

Dissection 3: Gluteal Region, Thigh, and Knee

Objective 1)

Identify the components of the pelvic bones and proximal femur with the associated ligaments and joint capsule and the contribution that each makes to the hip joint. Show the surface projections of these skeletal elements.

A). PELVIC BONES (3 COMPONENTS)

i. Hip bones (2) – three components of each meet at the *acetabulum*, which articulates, w/ the head of the femur and has a nonarticular floor called the *acetabular fossa* and an inferior *acetabular notch* giving it a horseshoe shape

1. **Ilium** – upper flattened portion

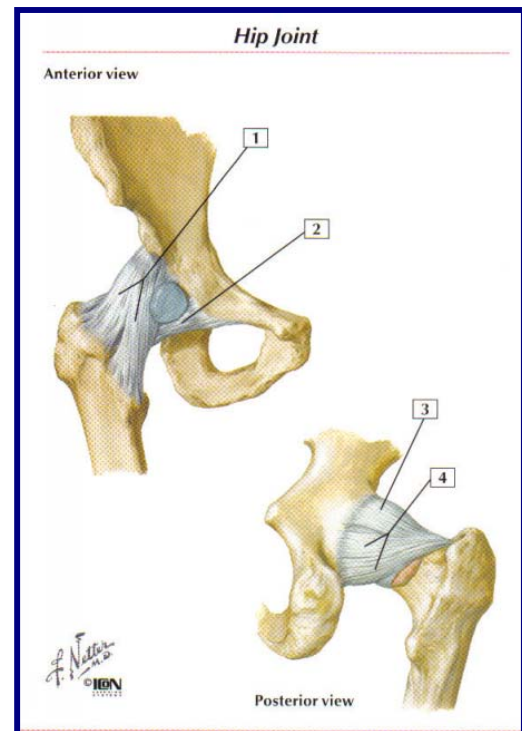
- a. *Iliac crest* – bounded by *anterior superior iliac spine* and *posterior superior iliac spine*
- b. *Tubercle of crest*
- c. *Anterior inferior iliac spine* and *posterior inferior iliac spine*
- d. *Iliac fossa*
- e. *Greater sciatic notch*
- f. *Iliopectineal line*

2. **Ischium** – L shaped possessing an upper thicker *body* and a lower thinner *ramus*

- a. *Ischial spine* – projects from posterior border between *greater* and *lesser sciatic notches*
- b. *Ischial tuberosity*
- c. Presence of the *sacrospinous* and *sacrotuberous* ligaments convert the *greater* and *lesser sciatic notches* into *greater* and *lesser sciatic foramina*

3. **Pubis** – divided into a *body*, a *superior ramus* and an *inferior ramus*

- a. *Symphysis pubis* is site of articulation of both pubic bones in the anterior midline
- b. Inferior ramus joins the ischial ramus below the *obturator foramen* which is filled in by the *obturator membrane*
- c. *Pubic crest*



d. *Pubic tubercle*

ii. Sacrum

iii. Coccyx

B). PROXIMAL FEMUR

- i. **Head** is the hemispherical portion which helps form the hip joint
- ii. In the center of the head is a small depression called the *fovea capitis*
- iii. **Neck** connects the head to the shaft
- iv. **Greater and lesser trochanters** connected by the *intertrochanteric line* anteriorly and the *intertrochanteric crest* containing the *quadratus tubercle* posteriorly
- v. **Shaft** is smooth and rounded on the anterior surface but has a posterior ridge called the *linea aspera*

C). LIGAMENTS AND JOINT CAPSULE OF HIP JOINT (BALL AND SOCKET SYNOVIAL JT)

