Hand & Foot
Hand
Lecture Objectives

- Describe the components of the wrist joint.
- List the ligaments associated with the wrist joint and their attachment.
- List the muscles acting on the wrist joint according to the type and movement they perform.
- Describe the bursas in relation to the wrist joint.
- Describe the stability of the wrist joint.
- List the blood supply and nerve supply of the wrist joint.
- Describe the major palpable bony prominences of the wrist joint.
- Describe the carpal tunnel and the flexor and extensor retinaculae and the structures passing in relation to the retinaculae.
- Describe the movement of the fingers.
- List the muscles acting on the fingers.
Hand

- Two eminences
  - Thenar eminence
    - Lateral, larger, more prominent
  - Hypothenar eminence
    - Medial and smaller
Hand: Fascia

• Palmar fascia
  – Thenar fascia
  – Hypothenar fascia
  – Palmar aponeurosis
    • Attaches to the flexor retinaculum
  – Digital sheaths
    • Contains and fixes the tendons of flexor digitorum muscles
Hand: Fascia

- Medial fibrous septum
- Lateral fibrous septum
- 5 Compartments
- Two spaces
  - Thenar space
  - Midpalmar space
    - Continuous with anterior compartment of forearm through the carpal tunnel
Thumb movements

Abduction  Adduction  Extension  Flexion  Opposition  Reposition
Hand Muscles: Thenar Muscles

- **Abductor pollicis brevis**
  - Anterolateral part of the thenar eminence
- **Flexor pollicis brevis**
- **Opponens pollicis**
  - Deep to the abductor pollicis brevis
Hand Muscles

- Adductor pollicis
  - Adductor compartment
  - Two heads
  - Ulnar nerve
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal Attachment</th>
<th>Distal Attachment</th>
<th>Innervation²</th>
<th>Main Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opponens pollicis</td>
<td>Flexor retinaculum and tubercles of scaphoid and trapezium</td>
<td>Lateral side of 1st metacarpal</td>
<td>Recurrent branch of median nerve (C8, T1)</td>
<td>To oppose thumb, it draws 1st metacarpal medially to center of palm and rotates it medially</td>
</tr>
<tr>
<td>Abductor pollicis brevis</td>
<td>Flexor retinaculum and tubercles of scaphoid and trapezium</td>
<td>Lateral side of base of proximal phalanx of thumb</td>
<td></td>
<td>Abducts thumb; helps oppose it</td>
</tr>
<tr>
<td>Flexor pollicis brevis</td>
<td>Flexor retinaculum and tubercles of scaphoid and trapezium</td>
<td>Lateral side of base of proximal phalanx of thumb</td>
<td></td>
<td>Flexes thumb</td>
</tr>
<tr>
<td>Superficial head</td>
<td>Flexor retinaculum and tubercles of scaphoid and trapezium</td>
<td>Lateral side of base of proximal phalanx of thumb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deep head</td>
<td>Flexor retinaculum and tubercles of scaphoid and trapezium</td>
<td>Lateral side of base of proximal phalanx of thumb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adductor pollicis</td>
<td>Flexor retinaculum and tubercles of scaphoid and trapezium</td>
<td>Lateral side of base of proximal phalanx of thumb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oblique head</td>
<td>Bases of 2nd and 3rd metacarpals, capitate, and adjacent carpals</td>
<td>Medial side of base of proximal phalanx of thumb</td>
<td>Deep branch of ulnar nerve (C8, T1)</td>
<td>Adducts thumb toward lateral border of palm</td>
</tr>
<tr>
<td>Transverse head</td>
<td>Anterior surface of shaft of 3rd metacarpal</td>
<td>Lateral side of base of proximal phalanx of thumb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hand Muscles: Hypothenar Muscles

- Abductor digiti minimi
  - Most superficial
- Flexor digiti minimi brevis
- Opponens digiti minimi
  - Deep
### Table 6.14. Intrinsic Muscles of Hand (Continued)

