

Introduction to lower limb

Objectives:

By the end of this lab students are expected to be able to identify the following structures:

A- Bones

❖ HIP:

- ✓ Ilium (Anterior superior iliac spine, iliac crest, iliac tubercle, Greater sciatic notch)
- ✓ Pubis (Superior/Inferior ramus, Pubic tubercle, Symphesis pubis)
- ✓ Ischium (Ischial spine, Ischeal tuberosity, Lesser sciatic notch)

➤ Important landmarks

- ✓ Acetabulum/acetabular notch
- ✓ Obturator foramen
- ✓ Sacrotuberous/Sacrospinous ligaments
- ✓ Greater/lesser sciatic foramina

❖ Femur

- Upper end
 - ✓ Head / Fovea capitis/ Neck
 - ✓ Greater and lesser trochanters
 - ✓ Intertrochanteric line (anterior) /Intertrochanteric crest (posterior)
- Shaft
- Lower end
 - ✓ Lateral and medial condyles

❖ Patella

❖ Tibia & Fibula

- ✓ Upper end/ Shaft/ Lower end

❖ Tarsus (Talus/ Calcaneus)

❖ Metatarsus & Phalanges

B- JOINTS (Hip/ Knee/ Ankle)

C- REGIONS (Gluteal/ Thigh/ Knee/ Leg/ Ankle/ Foot)

D- CUTANEOUS NERVES

- ✓ Saphenous Nerve
- ✓ Sural Nerve
- ✓ Superficial Peroneal Nerve
- ✓ Deep Peroneal Nerve

E- SUPERFICIAL VEINS

- ✓ Great (long) Saphenous Vein
- ✓ Small (Short) Saphenous Vein
- ✓ Dorsal venous arch
- ✓ Popliteal vein

F- LYMPHATICS

- ✓ Superficial Inguinal Group of Lymph Nodes

Muscles of gluteal region and thigh

Objectives:

By the end of this lab students are expected to be able to identify the following structures:

A- Gluteal region

- ✓ Gluteus maximus/ Gluteus medius/ Gluteus minimus
- ✓ Tensor fasciae latae
- ✓ Piriformis

➤ Other structures:

- ✓ Iliotibial Tract

B- Posterior Compartment of Thigh

- ✓ Semitendinosus
- ✓ Semimembranosus
- ✓ Biceps femoris (lateral)

C- Anterior Compartment of Thigh

- ✓ Iliopsoas
- ✓ Sartorius
- ✓ Quadriceps femoris (Rectus femoris, Vastus medialis, Vastus lateralis, Vastus intermedius)

➤ Other structures:

- ✓ Saphenous Opening
- ✓ Inguinal ligament

D- Medial Compartment of Thigh

- ✓ Adductor longus
- ✓ Adductor brevis
- ✓ Adductor magnus
- ✓ Pectineus
- ✓ Gracilis

➤ Other structures:

- ✓ Adductor Canal
 - ✓ Adductor Hiatus
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Leg and foot Bones and Muscles

Objectives:

By the end of this lab students are expected to be able to identify the following structures:

❖ **Tibia**

- ✓ Lateral and medial condyles/ Intercondylar eminence
- ✓ Shaft/ Tuberosity of the tibia/ Anterior surface
- ✓ Medial malleolus

❖ **Fibula**

- ✓ Lateral malleolus

❖ **Foot bones**

- ✓ Talus/ Calcaneum

❖ **Foot arches**

- ✓ Transverse arch/ Medial Longitudinal arch/ Lateral Longitudinal arch

❖ **Anterior compartment of leg**

- ✓ Tibialis anterior
- ✓ Extensor hallucis Longus
- ✓ Extensor digitorum Longus

➤ **Other structures:**

- ✓ Superior extensor retinaculum/ Inferior extensor retinaculum

❖ **Lateral Compartment of leg**

- ✓ Fibularis longus/ Fibularis brevis

❖ **Posterior Compartment of leg**

- ✓ Gastrocnemius
- ✓ Soleus
- ✓ Popliteus

➤ **Other structures:**

- ✓ Tendo Calcaneus (Achilles Tendon)
- ✓ Flexor Retinaculum (Between medial malleolus and medial surface of calcaneus)

