

# POHYBY DOLNÍCH KONČETIN



# POHYBY KYČELNÍHO KLOUBU

FLEXE - PŘEDNOŽENÍ

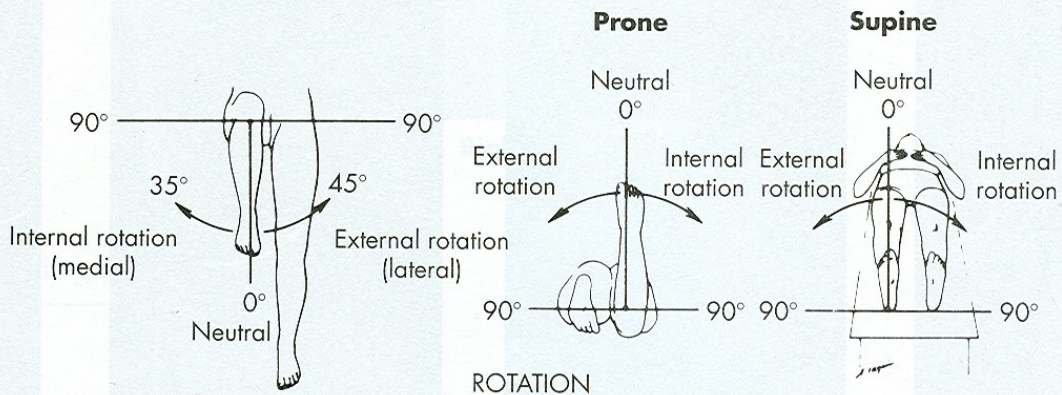
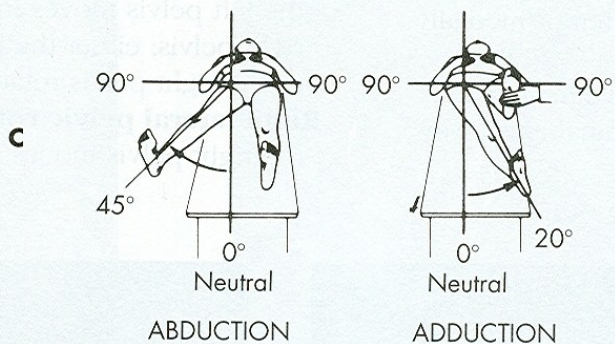
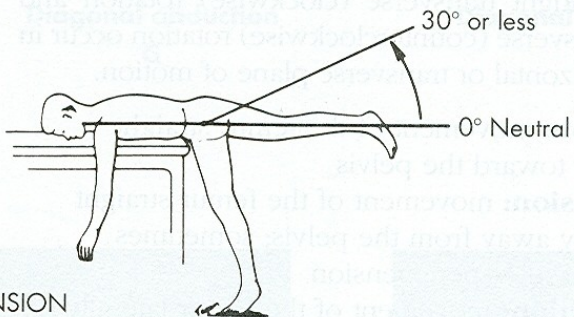
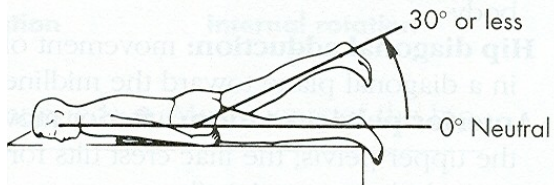
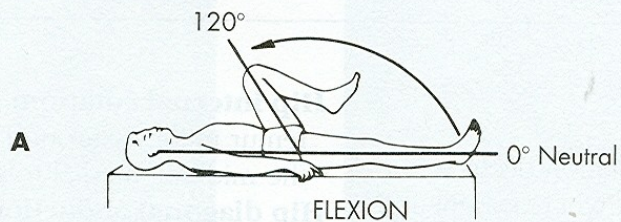
EXTENZE - ZANOŽENÍ

ABDUKCE - UNOŽENÍ

ADDUKCE - PŘINOŽENÍ

VNĚJŠÍ ROTACE

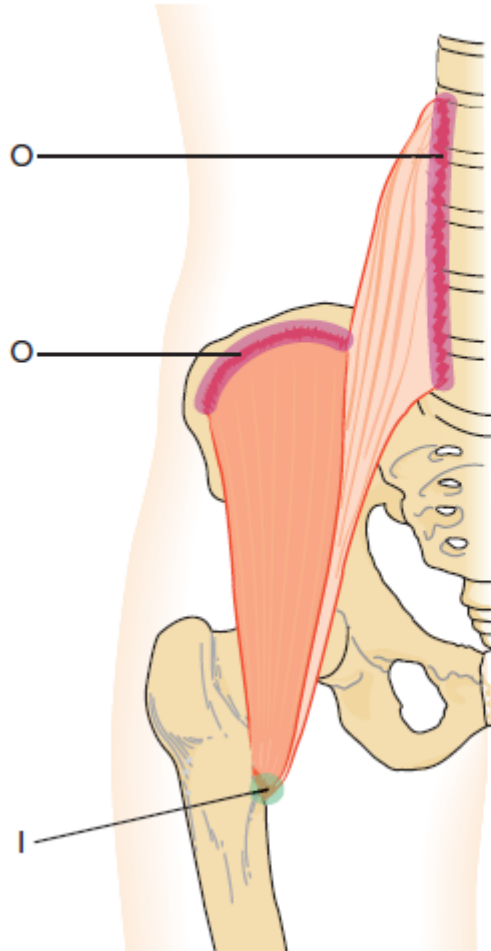
VNITŘNÍ ROTACE



**Table 18-2** Muscles of the Hip

Muscle Group	One-Joint Muscles	Two-Joint Muscles
Anterior	Iliopsoas	Rectus femoris Sartorius
Medial	Pectineus Adductor magnus Adductor longus Adductor brevis	Gracilis
Posterior	Gluteus maximus Deep rotators (6)	Semimembranosus Semitendinosus Biceps femoris (long head)
Lateral	Gluteus medius Gluteus minimus	Tensor fascia latae

## iliopsoas

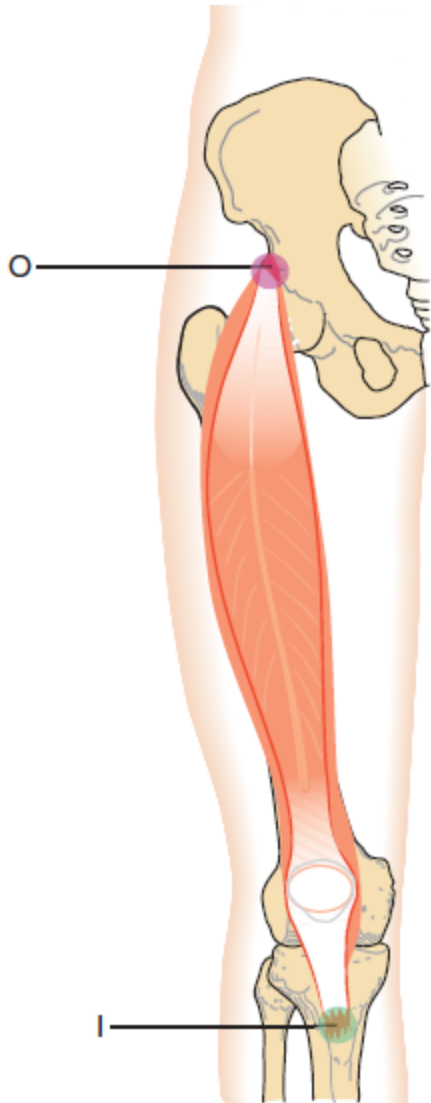


## Iliopsoas

- |          |  |
|----------|--|
| <b>O</b> | Iliac fossa, anterior and lateral surfaces of T12 through L5     |
| <b>I</b> | Lesser trochanter  |
| <b>A</b> | Hip flexion  |
| <b>N</b> | Iliacus portion: Femoral nerve<br>Psoas major portion: L2 and L3 |

Because of its attachment on the vertebrae, the psoas muscle portion contributes to trunk flexion when the femur is stabilized.

## rectus femoris



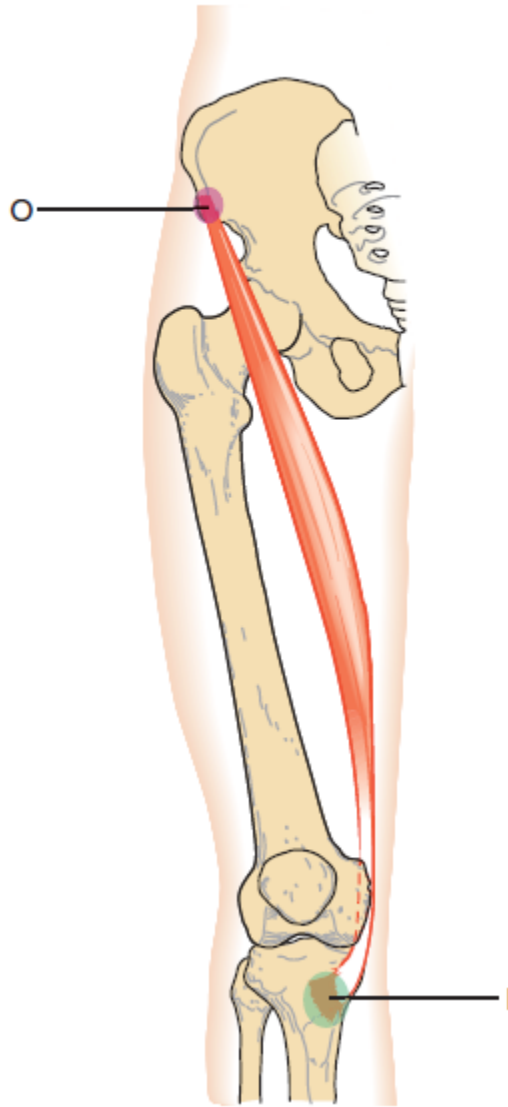
## Rectus Femoris

- |          |                                       |
|----------|---------------------------------------|
| <b>O</b> | Anterior inferior iliac spine         |
| <b>I</b> | Tibial tuberosity via patellar tendon |
| <b>A</b> | Hip flexion, knee extension           |
| <b>N</b> | Femoral nerve                         |

## 75 rectus femoris

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## sartorius



## Sartorius

- |          |   |
|----------|---|
| <b>O</b> | Anterior superior iliac spine   |
| <b>I</b> | Proximal medial aspect of tibia   |
| <b>A</b> | Combination of hip flexion, abduction, lateral rotation, and knee flexion |
| <b>N</b> | Femoral nerve   |

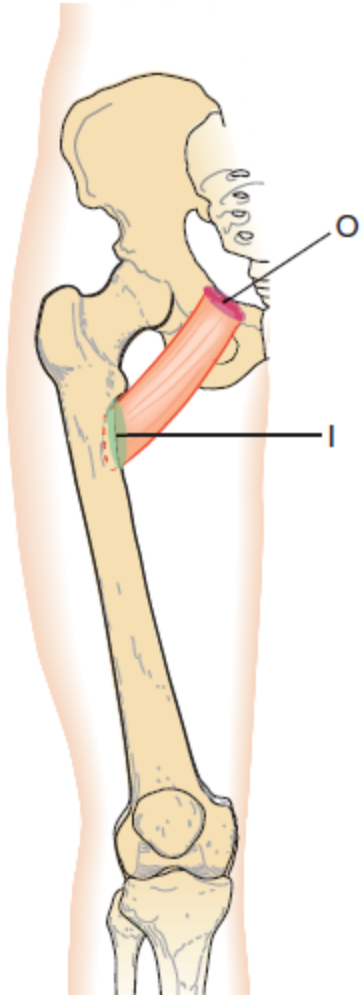
The **sartorius muscle** is the longest muscle in the body

It is most efficient when doing all four motions at the same time. An example of this motion is when you cross your legs by putting one foot on the opposite knee.

## 76 sartorius

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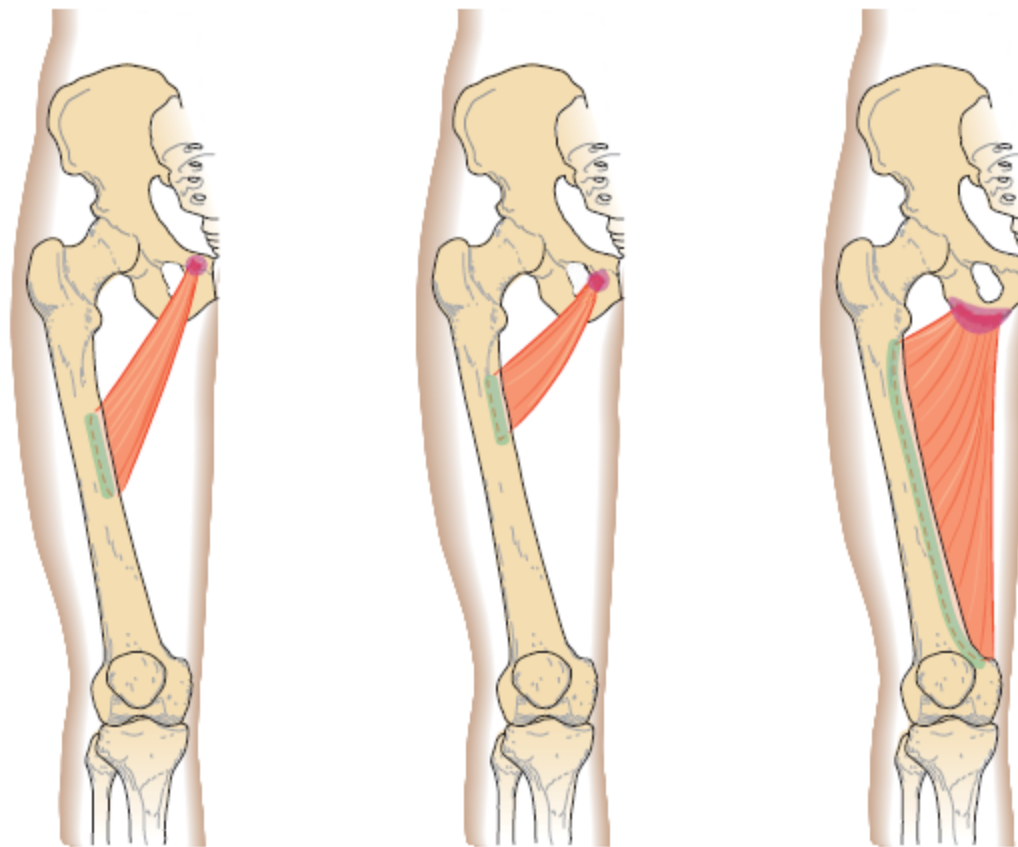
## pectineus



## Pectineus

- |          |                           |
|----------|---------------------------|
| <b>O</b> | Superior ramus of pubis   |
| <b>I</b> | Pectineal line of femur   |
| <b>A</b> | Hip flexion and adduction |
| <b>N</b> | Femoral nerve             |





Adductor longus

Adductor brevis

Adductor magnus

**Figure 18-18.** The three adductor muscles (anterior view). Note that the distal attachments are on the posterior femur.

### Adductor Longus

<b>O</b>	Pubis
<b>I</b>	Middle one-third of the linea aspera
<b>A</b>	Hip adduction
<b>N</b>	Obturator nerve

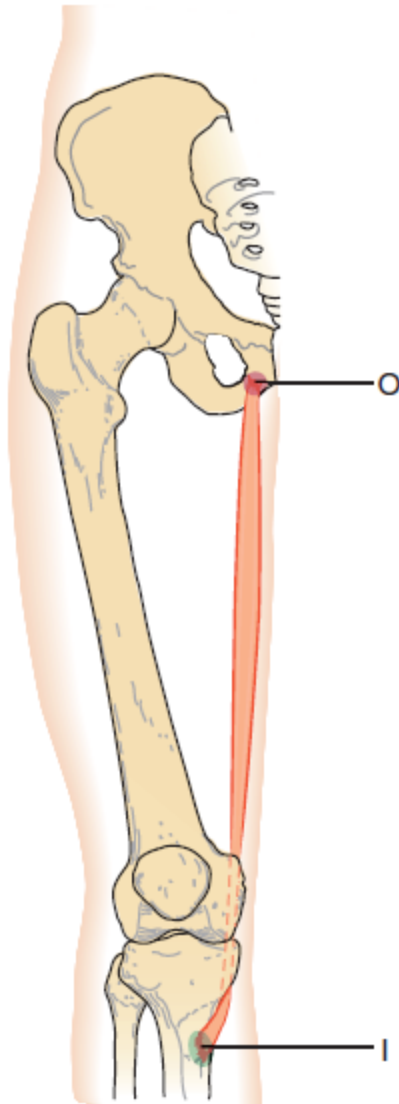
### Adductor Brevis Muscle

<b>O</b>	Pubis
<b>I</b>	Pectineal line and proximal linea aspera
<b>A</b>	Hip adduction
<b>N</b>	Obturator nerve (L3, L4)

### Adductor Magnus Muscle

<b>O</b>	Ischium and pubis
<b>I</b>	Entire linea aspera and adductor tubercle
<b>A</b>	Hip adduction
<b>N</b>	Obturator and sciatic nerve (L3, L4)

## gracilis



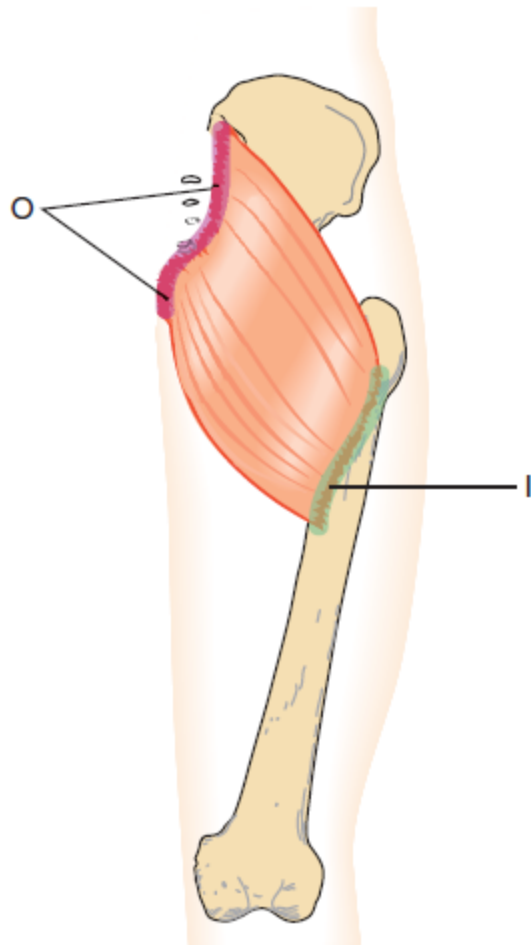
## Gracilis

- |          |  |
|----------|--|
| <b>O</b> | Pubis  |
| <b>I</b> | Anterior medial surface of proximal end of tibia |
| <b>A</b> | Hip adduction                                    |
| <b>N</b> | Obturator nerve                                  |