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal Attachment</th>
<th>Distal Attachment</th>
<th>Innervation&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Main Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothenar muscles</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abductor digiti minimi</td>
<td>Pisiform</td>
<td>Medial side of base of proximal phalanx of 5th digit</td>
<td>Deep branch of ulnar nerve (C8, T1)</td>
<td>Abducts 5th digit; assists in flexion of its proximal phalanx</td>
</tr>
<tr>
<td>Flexor digiti minimi brevis</td>
<td>Hook of hamate and flexor retinaculum</td>
<td></td>
<td></td>
<td>Flexes proximal phalanx of 5th digit</td>
</tr>
<tr>
<td>Opponens digiti</td>
<td></td>
<td>Medial border of 5th metacarpal</td>
<td></td>
<td>Draws 5th metacarpal anterior and rotates it, bringing 5th digit into opposition with thumb</td>
</tr>
</tbody>
</table>
Hand Muscles

• Palmaris brevis
  – **ORIGIN**: flexor retinaculum, palmar aponeurosis
  
  – **INSERTION**: skin along the medial border of the hand
  
  – **ACTION**: helps in gripping by wrinkling skin over it
  
  – **N. SUPPLY**: Ulnar n.
Short Muscles of Hand

• Lumbricals
  – Origin: tendon of FDP
  – Insertion: extensor expansion
Lumbricals: Action

Flex metacarpophalangeal

Extend interphalangeals

Palmar ligament
3rd metacarpal
2nd dorsal interosseous
Flexor digitorum profundus (FDP) tendon
2nd lumbrical

(B) Lateral view

Tendon of flexor digitorum superficialis (splitting to enable passage of FDP tendon)
Short Muscles of Hand

• Interossei
  – Dorsal interosseous muscles
    • Abduction
  – Palmar interosseous muscles
    • Adduction
TABLE 6.14. INTRINSIC MUSCLES OF HAND (Continued)

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal Attachment</th>
<th>Distal Attachment</th>
<th>Innervation*</th>
<th>Main Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumbricals</td>
<td></td>
<td></td>
<td>Median nerve (C8, T1)</td>
<td>Flex metacarpophalangeal joints; extend interphalangeal joints of 2nd–5th digits</td>
</tr>
<tr>
<td>1st and 2nd</td>
<td>Lateral two tendons of flexor digitorum profundus (as unipennate muscles)</td>
<td>Lateral sides of extensor expansions of 2nd–5th digits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd and 4th</td>
<td>Medial three tendons of flexor digitorum profundus (as bipennate muscles)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dorsal interossei, 1st–4th</td>
<td>Adjacent sides of two metacarpals (as bipennate muscles)</td>
<td>Bases of proximal phalanges; extensor expansions of 2nd–4th digits</td>
<td>Deep branch of ulnar nerve (C8, T1)</td>
<td>Abduct 2nd–4th digits from axial line; act with lumbricals in flexing metacarpophalangeal joints and extending interphalangeal joints</td>
</tr>
<tr>
<td>Palmar interossei, 1st–3rd</td>
<td>Palmar surfaces of 2nd, 4th, and 5th metacarpals (as unipennate muscles)</td>
<td>Bases of proximal phalanges; extensor expansions of 2nd, 4th, and 5th digits</td>
<td></td>
<td>Adduct 2nd, 4th, and 5th digits toward axial line; assist lumbricals in flexing metacarpophalangeal joints and extending interphalangeal joints; extensor expansions of 2nd–4th digits</td>
</tr>
</tbody>
</table>

*The spinal cord segmental innervation is indicated (e.g., "C8, T1" means that the nerves supplying the opponens pollicis are derived from the eighth cervical segment and first thoracic segment of the spinal cord). Numbers in boldface (C8) indicate the main segmental innervation. Damage to one or more of the listed spinal cord segments or to the motor nerve roots arising from them results in paralysis of the muscles concerned.
Distal Radioulnar Joint