- i. Sacrospinous (back of sacrum to ischial tuberosity) and sacrospinous (back of sacrum to ischial spine) ligaments in the gluteal region stabilize the sacrum and prevent its rotation at the sacroiliac joint
- ii. **Capsule** is attached to the acetabular labrum medially and laterally to the intertrochanteric line of the femur
- iii. Iliofemoral ligament attached to ant inf iliac spine and intertrochanteric line of femur; inverted Y shape; strong ligament prevents overextension during standing
- iv. Pubofemoral ligament attached to sup ramus of pubis and lower part of intertrochanteric line; triangular shape; limits extension and abduction
- v. Ischiofemoral ligament attached to body of ischium near acetabular margin and greater trochanter; spiral shaped; limits extension
- vi. Acetabular labrum is a fibrocartilaginous rim deepening the acetabulum; called the transverse acetabular ligament when it bridges across the acetabular notch; ligament converts the notch into a tunnel through which blood vessels and nerves enter the joint
- vii. Ligament of the head of the femur attaches to the fovea capitis and to the transverse ligament and margins of the acetabular notch; flat and triangular in shape; lies w/i joint and is ensheathed by synovial membrane which covers portion of the neck of the femur w/i the joint capsule

D). SURFACE PROJECTIONS

- i. Iliac crest
- ii. Anterior superior iliac spine
- iii. Ischial tuberosity
- iv. Greater trochanter of the femur

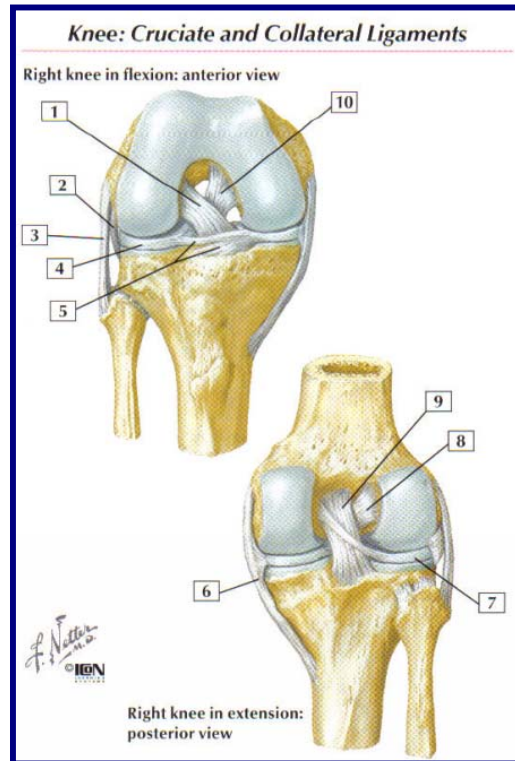
Objective 2)

Identify the osseous components of the distal femur, proximal tibia and fibula and the contribution that each makes to the knee joint. Indicate the functional role for each of the ligaments. Identify the functional consequences of damage or destruction to the ligaments or intra-articular structures of the knee joint.

A). DISTAL FEMUR

- i. Margins of the linea aspera diverge into medial supracondylar ridge to the adductor tubercle on the
- ii. Medial epicondyle
- iii. Lateral margin becomes continuous with the lateral supracondylar ridge
- iv. Popliteal surface
- v. Intercondylar notch

