
D. On the plantar aspect on the foot and then ascends posterior to the lateral malleolus
E. On the dorsal aspect on the foot and then ascends posterior to the medial malleolus

3. The medial border of the femoral triangle is formed by the:

A. Lateral border of adductor magnus
B. Medial border of adductor magnus
C. Lateral border of adductor longus
D. Medial border of adductor longus
E. Medial border of gracilis

4. Where does the tendon of sartorius insert?

A. Medial surface of proximal tibia, superior to gracilis and semitendinosus
B. Medial surface of femoral condyle, superior to gracilis and semitendinosus
C. Medial surface of proximal tibia, posterior to gracilis and semitendinosus
D. Medial surface of femoral condyle, anterior to gracilis and semitendinosus
E. Medial surface of proximal tibia, anterior to gracilis and semitendinosus

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5. What is the innervation of the vastus intermedius?

A. Anterior rami of L1, L2, and L3
B. Anterior rami of L2 and L3
C. Anterior rami of L2, L3, and L4
D. Posterior rami of L1, L2, and L3
E. Posterior rami of L2, L3, and L4

6. Where does the most powerful hip flexor insert?

A. Lesser trochanter of femur
B. Intertrochanteric crest of femur
C. Intertrochanteric line of femur
D. Medial surface of proximal tibia
E. Tibial tuberosity

7. What is the innervation of the muscle that can adduct the hip and flex the knee?

A. Anterior rami of L1, L2, and L3
B. Anterior rami of L2 and L3
C. Anterior rami of L2, L3, and L4
D. Posterior rami of L1, L2, and L3
E. Posterior rami of L2, L3, and L4

8. A 60-year-old patient presents with left-sided short-distance claudication. On examination, he has palpable pulses in his groin, posterior aspect of his knee, and posterior to medial malleolus. However, the pulse on the dorsal aspect of his left foot is not palpable. Which vessel is most likely to have the greatest degree of stenosis?

A. Superficial femoral artery
B. Popliteal artery
C. Fibular artery
D. Anterior tibial artery
E. Posterior tibial artery

9. What muscle is involved in dorsiflexion and eversion of the foot?

A. Extensor digitorum longus
B. Tibialis posterior
C. Fibularis longus
D. Fibularis brevis
E. Fibularis tertius

10. Following a recent road traffic accident, a 40-year-old presents with a high-stepping gait. What nerve has been injured?

A. Femoral nerve
B. Obturator nerve

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C. Sciatic nerve
D. Common fibular nerve
E. Sural nerve

11. What nerve provides sensory supply to the second dorsal webspace of the foot?

A. Superficial branch of common fibular nerve
B. Deep branch of common fibular nerve
C. Sural nerve
D. Saphenous nerve
E. Tibial nerve

12. Which muscle is solely involved in foot plantarflexion?

A. Soleus
B. Gastrocnemius
C. Plantaris
D. Flexor hallucis longus
E. Fibularis longus

13. Which muscle antagonises the action of tibialis anterior?

A. Tibialis posterior
B. Fibularis tertius
C. Fibularis longus
D. Flexor hallucis digitorum
E. Flexor digitorum longus

14. A patient presents with a positive Trendelenburg sign. What anatomical landmark lies between two muscles primarily responsible for this?

A. Iliac crest
B. Ischial tuberosity
C. Inferior gluteal line
D. Anterior gluteal line
E. Posterior gluteal line

15. What statement best describes the position of the sciatic nerve relative to muscles responsible for lateral rotation of the hip?

A. Superficial to superior and inferior gemelli and obturator internus
B. Deep to superior and inferior gemelli and obturator internus
C. Superficial to piriformis and superior gemellus
D. Deep to piriformis and superior gemellus
E. Deep to piriformis

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16. What are the attachments of the posterior cruciate ligament?

