**Muscles of the iliac region**

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| --- | --- | --- | --- | --- | --- | --- |
| **Action** | **Blood**  | **Notes** | **N.Supply** | **Insertion** | **Origin** | **Muscle** |
| **a)Acting from its origin:**powerful **flexion & medial rotation** of the thigh upon the pelvis**b)Acting from its insertion:**1-both psoas: **flexion** of the vertebral column as in raising the trunk from the recumbent (supine) to the sitting position2-one psoas only: **lateral flexion** of vertebral column | 1-subcostal a.2-lumbar a. | 1-psoas major leave the **abdomen**2-the 2 muscles pass over sup. Pupic ramus & deep to **inguinal lig.**3-If the femur is broken below the lesser trochanter, the iliopsoas tendon flexes and **rotates** the upper fragment of the femur **laterally**4-Both psoas & iliacus formthe lat. Part of the floor of **femoral traingle** | **Lumbar nerves** **(L1,2,3)** in the **abdomen** directly from lumbar plexus | Together with iliacus muscle they form the **iliopsoas tendon** which is inserted into the **lesser trochanter** of femur | 1-sides of **bodies** of last thoracic & all lumbar vertebrae and their **intervertebral discs**2-front & lower borders of all lumbar **transverse processes**3-**tendineous arches** | **Psoas major** |
| iliolumbar a. | **Femoral nerve** (by branches arising within the abdomen) | Together with psoas major muscle they form the **iliopsoas tendon** which is inserted into the **lesser trochanter** of femur | 1-illiac fossa 2- ala of **sacrum** | **Iliacus** |
| **Muscles of anterior compartment of thigh (extensor muscles of thigh)** |
| 1-**flexion, abduction and lateral rotation** of the thigh at the hip joint2-**flexion the and medial rotation** of the leg at the knee joint (tailor’s leg position)( DOS:putting the lower limb in classical cross leg position of tailor by acting on both hip & knee joints)3-steady the pelvis on the femur (together with the guy rope muscles: gracilis & semitendinosus) |  | 1-having parallel fibers (strap muscle)2- It belongs to the group of “guy-rope” muscles which steady the pelvis on the femur3-**Important Relations:**a-the most superficial m. in the front of thighb-its upper 1/3 forms lat. boundary of femoral trianglec-its middke 1/3 forms the roof the adductor canal**DOS:**d-its lower 1/3 descends along the med. Side of the kneee- 2 nerves pierce it : intermediate cutaneous n. of thigh &saphenous n. (or its infrapatellar br.) | **femoral nerve** | upper part of the medial surface of the shaft of tibia **(superficial & in front of insertion of gracilis and semitendinosus muscles) (S.G.S).** | anterior superior iliac spine below the attachment of inguinal lig. | **Sartorius** **(Longest muscle in the body)** |

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| **Quadriceps:** | **Rectus femoris** | **Vastus laterlis** | **Vastus medialis** | **Vastus intermedius** |
| **Origin** | **2 tendinous heads:** **1-straight head:** anterior inferior iliac spine**2-reflected head:** a-depression above the acetabulum b-capsule of hip joint | **The largest component of quadriceps**1-root of greater trochanter 2-upper part of intertrochanteric line 3-lateral lip of gluteal tuberosity4-lateral lip of linea aspera (upper ½)5-lateral intermuscular septum | 1-lower part of intertrochanteric line2-spiral line3-medial lip of linea aspera4- medial intermuscular septum5-medial supracondylar line | 1-upper 2/3 of the anterior and lateral surfaces of the femur2-lower part of the lateral intermuscular septum |
| **Insertion** | The tendons of 4 muscles unite to form a single tendon (at the lower part of the thigh) which is inserted into:1-Base of patella 2-tibial tuberosity through ligamentum patellae 3-condyles of tibia through patellar retinacula (fibrous expansion from sides of patellar lig.) |
| **N.Supply** | **Femoral nerve:** each head of quadriceps receives 2-3 branches from the femoral nerve. The branches to the rectus femoris supply the hip joint while the branches to the 3 vasti supply the knee joint. The branch to vastus intermedius supplies the **articularis genus** muscle |
| **Notes** | A small slender muscle called the **articularis genu (consideredas the deep lower fibers of vastus intermedius muscle)** arises from the lower part of the front of femur and is inserted into the upper part of the synovial membrane of the knee joint |
| **Blood supply** |  |
| **Action** | 1-powerful **extension** of the knee joint 2-**flexion** of the hip joint through the rectus femoris3-the lower fibers of the vastus medialis help to stabilize patella against the lateral pull induced by the ilio-tibial tract4-the articularis genu pulls the synovial membrane of the knee joint upwards during extension of the leg |

