

Front of Leg with Dorsum of Foot; Lateral and Medial Sides of Leg: FAQs, MCQs and Viva Voce

Front of Leg with Dorsum of Foot; Lateral and Medial Sides of Leg

Introduction

- The **front of the leg** extends from knee to ankle, between the tibial crest and anterior border of fibula.
 - It corresponds to the **anterior compartment**, containing muscles for **dorsiflexion of ankle** and **extension of toes**.
 - Supplied by the **deep peroneal nerve** and **anterior tibial artery**.
 - The skin is thin and tightly adherent over tibia but loose on the dorsum of foot.
-

Surface Landmarks

- **Tibial crest:** Subcutaneous from tibial tuberosity to medial malleolus.
 - **Tibial tuberosity:** Below patella; attachment of ligamentum patellae.
 - **Head of fibula:** Lateral prominence just below the knee.
 - **Medial malleolus:** Rounded projection on inner ankle.
 - **Lateral malleolus:** Posterior and lower than the medial malleolus.
-

- **Tendons (medial ? lateral):** *Tibialis anterior, Extensor hallucis longus, Extensor digitorum longus, Peroneus tertius.*
 - **Dorsalis pedis artery pulse:** Felt lateral to *extensor hallucis longus* tendon.
-

Superficial Fascia

- Contains **cutaneous veins, nerves, and lymphatics.**
 - **Tight over tibia,** loose on dorsum and lateral leg.
 - **Lymphatics** drain medially to *inguinal nodes*, laterally to *popliteal nodes*.
-

Superficial Veins

- **Great saphenous vein:** From medial dorsal venous arch ? in front of medial malleolus ? ascends along medial leg ? femoral vein.
 - **Small saphenous vein:** From lateral dorsal venous arch ? behind lateral malleolus ? popliteal vein.
 - **Dorsal venous arch:** Connects both saphenous veins.
-

Cutaneous Nerves

- **Saphenous nerve:** Medial leg to great toe.
 - **Superficial peroneal nerve:** Lower anterolateral leg and most of dorsum.
 - **Deep peroneal nerve:** First web space.
-

- **Sural nerve:** Posterolateral leg and lateral foot.
 - **Common peroneal nerve:** Around fibular neck, easily injured.
-

Deep Fascia

- Dense fibrous sheath continuous with fascia lata.
 - Gives **anterior and posterior intermuscular septa**, forming compartments.
 - Thickened below as **retinacula** to bind tendons.
-

Superior Extensor Retinaculum

- Fibrous band between **tibia and fibula above ankle**.
 - Structures deep to it (medial ? lateral):
Tibialis anterior, Extensor hallucis longus, Anterior tibial artery, Deep peroneal nerve, Extensor digitorum longus, Peroneus tertius.
-

Inferior Extensor Retinaculum

- **Y-shaped band** from calcaneum to medial malleolus and medial cuneiform.
 - Upper limb encloses *TA, EHL, artery, nerve*; lower limb encloses *EDL, PT*.
-

Muscles of Anterior Compartment

- **Tibialis anterior:** Dorsiflexes, inverts foot.

- **Extensor hallucis longus:** Extends great toe, dorsiflexes.
 - **Extensor digitorum longus:** Extends lateral four toes.
 - **Peroneus tertius:** Dorsiflexes and everts foot.
 - **Nerve:** Deep peroneal nerve.
-

Anterior Tibial Artery

- Continuation of popliteal artery through interosseous membrane.
 - Descends with deep peroneal nerve on interosseous membrane.
 - Branches: Posterior and anterior tibial recurrent, muscular, anterior medial & lateral malleolar arteries.
 - Continues as **dorsalis pedis artery** at ankle.
-

Deep Peroneal Nerve

- Branch of common peroneal nerve.
 - Descends with anterior tibial artery.
 - Muscular branches to anterior-compartment muscles.
 - Cutaneous branch ? *first web space*.
 - Lesion causes **foot drop**.
-

Dorsum of Foot

- **Skin:** Thin, mobile.
 - **Superficial fascia:** Dorsal venous arch, superficial nerves, lymphatics.
 - **Muscles:** *Extensor digitorum brevis* and *Extensor hallucis brevis*.
 - **Artery:** Dorsalis pedis artery.
 - **Nerve:** Deep peroneal (lateral terminal branch).
-

Dorsalis Pedis Artery

- Continuation of anterior tibial artery.
 - Lies **lateral to EHL tendon**.
 - Branches: *Medial & lateral tarsal, arcuate, first dorsal metatarsal, deep plantar*.
 - Pulse felt in front of ankle lateral to *EHL* tendon.
-

Lateral Side of Leg

- Between anterior and posterior septa.
 - Muscles: *Peroneus longus* and *Peroneus brevis*.
 - Nerve: *Superficial peroneal nerve*.
 - Action: **Eversion and plantarflexion**.
-

