

# MUSCLES OF THE LOWER EXTREMITY:

## *Movement of the hip and leg:*

### ***Anterior Compartment Thigh Muscles:***

<b><i>Pectineus</i></b>	<b>O:</b> Superior ramus of pubis.	Flexes, adducts and assists with medial rotation of hip.
Nerve: Femoral nerve, also fibers from obturator nerve	<b>I:</b> Pectineal line inferior to lesser trochanter of femur.	
Roots: L2 - L4		
<b>S:</b> Flexion: Rectus femoris, iliopsoas, TFL, Sartorius, Adductor (longus & brevis)	Adduction: Adductor (longus, brevis, and magnus), Gracilis Pectineus	Medial rotation: Gluteus (medius & minimis) Adductor (longus and brevis), Gracilis
<b>A:</b> Extension: Gluteus maximus, Semimembranosus, Semitendinosus, Biceps femoris, Adductor magnus	Abduction: Gluteus (medius and minimus), TFL Sartorius	Lateral rotation: Gluteus maximus, piriformis Sartorius

<b><i>Sartorius</i></b>	<b>O:</b> Anterior superior iliac spine.	Flexes knee.
Nerve: Femoral nerve	<b>I:</b> Upper medial surface of body of tibia.	Flexes, abducts and laterally rotates hip.
Roots: L2 - L3		
<b>S:</b> Hip flexion: Rectus femoris, iliopsoas, pectineus, TFL Lateral rotation: Gluteus maximus, piriformis	Hip Abduction: Gluteus minimis & medius	Knee Flexion: Semimembranosus, Semitendinosus, Biceps Femoris, Gracilis, Gastrocnemius Popliteus, Sartorius
<b>A:</b> Hip extension: Gluteus maximus, Semimembranosus, Semitendinosus, Biceps femoris, adductor magnus Medial rotation: Gluteus (medius & minimis), Adductor (longus and brevis), Gracilis, Pectineus	Hip adduction: Adductor (longus, brevis, and magnus), Pectineus, Gracilis	Knee extension: Quadriceps muscles

<b><i>Iliopsoas</i></b>		
<b><i>Psoas major</i></b>	<b>O:</b> Transverse processes of L1 - L5	hip/thigh flexion and lateral rotation
Nerve: Lumbar nerves (L1 - L3)	<b>I:</b> Lesser trochanter	
<b><i>Iliacus</i></b>	<b>O:</b> Iliac crest, fossa, anterior sacroiliac ligament.	hip/thigh flexion and lateral rotation
Nerve: Femoral (L2 -L3)	<b>I:</b> Lesser trochanter	
<b>S:</b> Hip flexion: Rectus femoris, pectineus, TFL, Sartorius, Adductor (longus & brevis)		Lateral rotation: Gluteus maximus, sartorius, piriformis, Iliopsoas
<b>A:</b> Hip extension: Gluteus maximus, Semimembranosus, Semitendinosus, Biceps femoris (long head), Adductor magnus		Medial rotation: Gluteus (minimis and medius), Adductor (All 3), Pectineus, TFL, Gracilis

<b><i>Quadriceps Femoris</i></b>		
<b><i>Rectus femoris</i></b>	<b>O:</b> Anterior inferior iliac spine.	Extension at knee.
Nerve: Femoral nerve	<b>I:</b> Patella via quadriceps tendon and then tibial tuberosity via patellar ligament.	Flexion at hip.
Roots: L2 - L4		

**S:** Hip flexion: Iliopsoas, Pectineus, TFL, Sartorius, Adductor (longus & brevis)  
**A:** Hip extension: Gluteus maximus, Semimembranosus, Semitendinosus, Biceps femoris

Knee Extension: Vastus (medialis, lateralis, and intermedialis)  
 Knee Flexion: Semimembranosus, Semitendinosus, Biceps femoris  
 Gracilis, Gastrocnemius, Popliteus, Sartorius

