OSTEOLOGY OF TIBIA

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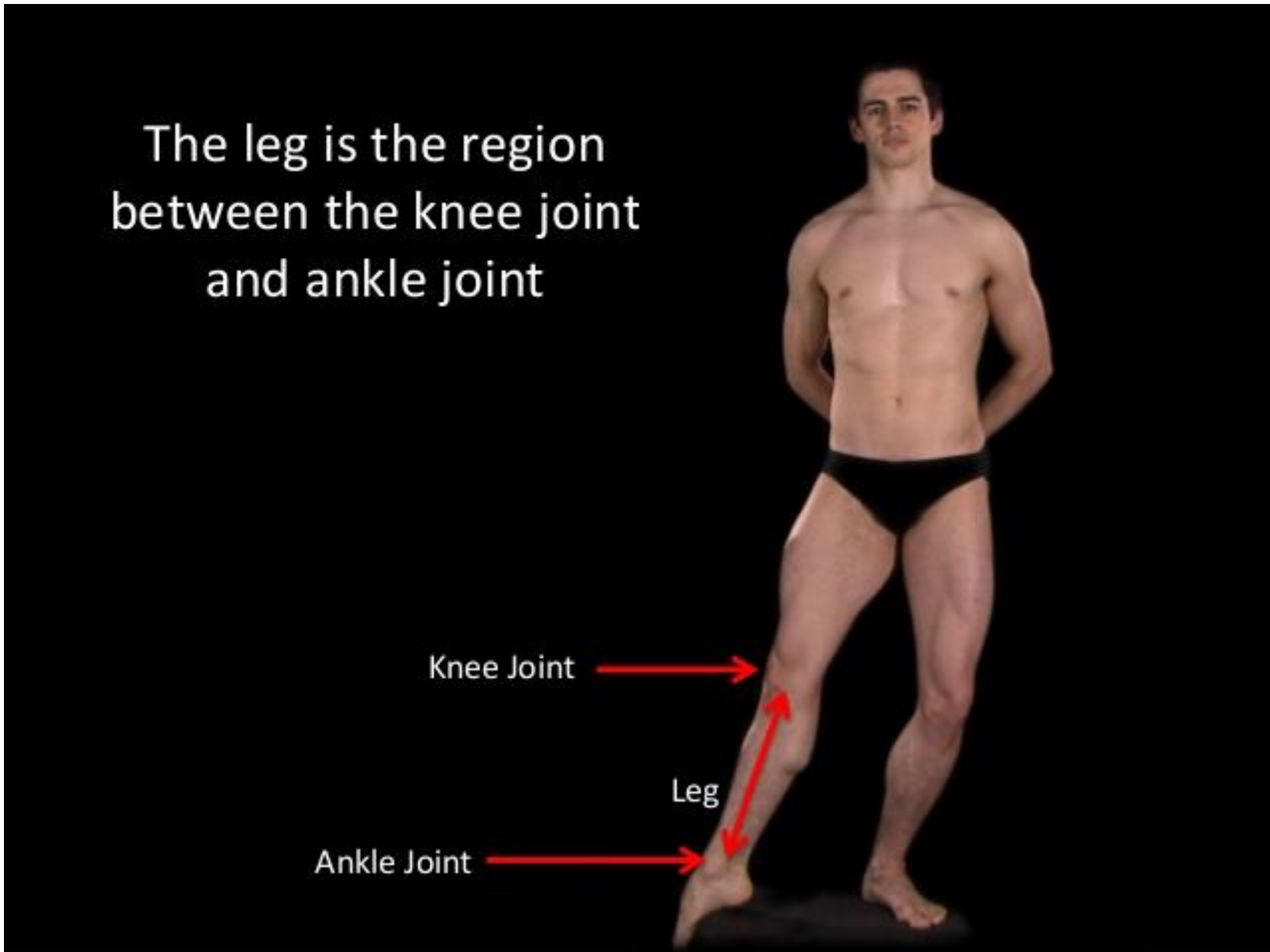
The leg is the region between the knee joint and ankle joint



There are two bones in the leg

There are two bones in the leg

Tibia

There are two bones in the leg

Fibula

There are two bones in the leg

The Fibula

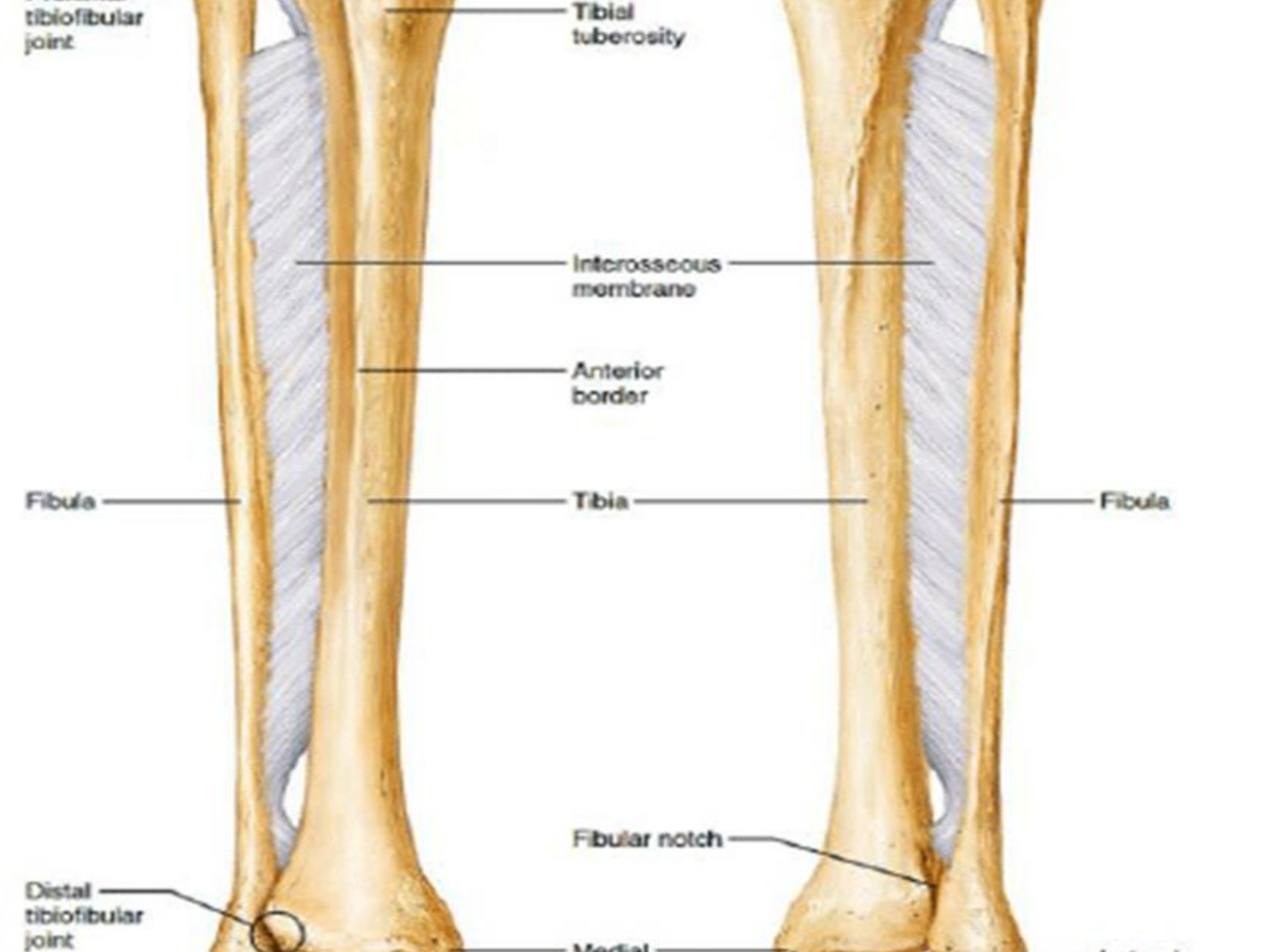
- Lies Laterally
- Is shorter
- Is not a weight-bearing bone

There are two bones in the leg

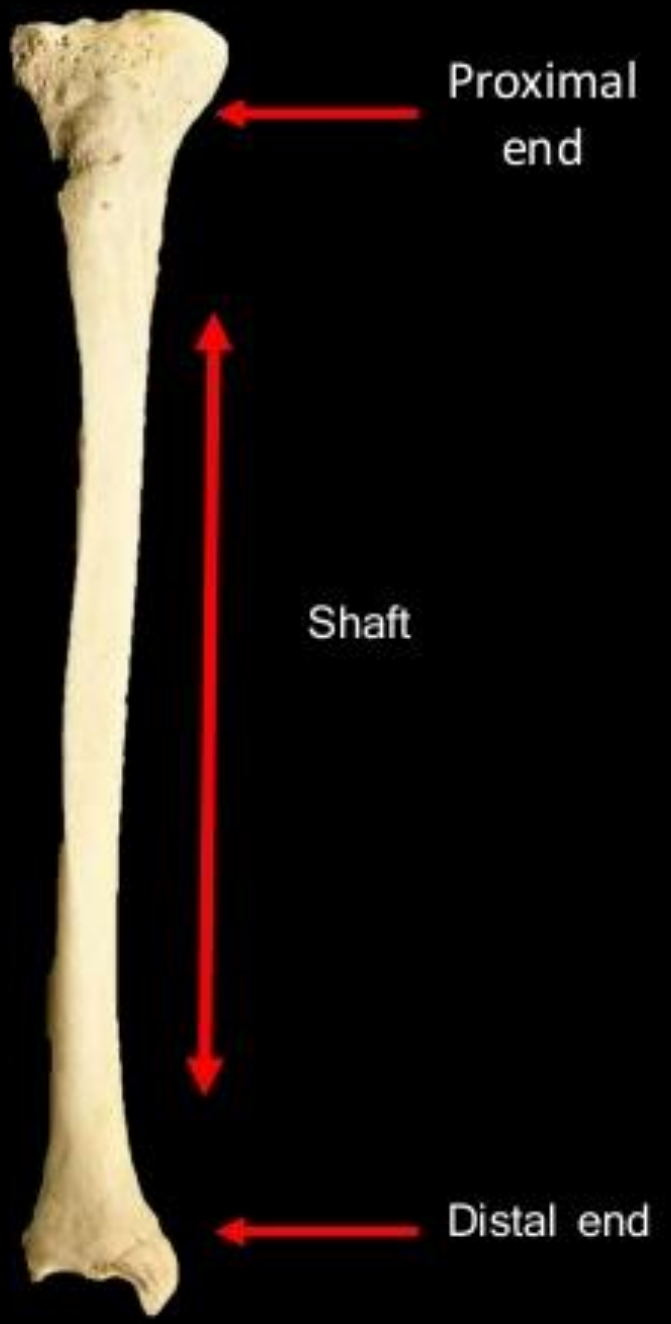
The Tibia

- Lies medially
- Is longer than the fibula
- Is a weight-bearing bone
- Is derived from the Latin word meaning flute

