Lower Limb

Lumbosacral Plexus

- Femoral nerve--posterior divisions L2-L4
- Obturator nerve--anterior divisions L2-L4
- Tibial nerve--anterior divisions L4-S3
- Common peroneal nerve--posterior divisions L4-S2
- Tibial and common peroneal nerve travel together as sciatic nerve; pass through greater sciatic foramen and course through thigh (posteriorly)
- Common peroneal nerve divides above popliteal fossa
    - Superficial peroneal nerve—supplies lateral surface and muscles of leg

Deep peroneal nerve--supply anterior compartment of leg

Terminal Nerve of Lumbosacral plexus

Terminal Nerve	Origin	Muscles Innervated
Femoral nerve	L2 through L4 posterior divisions	Anterior compartment of thigh (quadriceps femoris, sartorius, pectineus)
Obturator nerve	L2 through L4 anterior divisions	Medial compartment of thigh (gracilis, adductor longus, adductor brevis, anterior portion of adductor magnus)
Tibial nerve	L4 through S3 anterior divisions	Posterior compartment of thigh (semimembranosus, semitendinosus, long head of biceps femoris, posterior portion of adductor magnus) Posterior compartment of leg (gastrocnemius, soleus, flexor digitorum longus, flexor hallucis longus, tibialis posterior) Plantar muscles of foot
Common peroneal nerve	L4 through S2 posterior divisions	Short head of biceps femoris
Superficial peroneal nerve		Lateral compartment of leg (peroneus longus, peroneus brevis) – EVERT FOOT
Deep peroneal nerve		Anterior compartment of leg (tibialis anterior, extensor hallucis, extensor digitorum, peroneus tertius) INVERT FOOT – both ante + post m/s

Collateral Nerves of Lumbosacral Plexus

Collateral Nerve	Origin	Muscles or Skin Innervated
Superior gluteal nerve	L4 through S1 posterior divisions	Gluteus medius, gluteus minimus, tensor fasciae latae – stabilise hip
Inferior gluteal nerve	L5 through S2 posterior divisions	Gluteus maximus – powerful hip extensor

Nerve injuries

- Superior gluteal nerve
    - Affects gluteus medius and minimus muscles
    - Destabilizes pelvis
    - Patient cannot keep pelvis level when standing on one leg

    - "Trendelenburg gait" – stand on right, lt pelvis drop = damage to right superior gluteal nerve
- Inferior gluteal nerve
    - Affects gluteus maximus
    - Produces a weakened hip extension
    - Difficulty rising from a sitting position, climbing stairs, or running
- Sciatic nerve
    - Loss of flexion of the knee and function below the knee
    - Weakened extension of thigh
- Tibial nerve only
    - Loss of plantar flexion of foot
- Common peroneal nerve only
    - Affects dorsiflexion of foot
    - Commonly damaged since passes around head of femur and injured during trauma or improper cast placement
    - Sign is "foot drop"
- Deep proneal nerve only--"foot drop"
- Superficial peroneal nerve only--loss of eversion of the foot

Sensory innervations of lower limb and foot

- Common peroneal nerve results in loss of sensation over the entire dorsum of the foot
- Tibial nerve results in loss of sensation to plantar surface of foot

Femoral nerve results in loss of sensation to medial part of leg

Arterial supply

- Cruciate anastamosis
    - Inferior gluteal artery
    - Profunda femoris artery
    - Medial femoral circumflex artery
    - Lateral femoral circumflex artery
- Popliteal artery passes deep within the popliteal fossa behind the knee
    - May be damaged by supracondylar fracture of the femur

Femoral triangle contains the femoral artery, femoral vein, and femoral nerve (outside femoral sheath)

Joints

Hip

- Ball and socket joint formed by the head of the femur and the acetabulum
- Dislocation is usually posterior--called "dashboard injury" and may injure the sciatic nerve

Fracture may damage the neck of the femur and compromise the blood supply, which arises from the circumflex vessels, resulting in avascular necrosis of the head of the femur

Knee

- Formed by articulation of the medial and lateral femoral condyles, the medial and lateral tibial condyles and the patella
- Capsule is strengthened by the medial and lateral collateral ligaments which resist abduction and adduction
- Anterior cruciate ligament (intracapsular)
    - Attaches to the anterior tibia and prevents its anterior displacement
    - Rupture results in "anterior drawer sign"
- Posterior cruciate ligament (intracapsular)

Attaches to the posterior tibia and prevents its posterior displacement

- Medial meniscus

    - "C-shaped"
    - More firmly anchored to tibia and attached to medial collateral ligament
    - More susceptible to injury since less mobile
- Lateral meniscus
    - "O-shaped"
    - Less firmly anchored and not attached to lateral collateral ligament
- Terrible triad

Tear in the medial collateral ligament, medial meniscus, and anterior cruciate ligament

Ankle

- Talocrural joint
    - Formed by the distal ends of the tibia and fibula and the talus
    - "Hinge joint"--dorsiflexion and plantar flexion occur here
    - Medial collateral (deltoid) ligament prevents abduction and when sprained results in an eversion injury
    - Lateral collateral ligament prevents adduction and when sprained results in an inversion injury (very common)
- Subtalar joint
    - Compound joint formed by talocalcaneal joint and the talocalcaneonavicular joint
    - Inversion and eversion are permitted at this joint

Transverse tarsal joint