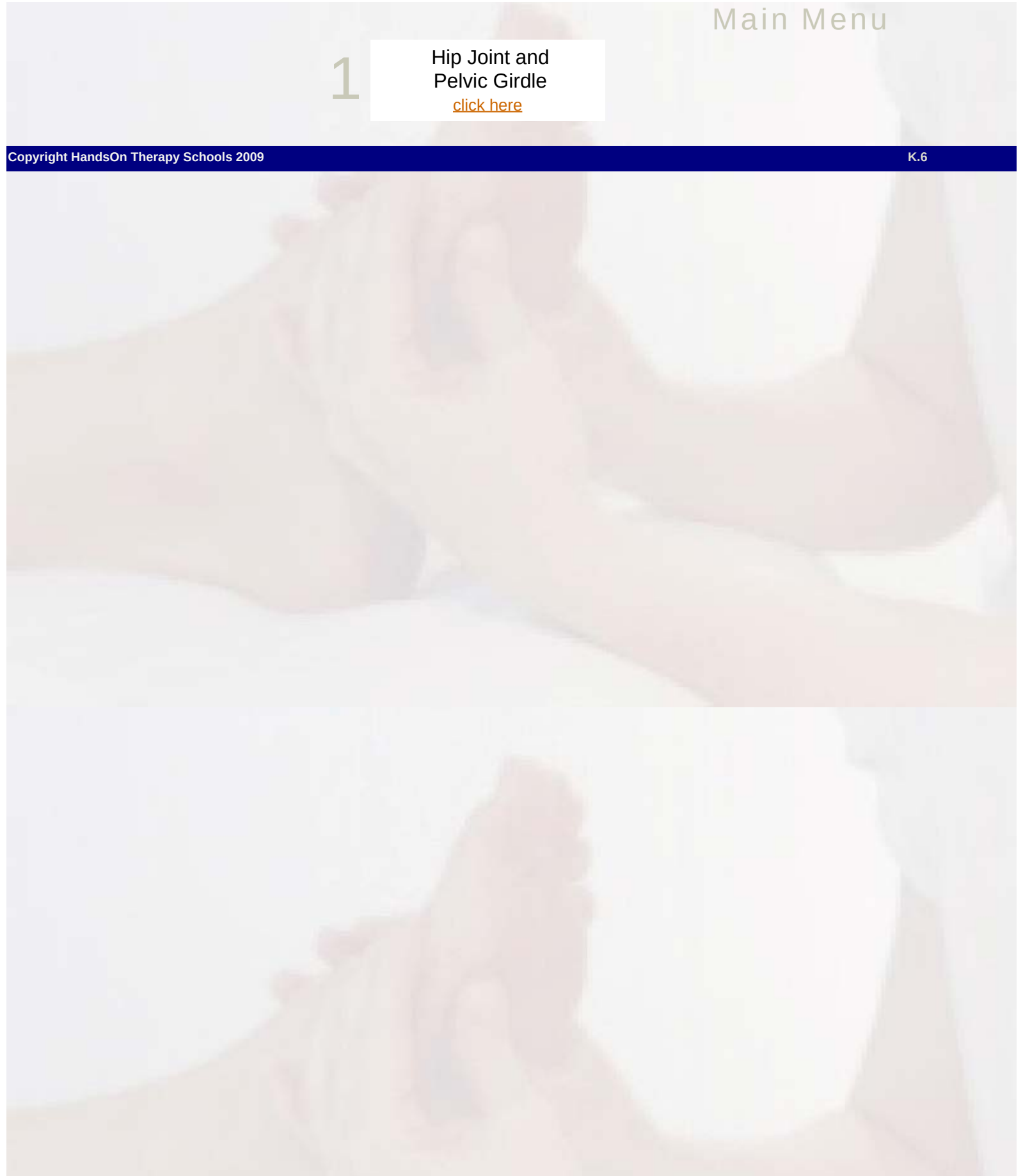






1

Hip Joint and Pelvic Girdle
[click here](#)

Main Menu

Hip Joint (acetabular femoral)

Relatively stable due to :

Bony architecture

strong ligaments

large supportive muscles

Functions in weight bearing and locomotion

enhanced significantly by its wide range of motion

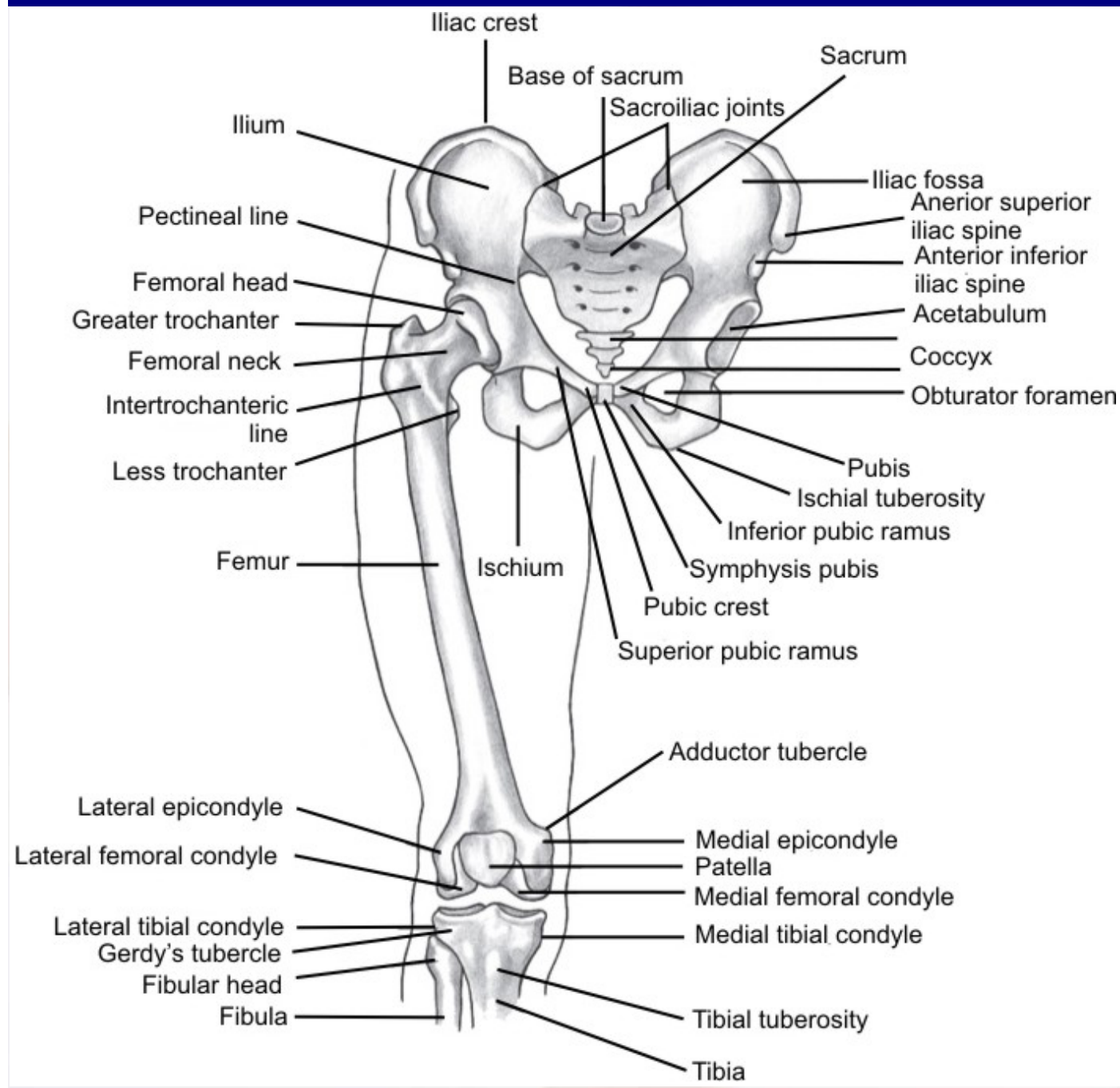
ability to run, cross-over cut, side-step cut, jump, and many other directional changes

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Bones



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Bones

Pelvic bone - divided into 3 areas

Upper two fifths = ilium

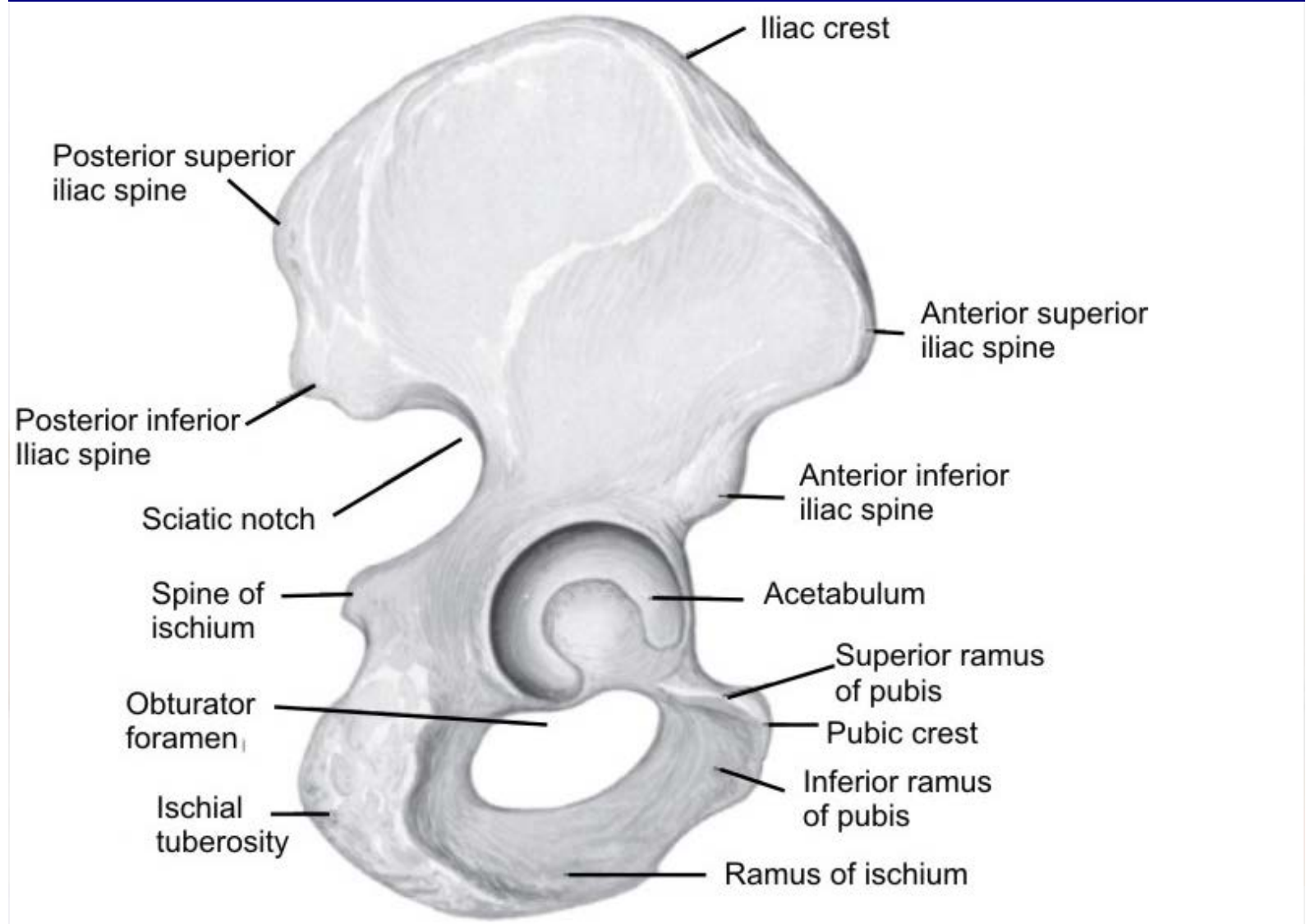
Posterior & lower two fifths = ischium

Anterior and lower one fifth

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Bones



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Boney Landmarks

Anterior pelvis - origin for hip flexors

tensor fasciae latae - anterior iliac crest

sartorius - anterior superior iliac spine

rectus femoris - anterior inferior iliac spine

Lateral pelvis - origin for hip abductors

gluteus medius and minimus - just below iliac crest

Medially - origin for hip adductors

adductor magnus, adductor longus, adductor brevis, pectineus, and gracilis - pubis and its inferior ramus

Posteriorly – origin for hip extensors

gluteus maximus - posterior iliac crest and posterior sacrum & coccyx

Posteroinferiorly - origin for hip extensors

hamstrings - ischial tuberosity

Proximal thigh - insertion for short muscles of hip

gluteal muscles and most of the six deep external rotators - greater trochanter

iliopsoas - lesser trochanter

Proximal thigh - origin for 3 knee extensors

three vasti muscles of quadriceps – anteriorly

hip adductors - linea aspera

Patella – insertion for all 4 quadriceps muscles

Proximal tibia or fibula – insertion for remainder of hip muscles

sartorius, gracilis, & semitendinosus - upper anteromedial tibial surface just below medial condyle after crossing knee posteromedially

semimembranosus - posteromedially on medial tibial condyle

Proximal tibia or fibula – insertion for remainder of hip muscles

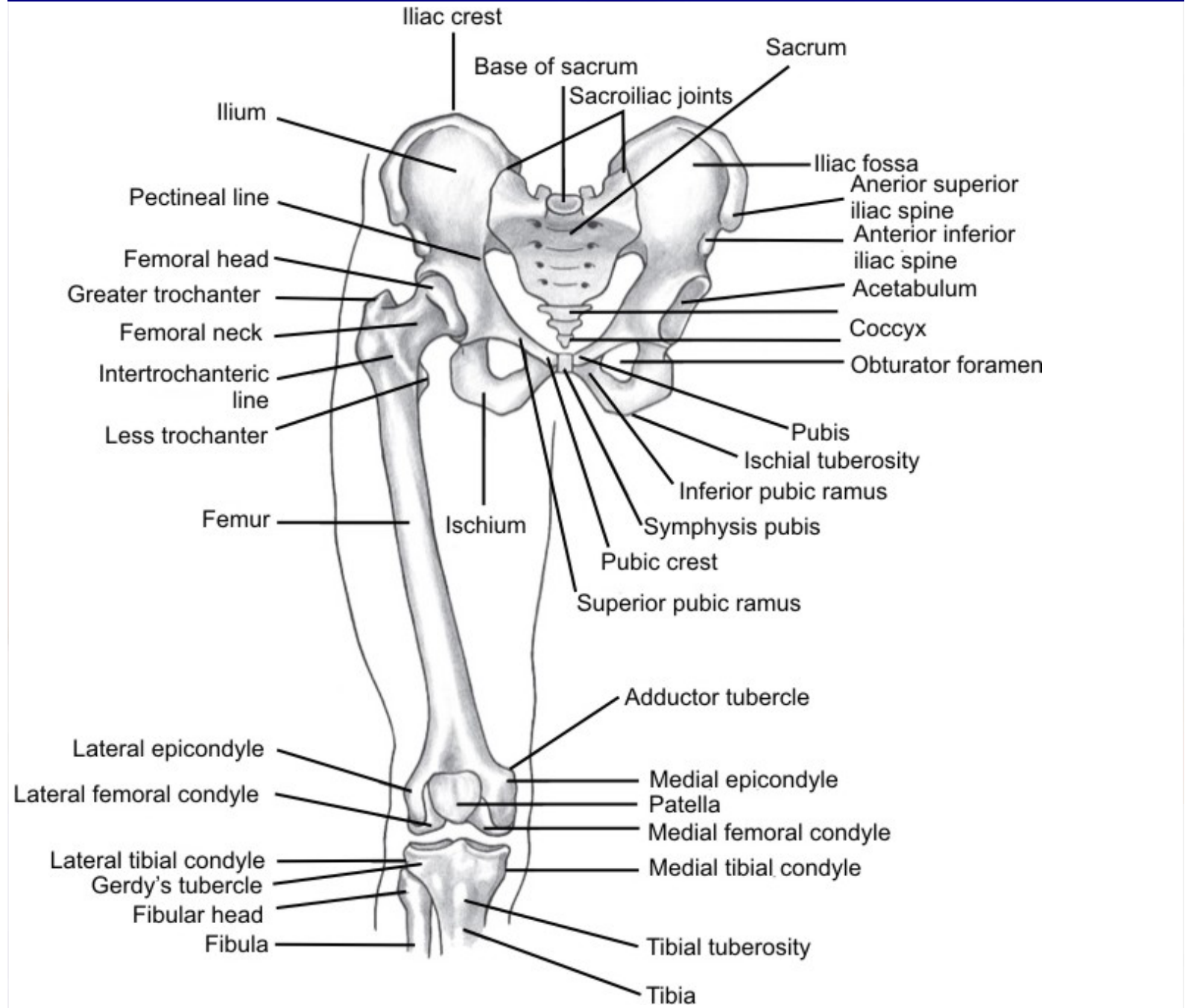
biceps femoris – laterally, primarily on fibula head with some fibers attaching on lateral tibial condyle

iliotibial tract of tensor fasciae latae – anterolaterally on Gerdy's tubercle of tibia

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Bones



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Joints

Anteriorly

Two pelvic bones join to form symphysis pubis, amphiarthrodial

Posteriorly

Sacrum is between the 2 pelvic bones and forms the sacroiliac joints

Strong ligaments unite these bones to form rigid, slightly movable joints

Large and heavy bones covered by thick, heavy muscles

Very minimal oscillating-type movements occur in sacroiliac joints, as in walking

Body movements usually involve entire pelvic girdle and hip joints

In walking, hip flexion and extension occur with pelvic girdle rotation, forward in hip flexion and backward in hip extension

Jogging and running result in faster movements and greater range of movement

Pelvic rotation increases the length of stride in running; in kicking it results in a greater distance or more speed to the kick

Acetabulofemoral joint - most mobile joints of body (except glenohumeral)

Multiaxial arrangement

Bony architecture provides stability

relatively few hip joint subluxations and dislocations

Enarthrodial-type joint

Femoral head inserting into acetabulum

Reinforced by extremely strong and dense ligamentous capsule, especially anteriorly

Joints

Acetabulofemoral joint

Iliofemoral or Y ligament – located anteriorly, prevents hyperextension

Pubofemoral ligament - located anteromedially and inferiorly, limits excessive extension and abduction

Teres ligament - attaches from deep in acetabulum to a depression in femoral head, slightly limits adduction

Ischiofemoral ligament – located posteriorly, extends from ischium to trochanteric fossa of femur, limits internal rotation

