Lower Limb

- Skeleton (homologous with upper limb)
- Muscles--anterior, posterior compartments
- Nerves--sciatic, femoral
- Surface anatomy
Upper-Lower Limb Comparison

See Table M&M, Table 8.1

Frolich, Human Anatomy, Lower LImb
Frolich, Human Anatomy, Lower Limb
- Tibia--big toe side
- Fibula--little toe side
(no pronation/supination)
Ankle

- Tarsus--forms ankle joint
- Calcaneus--forms heel
Foot

- **Function:**
  - Support weight
  - Act as lever when walking

- **Tarsals**
  - **Talus = ankle**
    - Between tibia + fibula
    - Articulates with both
  - **Calcaneus = heel**
    - Attachment for Calcaneal tendon
    - Carries talus

- **Metatarsals**
  - Homologous to metacarpals

- **Phalanges**
  - Smaller, less nimble
Joints of Lower Limb

- **Hip (femur + acetabulum)**
  - Ball + socket
  - Multiaxial
  - Synovial

- **Knee (femur + patella)**
  - Plane
  - Gliding of patella
  - Synovial

- **Knee (femur + tibia)**
  - Hinge
  - Biaxial
  - Synovial
Joints of Lower Limb

- Proximal Tibia + Fibula
  - Plane
  - Gliding
  - Synovial

- Distal Tibia + Fibula
  - Slight “give”
  - Fibrous

- Ankle (Tibia/Fibula + Talus)
  - Hinge
  - Uniaxial
  - Synovial
Lower Limb Movements

- Hip
  - Flexion/extension
  - Abduction/adduction
  - Lateral/medial rotation
- Knee
  - Flexion/extension
- Ankle
  - Dorsiflexion/plantarflexion
  - Inversion/eversion
- Toes
  - Flexion/extension

- Bending on posterior side is flexion (except hip)
- Bending on anterior sided is extension (except hip)
## Anterior/Posterior compartments

<table>
<thead>
<tr>
<th>MOVEMENT</th>
<th>ANTERIOR COMPARTMENT</th>
<th>POSTERIOR COMPARTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension</td>
<td></td>
<td>Flexion</td>
</tr>
<tr>
<td>MUSCLES</td>
<td>Quads</td>
<td>Hamstrings</td>
</tr>
<tr>
<td>Shin</td>
<td></td>
<td>Gastrocs</td>
</tr>
<tr>
<td>NERVES</td>
<td>Femoral n.</td>
<td>Sciatic n.</td>
</tr>
<tr>
<td>(lumbar plexus)</td>
<td></td>
<td>(sacral plexus)</td>
</tr>
</tbody>
</table>

Frolich, Human Anatomy, Lower Limb
Thigh movements by compartment

Key:
- Red = Posterior compartment muscles
- Orange = Anterior compartment muscles
- Yellow = Medial compartment muscles of thigh and lateral compartment muscles of leg

- Adductors
- Hamstrings
- Vastus lateralis
- Vastus intermedius
- Femur
- Rectus femoris
- Intermuscular septa
- Vastus medialis

Posterior compartment of thigh (flexes leg and extends thigh)
Anterior compartment (extends leg)
Medial compartment (adducts thigh)
Posterior Thigh

- **Gluts (gluteal nn.)**
  - Maximus—extensor of thigh
  - Medius--pelvic tilt

- **Lateral rotators (spinal nn.)**
  - Piriformis syndrome

- **Hamstrings (sciatic n.)**
  - Biceps femoris
  - Semimembranous
  - Semitendinosus
Anterior thigh (femoral n.)

- Sartorius (Tailor’s muscle)
- Quads (four)
  - Rectus femoris (crosses hip)
  - 3 vastus mm. (vast--big)
Medial compartment (obturator n.)

- Adductor muscles
  - Gracilis
  - Adductor
    - Magnus
    - Longus
    - brevis

Frolich, Human Anatomy, Lower Limb
Leg movements by compartment (in leg all nn are branches of sciatic)

Key:
- Posterior compartment muscles
- Anterior compartment muscles
- Medial compartment muscles of thigh and lateral compartment muscles of leg

Lateral compartment of leg (plantar flexes and everts foot)

Posterior compartment of leg (plantar flexes foot, flexes toes)

Anterior compartment of leg (dorsiflexes foot, extends toes)
Anterior Leg (deep fibular n.)

- Fibularis (peroneus) longus
- Extensor digitorum longus
- Extensor hallucis longus
- Tibialis anterior
Lateral Leg (superficial fibular n.)

- Fibularis brevis/longus
Posterior Leg (tibial n.)

- Gastrocs and soleus
- Flexor digitorum longus
- Flexor hallucis longus
Intrinsics of foot
With leg out to side like quadruped, lumbar-anterior, sacral-posterior makes sense
Dermatomes show twisting of leg in development
**Blood supply to lower limb**

- **Internal Iliac**
  - Cranial + Caudal Gluteals = gluteals
  - Internal Pudendal = perineum, external genitalia
  - Obturator = adductor muscles

- **External Iliac**
  - Femoral = lower limb
    - Deep femoral = adductors, hamstrings, quadriceps
  - Popliteal (continuation of femoral)
    - Genicular = knee
    - Anterior Tibial = ant. leg muscles, further branches to feet
    - Posterior Tibial = flexor muscles, plantar arch, branches to toes
Surface Anatomy: Posterior Pelvis

- Iliac crest
- Gluteus maximus = cheeks
- Natal/gluteal cleft = crack
- Gluteal folds = bottom of cheek
Surface Anatomy: Anterior Thigh + Leg

- Palpate
  - Patella
  - Condyles of femur
- Femoral Triangle
  - Sartorius (lateral)
  - Adductor longus (medial)
  - Inguinal ligament (superior)
  - Femoral a + v, lymph nodes
Surface Anatomy: Posterior Leg

- **Popliteal fossa**
  - Diamond-shape fossa behind knee

- **Boundaries**
  - Biceps femoris (sup-lat)
  - Semitendinosus + semimembranosis (sup-med)

- **Contents**
  - Gastrocnemius heads (inf)
  - Popliteal a + v

- **Calcaneal (Achilles) tendon**