## 81 gracilis

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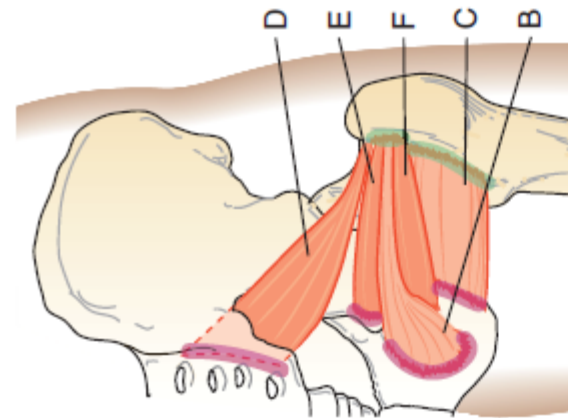
## gluteus maximus



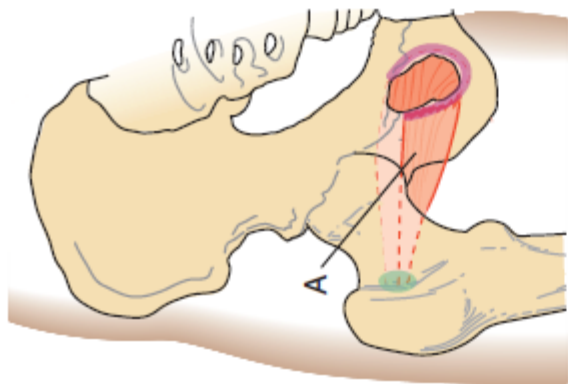
## Gluteus Maximus

- |          |  |
|----------|--|
| <b>O</b> | Posterior sacrum and ilium                                       |
| <b>I</b> | Posterior femur distal to greater trochanter and iliotibial band |
| <b>A</b> | Hip extension, hyperextension, lateral rotation                  |
| <b>N</b> | Inferior gluteal nerve   |

## deep rotators



Posterior



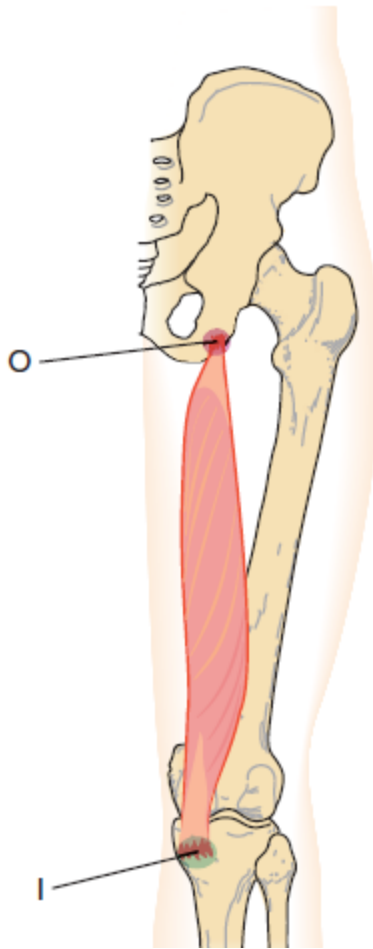
Anterior

## Deep Rotators

- O** Posterior sacrum, ischium, pubis
- I** Greater trochanter area
- A** Hip lateral rotation
- N** Obturator, S1, S2, nerves to obturator internus and quadratus femoris

- A. Obturator externus
- B. Obturator internus
- C. Quadratus femoris
- D. Piriformis
- E. Gemellus superior
- F. Gemellus inferior

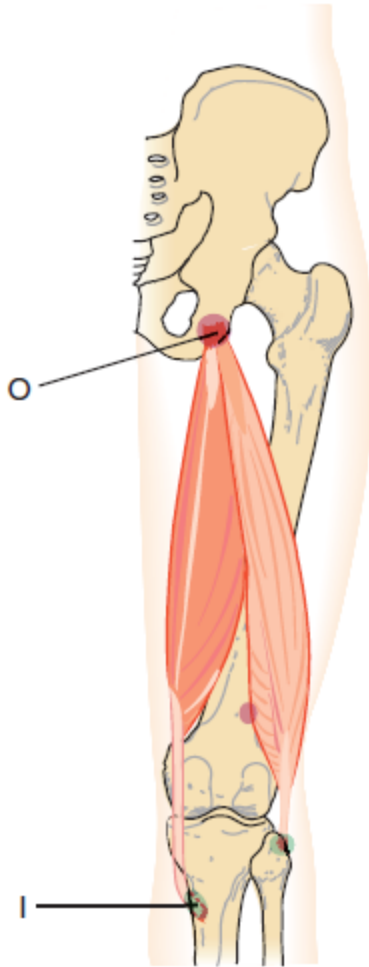
## semimembranosus



## Semimembranosus

- |          |  |
|----------|--|
| <b>O</b> | Ischial tuberosity                           |
| <b>I</b> | Posterior surface of medial condyle of tibia |
| <b>A</b> | Hip extension and knee flexion               |
| <b>N</b> | Sciatic nerve                                |

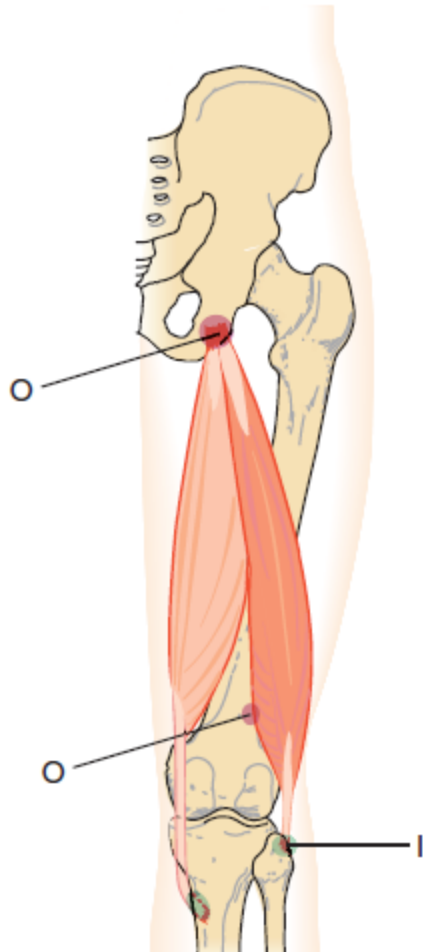
## semitendinosus



## Semitendinosus

- |          |  |
|----------|--|
| <b>O</b> | Ischial tuberosity                     |
| <b>I</b> | Anteromedial surface of proximal tibia |
| <b>A</b> | Hip extension and knee flexion         |
| <b>N</b> | Sciatic nerve                          |

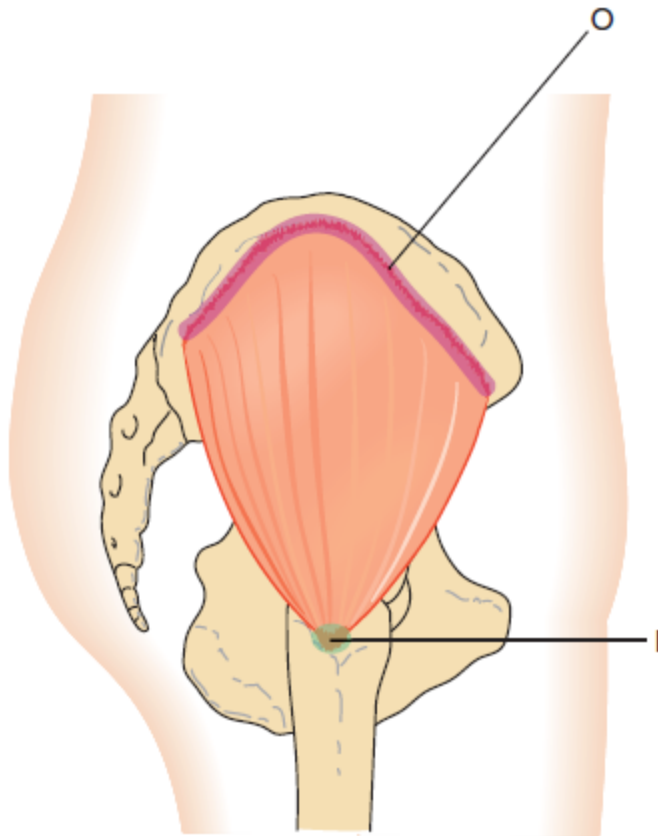
## biceps femoris



## Biceps Femoris

- O** Long head: Ischial tuberosity  
Short head: Lateral lip of linea aspera
- I** Fibular head
- A** Long head: Hip extension and knee flexion  
Short head: knee flexion
- N** Long head: Sciatic nerve  
Short head: Common peroneal nerve

## gluteus medius

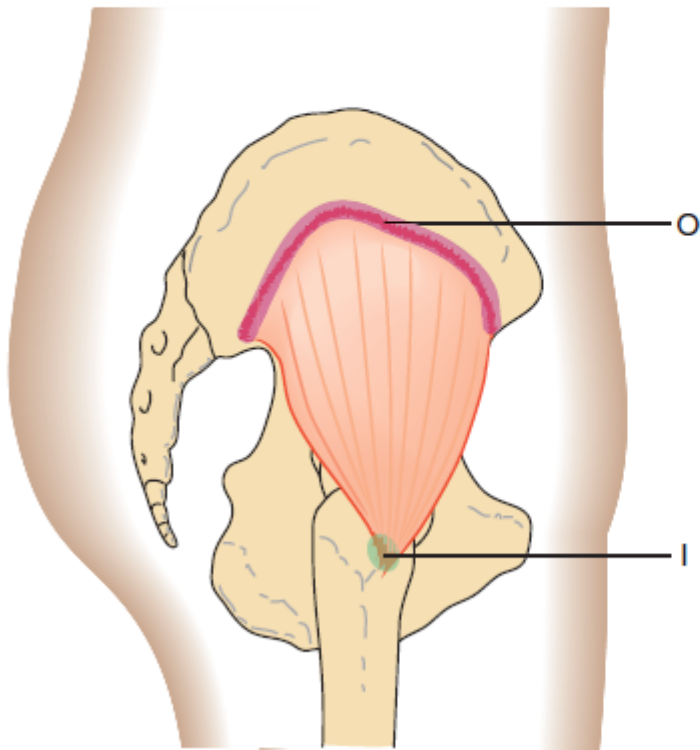


## Gluteus Medius

- |          |                                       |
|----------|---------------------------------------|
| <b>O</b> | Outer surface of ilium                |
| <b>I</b> | Lateral surface of greater trochanter |
| <b>A</b> | Hip abduction                         |
| <b>N</b> | Superior gluteal nerve                |

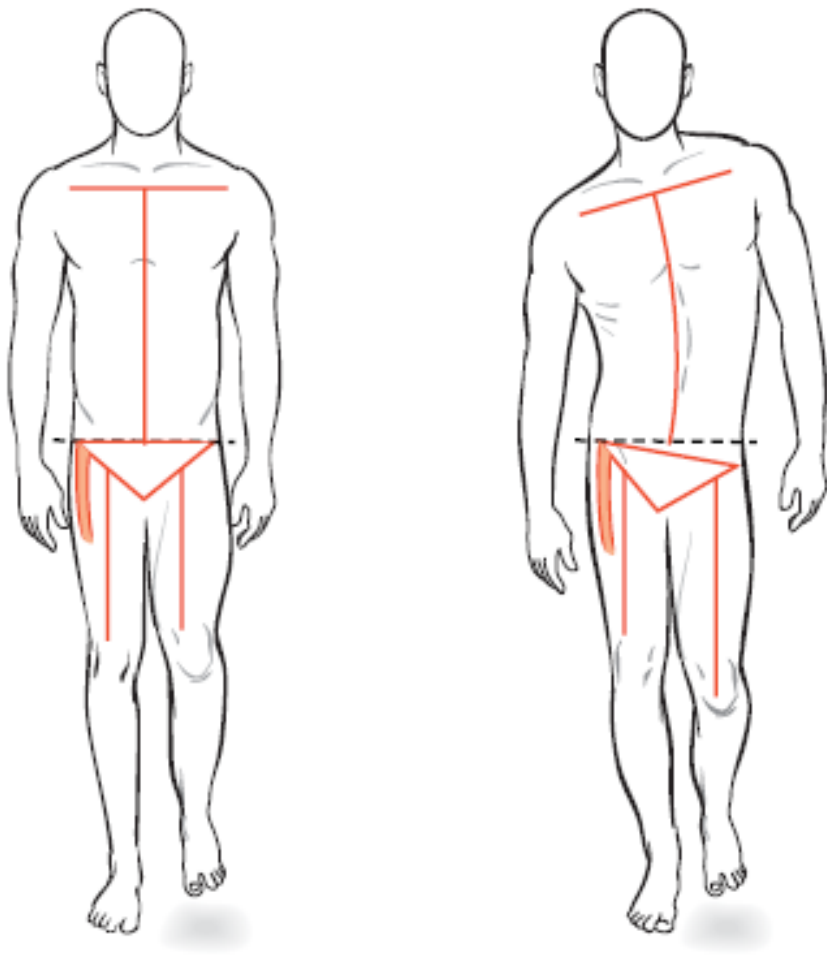


## gluteus minimus



## Gluteus Minimus

- |          |  |
|----------|--|
| <b>O</b> | Lateral ilium                              |
| <b>I</b> | Anterior surface of the greater trochanter |
| <b>A</b> | Hip abduction, medial rotation             |
| <b>N</b> | Superior gluteal nerve                     |



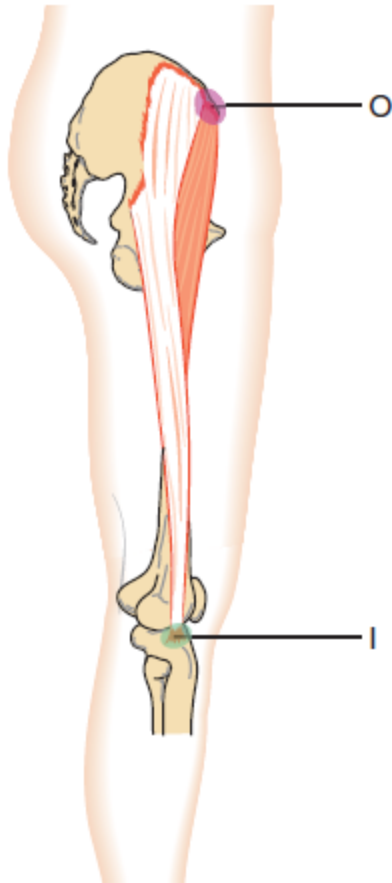
**A**

**B**

**Figure 18-25.** Anterior view. **(A)** In reversal of muscle function, the right hip abductors contract to keep the pelvis steady when the left leg is lifted. **(B)** When right hip abductors are weak, the left side of the pelvis drops.

when you stood on one leg, the opposite side of your pelvis would drop. Therefore, the gluteus medius and minimus muscles contract to keep the pelvis fairly level and to prevent the opposite side of the pelvis from dropping too much when you stand on one leg.

## tensor fascia lata



## Tensor Fascia Lata

- |          |                                    |
|----------|------------------------------------|
| <b>O</b> | Anterior superior iliac spine      |
| <b>I</b> | Lateral condyle of tibia           |
| <b>A</b> | Combined hip flexion and abduction |
| <b>N</b> | Superior gluteal nerve             |

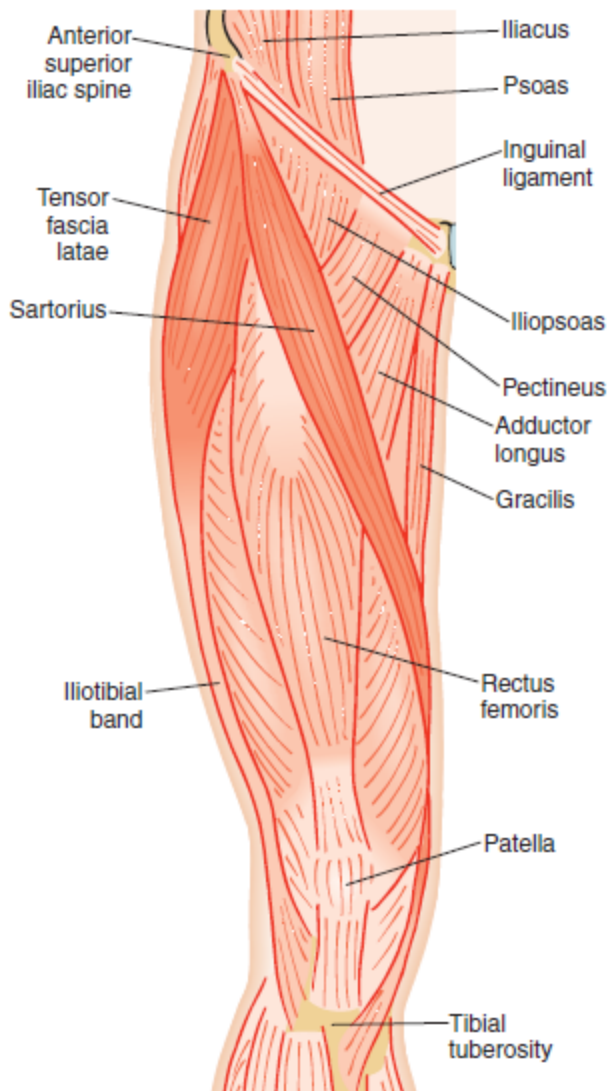


Figure 18-27. Anterior superficial muscles (right leg).