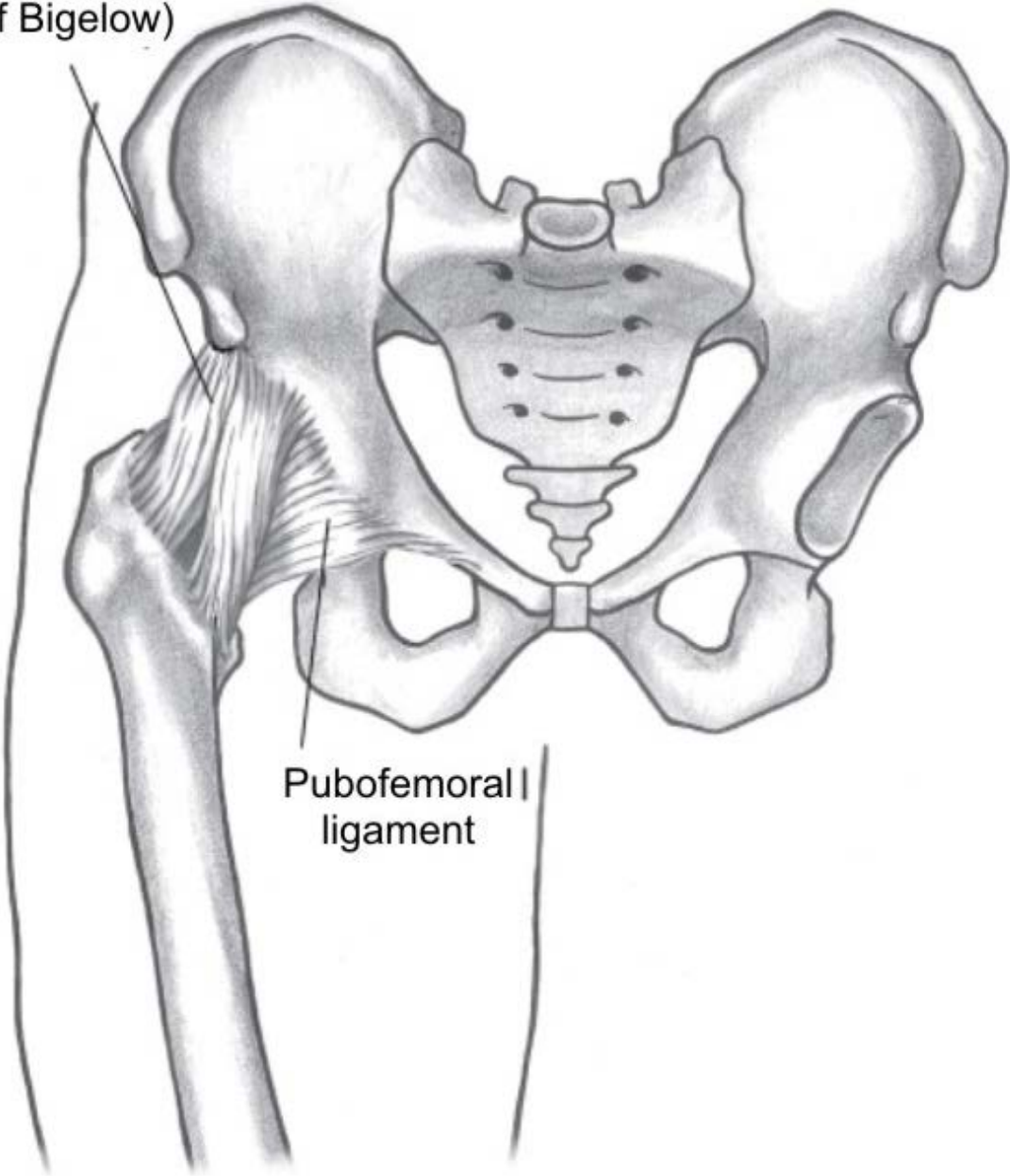
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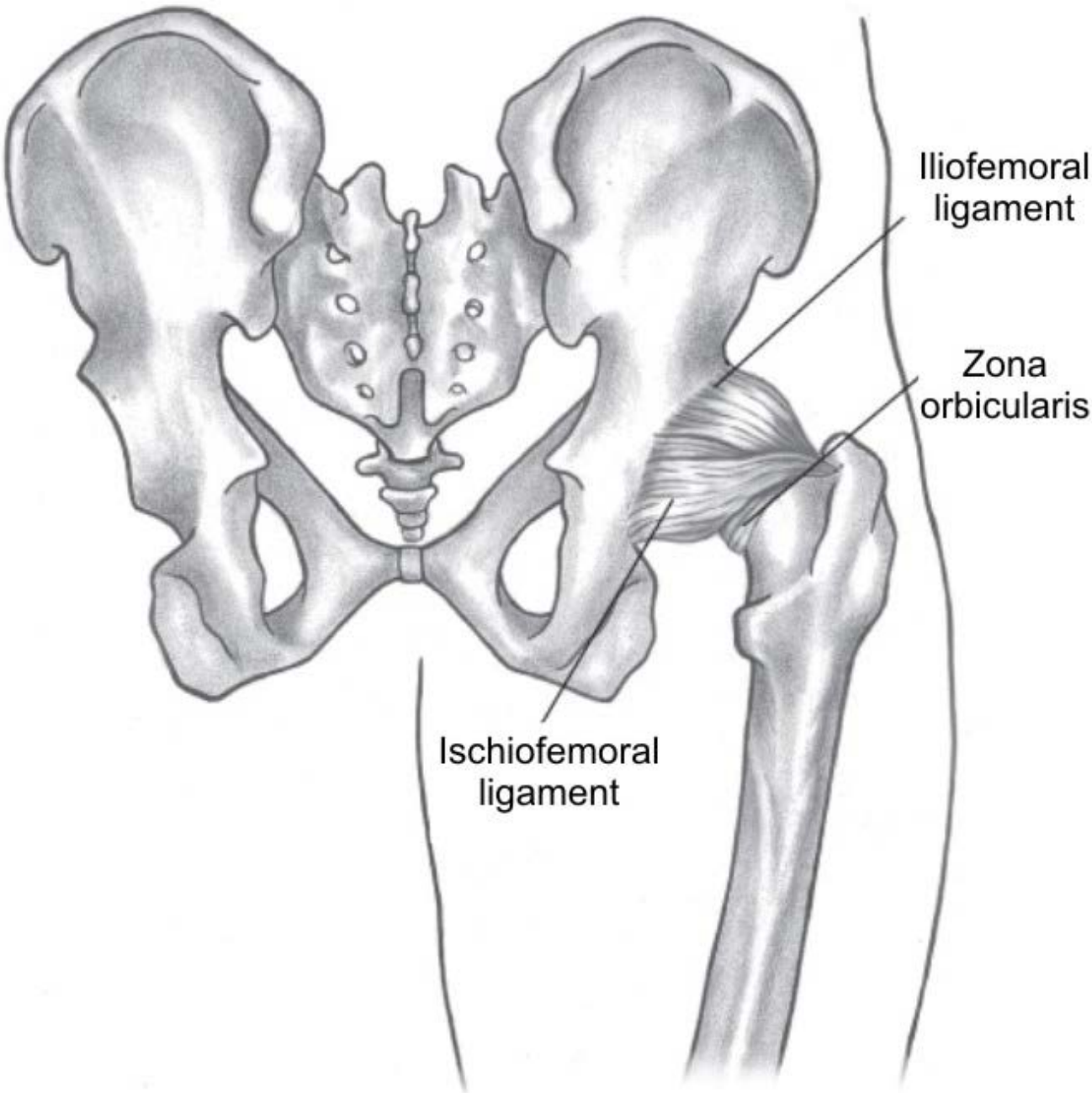


Joints

Iliofemoral ligament
("Y" ligament of Bigelow)



Pubofemoral
ligament



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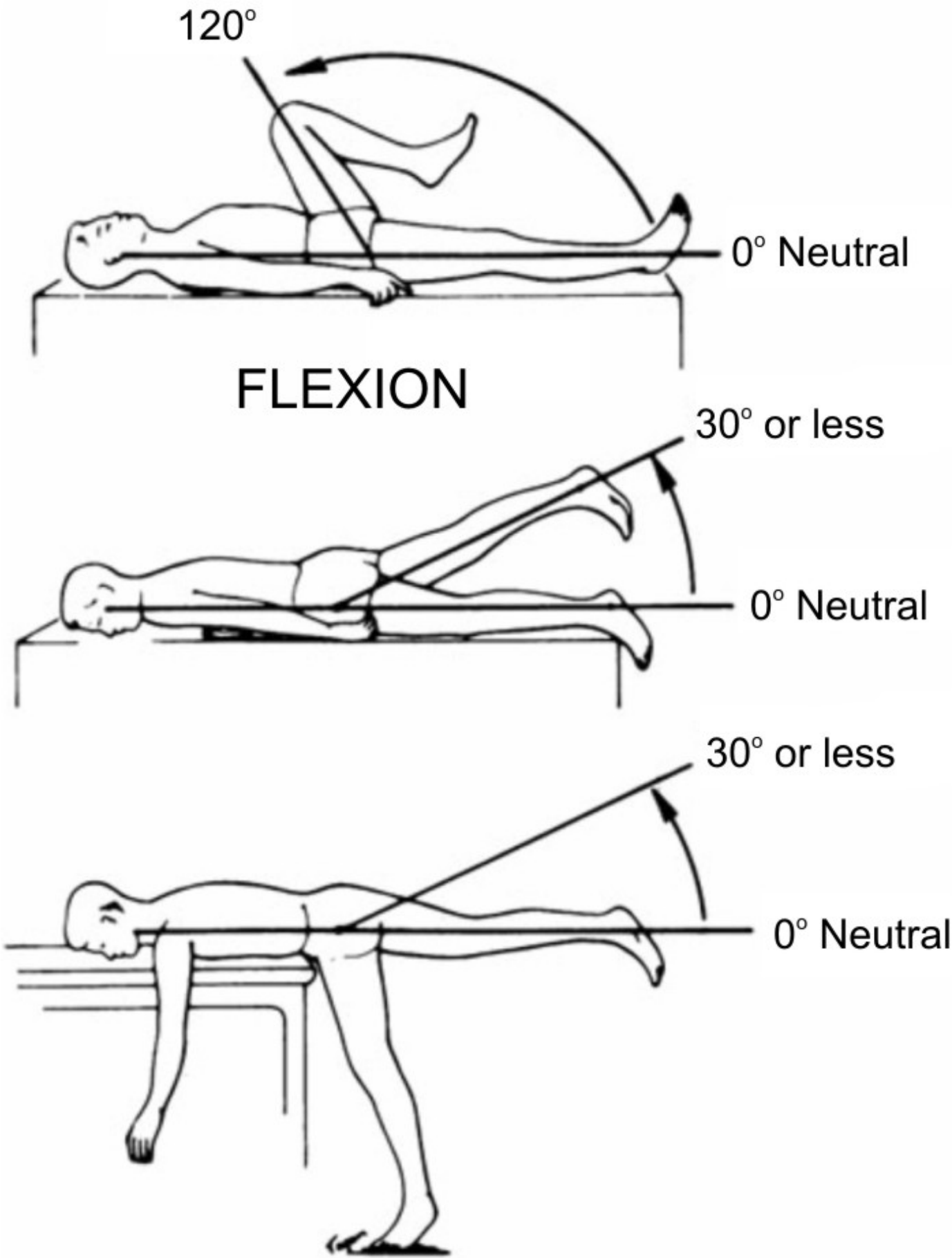
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Joints

Some disagreement about exact possible range of each movement in hip joint

0 to 130 degrees of flexion

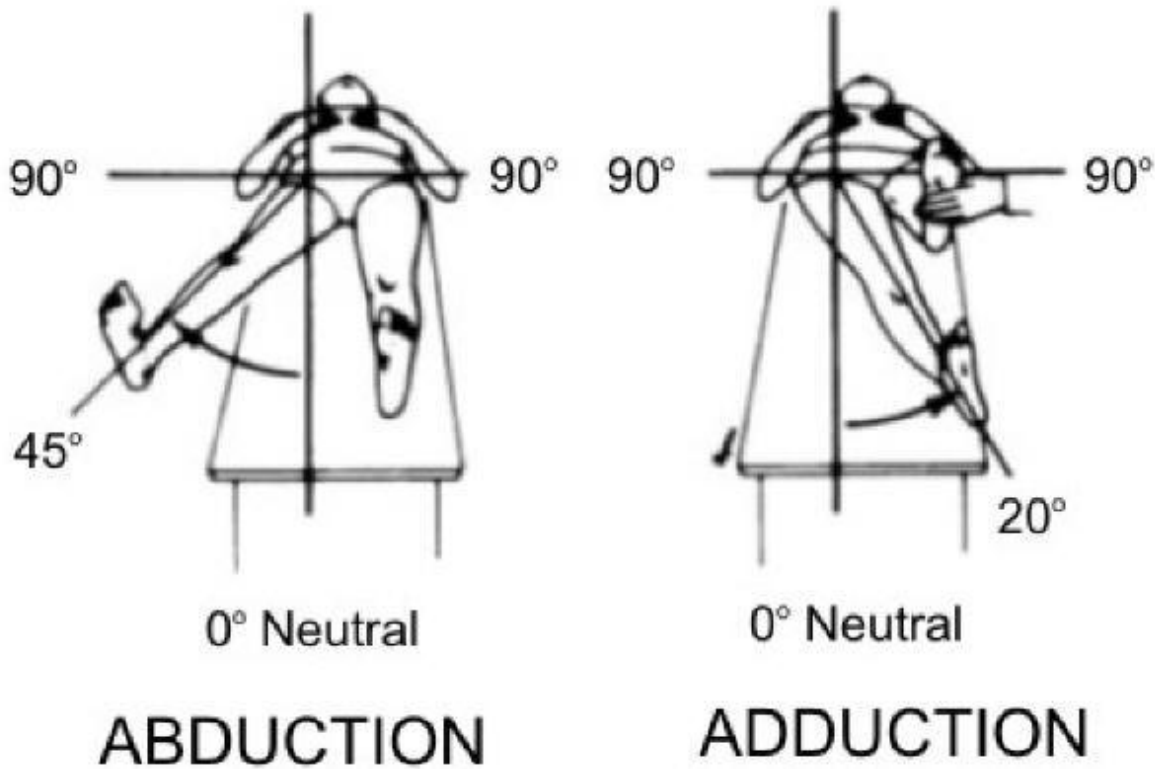
0 to 30 degrees of extension



Joints

0 to 35 degrees of abduction

0 to 30 degrees of adduction



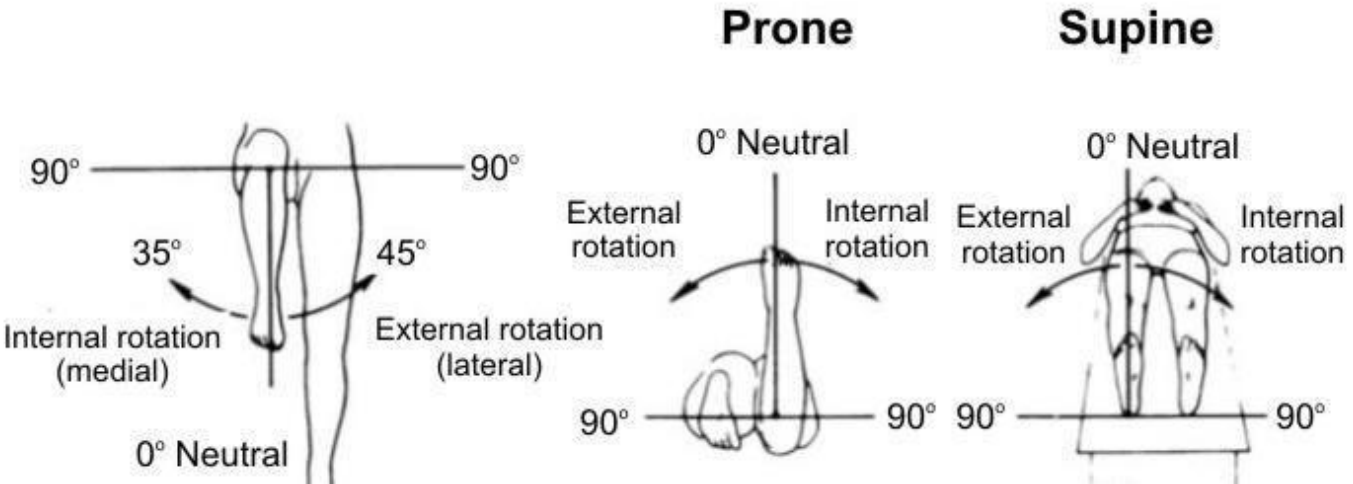
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Joints

0 to 45 degrees of internal rotation

0 to 50 degrees of external rotation



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Joints

Pelvic girdle moves back and forth within 3 planes for a total of 6 different movements :

All pelvic girdle rotation results from motion at one or more locations

right hip

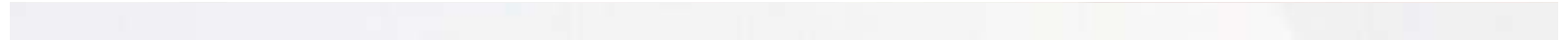
left hip

lumbar spine

Pelvic Rotation	Lumbar Spine Motion	Right Hip Motion	Left Hip Motion
Anterior rotation	Extension	Flexion	Flexion
Posterior rotation	Flexion	Extension	Extension
Right lateral rotation	Right lateral flexion	Adduction	Abduction
Left lateral rotation	Left lateral flexion	Abduction	Adduction
Right transverse rotation	Left transverse rotation	Internal rotation	External rotation
Left transverse rotation	Right transverse rotation	External rotation	Internal rotation

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Movements

Anterior and posterior pelvic rotation

sagittal or anteroposterior plane

Right and left lateral rotation

lateral or frontal plane

Right transverse (clockwise) rotation and left transverse (counterclockwise) rotation

horizontal or transverse plane of motion



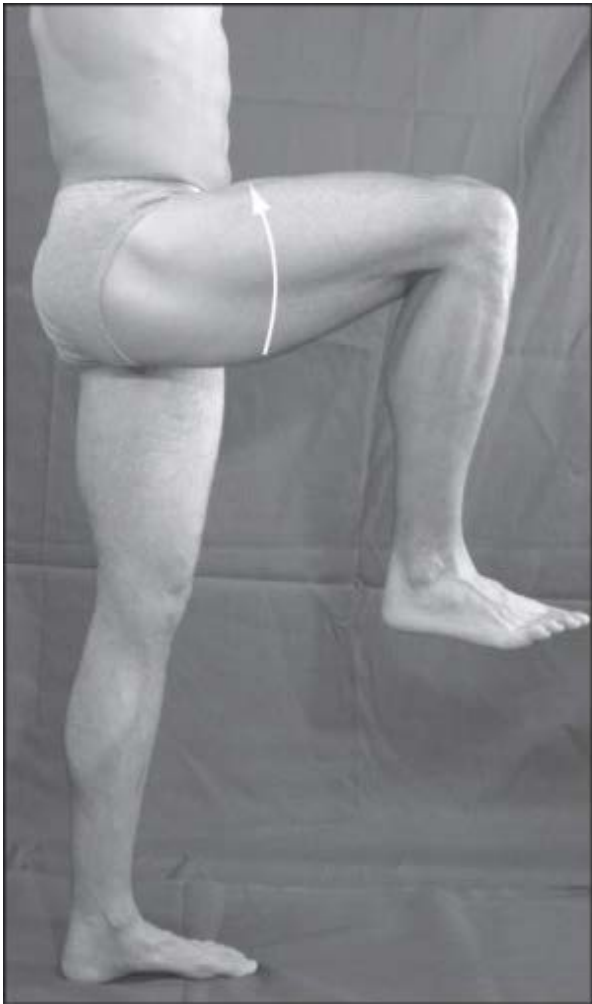
Movements

Hip flexion

movement of femur straight anteriorly toward pelvis

Hip extension

movement of the femur straight posteriorly away from the pelvis; sometimes referred to as hyperextension