The Fibula and Tibia are held together by the Interosseous Membrane

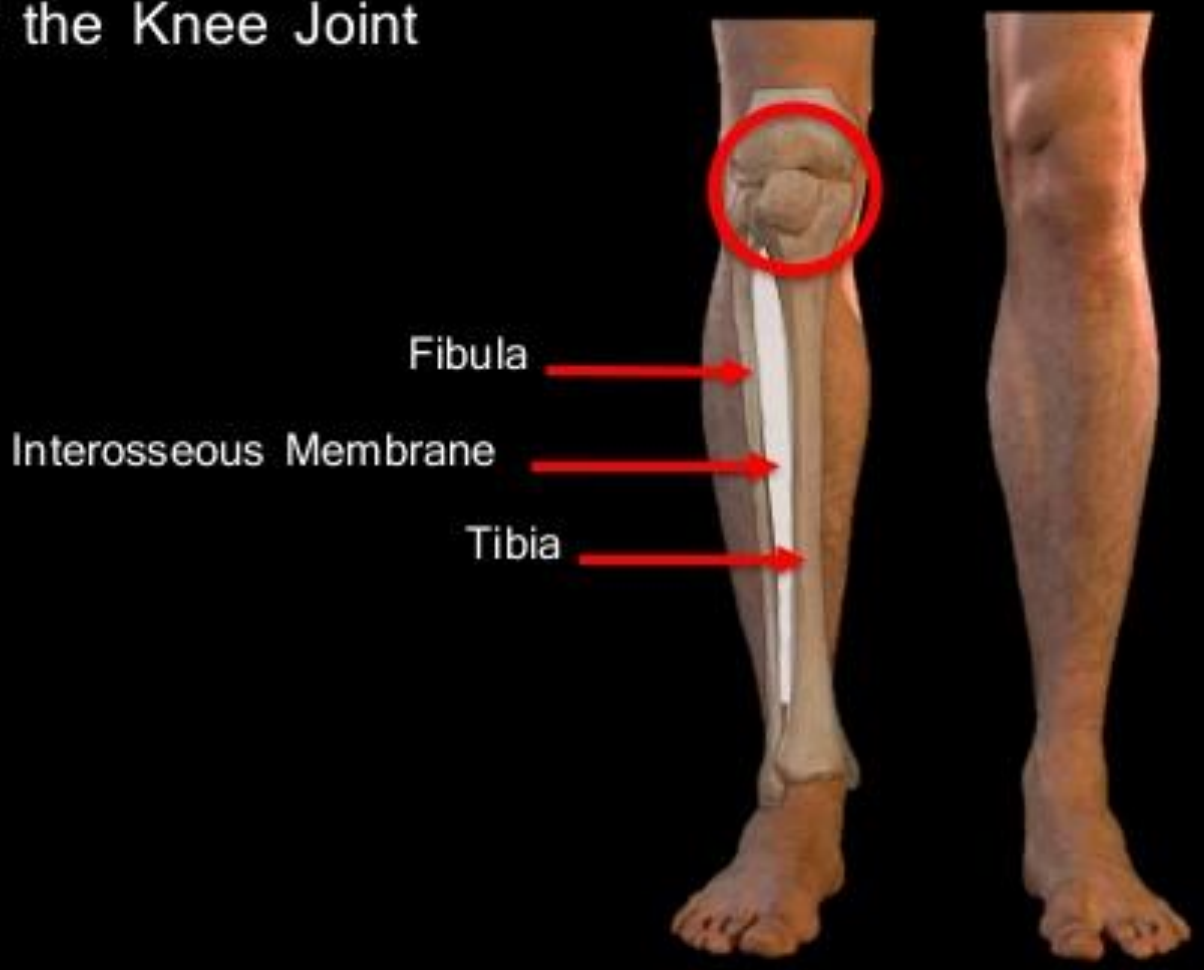

tibiofibular joint
Tibial tuberosity
Interosseous membrane
Anterior border
Fibula
Tibia
Fibula
Fibular notch
Distal tibiofibular joint

The Tibia is a long bone with expanded proximal and distal ends with a shaft in between



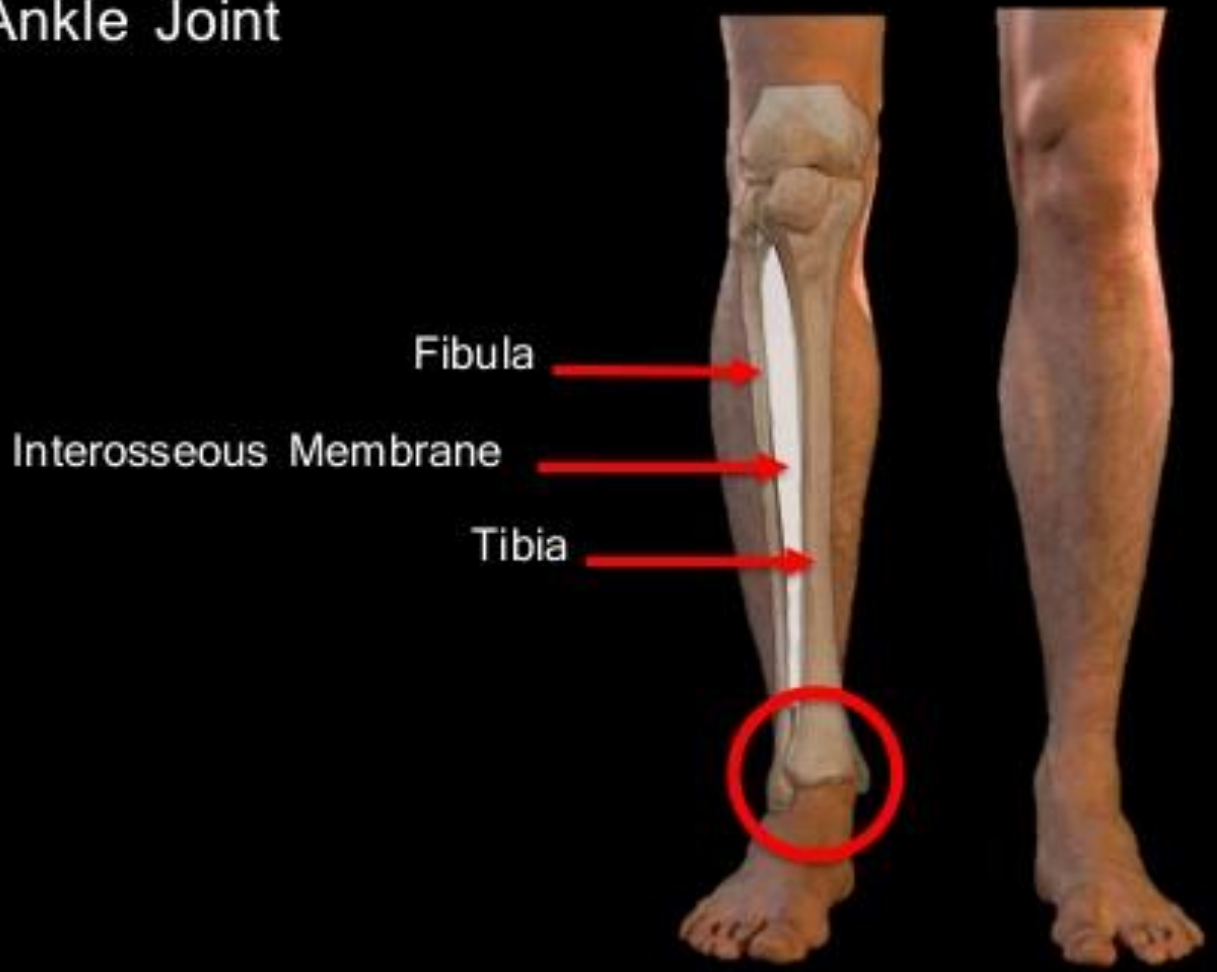
right Tibia, anterior view

The Tibia articulates proximally at the Knee Joint



right Tibia, anterior view

The Tibia articulates distally at the Ankle Joint



right Tibia, anterior view

The Proximal Tibia

Proximal Tibia

right Tibia

Anterior View

Posterior View

Proximal Tibia

right Tibia

Anterior View

The proximal end of the Tibia has two shelf-like projections known as Condyles

UPPER END

- The upper end of the tibia is markedly expanded from side to side, to form two large condyles which overhang the posterior surface of the shaft.
- The upper end includes:
  - (a) A medial condyle,
  - (b) A lateral condyle,
  - (c) An **intercondylar area**,
  - (d) A tuberosity.

