



# TARSOMETATARSAL JOINT

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- Plane synovial joint.
- Articulation: distal row of tarsal bones and base of metatarsals.

- 1<sup>st</sup> tarsometatarsal joint articulates with – **base of first metatarsal and medial cuneiform .**
- Has its own joint capsule.
- 2<sup>nd</sup> metatarsal joint- **2<sup>nd</sup> metatarsal and middle cuneiform and sides of medial and lateral cuneiform.**
- 3<sup>rd</sup> metatarsal joint- **3<sup>rd</sup> metatarsal and lateral cuneiform.**
- Share capsule with 2<sup>nd</sup> metatarsal joint.

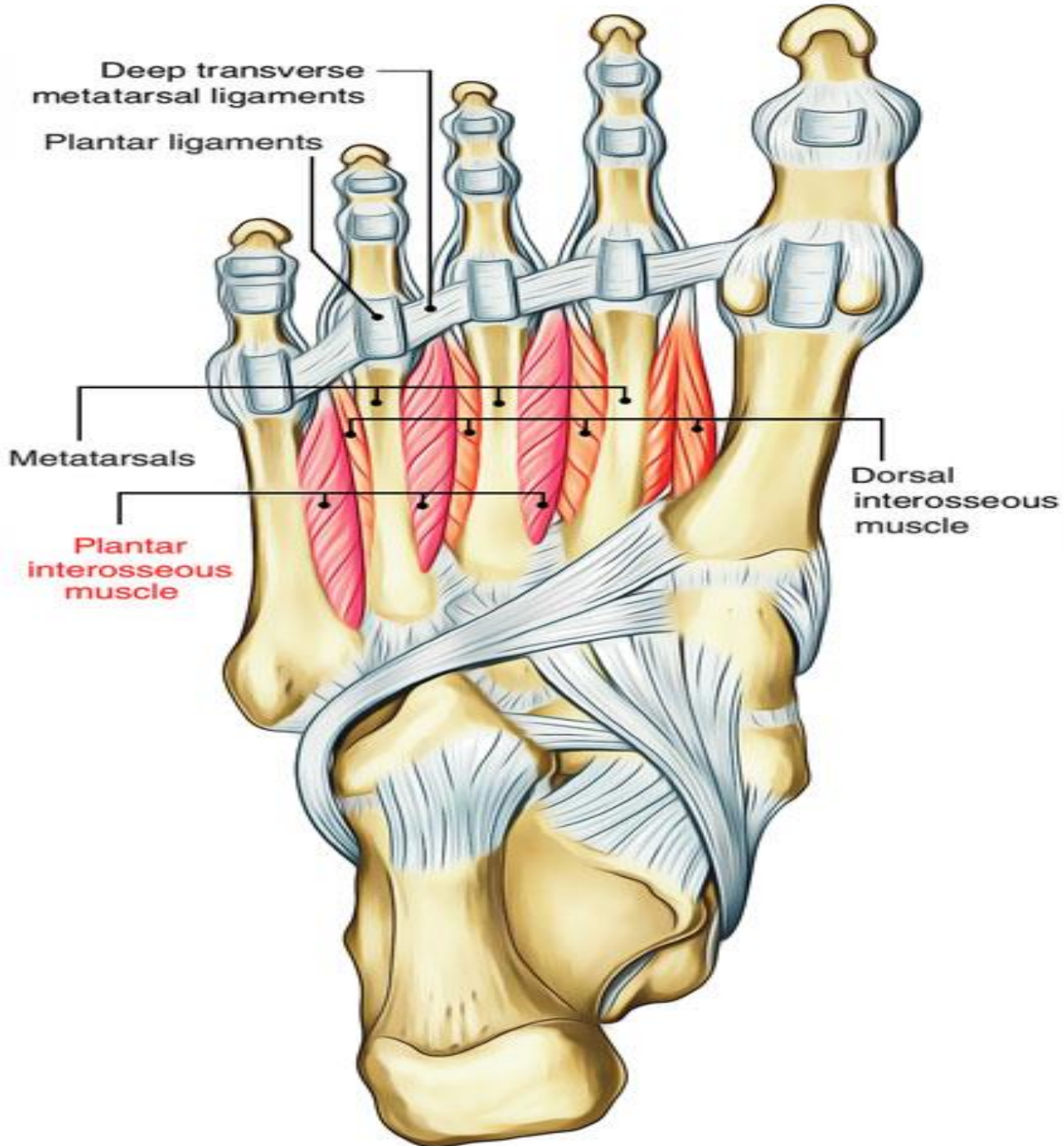


- 4<sup>th</sup> and 5<sup>th</sup> metatarsal joint articulates with **cuboid bone.**
- Shares common joint capsule