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**Vastus medialis** **O:** Linea aspera of femur. Extension at knee.  
 Nerve: Femoral nerve **I:** Patella via quadriceps tendon and then  
 Roots: L2 - L4 tibial tuberosity via patellar ligament.  
**S:** Extension: Rectus femoris, Vastus (lateralis and intermedialis)  
**A:** Flexion: Semimembranosus, Semitendinosus, Biceps femoris, Gracilis, Gastrocnemius, Popliteus, Sartorius

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**Vastus lateralis** **O:** Intertrochanteric line and linea aspera of femur. Extension at knee.  
 Nerve: Femoral nerve **I:** Patella via quadriceps tendon and then  
 Roots: L2 - L4 tibial tuberosity via patellar ligament.  
**S:** Extension: Rectus femoris, Vastus (medialis and intermedialis)  
**A:** Flexion: Semimembranosus, Semitendinosus, Biceps femoris, Gracilis, Gastrocnemius, Popliteus, Sartorius

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**Vastus intermedius** **O:** Anterior 2/3 and lateral shaft of femur Extension at knee.  
 Nerve: Femoral nerve **I:** Patella via quadriceps tendon and then  
 Roots: L2 - L4 tibial tuberosity via patellar ligament.  
**S:** Extension: Rectus femoris, Vastus (lateralis, and medialis)  
**A:** Flexion: Semimembranosus, Semitendinosus, Biceps femoris, Gracilis, Gastrocnemius, Popliteus, Sartorius

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**Medial Thigh Muscles:**

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**Adductor brevis** **O:** Anterior surface of the inferior ramus of pubis Adducts, flexes, and helps medially rotate hip.  
 Nerve: Obturator nerve **I:** pectineal line, medial lip of linea aspera of femur.  
 Roots: L2 - L4  
**S:** Adduction: Adductor (longus and magnus), Medial rotation: Gluteus (minimus and medius), Flexion: Rectus femoris, Iliopsoas, Pectineus, TFL, Sartorius  
 Gracilis, Pectineus Adductor (All 3), Pectineus, TFL, Gracilis  
**A:** Abduction: Gluteus (maximus, medius and minimus), Lateral Rotation: Gluteus maximus, Sartorius, Extension: Gluteus maximus, Semimembranosus, Semitendinosus, Biceps femoris, adductor magnus  
 TFL, Sartorius

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**Adductor longus** **O:** Body of pubis inferior to Pubic crest and lateral pubic symphysis. Adducts, flexes, and helps medially rotate hip.  
 Nerve: Obturator nerve **I:** middle 1/3 of Linea aspera of femur.  
 Roots: L2 - L4  
**S:** Same as Adductor brevis but for adduction change longus to brevis  
**A:** Same as Adductor brevis

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**Adductor magnus**

Nerve: Obturator and Tibial nerves

Roots: L2 - L4

**O:** Inferior ramus of pubis and ischium to ischial tuberosity.**I:** Linea aspera of femur.  
Medial supracondylar line and adductor tubercleAdducts thigh, superior horizontal fibers flexes thigh  
Posterior portion extends thigh at hip joint.**S:** Adduction: Adductor (longus and brevis), Gracilis, Pectineus

Hip Flexion: Rectus femorus, Iliopsoas, Pectineus, TFL, Gluteus (medius and minimus), Adductor (longus and brevis)

**A:** Abduction: Gluteus (Maximus, medius and minimus), TFL, Sartorius

Hip Extension: Gluteus maximus, Semimembranosus, Semitendinosus, Biceps femoris

**Gracilis**

Nerve: Obturator nerve

Roots: L2 &amp; L3

**O:** Body and inferior ramus of pubis**I:** Anterior medial proximal tibia.

Adducts and medially rotates hip; and flexes knee.