Proximal Tibia

right Tibia

Medial Tibial Condyle

Anterior View

Posterior View

Proximal Tibia

right Tibia

Lateral Tibial Condyle

Anterior View

Posterior View

Proximal Tibia

right Tibia

Bird's-Eye View

anterior

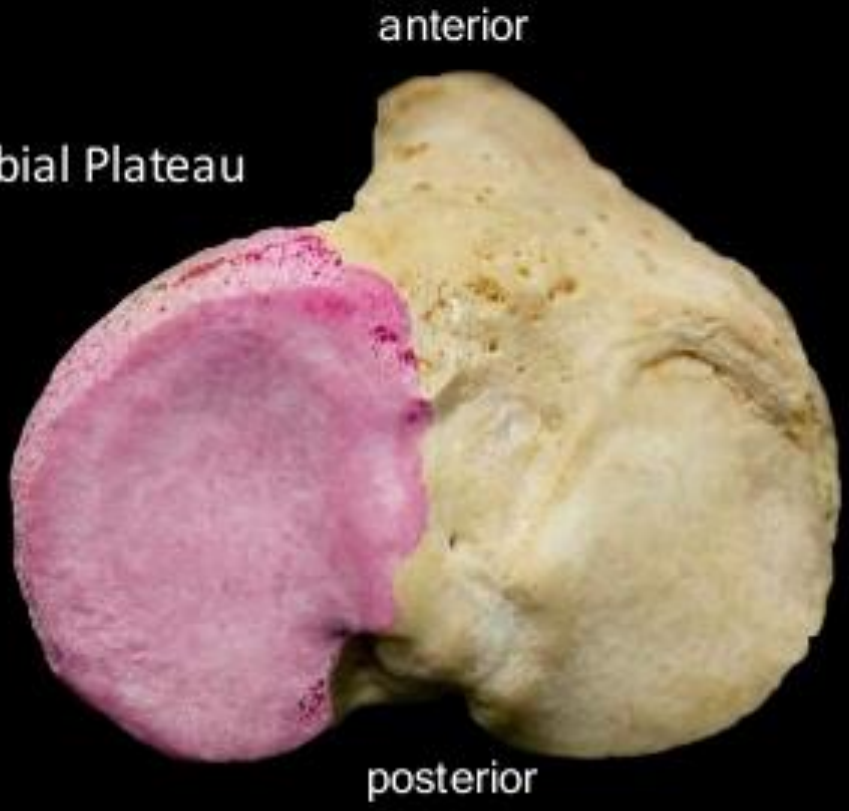
posterior

The upper surface of the Tibia is referred to as the Tibial Plateau

Proximal Tibia

right Tibia

Bird's-Eye View

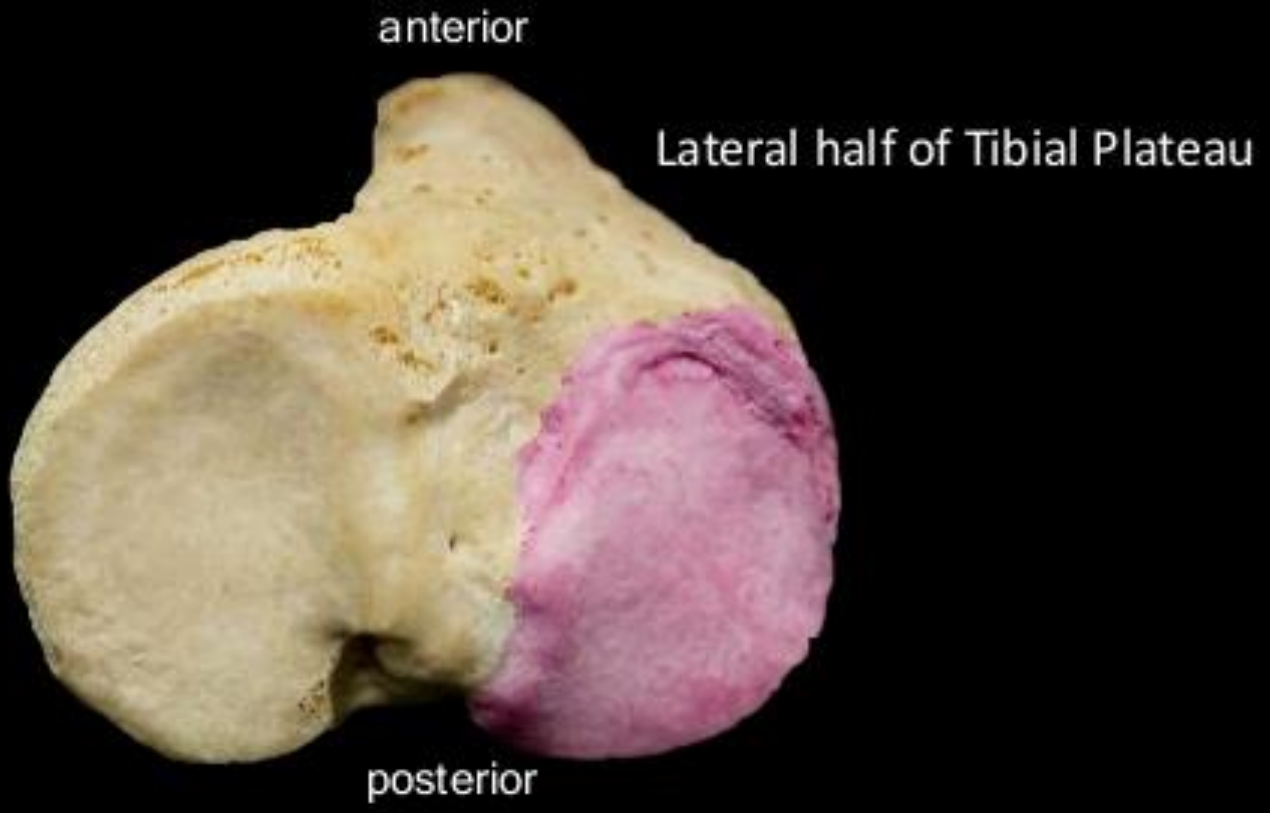


The upper surface of the Tibia is referred to as the Tibial Plateau

Proximal Tibia

right Tibia

Bird's-Eye View

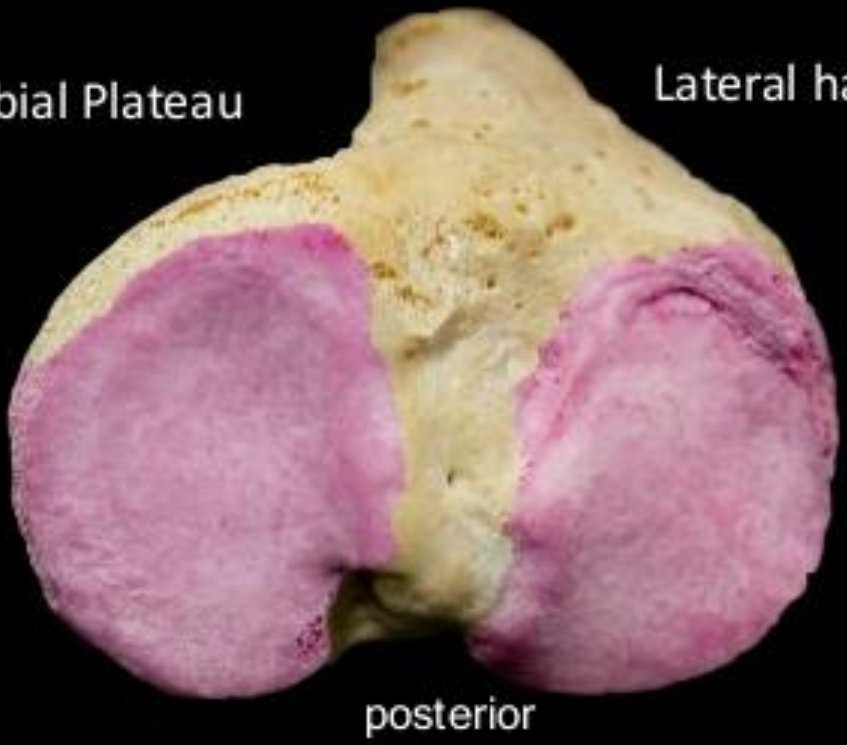


The upper surface of the Tibia is referred to as the Tibial Plateau

Proximal Tibia

right Tibia

Bird's-Eye View

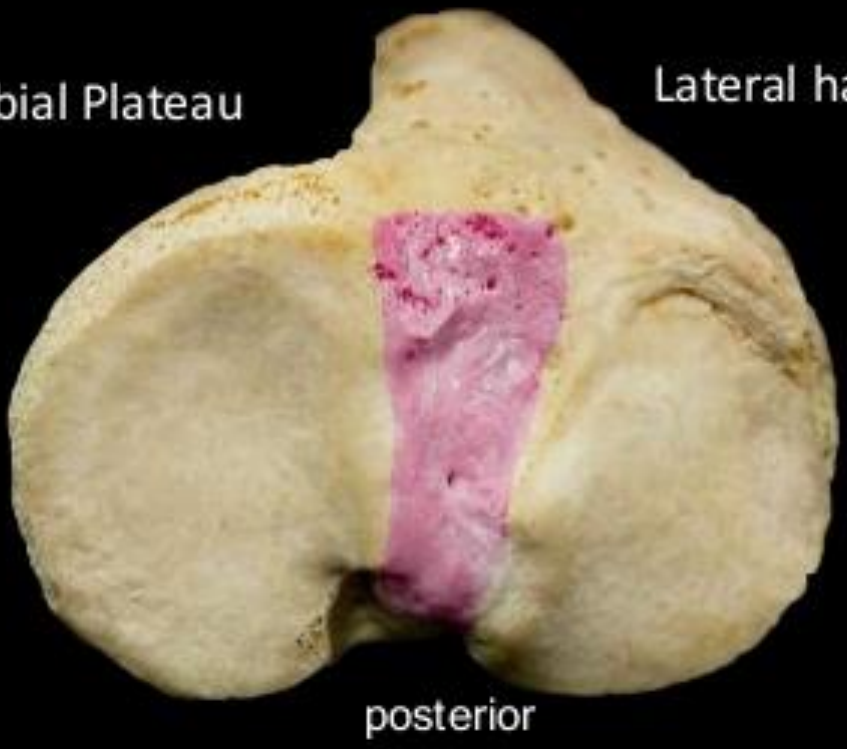


The Tibial Plateau has two articular facets that articulate with the Condyles of the Femur

Proximal Tibia

right Tibia

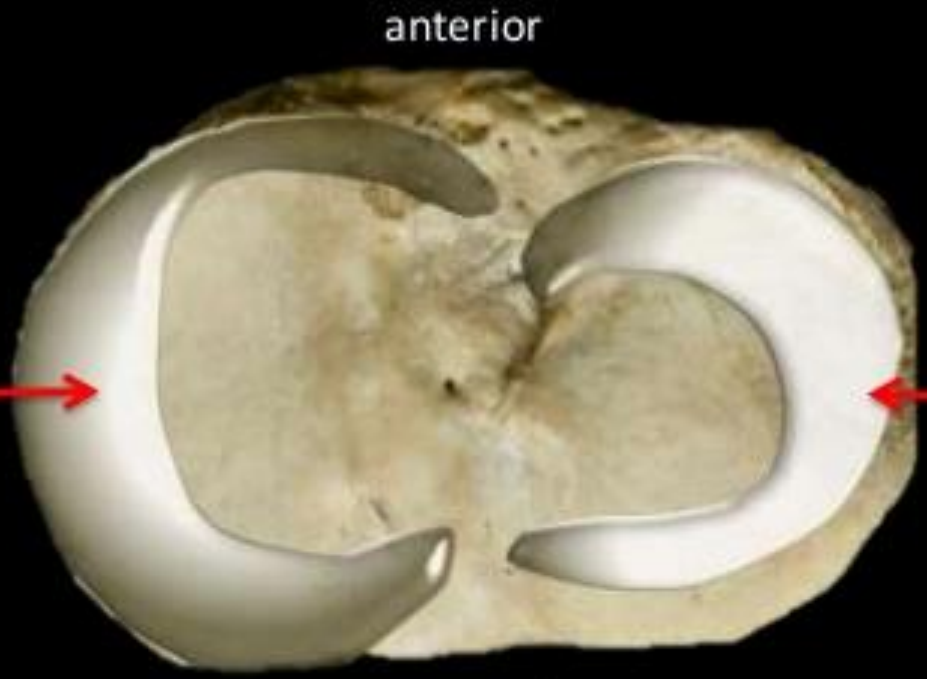
Bird's-Eye View



Between the facets is a non-articular area that features the Intercondylar Eminence also known as the Tibial Spine