- Head of ulna and ulnar notch of radius
- **Articular disc** (triangular cartilaginous ligament)
- Pivot joint
- Rotation: pronation and supination
- Nerve supply: anterior interosseous nerve (from median nerve) and deep branch of the radial nerve
Wrist joint

• Proximal part
  – Distal end of the radius
  – Articular disc

• Distal part
  – scaphoid, lunate, and triquetrum

• Ellipsoid joint

• Nerve supply: anterior interosseous nerve (from median nerve) and deep branch of the radial nerve
Wrist joint

- Ligaments
  - Anterior and posterior ligaments
  - Medial ligament
  - Lateral ligament
Wrist Joint: Movements

(B) Anteroposterior view

(C) Inferior view
Intercarpal Joints

- Between bones in the same row and midcarpal joint between rows
- Plane joints
- Gliding movement
- Anterior, posterior, and interosseous ligaments
- Nerve supply: anterior interosseous nerve (from median nerve), deep branch of the radial nerve, and deep branch of the ulnar nerve,
Carpometacarpal and Intermetacarpal Joints

- Plane joints
- Gliding movement
- Anterior, posterior, and interosseous ligaments
- Common joint cavity
Carpometacarpal Joint of the Thumb

- Between trapezium and first metacarpal bone
- Saddle joint
- Flexion, extension, abduction, and adduction
Metacarpophalangeal Joints

- Heads of metacarpal bones and bases of the proximal phalanges
- Condyloid joints
- Flexion, extension, abduction, and adduction
- Palmar ligament and collateral ligaments
- Deep transverse metacarpal ligament
Interphalangeal joints

- Proximal interphalangeal joint
- Distal interphalangeal joint
- Hinge joints
- Flexion, extension
- collateral ligaments
The Deep Palmar Arch

• Components
  – **Radial a.**
    • Through 1\textsuperscript{st} dorsal interosseous m.
    • Between heads of adductor policis m.
  – **Deep branch of ulnar a.**

• Relations
The Superficial Palmar Arch

• Components
  – Ulnar a.
  – Superficial palmar branch of radial a.

• Relations
  – Palmar aponeurosis
  – Tendons of flexor digitorum muscles
Relations of Structures Interning the Hand
Median nerve injury

• Injury at wrist
  – Paralysis and atrophy of the thenar mm.
  – Loss of opposition movement

• Carpal tunnel syndrome
  – Compression of the median n. by the content of the carpal tunnel
  – Pain (pins and needles) along the distribution of the median n. to the lateral 3 & ½ fingers
Dermatomes & Cutaneous Nerves of the Hand

Note: Palm sensation is not affected by carpal tunnel syndrome; the superficial palmar cutaneous branch of median nerve passes superficial to the carpal tunnel.

Anterior (palmar)
- Musculocutaneous nerve (C5–C6) to lateral forearm
- Radial nerve
- C6 dermatome
- Ulnar nerve (1½)

Posterior (dorsal)
- Ulnar nerve (C8–T1) to medial forearm
- C8 dermatome
- 3½
- Median nerve
- Ulnar nerve (1½)
Surface Anatomy of Wrist Region

- Hypothenar eminence
- Location of pisiform bone
- Tendon of flexor carpi ulnaris (FCU)
- Tendon of palmaris longus
- Thenar eminence
- Tendon of abductor pollicis longus (APL)
- Site for taking radial artery pulse
- Tendon of flexor carpi radialis (FCR)

Anterolateral view

S = location of tendons of FDS
Surface Anatomy of Hand

- Adductor pollicis
- 1st dorsal interosseous
- Tendon of extensor pollicis longus (EPL)
- Anatomical snuff box
- Tendon of abductor pollicis longus (APL) and extensor pollicis brevis (EPB)
- Tendons of extensor digitorum
- Head of ulna