- vi. Medial condyle
 - vii. Lateral epicondyle
 - viii. Lateral condyle
- B). PATELLA
- C). PROXIMAL TIBIA
- i. Medial condyle (or medial tibial plateau)
 - ii. Lateral condyle (or lateral tibial plateau)
 - iii. Circular articular facet for the head of the fibula
 - iv. Anterior and posterior intercondyler areas
 - v. Intercondyler eminence
 - vi. Tuberosity
- D). PROXIMAL FIBULA
- i. Head
 - 1. Apex of head of fibula
 - 2. Articular surface for articulation with the tibia
- E). **Knee Joint** – hinge type of synovial joint
- i. **Innervation:** obturator, femoral, tibial, common fibular nerves
 - ii. **3 articulations:**
 - 1. Lateral and Medial articulations between femoral and tibial condyles
 - 2. Patella and femur
 - 3. Quadriceps femoris – most important muscle in stabilizing knee jt.
 - iii. **Articular capsule:** fibrous capsule attaching from femur to tibia except where the patella and patellar ligament serve as the capsule anteriorly; lined by synovial membrane that attaches to the periphery of the patella and edges of menisci.
 - iv. **Ligaments- 5; strengthen the fibrous capsule**
 - 1. Patellar ligament-from apex of patella to tibial tuberosity; important to extension of the knee
 - 2. Fibular collateral ligament-from lateral epicondyle of femur to lateral surface of head of fibula; tendon of popliteus muscle passes deep to fib collateral lig and separates it from lateral meniscus
 - 3. Tibial collateral ligament- from medial epicondyle of femur to superior medial surface of tibia; attached to medial meniscus
 - a. Tibial and fibular collateral ligaments prevent disruption to the sides of the knee jt. Taut when leg extended and prevent rotation of the tibia laterally or the femur medially. Slack during leg flexion and allow some rotation of tibia on femur.
 - 4. Oblique popliteal ligament; expansion of tendon of semimembranosus muscle and strengthens capsule posteriorly; from medial tibial condyle, passing superolaterally, to posterior part of capsule
 - 5. Arcuate popliteal ligament- from posterior aspect of fibular head, passing superomedially over tendon of popliteus, to the posterior surface of knee jt
 - 6. Intra-articular ligaments
 - a. **Cruciate ligaments**- join femur and tibia; form an X within the articular capsule but are outside of synovial jt cavity; stability to the knee jt



- i. **Anterior cruciate ligament:** weaker of the two; from anterior intercondyler area of tibia, passing superolaterally to medial side of lateral condyle of the femur; slack when knee is flexed and taut when knee fully extended; prevents anterior displacement of the tibia from the femur and hyperextension of knee jt
 - ii. **Posterior cruciate ligament:** stronger of the two; from posterior intercondyler area of tibia, passing superomedially, to the lateral surface of the medial condyle of femur; tight during flexion; prevents posterior displacement of the tibia from the femur and prevents hyperflexion; main stabilizing factor in the weight bearing flexed knee (e.g. Walking downhill)
- b. **Menisci**-fibrocartilage on articular surface of tibia; may act as shock absorbers; increase congruity for articulating surface of femoral condyles; coronary ligaments attach margins of menisci to tibial condyles; transverse ligament of the knee joins anterior edges of menisci so that move together during knee movements
 - i. **Medial meniscus:** C shaped
 - ii. **Lateral meniscus:** almost circular and smaller, and more freely movable; posterior meniscofemoral ligament joins lateral meniscus to the PCL and medial femoral condyle

7. Knee Injuries

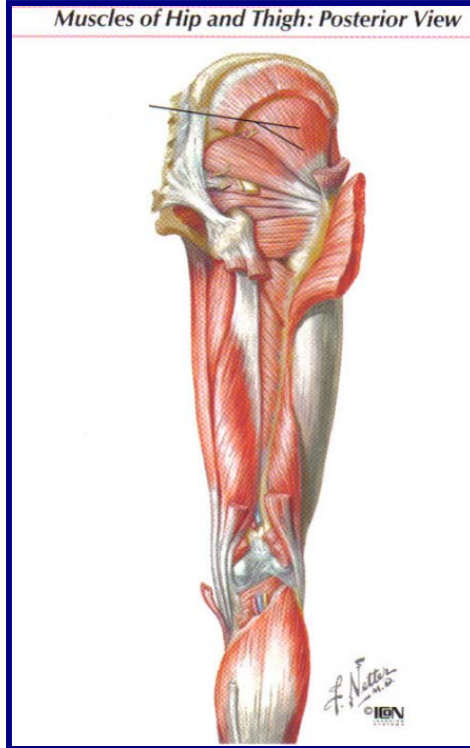
- a. Ligament sprains most common knee injury in contact sports
- b. Tear in tibial collateral ligament frequently also tears the medial meniscus
- c. ACL may tear when tibial collateral ligament tears
- d. **Unhappy triad of knee injuries:** torn ACL, tibial collateral lig, medial meniscus
- e. **ACL rupture:** allows tibia to slide anteriorly to femur
- f. **PCL rupture-** allows tibia to slide posteriorly to femur

Objective 3)

Identify the muscles of the gluteal region and posterior thigh and their innervation. Be able to describe the actions of these muscles around the hip and knee joints and to predict the functional consequences of weakness or loss of function of each muscle.