- **A.** Posterior aspect of intercondylar area of tibia and anterolateral surface of medial femoral condyle
- **B.** Anterior aspect of intercondylar area of tibia and anterolateral surface of medial femoral condyle
- **C.** Posterior aspect of intercondylar area of tibia and posterolateral surface of medial femoral condyle
- **D.** Anterior aspect of intercondylar area of tibia and anteromedial surface of medial femoral condyle
- **E.** Anterior aspect of intercondylar area of tibia and posteromedial surface of medial femoral condyle

17. Following trauma to the lateral aspect of the knee during a contact sport, what structures are often injured?

- **A.** Anterior cruciate ligament, posterior cruciate ligament, and lateral collateral ligament
- **B.** Lateral collateral ligament, anterior cruciate ligament, and lateral meniscus
- **C.** Medial collateral ligament, anterior cruciate ligament, and medial meniscus
- **D.** Anterior cruciate ligament, posterior cruciate ligament, and medial collateral ligament
- **E.** Anterior cruciate ligament, posterior cruciate ligament, and medial meniscus

18. What are the main movements of the ankle joint?

- **A.** Plantarflexion and dorsiflexion
- **B.** Plantarflexion, dorsiflexion, and adduction
- **C.** Plantarflexion, dorsiflexion, abduction, and adduction
- **D.** Plantarflexion, dorsiflexion, and inversion
- **E.** Plantarflexion, dorsiflexion, eversion, and inversion

19. Which structure does the superior gluteal nerve supply?

- **A.** Gluteus maximus
- **B.** Superior gemellus
- **C.** Piriformis
- **D.** Tensor fasciae latae
- **E.** Quadratus femoris

20. The common fibular nerve supplies all of the following muscles except:

- **A.** Fibularis tertius
- **B.** Fibularis brevis
- **C.** Tibialis anterior
- **D.** Short head of biceps femoris
- **E.** Long head of biceps femoris

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21. The deltoid ligament consists of fibres running between the:

A. Lateral malleolus and calcaneus
B. Lateral malleolus and talus
C. Lateral malleolus and talus and cuboid
D. Medial malleolus and calcaneus
E. Medial malleolus and calcaneus, talus and navicular

22. Which of the following structures is most deep in the popliteal fossa?

A. Tibial nerve
B. Popliteal artery
C. Popliteal vein
D. Common fibular nerve
E. Femoral artery

23. Which of the following structures does not pass posterior to the medial malleolus?

A. Posterior tibial artery
B. Posterior tibial vein
C. Tibialis posterior tendon
D. Fibularis longus tendon
E. Flexor hallucis longus tendon

24. Which of the following muscles are not involved in dorsiflexion?

A. Fibularis tertius
B. Tibialis anterior
C. Fibularis brevis
D. Extensor hallucis longus
E. Extensor digitorum longus

25. Which of the following is true concerning ankle inversion?

A. Fibularis longus and brevis are involved
B. The superficial fibular nerve innervates the responsible muscles
C. Ankle inversion occurs at the tibiotalar (ankle) joint
D. Tibialis anterior and tibialis posterior contract together
E. Injury to the deep fibular nerve does not affect this movement

26. Which of the following statements is true with regard to compartments of the leg?

A. There are two posterior compartments of the leg
B. There are three compartments in the leg
C. The lateral compartment has three muscles
D. There are five muscles in the anterior compartment of the leg
E. The interosseous membrane of the leg separates the muscles of the deep posterior compartment from the muscles of the superficial posterior compartment

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27. Which of the following is not a bone of the foot?

A. Talus
B. Calcaneus
C. Cuboid
D. Medial cuneiform
E. Trapezoid

28. Which of the following muscles is not an external rotator of the hip?

A. Piriformis
B. Inferior gemellus
C. Obturator internus
D. Quadratus femoris
E. Pectineus

29. Which of the following is an example of a sesamoid bone?

A. Fibula
B. Patella
C. Talus
D. Navicular
E. Triquetral

30. Which of the following is not a ligament of the knee joint?

A. Lateral collateral ligament
B. Anterior cruciate ligament
C. Posterior cruciate ligament
D. Medial cruciate ligament
E. Medial collateral ligament

31. Which muscle is principally involved with sitting cross-legged?

A. Gracilis
B. Pectineus
C. Sartorius
D. Biceps femoris
E. Semitendinosus

32. What type of joint is the inferior tibiofibular joint?

A. Fibrous joint
B. Primary cartilaginous joint
C. Secondary cartilaginous joint
D. Typical synovial joint
E. Atypical synovial joint

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33. A 14-year-old active boy presents with pain and swelling over the tibial tuberosity. The pain is worse after exercise. Which ligament has sustained a chronic fatigue injury?