Peroneal Retinacula

- **Superior:** From lateral malleolus ? calcaneum, holds both tendons in common sheath.
 - **Inferior:** From calcaneum ? inferior extensor retinaculum, tendons in separate sheaths.
-

Superficial Peroneal Nerve

- Branch of common peroneal.
 - Supplies *peroneus longus* and *brevis*.
 - Pierces fascia in lower leg to supply **skin of dorsum** except first web space and lateral border.
-

Medial Side of Leg

- Contains **great saphenous vein** and **saphenous nerve** anterior to medial malleolus.
 - Skin thin; tibial crest subcutaneous and often bruised.
-

Clinical Anatomy

- **Foot drop:** Injury to deep peroneal or common peroneal nerve.
 - **Anterior compartment syndrome:** Compression under tight fascia ? ischemia.
 - **Shin splints:** Overuse of *tibialis anterior*.
 - **Avulsion of 5th metatarsal:** Pull of *peroneus brevis*.
-

- **Dorsalis pedis pulse:** Assesses peripheral circulation.
 - **Varicose veins:** Due to great saphenous valve incompetence.
-

Mnemonics

- **Retinaculum contents:** "Tom Has A Nervous Dog Pet."
 - **Branches of anterior tibial artery:** "Pretty Arteries Make Legs Alive."
 - **Branches of dorsalis pedis artery:** "Many Lovers Are Found Deep."
 - **Anterior-compartment muscles:** "The Extra Energetic Person."
-

Facts to Remember

- Four dorsiflexor muscles in anterior compartment, all by deep peroneal nerve.
 - Dorsalis pedis artery continues from anterior tibial artery.
 - Great saphenous vein ? anterior to medial malleolus; small saphenous ? behind lateral.
 - Deep peroneal ? first web space; superficial peroneal ? dorsum of foot.
 - Peroneus longus maintains transverse arch.
 - Shin splints and anterior-compartment syndrome are important applied points.
-

Clinicoanatomical Problems

- **Deep peroneal nerve injury ?** Foot drop + sensory loss in first web space.

- **Shin splints:** Overuse of tibialis anterior.
 - **Anterior compartment syndrome:** Compression of artery and nerve ? ischemia.
 - **Avulsion of 5th metatarsal:** By peroneus brevis.
 - **Dorsalis pedis palpation:** Just lateral to EHL tendon.
 - **Peroneal tendon subluxation:** Tear of superior peroneal retinaculum.
-

Frequently Asked in Viva

- Nerve supply of dorsum of foot? ? *Deep and superficial peroneal nerves.*
- Pulse point of dorsalis pedis? ? *Lateral to EHL tendon.*
- Main action of anterior-compartment muscles? ? *Dorsiflexion.*
- Which muscle crosses sole obliquely? ? *Peroneus longus.*
- Site for venesection in leg? ? *Great saphenous vein, anterior to medial malleolus.*

Multiple Choice Questions

1. Which of the following arteries continues as the dorsalis pedis artery?

- A. Posterior tibial artery
- B. Popliteal artery
- C. Anterior tibial artery
- D. Peroneal artery

? **Answer:** C – Anterior tibial artery

? It passes through the interosseous membrane and becomes the dorsalis pedis artery on the

dorsum of foot.

2. The deep peroneal nerve supplies which area of skin on the foot?

- A. Medial border of foot
- B. First interdigital cleft
- C. Lateral border of foot
- D. Whole dorsum of foot

? **Answer:** B – First interdigital cleft

? Cutaneous supply of deep peroneal nerve is restricted to the first web space.

3. All the following muscles are dorsiflexors of the ankle except:

- A. Tibialis anterior
- B. Extensor hallucis longus
- C. Extensor digitorum longus
- D. Peroneus longus

? **Answer:** D – Peroneus longus

? Peroneus longus is an everter and plantarflexor, not a dorsiflexor.

4. The pulse of dorsalis pedis artery is felt:

- A. Anterior to lateral malleolus
- B. Posterior to medial malleolus
- C. Lateral to tendon of extensor hallucis longus
- D. Medial to tendon of tibialis anterior

? **Answer:** C – Lateral to tendon of extensor hallucis longus

? This is the surface anatomy point used to palpate dorsalis pedis pulse.

5. The superficial peroneal nerve supplies:

- A. Peroneus longus and brevis
- B. Tibialis anterior and peroneus longus
- C. Peroneus tertius and tibialis anterior
- D. Extensor hallucis longus and brevis

? **Answer:** A – Peroneus longus and brevis

? It is the nerve of the lateral (compartment of everters) muscles.