A). Gluteal muscles:

- i. Gluteus maximus:
 - 1.) Ilium posterior to gluteal line and dorsal surface of sacrum and coccyx to gluteal tuberosity of femur or iliotibial tract (to lateral condyle of tibia)
 - 2.) Innervated by the inferior gluteal nerve (L5, S1 and S2)
 - 3.) Action: extends thigh and assists in its lateral rotation; steadies thigh and assists in rising from sitting position
- ii. Gluteus medius:
 - 1.) External surface of ilium b/ anterior and posterior gluteal lines to lateral surface of greater trochanter of femur
 - 2.) Innervated by the superior gluteal nerve (L5 and S1)
 - 3.) Action: abduct and medially rotate thigh; keeps pelvis level when opposite leg is raised



- 4.) Fxnal Consequences:
Loss of function of sup gluteal nerve weakens ability to abduct the thigh and causes a dipping gait; the pelvis will also tilt when standing on one leg (a positive Trendelenburg's sign)
- iii. Gluteus minimus:
 - 1.) External surface of ilium b/ anterior and posterior gluteal lines to anterior surface of greater trochanter of femur
 - 2.) Innervated by the superior gluteal nerve (**L5** and **S1**)
 - 3.) Action: abduct and medially rotate thigh; keeps pelvis level when opposite leg is raised
 - 4.) Fxnal Consequences: Loss of function of sup gluteal nerve weakens ability to abduct the thigh and causes a dipping gait; the pelvis will also tilt when standing on one leg (a positive Trendelenburg's sign)
 - iv. Piriformis:
 - 1.) Anterior surface of sacrum and sacrotuberous ligament to superior border of greater trochanter of femur
 - 2.) Innervated by branches of anterior rami of S1 and S2
 - 3.) Action: laterally rotate extended thigh and abduct flexed thigh; steady femoral head in acetabulum
 - 4.) Fxnal Consequence: If the abductors are damaged will also observe Trendelenburg's sign because muscles no longer stabilizing head of femur in the acetabulum
 - v. Obturator internus:
 - 1.) Pelvic surface of obturator membrane and surrounding bones to medial surface of greater trochanter of femur
 - 2.) Innervated by nerve to obturator internus from the sacral plexus (**L5** and **S1**)
 - 3.) Action: laterally rotate extended thigh and abduct flexed thigh; steady femoral head in acetabulum
 - 4.) Fxnal Consequence: If the abductors are damaged will also observe Trendelenburg's sign because muscles no longer stabilizing head of femur in the acetabulum
 - vi. Gemelli, superior and inferior:
 - 1.) Ischial spine (superior) and ischial tuberosity (inferior) to medial surface of greater trochanter of femur
 - 2.) Innervated by nerve to obturator internus from the sacral plexus (**L5** and **S1**) (superior) and nerve to quadratus femoris from the sacral plexus (**L5** and **S1**) (inferior)
 - 3.) Action: laterally rotate extended thigh and abduct flexed thigh; steady femoral head in acetabulum