Menisci

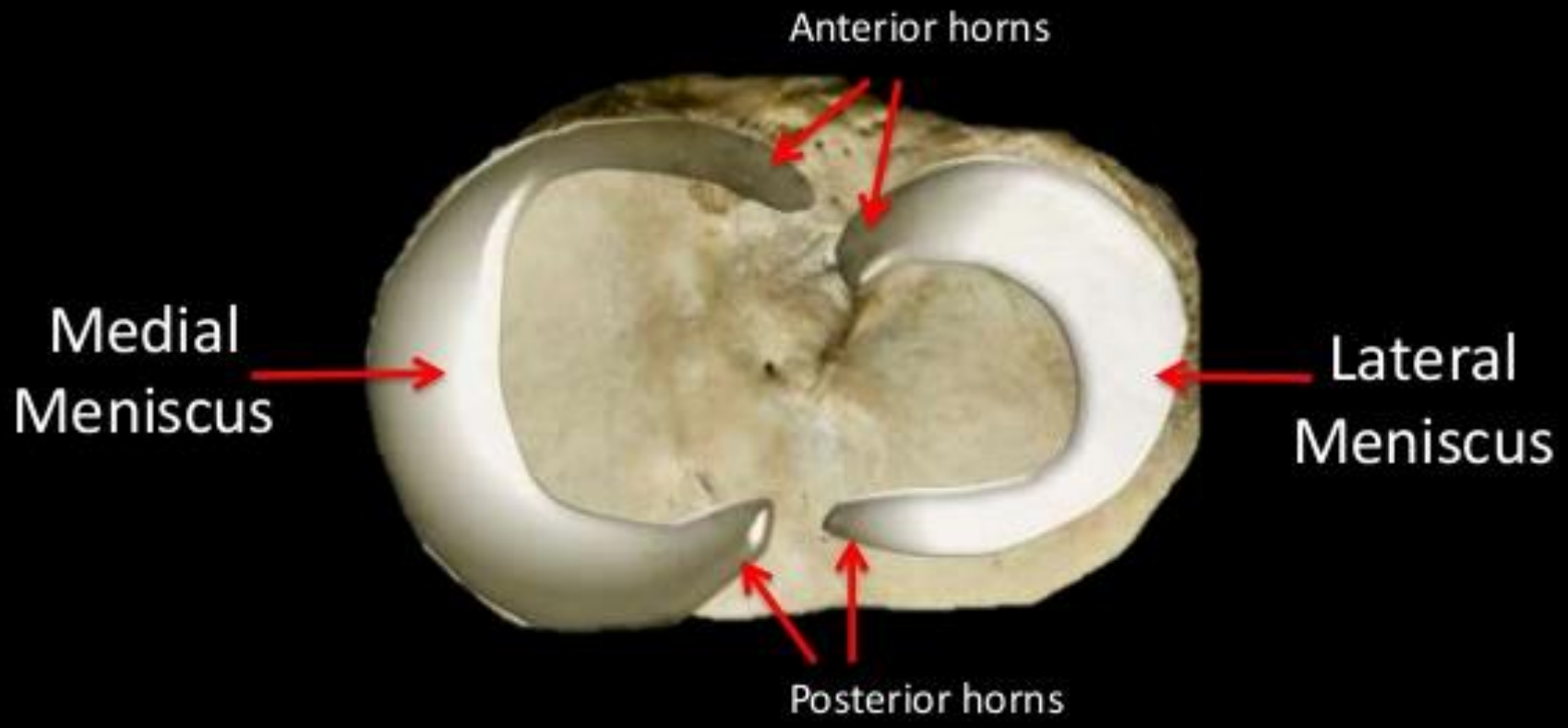
2 crescent-shaped intra-capsular fibrocartilaginous structures situated one on each Tibial Facet



Superior view proximal Tibia

Menisci

Each meniscus has an anterior and posterior horn that provide attachments to stabilise the meniscus



Superior view proximal Tibia

Menisci are wedge-shaped in cross-section

The menisci widen and deepen the Tibial articular surface that receives the Femoral Condyles

Proximal Tibia

right Tibia

Posterior View

Medial

Lateral

Between the facets is a non-articular area which features the Intercondylar Eminence also known as the Tibial Spine

Proximal Tibia

right Tibia

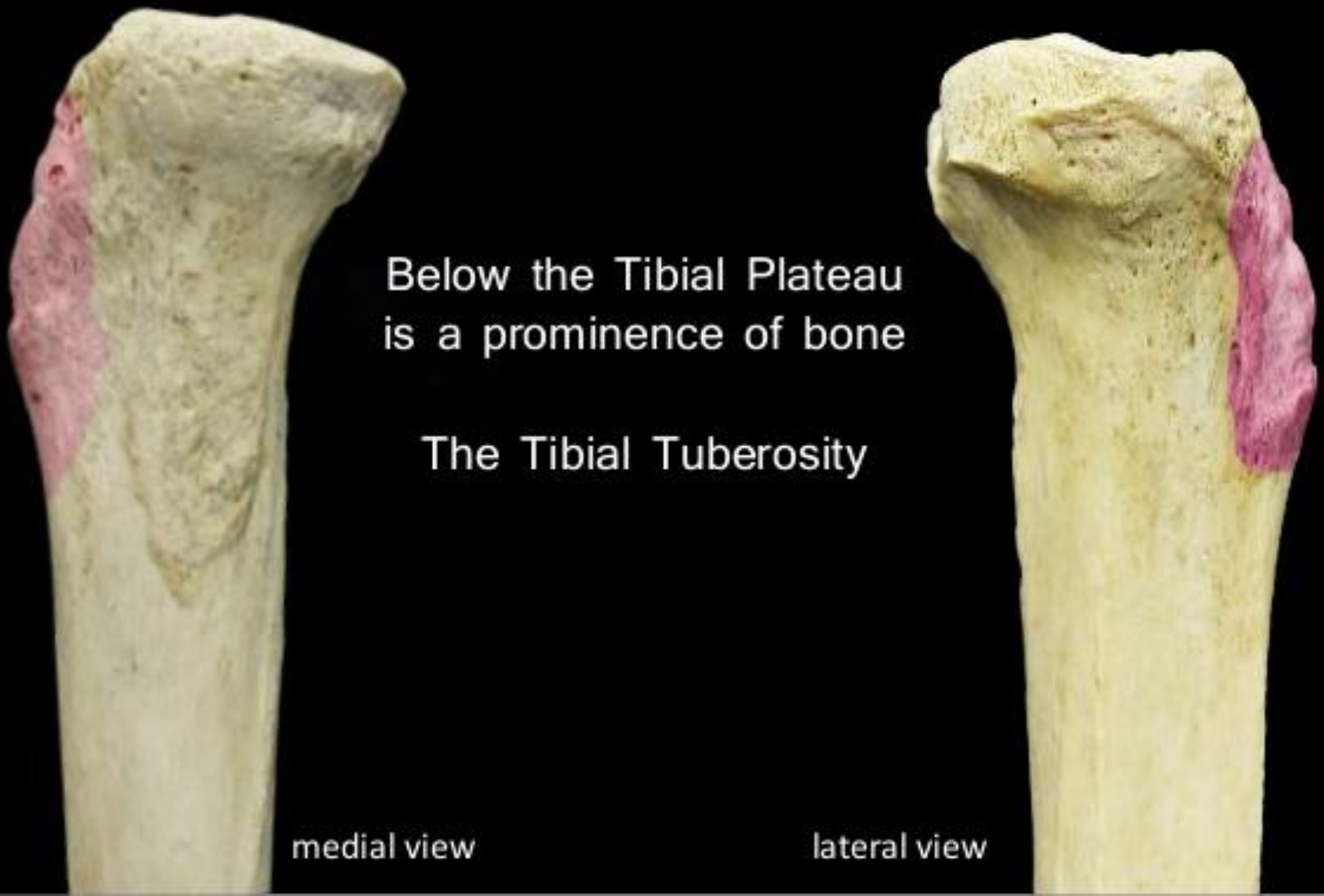
Anterior View

Anteriorly, below the Tibial Plateau is a prominence of bone

The Tibial Tuberosity

Proximal Tibia

right Tibia



Below the Tibial Plateau
is a prominence of bone

The Tibial Tuberosity

medial view

lateral view

Proximal Tibia

right Tibia

Gerdy's Tubercle is a faceted prominence on the anterior surface of the Lateral Tibial Condyle

It receives the distal end of the Iliotibial Tract (band)

