Gait disorders

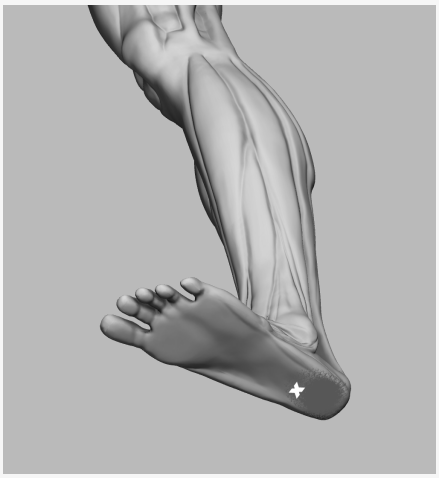
- If posterior muscle contract before full stance phase, foot will lock

- Prevents MTP joint dorsiflexion - causes abduction and eversion of the foot to accommodate

- Kinetic chain dysfunction as 1st MTP weigh bears on its medial surface instead of plantar
Subtalar and midtarsal joints collapse - flat feet
Tib post becomes tethered around tibial malleoalus - causes pos tib tendosynovitis and possible rupture

- Shift from pronation to supination fails to occur at toe off leading to
- stresses of medial column of the foot and medial aspect of heel (entire limb has to be abducted)
- Weakening of talonavicular and subtalar joints
- Shearing forces occur on medial tubercle of the calcaneus

Quadratus Plantae - TrPs



- Can mimic heel spurs and plantar fasciitis

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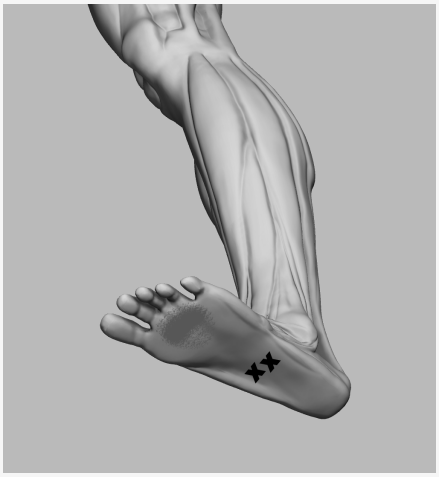
Quadratus Plantae

Origin: Calcaneus, Long plantar ligament
Insertion: Tendons of FDL
NS: Lateral plantar nerve (S1,S2)
Action: Assists FDL in flexion of DIP joints

Flexor Digitorum Brevis - TrPs



- Rolling iced rolling pin/water bottle/golf ball good for releasing TrPs

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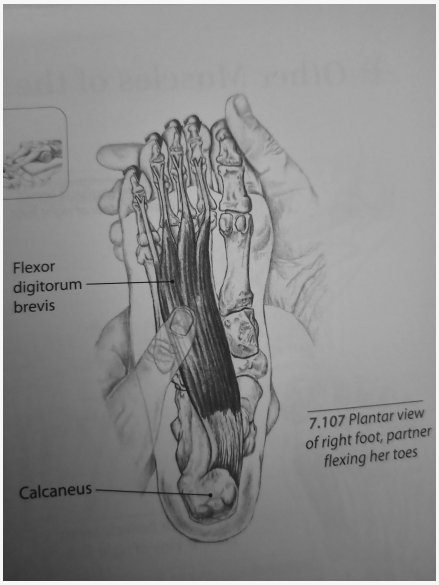
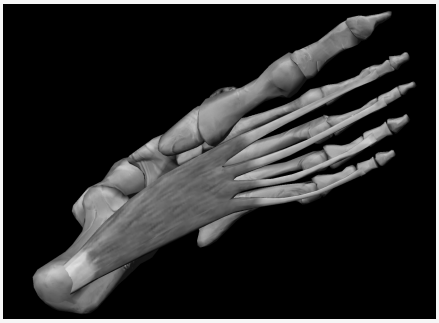
Flexor Digitorum Brevis - Palpation



- Locate Plantar surface of the heel and 2-5th toes
- Palpate along arch of foot, flex and relax toes