A. Lateral collateral ligament
B. Medial collateral ligament
C. Anterior cruciate ligament
D. Patellar ligament
E. Posterior cruciate ligament

34. A 29-year-old man presents with pain in the foot after falling from a height. A radiograph of the foot shows widening of the interval between the first and second ray. Which joint has been injured?

A. Ankle joint
B. Subtalar joint
C. Tarsometatarsal joint
D. First metatarsophalangeal joint
E. Interphalangeal joint

35. Where would an anatomist find the fabella?

A. Lateral lower leg
B. Posterior to the knee
C. Medial lower leg
D. Anterior to the knee
E. In the foot

36. A patient has an injection into the buttock. She complains of loss of sensation to the sole and upper surface of the foot. Which nerve has been affected?

A. Sciatic nerve
B. Common fibular nerve
C. Tibial nerve
D. Femoral nerve
E. Superior gluteal nerve

37. The fovea capitis is located in the centre of which bony structure?

A. Acetabulum
B. Femoral head
C. Greater trochanter
D. Lesser trochanter
E. Intercondylar sulcus

38. Which of the following is not true of the hip joint capsule and ligaments?

A. The capsule attaches anteriorly along the intertrochanteric line
B. The capsule attaches posteriorly along the intertrochanteric crest

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C. The capsule attaches more proximally on the posterior femur
D. The transverse acetabular ligament is an intra-articular structure of the hip
E. The ligamentum teres attaches to the cotyloid fossa of the acetabulum

39. A patient presents with pain, particularly on prolonged standing or walking, and numbness of the sole of the foot. The patient is diagnosed with posterior tarsal tunnel syndrome which requires surgical decompression after 6 months of failed conservative management. Which of the following structures does not pass through the posterior tarsal tunnel?

A. Tibial nerve
B. Flexor hallucis longus tendon
C. Posterior tibial artery
D. Deep fibular nerve
E. Tibialis posterior tendon

40. Regarding the blood supply of the lower limb, which of the following statements is true?

A. The fibular artery is a branch of the anterior tibial artery
B. The medial circumflex artery is a direct branch of the femoral artery
C. The popliteal artery begins at the subsartorial canal
D. The femoral artery is a continuation of the internal iliac artery
E. The dorsalis pedis artery is a continuation of the posterior tibial artery

41. Which of the following lies most medially in the femoral triangle?

A. Femoral nerve
B. Femoral vein
C. Femoral artery
D. Femoral canal
E. Pectineus

42. A 30-year-old patient is unable to extend his hallux. Which nerve root is predominantly responsible for this action?

A. L2
B. L3
C. L4
D. L5
E. S1

43. Which nerve root provides sensory supply to the medial aspect of the lower leg?

A. L2
B. L3
C. L4
D. L5
E. S1

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44. Which of the given muscles is innervated by the posterior division of the femoral nerve?

A. Iliacus
B. Pectineus
C. Sartorius
D. Gracilis
E. Vastus medialis

45. Which of the following is not true of the popliteus muscle?

A. Attaches onto the lateral surface of the lateral condyle of the femur
B. Passes outside of the capsule of the knee joint
C. Attaches onto the posterior tibia, above the soleal line
D. Innervated by the tibial nerve
E. Supplied by the popliteal artery

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Answers

1. B. Biceps femoris

Biceps femoris is the only posterolateral thigh muscle listed. Semimembranosus and semitendinosus lie posteromedially, while gracilis lies medially and sartorius (the longest muscle in the human body) lies anteriorly.

2. B. Anterior to the medial malleolus

The great (long) saphenous vein is one of the main superficial veins of the lower limb. It arises from the venous arch on the dorsum of the foot and ascends the limb anterior to the medial malleolus (with the saphenous nerve) and then along the posterior border of the medial epicondyle of the femur, before draining into the femoral vein on the medial aspect of the thigh at the saphenofemoral junction.

3. D. Medial border of adductor longus

The femoral triangle is formed by the inguinal ligament (superiorly), medial border of sartorius (laterally), and medial border of adductor longus (medially). Its contents include the femoral nerve and femoral sheath encompassing the femoral artery, vein, and canal (from lateral to medial).