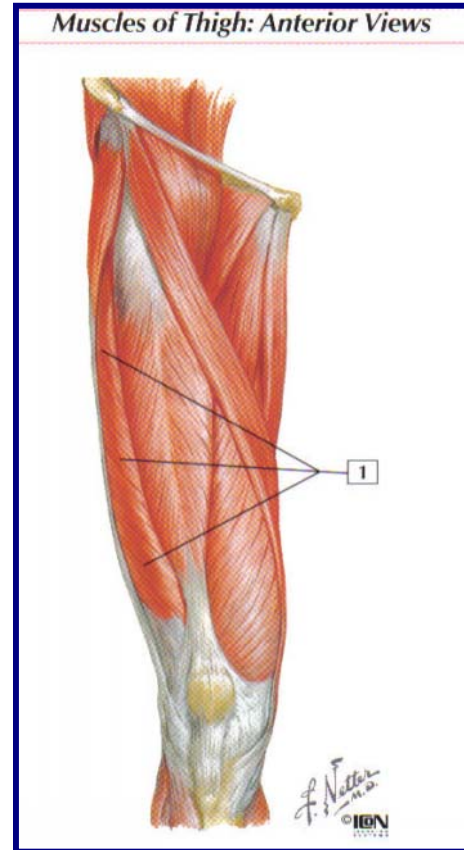
- 4.) Fxnal Consequence: If the abductors are damaged will also observe Trendelenburg's sign because muscles no longer stabilizing head of femur in the acetabulum
- vii. Quadratus femoris:
 - 1.) Lateral border of ischial tuberosity to quadrate tubercle on intertrochanteric crest of femur and inferior to it
 - 2.) Innervated by nerve to quadratus femoris from the sacral plexus (L5 and S1)
 - 3.) Action: laterally rotates thigh; steadies femoral head in acetabulum
 - 4.) Fxnal Consequence: If the abductors are damaged will also observe Trendelenburg's sign because muscles no longer stabilizing head of femur in the acetabulum
- B). Posterior thigh muscles: (Extensors of thigh, flexors of leg; all tibial division of sciatic nerve but short head of biceps femoris)
 - i. Semitendinosus:
 - 1.) Ischial tuberosity to medial surface of superior part of tibia
 - 2.) Innervated by tibial division of sciatic nerve (**L5, S1** and S2)
 - 3.) Action: extend thigh, flex leg and medially rotate it, when thigh and leg flexed → extend trunk
 - 4.) Fxnal Consequence: loss of function to all the "hamstrings" such as from sciatic nerve damage results in impairment of ability to extend thigh and flex the leg
 - ii. Semimembranosus:
 - 1.) Ischial tuberosity to posterior part of medial condyle of tibia
 - 2.) Innervated by tibial division of sciatic nerve (**L5, S1** and S2)
 - 3.) Action: extend thigh, flex leg and medially rotate it, when thigh and leg flexed → extend trunk
 - 4.) Fxnal Consequence: loss of function to all the "hamstrings" such as from sciatic nerve damage results in impairment of ability to extend thigh and flex the leg
 - iii. Biceps femoris:
 - 1.) Ischial tuberosity (long head) and linea aspera and lateral supracondylar line of femur (short head) to lateral side of head of fibula (tendon is split at this site by fibular collateral ligament of the knee)
 - 2.) Innervated by tibial division of sciatic nerve (**L5, S1** and S2) (long head) and common fibular division of sciatic nerve (L5, **S1** and S2) (short head)
 - 3.) Action: flexes leg and laterally rotates it; extends thigh
 - 4.) Fxnal Consequence: loss of function to all the "hamstrings" such as from sciatic nerve damage results in impairment of ability to extend thigh and flex the leg

Objective 4)

Identify the muscles of the anterior and medial regions of the thigh and their innervation. Identify the cutaneous innervation of the thigh. Be able to describe the actions of these muscles around the hip and knee joints and to predict the functional consequences of weakness or loss of function of each muscle.

- A). Anterior thigh muscles: (Hip flexors and leg extensors)
 - i. Pectinus:
 - 1.) Superior ramus of pubis to pectineal line of femur just inferior to lesser trochanter
 - 2.) Innervated by femoral n. (**L2** and L3) and may get branch from obturator n.