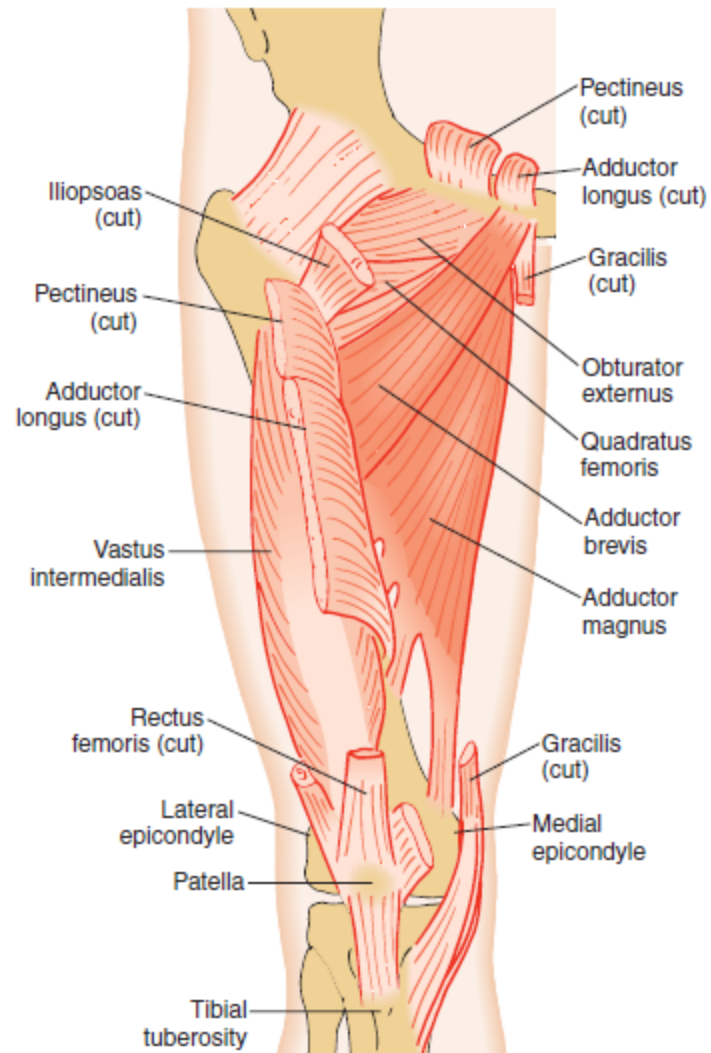
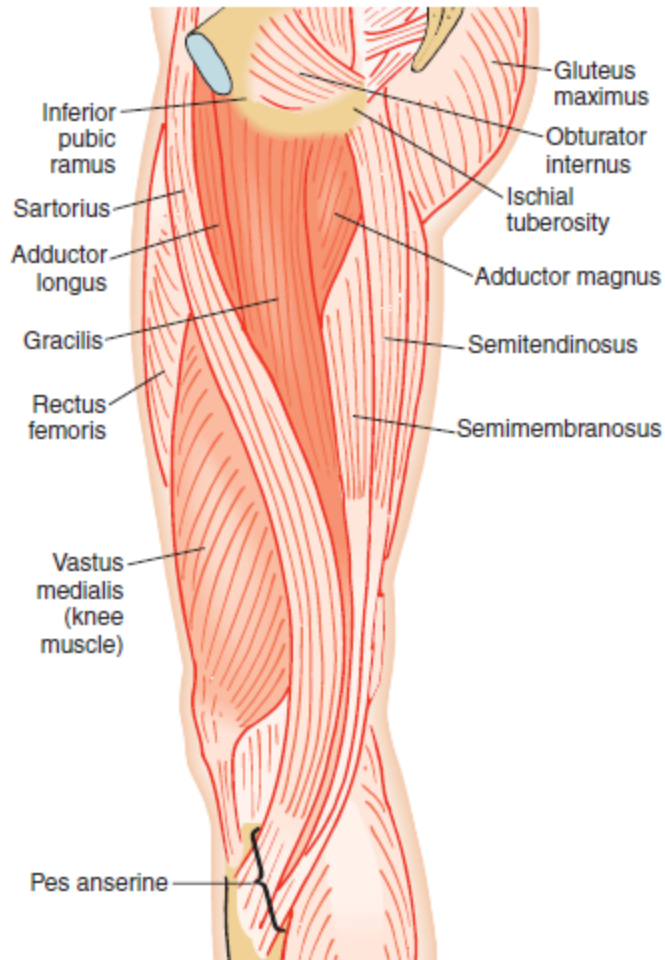
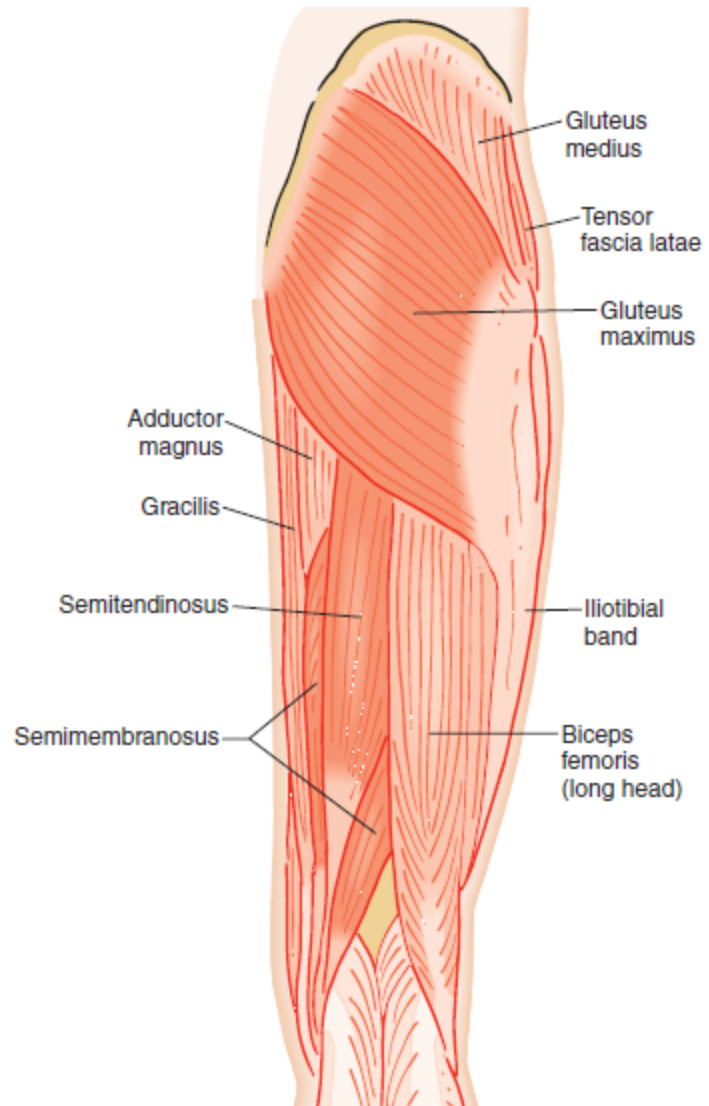


Figure 18-28. Anterior deep muscles (right leg).



**Figure 18-29.** Medial muscles (right leg).

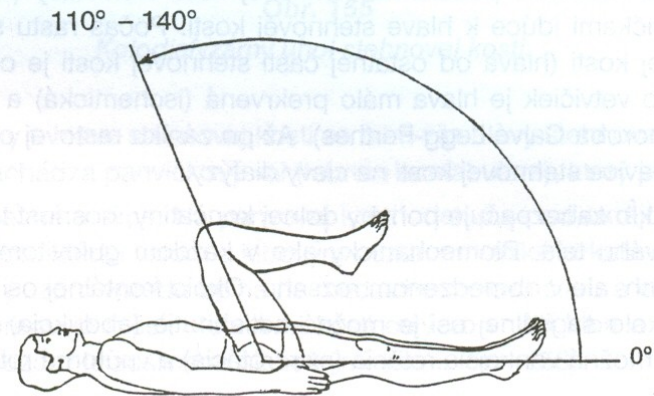
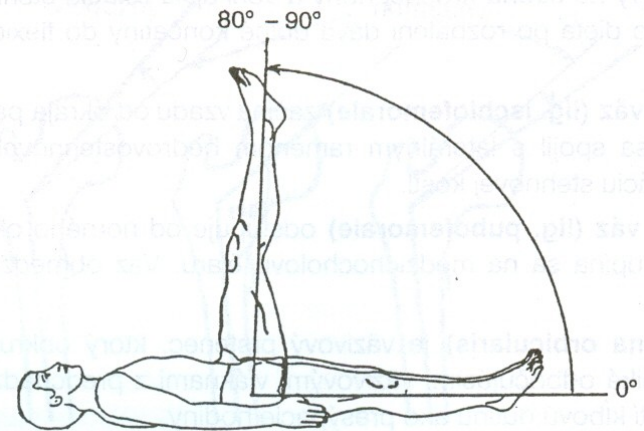


**Figure 18-30.** Posterior superficial muscles (right leg).

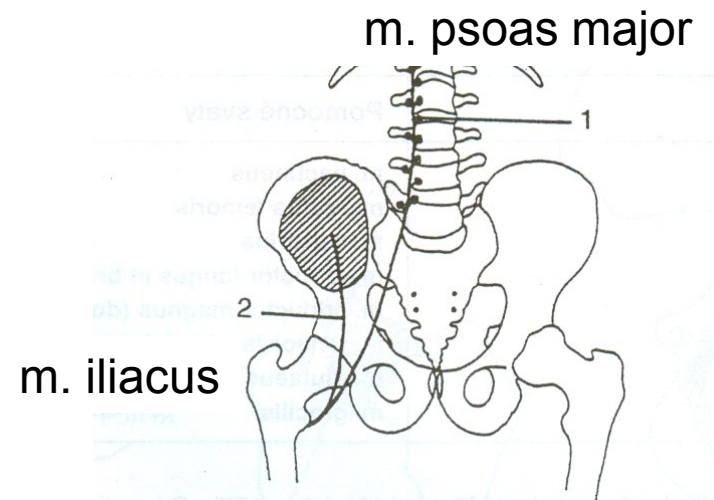
**Table 18-4** Action of Hip Prime Movers

Action	Muscle
Combination of flexion and abduction	Tensor fascia latae
Combination of flexion, abduction, and lateral rotation	Sartorius
Flexion	Rectus femoris, iliopsoas, pectineus
Extension	Gluteus maximus, semitendinosus, semimembranosus, biceps femoris (long head)
Hyperextension	Gluteus maximus
Abduction	Gluteus medius, gluteus minimus
Adduction	Pectineus, adductor longus, adductor brevis, adductor magnus, gracilis
Medial rotation	Gluteus minimus
Lateral rotation	Gluteus maximus, deep rotators

# FLEXE - PŘEDNOŽENÍ

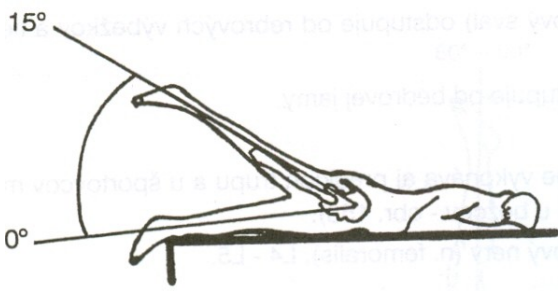


m. iliopsoas

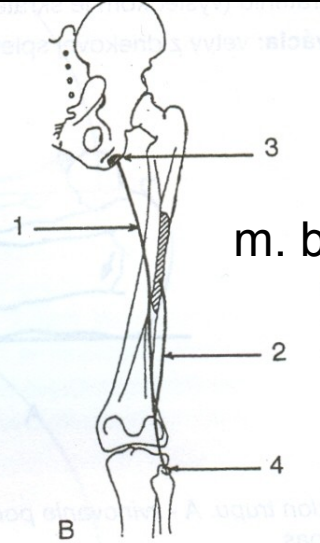
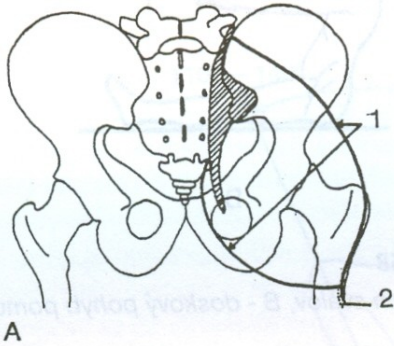


m. iliacus

# EXTENZE - ZANOŽENÍ



m. gluteus maximus

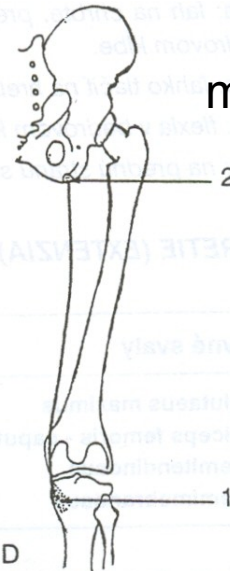


m. biceps femoris

m. semimembranosus

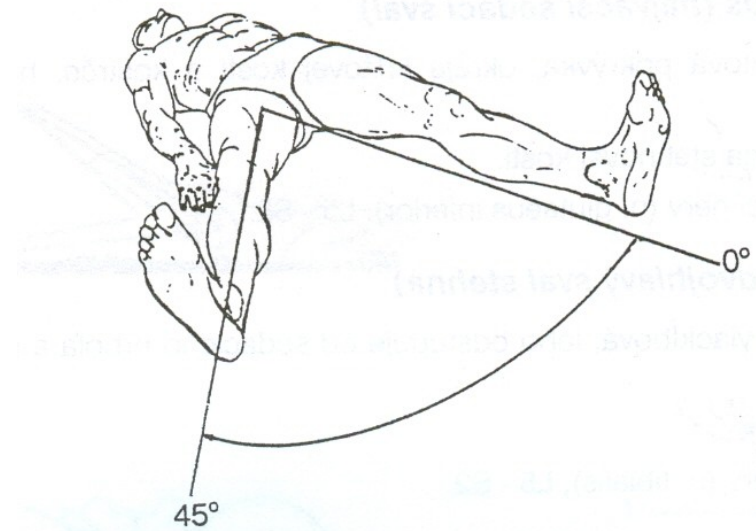


m. semitendinosus

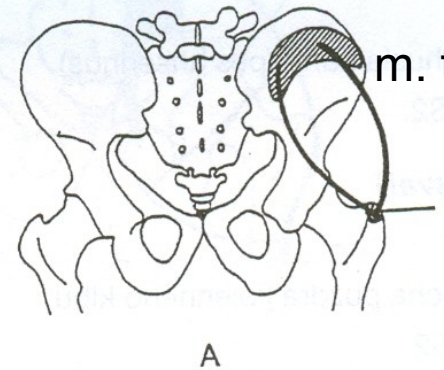




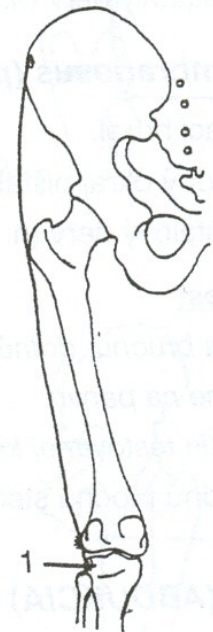
# ABDUKCE - UNOŽENÍ



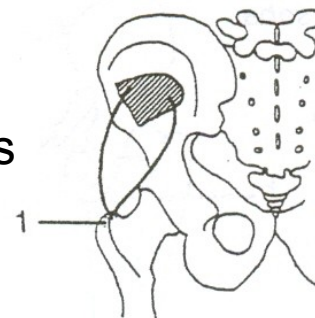
m. gluteus medius



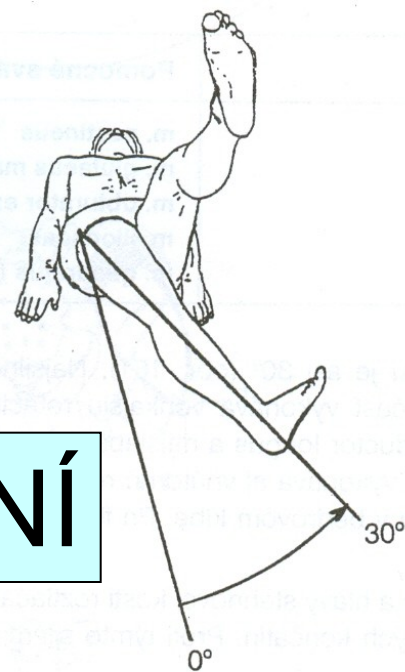
m. tensor fasciae latae



m. gluteus minimus

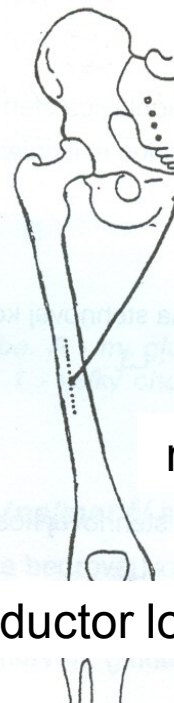


# ADDUKCE - PŘINOŽENÍ

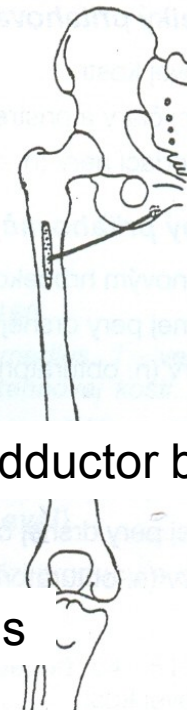


m. gracilis

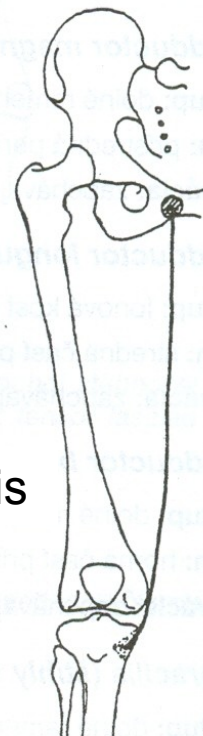
m. adductor magnus



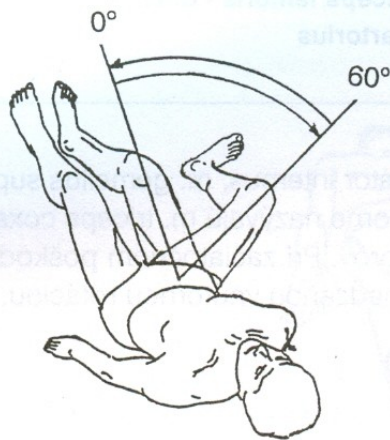
m. adductor longus



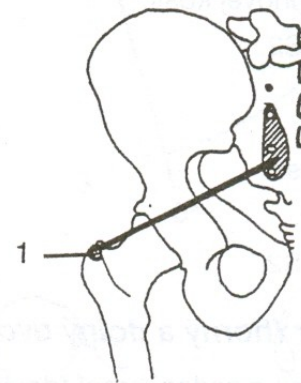
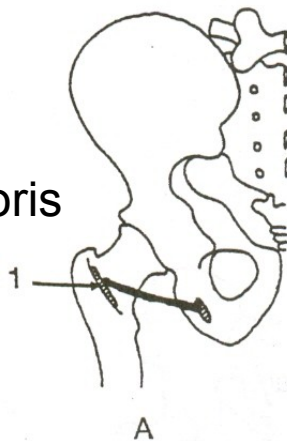
m. adductor brevis