Flexor Digitorum Brevis



Origin: Calcaneus
Insertion: Middle Phalanges of toe 2-5
NS: Medial plantar nerve S1-S2
Action: Flexion of the lateral four digits

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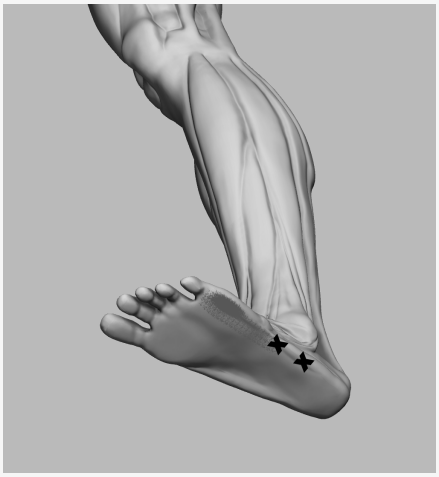
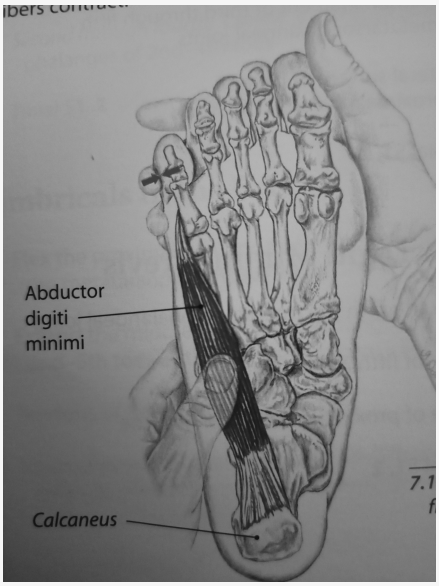
Abductor Digiti Minimi (Foot) - TrPs



Abductor Digiti Minimi (Foot) - Palpation



- Locate plantar surface of the heel and lateral surface of 5th toe
- Palpate between those points
- Ask pt to abduct/flex 5th toe

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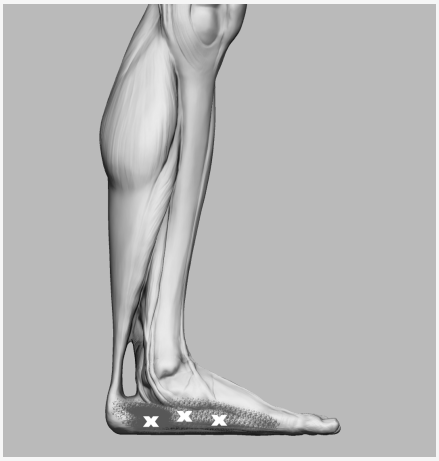
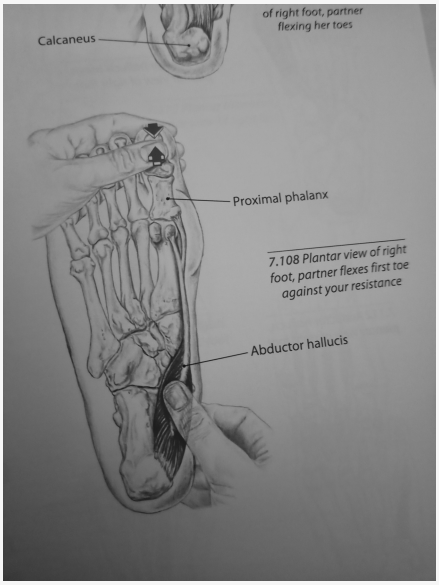
Abductor Hallucis - TrP



- Can entrap posterior tibial nerve / two branches of the lateral and medial plantar nerves against the medial tarsal bones

Abductor Hallucis - Palpation



- Locate medial surface of the heel and medial side of first toe
- Palpation between those points
- Get pt to flex first toe against resistance