- 3.) Action: adducts and flexes thigh; assists with medial rotation of thigh
- ii. Iliopsoas: (chief flexor of thigh)
- 1.) Psoas major:
 - a. Sides of T12 – L5 and disc b/ them and transverse processes of all lumbar vertebrae to lesser trochanter of femur (**L1, L2** and L3)
 - b. Innervated by anterior rami of lumbar nn.
 - c. Action: with iliacus flexes thigh at hip and stabilizes hip
 - 2.) Iliacus:
 - a. Iliac crest, iliac fossa, ala of sacrum to tendon of psoas major, lesser trochanter, and femur distal to it
 - b. Innervated by femoral n. (**L2** and L3)
 - c. Action: with psoas major flexes thigh at hip and stabilizes hip
- iii. Tensor fasciae latae:
- 1.) Anterior superior iliac spine and anterior part of notch inferior to iliotibial tract that attaches to the lateral condyle of tibia
 - 2.) Innervated by superior gluteal n. (L4 and L5)
 - 3.) Action: abducts, medially rotates, and flexes thigh (primarily a flexor); helps keep knee extended; steadies trunk of thigh
- iv. Sartorius:
- 1.) Anterior superior iliac spine and superior part of notch inferior to it to superior part of the medial side of the tibia
 - 2.) Innervated by femoral n. (L2 and L3)
 - 3.) Action: flexes, abducts, and laterally rotates thigh at hip; flexes leg at knee
- v. Quadriceps femoris: (great extensor of leg)
- 1.) Rectus femoris:
 - a. Anterior inferior iliac spine and ilium superior to acetabulum to base of patella and by patellar ligament to tibial tuberosity
 - b. Innervated by femoral n. (L2, **L3** and **L4**)
 - c. Action: extends leg at knee; steadies hip and helps iliopsoas to flex thigh
 - 2.) Vastus lateralis:
 - a. Greater trochanter and lateral lip of linea aspera of femur to base of patella and by patellar ligament to tibial tuberosity
 - b. Innervated by femoral n. (L2, **L3** and **L4**)
 - c. Action: extends leg at knee
 - 3.) Vastus medialis:
 - a. Intertrochanteric line and medial lip of linea aspera of femur to base of patella and by patellar ligament to tibial tuberosity
 - b. Innervated by femoral n. (L2, **L3** and **L4**)