4. E. Medial surface of proximal tibia, anterior to gracilis and semitendinosus

Sartorius arises from the anterior superior iliac spine of the pelvic bone and attaches to the anteromedial aspect of the proximal tibia anterior to the tendons of gracilis and semitendinosus. They form a common tendon of insertion, often referred to as pes anserinus. Inflammation of the bursa between the bone and tendon is termed bursitis. In crossing both the hip and knee joints, it has actions on both: Abduction, flexion and external rotation of the hip and flexion and internal rotation of the knee. It is the longest muscle in the body.

5. C. Anterior rami of L2, L3, and L4

Vastus intermedius arises deep to vastus medialis, vastus lateralis and rectus femoris, combining with these muscles to form the quadriceps muscle. This inserts into the tibial tuberosity, via the patellar ligament. It is supplied by the femoral nerve, a branch of the lumbar plexus, formed by the anterior rami of L2, L3, and L4.

6. A. Lesser trochanter of femur

The iliopsoas muscle is the most powerful hip flexor and is attached to the lesser trochanter of the femur. Rectus femoris and sartorius also have hip flexor action,

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but insert into the tibial tuberosity (via patellar ligament) and the anteromedial surface of the proximal tibia, respectively.

7. C. Anterior rami of L2, L3, and L4

Gracilis is a muscle found in the medial aspect of the thigh and inserts into the anteromedial aspect of the proximal tibia (via the pes anserinus tendon). Hence, it has both hip flexor and knee flexor actions. It is supplied by the obturator nerve, which arises from ventral divisions of the anterior rami of L2, L3, and L4 of the lumbar plexus.

8. D. Anterior tibial artery

After emerging from the adductor hiatus, the superficial femoral artery continues as the popliteal artery. This vessel terminates by dividing into the anterior tibial artery (ATA) and tibiofibular trunk, with the latter in turn dividing into the posterior tibial and fibular arteries. The dorsalis pedis artery is a branch of the ATA, hence stenosis of the ATA leads to a reduction of flow in its branches. Clinically, the pulse of the dorsalis pedis will be difficult to palpate in this case.

9. E. Fibularis tertius

Fibularis longus, fibularis brevis, and fibularis tertius evert the foot. As the tendons of fibularis longus and fibularis brevis pass posterior to the lateral malleolus, they plantarflex the foot. However, fibularis tertius inserts into the dorsum of the base of the fifth metatarsal, with its tendon passing anterior to the lateral malleolus, thus contributing to the dorsiflexion.

10. D. Common fibular nerve

The deep branch of the common fibular nerve supplies the muscles of the anterior compartment of the leg, responsible for dorsiflexion of the foot and toes. Damage to the common fibular nerve can therefore cause a 'foot drop', leading to a high-stepping gait, with more pronounced hip and knee flexion in order to ensure the toes do not drag across the ground. The superficial branch of the common fibular nerve supplies the muscles of the lateral compartment of the leg.

11. A. Superficial branch of common fibular nerve

The sensory supply of the dorsum of the foot derives from the common fibular nerve. This is predominantly by the superficial branch, except from the first dorsal webspace (between the first and second toes). The sural nerve accompanies the short saphenous vein and supplies that lateral aspect of the foot, while the saphenous nerve accompanies the great saphenous vein and supplies the medial aspect of the foot.

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12. A. Soleus

Soleus, gastrocnemius, and plantaris combine to form a common calcaneal tendon which inserts on the posterior aspect of the calcaneus. Hence, they all plantarflex the foot. However, plantaris and gastrocnemius arise proximal to the knee and so can also flex the knee. Although both plantarflex the foot, flexor hallucis longus also flexes the hallux and fibularis longus also everts the foot.

13. C. Fibularis longus

Tibialis anterior is found in the anterior compartment of the leg and inserts into the medial surface of the medial cuneiform and base of the first metatarsal. It inverts and dorsiflexes the foot. The fibularis longus is found in the lateral compartment of the leg and its tendon runs along the sole of the foot to insert onto the plantar aspect of the medial cuneiform and base of the first metatarsal. It everts and plantarflexes the foot.

14. D. Anterior gluteal line

A positive Trendelenburg sign is demonstrated when a patient stands on one foot and the contralateral side of their pelvis descends. This is a sign of weakness of the hip abductors (gluteus medius and gluteus minimus). They both arise from the wing of the ilium with the gluteus medius arising from between the anterior and posterior gluteal lines and the gluteus minimus between the anterior and inferior gluteal lines.