**Muscles of the medial compartment of thigh (adductor muscles of the thigh)**

**General remarks : LOOK page 44 DOS**

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| **Muscle** | **Origin** | **Insertion** | **N.supply** | **Notes** | **Blood** | **Action** |
| **Gracilis** | 1-lower part of the **body of pubis**2-**pubic** **arch** close to the symphysis pubis(dos: inferior pubic ramus &superior part of ischial ramus) | upper part of the medial surface of the shaft of **tibia** between the insertion of Sartorius & semitendinosus | **obturator nerve** (anterior division) | 1-the **most medial** muscle of the thigh2-the other adductors are arranged in 3 layers:1st layer: pectineus & adductor longus2nd layer: adductor brevis3rd layer: adductor mangus |  | 1-adduction of the thigh2-**flexion & medial rotation** of the leg3-steady the pelvis on the femur (guy rope group) |
| **Pectineus** | 1-pectineal line 2-pectineal surface of **superior** pubic ramus | **upper ½** of pectineal line of femur extending from lesser trochanter to the linea aspera | 1-**femoral nerve**2-sometimes receives branch from obturator n. (or accessory obturator n.) | **Important Relations (DOS):**1-forms part of the floor of **femoral triangle**2-related anteriorly to the **femoral sheath**3-related posteriorly to **obturator externus m.** |  | 1-adduction of the thigh2-flexion of the hip joint |
| **Adductor longus** | outer surface of the **body of pubis** below the pubic tubercle | middle 2/4 of **linea aspera** of femur | **obturator nerve** (anterior division) | 1-the adductor longus is liable to be severely strained in those who ride much on horseback, or it may be ruptured by suddenly gripping the saddle (rider’s bone) |  | adduction **& lateral rotation** of the thigh |
| **Adductor brevis** | 1-front of **body of pubis** 2-**inferior pubic ramus** between the origins of gracilis and obturator externus | 1-**lower ½** of pectineal line of femur2-upper part of linea aspera | **obturator nerve (L2,3,4)** either anterior or posterior division | 1-the anterior division of obturator nerve lies anterior to the adductor brevis muscle and its posterior division lies posterior to it2-lies deep to adductor longus & pectineus |  | adduction & lateral rotation of the thigh  |
| **Adductor mangus****1-pubic(adductor) part** | outer surface of **pubic arch****N.B:** UPPERMOST FIBERS RUN HORIZONTALLY while the remaining run downwards & laterally | 1- medial lip of gluteal tuberosity2-medial lip of **linea aspera**3-medial supracondylar line | **obturator nerve** (posterior division) | **Important Relations:**1-forms the floor of **adductor canal**2-its insertion is perforated by the perforating branches of the **profunda femoris** vessels3-it has an opening called **adductor hiatus** which allows the femoral vessels to pass from the adductor canal downwards into the popliteal fossa (it is a gap in the attachment of it to medial supracondylar line) |  | adduction **& lateral rotation** of the thigh |
| **2-ischial(hamstring) part:** | lat. Part of the lower triangular area of **ischial tuberosity****N.B:** its fibers descend vertically | 1-**adductor tubercle** of femur2- medial supracondylar line  | **sciatic nerve** (tibial part) |  | **extension** of the hip joint (like hamstring muscles) |