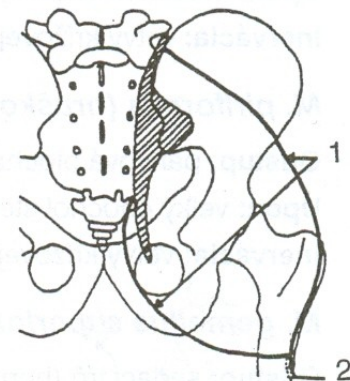
# VNĚJŠÍ ROTACE



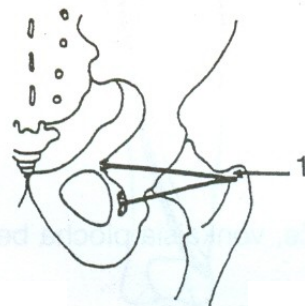
m. quadratus femoris



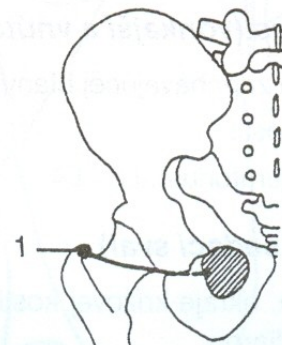
m. piriformis



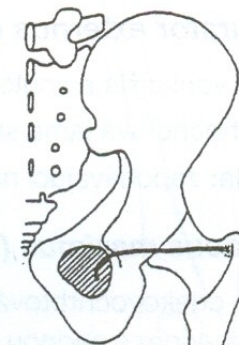
m. gluteus maximus



m. gemellus superior

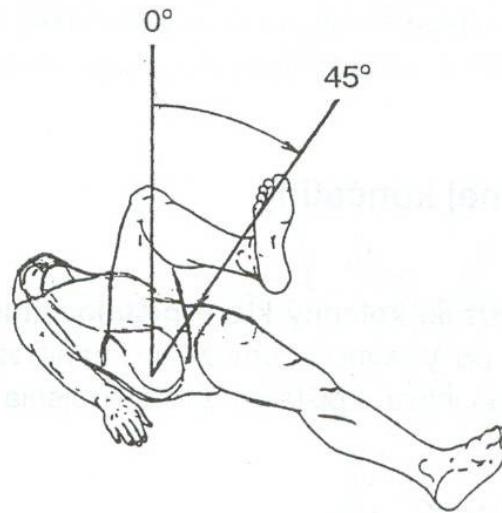


m. obturator externus

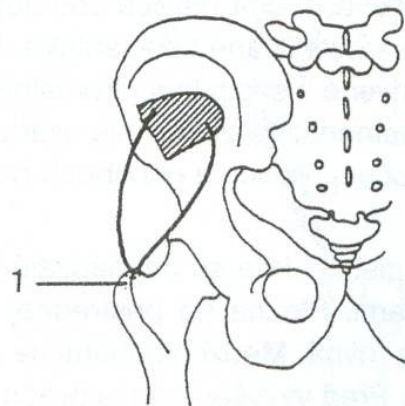


m. obturator internus

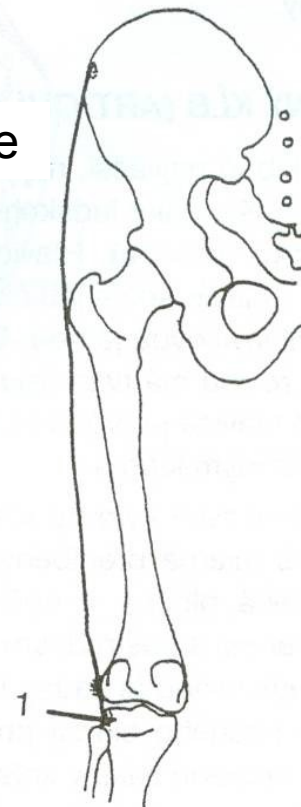
# VNITŘNÍ ROTACE



m. tensor fasciae latae



m. gluteus minimus





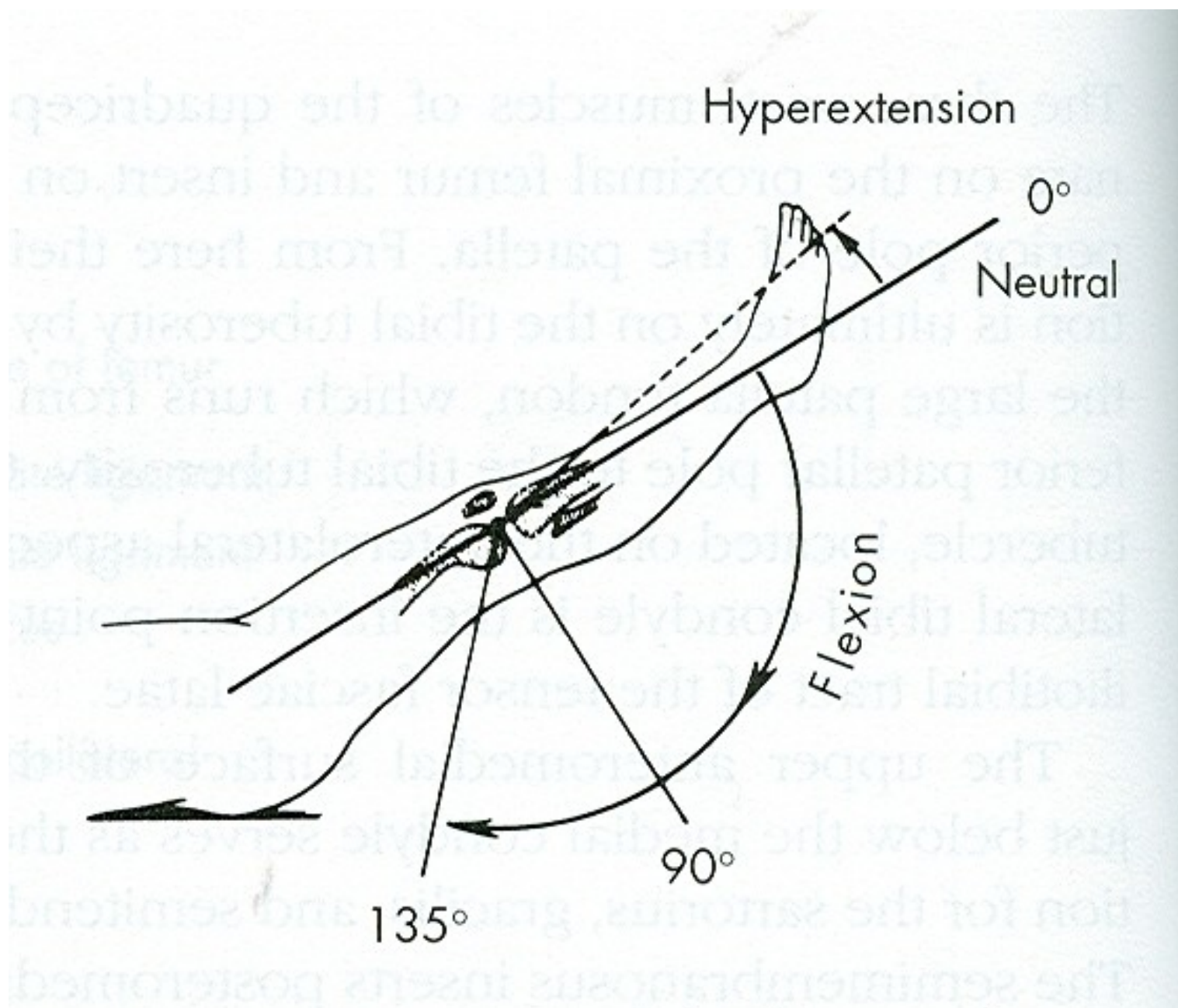
# POHYBY KOLENNÍHO KLOUBU

FLEXE

EXTENZE

ZEVNÍ ROTACE

VNITŘNÍ ROTACE



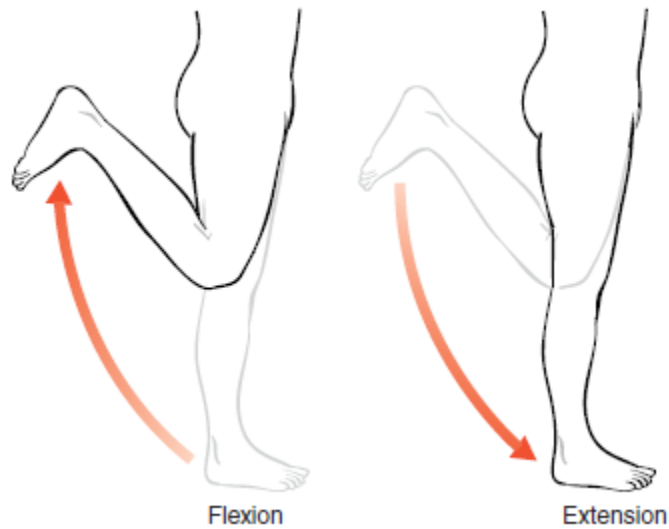


Figure 19-2. Knee motions (lateral view).

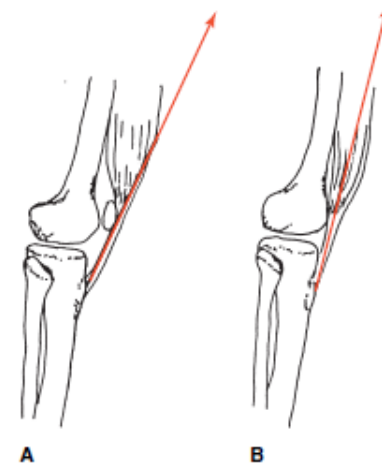
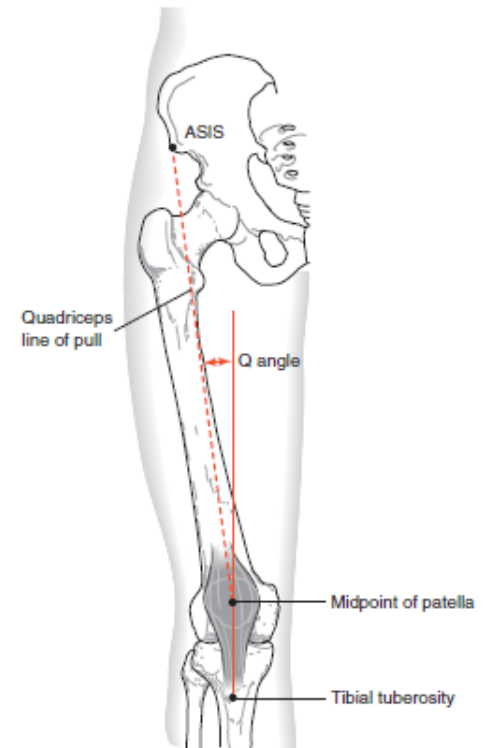
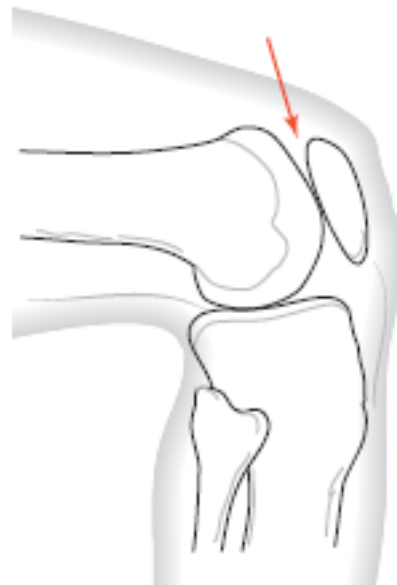
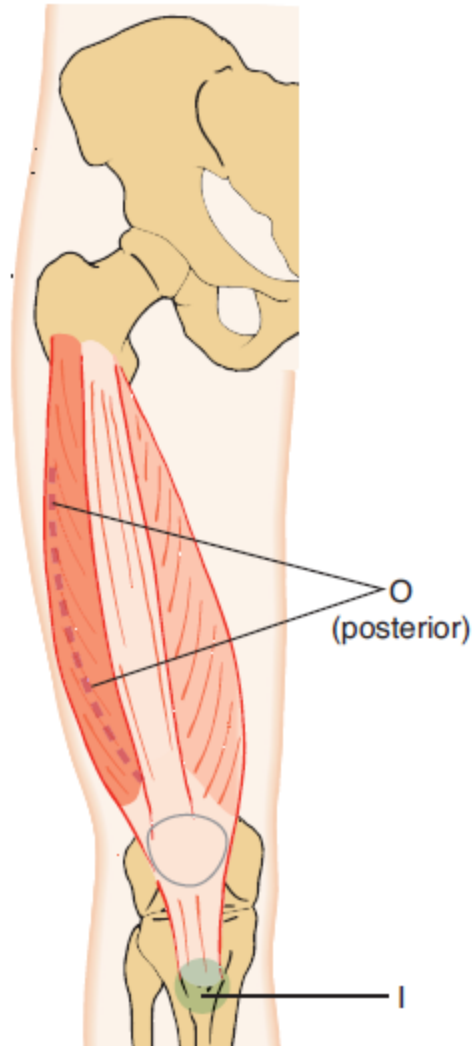


Figure 19-6. Moment arm of the quadriceps muscles is greater with a patella (A), than without a patella (B) (side view).





## vastus lateralis



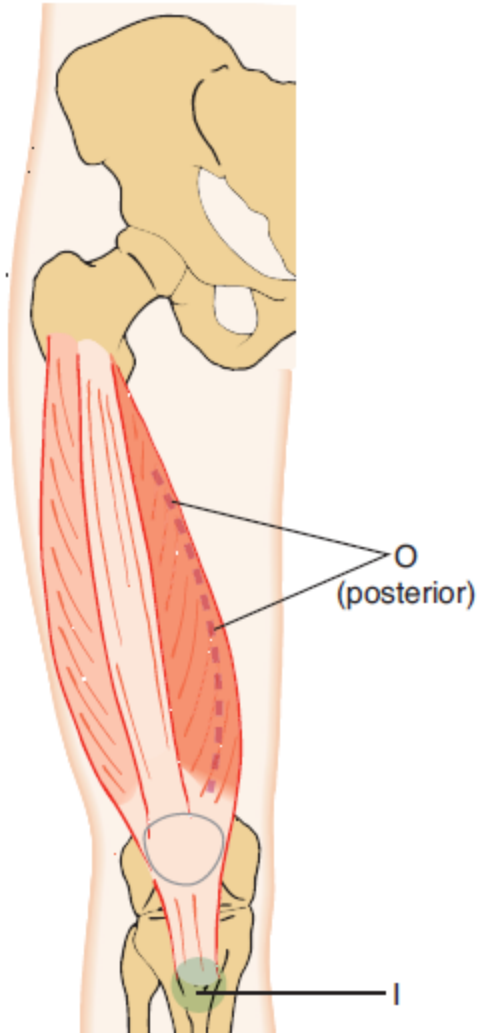
## Vastus Lateralis

- O** Linea aspera
- I** Tibial tuberosity via patellar tendon
- A** Knee extension
- N** Femoral nerve

Table 19-2 Muscles of the Knee

Area	One-Joint Muscle	Two-Joint Muscle
Anterior	Vastus lateralis	Rectus femoris
	Vastus medialis	
	Vastus intermedialis	
Posterior	Biceps femoris (short)	Biceps femoris (long)
	Popliteus	Semimembranosus
		Semitendinosus
		Sartorius
		Gracilis
		Gastrocnemius
Lateral		Tensor fascia latae

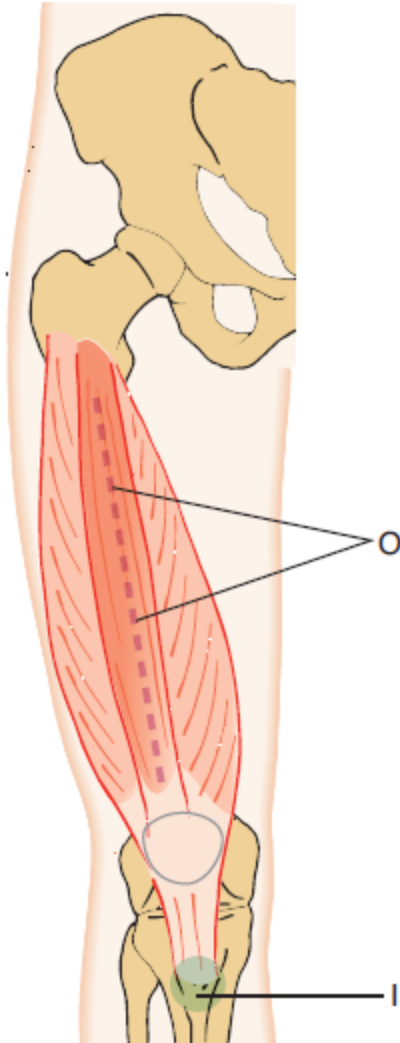
## vastus medialis



## Vastus Medialis

- |          |                                       |
|----------|---------------------------------------|
| <b>O</b> | Linea aspera                          |
| <b>I</b> | Tibial tuberosity via patellar tendon |
| <b>A</b> | Knee extension                        |
| <b>N</b> | Femoral nerve                         |

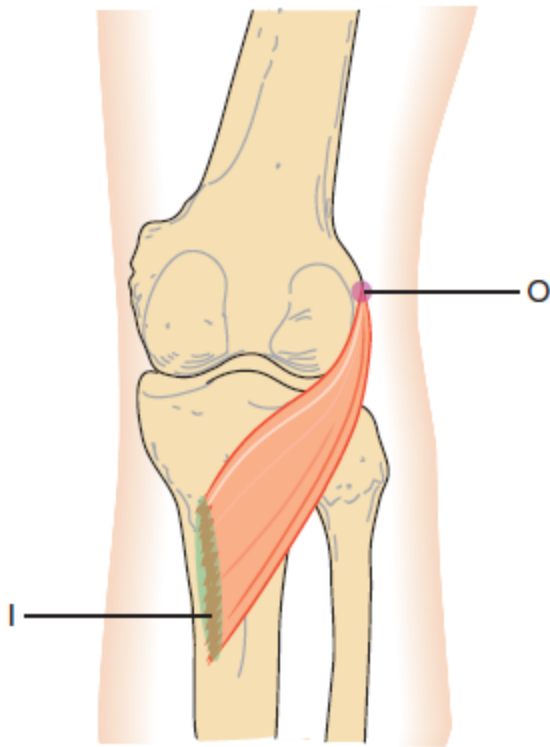
## vastus intermedius



## Vastus Intermedius

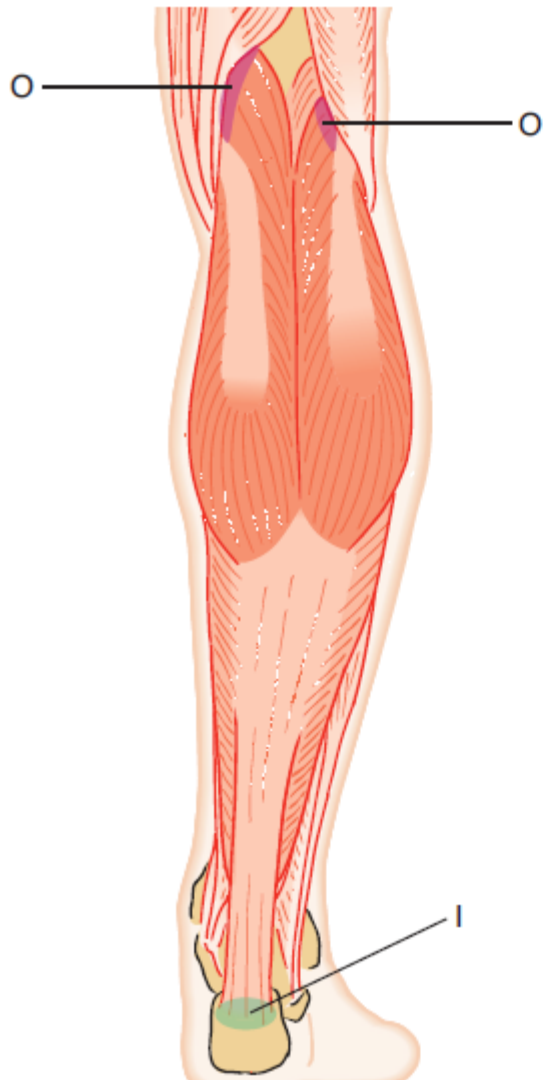
- |          |                                       |
|----------|---------------------------------------|
| <b>O</b> | Anterior femur                        |
| <b>I</b> | Tibial tuberosity via patellar tendon |
| <b>A</b> | Knee extension                        |
| <b>N</b> | Femoral nerve                         |