❖ **Dorsum of the foot**

- ✓ Extensor digitorum brevis
- ✓ Extensor Hallucis brevis

❖ **Planter surface of the foot**

- ✓ Plantar aponeurosis
- ✓ Four layers

Nerves of the lower limb

Objectives:

By the end of this lab students are expected to be able to identify the following structures:

- ✓ **Femoral Nerve**
 - Deep to inguinal ligament
 - Femoral triangle (lateral to femoral artery)
 - Divides to branches (Short course)
- ✓ **Saphenous nerve (superficial)**
 - Branch of the femoral nerve at femoral triangle
 - Passes through adductor canal
 - Medial side of the knee
 - Accompany the long saphenous vein down to ankle
 - In front of medial malleolus (with great saphenous vein)
- ✓ **Obturator Nerve**
 - Passes through the obturator foramen
 - Reach the Adductor compartment
 - Divides to anterior and posterior branches (Short course)
- ✓ **Sciatic nerve**
 - Enters the gluteal region by passing through greater sciatic foramen
 - Enters the posterior thigh by passing just lateral to the ischial tuberosity
 - Divide near the popliteal fossa into tibial and common peroneal
- ✓ **Tibial nerve**
 - Medial terminal branch of the sciatic nerve in popliteal fossa
 - Pass deeply between the two heads of gastrocnemius deep to soleus
 - Pass behind medial malleolus (with posterior tibial artery)
 - Reach the sole of the foot
- ✓ **Sural nerve (superficial)**
 - Branch of tibial nerve
 - Emerge between the two heads of gastrocnemius
 - Take a superficial course at the Back of the leg (with short saphenous vein)
 - Pass behind the lateral malleolus (superficial)
- ✓ **Common peroneal nerve**
 - Lateral terminal branch of the sciatic nerve in the popliteal fossa
 - Across the lateral head of the gastrocnemius
 - Subcutaneous just distal to the head of the fibula
- ✓ **Superficial peroneal nerve**
 - Lateral compartment of the leg
 - Becomes subcutaneous near the middle of the leg
 - Pass superficial to extensor retinacula
- ✓ **Deep peroneal nerve**
 - Anterior compartment of the leg (with anterior tibial artery)
 - Deep to the extensor retinacula

Vessels of the lower limb

Objectives:

By the end of this lab students are expected to be able to identify the following structures:

- ✓ **Femoral artery**
 - Deep to inguinal ligament
 - Midway between ASIS and pubic tubercle
 - Femoral triangle (lateral to femoral vein)
 - Adductor canal and hiatus
 - Continue as popliteal artery
- ✓ **Profunda femoris artery**
 - Branch of femoral artery (from lateral side)
 - Pass medially behind the artery
 - Pass deep to adductor longus
- ✓ **Popliteal artery**
 - Continuation of femoral artery
 - From adductor hiatus to soleus
 - Deep to all other neurovascular structures passing through the popliteal fossa
 - Divides into anterior and posterior tibial arteries
- ✓ **Anterior tibial artery**
 - Terminal Branch of popliteal artery
 - Pass along the anterior compartment of leg (with deep peroneal nerve)
 - Pass deep to extensor retinacula
 - Continue as dorsalis pedis artery.
- ✓ **Dorsalis pedis artery**
 - Direct continuation of the anterior tibial artery
 - Pass along the dorsum of the foot
 - Just lateral to extensor hallucis longus tendon (here it can be palpated)
- ✓ **Posterior tibial artery**
 - Terminal Branch of popliteal artery
 - Pass along the posterior compartment of leg (with tibial nerve)
 - Pass behind medial malleolus where it can be palpated
 - Enter the sole of the foot

Joints of the lower limb

Objectives:

By the end of this lab students are expected to be able to **IDENTIFY** the following structures:

➤ Hip Joint:

- ✓ Hip bone: Acetabulum and acetabular notch
- ✓ Femur: Head and fovea capitis
- ✓ Joint capsule

➤ Knee:

