LOWER LIMB

COURSE CONTENT

COMPETENCIES

The first year medical student should be able to understand and describe the gross anatomy of the various regions, bones, joints, muscles, vessels and nerves of lower limb, demonstrate the actions of the muscle groups at various joints, correlate the anatomical basis of clinical manifestations of nerve injuries and fractures of lower limb and demonstrate the radiological anatomy of lower limb.

REGION

Gluteal; Femoral triangle; Adductor canal; Compartments of thigh, leg; Popliteal fossa; Sole; Arches of foot

Definition, location, boundaries, major contents; gluteal IM injections

Level 2: Details with relations and functional importance of individual structures; Gait - normal and walking cycle; Femoral hernia; Gluteal abscess

Level 3: Applied aspects of adductor canal – Site for femoral artery ligation for popliteal aneurysms; Common peroneal nerve injuries; Gait–abnormal

OSTEOLOGY

Identification, region, anatomical position; parts, joints formed, development of long bones For tarsals - identification of individual tarsals in an articulated foot

Level 2: Description, attachments, relations; Blood supply to long bones, blood supply to head of femur**;** Fracture neck of femur – intra and extra-capsular; calcaneal spur

Level 3: Applied aspects: Bony specialization for bipeds; Walking and transmission of weight; Comprehending the value of phylogeny and embryology in the study of lower limb; Fracture, angle of femoral torsion, neck shaft angle, bone grafts

ARTHROLOGY

Hip, knee, ankle, subtalar

Bones taking part; Classification of joints; Movements with muscles causing movements

Level 2: Details of structure with functional correlation e.g. Axis of movement, understanding mechanics movement of various joints; especially of hip and knee joint, Interosseous membrane, retinacula, bursae; ligaments of foot; Trendelenburg test; Knee joint : derangement, injury to cruciate ligaments, menisci; (tear - bucket handle type); Ankle : Sprain

Level 3: Applied aspects; Hip joint : dislocation, congenital, traumatic, surgical approach to joints (anatomical basis), traumatic effusion, bursitis

MYOLOGY

Attachments, nerve supply, actions of:

Gluteus maximus, gluteus medius, gluteus minimus, iliopsoas, quadriceps femoris, sartorius, adductors, hamstrings, popliteus, invertors, evertors, plantar flexors (soleus, gastrocnemius), dorsiflexors, iliotibial tract

Level 2: Details, relations, with functional correlation, Remaining muscles including the muscles of the sole
Level 3: Applied aspects: Tendon transplant; Muscle specialization - calf pump; Antigravity muscles (in relation to weight transmission); EMG and muscle testing; Tendon rupture

ANGIOLOGY

Artery: Femoral, profunda femoris, popliteal, dorsalis pedis
Commencement, course, branches, termination, main area of supply
Veins: Venous drainage of lower limb, great and small saphenous veins - communications and valves
Lymphatics: Inguinal group of lymph nodes
Level 2: Details and relations, functional correlation, presence and absence of collaterals in certain areas, mechanism of venous return
Level 3: Applied aspects: Development – axial artery; Intermittent claudication; Clinical significance of anastomosis – around knee, cruciate, trochanteric; Venous thrombosis

NEUROLOGY

Plexus – Lumbar and sacral
Location, formation, distribution
Nerves – Root value of sciatic, femoral, obturator, tibial, common peroneal nerves; Origin, course, distribution; sciatica, foot drop
Level 2: Details of individual components; Root value of other nerves and details; Dermatomes
Level 3: Development of limb buds and preaxial, postaxial borders of limb bud;
Explain causation of dipping gait, pes cavus, equinovarus, clawing of toes, meralgia paraesthetica; Nervous control of walking and running

ANATOMY PRACTICALS

SURFACE LIVING ANATOMY

BONY LANDMARKS (PALPATION OF): Anterior superior iliac spine, iliac crest, tubercle of the iliac crest, ischial tuberosity, greater trochanter, adductor tubercle, head and neck of fibula, lateral and medial malleoli, tibial tuberosity, subcutaneous surface of tibia, patella

JOINTS (DEMONSTRATION OF MOVEMENTS): Hip, knee, ankle, subtalar

MUSCLES (DEMONSTRATION OF ACTION):
Hip - Flexors, extensors, abductors, adductors
Knee – Flexors, extensors
Ankle – Dorsiflexors, plantar flexors
Subtalar – Invertors, evertors

TENDONS: Semitendinosus, semimembranosus, biceps femoris, iliotibial tract

NERVES: Dermatomes, sciatic, tibial, common peroneal, femoral, obturator

Level 2: Thickening of common peroneal nerve in Leprosy

VESSELS (PALPATION OF): Femoral, popliteal, dorsalis pedis, posterior tibial arteries, Great saphenous & small saphenous veins

OTHERS: Femoral triangle; Popliteal fossa,Ligamentum patellae, inguinal lymph nodes

RADIOLOGICAL ANATOMY:
LIST OF SKIAGRAMS

Region	View	Identify
Hip region	AP	Parts of hip bone, femur, Shenton's line
Thigh Knee region	AP/Lateral AP/Lateral	Condyles, adductor tubercle of femur
Leg Ankle region	AP/Lateral AP/Lateral	Tarsal bones, metatarsals
Foot	AP/Oblique	Tarsal bones, metatarsals

SECTIONAL ANATOMY

Cross-section through adductor canal, through knee joint, through ankle joint

CLINICAL, SURGICAL AND FUNCTIONAL ANATOMY
(Anatomical basis only)

NERVES

Sciatic – Gluteal intramuscular injection; Common peroneal nerve – Foot drop, common site of injury, groups of muscles involved; Femoral nerve

Level 2: Posterior dislocation of hip, Common causes of foot drop, Poliomyelitis – quadriceps paralysis

VESSELS

Femoral artery; Palpation of femoral pulse; Great saphenous vein; Superficial / deep veins; Perforators - valves, varicose veins

Level 2: Involvement of lower limb arteries in arteriosclerosis and diabetes, Thrombo-angiitis obliterans

Level 3: Gangrene of foot

BONES

Fracture - Common sites; Fracture neck femur and Pott's fractures
Level 2: Involvement of vessels and nerves

JOINTS

Hip – Posterior Dislocation
Knee – Bursitis, Menisci and cruciate ligaments
Ankle and foot – Deformities

Leonardo da Vinci
(1452 –1519)

Leonardo di ser Piero da Vinci was an Italian polymath, scientist, mathematician, engineer, inventor, anatomist, painter, sculptor, architect, botanist, musician and writer.

Leonardo has often been described as the archetype of the renaissance man whose unquenchable curiosity was equaled only by his powers of invention.

He is widely considered to be one of the greatest painters of all time and perhaps the most diversely talented person ever to have lived.