**S:** Adduction: Adductor (Magnus, brevis and longus),  
Gracilis, PectineusMedial rotation: Gluteus (minimis and medius)  
Adductor (All 3), Pectineus, TFL, GracilisKnee Flexion: Semimembranosus, Semitendinosus,  
Biceps femoris, Gracilis, Gastrocnemius,  
Popliteus, Sartorius**A:** Abduction: Gluteus (Maximus, minimus and minimus),  
TFL, SartoriusLateral rotation: Gluteus maximus, sartorius,  
piriformis, IliopsoasKnee Extension: Rectus femoris, Vastus (medialis,  
lateralis, and intermedialis)**Gluteal Region Muscles:****Tensor fascia latae (TFL)**

Nerve: Superior Gluteal nerve

Roots: L4 &amp; L5, S1

**O:** Anterior superior iliac spine and anterior Iliac crest**I:** Tibia by way of the iliotibial tract.

Flexes and abducts thigh at hip joint.

Helps stabilize and steady the hip and knee joints  
by putting tension on the iliotibial band of fascia**S:** Flexion: Rectus femoris, Iliopsoas, Pectineus, Sartorius

Abduction: Gluteus (maximus, medius and minimus), Sartorius

**A:** Extension: Gluteus maximus, Semimembranosus, Semitendinosus, Biceps femoris

Adduction: Gracilis, Pectineus, Adductors (all 3)

**Gluteus maximus**

Nerve: Inferior Gluteal nerve

Roots: L5, S1 &amp; S2

**O:** Iliac crest, sacrum, coccyx, and aponeurosis of sacrospinalis.**I:** Iliotibial tract of fascia lata and lateral part of linea aspera under greater trochanter (gluteal tuberosity) of femur.Extends thigh at hip and laterally rotates thigh.  
upper fibers abduct**S:** Extension: Semimembranosus, Semitendinosus, Biceps femoris  
Adductor magnus

Lateral Rotation: Piriformis, Iliopsoas, sartorius, iliopsoas

**A:** Flexion: Rectus femoris, Iliopsoas, Pectineus, TFL, Sartorius,

Medial rotation: Gluteus (medius and minimis), TFL,

Adductor (Magnus, longus, and brevis), pectineus, gracilis

**Gluteus medius**

Nerve: Superior Gluteal nerve

Roots: L4 &amp; L5, S1

**S:** Abduction: Gluteus (maximus & minimus), TFL, Sartorius**A:** Adduction: Adductors (All 3), Gracilis, Pectineus**O:** Dorsal ilium inferior to iliac crest**I:** Greater trochanter of femur.

Abducts and medially rotates hip.

Medial rotation: Gluteus minimus, TFL, Adductor (all 3), Pectineus, Gracilis

Lateral rotation: Gluteus maximus, piriformis, Iliospoas, Sartorius

**Gluteus minimus**

Nerve: Superior Gluteal nerve

Roots: L4 &amp; L5, S1

**S:** Abduction: Gluteus(maximus & medius), TFL, Sartorius**A:** Adduction: Adductors (All 3), Gracilis, Pectineus**O:** Dorsal ilium between inferior and anterior**I:** Greater trochanter of femur.

Abducts and medially rotates hip.

Medial rotation: Gluteus medius, TFL, Adductor (all 3), Pectineus, Gracilis

Lateral rotation: Gluteus maximus, Piriformis, Iliospoas, Sartorius

**Piriformis**

Nerve: Piriformis nerve

Roots: L5, S1 &amp; S2

**S:** Abduction: Gluteus (medius, minimis), TFL, Sartorius**A:** Adduction: Adductors (All 3), Gracilis, Pectineus**O:** Anterior surface of lateral process of sacrum and gluteal surface of ilium at the margin of the greater sciatic notch**I:** Superior border of greater trochanter

Laterally rotates and abducts thigh when hip is flexed

Lateral rotation: Gluteus maximus, Iliospoas, Piriformis, Sartorius

Medial rotation: Gluteus (minimis and medius), TFL, Adductor (all 3), Pectineus, Gracilis