- Bones forming it:
 - ✓ Femur (Lower end)
 - ✓ Tibia (upper end)
 - ✓ Patella
- Important structures:
 - ✓ Patellar ligament
 - ✓ Lateral and medial condyles of tibia (tibial plateau)
 - ✓ Lateral and medial menisci
 - ✓ Cruciate ligaments (anterior/ posterior)

Summary of important lower limb regions

Objectives:

By the end of this lab students are expected to be able to **IDENTIFY** the following structures:

➤ Femoral triangle:

- Important boundaries:
 - ✓ Inguinal ligament, Sartorius, and Adductor longus
- Important structures: (from medial to lateral)
 - ✓ Femoral canal, Femoral V., Femoral A., & Femoral N.

Note: Other structures

- ✓ Femoral Sheath
- ✓ Femoral Ring
- ✓ Saphenous opening

➤ Front of thigh:

- Important muscles:
 - ✓ Rectus femoris
 - ✓ Vastus lateralis, intermedius, and medialis
- Important structures: (deep to sartorius)
 - ✓ Femoral artery and vein
 - ✓ Saphenous nerve

➤ Medial thigh:

- Important muscles:
 - ✓ Adductor longus, brevis and magnus
- Important structures:
 - ✓ Obturator nerve
 - ✓ Adductor hiatus

➤ Gluteal region:

- Important muscles:
 - ✓ Gluteus maximus, medius, minimus/ Piriformis
- Important structures above the piriformis muscle:
 - ✓ Superior gluteal nerve and vessels
- Important structures below the piriformis muscle:
 - ✓ Sciatic nerve

Note: the upper outer quadrant of the gluteal region (gluteus medius) is a good site for performing intramuscular injection

➤ Back of the thigh:

- Important muscles:
 - ✓ Biceps femoris (lateral)
 - ✓ Semimembranosus (deep medial)/ Semitendinosus (superficial medial)
- Important structures:
 - ✓ Sciatic nerve

➤ Popliteal fossa:

- Important boundaries:
 - ✓ Muscles of the Back of thigh
 - ✓ Gastrocnemius
- Important structures:
 - ✓ Tibial nerve/ Common peroneal nerve
 - ✓ Popliteal vein and artery

➤ Front of knee:

- Important landmarks:
 - ✓ Patella/ Patellar ligament
 - ✓ Tibial tuberosity

➤ Front of leg:

- Medially:
 - ✓ Shaft of tibia (subcutaneous medial surface)
 - ✓ Great saphenous vein/ Saphenous nerve
- Laterally: (anterior compartment of leg)
 - ✓ Muscles
 - ✓ Anterior tibial artery
 - ✓ Deep peroneal nerve

➤ **Dorsum of the foot:**

- Important landmarks:
 - ✓ Tendon of extensor hallucis longus
- Important structures:
 - ✓ Dorsalis pedis artery

➤ **Lateral compartment of leg:**

- Important muscles:
 - ✓ Peroneus longus/ Peroneus brevis
- Important structures:
 - ✓ Neck of fibula
 - ✓ Bifurcation of common peroneal nerve
 - ✓ Superficial peroneal nerve

➤ **Posterior compartment of leg:**

- Important muscles:
 - ✓ Gastrocnemius/ Soleus
 - ✓ Deep muscles
- Important structures:
 - ✓ Tibial nerve
 - ✓ Posterior tibial artery
 - ✓ Calcaneal tendon

➤ **Nerve supply of the lower limb muscles:**

1. **Anterior thigh:** Femoral nerve
2. **Medial thigh:** Obturator nerve except hamstring part of adductor Magnus (tibial N)
3. **Posterior thigh:** Tibial nerve except short head of biceps (common peroneal)
4. **Posterior leg:** Tibial
5. **Anterior leg:** Deep peroneal
6. **Lateral leg:** Superficial peroneal

➤ **Structures passing behind medial malleolus**

1. Tibialis posterior
2. flexor Digitorum longus
3. posterior tibial Artery
4. posterior tibial Vein,
5. tibial Nerve,
6. flexor Hallucis longus