## popliteus



## Popliteus

- |          |  |
|----------|--|
| <b>O</b> | Lateral condyle of femur                     |
| <b>I</b> | Posterior surface of medial condyle of tibia |
| <b>A</b> | Initiates knee flexion                       |
| <b>N</b> | Tibial nerve                                 |

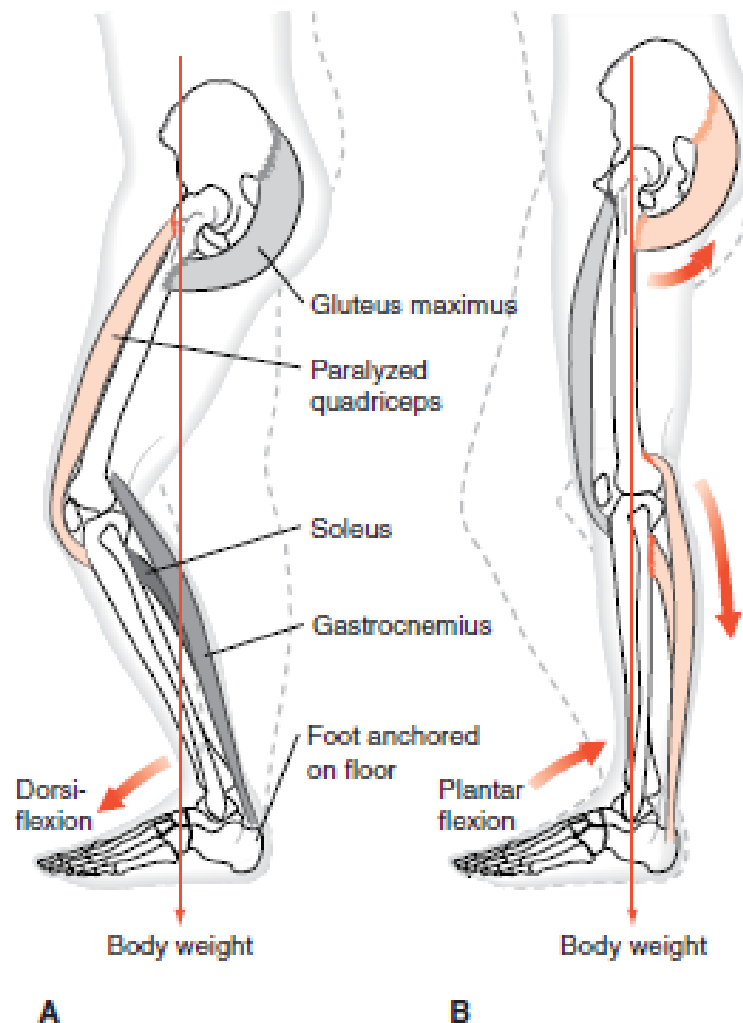


## Gastrocnemius

- |          |                                      |
|----------|--------------------------------------|
| <b>O</b> | Medial and lateral condyles of femur |
| <b>I</b> | Posterior calcaneus                  |
| <b>A</b> | Knee flexion, ankle plantar flexion  |
| <b>N</b> | Tibial nerve                         |

### 94 gastrocnemius

Figure 8.149: *Myoanatomical Atlas*, 2e © 2011 F. A. Davis Company



**Figure 19-22.** Side view. **(A)** With a paralyzed quadriceps unable to pull the knee into extension, the body weight line falls behind the knee, causing flexion. However, in a combined reversal of muscle action of the gluteus maximus and gastrocnemius muscles, knee extension during stance is possible. **(B)** In the closed-chain position, they pull the knee into extension. The soleus assists by plantar flexing the dorsiflexed ankle into a neutral ankle position. This puts the body weight line in front of the knee and ankle axes and allows the knee to remain extended.

# FLEXO

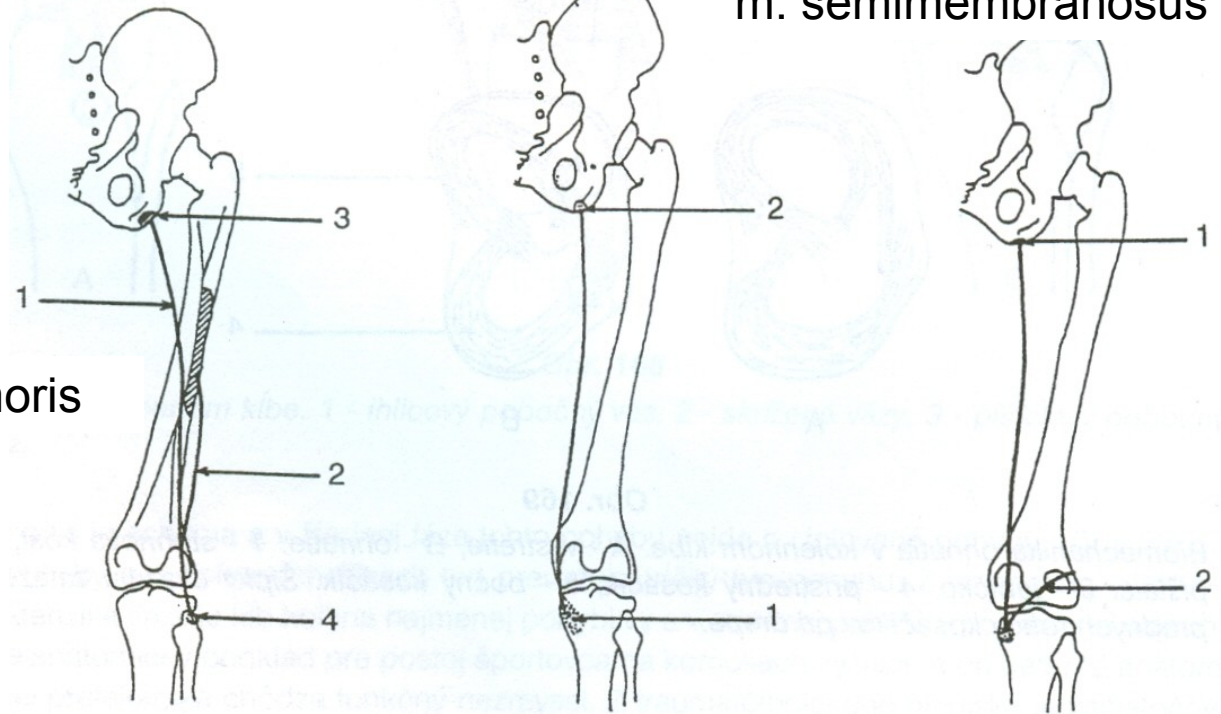
- 140°

0°

m. semitendinosus

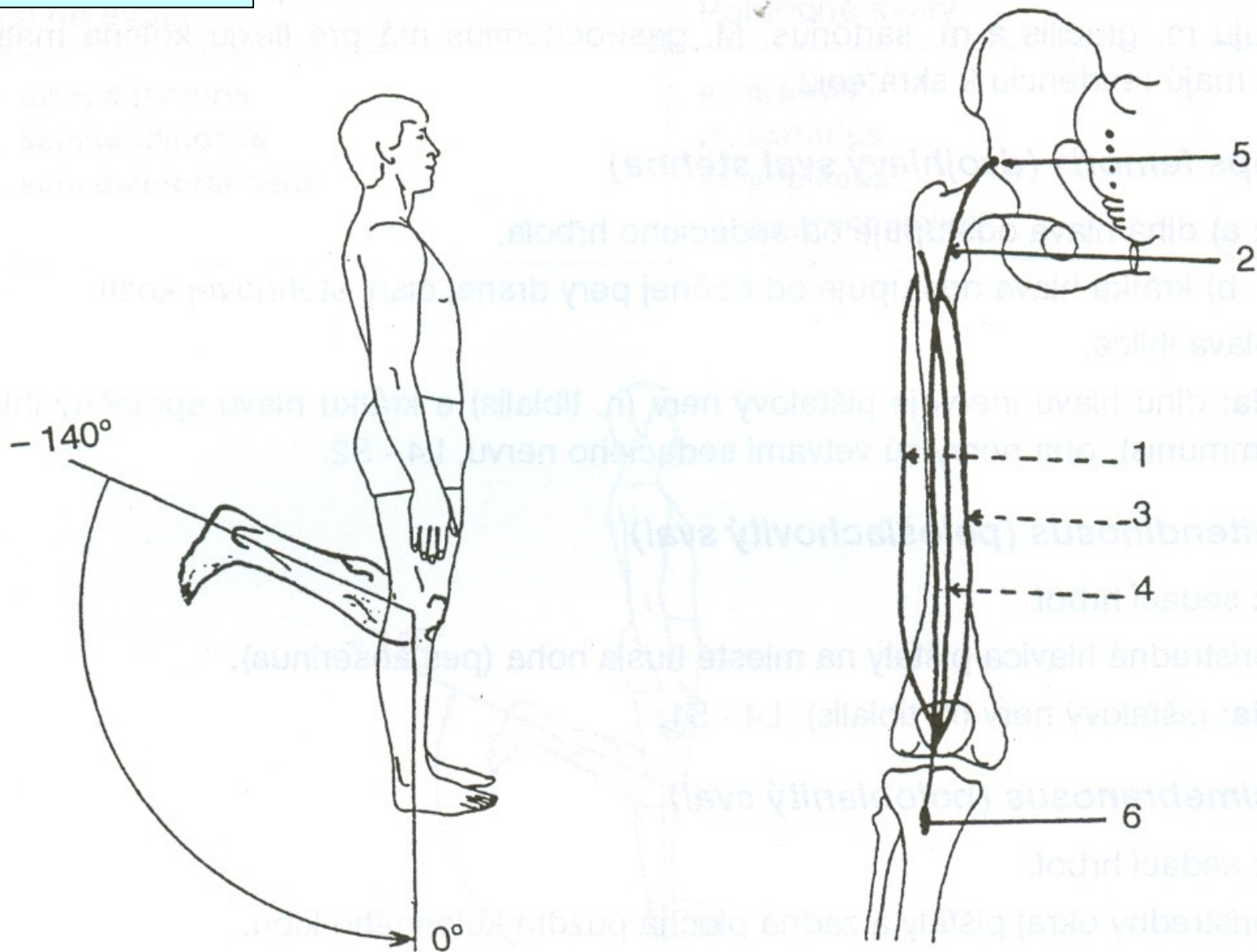
m. semimembranosus

m. biceps femoris



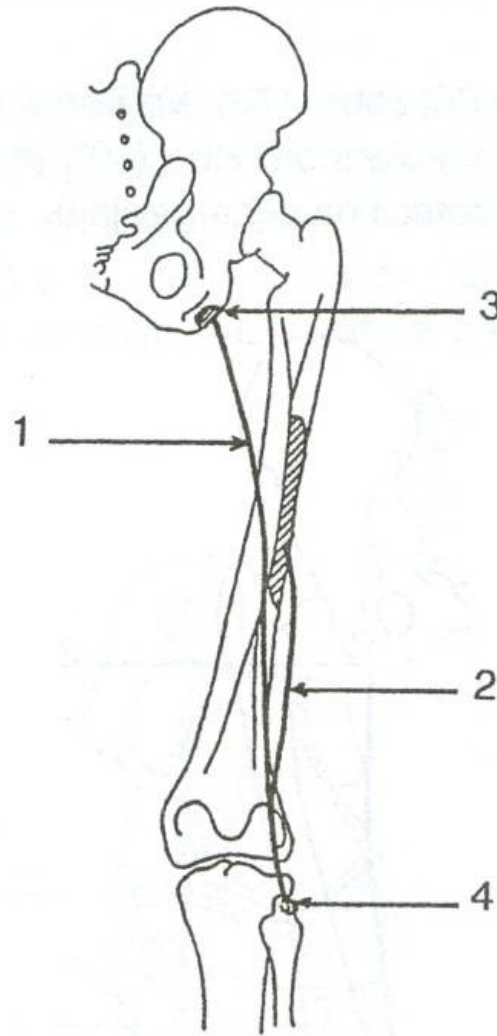
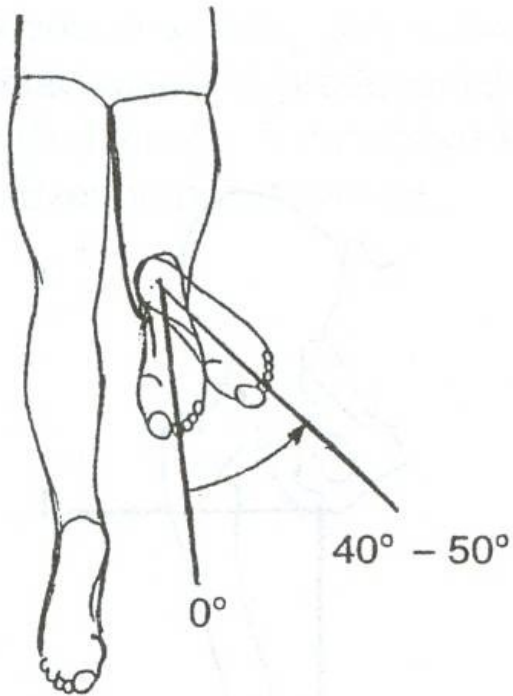
# EXTENZE

m. quadriceps femoris

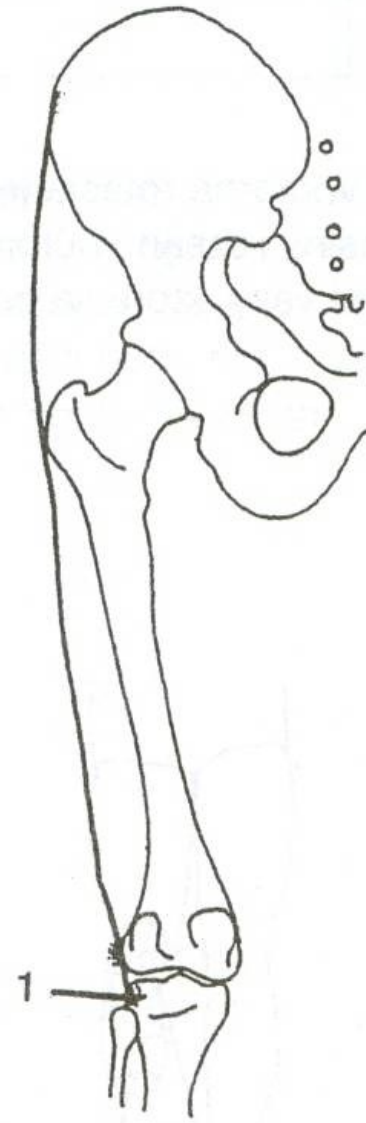




# ZEVNÍ ROTACE

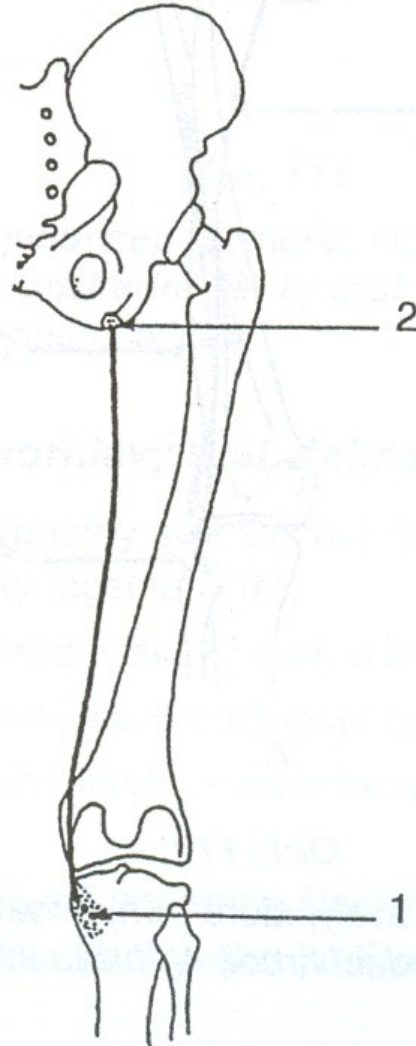


m. biceps femoris

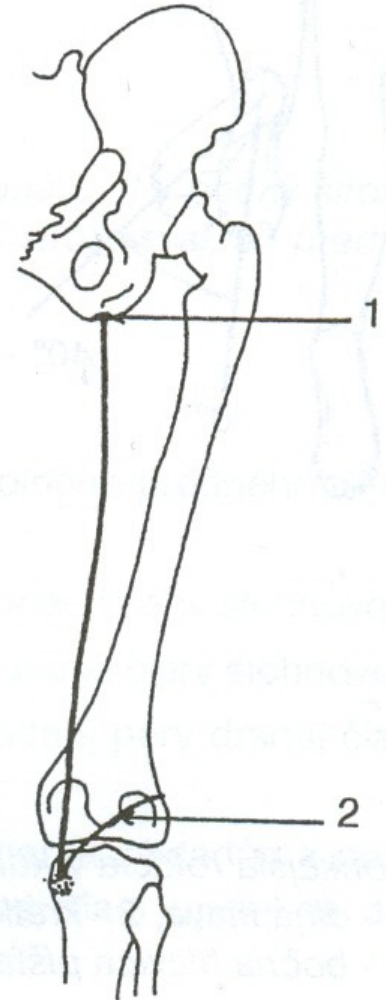


m. tensor fasciae latae

# VNITŘNÍ ROTACE



m. semitendinosus



m. semimembranosus

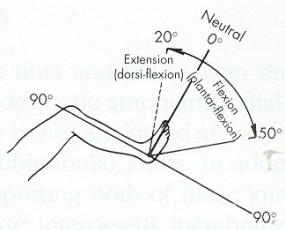
# POHYBY HLEZENNÍHO KLOUBU

PLANTÁRNÍ FLEXE –  
PROPNUŤÍ ŠPIČEK

DORZÁLNÍ FLEXE - FAJFKY

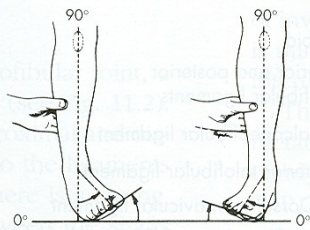
PRONACE

SUPINACE



Ankle joint

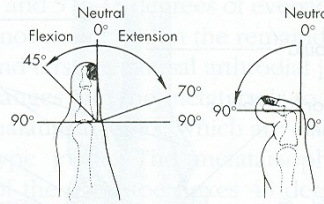
**A**



Inversion

Eversion

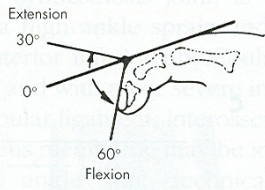
**B**



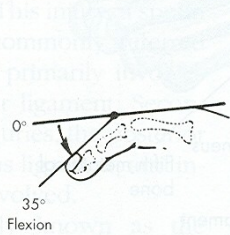
Metatarsophalangeal joint

Interphalangeal joint

**C**

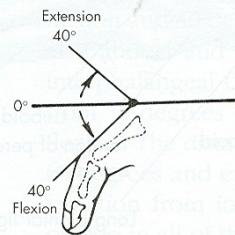


Distal interphalangeal joint

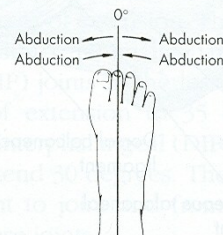


Proximal interphalangeal joint

**D**



Metatarsophalangeal joint



Toe spread

**Inversion** is the raising of the medial border of the foot, turning the forefoot inward. **Eversion**, the opposite motion, is the raising of the lateral border of the foot, turning the forefoot outward.