**Posterior Thigh Muscles:****Biceps femoris**

Nerve: Tibial nerve (LH) and fibular nerve (SH)

Roots: L5, S1 &amp; S2

**S:** Hip extension: Gluteus maximus, Semtendinosus, Semimembranosus, Adductor**A:** Hip flexion: Rectus femoris, iliopsoas, Pectineus, TFL, Sartorius**O:** Long head: Ischial tuberosity  
Short head: linea aspera of femur.**I:** Head of fibula and lateral condyle of tibia.

Lateral rotation: Gluteus maximus, Piriformis, Iliopsoas, Sartorius

Medial rotation: Gluteus (medius and minimis), TFL, Adductor (magnus, longus and brevis), pectineus, Gracilis

Long head : Extends hip and Flexes knee.

Short Head flexes knee and laterally rotates hip.

Laterally rotates flexed knee

Knee flexion: Semtendinosus, Semimembranosus  
Gracilis, Sarortius, Gastrocnemius

Knee Extension: Vastus (medalis, lateralis, and intermedialis), Rectus femoris

**Semitendinosus**

Nerve: Tibial nerve

Roots: L5, S1 &amp; S2

**S:** Knee flexion: Biceps femoris, Semimembranosus, Gracilis, Sartorius, Gastrconemius, Popliteus**A:** Knee extension: Rectus femoris, Vastus (medalis, lateralis, and intermedialis)**O:** Ischial tuberosity.**I:** Proximal medial shaft of tibia.  
at Pes Anserinus tendon

Hip extension: Gluteus maximus, Biceps femoris, Semimembranosus

Hip flexion: Rectus femoris, iliopsoas, Pectineus  
Sartorius,

Flexes knee. Medially rotates flexed knee

Extends hip.

Medial rotation: Semimembranosus, Gracilis  
Sartorius, Popliteus

Lateral rotation: Biceps femoris

**Semimembranosus**

Nerve: Tibial nerve

Roots: L5, S1 &amp; S2

**S:** Same as Semitendinosus**A:** Same as Semitendinosus**O:** Ischial tuberosity.**I:** Posterior medial condyle of tibia.

Flexes knee. Medially rotates flexed knee

Extends hip.

**Muscles of the Anterior Compartment of the lower Leg****Tibialis Anterior**

Nerve: Deep Fibular nerve

Roots: L4 &amp; 5

**O:** lateral condyle, superior lateral 2/3 surface of the Tibia, interosseous membrane**I:** Medial inferior surface of 1st cuneiform and base of 1st metatarsal

Dorsiflexes ankle, inverts foot, supports longitudinal arch

**S:** Dorsiflexion: Extensor digitorum longus, Fibularis tertius  
Extensor hallucis longus

Inversion: Tibialis posterior, Flexor digitorum longus, Flexor hallucis longus, Extensor Hallucis longus

**A:** Plantar flexion: Gastrocnemius, Soleus, Plantaris, Tibialis posterior  
Fibularis (longus and brevis)

Eversion: Fibularis (longus, brevis &amp; tertius), Extensor digitorum longus

**(Deeper Layers)****(PTA Students only)****Extensor Hallucis longus**

Nerve: Deep Fibular nerve

Roots: L4 L5 &amp; S1

**O:** Middle anterior surface of fibula, interosseous membrane**I:** Dorsal aspect of base of distal phalanx of Hallux

Extends Hallux, Dorsiflexes ankle, Inversion of foot

**S:** Extension: Extensor hallucis brevis

Dorsiflexion: Tibialis anterior, Extensor digitorum longus, Fibularis tertius

Inversion: Tibialis posterior, Flexor digitorum longus, Flexor hallucis longus, Tibialis anterior