Proximal Tibia
Posterior View

right Tibia

medial

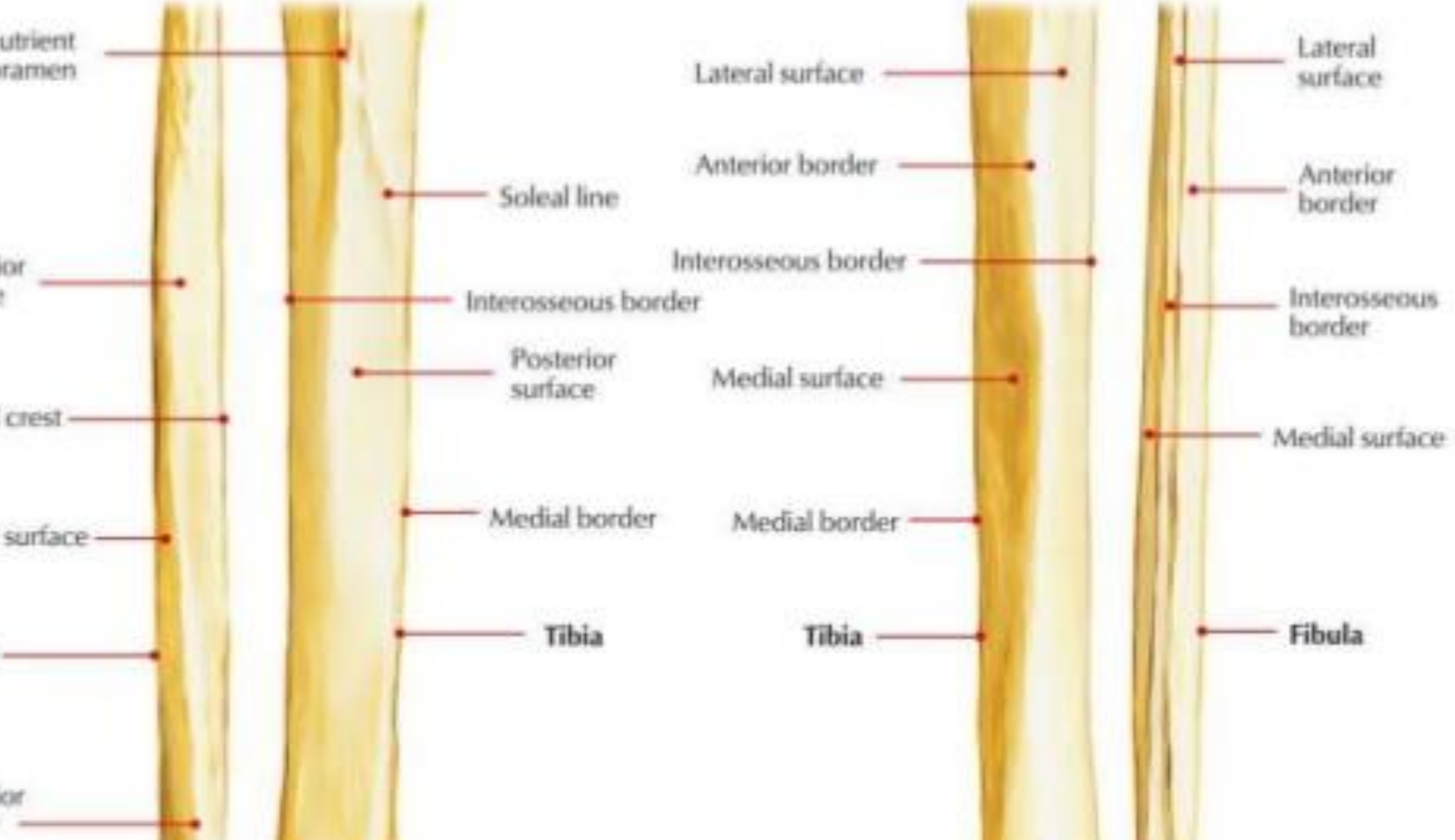
lateral

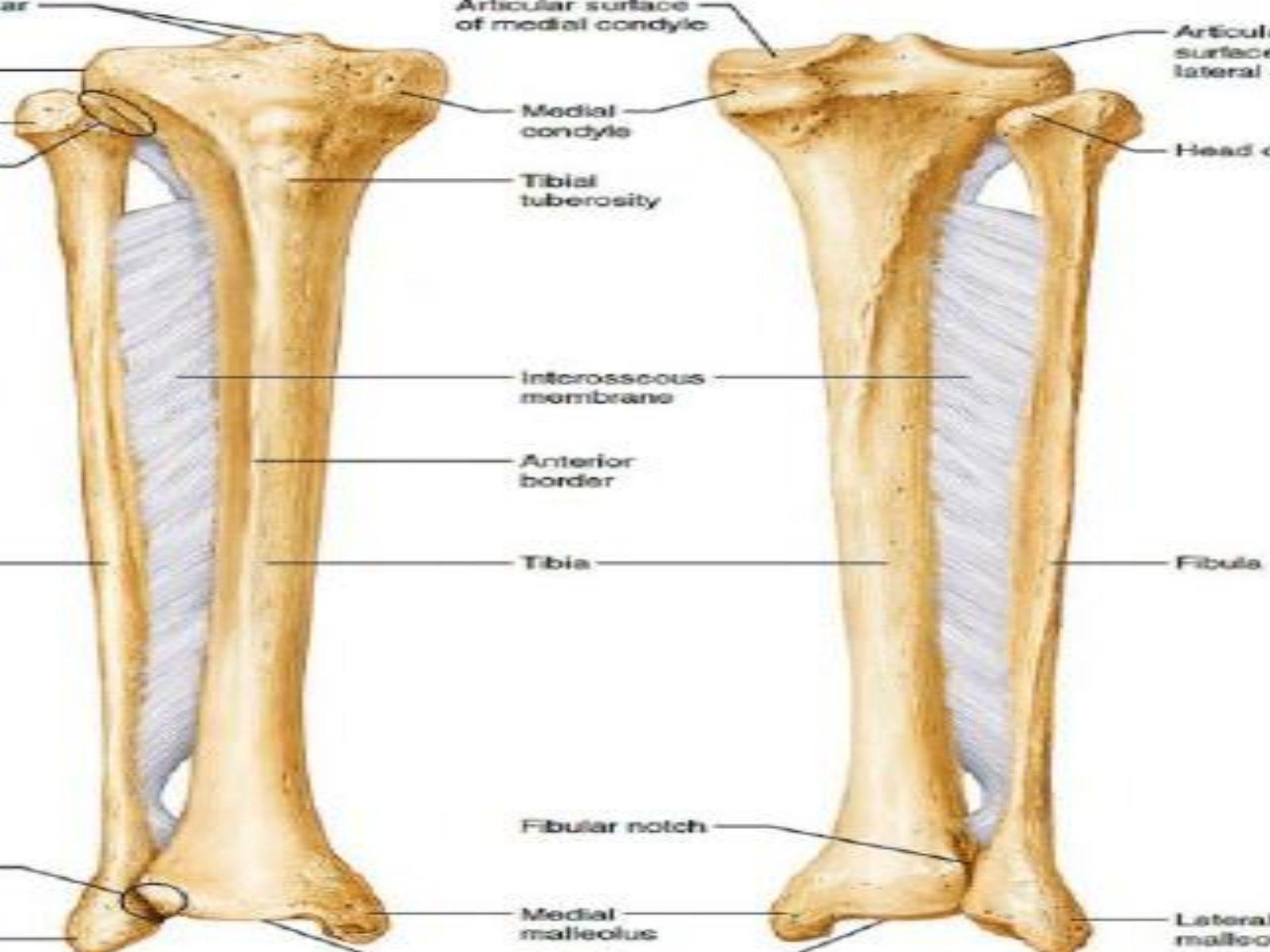
Soleal Line

Provides attachment for the Soleus Muscle

Tibial Shaft

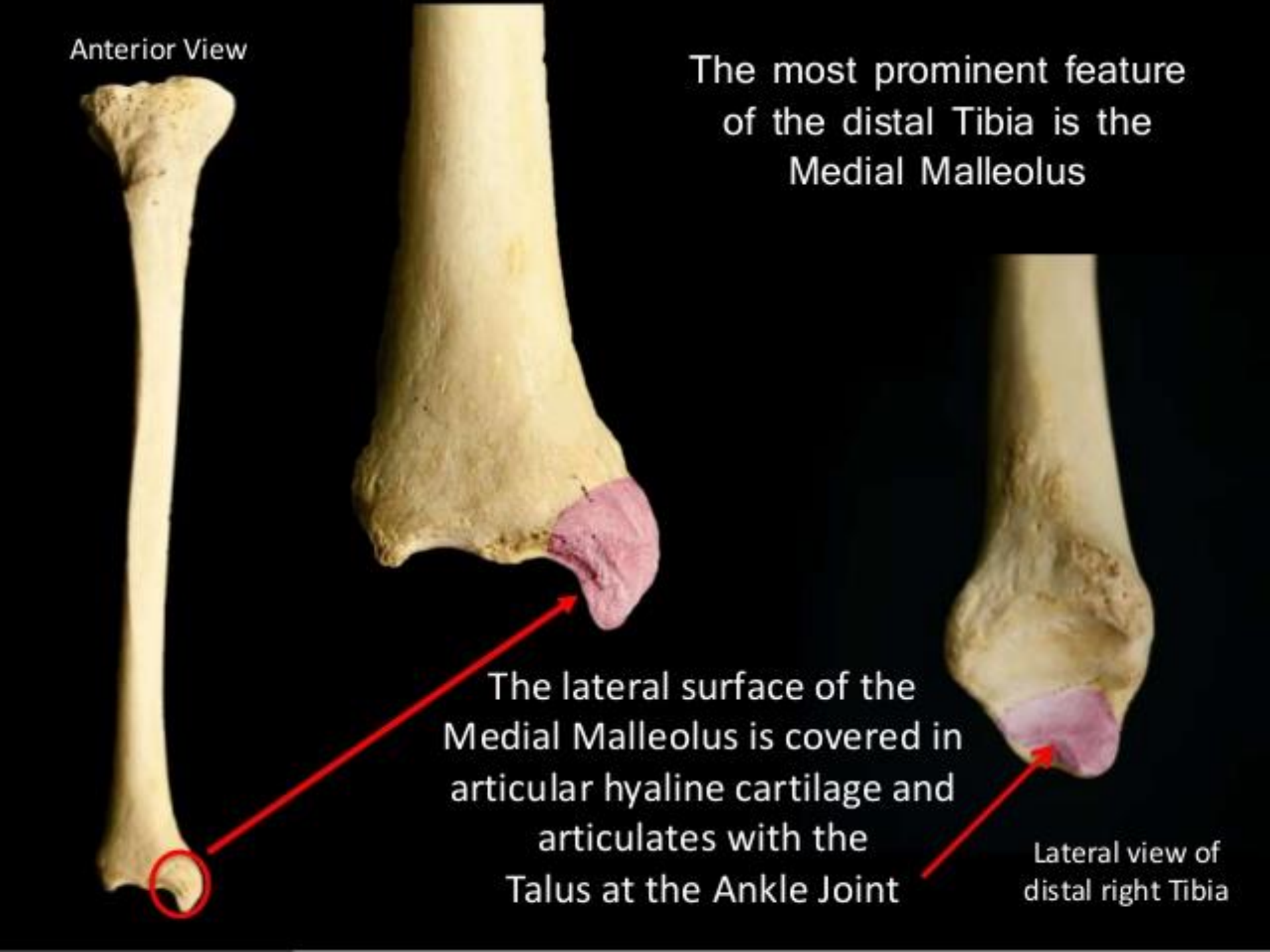
ee borders: anterior, medial and interosseous;
ee surfaces: lateral, medial and posterior.