Posterior view
Surface Anatomy of Hand
Foot
Lecture Objectives

• Describe the movement of the toes.
• List the muscles acting on the toes.
• Describe the retinaculae which are related to the foot and the structures passing in relation to the retinaculae.
• Describe the four muscle layers of the foot.
• Describe the components of the ankle joint.
• List the ligaments associated with the ankle joint and their attachment.
• List the muscles acting on the ankle joint according to the type and movement they perform.
• Describe the bursas in relation to the ankle joint.
• Describe the stability of the ankle joint.
• List the blood supply and nerve supply of the ankle joint.
• Describe the major palpable bony prominences of the ankle joint.
Extensor Retinacula

- Superior extensor retinaculum
  - Between the leg bones above the malleoli
- Inferior Extensor retinaculum
  - In front of the ankle joint
  - Originates from the lateral surface of the calcaneus and tarsal sinus
  - Y-shaped
    - Superior band – passes to the medial malleolus
    - Inferior band – to the navicular and medial cuneiform bones
Extensor Retinacula

• Three compartments with three synovial sheathes
Lateral (peroneal) Retinaculum

- Superior peroneal retinaculum
  - From the lateral malleolus to the calcaneus
  - Common synovial sheath

- Inferior peroneal retinaculum
  - Located on the lateral surface of the calcaneum
  - Separated synovial sheaths
Medial Flexor Retinacula

• Passes from the calcaneus to the medial malleolus

• Passing structures with synovial sheathes

  Anterior → Posterior

  I – synovial sheath of the tibialis posterior

  II - synovial sheath of the flexor digitorum longus

  III – posterior tibial artery and tibial nerve

  IV – synovial sheath of the flexor hallucis longus
FIGURE 10.48 Relations of the right ankle joint.
Muscles of the Dorsum of Foot

- Extensor digitorum brevis m.
- Extensor hallucis brevis m.
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal Attachment</th>
<th>Distal Attachment</th>
<th>Innervation*</th>
<th>Main Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensor digitorum brevis</td>
<td>Calcaneus (floor of tarsal sinus); interosseous talocalcaneal ligament; stem of inferior extensor retinaculum</td>
<td>Long extensor tendons of four medial digits (toes 2–4)</td>
<td>Deep fibular nerve (L5 or S1, or both)</td>
<td>Aids the extensor digitorum longus in extending the four medial toes at the metatarsophalangeal and interphalangeal joints</td>
</tr>
<tr>
<td>Extensor hallucis brevis</td>
<td>In common with extensor digitorum brevis (above)</td>
<td>Dorsal aspect of base of proximal phalanx of great toe (digit 1)</td>
<td></td>
<td>Aids the extensor hallucis longus in extending the great toe at the metatarsophalangeal joint</td>
</tr>
</tbody>
</table>

*The spinal cord segmental innervation is indicated (e.g., “L5 or S1” means that the nerve supplying the extensor digitorum brevis is derived from either the fifth lumbar segment or first sacral segment of the spinal cord). Damage to one or more of the listed spinal cord segments or to the motor nerve roots arising from them results in paralysis of the muscles concerned.
Dorsalis Pedis Artery

- Superficial
- Relations
  - Inferior extensor retinaculum
  - Deep to 1st tendon of extensor digitorum (hallucis) previs m.
  - Penetrate 1st dorsal interosseous
- At planter side join the planter arch
Muscles of the Sole of Foot

1\textsuperscript{st} layer

- Abductor hallucis m.
- Flexor digitorum brevis m.
  - middle phalanges
- Abductor digiti minimi m.
Muscles of the Sole of Foot

- 2nd layer
  - Quadratus plantae m. – fixes the flexor digitorum longus tendons
  - Lumbricals
  - Tendons of flexor digitorum longus
  - Tendon of flexor hallucis longus
Muscles of the Sole of Foot