15. A. Superficial to superior and inferior gemelli and obturator internus

The sciatic nerve passes through the greater sciatic foramen to lie superficial to superior gemellus, obturator internus, inferior gemellus, and quadratus femoris. They are all involved in lateral hip rotation. The nerve usually emerges deep to piriformis, although the common fibular nerve may come out (10% of cases) above or through piriformis.

16. A. Posterior aspect of intercondylar area of tibia and anterolateral surface of medial femoral condyle

The cruciate ligaments are important in maintaining the integrity of the knee joint by preventing excessive displacement of the tibia relative to the femur. The anterior cruciate ligament arises from the anterior aspect of the intercondylar area of tibia and attaches to the posteromedial surface of the lateral femoral condyle. The posterior cruciate ligament travels in the opposite direction, hence giving the appearance of an 'X'.

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17. C. Medial collateral ligament, anterior cruciate ligament, and medial meniscus

Due to its close association to each other and the knee joint capsule, the medial collateral ligament, anterior cruciate ligament, and medial meniscus may be injured following valgus trauma to the knee. This is also known as the unhappy triad of O'Donoghue.

18. A. Plantarflexion and dorsiflexion

The main ankle movements involve dorsiflexion (muscles of the anterior compartment) and plantarflexion (muscles of the posterior and lateral compartments). Inversion and eversion movements occur at the subtalar joint.

19. D. Tensor fasciae latae

Tensor fasciae latae is innervated by the superior gluteal nerve. It arises from the iliac crest and inserts into the iliotibial tract with the gluteus maximus. It is thereby involved in stabilising the hip and knee joints. Gluteus maximus receives its supply from the inferior gluteal nerve.

20. E. Long head of biceps femoris

The long head of biceps femoris arises from the ischial tuberosity with semitendinosus and semimembranosus and they are all innervated by the tibial nerve. The short head of biceps femoris arises more distally from the linea aspera of the femur and is supplied by the common fibular nerve. Therefore, unlike the other hamstring muscles, this portion of biceps femoris cannot extend the hip. The common fibular nerve also innervates fibularis tertius and tibialis anterior (deep branch) and fibularis brevis (superficial branch).

21. E. Medial malleolus and calcaneus, talus and navicular

The deltoid ligament is found over the medial aspect of the ankle joint with fibres extending from the medial malleolus to the calcaneus, talus, and navicular. Therefore, it prevents hyper-eversion of the ankle in normal function.

22. B. Popliteal artery

The popliteal artery lies deep to the popliteal vein which lies deep to the tibial nerve. Thus, palpating the popliteal pulse can be uncomfortable. The common fibular nerve begins at the superior angle of the popliteal fossa. The popliteal artery is a continuation of the femoral artery.

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23. D. Fibularis longus tendon

The structures that pass posterior to the medial malleolus from anterior to posterior can be remembered using the mnemonic 'Tom Dick and Very Naughty Harry'. They are **t**ibialis posterior tendon, flexor **d**igitorum longus tendon, posterior tibial **a**rtery, posterior tibial **v**ein, tibial **n**erve and the flexor **h**allucis longus tendon. The fibularis longus tendon passes posterior to the lateral malleolus.

24. C. Fibularis brevis

The muscles of the anterior compartment of the leg are involved with dorsiflexion. The structures which pass anterior to the ankle joint, deep to the extensor retinaculum from medial to lateral can be remembered by the mnemonic 'Timothy Has A Very Nasty Disease, Feverish Timothy' as follows: **t**ibialis anterior, extensor **h**allucis longus, anterior tibial **a**rtery, anterior tibial **v**ein, deep fibular **n**erve, extensor **d**igitorum longus and **f**ibularis **t**ertius. Fibularis brevis passes posterior to the lateral malleolus and is therefore, not involved in dorsiflexion.

25. D. Tibialis anterior and tibialis posterior contract together

Fibularis longus and brevis are involved in ankle eversion. The superficial fibular nerve innervates the muscles of the lateral compartment of the leg which are involved with eversion. Ankle inversion occurs at the subtalar joint. If the deep fibular nerve were injured, ankle inversion would be impaired.