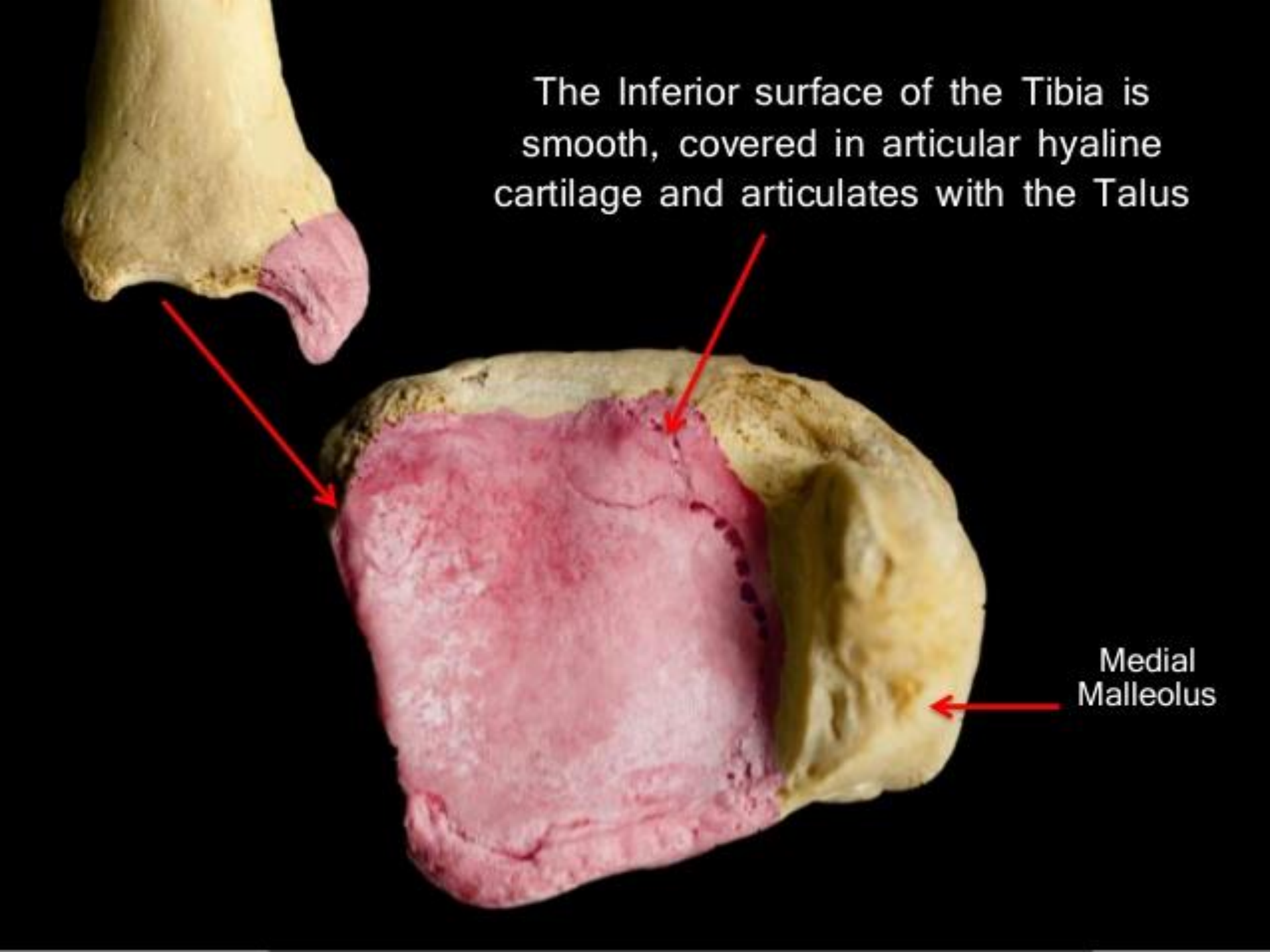



Articular surface of medial condyle
Medial condyle
Tibial tuberosity
Interosseous membrane
Anterior border
Tibia
Fibular notch
Medial malleolus
Fibula

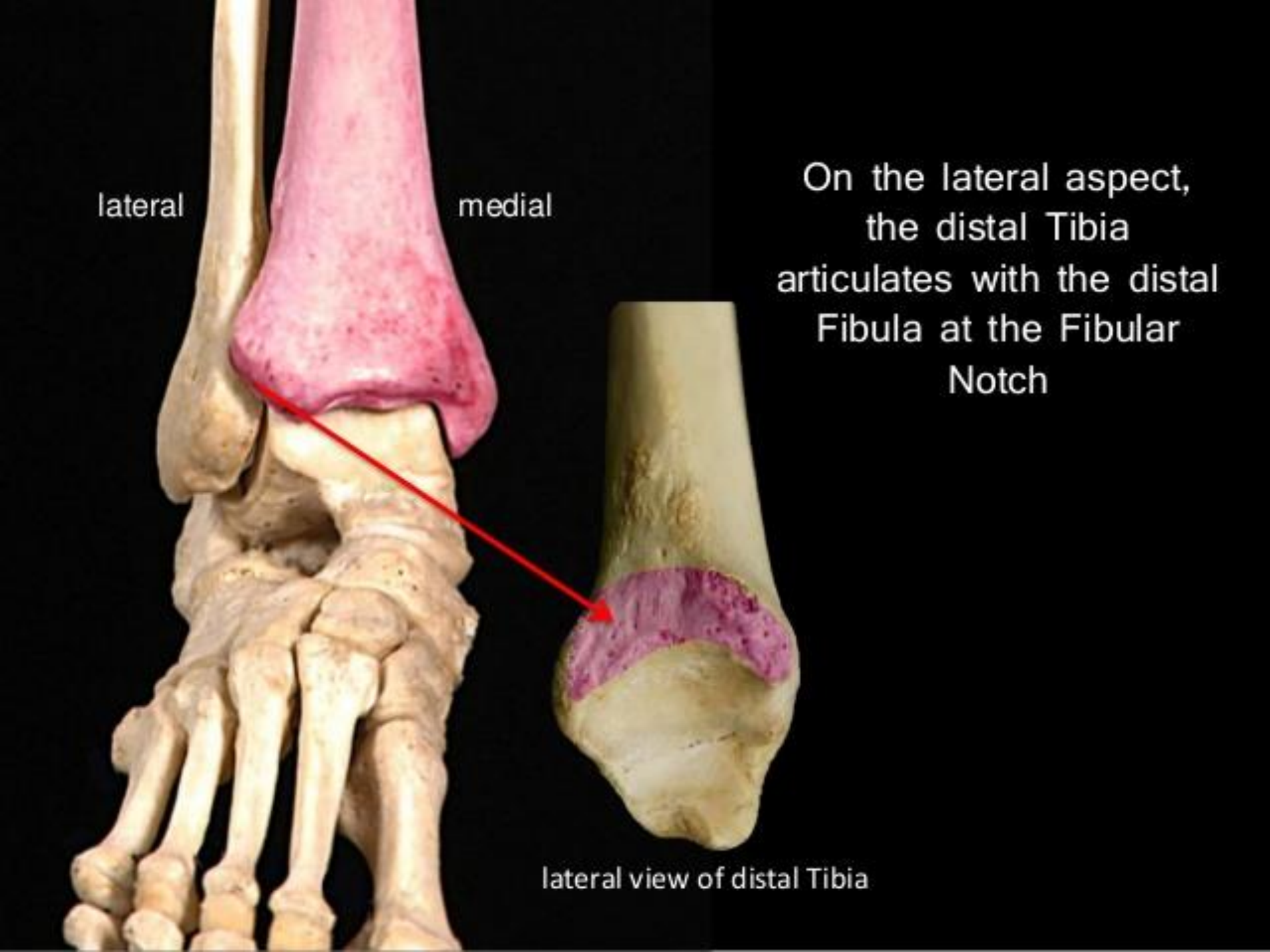
Distal Tibia

The most prominent feature of the distal Tibia is the Medial Malleolus


Anterior View
The most prominent feature of the distal Tibia is the Medial Malleolus
The lateral surface of the Medial Malleolus is covered in articular hyaline cartilage and articulates with the Talus at the Ankle Joint
Lateral view of distal right Tibia


The Inferior surface of the Tibia is smooth, covered in articular hyaline cartilage and articulates with the Talus
Medial Malleolus

The Tibia and Medial Malleolus form the medial part of the articulation of the Ankle Joint


lateral
medial
On the lateral aspect, the distal Tibia articulates with the distal Fibula at the Fibular Notch
lateral view of distal Tibia

Muscle Attachments

MUSCLES

- Illio tibial tract
- Tibialis anterior
- Tibialis posterior
- Semimembranosus
- Semitendinosus
- Sartorius
- Gracillis
- Popliteus
- Soleus
- Flexor digitorum longus

Iliotibial Band or Tract

Proximal Tibia
Anterior View

Proximally it receives two muscles

- Tensor Fasciae Latae
- Gluteus Maximus

Iliotibial Band or Tract

Distally inserts onto
Gerdy's Tubercle

Proximal Tibia
Anterior View

Proximal Tibia
Lateral View

posterior

anterior

Iliotibial Band or Tract

Distally inserts onto
Gerdy's Tubercle

Tibialis Anterior

Originates from

- Lateral Condyle of Tibia
- proximal 2/3^{rds} of lateral surface of Tibia
- Interosseous membrane

Proximal Tibia
Anterior View

Tibialis Anterior

lateral

medial

Originates from

- Lateral Condyle of Tibia
- proximal 2/3^{rds} of lateral surface of Tibia
- Interosseous membrane

Inserts onto Medial Cuneiform and base of 1st Metatarsal


TIBIALIS ANTERIOR
EXTENSOR DIGITORUM LONGUS
EXTENSOR HALLUCIS LONGUS
Superior extensor retinaculum
Inferior extensor retinaculum
TIBIALIS ANTERIOR
EXTENSOR DIGITORUM LONGUS
EXTENSOR HALLUCIS