**Muscles of gluteal region**

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| --- | --- | --- | --- | --- | --- | --- |
| **Muscle** |  **Origin** | **Insertion** | **N.supply** | **Notes** | **Blood** | **Action** |
| **Gluteus maximus** | 1-outer gluteal surface of ilium posterior to posterior gluteal line2-posterior surface of sacrum & coccyx3-back of sacro-tuberous lig. | 1-superficial 3/4 : posterior border of the upper part of **ilio-tibial tract**2-deep ¼ floor of **gluteal tuberosity** | **inferior gluteal nerve****DOS: (L5,S1,2)** | 1-the largest muscle in the body2-its great thickness make it ideal for I.M injection.to avoid injury to the underlying sciatic nerve, the injection should be given well forward on the upper outer ¼ of the buttock |  | 1-**main extensor of** hip joint during climbing upstairs , rising from sitting position & walking (dos: running) (when force is needed)2-**lateral rotation & abduction** of hip joint3-**stabilization** of knee joint during extension as it is inserted into ilio-tibial tract4-**chief tensor** of the deep fascia of the thigh helped by tensor faciae latae muscle |
| **Structures deep to the gluteus maximus:** |
| **Bony prominences** | **Ligaments** | **Muscles & tendons** | **Vessels** | **Nerves** | **Bursae** |
| 1-ischial tuberosity2-greater trochanter3-DOS:a- back of ilium & sacrumb-gluteal tuberosity | 1-sacro-tuberous2-sacro-spinous | 1-gluteus medius (&minimus)2-priformis3- 2 gamelli4- quadratus femoris5- obturator internus6-vastus lateralis7-**adductor mangus**8-**origin of hamstring muscles** | 1-sup. Gluteal vessels2-inf gluteal vessels3-internal pudendal vessels | 1-sup. Gluteal nerve2-inf. Gluteal nerve3-sciatic nerve 4-post. Cutaneous nerve of the thigh5-nerve to quadratus femoris6-nerve to obturator internus7-pudendal nerve | 3 bursae on:1-greater trochanter2-vastus lateralis3-ischial tuberosity |
| **Muscle** | **Origin** | **Insertion** | **N.supply** | **Notes** | **Blood** | **Action** |
| **gluteus medius** | gluteul surface of the ilium between1-iliac crest (above) 2-post. gluteal line3-ant. gluteal line | oblique ridge on the **lateral** surface of greater trochanter | **superior gluteal nerve** | 1-intramuscular injection is given in the upper lat. quadrant of gluteal region (i.e in the y medius & minimus) to avoid injury of important nerves & vessels undercover gluteus maximus (mainly in the lower med. quadrant)2-when **gluteus maximus** is paralysed, the patient can't stand up from sitting position without a support3-in **unilateral** paralysis of glutei medius & minimus the patient shows a **lurching gait (limping gait)**4-in **bilateral** paralysis of glutei medius & minimus the patient shows a **waddling gait** |  | 1-abduction of the hip joint2-medial rotation of th thigh (the ant. fibers)3-prevent sagging (tilting) of the pelvis when the opposite leg is off the ground (acting from below) |
| **gluteus minimus** | gluteul surface of the ilium between1-ant. gluteal line 2-inf.gluteal line | **Anterior** surface of greater trochanter | **superior gluteal nerve** |  |
| **Tensor fasciae latae** | Outer lip of the **iliac crest** between ASIS and iliac tubercle | Anterior border of **ilio-tibial tract** | **superior gluteal nerve** |  |  | 1-tightens ilio-tibial tract2-assists in keeping the knee extended in standing & walking through its insertion3-**weak** abductor & medial rotator |