**A:** Flexion: Flexor hallucis longusPlantar flexion: Gastrocnemius, Soleus, Plantaris, Tibialis posterior  
Fibularis (longus and brevis)Eversion: Fibularis (longus, brevis & tertius),  
Extensor digitorum longus**Extensor digitorum longus**

Nerve: Deep Fibular nerve

Roots: L5 &amp; S1

**O:** Lateral condyle of tibia, superior 3/4 of the anterior surface of the Fibula and interosseous membrane**I:** Middle and distal phalanges of 2 - 5 toesExtends all digits of phalanx 2 - 5,  
Dorsiflexes ankle**S:** Extension: Extensor digitorum brevis

Dorsiflexion: Tibialis anterior, Extensor hallucis longus, Fibularis tertius

**A:** Flexion: Flexor digitorum (longus and brevis)

Plantarflexion: Gastrocnemius, Soleus, Plantaris, Tibialis posterior, Fibularis (longus and brevis)

<b><i>Fibularis tertius</i></b>	<b>O:</b>	Inferior 1/3 of anterior surface of tibia and interosseus membrane	Dorsiflexes ankle, aids in eversion of foot
Nerve: Deep Fibular nerve			
Roots: L5 & S1	<b>I:</b>	Dorsum of the base of 5th metatarsal	
<b>S:</b> Dorsiflexion: Extensor digitorum longus, Tibialis anterior, Extensor hallucis longus			Eversion: Fibularis (longus & brevis), Extensor digitorum longus
<b>A:</b> Plantarflexion: Gastrocnemius, Soleus, Plantaris, Tibialis posterior			Inversion: Tibialis anterior, Tibialis posterior, Extensor Hallucis longus
Fibularis (longus and brevis)			Flexor digitorum longus, Flexor hallucis longus,

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### ***Muscles of the lateral Compartment of the lower Leg***

<b><i>Fibularis Longus</i></b>	<b>O:</b>	Head, superior 2/3 of lateral fibula	Everts foot, weakly plantarflexes ankle, Supports transverse arch
Nerve: Superficial Fibular nerve			
Roots: L5 & S1 - 2	<b>I:</b>	Plantar surface of base of 1st metatarsal and 1st cuneiform	
<b>S:</b> Eversion: Fibularis (brevis & tertius), Extensor digitorum longus			Plantarflexion: Gastrocnemius, Soleus, Plantaris, Tibialis posterior, Fibularis brevis
<b>A:</b> Inversion: Tibialis anterior, Tibialis posterior, Extensor Hallucis longus			Dorsiflexion: Extensor digitorum longus, Tibialis anterior, Fibularis tertius
Flexor digitorum longus, Flexor hallucis longus			Extensor hallucis longus

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<b><i>Fibularis brevis</i></b>	<b>O:</b>	Lateral inferior 2/3 of fibula	Everts foot, weakly plantarflexes ankle,
Nerve: Superficial Fibular nerve			Supports transverse arch
Roots: L5 & S1 - 2	<b>I:</b>	Dorsal surface of tuberosity of 5th metatarsal	
<b>S:</b> Eversion: Fibularis (longus & tertius), Extensor digitorum longus			Plantarflexion: Gastrocnemius, Soleus, Plantaris, Tibialis posterior, Fibularis longus
<b>A:</b> Inversion: Tibialis anterior, Tibialis posterior, Extensor Hallucis longus			Dorsiflexion: Extensor digitorum longus, Tibialis anterior, Fibularis tertius
Flexor digitorum longus, Flexor hallucis longus			Extensor hallucis longus

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### ***Muscles of the posterior Compartment of the lower Leg***