Proximal right Tibia
Posterior View

Tibialis Posterior

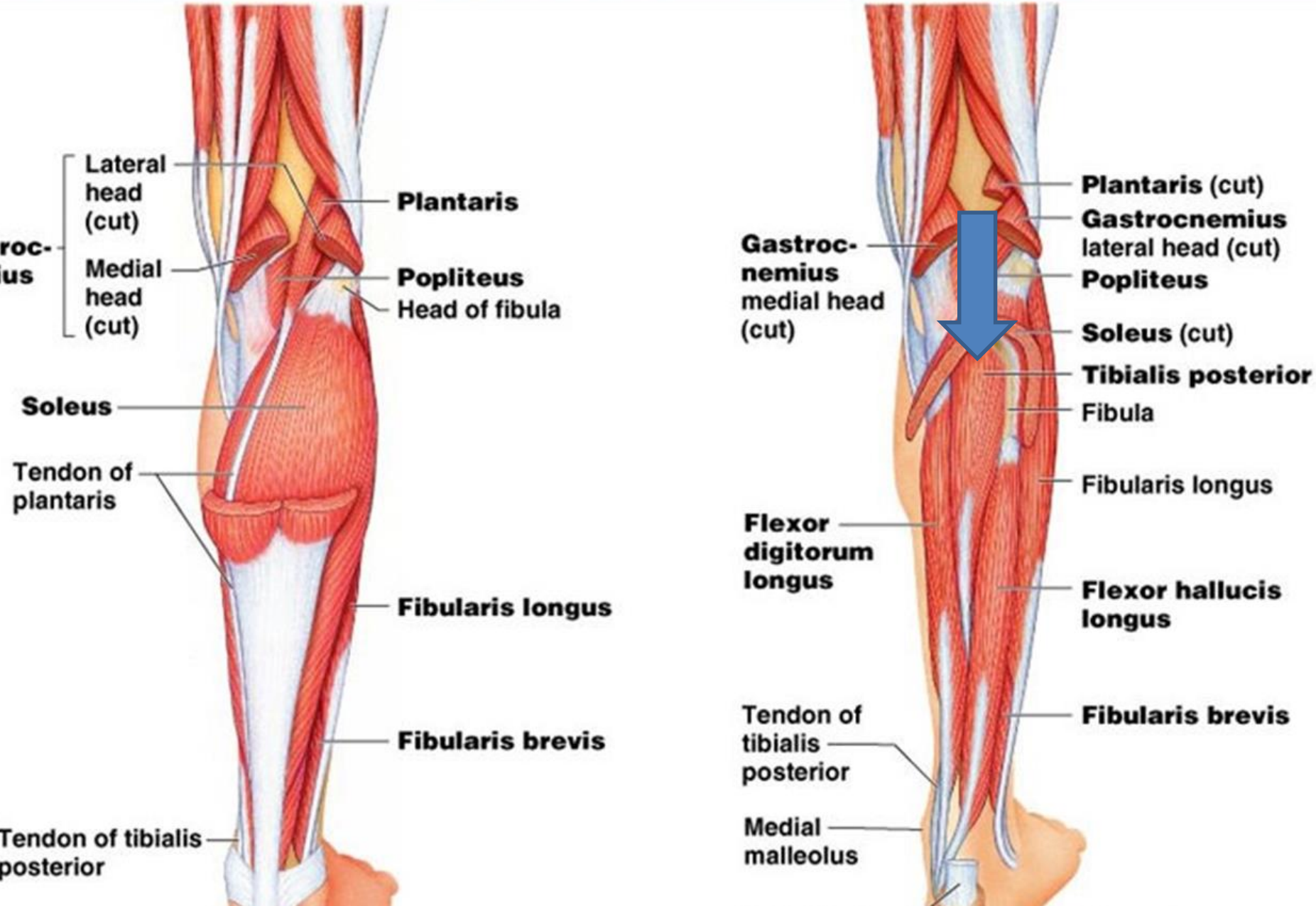
Originates from

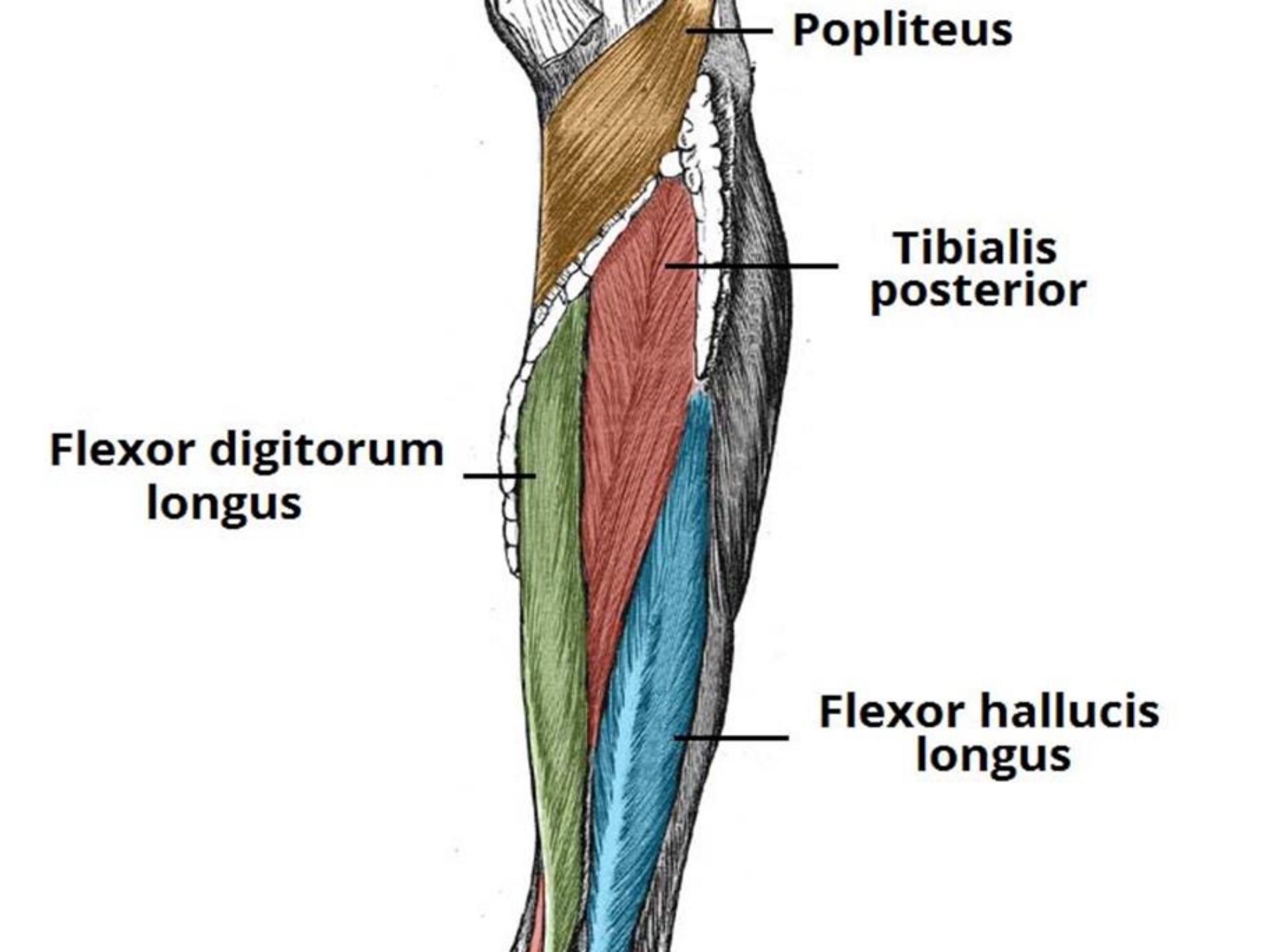
- Posterior aspect interosseous membrane
- superior half of posterior surface of tibia distal to soleal line
- medial half of posterior surface of fibula

Inserts onto tuberosity of the navicular with extensions to other tarsal bones and metatarsals 2 - 4

Inverts, adducts, supinates foot
Plantar flexes ankle

scles of the Posterior Compartment




Popliteus
Tibialis posterior
Flexor digitorum longus
Flexor hallucis longus

Proximal right Tibia
Posterior View

Semimembranosus

Originates from superior lateral quadrant on the posterior surface of the Ischial Tuberosity

Proximal right Tibia
Posterior View

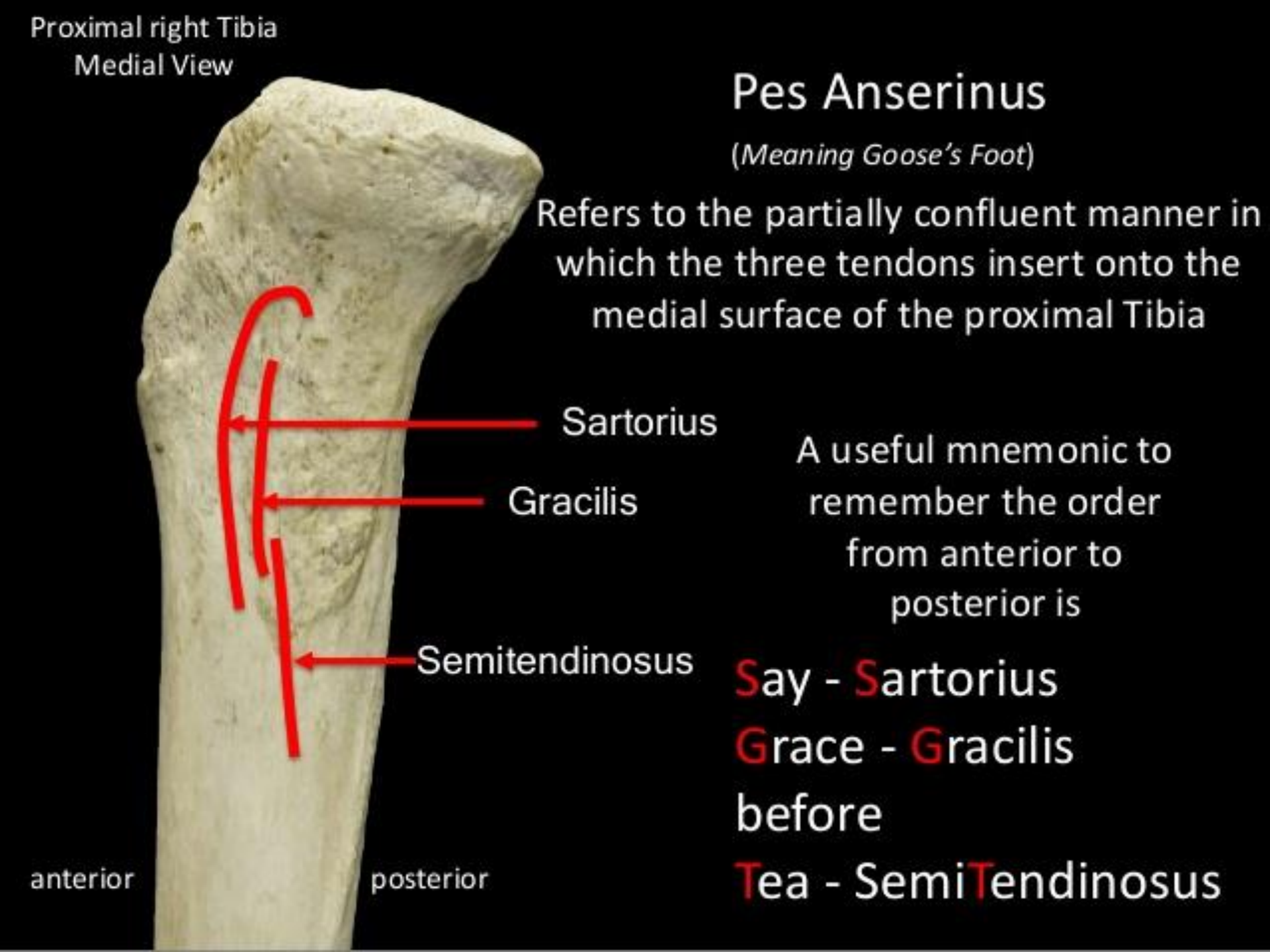
medial

lateral

Semimembranosus

Originates from superior lateral quadrant on the posterior surface of the Ischial Tuberosity

Inserts onto the posterior aspect of the Medial Tibial Condyle



Pes Anserinus

(*Meaning Goose's Foot*)