6. Eversion of foot is mainly produced by:

- A. Tibialis anterior and posterior
- B. Peroneus longus and brevis
- C. Gastrocnemius and soleus
- D. Flexor digitorum longus and hallucis longus

? **Answer:** B – Peroneus longus and brevis

? They pull the foot laterally and downward.

7. Foot drop occurs due to injury of:

- A. Tibial nerve
- B. Superficial peroneal nerve
- C. Deep peroneal nerve
- D. Sural nerve

? **Answer:** C – Deep peroneal nerve

? Paralysis of anterior compartment muscles causes loss of dorsiflexion.

8. The tendon inserted into the base of the fifth metatarsal is that of:

- A. Peroneus brevis
- B. Peroneus longus
- C. Peroneus tertius
- D. Tibialis posterior

? **Answer:** A – Peroneus brevis

? It is often avulsed in inversion injuries.

9. The great saphenous vein passes:

- A. Behind lateral malleolus
- B. In front of medial malleolus
- C. Behind medial malleolus
- D. In front of lateral malleolus

? **Answer:** B – In front of medial malleolus

? A reliable landmark for venesection.

10. The muscle helping to maintain the transverse arch of foot is:

- A. Tibialis posterior

- B. Peroneus longus
 - C. Flexor hallucis longus
 - D. Extensor hallucis longus
- ? **Answer:** B – Peroneus longus

? Its tendon crosses the sole obliquely and supports the arch.

11. Which structure lies in the first interdigital cleft and is tested for deep peroneal nerve sensation?

- A. Medial tarsal artery
- B. Superficial peroneal nerve branch
- C. Deep peroneal nerve cutaneous branch
- D. Sural nerve

? **Answer:** C – Deep peroneal nerve cutaneous branch

12. The retinaculum which prevents bowstringing of extensor tendons is:

- A. Flexor retinaculum
- B. Peroneal retinaculum
- C. Superior extensor retinaculum
- D. Inferior peroneal retinaculum

? **Answer:** C – Superior extensor retinaculum

13. All muscles of anterior compartment are supplied by the deep peroneal nerve except:

- A. Tibialis anterior
- B. Extensor hallucis longus
- C. Extensor digitorum longus
- D. None of the above

? **Answer:** D – None of the above

? All four (anterior compartment) receive branches from deep peroneal nerve.

14. The lateral compartment of leg is bounded anteriorly by:

- A. Posterior intermuscular septum
- B. Anterior intermuscular septum
- C. Interosseous membrane

D. Deep fascia of leg

? **Answer:** B – Anterior intermuscular septum

15. Pain and swelling in the shin region of athletes is known as:

A. Plantar fasciitis

B. Anterior compartment syndrome

C. Shin splints

D. Tenosynovitis

? **Answer:** C – Shin splints

Viva Voce

1. What is the main action of muscles in the anterior compartment of the leg?

? **Dorsiflexion of ankle and extension of toes.**

2. Which nerve supplies the anterior compartment?

? **Deep peroneal nerve.**

3. What is the cutaneous supply of the deep peroneal nerve?

? **First interdigital cleft (between great and second toe).**

4. Name the main artery of the anterior compartment.

? **Anterior tibial artery.**

5. Which artery continues as dorsalis pedis?

? **Anterior tibial artery.**

6. Where is the dorsalis pedis pulse felt?

? **Lateral to the tendon of extensor hallucis longus in front of ankle.**

7. Which muscles produce eversion of the foot?

? **Peroneus longus and peroneus brevis.**

8. Which muscles cause inversion of the foot?

? **Tibialis anterior and tibialis posterior.**

9. Which nerve supplies the peroneus longus and brevis?

? **Superficial peroneal nerve.**

10. What are the contents deep to the superior extensor retinaculum (from medial to lateral)?

? *Tibialis anterior, Extensor hallucis longus, Anterior tibial artery, Deep peroneal nerve, Extensor digitorum longus, Peroneus tertius.*

11. What are the actions of tibialis anterior?

? **Dorsiflexion and inversion of the foot.**

12. What deformity results from paralysis of the deep peroneal nerve?

? **Foot drop.**

13. What are shin splints?

? **Pain along tibia due to overuse of tibialis anterior.**

14. What is the function of peroneus longus in the sole?

? **Maintains the transverse arch of foot.**

15. Which vein passes anterior to the medial malleolus?

? **Great saphenous vein.**

16. Which vein passes posterior to the lateral malleolus?

? **Small saphenous vein.**

17. What are the signs of anterior compartment syndrome?

? **Pain, paresthesia, pallor, paralysis, pulselessness (5 Ps).**

18. Which nerve is most commonly injured in fractures of the neck of fibula?

? **Common peroneal nerve.**

19. Which artery supplies the dorsum of foot?

? **Dorsalis pedis artery.**

20. What is the importance of the dorsalis pedis artery clinically?

? **Its pulse indicates patency of the anterior tibial artery and peripheral circulation**