Flexion



Extension

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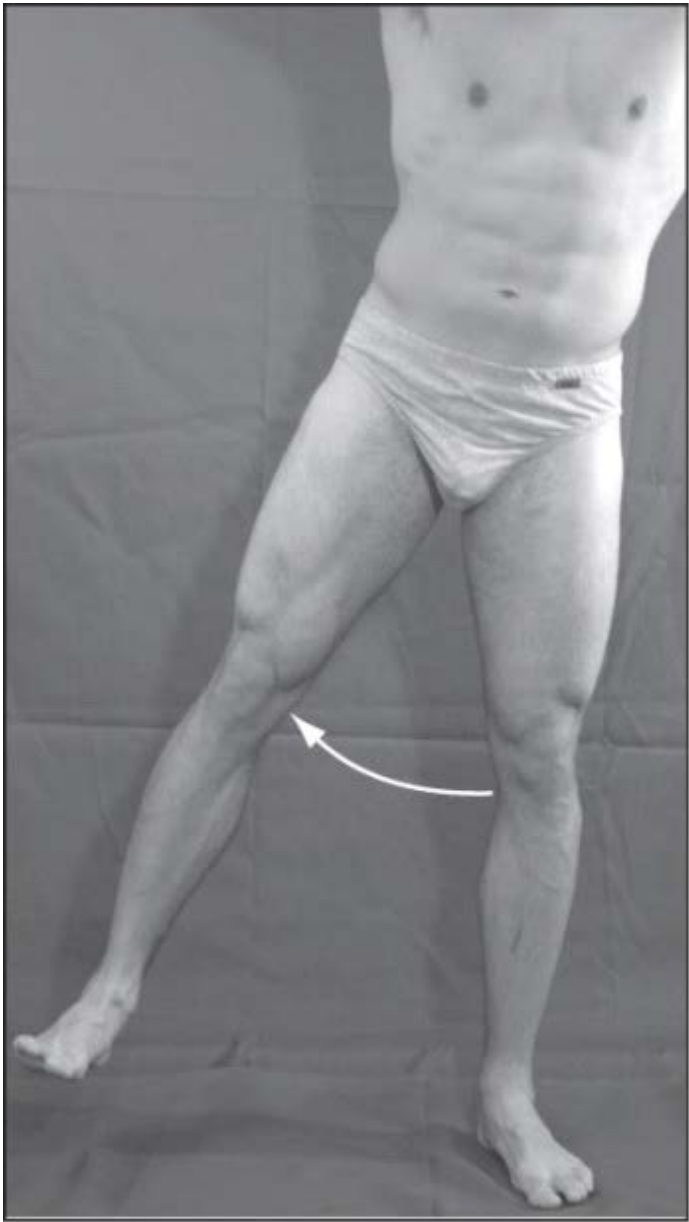
Movements

Hip abduction

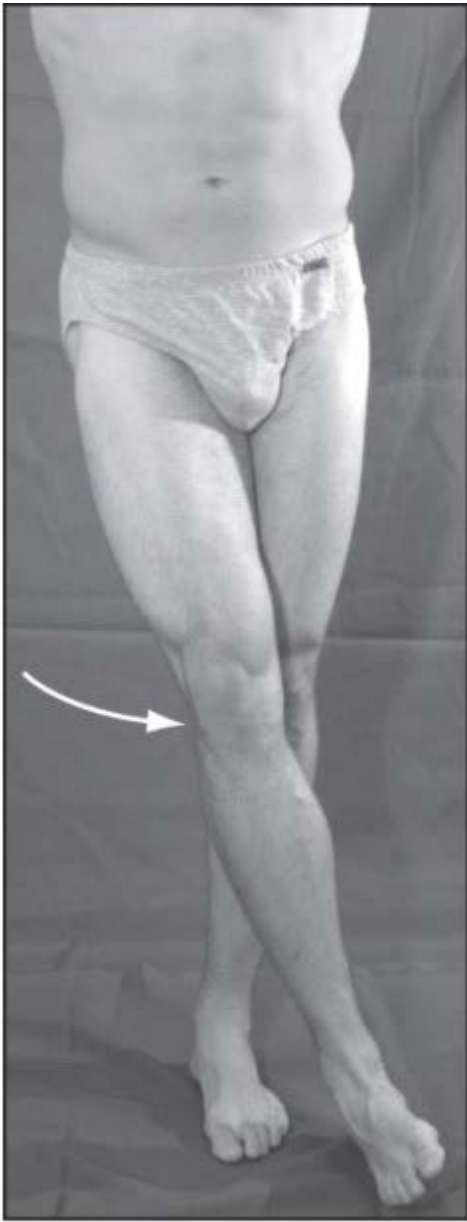
movement of femur laterally to side away from midline

Hip adduction

movement of femur medially toward midline



Abduction



Adduction

Movements

Hip external rotation

rotary movement of femur laterally around its longitudinal axis away from midline; lateral rotation

Hip internal rotation

rotary movement of femur medially around its longitudinal axis toward to midline; medial rotation



External rotation



Internal rotation

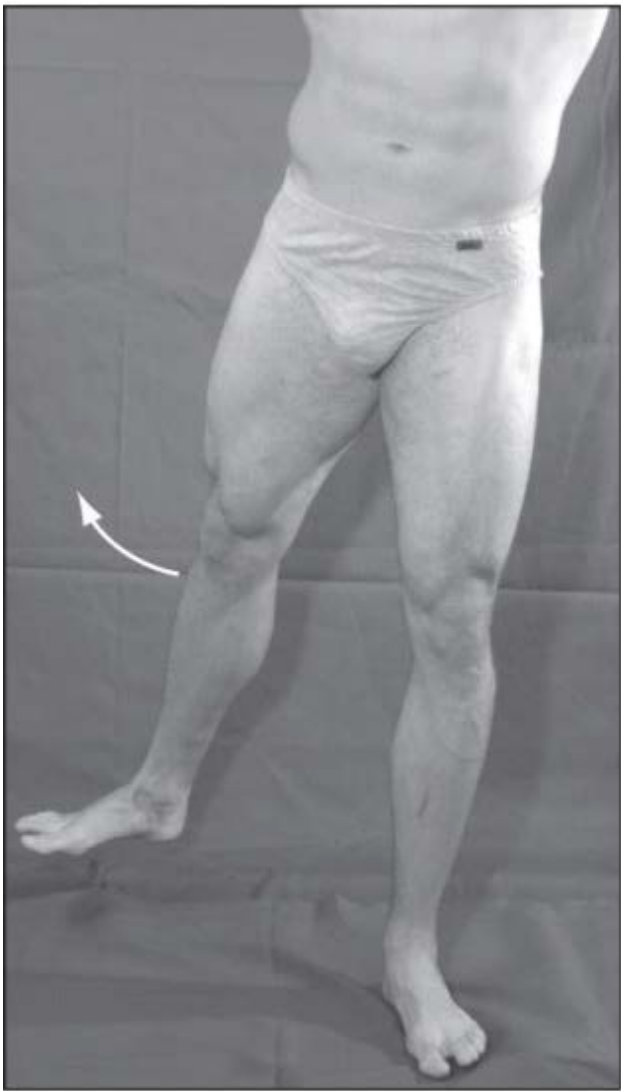
Movements

Hip diagonal abduction

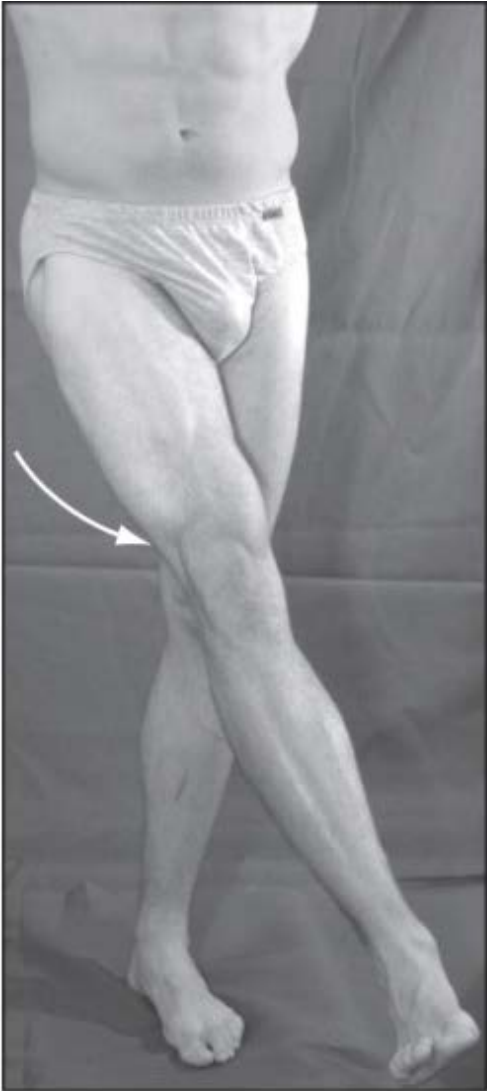
movement of femur in a diagonal plane away from midline of body

Hip diagonal adduction

movement of femur in a diagonal plane toward midline of body



Diagonal abduction



Diagonal adduction

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Movements

Anterior pelvic rotation

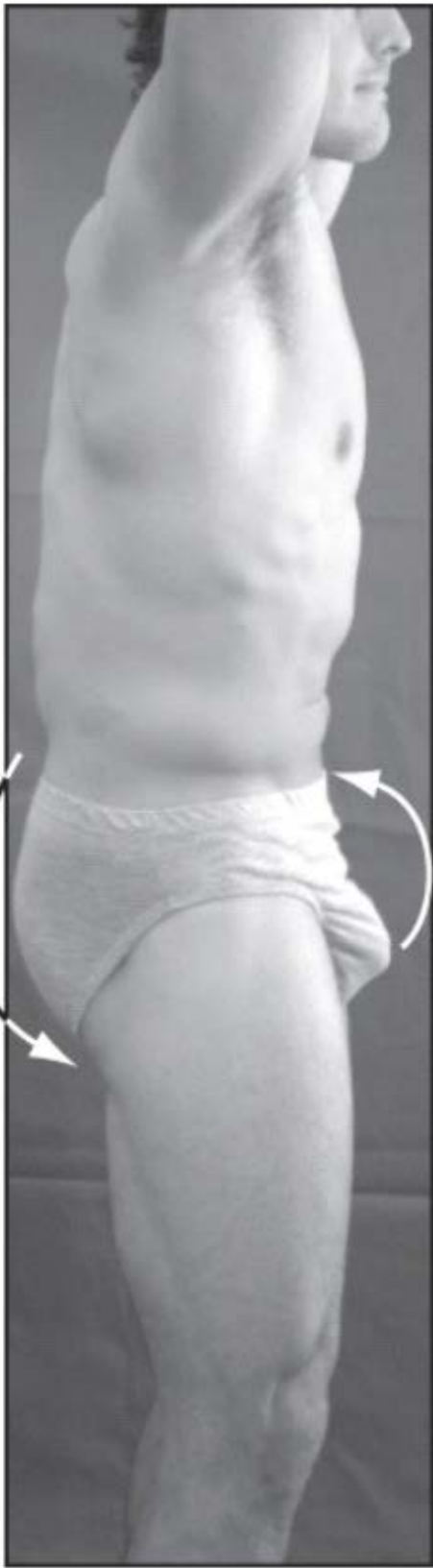
anterior movement of upper pelvis; iliac crest tilts forward in a sagittal plane; anterior tilt

Posterior pelvic rotation

posterior movement of upper pelvis; iliac crest tilts backward in a sagittal plane; posterior tilt



Anterior pelvic
rotation



Posterior pelvic
rotation

Movements

Left lateral pelvic rotation

in frontal plane left pelvis moves inferiorly in relation to right pelvis; either left pelvis rotates downward or right pelvis rotates upward; left lateral tilt

Right lateral pelvic rotation

in frontal plane right pelvis moves inferiorly in relation to left pelvis; either right pelvis rotates downward or left pelvis rotates upward; right lateral tilt



Left lateral pelvic rotation

Movements

Left transverse pelvic rotation

in horizontal plane pelvis rotates to body's left; right iliac crest moves anteriorly in relation to left iliac crest, which moves posteriorly

Right transverse pelvic rotation

in horizontal plane pelvis rotates to body's right; left iliac crest moves anteriorly in relation to right iliac crest, which moves posteriorly





Right transverse pelvic rotation

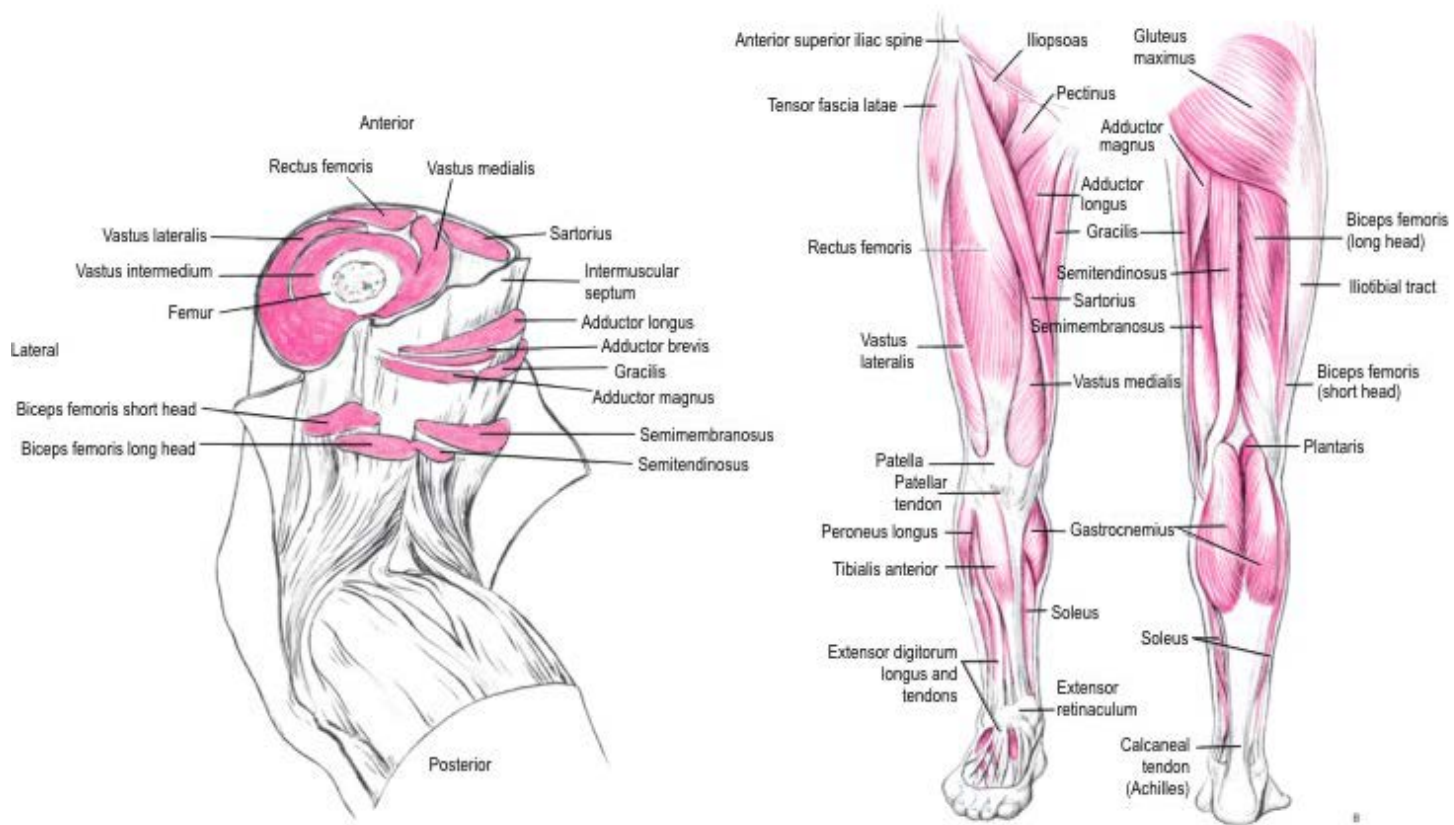
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Muscles

Seven two-joint muscles have one action at hip and another at knee



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Muscles

Muscles involved in hip and pelvic girdle motions depend largely on direction of movement and position of body in relation to earth and gravitational forces

Body part that moves most will be the part least stabilized

Standing on both feet and contracting hip flexors, the trunk and pelvis rotate anteriorly

Lying supine and contracting hip flexors, the thighs move forward into flexion on the stable pelvis

Hip flexor muscles used in moving thighs up toward trunk

Hip extensor muscles used eccentrically when pelvis and trunk move downward slowly on the femur and concentrically when trunk is raised on femur (rising to standing position)

In downward phase of knee-bend exercise, movement at hips and knees is flexion

muscles primarily involved - hip and knee extensors in eccentric contraction

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Muscles

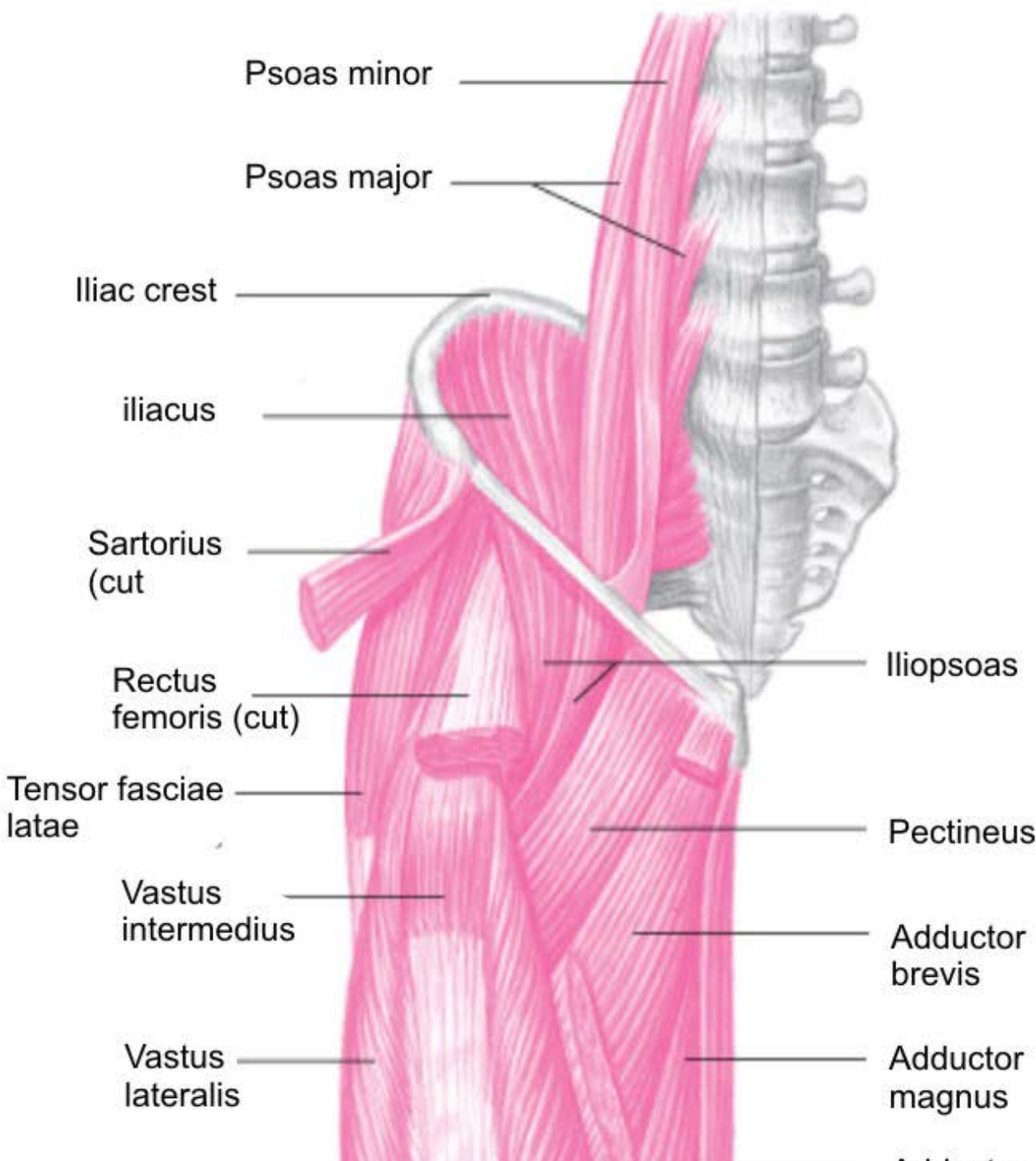
Hip joint and pelvic girdle muscles : Anterior - primarily hip flexion