**The Six Lateral Rotators of the Hip Joint**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Muscle** | **Origin** | **Insertion** | **N.supply** | **Notes** | **Blood** | **Action** |
| **Priformis** | anterior surface of the middle 3 **sacral vertebrae** | **tip** of greater trochanter: the fibers pass downward & laterally and leave the pelvis via the greater sciatic foramen to insert | branches from the sacral plexus **(S1,2)** | identification of this muscle in the glutal region grtly assists in the recognition of the nerves & vessaels of this region |  | Lateral rotation of the thigh at the hip joint |
| **Obturator internus** | 1-pelvic surface (inner) of obturator membrane 2-margins of obturator foramen3-area extending between obturator foramen & greater sciatic notch | **med.** surface of greater trochanter: its tendon passes throug the leser sciatic foramen lateraaly across the back of hip joint and joined by two gamelli | nerve to obturator internus from the sacral plexus **(L5 & S1,2)** |  |  | Lateral rotation of the thigh at the hip joint |
| **Superior gemellus** | upper margin of the **lesser sciatic notch** | upper border of the obturator internus tendon | nerve to **obturator internus** from the sacral plexus |  |  | Lateral rotation of the thigh at the hip joint |
| **Inferior gemellus** | lower margin of the **lesser sciatic notch** | lower border of the obturator internus tendon | nerve to **quadratus femoris** from the sacral plexus |  |  | Lateral rotation of the thigh at the hip joint |
| **Quadratus femoris** | lateral margin of **ischial tuberosity** | 1-**quadrate tubercle**2-lower part of **inertrochanteric crest** | nerve to quadratus femoris **(L4,5 & S1**) |  |  | Lateral rotation of the thigh at the hip joint |
| **Obbturator externus** | 1-outer surface of obturator membrane2-medial & lower margins of obturator foramen | **trochanteric fossa**: its tendons pass backward below the hip joint then upwards and laterally on the back of the neckof femur to insert | post.division of **obturator nerve** (from lumbar plexus) |  |  | Lateral rotation of the thigh at the hip joint |

**Hamstring muscles**

all arise from **ischial tuberosity** except the short head of biceps

all are supplied by **tibial** part of sciatic nerve except the short head of biceps

all are **flexors of the knee and extensor of the hip joint**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Muscle** | **Origin** | **Insertion** | **N.supply** | **Notes** | **Blood** | **Action** |
| **Biceps Femoris** | **1-the long head:** lower medial area of the upper quadrangular part of the ischial tuberosity in common with semitendinosus muscle**2-the short head:**a-lateral lip of linea aspera b-upper part of lateral supracondylar linec-lateral intermuscular septum | head of fibula (lateral) | **long head:** tibial part of the sciatic nerve**short head:** peroneal part of the sciatic nerve |  |  | 1-flexion and **lateral rotation** of the leg at the knee joint2-extension of the hip joint by the long head alone |
| **Semitendinosus** | lower medial area of the upper quadrangular part of the ischial tuberosity | upper part of the medial surface of tibia behind the insertion of sartorius & gracilis (S.G.S) | tibial part of the sciatic nerve | 1-it is so called as half of its length is made of a long tendon2-it belongs to the group of "**guy-rope**" muscles (**sartorius, gracilis & semitendinosus**) which steady the pelvis on the femur |  | 1-flexion and **medial rotation** of the leg at the knee joint2-extension of the hip joint3-helps to steady the pelvis on the femur (guy-rope) |
| **semimembranosus** | upper lateral area of the upper quadrangular part of the ischial tuberosity | 1-groove on the back of the medial condyle of the tibia2-the capsule of the knee joint3-popliteal facia4-soleal line | tibial part of the sciatic nerve | its upper part is formed of a wide membrane, hence its name |  | 1-flexion and **medial rotation** of the leg at the knee joint2-extension of the thigh at hip joint |

**Muscles of anterior compartment of the leg (Extensor)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Muscle** | **Origin** | **Insertion** | **N.supply** | **Notes** | **Blood** | **Action** |
| **Tibialis Anterior** | 1- upper 2/3 of lateral surface of shaft of tibia2-interosseus membrane | 1- medial side of medial cuneiform bone2- base of 1st­ metatarsal bone | anterior tibial nerve | the tendon of the muscle passes deep to both superior & inferior extensor retinacula |  | 1-Dorsiflexion (extension) of the ankle (when foot is off the ground)2-**inversion** of the foot (at subtalar joint)3-support the **medial** longitudinal arch of foot |
| **Extensor digitorum longus** | 1-upper 3/4 of ant. surface of shaft of fibula2-interosseus membrane | each expansion divides into 3slips: a- middle slip inserts into the bases of middle phalanges of lateral 4 toesb- 2 collateral slips unite and insert into the bases of the terminal phalanges of lateral 4 toes | anterior tibial nerve | the tendon of the muscle passes deep to superior extensor retinaculam and then divides deep to inferior extensor retinaculum into 4 tendons for the lateral 4toes.each tendon expands on the dorsum of the proximal phalanx forming an extensor expansion2- extensor expansion is joined by:a- tendon of extensor digitorum brevis (except the little toe)b- tendon of one lumbrical muscles3- tendons of 2 interosseous muscles (except the little toe which receives only one) |  | 1- Dorsiflexion of ankle joint2-extension of all joints of the lateral 4 toes |
| **Extensor hallucis longus** | 1- middle 2/4 of anterior surface shaft of fibula2- interosseus membrane | the dorsal surface of the base of the terminal phalanx of big toe (hallux) | anterior tibial nerve | the tendon of the muscle passes deep to both superior & inferior extensor retinacula |  | 1-Dorsiflexion of ankle joint2-extension of all joints of big toe |
| **Peroneus Tertius**  | 1- lower 1/4 of anterior surface shaft of fibula2- interosseus membrane | the dorsal surface of the base of the 5th metatarsal bone | anterior tibial nerve | may be considered as a 5th tendon of extensor digitorum longus |  | 1-Dorsiflexionof ankle 2-**eversion** of the foot (at subtalar joint)3-support the **lateral** longitudinal arch of foot |