- 3rd layer
  - Flexor hallucis brevis m. – two sesamoid bones
  - Adductor hallucis m. – transverse & oblique heads
  - Flexor digiti minimi brevis m.
Muscles of the Sole of Foot

- 4th layer
  - Planter interossei mm. – 1st-3rd (adductors)
  - Dorsal interossei mm. – 1st-4th (abductors)
### TABLE 5.14.1. MUSCLES OF FOOT: 1ST AND 2ND LAYERS OF SOLE

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal Attachment</th>
<th>Distal Attachment</th>
<th>Innervation&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Main Action&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st layer</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abductor hallucis</td>
<td>Medial tubercle of tuberosity of calcaneus; flexor retinaculum; plantar aponeurosis</td>
<td>Medial side of base of proximal phalanx of 1st digit</td>
<td>Medial plantar nerve (S2, S3)</td>
<td>Abducts and flexes 1st digit (great toe, hallux)</td>
</tr>
<tr>
<td>Flexor digitorum brevis</td>
<td>Medial tubercle of tuberosity of calcaneus; plantar aponeurosis; intermuscular septa</td>
<td>Both sides of middle phalanges of lateral four digits</td>
<td>Medial plantar nerve (S2, S3)</td>
<td>Flexes lateral four digits</td>
</tr>
<tr>
<td>Abductor digiti minimi</td>
<td>Medial and lateral tubercles of tuberosity of calcaneus; plantar aponeurosis; intermuscular septa</td>
<td>Lateral side of base of proximal phalanx of 5th digit</td>
<td>Lateral plantar nerve (S2, S3)</td>
<td>Abducts and flexes little toe (5th digit)</td>
</tr>
<tr>
<td><strong>2nd layer</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quadratus plantae</td>
<td>Medial surface and lateral margin of plantar surface of calcaneus</td>
<td>Posterolateral margin of tendon of flexor digitorum longus</td>
<td>Lateral plantar nerve (S2, S3)</td>
<td>Assists flexor digitorum longus in flexing lateral four digits</td>
</tr>
<tr>
<td>Lumbricals</td>
<td>Tendons of flexor digitorum longus</td>
<td>Medial aspect of expansion over lateral four digits</td>
<td>Medial one: medial plantar nerve (S2, S3)</td>
<td>Flex proximal phalanges, extend middle and distal phalanges of lateral four digits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lateral three: lateral plantar nerve (S2, S3)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> The spinal cord segmental innervation is indicated (e.g., “S2, S3” means that the nerves supplying the abductor hallucis are derived from the second and third sacral segments of the spinal cord). Damage to one or more of the listed spinal cord segments or to the motor nerve roots arising from them results in paralysis of the muscles concerned.

<sup>b</sup> Despite individual actions, the primary function of the intrinsic muscles of the sole of the foot is to resist flattening or maintain the arch of the foot.
### TABLE 5.14.II. MUSCLES OF FOOT: 3RD AND 4TH LAYERS OF SOLE