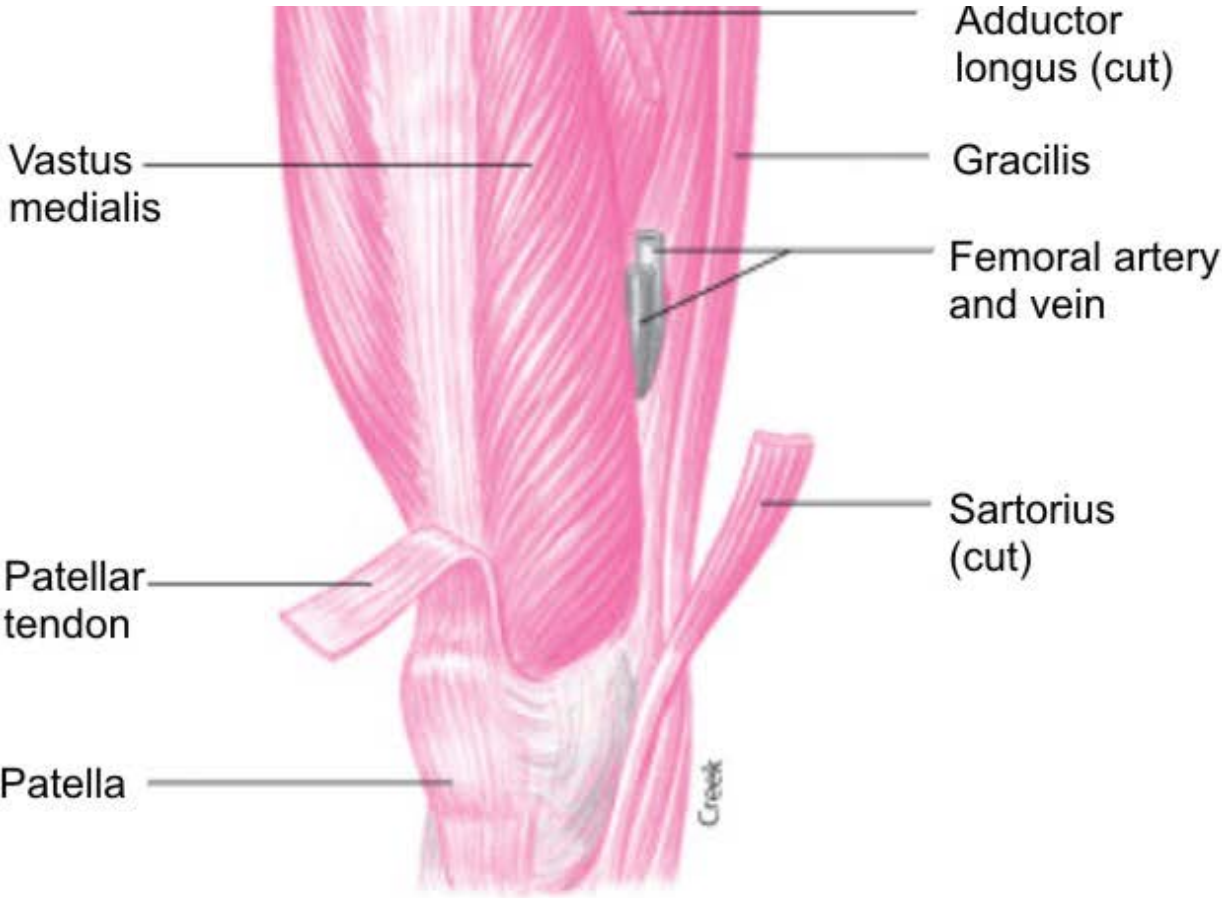
Iliopsoas

Pectineus

Rectus femoris

Sartorius





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Muscles

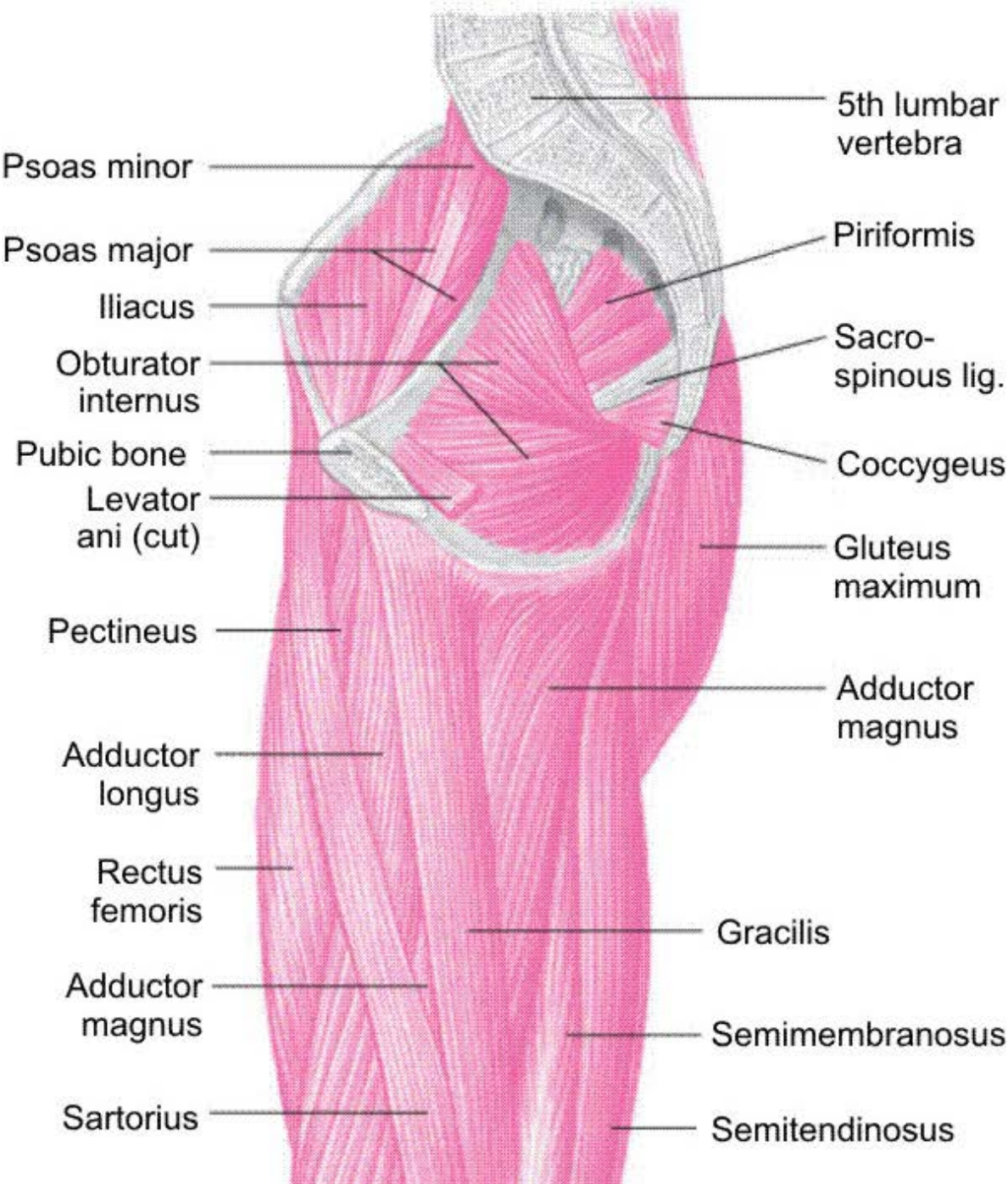
Hip joint and pelvic girdle muscles : Medial - primarily hip adduction

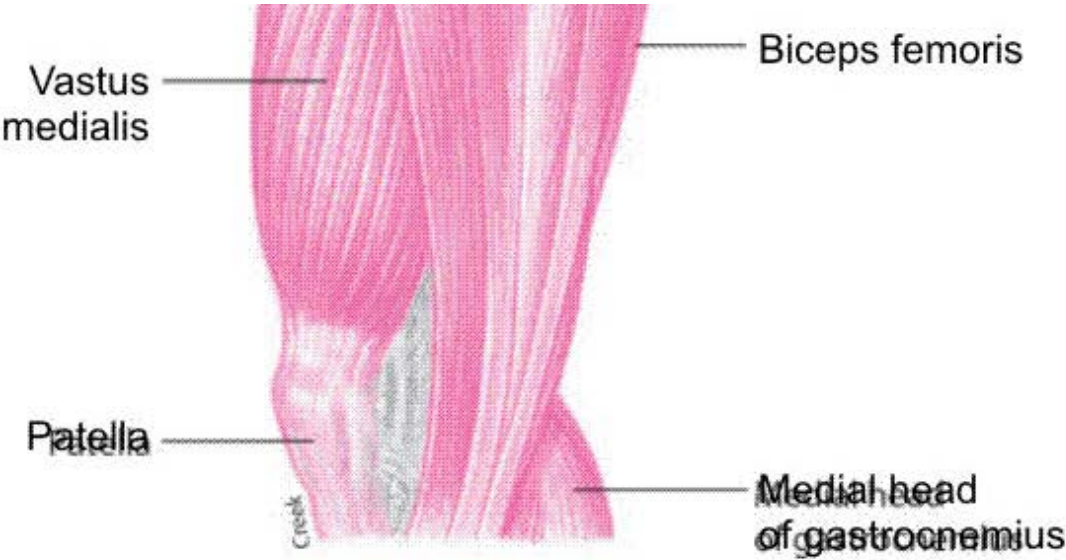
Adductor brevis

Adductor longus

Adductor magnus

Gracilis





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Muscles

Hip joint and pelvic girdle muscles : Posterior - primarily hip extension

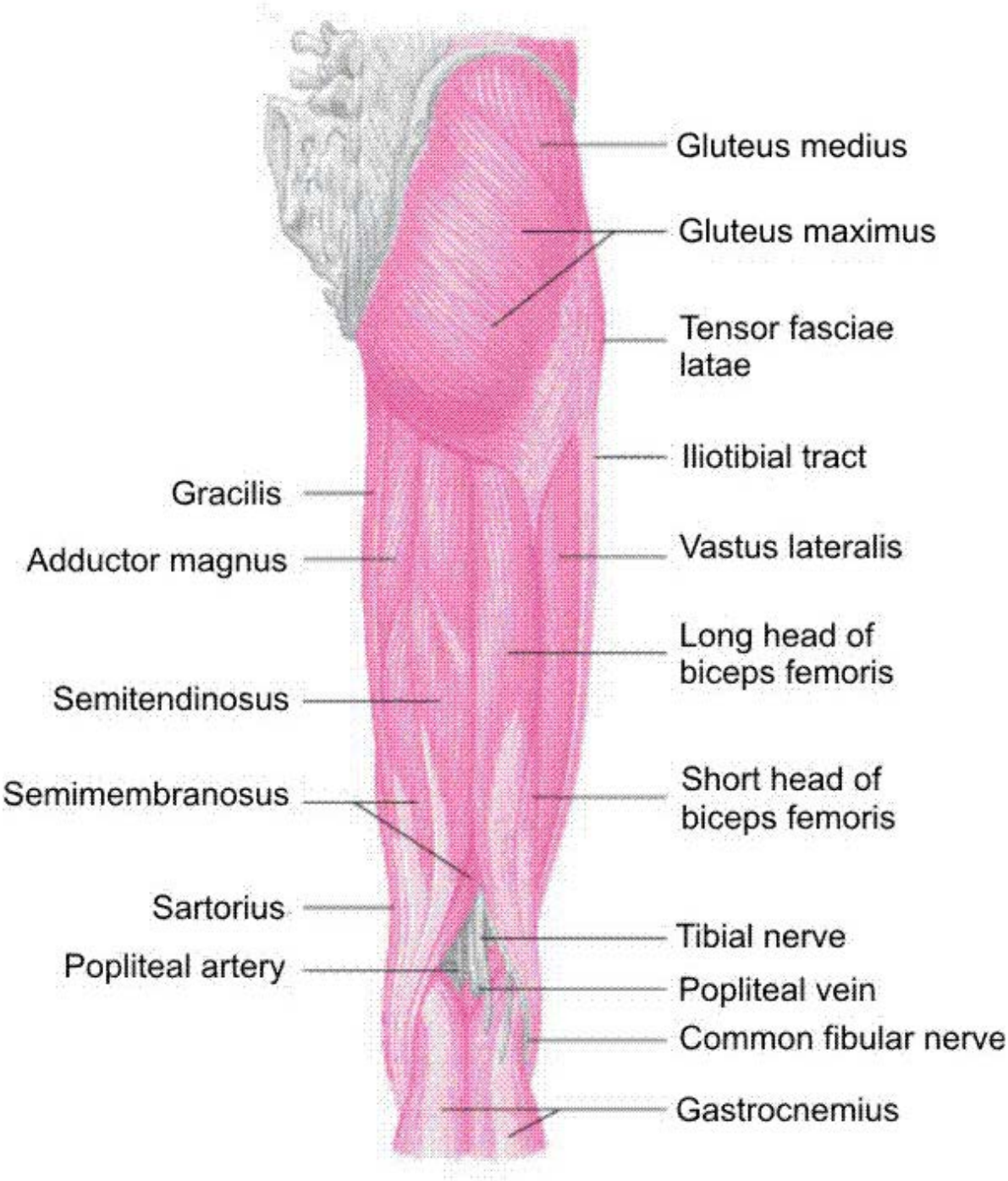
Gluteus maximus

Biceps femoris

Semitendinosus

Semimembranosus

External rotators



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Muscles

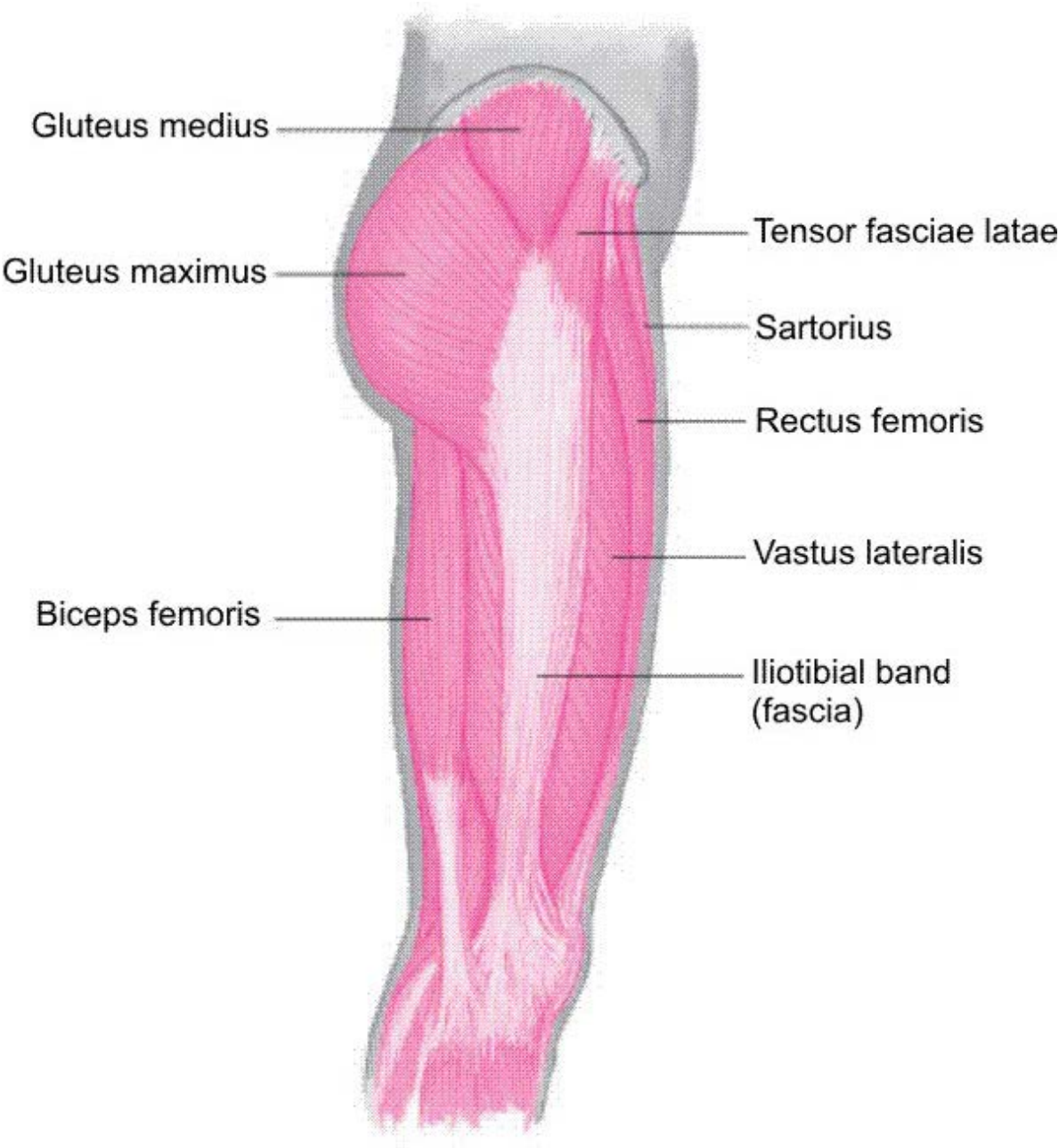
Hip joint and pelvic girdle muscles : Lateral - primarily hip abduction