**Muscles of the back of the leg**

**Deep Flexor Group (Deep Calf Muscles)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Muscle** | **Origin** | **Insertion** | **N.supply** | **Notes** | **Blood** | **Action** |
| **Popliteus** | **popliteal sulcus** on lateral surface of lateral condyle of femur below the lateral epicondyle**(intra-capsular)** | posterior surface of tibia **above** the soleal line | branch from **tibial nerve** (in popliteal fossa) | 1- the popliteus muscle forms the lower part of the floor of the popliteal fossa2-tendon of origin of popliteus is **intracapsular** structure of knee joint **(intra-articular)** &perforates back of capsule3- at its lower border: a- the popliteal artery divides into anterior & posterior tibial arteriesb- the medial popliteal nerve becomes the posterior tibial nerve |  | 1- flexion of knee joint2- **unlocking** of a fully extended knee at the begining of flexion :a-if the foot is off the ground, the muscle rotates the tibia medially on femur (as the tibia is freely mobile)b-if the foot is on the ground, the muscle (acting from below) rotates the femur laterally on tibia (as the tibia is fixed) |
| **Flexor hallucis longus** | 1-lower 2/3 of back of fibula (**below** the origin of soleus, lateral to medial crest)2-back of interosseus mambrane | base of terminal phalanx of big toe | posterior tibial nerve |  |  | 1- flexion of all joints of big toe (M/P & I/P joints)2-helps in planter flexion of foot (at ankle joint)3-supports the **medial** longitudinal arch of foot |
| **Flexor Digitorum longus** | back of tibia **below** the soleal line, medial to the vertical line | bases of terminal phalanges of lateral 4 toes | posterior tibial nerve | 1-tendon of the muscle passes behind the medial malleolus, lateral to the tendon of tibialis posterior and deep to flexor retinaculum of ankle2-then it enters the foot along the medial border of sustentaculum tail of calcaneus3-in the sole it crosses the tendon of flexor hallucis longus4-near the toes, the tendon divides into 4 slips which pass forward and then perforate the tendons of flexor digitorum brevis to become inserted into the bases of the terminal phalanges of the lateral 4 toes |  | 1-flexion of all joints of the lateral 4 toes(M/P and I/P)2-planter flexion of foot (at ankle joint)3-supports the **lateral & medial** longitudinal arches |
| **Tibialis posterior (lies deep to F.H.L and F.D.L)** | 1-back of tibia **below** the soleal line, lateral to vertical line2-back of interosseus membrane | 1-the tuberosity of navicular bone(main insertion)2-the bases of 2,3&4 metatarsal bones3-all tarsal bones **except the talus** (all 3 cuneiforms & cuboid) | posterior tibial nerve | 1-in the distal part of the leg the tendon of the muscle passes deep to flexor digitorum longus in a groove on the back of the medial malleolus then deep to flexor retinaculum2- it enters the foot above the sustentaculum tail on the deltoid ligament and continues its course in 4 layer of sole |  | 1-planter flexion of foot (at ankle joint)2-**inversion** of foot(at subtalar joint)3-maintains the **medial** longitudinal arch, as its tendon is stretched below the **spring** **ligament** (main support of arch) |