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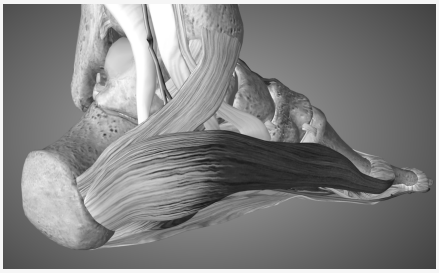
Abductor Hallucis



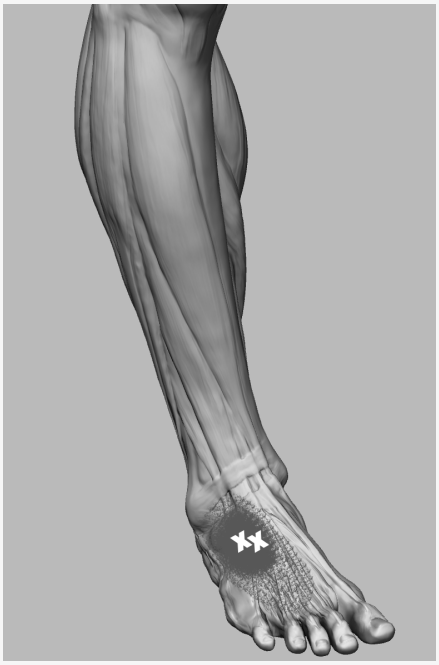
Origin: Medial process of calcaneal tuberosity , plantar aponeurosis, flexor retinaculum

Insertion: Medial aspect of base of 1st phalanx of hallux

NS: Medial Plantar nerve S1, S2

Action: Abducts hallux

EDB - TrPs



- Pain usually does not occur above ankle

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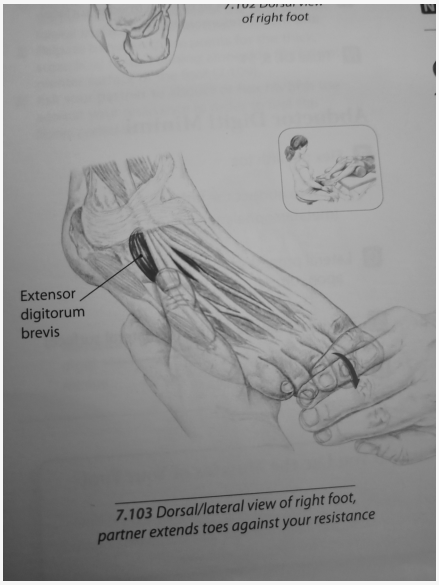
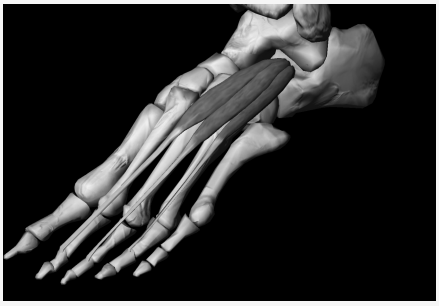
EDB - Palpation



- Slide two inches off the lateral malleolus
- Lateral to EDL tendons
- Get patient to extend toes against resistance

Extensor Digitorum Brevis and EHB



EDB

Origin: Dorsal surface of calcaneus

Insertion: Proximal dorsal region of middle phalanges 2,3,4

NS: Deep fibular Nerve L5-S1

Action: Extends digits 2-4

Can have a slip attaching onto the base of proximal phalanx of the hallux (EHB)

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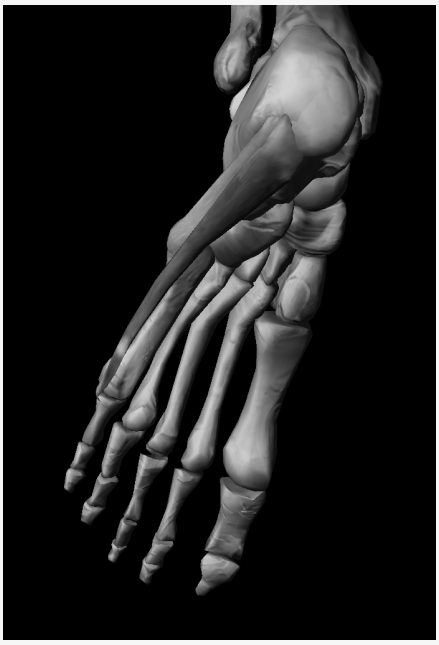
Foot mechanics during Gait