Gluteus medius

Gluteus minimus

External rotators

Tensor fasciae latae



Muscles

Pelvic muscles acting on hip joint : **Iliac region - iliopsoas muscle flexes hip**

Iliacus

Psoas major

Psoas minor

Pelvic muscles acting on hip joint

Gluteal region - extend and rotate hip

Gluteus maximus

Gluteus medius

Gluteus minimi

Tensor fascia latae

Six deep external rotators - piriformis, obturator externus, obturator internus, gemellus superior, gemellus inferior, & quadratus femoris

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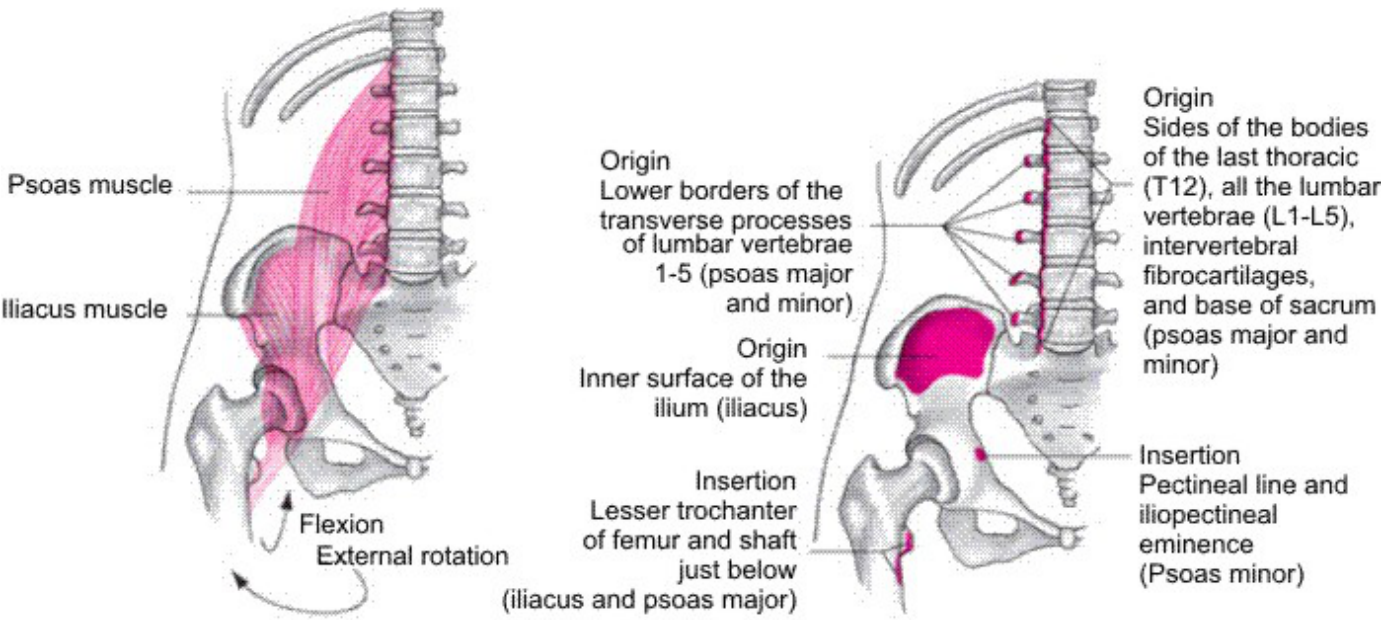
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Iliopsoas Muscle

Flexion of hip

External rotation of femur

Transverse pelvic rotation contralaterally when ipsilateral femur is stabilized



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Sartorius Muscle

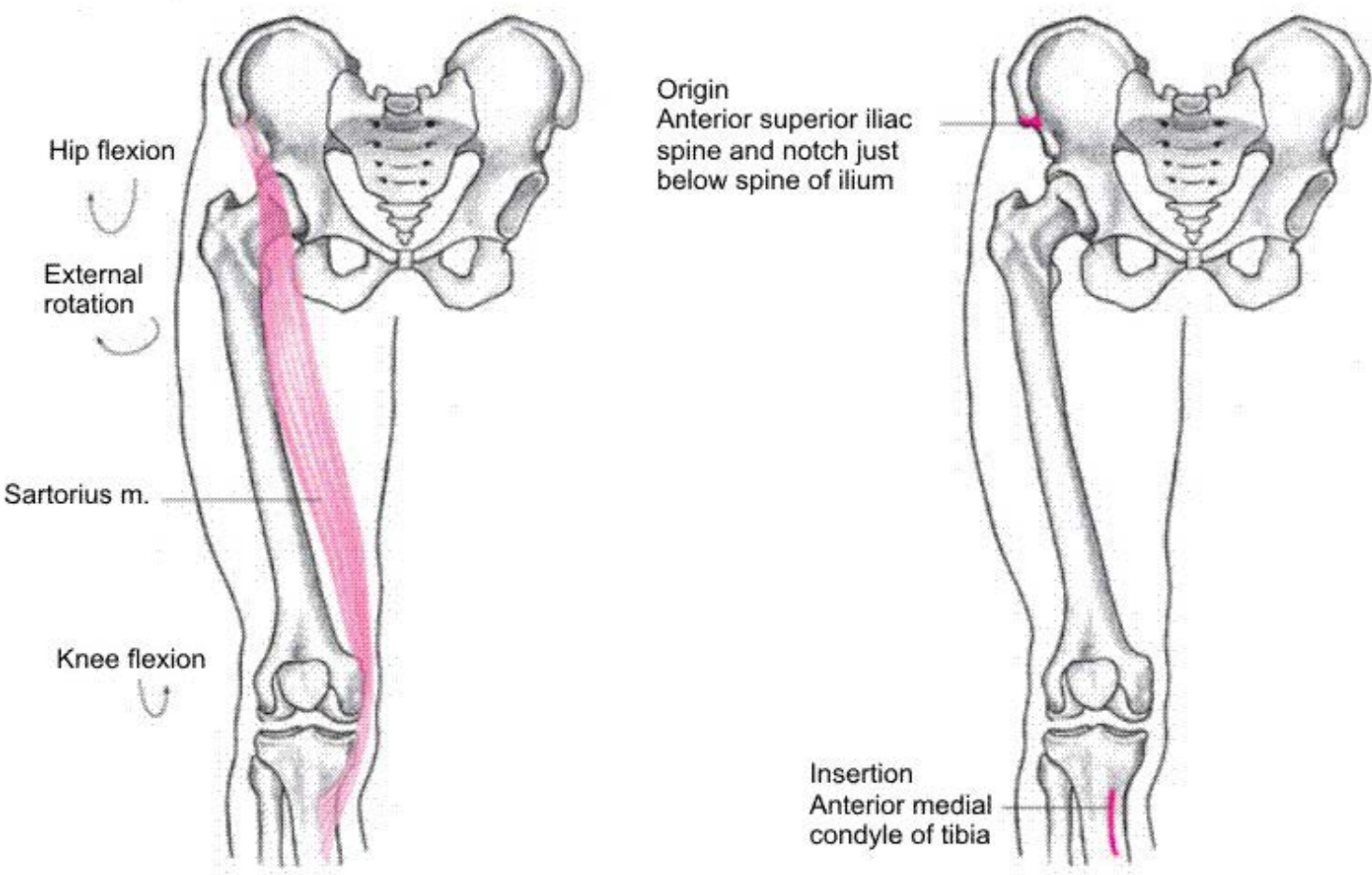
Flexion of hip

Flexion of knee

External rotation of thigh as it flexes hip & knee

Abduction of hip

Anterior pelvic rotation



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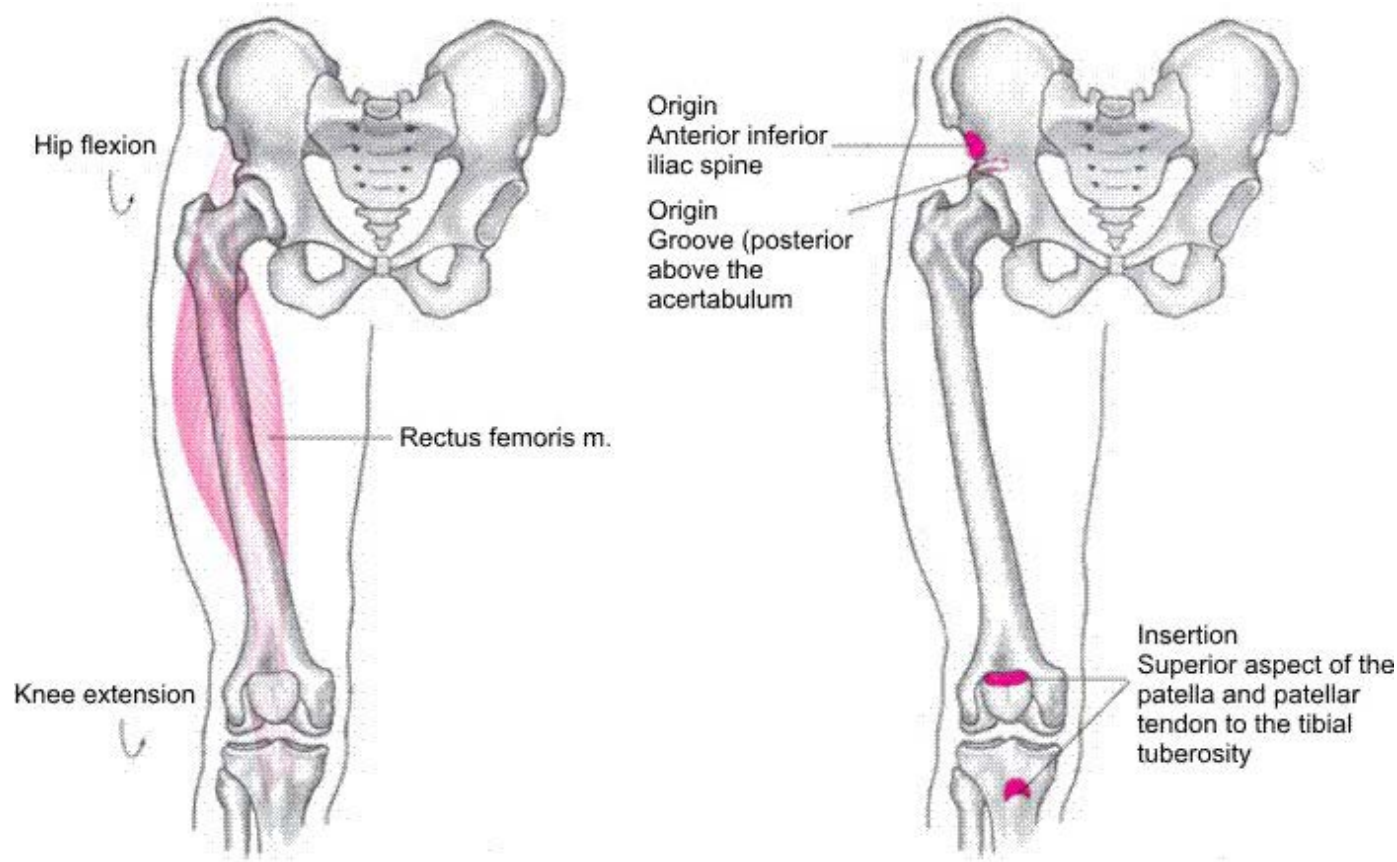
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Rectus Femoris Muscle

Flexion of hip

Extension of knee

Anterior pelvic rotation



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Gluteus Maximus Muscle

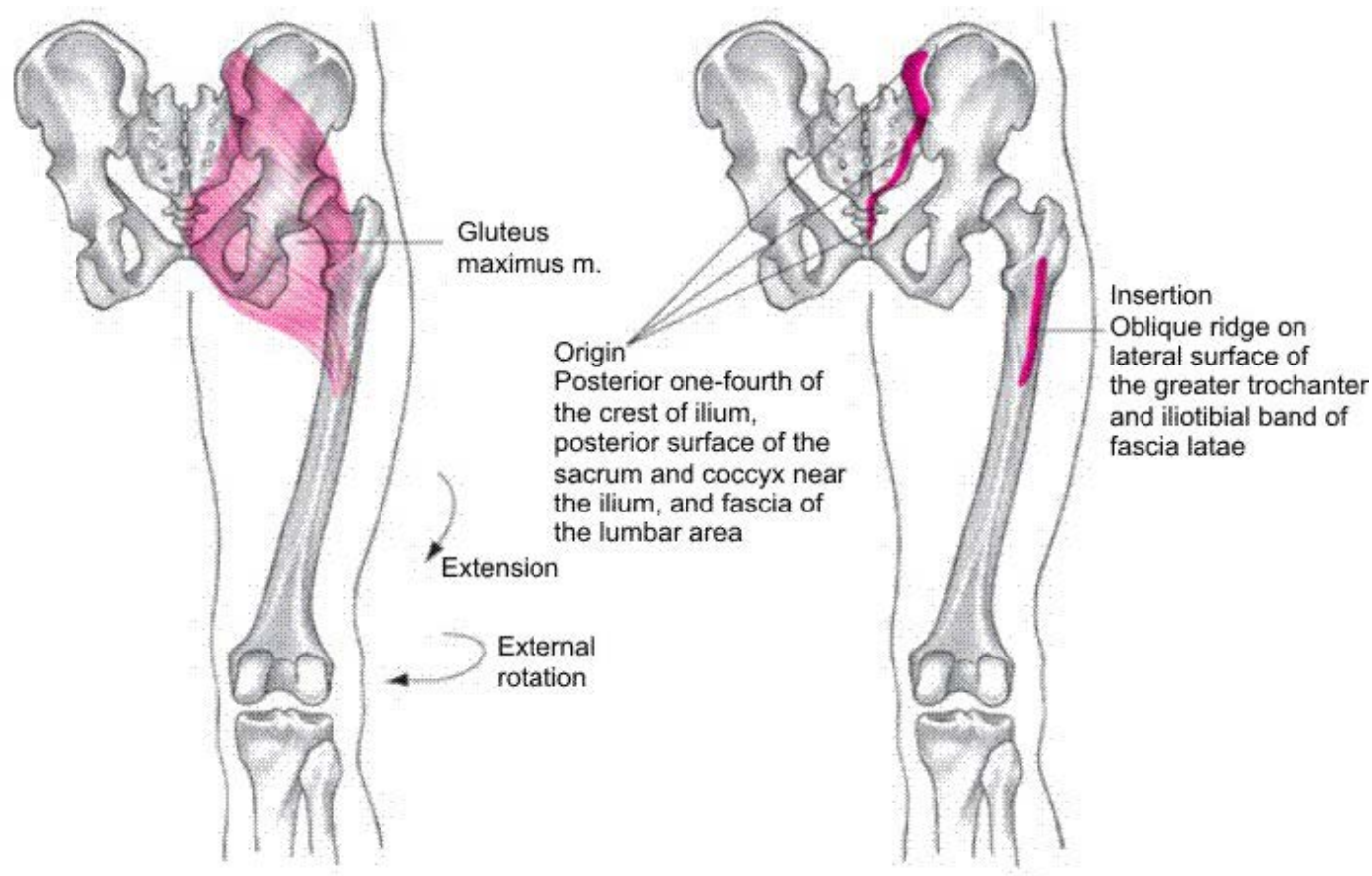
Extension of hip

External rotation of hip

Upper fibers assist in abduction

Lower fibers assist in adduction

Posterior pelvic rotation



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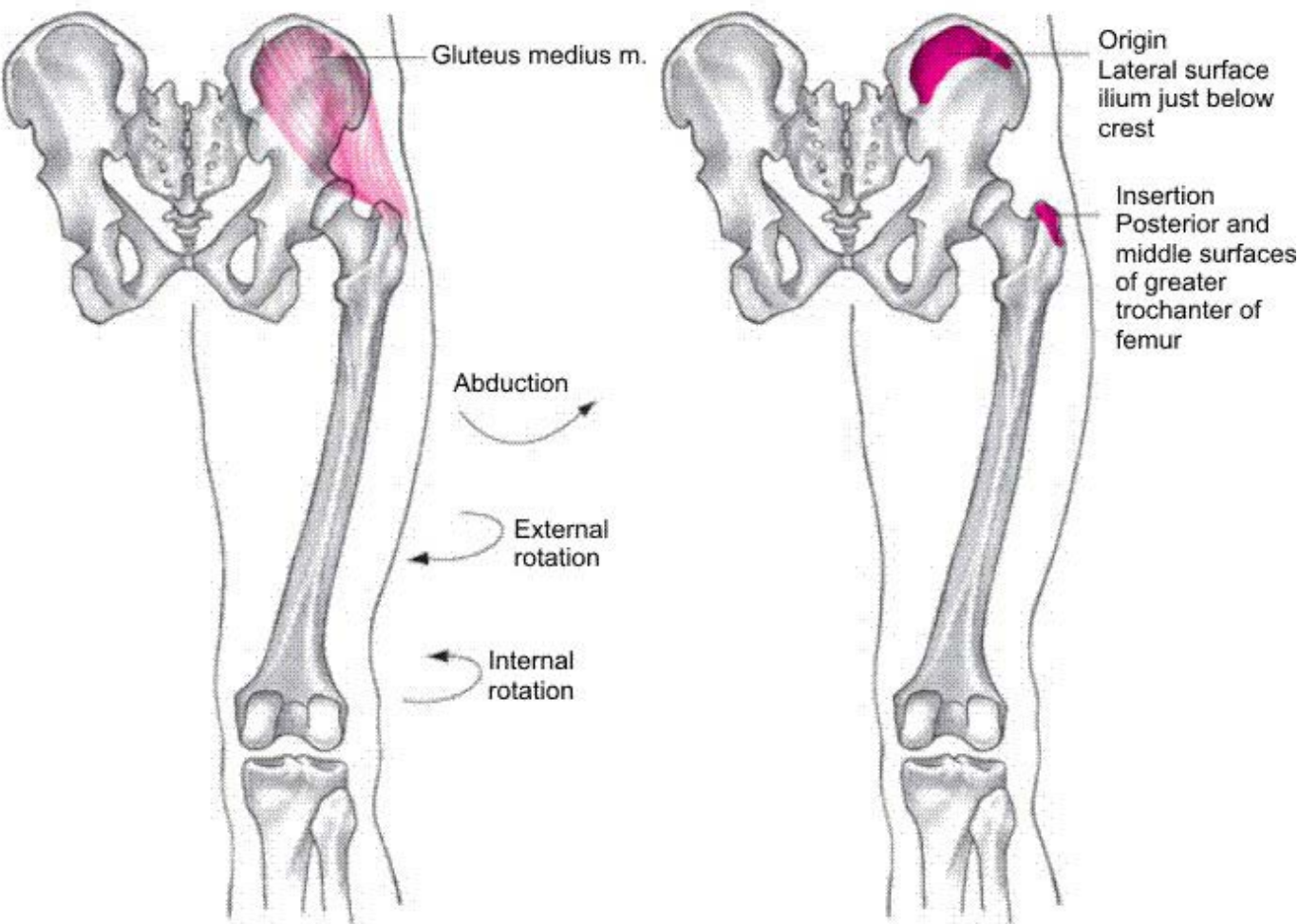
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Gluteus Medius Muscle