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal Attachment</th>
<th>Distal Attachment</th>
<th>Innervation&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Main Action&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3rd layer</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexor hallucis brevis</td>
<td>Plantar surfaces of cuboid and lateral cuneiforms</td>
<td>Both sides of base of proximal phalanx of 1st digit</td>
<td>Medial plantar nerve (S2, S3)</td>
<td>Flexes proximal phalanx of 1st digit</td>
</tr>
<tr>
<td>Adductor hallucis</td>
<td>Oblique head: bases of metatarsals 2–4</td>
<td>Tendons of both heads attach to lateral side of base of proximal phalanx of 1st digit</td>
<td>Deep branch of lateral plantar nerve (S2, S3)</td>
<td>Traditionally said to adduct 1st digit; assists in transverse arch of foot by metatarsals medially</td>
</tr>
<tr>
<td>Flexor digit minimi brevis</td>
<td>Transverse head: plantar ligaments of metatarsophalangeal (MTP) joints</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Base of 5th metatarsal</td>
<td>Base of proximal phalanx of 5th digit</td>
<td>Superficial branch of lateral plantar nerve (S2, S3)</td>
<td>Flexes proximal phalanx of 5th digit, thereby assisting with its flexion</td>
</tr>
<tr>
<td><strong>4th layer</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plantar interossei</td>
<td>Bases and medial sides of metatarsals 3–5</td>
<td>Medial sides of bases of phalanges of 3rd–5th digits</td>
<td>Lateral plantar nerve (S2, S3)</td>
<td>Adduct digits (2–4) and flex metatarsophalangeal joints</td>
</tr>
<tr>
<td>(three muscles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dorsal interossei</td>
<td>Adjacent sides of metatarsals 1–5</td>
<td>1st: medial side of proximal phalanx of 2nd digit;</td>
<td>Lateral plantar nerve (S2, S3)</td>
<td>Abduct digits (2–4) and flex metatarsophalangeal joints</td>
</tr>
<tr>
<td>(four muscles)</td>
<td></td>
<td>2nd–4th: lateral sides of 2nd–4th digits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> The spinal cord segmental innervation is indicated (e.g., “S2, S3” means that the nerves supplying the flexor hallucis brevis are derived from the second and third sacral segments of the spinal cord). Damage to one or more of the listed spinal cord segments or to the motor nerve roots arising from them results in paralysis of the muscles concerned.

<sup>b</sup> Despite individual actions, the primary function of the intrinsic muscles of the sole of the foot is to resist flattening or maintain the arch of the foot.
Posterior Tibial Artery

- Medial planter a.
  - Smaller
  - Deep to abductor hallucis m.
- Lateral planter a.
  - Deep to the abductor hallucis m. and flexor digitorum brevis m.
  - Continue as planter arch
    - Planter digital aa.
Tibial Nerve: Branches in sole

- Medial planter n.
  - Companies medial planter a.
  - Deep to abductor hallucis m.
- Lateral planter n.
  - Companies lateral planter a.
  - Deep to abductor hallucis & flexor digitorum brevis mm.
Distal Tibiofibular Joint

- Fibular notch and fibula
- Fibrous joint
- Ligaments
  - Interosseous ligaments
  - Interosseous membrane
  - Anterior and posterior ligaments
  - Inferior transverse ligament
- Nerve supply: deep peroneal and tibial nerves
Ankle Joint

- Distal end of tibia and fibula and the body of talus
- Hinge joint
- Ligaments
  - Medial (deltoid) ligament
  - Lateral ligament
    - Anterior talofibular ligament
    - Calcaneofibular ligament
    - Posterior talofibular ligament
- Nerve supply: deep peroneal and tibial nerves
Joints of the Foot and Toes

- **Subtalar joint**
  - Medial and lateral talocalcaneal ligaments
  - Interosseous talocalcaneal ligament
- **Talocalcaneonavicular joint**
  - Planter calcaneonavicular ligament
- **Calcaneocuboid joint**
  - Bifurcated ligament
  - Long planter ligament
  - Short planter ligament

- Talocalcaneonavicular and Calcaneocuboid joints form the midtarsal or transverse tarsal joints
- Eversion and inversion movements happen at the midtarsal and subtalar joints
Joints of the Foot and Toes

- **Cuneonavicular joint**
  - Dorsal and planter ligaments

- **Cuboideonavicular joint**
  - Dorsal, planter and interosseous ligaments

- **Intercuneiform and cuneocuboid joints**
  - Dorsal, planter and interosseous ligaments
  - Same cavity with cuneonavicular joint

- **Tarsometatarsal and intermetatarsal joints**
  - Dorsal, planter and interosseous ligaments
  - For big toe there is separate cavity

- **Metatarsophalangeal and interphalangeal joints**
  - Deep transverse ligaments
Surface Anatomy of Foot