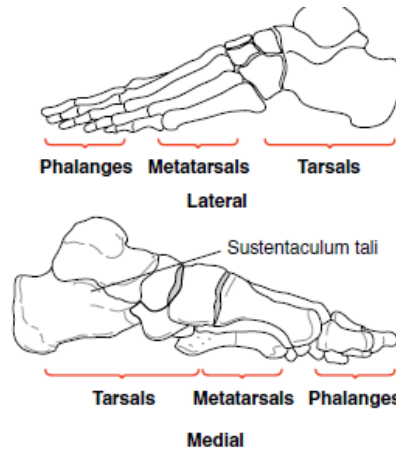
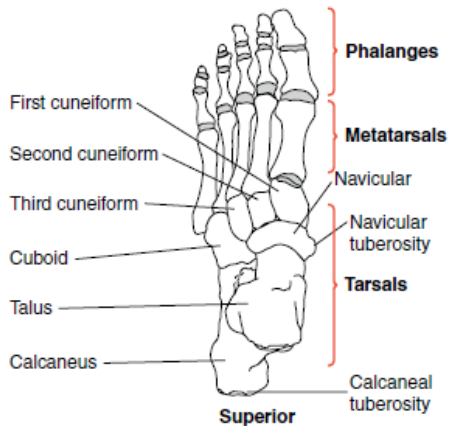
Flexion



Dorsiflexion



Plantar flexion



Extension



Hyperextension



Supination (inversion)



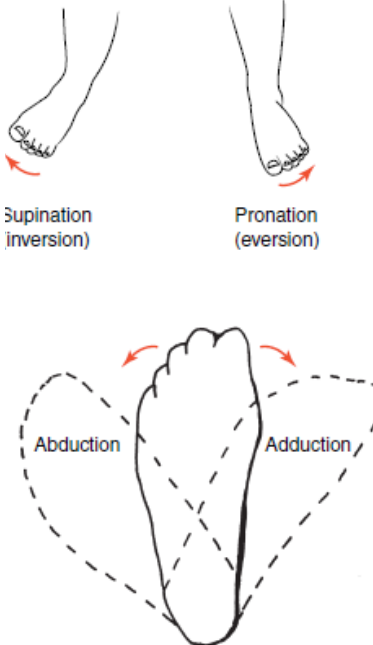
Pronation (eversion)



Abduction



Adduction

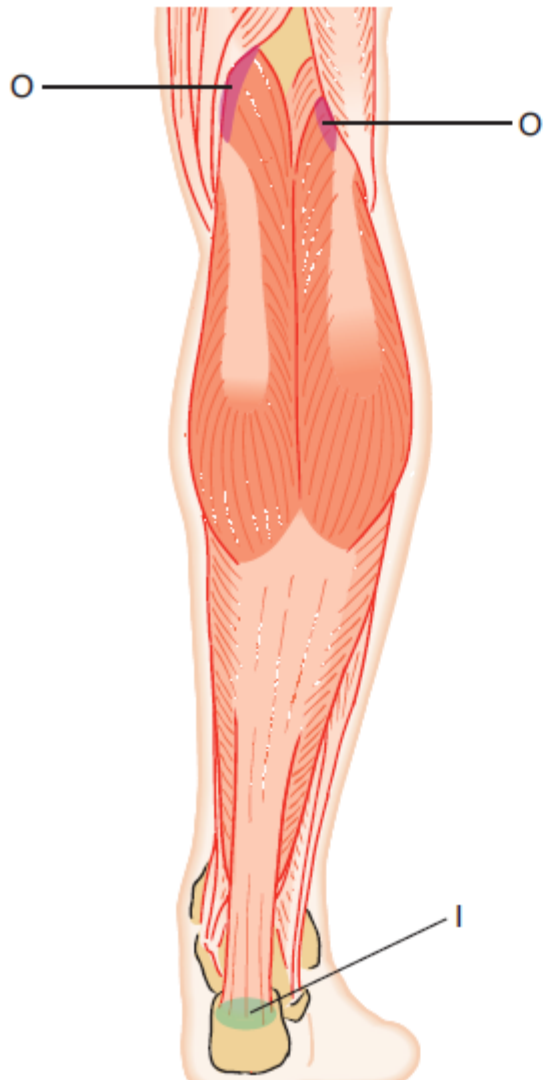


20-13. Toe motions.

**Table 20-2** Extrinsic Muscles of the Ankle and Foot

Muscle	Joint Crossing	Possible Actions
<b>Posterior Group</b>		
<b>Superficial Posterior Group</b>		
Gastrocnemius	Posterior	Plantar flexion
Soleus	Posterior	Plantar flexion
(Plantaris)	Posterior	Plantar flexion
<b>Deep Posterior Group</b>		
Tibialis posterior	Posterior, medial	Plantar flexion, inversion
Flexor digitorum longus	Posterior, medial	Plantar flexion, inversion, lesser toe flexion
Flexor hallucis longus	Posterior, medial	Plantar flexion, inversion, great toe flexion
<b>Anterior Group</b>		
Tibialis anterior	Anterior, medial	Dorsiflexion, inversion
Extensor hallucis longus	Anterior, medial	Dorsiflexion, inversion, great toe extension
Extensor digitorum longus	Anterior	Dorsiflexion, lesser toe extension
<b>Lateral Group</b>		
Peroneus longus	Posterior, lateral	Eversion, plantar flexion
Peroneus brevis	Posterior, lateral	Eversion, plantar flexion
(Peroneus tertius)	Anterior	Eversion, dorsiflexion

**Zadní  
skupina**



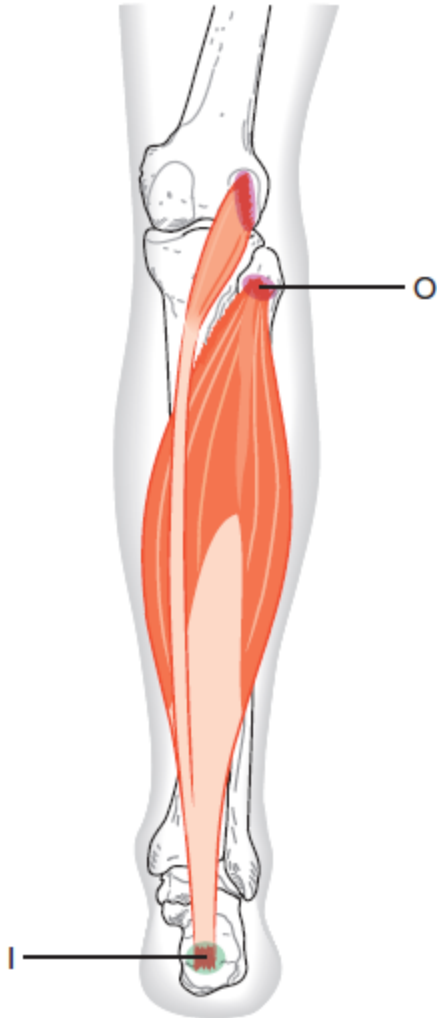
## Gastrocnemius

- |          |                                      |
|----------|--------------------------------------|
| <b>O</b> | Medial and lateral condyles of femur |
| <b>I</b> | Posterior calcaneus                  |
| <b>A</b> | Knee flexion, ankle plantar flexion  |
| <b>N</b> | Tibial nerve                         |

### 94 gastrocnemius

Figure 8. Muscle Kinetics, Bookends 2e © 2011 F. A. Davis Company

## soleus

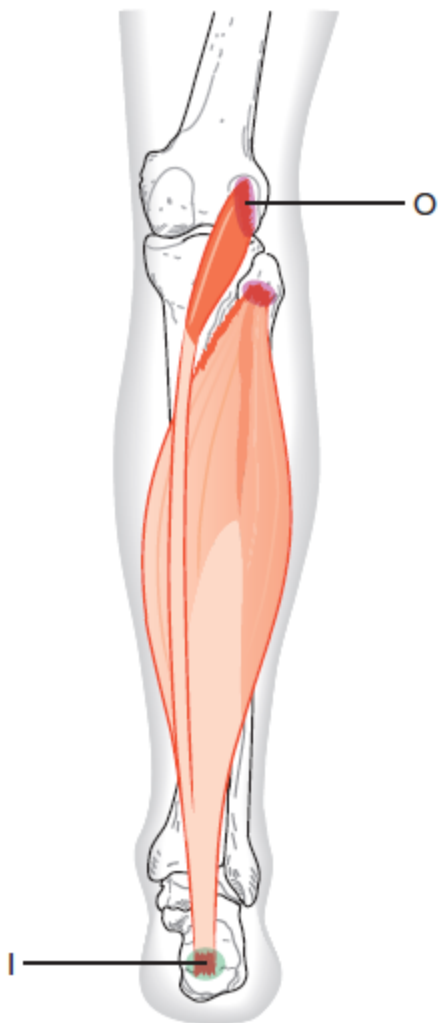


## Soleus

- |          |                            |
|----------|----------------------------|
| <b>O</b> | Posterior tibia and fibula |
| <b>I</b> | Posterior calcaneus        |
| <b>A</b> | Ankle plantar flexion      |
| <b>N</b> | Tibial nerve               |



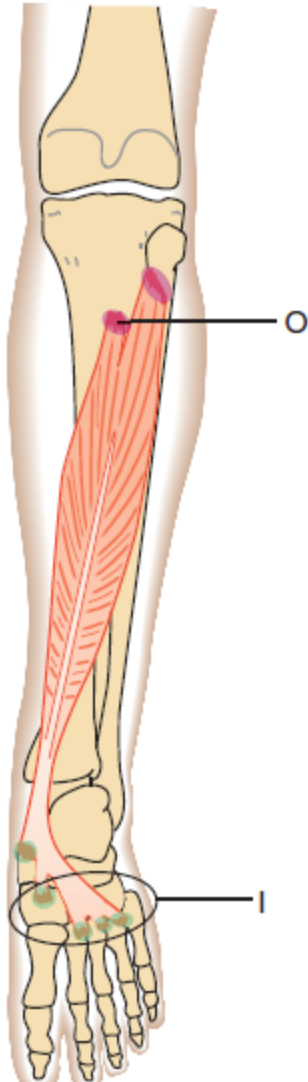
## plantaris



## Plantaris

- |          |  |
|----------|--|
| <b>O</b> | Posterior lateral condyle of femur                 |
| <b>I</b> | Posterior calcaneus                                |
| <b>A</b> | Very weak assist in knee and ankle plantar flexion |
| <b>N</b> | Tibial nerve                                       |

## tibialis posterior



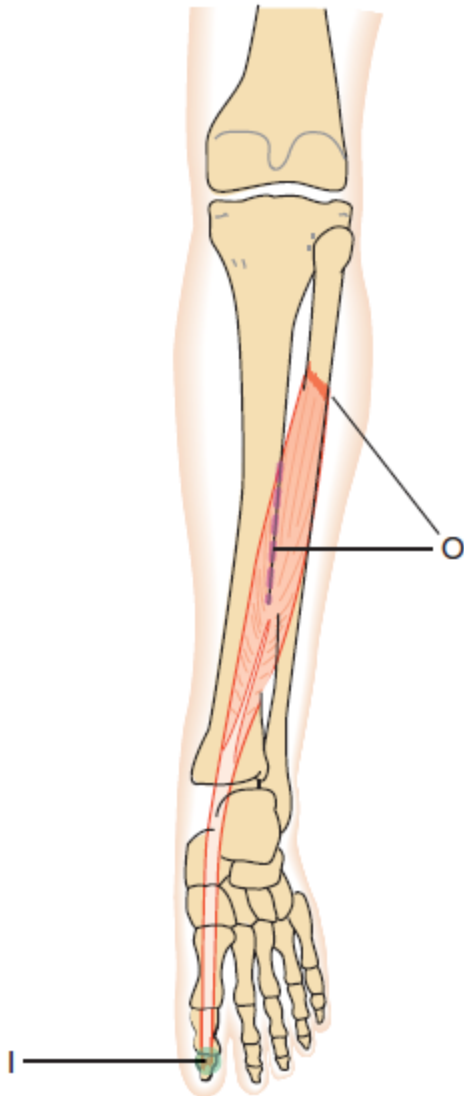
## Tibialis Posterior

- O** Interosseous membrane, adjacent tibia and fibula
- I** Navicular and most tarsals and metatarsals
- A** Ankle inversion; assists in plantar flexion
- N** Tibial nerve

## 97 tibialis posterior

Lippert & Minor: Kinesiology Flashcards 3e, © 2011 F. A. Davis Company

## flexor hallucis longus



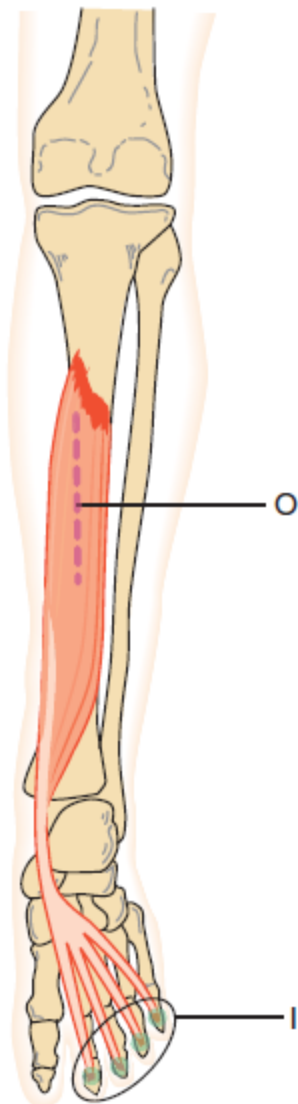
## Flexor Hallucis Longus

- |          |  |
|----------|--|
| <b>O</b> | Posterior fibula and interosseous membrane                               |
| <b>I</b> | Distal phalanx of the great toe  |
| <b>A</b> | Great toe flexion; assists in inversion and plantar flexion of the ankle |
| <b>N</b> | Tibial nerve   |

## 98 flexor hallucis longus

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## flexor digitorum longus



## Flexor Digitorum Longus

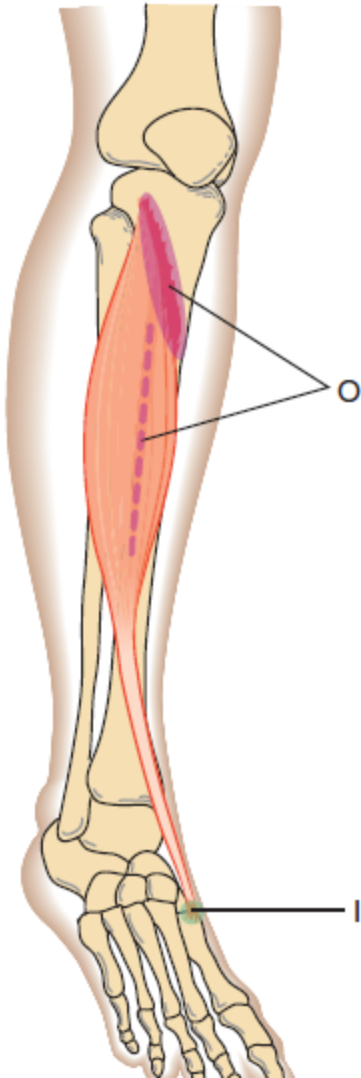
- |          |  |
|----------|--|
| <b>O</b> | Posterior tibia  |
| <b>I</b> | Distal phalanx of four lesser toes   |
| <b>A</b> | Flexion of four lesser toes; assists in ankle inversion and plantar flexion of the ankle |
| <b>N</b> | Tibial nerve   |

## 99 flexor digitorum longus

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# Přední skupina

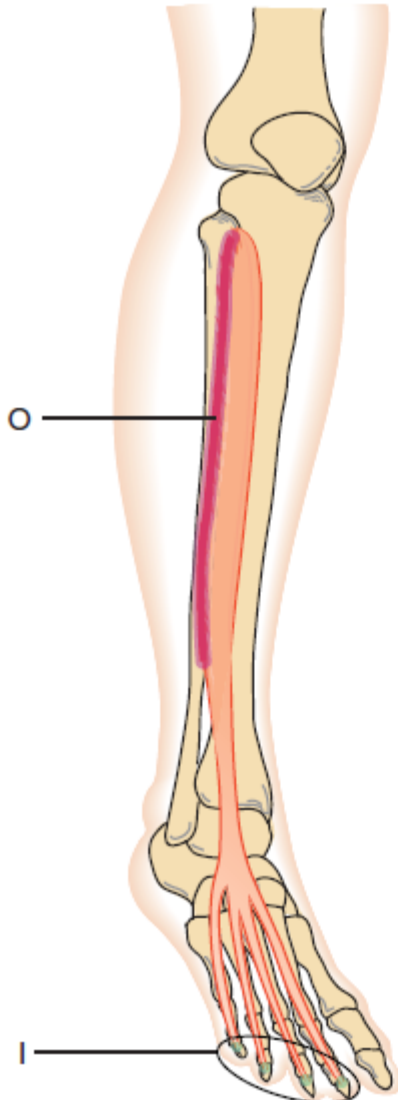
## tibialis anterior



## Tibialis Anterior

- |          |   |
|----------|---|
| <b>O</b> | Lateral tibia and interosseous membrane |
| <b>I</b> | First cuneiform and first metatarsal    |
| <b>A</b> | Ankle inversion and dorsiflexion        |
| <b>N</b> | Deep peroneal nerve                     |