Abduction of hip

Internal rotation & flexion (anterior fibers)

External rotation & extension (posterior fibers)



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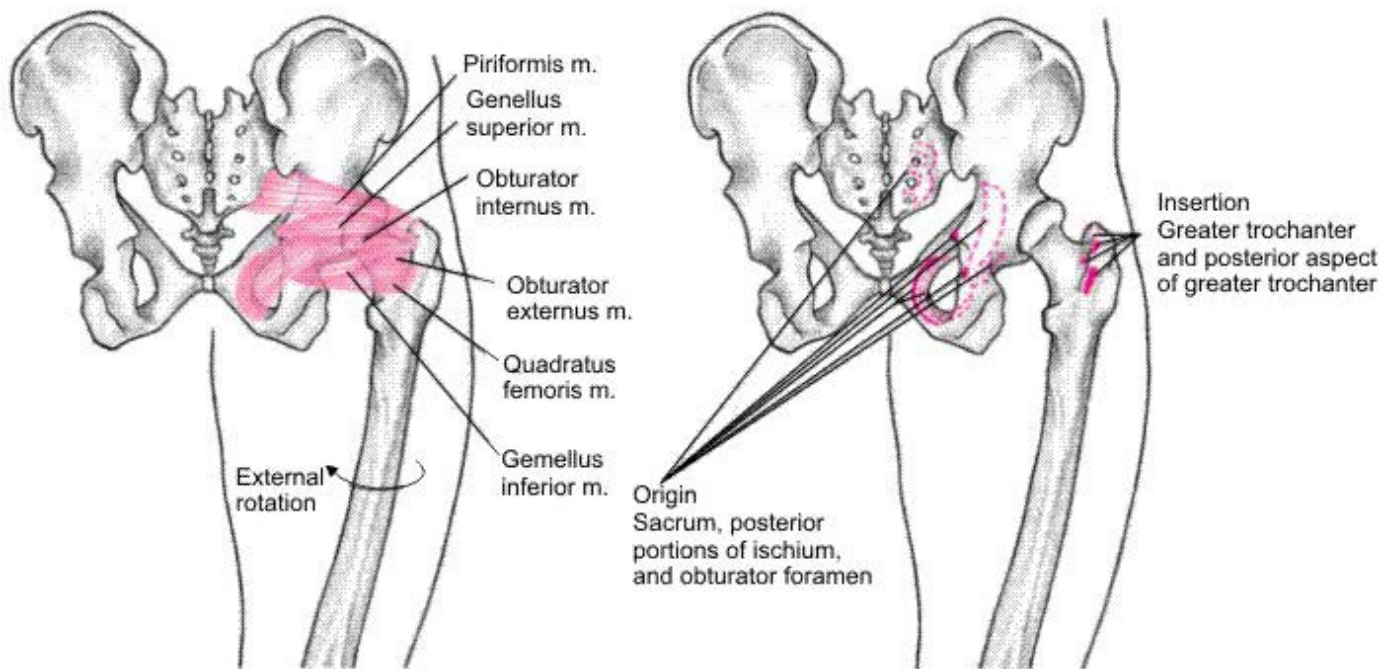
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Six Deep Lateral Rotator Muscles :

Piriformis, Gemellus superior, Gemellus inferior,

Obturator externus, Obturator internus, Quadratus femoris

External Rotation of Hip



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Semitendinosus Muscles

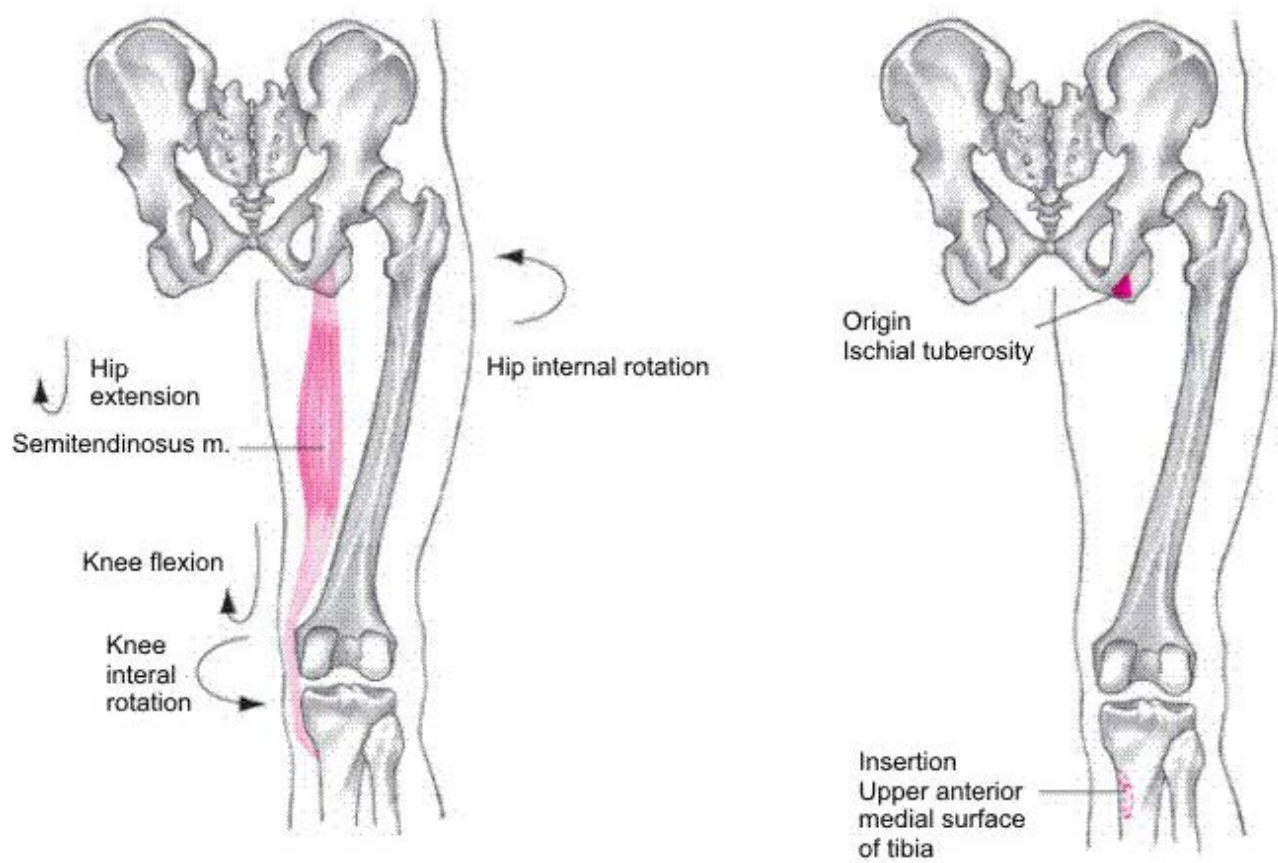
Flexion of knee

Extension of hip

Internal rotation of hip

Internal rotation of flexed knee

Posterior pelvic rotation



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Semimembranosus Muscles

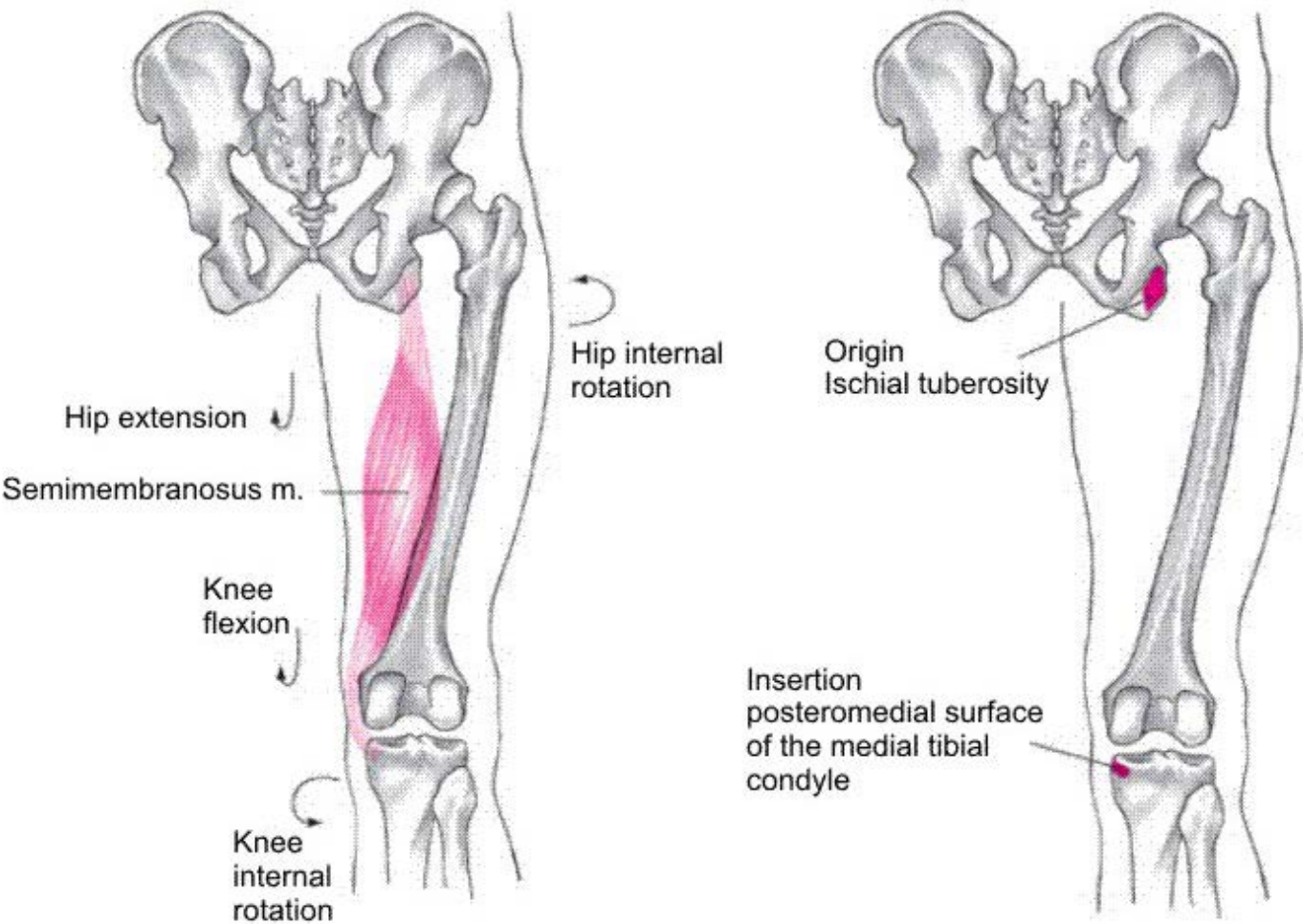
Flexion of knee

Extension of hip

Internal rotation of hip

Internal rotation of flexed knee

Posterior pelvic rotation



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Biceps Femoris Muscles

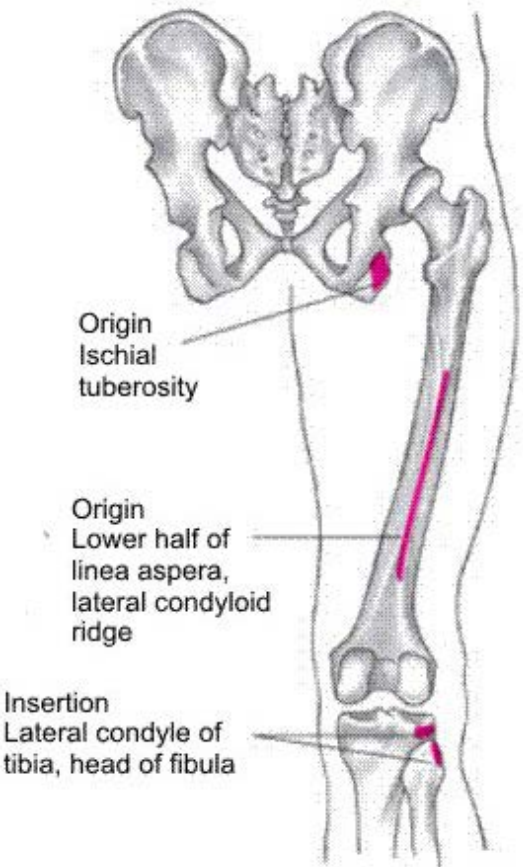
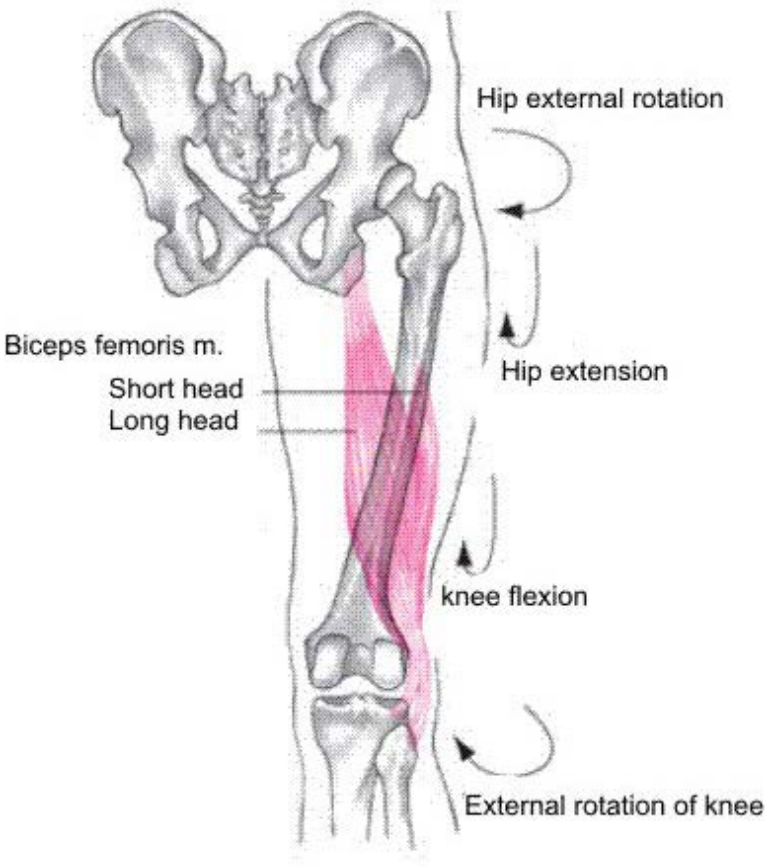
Flexion of knee

Extension of hip

External rotation of hip

External rotation of flexed knee

Posterior pelvic rotation



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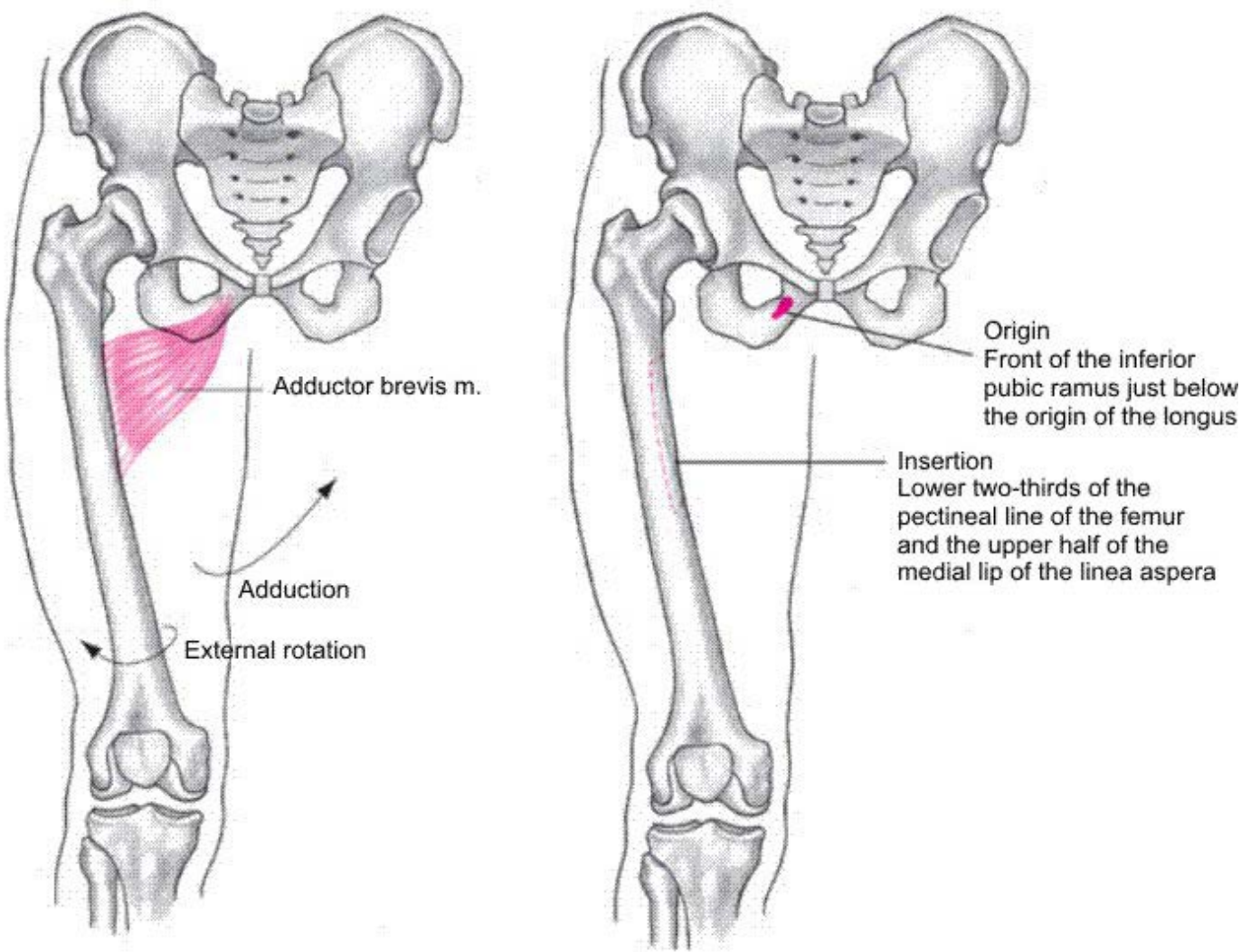
Adductor Brevis Muscles

