MEDICAL EDUCATION RESOURCE

Arches of Foot: FAQs, MCQs and Viva Voce

? Frequently Asked Questions — Arches of the Foot

1. What are the arches of the foot?

? They are **curved arrangements of bones** of the foot that form **longitudinal and transverse concavities** to support body weight and allow locomotion.

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2. How many arches are present in the human foot?

? **Four arches:**

- Two longitudinal — **medial and lateral**.
- Two transverse — **anterior and posterior**.

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3. What is the importance of the arches of the foot?

? They make the foot **strong, elastic, and stable**, enabling **shock absorption, weight distribution**, and **spring action** during walking or running.

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4. Which arch is the highest and most important?

? The **medial longitudinal arch** — it is higher, more mobile, and acts as the chief shock absorber.

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5. Which arch is the lowest and most rigid?

? The **lateral longitudinal arch** — it is short and transmits weight directly to the ground.

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6. What bones form the medial longitudinal arch?

? **Calcaneus, talus, navicular, three cuneiforms, and first to third metatarsals.**

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7. What bones form the lateral longitudinal arch?

? **Calcaneus, cuboid, and fourth and fifth metatarsals.**

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8. Which bone acts as the keystone of the medial longitudinal arch?

? **Talus.**

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9. Which bone acts as the keystone of the lateral longitudinal arch?

? **Cuboid.**

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10. What are the supporting factors of the medial longitudinal arch?

? **Spring ligament**, **plantar aponeurosis**, **tibialis posterior**, **flexor hallucis longus**, and **tibialis anterior**.

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11. What are the supporting factors of the lateral longitudinal arch?

? **Long and short plantar ligaments**, **plantar aponeurosis**, **peroneus longus**, **peroneus brevis**, and **abductor digiti minimi**.

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12. What are the components of the transverse arches?

? **Anterior transverse arch:** heads of metatarsals.

Posterior transverse arch: navicular, three cuneiforms, cuboid, and bases of metatarsals.

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13. Which ligaments maintain the arches of the foot?

? **Spring ligament, long plantar ligament, and short plantar ligament.**

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14. What is the function of the spring (plantar calcaneonavicular) ligament?

? It supports the **head of talus** and helps maintain the **medial longitudinal arch**.

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15. What is the role of the plantar aponeurosis?

? Acts as a **tie-beam** connecting the ends of the longitudinal arches and resists flattening of the sole.

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16. What are tie-beams and slings in the foot?

? **Tie-beams:** plantar aponeurosis and short flexor muscles — prevent flattening.

Slings: tendons like **tibialis posterior** and **peroneus longus** — pull the arch upward.

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17. Which muscles form the “stirrup” of the foot?

? **Tibialis anterior** and **peroneus longus** — they cross under the sole to maintain the arches.

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18. What are the main functions of the arches?

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- **Weight transmission** to heel and toes.
- **Shock absorption** during walking.
- **Spring action** during locomotion.
- **Protection** to plantar soft tissues.

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19. What happens if the arches collapse?

? **Flat foot (pes planus)** develops ? pain, fatigue, and valgus deformity.

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20. What is pes cavus?

? **Exaggerated medial arch** due to spasticity or neurological disorders.

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21. What is clubfoot (talipes equinovarus)?

? Congenital deformity with **plantar flexion, inversion, and adduction** of the foot.

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22. What is clawfoot?

? Hyperextension at metatarsophalangeal joints and flexion at interphalangeal joints due to weakness of small foot muscles.

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23. What is the function of the great toe in weight bearing?

? The great toe, through its **two sesamoid bones**, bears **double the weight** of each of the

other toes.

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24. What is the clinical significance of the plantar aponeurosis?

? Its tight fibrous septa can limit swelling in **plantar abscess** and is commonly inflamed in **plantar fasciitis**.

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25. What does Hilton's Law state (as applied to the foot)?

? The **same nerves** that supply the muscles moving a joint also supply the **joint capsule and the overlying skin**.

? Multiple Choice Questions — Arches of the Foot

1. All of the following bones take part in formation of **lateral longitudinal arch**, **except:**

a. Calcaneum

b. Cuboid

c. Navicular

d. 4th metatarsal

? **Answer:** c. Navicular

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2. The **keystone** of the medial longitudinal arch of the foot is:

a. Navicular

b. Talus

c. Cuboid

d. Calcaneum

? **Answer:** b. Talus

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3. The **important joint** of the medial longitudinal arch is:

a. Calcaneocuboid joint

b. Talonavicular joint

c. Talocalcaneonavicular joint

d. Intercuneiform joint

? **Answer:** c. Talocalcaneonavicular joint

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4. The **main supports** of the medial longitudinal arch are:

a. Tibialis posterior, tibialis anterior, peroneus longus

b. Tibialis posterior, tibialis anterior, flexor digitorum brevis

c. Flexor hallucis longus, peroneus longus, tibialis anterior

d. Abductor hallucis, peroneus brevis, long plantar ligament

? **Answer:** a. Tibialis posterior, tibialis anterior, peroneus longus

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5. The **important joint** of the lateral longitudinal arch is:

a. Subtalar joint

b. Talonavicular joint

c. Calcaneocuboid joint

d. Cuneonavicular joint

? **Answer:** c. Calcaneocuboid joint

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6. The **main supports** of the lateral longitudinal arch are:

a. Short plantar ligament

b. Long plantar ligament

c. Peroneus longus tendon

d. All of the above

? **Answer:** d. All of the above

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7. The **posterior transverse arch** is supported by:

a. Tibialis anterior

b. Peroneus longus

c. Flexor hallucis longus

d. Abductor digiti minimi

? **Answer:** b. Peroneus longus

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8. The **anterior transverse arch** is supported by:

a. Deep metatarsal ligaments and dorsal interossei

b. Long plantar ligament

c. Abductor hallucis

d. Short plantar ligament

? **Answer:** a. Deep metatarsal ligaments and dorsal interossei

9. The **spring ligament** connects which of the following bones?

a. Calcaneus and navicular

b. Talus and cuboid

c. Calcaneus and cuboid

d. Talus and navicular

? **Answer:** a. Calcaneus and navicular

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10. Which of the following statements about **flat foot (pes planus)** is true?

a. It results from fracture of talus

b. It results from collapse of medial longitudinal arch

c. It results from overactivity of peroneus longus

d. It results from injury to plantar aponeurosis

? **Answer:** b. It results from collapse of medial longitudinal arch

? Viva Voce — Arches of the Foot

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1. What is an arch of the foot?

? A curved arrangement of tarsal and metatarsal bones forming a concavity on the plantar surface of the foot.

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2. How many arches are present in the human foot?

? Four in total — **two longitudinal (medial and lateral)** and **two transverse (anterior and posterior).**

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3. Which arch is the most important?

? The **medial longitudinal arch**, as it is higher, more mobile, and acts as the main spring of the foot.

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4. Which is the keystone of the medial longitudinal arch?

? **Head of the talus.**

5. Which is the keystone of the lateral longitudinal arch?
? **Cuboid.**

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6. Which joints are important for the medial and lateral arches?
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- **Medial arch:** Talocalcaneonavicular joint.
- **Lateral arch:** Calcaneocuboid joint.

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7. Which ligaments maintain the medial longitudinal arch?
? **Spring (plantar calcaneonavicular) ligament** and **deltoid ligament.**

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8. Which ligaments maintain the lateral longitudinal arch?
? **Long plantar** and **short plantar ligaments.**

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9. What are the muscular supports of the medial longitudinal arch?
? **Tibialis anterior**, **tibialis posterior**, and **flexor hallucis longus.**

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10. What are the muscular supports of the lateral longitudinal arch?
? **Peroneus longus**, **peroneus brevis**, and **abductor digiti minimi.**

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11. What is the function of the plantar aponeurosis?
? Acts as a **tie-beam** connecting the two ends of the arch and prevents its flattening.

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12. What are the tie-beams of the foot?
? **Plantar aponeurosis** and **short muscles of the sole**, such as flexor digitorum brevis and abductor hallucis.

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13. What is meant by the “stirrup” of the foot?
? The **tendons of tibialis anterior and peroneus longus** cross under the sole forming a sling or stirrup that supports both arches.

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14. What are the functions of the arches of the foot?

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- **Distribute body weight** during standing and walking.
- **Absorb shocks.**
- **Provide elasticity** for locomotion.
- **Protect** vessels, nerves, and soft tissues of the sole.

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15. What is flat foot (pes planus)?

? Flattening of the medial longitudinal arch so that the sole almost completely touches the ground.

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16. What is pes cavus?

? Exaggerated height of the medial longitudinal arch (high-arched foot).

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17. What is clubfoot (talipes equinovarus)?

? Congenital deformity in which the foot is **plantarflexed, inverted, and adducted.**

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18. What is clawfoot?

? Hyperextension at metatarsophalangeal joints and flexion at interphalangeal joints due to paralysis of intrinsic muscles.

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19. What is hallux valgus?

? Lateral deviation of the great toe at the first metatarsophalangeal joint, often associated with bunion formation.

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20. What is the clinical importance of the arches?

? They **absorb shock**, **maintain balance**, and **protect deep plantar structures** during standing and movement; loss leads to deformities like **flat foot** or **painful strain**.