- Heel strike - Supinated position, body moves forward, weight travels through lateral heel and 5th metatarsal base, foot then pronates
- Stance phase - weight transfers to medial side through midtarsal bones
- Toe off - Shift from pronation to supination when propulsion happens, achilles activate, forces transferred through plantar fascia to 1st MT joint

Abductor Digiti Minimi (Foot)



Origin: Plantar Aponeurosis
Insertion: 5th toe/phalanges
NS: Lateral plantar nerve S1-S3
Action: Flexion and abduction of the 5th toe

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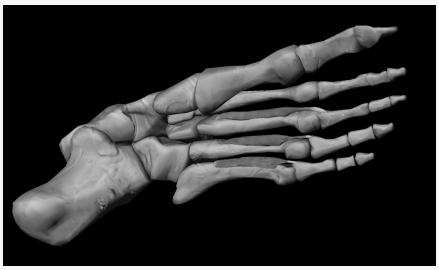
Plantar Interossei (foot) - TrPs

- Runs along body of the muscle

Plantar Interossei (foot)



Origin: Metatarsals, long plantar ligament
Insertion: Medial side of proximal phalanges of 3rd to 5th toe
NS: Lateral plantar nerve S2-S3
Action: Adduct toes

Dorsal Interossei (foot) - TrPs

- TrPs run along line of muscle

Dorsal Interossei (foot) - TrPs

- TrPs run along line of muscle

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Dorsal Interossei (foot)

Origin: Metatarsals
Insertion: Proximal phalanges
NS: Lateral plantar nerve S2-S3
Action: Abducts toes

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Adductor Hallucis - TrPs

Adductor Hallucis

Origin: Oblique head: Proximal ends of middle 3 metatarsal bones Transverse head: MTP, ligaments of lateral 3 toes

Insertion: Lateral side of base of 1st phalanx of the 1st toe, sesamoid apparatus

NS: Lateral Plantar Nerve S2 and S3

Action: Adducts Hallux

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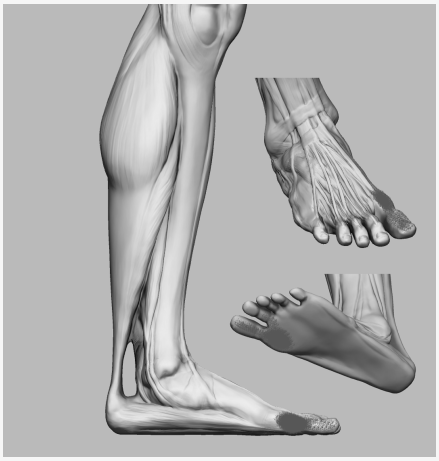
Flexor Hallucis Brevis - TrPs



- Help prevents clawing of great toe

Flexor Hallucis Brevis

Origin: Plantar aspect of cuneiforms, plantar calcaneocuboid ligament, long plantar ligament
Insertion: Medial head: Medial sesamoid bone of the MTP joint, proximal phalanx of great toe
Lateral Head: Lateral sesamoid bone of the MTP joint, proximal phalanx of great toe
NS: Medial plantar nerve S1-S2
Action: Flex Hallux

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Flexor Digiti Minimi Brevis

Origin: 5th Metatarsal bone
Insertion: 1st Phalanx of the fifth toe
NS: Superficial branch of lateral plantar nerve S2-S3
Action: Flexion and adduction of the 5th toe

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Lumbricals TrPs

- Runs along body of the muscle
- Add leverage to the toes to dig in more effectivetly when walking on soft sand

Lumbricals

Origin: Medial borders of long flexor tendons
Insertion: Proximal phalanges and extensor tendons of the 4 lateral toes
NS: Medial and lateral plantar nerves S3
Action: Flexes MTP joints, extends interphalangeal joints

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