26. A. There are two posterior compartments of the leg

There are two posterior compartments of the leg: (1) Deep and (2) Superficial. There are four compartments of the leg in total. The lateral compartment of the leg only contains two muscles: (1) Fibularis longus and (2) Brevis. The anterior compartment of the leg contains four muscles: (1) Tibialis anterior, (2) Extensor hallucis longus, (3) Extensor digitorum longus, and (4) Fibularis tertius. The interosseous membrane separates the anterior from the deep posterior compartment of the leg. The deep posterior compartment is separated from the superficial posterior compartment by the posterior fascial septum.

27. E. Trapezoid

The trapezoid is one of the carpal bones in the hand. The other listed bones are among the seven tarsal bones of the foot.

28. E. Pectineus

Six small muscles of the hip make up the lateral/external rotator group. These are piriformis, gemellus superior, gemellus inferior, obturator internus, obturator

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externus, and quadratus femoris. Other muscles contribute to lateral rotation, although pectineus is not generally considered among them. Pectineus is involved with adduction and flexion of the hip joint.

29. B. Patella

Sesamoid bones are embedded within tendons or ligaments. They often represent normal variants; however, two ubiquitous examples are the patella (within the quadriceps tendon) and the pisiform (within the flexor carpi ulnaris tendon).

30. D. Medial cruciate ligament

The knee joint is a compound modified synovial hinge joint which is supported by many ligaments. The anterior and posterior cruciate ligaments are intracapsular and contribute to anterior-posterior stability. The medial and lateral collateral ligaments are extracapsular and contribute to varus-valgus stability.

31. C. Sartorius

The sartorius muscle (from the Latin *sartor*, meaning 'tailor') originates from the anterior superior iliac spine and inserts into the anteromedial surface of the proximal tibia. This insertion is part of the pes anserinus ('goose foot'), the insertion of three conjoined tendons of sartorius, gracilis, and semitendinosus. The muscle is supplied by the femoral nerve and femoral artery. It acts to flex, abduct and laterally rotate the hip, as well as flex the knee. This facilitates sitting cross-legged, the position in which tailors used to sit and work.

32. A. Fibrous joint

The inferior tibiofibular joint is the lower end of the interosseous membrane of the leg. It is a fibrous joint, binding the inferior tibia and fibula together. This contributes to ankle stability in weight-bearing and mobilisation.

33. D. Patellar ligament

This patient has Osgood–Schlatter disease, a traction apophysitis of the tibial tuberosity. This is a chronic fatigue injury caused by microtrauma at the patellar ligament insertion onto the tibial tuberosity. It is most common in young adolescent males. It is usually treated with rest, ice, and activity modification.

34. C. Tarsometatarsal joint

This patient has sustained a Lisfranc injury. These are severe injuries of the tarsometatarsal (Lisfranc) joint. They may be purely ligamentous or fracture-dislocations. They can be commonly missed progressing to deformity, chronic pain,

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and dysfunction of the foot. Widening of the interval between the first and second ray on an anteroposterior foot radiograph can be a subtle but diagnostic finding.

35. B. Posterior to the knee

The fabella is a small sesamoid bone commonly found embedded in the tendon of the lateral head of gastrocnemius. It is a normal variant, and is rarely associated with any pathology.

36. A. Sciatic nerve

This patient has sustained an injury to the sciatic nerve. The sciatic nerve forms from L4 to S3 segments of the sacral plexus as the lumbosacral trunk (L4 and L5) and S1-S3 roots unite over the piriformis muscle. It is the largest nerve in the body, and innervates the muscles of the posterior thigh, and all the muscles of the leg and foot, as well as indirectly supplying sensation to the lateral leg as well as the dorsal and plantar surfaces of the foot. The sciatic nerve passes through the lower medial quadrant of the gluteal region. Injections should therefore be performed into the upper lateral quadrant. Poorly performed intramuscular injections into the buttock can cause sciatic nerve injury.

37. B. Femoral head

The fovea capitis is a small rounded concave impression within the head of the femur which is the point of attachment for the ligamentum teres. This ligament transmits an important artery to the femoral head in infants, but in adults this is less important. Therefore, an intracapsular fracture of the femoral neck will likely cause avascular necrosis of the head of the femur, which is why arthroplasty rather than fixation is usually the treatment of choice.