Adduction of hip

Extension of hip

External rotation as it rotates hip

Assists in flexion of hip



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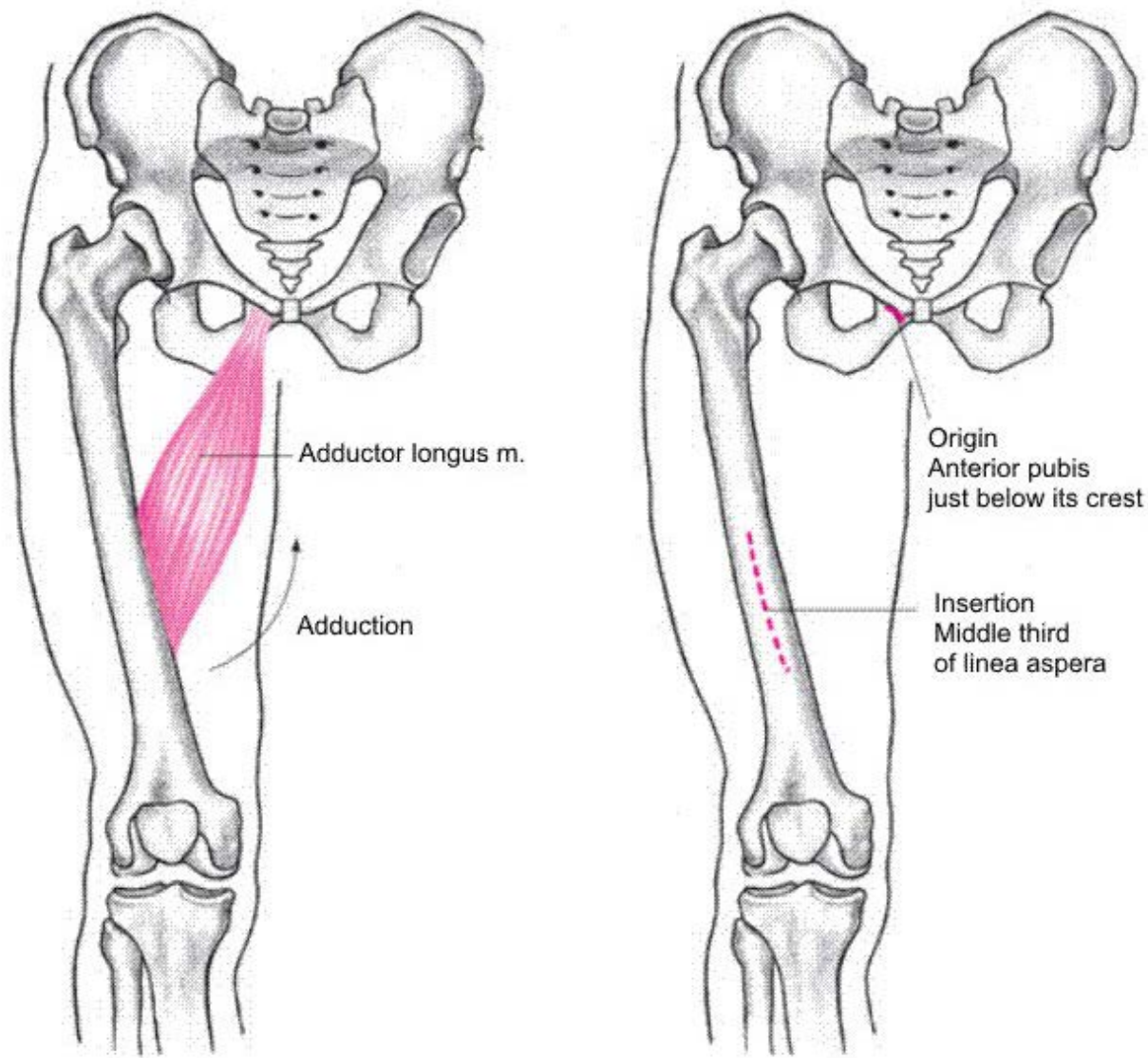
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Adductor Longus Muscles

Adduction of hip

Assists in flexion of hip



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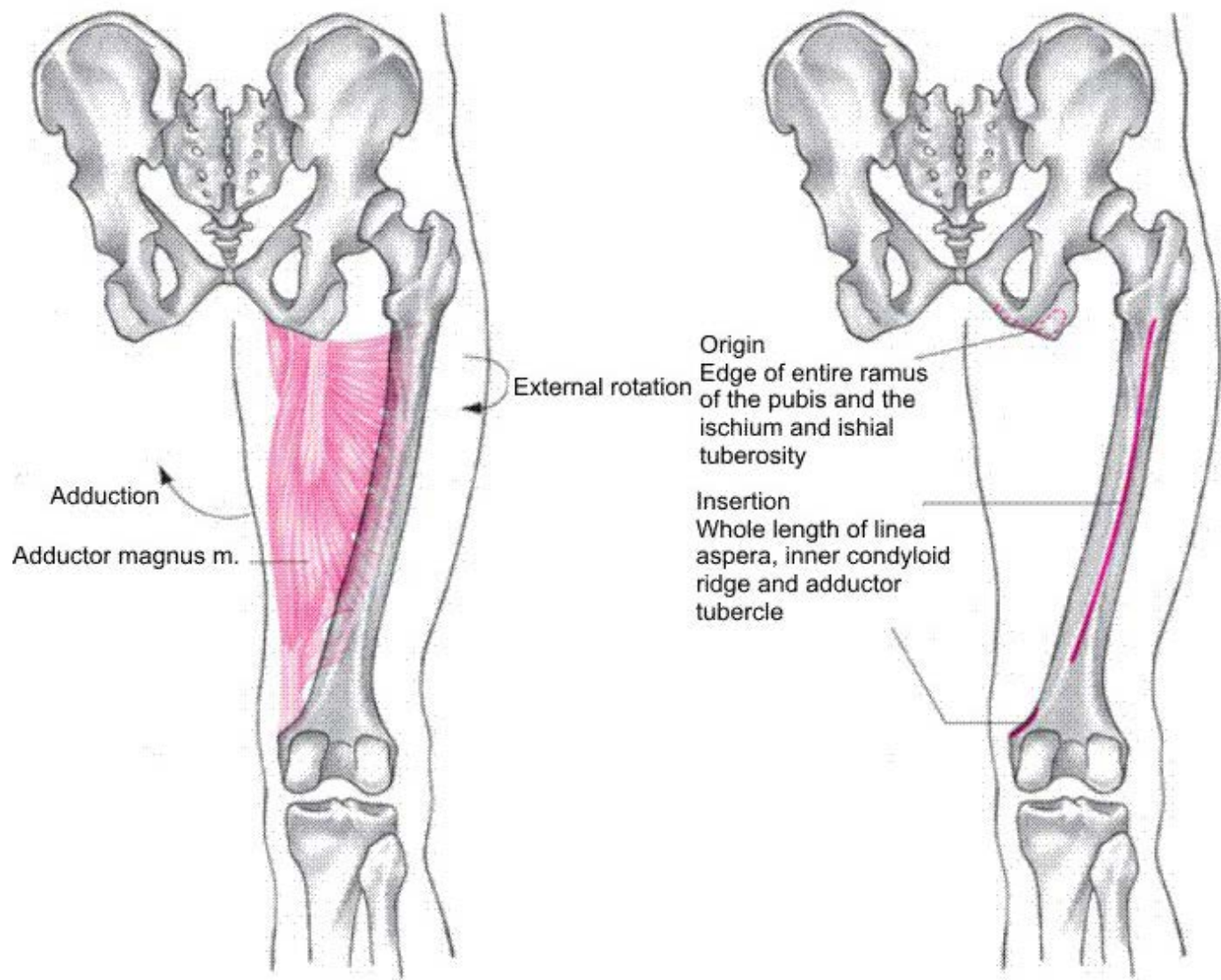
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Adductor Magnus Muscles

Adduction of hip

External rotation as hip adducts

Extension of hip



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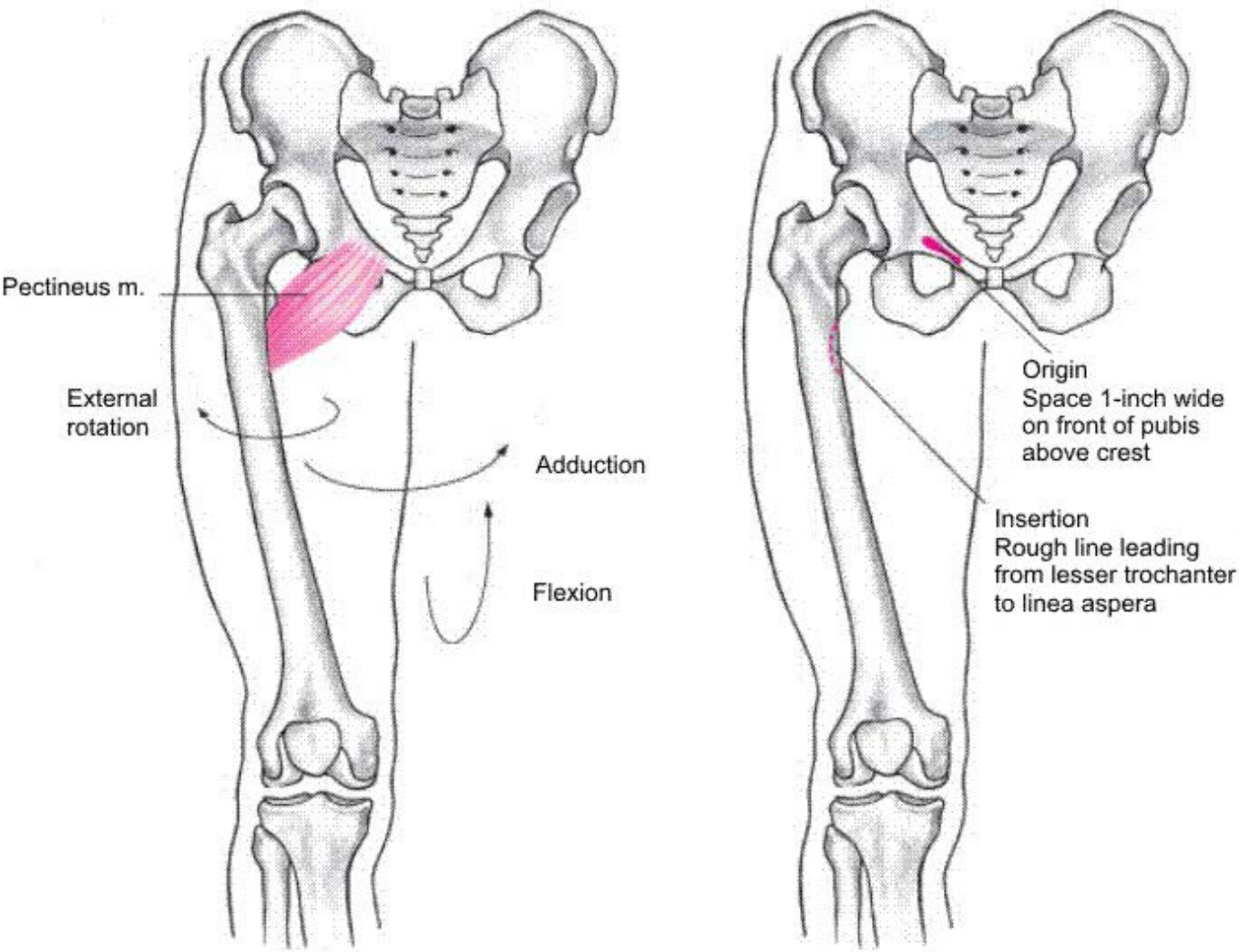
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Pectineus Muscles

Flexion of hip

Adduction of hip

External rotation of hip



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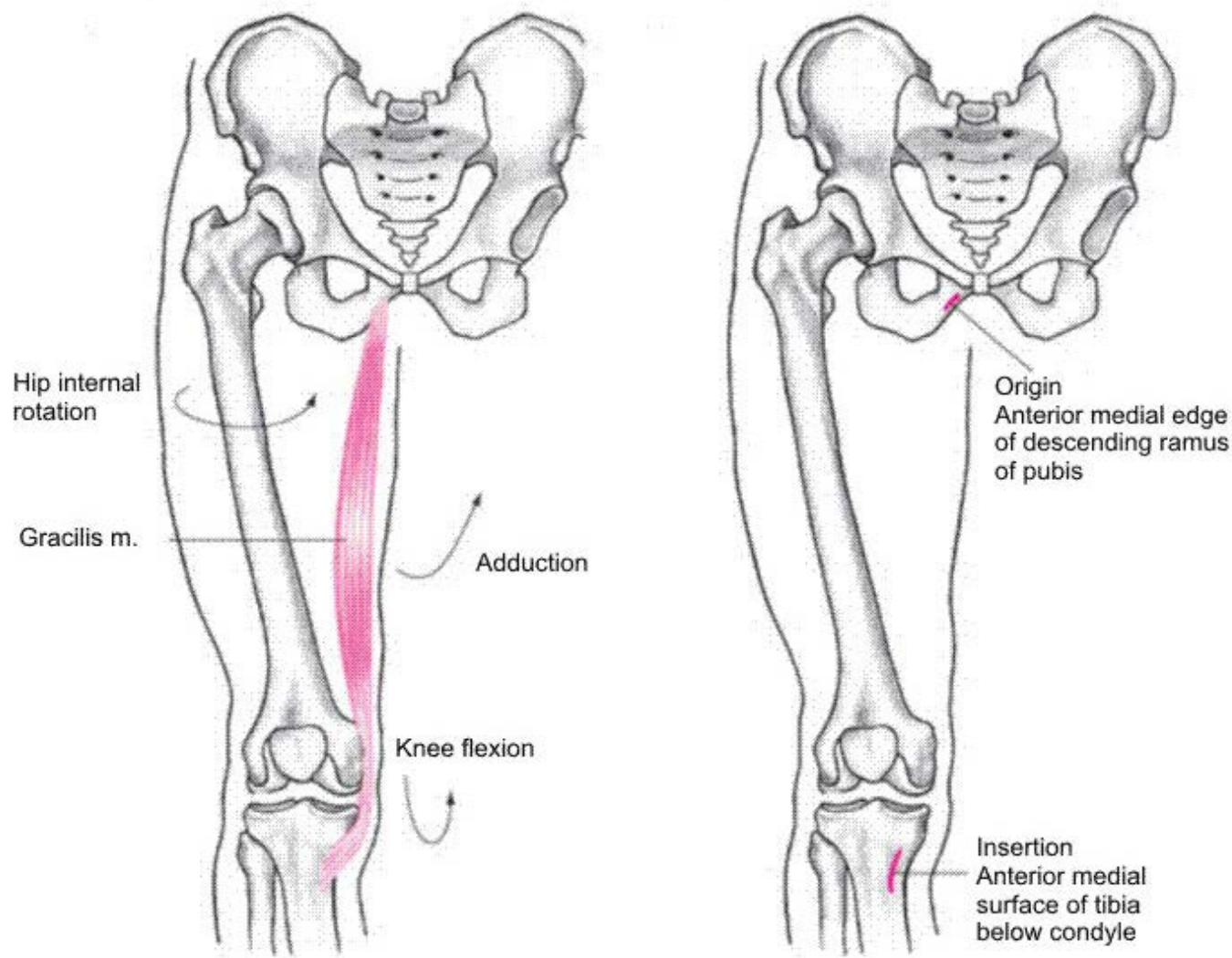
Gracilis Muscles

Adduction of hip

Weak flexion of knee

Internal rotation of hip

Assists with flexion of hip



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Hip Flexion

Agonists

Psoas

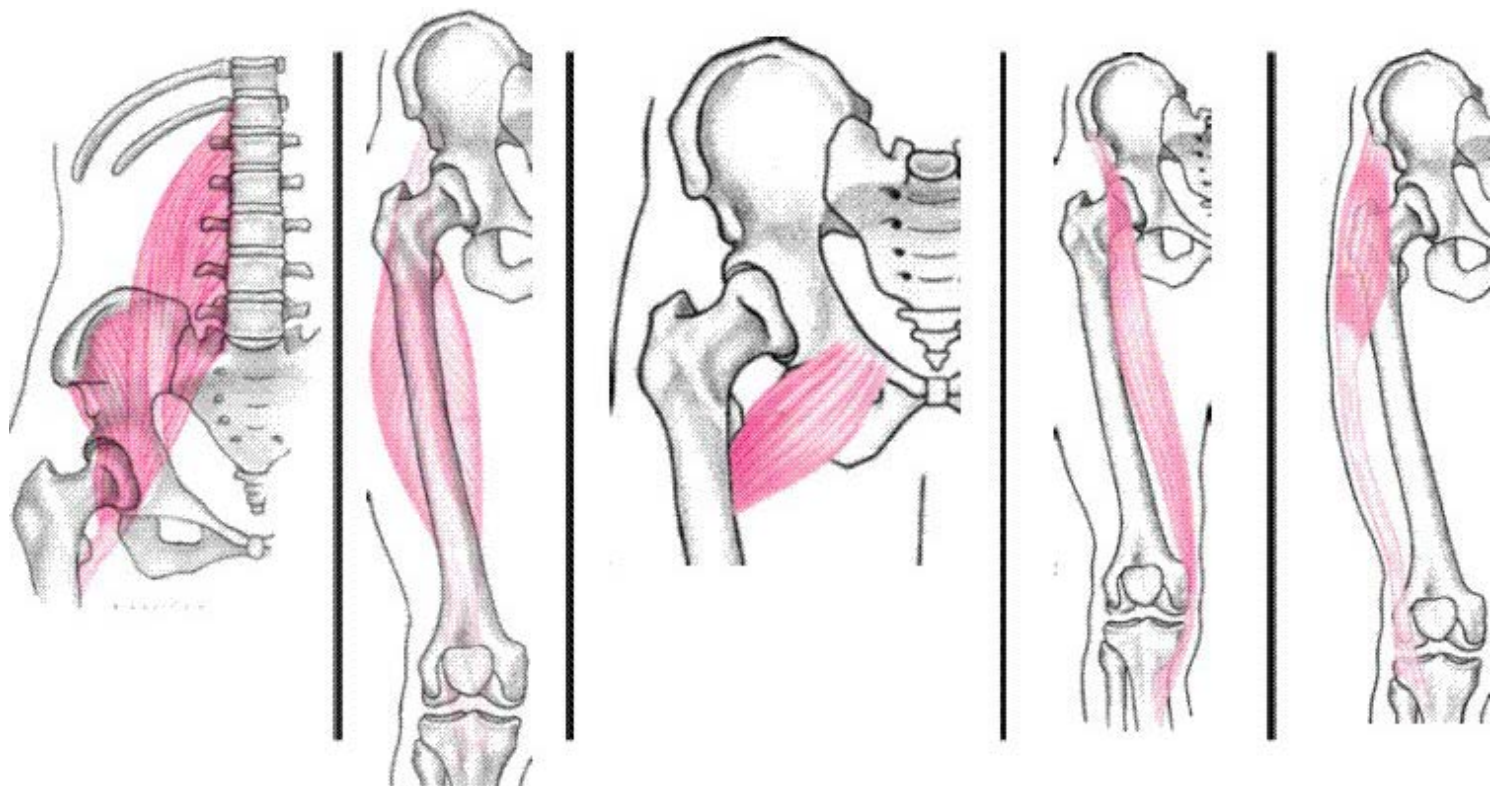
Iliacus (Iliopsoas)

