Musculoskeletal Anatomy

Leg & Foot

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Foot

- The skeleton of the foot includes the tarsus, metatarsus, and the phalanges (toes)

- The foot supports body weight and acts as a lever to propel the body forward in walking and running

Tarsus

• Composed of seven bones that form the posterior half of the foot

• Body weight is carried primarily on the talus and calcaneus

• Talus articulates with the tibia and fibula superiorly, and the calcaneus inferiorly

• Other tarsus bones include the cuboid and navicular, and the medial, intermediate, and lateral cuneiforms

Figure 7.31b, c
Calcaneus

- Forms the heel of the foot
- Carries the talus on its superior surface
- Point of attachment for the calcaneal (Achilles) tendon of the calf muscles

Metatarsus and Phalanges

- **Metatarsals**
  - Five (1-5) long bones that articulate with the proximal phalanges
  - The enlarged head of metatarsal 1 forms the “ball of the foot”

- **Phalanges**
  - The 14 bones of the toes
  - Each digit has three phalanges except the hallux, which has no middle phalanx
Arches of the Foot

- The foot has three arches maintained by interlocking foot bones and strong ligaments
- Arches allow the foot to hold up weight
- The arches are:
  - Lateral longitudinal – cuboid is keystone of this arch
  - Medial longitudinal – talus is keystone of this arch
  - Transverse – runs obliquely from one side of the foot to the other
Arches of the Foot

Figure 7.32

Fascia of the Leg

- A deep fascia of the leg is continuous with the fascia lata
- This fascia segregates the leg into three compartments: anterior, lateral, and posterior
- Distally, the fascia thickens and forms the flexor, extensor, and fibular retinaculae
Muscles of the Leg: Movements

- Various leg muscles produce the following movements at the:
  - Ankle – dorsiflexion and plantar flexion
  - Intertarsal joints – inversion and eversion of the foot
  - Toes – flexion and extension

Muscles of the Anterior Compartment

These muscles are the primary toe extensors and ankle dorsiflexors

- tibialis anterior
- extensor digitorum longus
- extensor hallucis longus
- fibularis tertius

Figure 10.21a
Muscles of the Anterior Compartment

These muscles plantar flex and evert the foot

They include:
- fibularis longus
- fibularis brevis

Muscles of the Lateral Compartment

These muscles plantar flex and evert the foot

They include:
- fibularis longus
- fibularis brevis
Muscles of the Lateral Compartment

Muscles of the Posterior Compartment

These muscles primarily flex the foot and the toes

They include:
- Gastrocnemius
- Soleus
- Tibialis posterior
- Flexor digitorum longus
- Flexor hallucis longus
Muscles of the Posterior Compartment

Figure 10.23b, c

GASTROCNEMIUS (Part of Tripezi Gana)

Leg—posterior view

- **Origin**: Lateral head—lateral aspect and posterior surface of distal femur; Medial head—posterior surface of femoral condyles
- **Insertion**: Posterior surface of the calcaneus
- **Action**: Plantar flexes foot, moves leg when knee is flexed and knee is extended
- **Name**: Gastrocnemius (G1, G2)

From: Stone & Stone, Atlas of Musculoskeletal Anatomy
SOLEUS

Leg—posterior view

- Origin
  Posterior surface of the distal shaft, upper third of posterior surface of fibula, fibrous arch between tibia and fibula
- Insertion
  Inferior surface of the calcaneus
- Action
  Plantar flexion
- Nerve
  Tibial nerve (S1, S2)

From: Stone & Stone, Atlas of Musculoskeletal Anatomy

PLANTARIS

Leg—posterior view

- Origin
  Anterior to supinator, ridge of femur, extensor proximal epicondyle
- Insertion
  Posterior surface of the calcaneus
- Action
  Dorsiflexion
- Nerve
  Tibial nerve (S1, S2)

From: Stone & Stone, Atlas of Musculoskeletal Anatomy
Posterior Compartment
(Tom Dick & Harry)

From: Stone & Stone, Atlas of Musculoskeletal Anatomy
Intrinsic Muscles of the Foot

• These muscles help flex, extend, abduct, and adduct the toes

• In addition, along with some leg tendons, they support the arch of the foot

• There is a single dorsal foot muscle, the extensor digitorum brevis, which extends the toes

• The plantar muscles occur in four layers
Plantar Muscles: First Layer (Superficial)

These muscles are similar to the corresponding muscles of the hand.

Plantar Muscles: Second Layer
Plantar Muscles: Third Layer

(6) Third layer

Plantar Muscles: Fourth Layer

(e) Fourth layer: plantar interossei (f) Fourth layer: dorsal interossei