## extensor digitorum longus



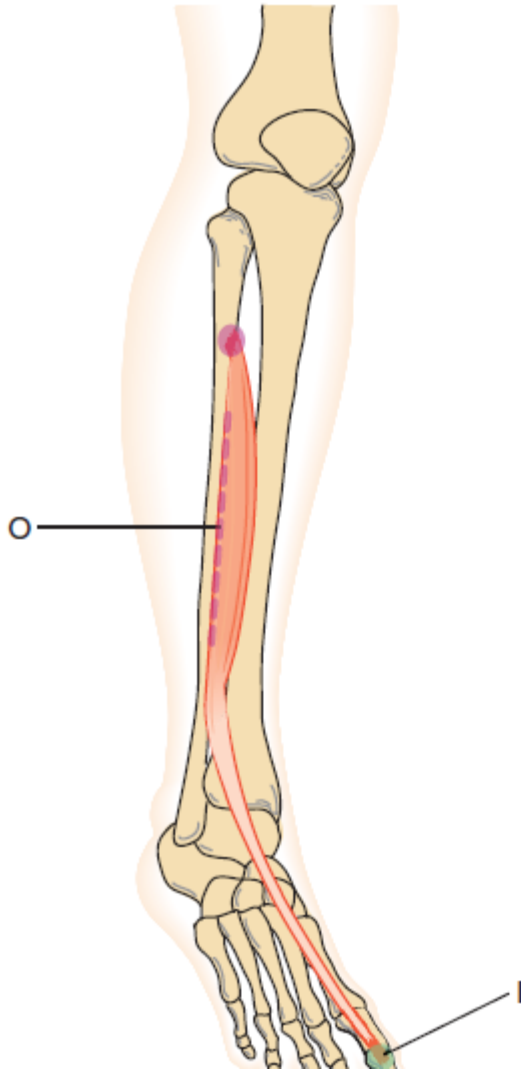
## Extensor Digitorum Longus

- |          |  |
|----------|--|
| <b>O</b> | Fibula, interosseous membrane, tibia                         |
| <b>I</b> | Distal phalanx of four lesser toes                           |
| <b>A</b> | Extension of four lesser toes; assists in ankle dorsiflexion |
| <b>N</b> | Deep peroneal nerve  |

## 102 extensor digitorum longus

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## extensor hallucis longus



## Extensor Hallucis Longus

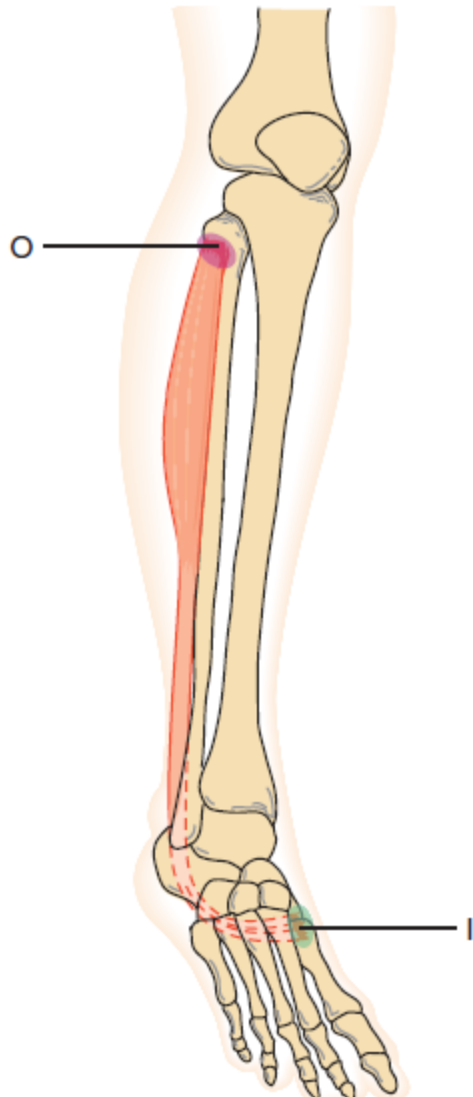
- |          |  |
|----------|--|
| <b>O</b> | Fibula and interosseous membrane                                 |
| <b>I</b> | Distal phalanx of great toe                                      |
| <b>A</b> | First toe extension; assists in ankle inversion and dorsiflexion |
| <b>N</b> | Deep peroneal nerve  |

101 extensor hallucis longus



# Boční skupina

## peroneus longus



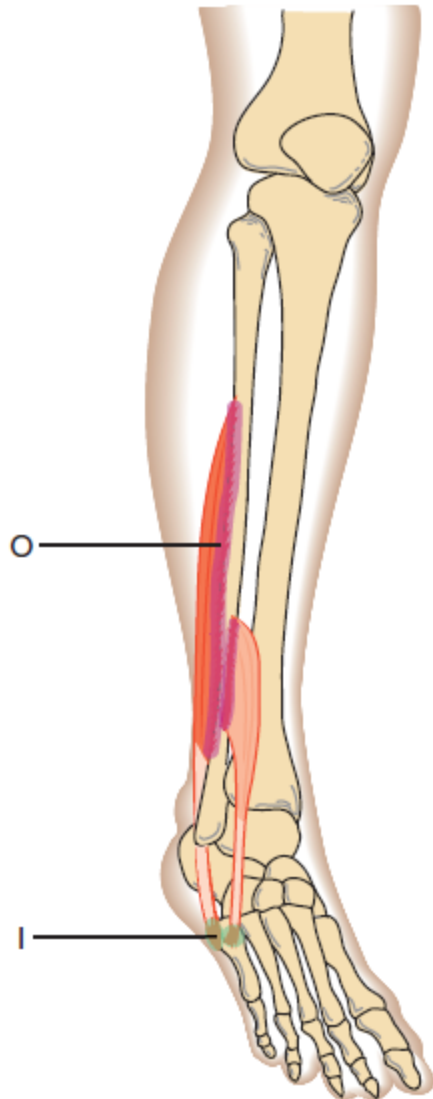
## Peroneus Longus

- |          |   |
|----------|---|
| <b>O</b> | Lateral proximal fibula and interosseous membrane |
| <b>I</b> | Plantar surface of first cuneiform and metatarsal |
| <b>A</b> | Ankle eversion; assists in ankle plantar flexion  |
| <b>N</b> | Superficial peroneal nerve                        |

## 103 peroneus longus

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## peroneus brevis

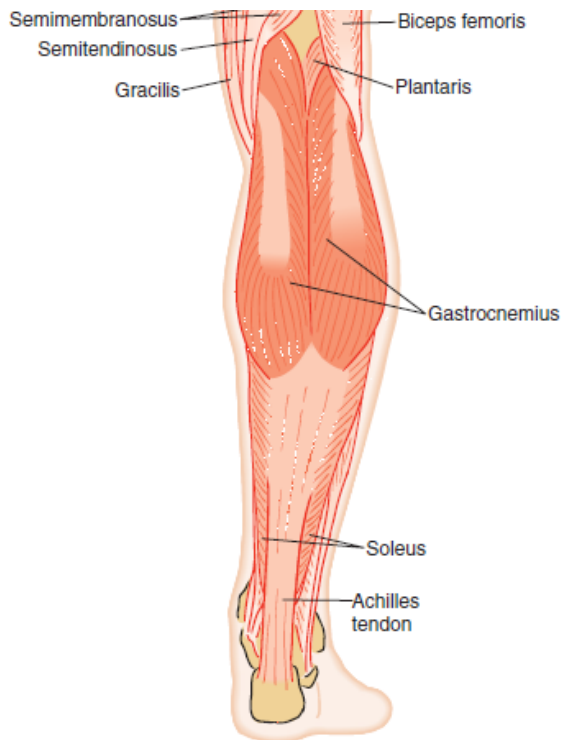


### Peroneus Brevis

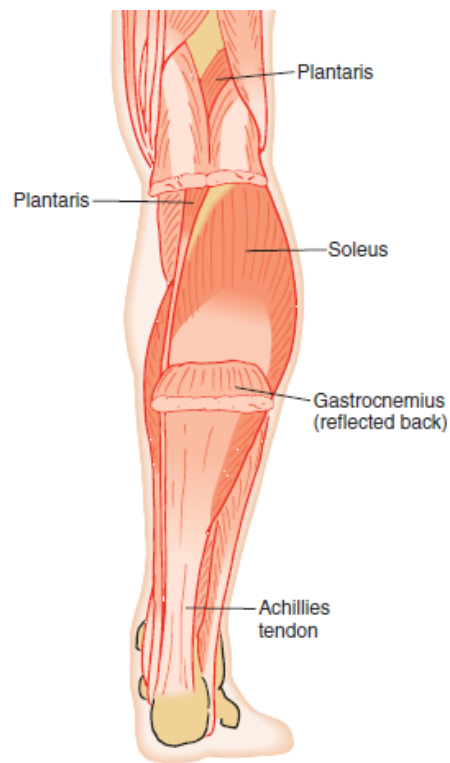
- |          |  |
|----------|--|
| <b>O</b> | Lateral distal fibula                      |
| <b>I</b> | Base of fifth metatarsal                   |
| <b>A</b> | Ankle eversion; assists in plantar flexion |
| <b>N</b> | Superficial peroneal nerve                 |

### Peroneus Tertius

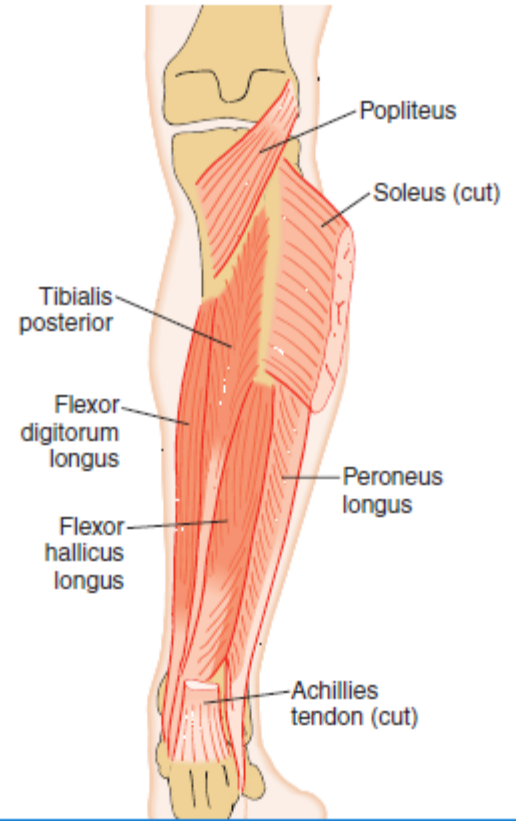
- |          |   |
|----------|---|
| <b>O</b> | Distal medial fibula                                |
| <b>I</b> | Base of fifth metatarsal                            |
| <b>A</b> | Assists somewhat in ankle eversion and dorsiflexion |
| <b>N</b> | Deep peroneal nerve                                 |



**Figure 20-33.** Muscles of the posterior leg, superficial layer (posterior view, right leg).

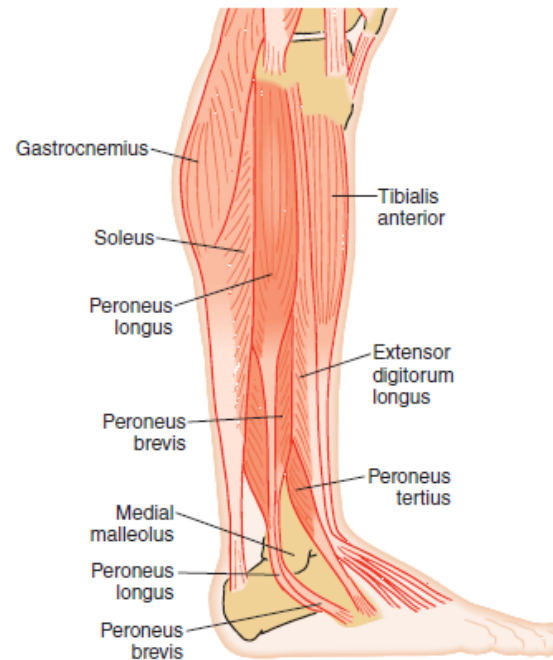


**Figure 20-34.** Middle layer of the posterior group. The middle section of the gastrocnemius muscle has been removed.

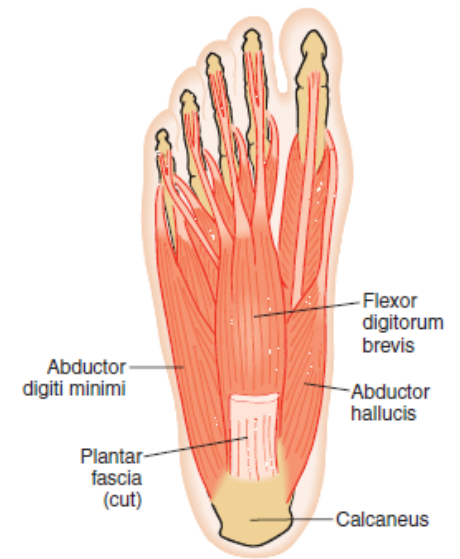
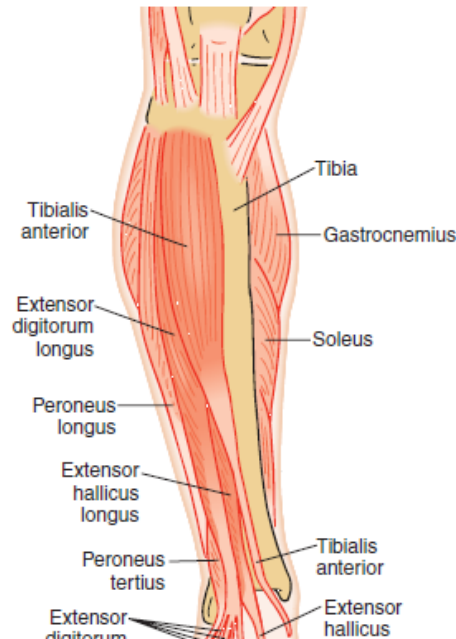


**Table 20-4** Actions of Ankle Prime Movers

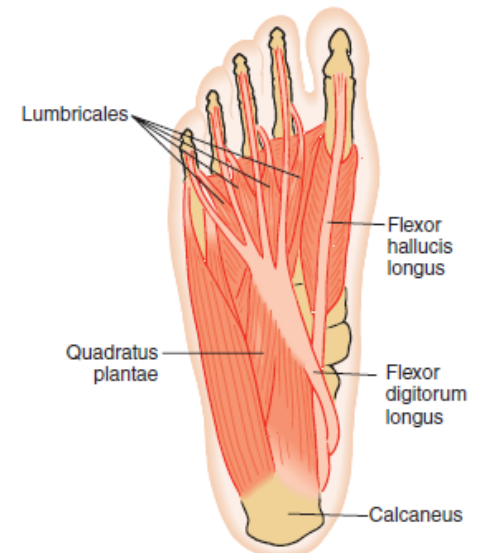
Action	Muscle
Plantar flexion	Gastrocnemius, soleus
Dorsiflexion	Tibialis anterior
Inversion	Tibialis anterior, tibialis posterior
Eversion	Peroneus longus, peroneus brevis
Flexion of second through fifth toes	Flexor digitorum longus
Flexion of first toe	Flexor hallucis longus
Extension of second through fifth toes	Extensor digitorum longus
Extension of first toe	Extensor hallucis longus
No prime mover action	Plantaris, peroneus tertius