Refers to the partially confluent manner in which the three tendons insert onto the medial surface of the proximal Tibia

A useful mnemonic to remember the order from anterior to posterior is

Say - Sartorius
Grace - Gracilis
before
Tea - SemiTendinosus

Proximal right Tibia
Posterior View

Popliteus

Originates from posterior surface of Tibia superior to soleal line

The tendon passes upward and laterally and courses through the knee joint before inserting onto the Lateral Condyle of the Femur

Unlocks the extended knee by laterally rotating the Femur on the Tibia

Proximal right Tibia
Posterior View

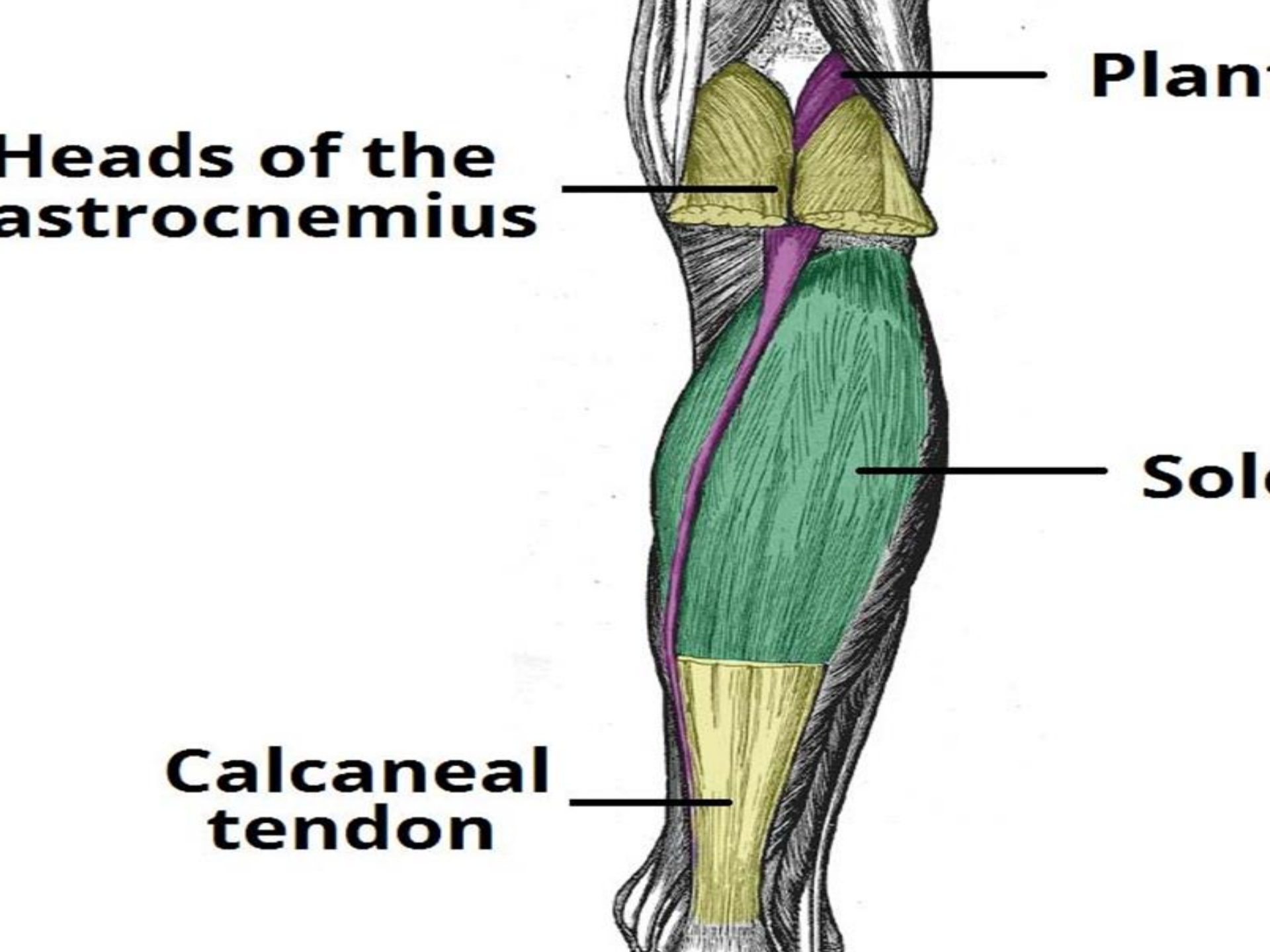
Soleus

Originates from

- posterior aspect of Fibular Head
- upper 1/3 of posterior surface of Fibular shaft
- along the full length of soleal line
- middle 1/3 medial border of Tibial Shaft

Unites with gastrocnemius aponeurosis to form the Achilles tendon, inserts middle 1/3 posterior calcaneum

Plantarflexes the ankle


Plan
Heads of the
astrocnemius
Sol
Calcaneal
tendon

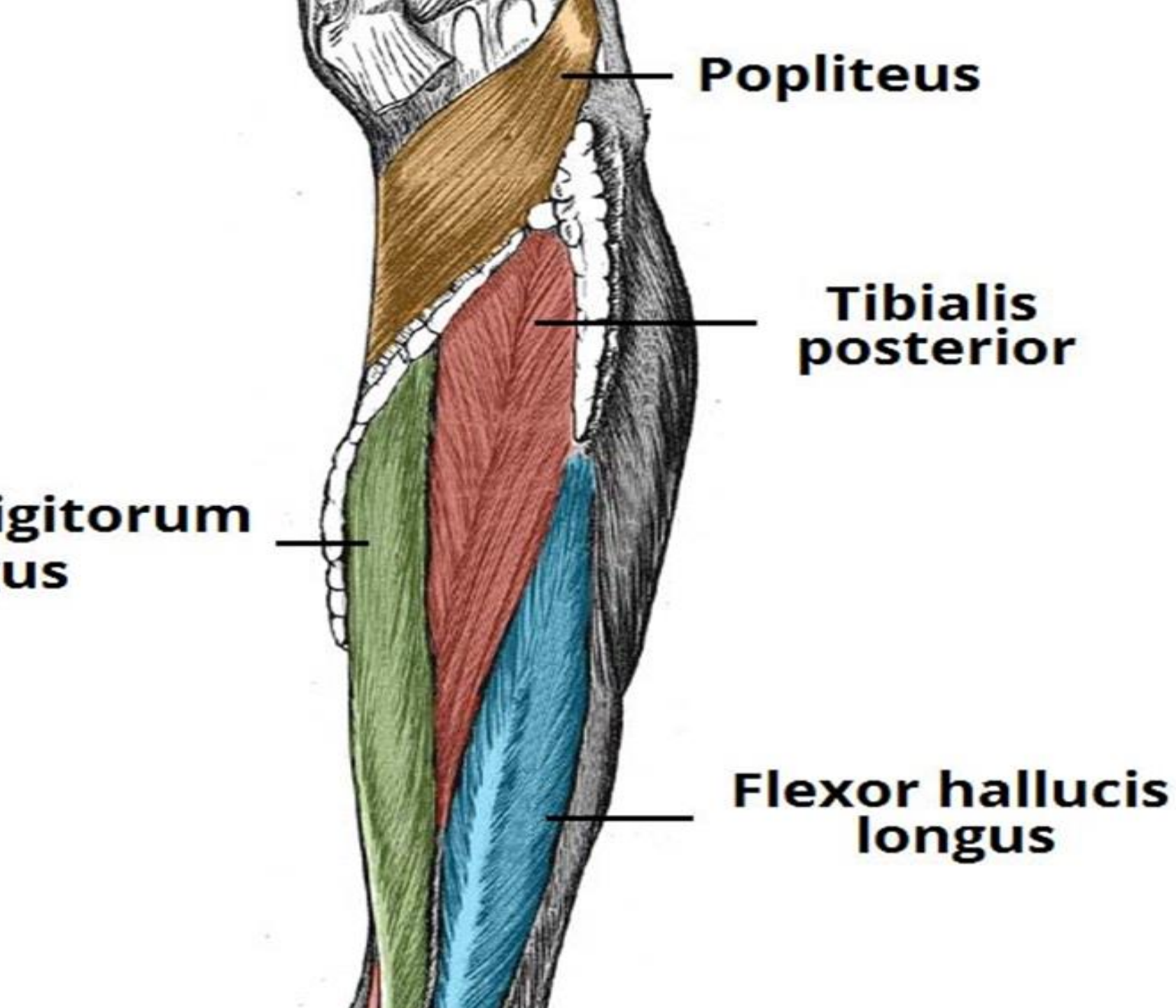
Proximal Tibia
Posterior View

Flexor Digitorum Longus

Originates from the
posterior surface of Tib
distal to Popliteal Lin

Splits into four slips, inserts
plantar surface of bases of 2
5th distal phalanges

Flexes toes 2 – 5
Plantarflexes ankle


Popliteus
Tibialis posterior
igitorum us
Flexor hallucis longus

OSSIFICATION

- The tibia ossifies from 3 centers- 1 primary and 2 secondary.
- 1. Primary center appears in the middle of shaft in the age of seventh week of intrauterine life.
- 2. Secondary centers.
- (a) For the upper end:
  - At birth or soon after beginning.
  - Fusion with all the shaft: 20 years.
- (b) For the lower end:
  - 2 years.
  - Fusion with all the shaft 18 years.
- The upper epiphysis goes anteriorly as a tongue like process to create the upper part of tibial tuberosity.

CLINICAL SIGNIFICANCE

- **OSTEOMYELITIS OF THE UPPER END OF TIBIA**
- The upper end of tibia is the commonest site of acute osteomyelitis, but **knee joint** stay unaffected since the capsule of **knee joint** is connected near to the margins of articular surfaces proximal to the **epiphyseal line**.

Clinical Relevance: Fractures of the Tibia

- Fractures of the tibia are relatively common, and occur most frequently in the middle aged and elderly. If the fibula is not fractured, it supports the tibia, and displacement of the fragments is **minimal**.
- The proximal end of the tibia is the site that is most vulnerable to damage, resulting usually from some traumatic accident e.g vehicular.
- At the ankle, the medial malleolus can be fractured. This is caused by the ankle being twisted inwards (**over-inversion**) – the talus of the foot is forced against the medial malleolus, causing a spiral fracture.

FRACTURE OF TIBIA

the medial malleolus fracture

FRACTURE OF TIBIA

tibia is normally fractured in the junctio
er 2/3rd and lower 1/3rd of its shaft. (Th
t is narrowest at the junction of upper t
lower two-third, therefore the common
acture.).

lower two-third of the tibial shaft is emp
s devoid of any muscular connection) an
blood supply; for this motive, the **fractu**
ower 1/3rd of the shaft of tibia show de
n or non union.