<b><i>Gastrocnemius</i></b>	<b>O:</b>	<i>Lateral head:</i> Lateral condyle of femur <i>Medial head:</i> superior to medial condyle of femur	Plantarflexes ankle, flexes leg at knee
Nerve: Tibial			
Roots: S1 - 2	<b>I:</b>	Calcaneus via calcaneal tendon	
<b>S:</b> Plantarflexion: Soleus, Plantaris, Tibialis posterior			Flexion of knee: Biceps femoris, Semitendinosus, Semimembranosus, Popliteus, Gracilis, Sartorius
Fibularis (longus and brevis)			Knee extension: Rectus femoris, Vastus (medialis, lateralis, and intermedius)
<b>A:</b> Dorsiflexion: Extensor digitorum longus, Tibialis anterior			
Extensor hallucis longus, Fibularis tertius			

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**Soleus**  
 Nerve: Tibial  
 Roots: S1 - 2  
**S:** Plantar flexion: Gastrocnemius, Plantaris, Flexor hallucis longus, Flexor digitorum longus, Tibialis posterior, Fibularis (longus & brevis)  
**A:** Dorsiflexion: Extensor digitorum longus, Tibialis anterior, Extensor hallucis longus

**Muscles of the posterior Compartment of the lower Leg (PTA 106 students only)**

**Plantaris**  
 Nerve: Tibial  
 Roots: S1 - 2  
**S:** Plantar flexion: Gastrocnemius, Flexor hallucis longus, Flexor digitorum longus, Tibialis posterior, Fibularis (longus & brevis)  
**A:** Dorsiflexion: Extensor digitorum longus, Tibialis anterior, Extensor hallucis longus

**(Deepest layer)**

**Popliteus**  
 Nerve: Tibial  
 Roots: L4 - 5, S1  
**S:** Knee flexion: Biceps femoris, Semitendinosus, Semimembranosus, Gracilis, Sartorius, Gastrocnemius  
**A:** Knee extension: Rectus femoris, Vastus (medalis, lateralis, and intermedialis)

**Flexor hallucis longus**  
 Nerve: Tibial  
 Roots: L5, S2 - 3  
**S:** Hallux flexion: Flexor Hallucis brevis  
**A:** Hallux extension: Extensor hallucis longus and brevis  
**O:** Inferior 2/3 of posterior fibula, inferior interosseous membrane  
**I:** Base of distal phalanx of hallux  
 Inversion: Tibialis (anterior and posterior), Flexor digitorum longus, Flexor hallucis longus, Extensor hallucis longus  
 Eversion: Fibularis (longus and brevis), Extensor digitorum longus  
 Flexes hallux, weakly plantarflexes ankle, inverts foot supports longitudinal arch

**Flexor digitorum longus**  
 Nerve: Tibial  
 Roots: L5, S2 - 3  
**S:** Digit flexion: none  
**A:** Digit extension: Extensor digitorum (longus and brevis)  
**O:** Medial posterior tibia  
**I:** Base of distal phalanges toes 2-5  
 Plantar flexion: Gastrocnemius, soleus, Plantaris, Flexor hallucis longus, Tibialis posterior  
 Fibularis (longus & brevis)  
 Dorsiflexion: Extensor digitorum longus, Tibialis anterior, Extensor hallucis longus, Fibularis tertius  
 Flexes all joints of toes 2-5, weakly plantarflexes ankle, supports longitudinal arch

***Tibialis posterior***

Nerve: Tibial

Roots: L4 - 5

**O:** Posterior tibia and fibula, interosseous membrane

**I:** Navicular, all cuneiforms, cuboid, and 2-4 metatarsals

Plantarflexes ankle, inverts foot  
supports medial longitudinal arch

**S:** Plantar flexion: Gastrocnemius, soleus, Plantaris, Flexor hallucis longus,  
Flexor digitorum longus, Fibularis (longus & brevis)

Inversion: Tibialis anterior, Flexor digitorum longus, Flexor hallucis longus,  
Extensor hallucis longus

**A:** Dorsiflexion: Fibularis tertius, tibialis anterior, Extensor hallucis longus, Extensor digitorum longus

Eversion: Fibularis (longus and brevis), Extensor digitorum longus

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