Rectus Femoris

Pectineus

Sartorius

Tensor Fasciae Latae



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Hip Extension

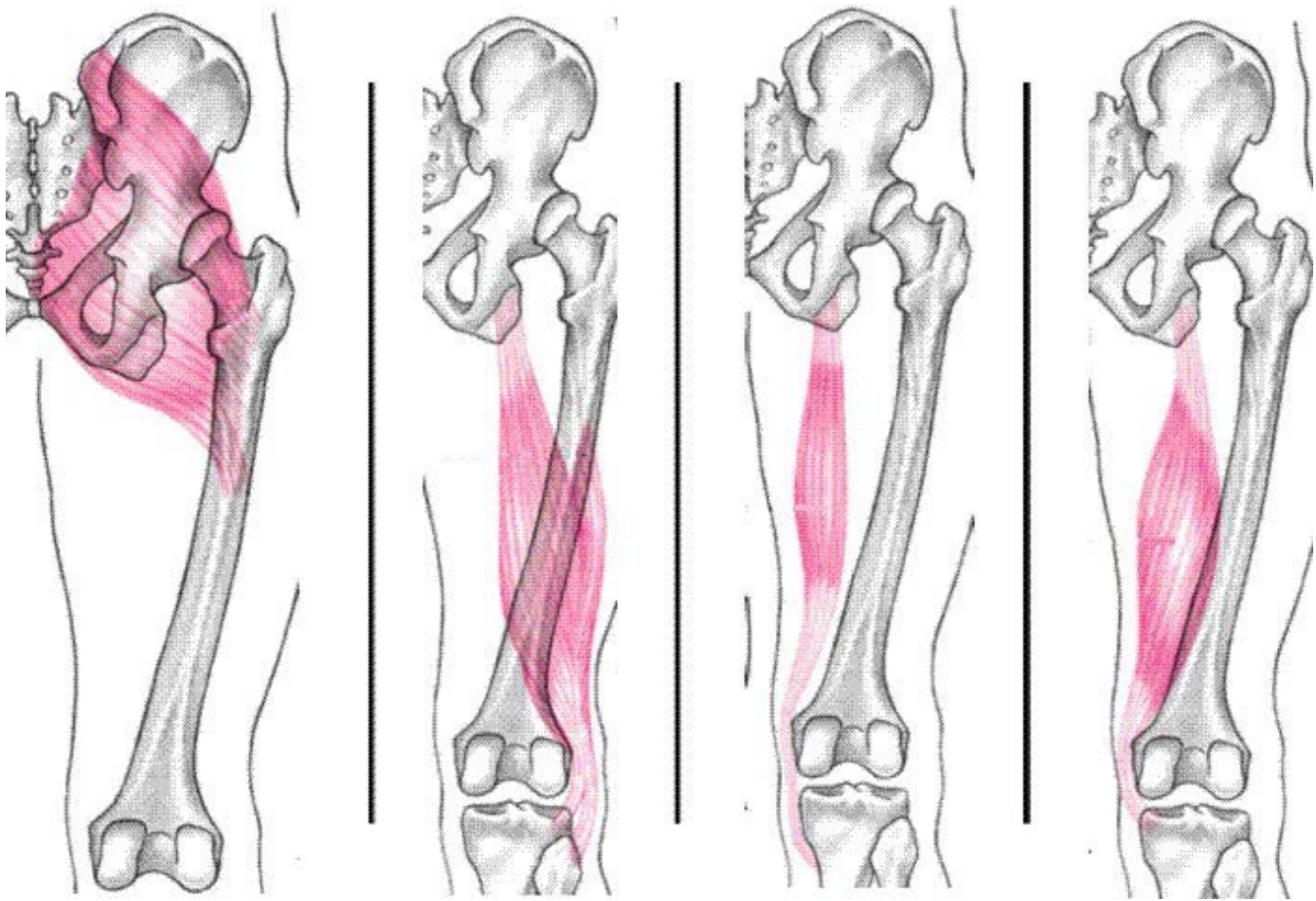
Agonists

Gluteus Maximus

Biceps Femoris (Long Head)

Semitendinosus

Semimembranosus



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Hip Abduction

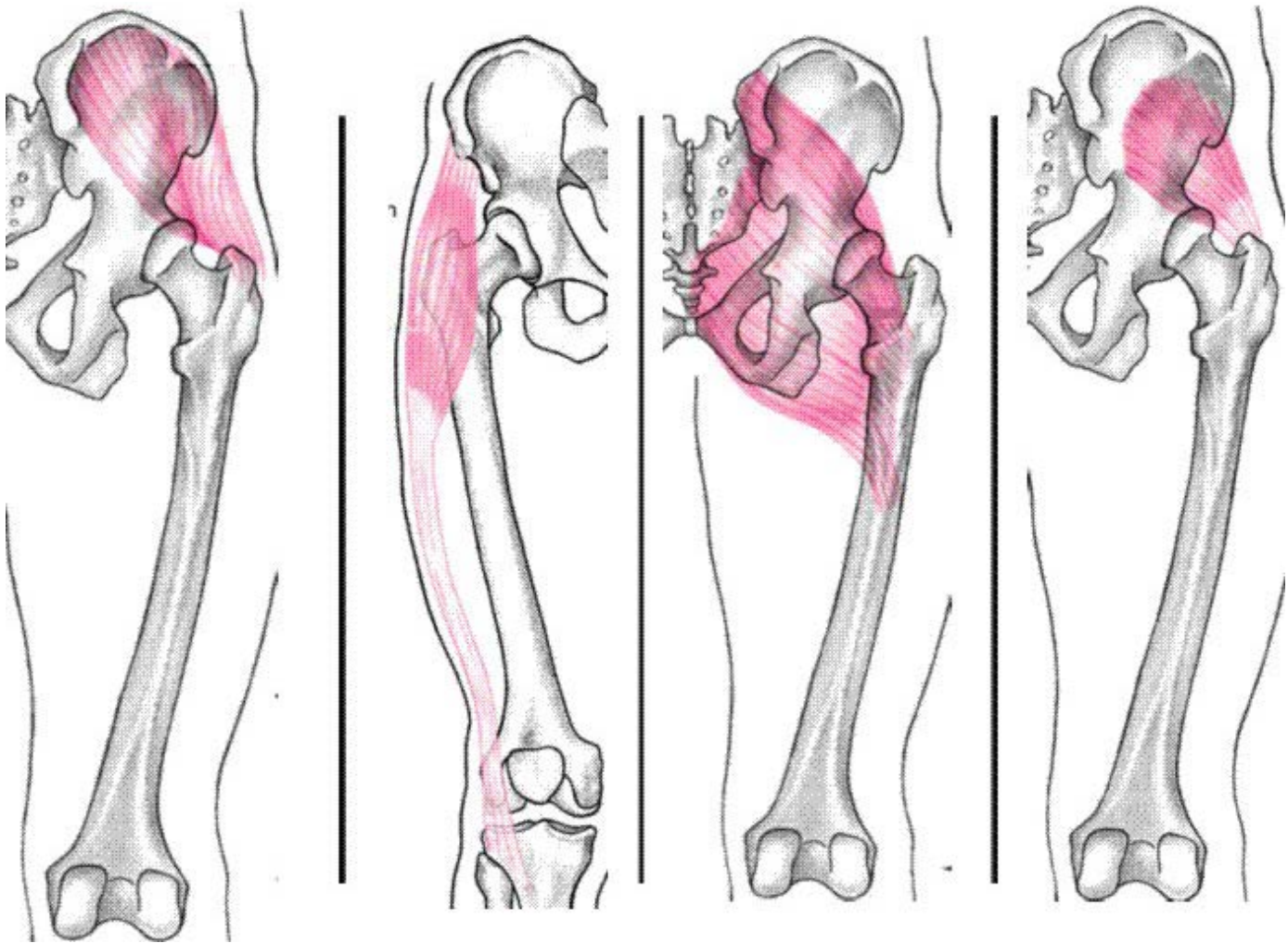
Agonists

Gluteus Medius

Tensor Fasciae Latae

Gluteus Maximus

Gluteus Minimus



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Hip Adduction

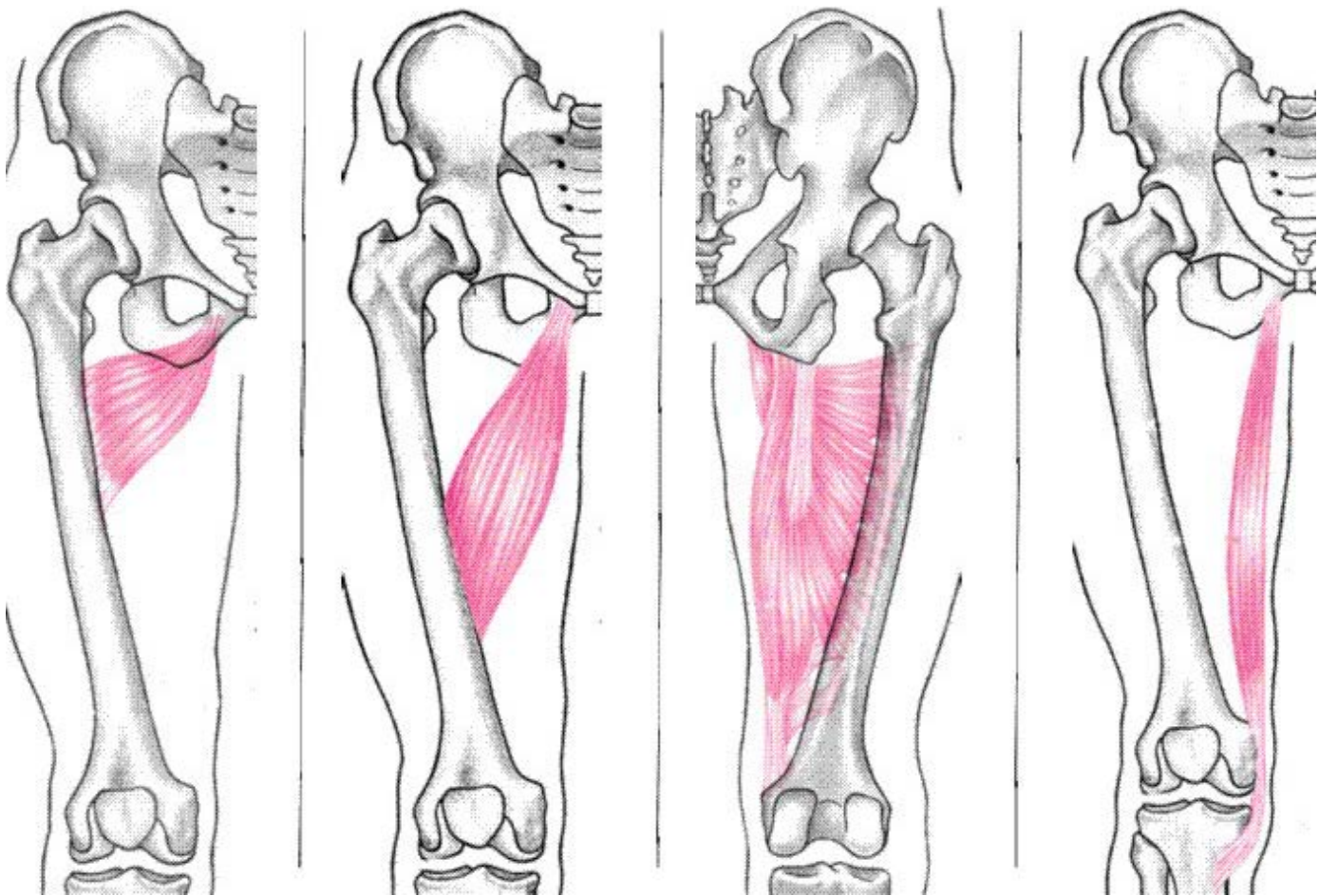
Agonists

Adductor Brevis

Adductor Longus

Adductor Magnus

Gracilis



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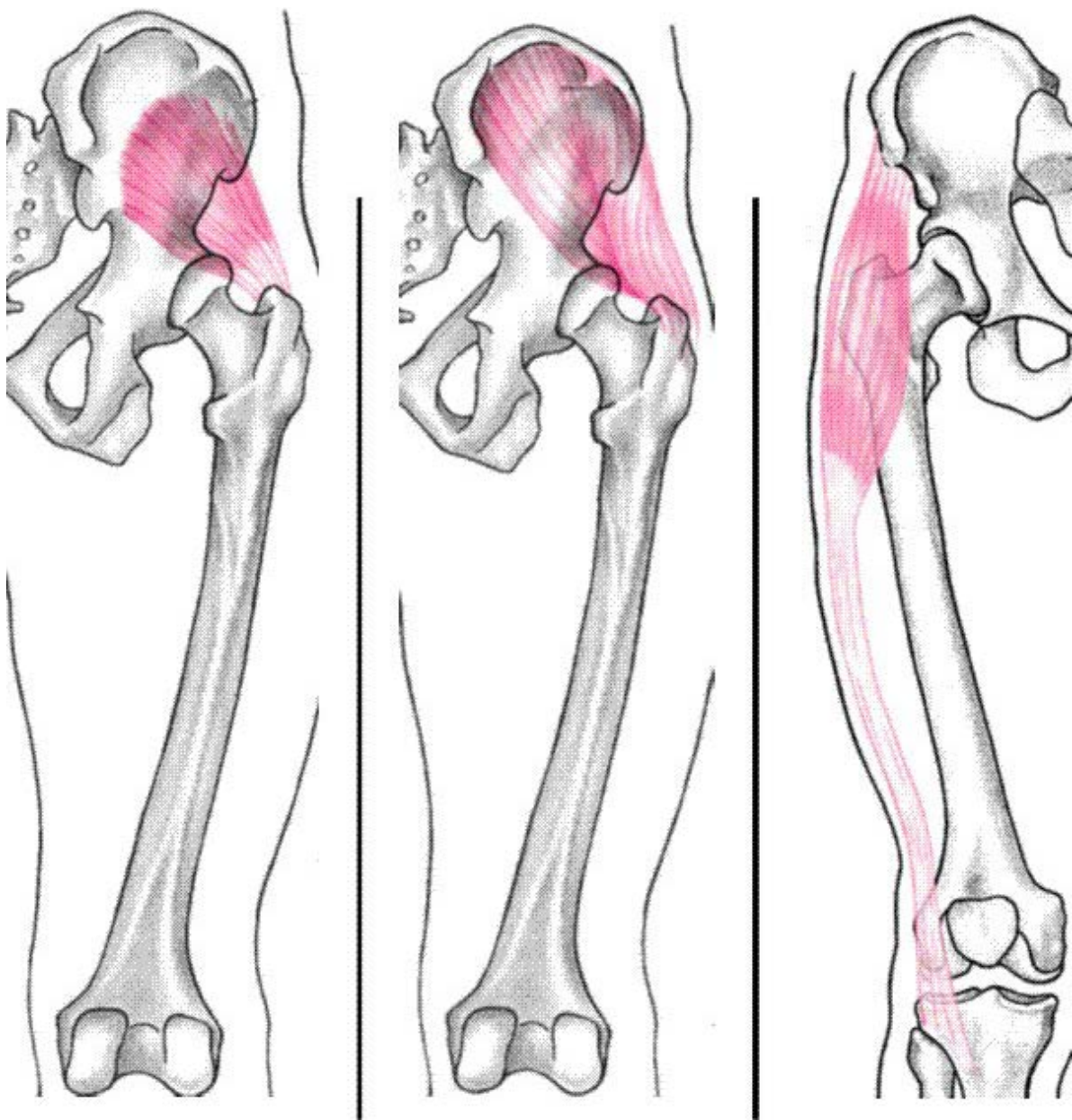
Hip Internal Rotation

Agonists

Gluteus Minimus

Gluteus Medius

Tensor Fasciae Latae



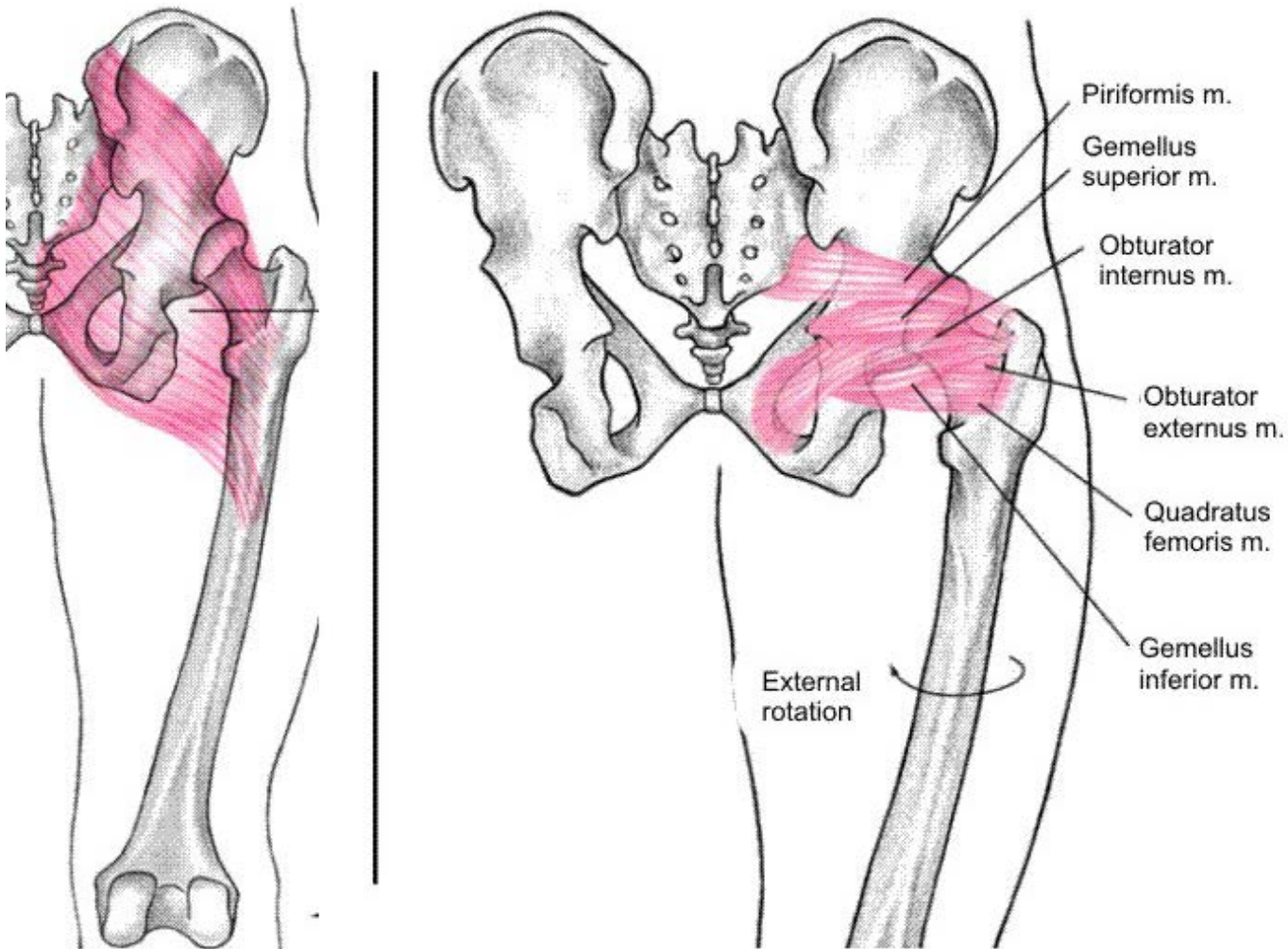
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Hip External Rotation

Agonists

Gluteus Maximus

Six Deep External Rotators



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