38. B. The capsule attaches posteriorly along the intertrochanteric crest

The hip joint capsule distal attachment is in the region of the intertrochanteric line anteriorly, but more proximal than the intertrochanteric crest posteriorly. Therefore, posteriorly, the capsule only covers part of the femoral neck. This is significant because basicervical as well as intertrochanteric fractures of the neck of the femur are considered extracapsular, and may be treated with fixation rather than replacement surgery.

39. D. Deep fibular nerve

Tarsal tunnel syndrome is a compressive neuropathy analogous to carpal tunnel syndrome in the upper limb, and is caused by compression of the tibial nerve.

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The tarsal tunnel lies under the flexor retinaculum between the medial malleolus and the medial calcaneal process. The anterior aspect of the ankle is sometimes referred to as the anterior tarsal tunnel, deep to the inferior extensor retinaculum. The deep fibular nerve lies in this anterior tarsal tunnel, not the posterior tarsal tunnel. Thus, anterior tarsal tunnel syndrome occurs due to compression of the deep fibular nerve, but posterior tarsal tunnel syndrome, more often referred to as 'tarsal tunnel syndrome' does not involve the deep fibular nerve.

40. C. The popliteal artery begins at the subsartorial canal

The popliteal artery is a continuation of the femoral artery as it passes through the subsartorial (also called the 'adductor', or 'Hunter's' canal). The subsartorial canal is an aponeurotic tunnel in the mid-thigh. Compression of this canal may cause entrapment of the neurovascular bundle within, resulting in lower limb claudication. This may be caused by hypertrophy of the proximate musculature such as vastus medialis, and often presents in young men. The fibular artery arises at the bifurcation of the tibial-fibular trunk into the posterior tibial and fibular arteries. The medial circumflex artery is a direct branch of the profunda femoris artery. The femoral artery is a continuation of the external iliac artery. The dorsalis pedis artery is a continuation of the anterior tibial artery.

41. D. Femoral canal

The femoral triangle, in the superomedial thigh, is bounded by the inguinal ligament superiorly, the medial border of sartorius laterally, and the medial border of adductor longus medially. Fascia lata forms the roof of this space, and the floor consists of the pectineus, iliopsoas, and adductor longus muscles. The femoral canal is most medial in the triangle, then the femoral vein, then the femoral artery, then the femoral nerve most laterally. The femoral canal contains lymphatic vessels and the lacunar deep lymph node as well as loose connective tissue. It provides a space for distension of the femoral vein to allow for increased intra-abdominal pressure and increased venous return from the lower limb.

Remember, the femoral triangle is shaped like a '**SAIL**' which gives an acronym for the boundaries: **S**artorius, **A**dductor longus, and the **i**nguinal **L**igament. The contents can be remembered with another nautical mnemonic, '**NAVY**', which reminds us of the structures from lateral to medial: **N**erve, **A**rtery, and **V**ein then **Y** fronts (i.e., male underwear).

42. D. L5

A myotome describes a muscle group that is predominantly supplied by a single spinal nerve root. The following myotomes are commonly noted in the lower limb: Hip flexion (L2), knee extension (L3), ankle dorsiflexion (L4), hallux extension (L5), and ankle plantarflexion (S1).

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43. C. L4

A dermatome describes an area of skin that is predominantly supplied by a single spinal nerve root. The following dermatomes are commonly noted in the lower limb: Anterolateral aspect of thigh (L2), anterior aspect for knee (L3), medial aspect of lower leg (L4), first dorsal webspace (L5), and lateral aspect of lower leg and foot (S1).

44. E. Vastus medialis

Vastus medialis is part of the quadriceps muscle group, which is innervated by the posterior division of the femoral nerve. Iliacus (part of the iliopsoas group) is supplied by the femoral nerve in the abdomen and direct branches form the lumbar plexus. The nerve to pectineus arises from the femoral nerve above the inguinal ligament. Sartorius is innervated by the anterior division of the femoral nerve. Gracilis is supplied by the anterior branch of the obturator nerve.

45. B. Passes outside of the capsule of the knee joint

Popliteus is a small muscle and major stabiliser of the posterolateral knee. Its tendon is intracapsular; however, it is not within the joint itself (it is extra-articular) and not bathed in synovial fluid (it is extra-synovial). Popliteus attaches onto the lateral surface of the lateral femoral condyle, and above the soleal line on the posterior tibia, and is supplied by the tibial nerve and popliteal artery.

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