**Superficial Flexor Group**

**(superficial calf muscles)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Muscle** | **Origin** | **Insertion** | **N.supply** | **Notes** | **Blood** | **Action** |
| **Gastrocnemius (most superficial of the 3 calf muscles)** | **1**-**lateral head:** impression on the lateral surface of lateral condyle of femur above the lateral epicondyle**2**-**medial head**: popliteal surface of femur above the medial condyle (larger head) | its tendon joins the tendon of soleus muscle forming the tendo-calceneus or tendo-achilles **(most powerful tendon in the body)**which is inserted into **the middle of the dorsal surface of calcaneus** | **tibial nerve** (by a seperate branch to each head) | the 2 heads are seperated by a groove containig: a-**s**ural nerve b-**s**hort **s**aphenous vein |  | **Action of** **triceps surae:**1-powerful **planter flexors** of the ankle joint by raising the heel off the ground during walking and running2-they **lift the weight of the body** **in rising on tip toes** as do ballet players3-Gastrocnemius alone is also a flexor to the knee joint but it can't perform the 2 actions on both joints at the same time, as its fibers are short4-Soleus: acts as a **muscle** **pump** |
| **Soleus** **(lies deep to gastrocnemius)** | **1-Tibial origin:** a-middle 1/3 of medial border of shaft of tibiab-soleal line on the back of tibia**2-fibular origin:**a-back of head of fibulab-upper 1/3 of posterior surface of shaft of fibula**c-from fibrous tendinous arch** between tibia & fibula which overlies the posterior tibial vessels and nerve, thus protecting them from contractions of soleus muscle | In tendo-calcaneus…… | **1-a superficial branch** from the **tibial nerve** (in popliteal fossa): supplies its superficial surface**2-a deep branch** from the **tibial nerve** (in back of leg): supplies its deep surface | these 2 calf muscles form together a bulky mass with 3 heads so given the name of **triceps surae** |  |
| **Plantaris** | 1-lower part of lateral supracondylar line of femur.2-**oblique popliteal ligament** | either in tendo-calcaneus **or** in posterior surface of calcaneus | **tibial nerve** | 1- a very small muscle & may be absent2-has along slender tendon which runs obliquely between gastrocnemius and soleus to reach the medial side of tendo-calcaneus3-its tendon is used in surgical autograft to repair severed flexor tendons of fingers |  | weak flexion of knee and ankle joints |

**Muscles of the lateral (peroneal) compartment of the leg**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Muscle** | **Origin** | **Insertion** | **N.supply** | **Notes** | **Blood** | **Action** |
| **Peroneus Longus** | 1-**upper 2/3** of lateral surface of shaft of **fibula**2-anterior& posterior intermuscular septa | 1-lateral aspect of the medial cuneiform bone2-base of **1st** **metatarsal** bone | **Musculo-cautaneoous** **nerve** | The tendon crosses the sole transversely from lateral to medial lying in a groove on the lower surface of the cuboid bone |  | 1-**Eversion** of foot (at subtalar joint)2-**planter flexion** of foot (at ankle joint)3-supports the **lateral** **longitudinal & transverse** arches of foot |
| **Peroneus brevis** | 1- **lower** **2/3** of lateral surface of shaft of **fibula**2-anterior& posterior intermuscular septa | **Tuberosity** on the base of **5th metatarsal** bone | **Musculo-cautaneoous** **nerve** | **Both tendons** **of 2 muscles:**1- descend behind then below the **lateral** **malleolus** over the lateral surface of calcaneus2-both are held down by the superior & inferior peroneal retinacula |  | 1-**Eversion** of foot (at subtalar joint)2-**planter flexion** of foot (at ankle joint)3-supports the **lateral** **longitudinal** arches of foot |

· **E**version muscles: support **medial** longitudinal arch:
p**E**roneus longus tibialis anterior
p**E**roneus brevis tIbialis posterior
p**E**roneus terius support **lateral** longitudinal arch:
· **I**nversion muscles: peroneus longus (&transvrse arch)
t**I**bialis anterior peroneus brevis
t**I**bialis posterior peroneus tertius