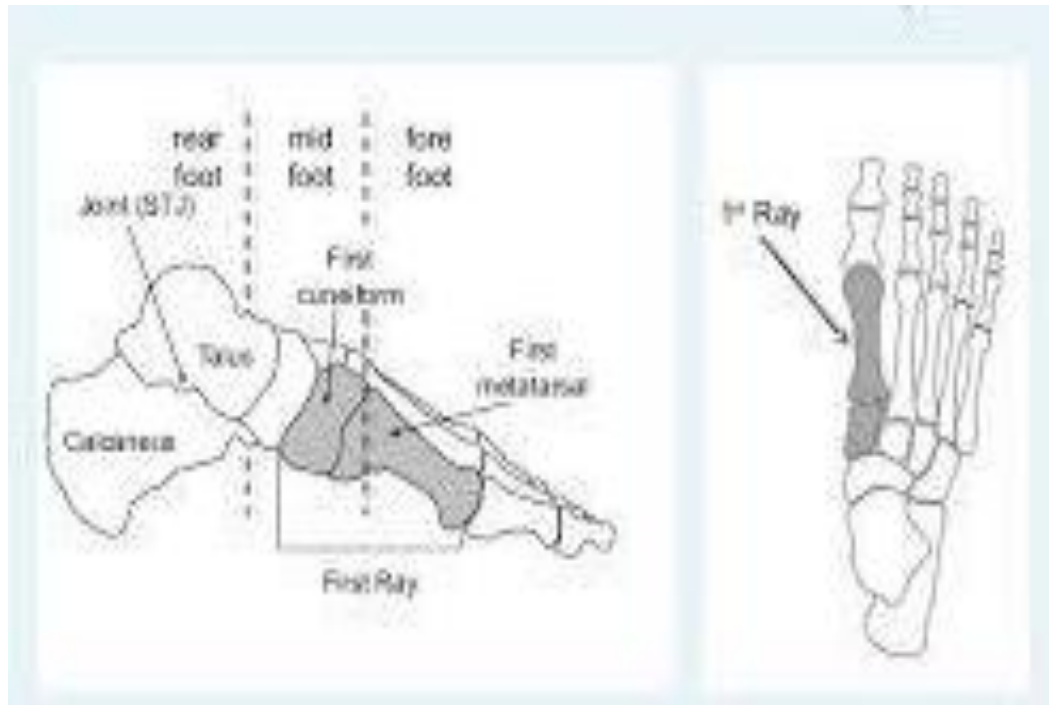
- **LIGAMENTS:**

1. Dorsal, plantar interosseous ligament
2. **Deep transverse metatarsal ligament:**
  - Spans head of metatarsal on plantar surface.



# Axes

- Ray- functional unit formed by metatarsal and associated cuneiform.
- Axis for 1<sup>st</sup> and 5<sup>th</sup> ray is oblique





## Axis Of Tarsometatarsal Joint



# MOTION AT 1<sup>ST</sup> AND 5<sup>TH</sup> RAY

- Largest motion occurs at 1<sup>st</sup> and 5<sup>th</sup> ray

## 1 st ray

**DORSIFLEXION**

**PLANTARFLEXION**

**INVERSION + ADDUCTION**

**EVERSION + ABDUCTION**

## 5<sup>th</sup> ray

**DORSIFLEXION**

**PLANTARFLEXION**

**EVERSION + ABDUCTION**

**INVERSION + ADDUCTION**



# **Tarsometatarsal function- SUPINATION TWIST AND PRONATION TWIST**

In weight bearing hindfoot pronates



Transverse tarsal joint supinates to keep plantar aspect of foot in contact

If TT supination is less or unable to do supination, medial forefoot presses ground (1<sup>st</sup> and 2<sup>nd</sup> ray) and lateral forefoot lifts

1<sup>st</sup> and 2<sup>nd</sup> ray will be pushed into DF by **GRF**

Muscles controlling 4<sup>th</sup> and 5<sup>th</sup> ray will PF, Tarsometatarsal joint maintain contact with ground.

DF of the 1<sup>st</sup> and 2<sup>nd</sup> ray and pronation of 4,5th ray – result **inversion**

entire forefoot goes to inversion

**SUPINATION TWIST** of TMT joints

# PRONATION TWIST

In weight bearing hindfoot supination



Forefoot tends to lift off the ground on its medial side and press in to the ground on its lateral side



Muscles controlling 1 and 2<sup>th</sup> ray to PF,



4<sup>th</sup> and 5<sup>th</sup> rays are forced into DF by GRF



Eversion of 1<sup>st</sup> and 2<sup>nd</sup> ray and DF of 4<sup>th</sup>