**Figure 20-36.** Muscles of the right lateral group (lateral view).

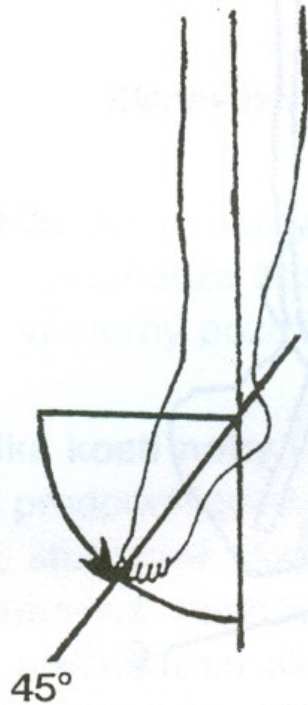


**Figure 20-38.** Muscles of the plantar surface of the foot—first (superficial) layer (plantar view).

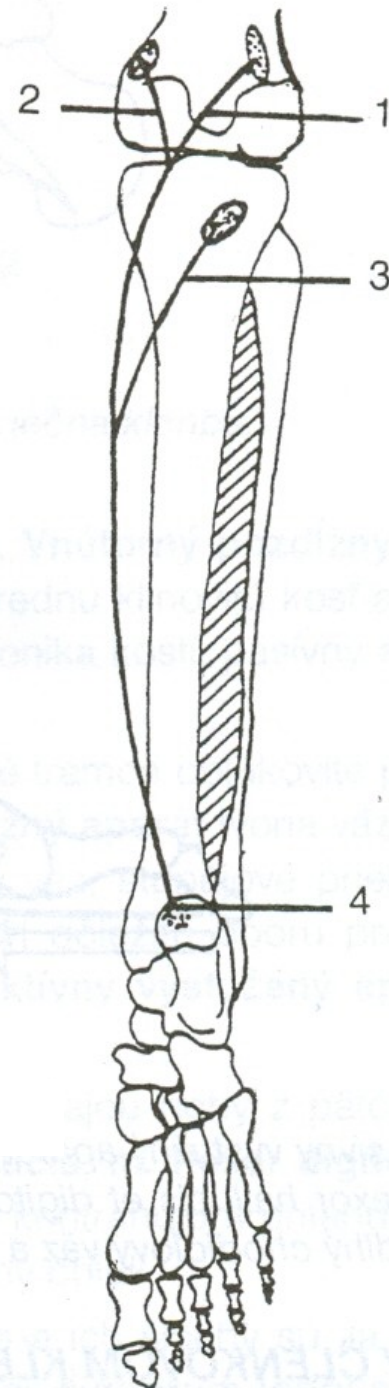


**Figure 20-39.** Muscles of the plantar surface of the foot—second layer (plantar view).

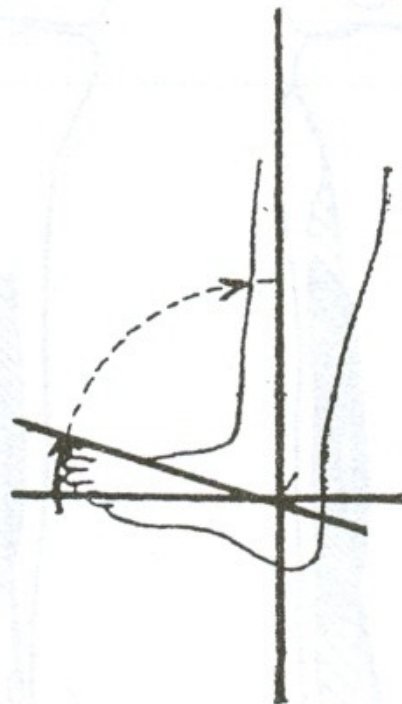
# PLANTÁRNÍ FLEXE – PROPNUÍ ŠPIČEK



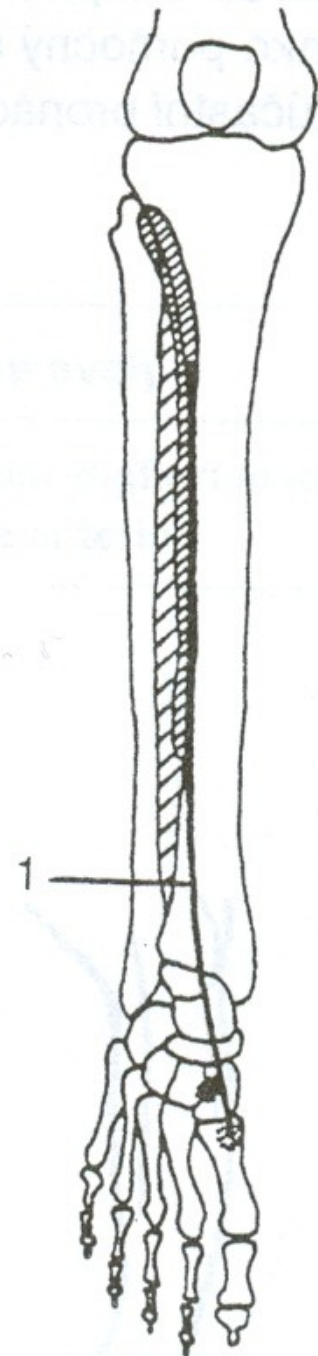
m. triceps surae



# DORZÁLNÍ FLEXE - FAJFKY



m. tibialis anterior



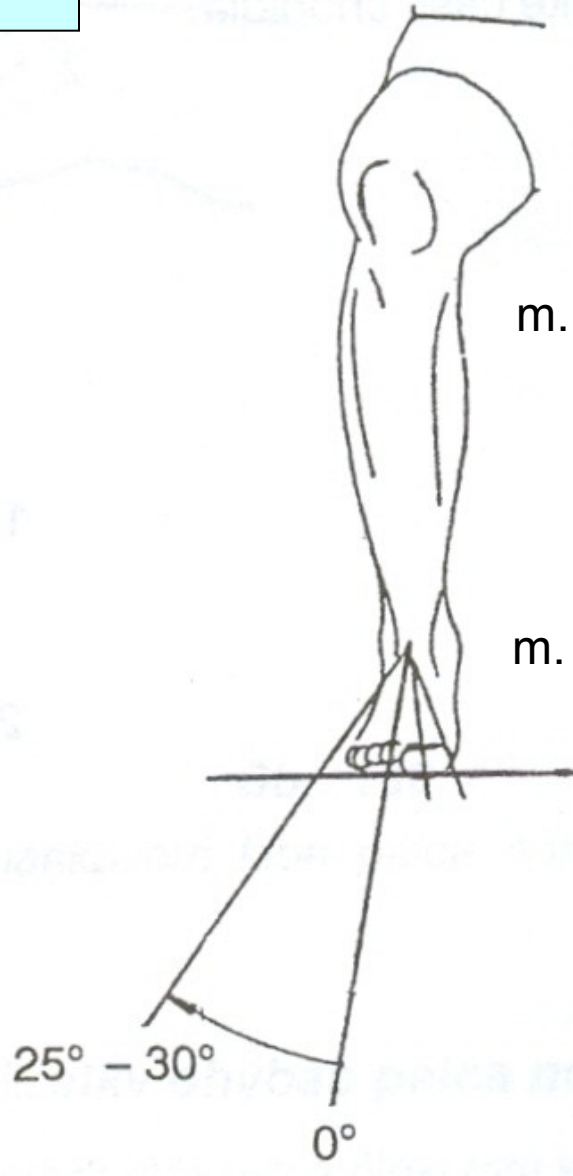
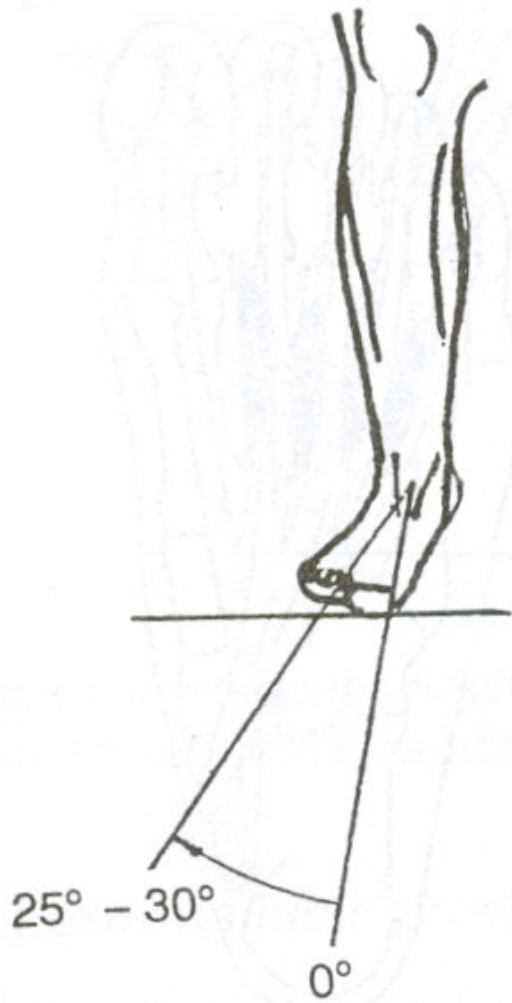
# POHYBY DOLNÍHO KLOUBU ZÁNÁRTNÍHO

EVERZE

INVERSE

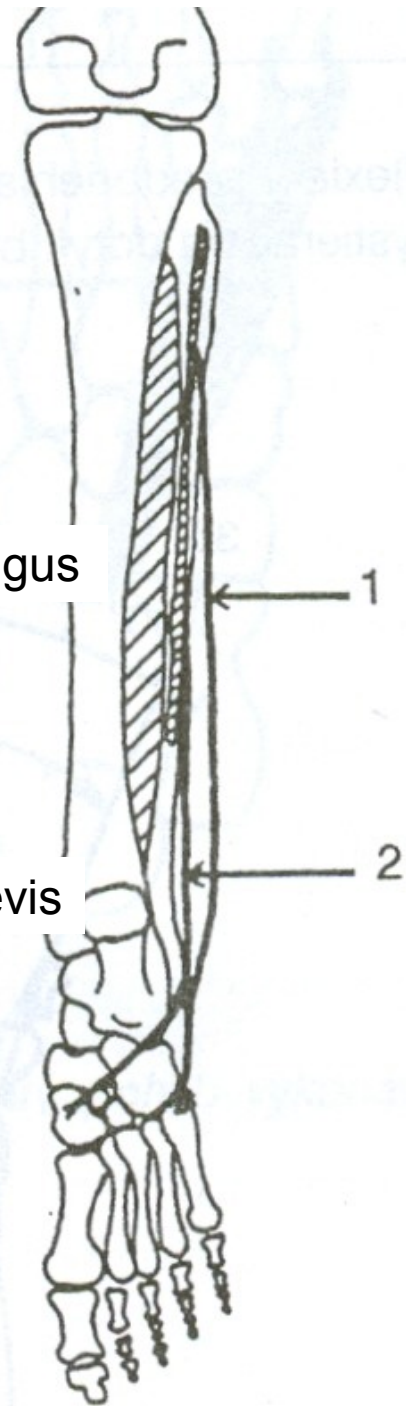


# EVERZE

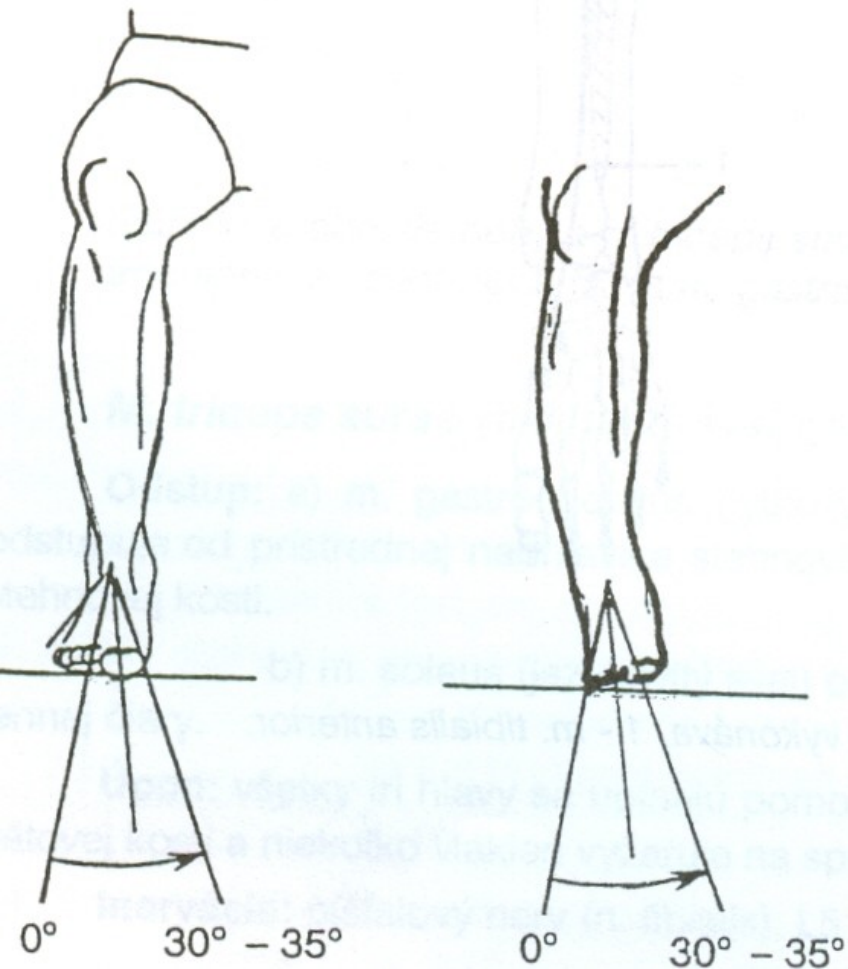


m. peroneus longus

m. peroneus brevis



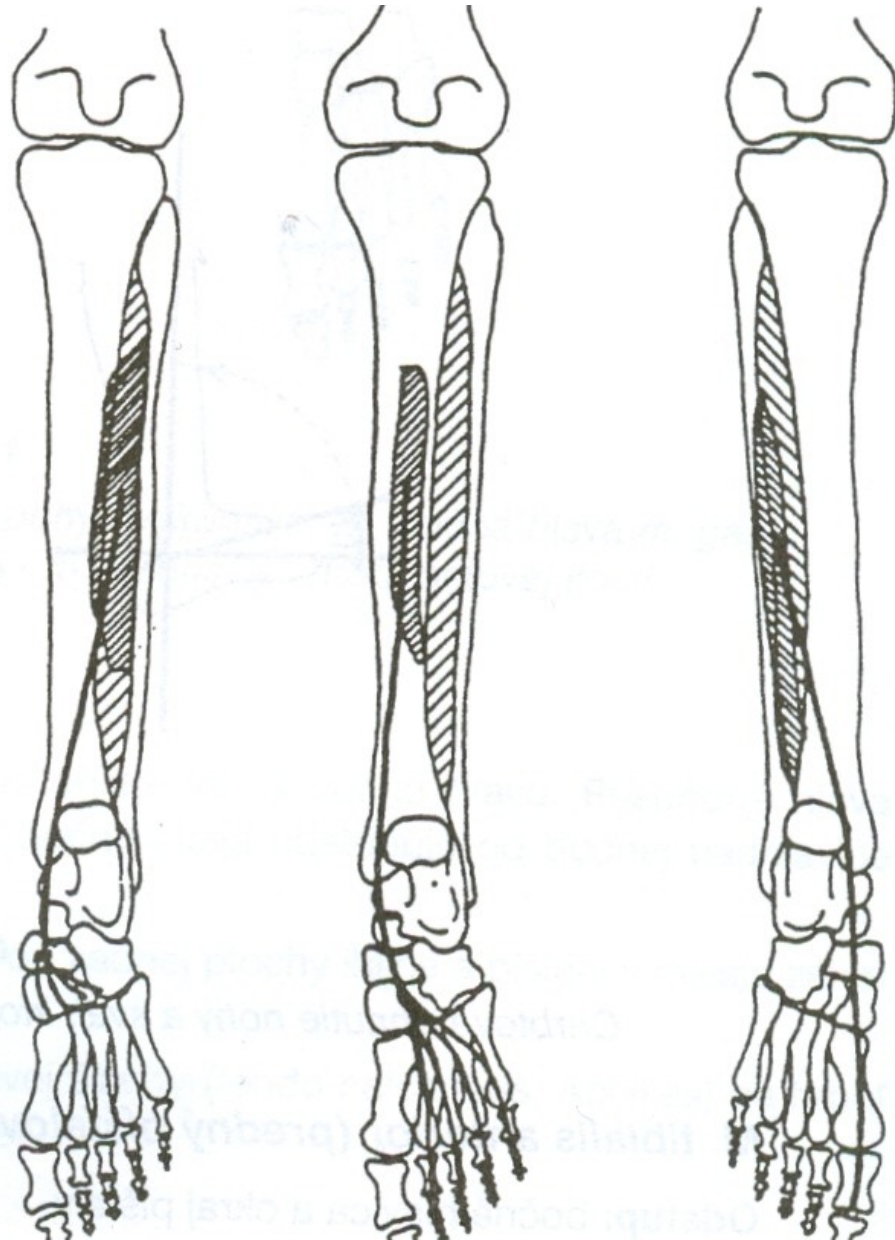
# INVERSE



m. tibialis posterior

m. flexor digitorum longus

m. flexor hallucis longus





# POHYBY PRSTŮ

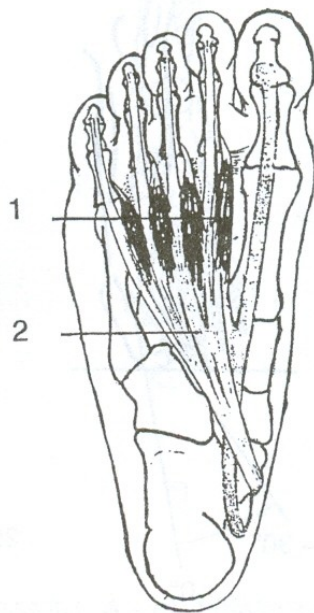
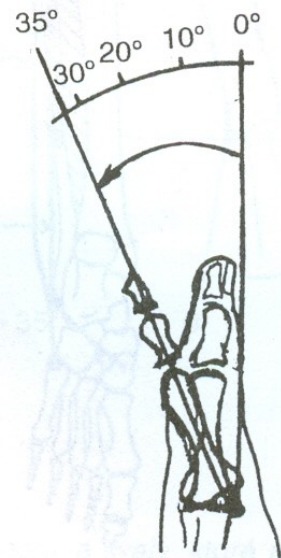
FLEXE - OHNUTÍ

EXTENZE - NATAŽENÍ

ABDUKCE - ODTAŽENÍ

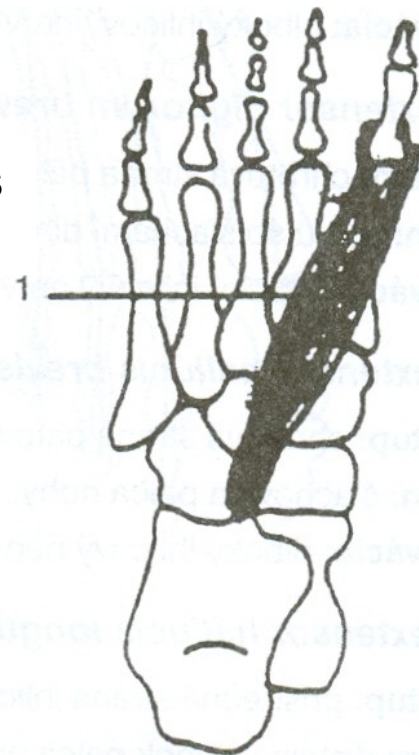
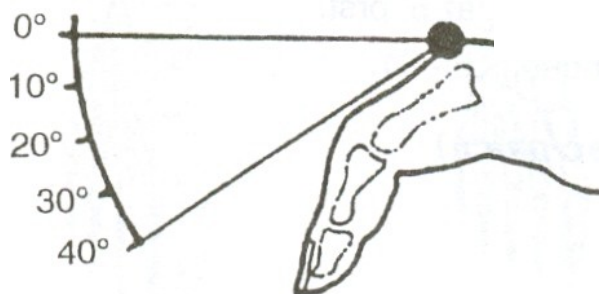
ADDUKCE - PŘITAŽENÍ

mm. lumbricales

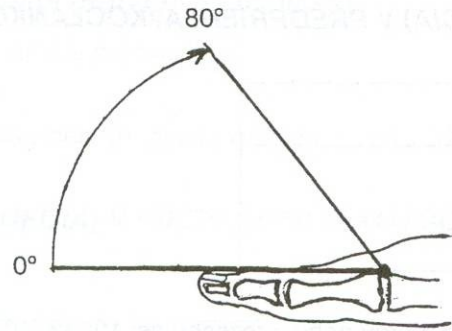


**FLEXE**

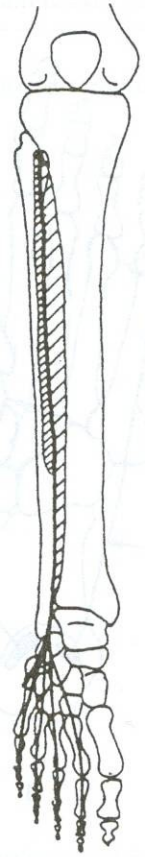
m. flexor hallucis  
brevis



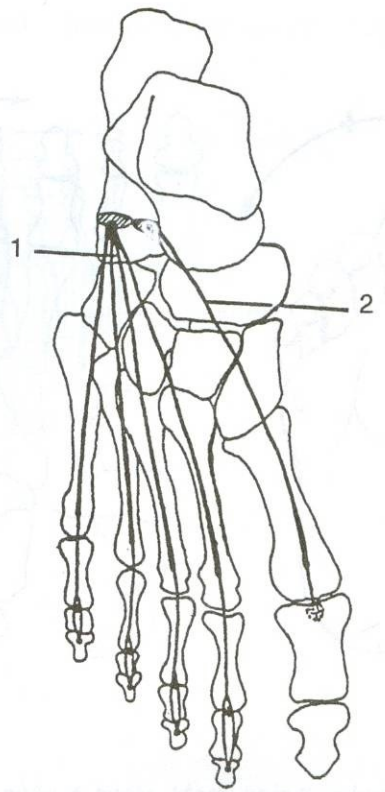
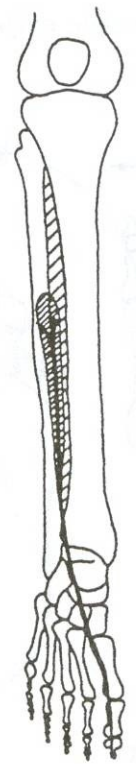
# EXTENZE



m. extensor digitorum longus



m. extensor hallucis longus



m. extensor hallucis brevis