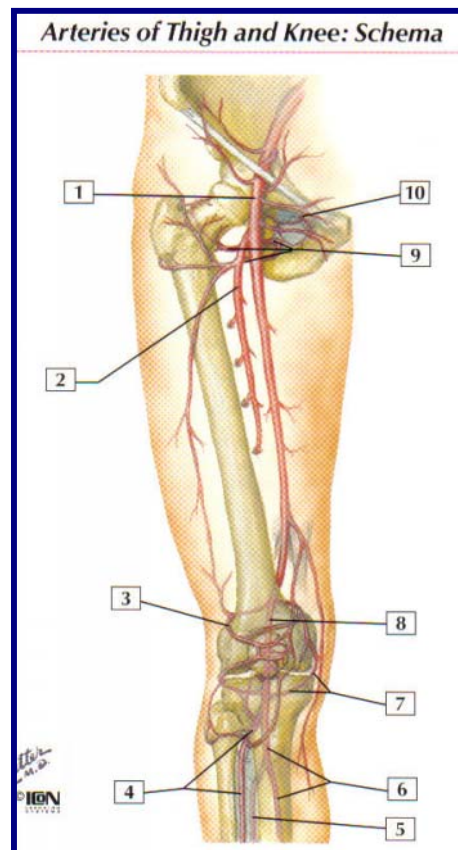
- c. Action: extends leg at knee
 - 4.) Vastus intermedius:
 - a. Anterior and lateral surfaces of shaft of femur to base of patella and by patellar ligament to tibial tuberosity
 - b. Innervated by femoral n. (L2, **L3** and **L4**)
 - c. Action: extends leg at knee
- B). Medial thigh muscles: (Adductor group; all obturator n. but hamstring head of adductor magnus)
 - i. Adductor longus: (most anterior)
 - 1.) Body of pubis inferior to pubic crest to middle third of linea aspera of femur
 - 2.) Innervated by obturator n. (L2, **L3** and L4)
 - 3.) Action: adducts thigh
 - ii. Adductor brevis: (deep to pectineus m. and adductor longus)
 - 1.) Body and inferior ramus of pubis to pectineal line and proximal part of linea aspera of femur
 - 2.) Innervated by obturator n. (L2, **L3** and L4)
 - 3.) Action: adducts thigh and to some extent flexes it
 - iii. Adductor magnus: (largest adductor m.)
 - 1.) Adductor part:
 - a. Inferior ramus of pubis and ramus of ischium to gluteal tuberosity, linea aspera and medial supracondylar line
 - b. Innervated by obturator n. (L2, **L3** and L4)
 - c. Action: adducts and flexes thigh
 - 2.) Hamstring part:
 - a. Ischial tuberosity to adductor tubercle of femur
 - b. Innervated by tibial part of sciatic n. (**L4**)
 - c. Action: extends thigh
 - iv. Gracilis:
 - 1.) Body and inferior ramus of pubis to superior part of medial surface of tibia
 - 2.) Innervated by obturator n. (**L2** and L3)
 - 3.) Action: adducts thigh, flexes and helps medially rotate leg
 - v. Obturator externus:
 - 1.) Margins of obturator foramen and obturator membrane to trochanteric fossa of femur
 - 2.) Innervated by obturator n. (L3 and **L4**)
 - 3.) Action: laterally rotates thigh; steadies head of femur in acetabulum
- C). Cutaneous innervation
 - i. Gluteal region
 - 1.) Upper medial quadrant innervated by posterior rami of L1-L3 and S1-S3 (superior and medial clunial nerves)
 - 2.) Upper lateral quadrant innervated by anterior ramus of T12 and the lateral branches of the iliohypogastric (L1)
 - 3.) Lower lateral quadrant innervated by branches from the lateral cutaneous nerve of the thigh (anterior rami of L2 and L3)
 - 4.) Lower medial quadrant innervated by branches from the posterior cutaneous nerve of the thigh (anterior rami of S1-S3 also called inferior clunial nerve)
 - ii. Posterior
 - 1.) Posterior cutaneous nerve of the thigh (posterior femoral cutaneous nerve) S2 and S3

- 2.) Gluteal branches to lower medial quadrant of gluteal region (inferior clunial nerve)
- 3.) Perineal branches
- 4.) Cutaneous branches to back of thigh and upper part of leg
- iii. Anterior and medial
 - 1.) Lateral cutaneous nerve of the thigh (lateral femoral cutaneous nerve) L2 and L3
 - a. Divides into anterior and posterior branches
 - b. Anterior branch to anterior and medial part of thigh
 - c. Posterior branch to lateral and posterior surface of thigh
 - 2.) Femoral branch of the genitofemoral nerve (L2, 3) - skin inf to middle part of inguinal ligament
 - 3.) Ilioinguinal nerve (L1, T12)- skin over proximal anteromedial part of thigh
 - 4.) Obturator nerve
 - 5.) Subcostal nerve (T12) skin of hip and thigh anterior to greater trochanter of femur

Objective 5)

Trace the flow of blood from the common iliac artery to the gluteal region and hip joint. Trace the flow of blood from the common iliac artery into and out of the thigh. For both arteries, indicate the different sources of the vascular network and known collateral connections. Trace the venous return from these areas to the inferior vena cava.

- A). Gluteal arterial supply: common iliac a. → internal iliac a. →
- i. Superior gluteal artery:
 - 1.) Course: enters gluteal region through greater sciatic foramen superior to the piriformis and divides into superficial and deep branches; anastomoses with inferior gluteal a. and medial circumflex femoral a.
 - 2.) Supplies: gluteus maximus (superficial branch) and supplies gluteus medius and minimus by running b/ them and the tensor fasciae latae (deep branch)
 - ii. Inferior gluteal artery:
 - 1.) Course: enters gluteal region through greater sciatic foramen inferior to the piriformis and descends on the medial side of the sciatic n.; anastomoses with the superior gluteal a. and participates in cruciate anastomosis of thigh involving



- the first perforating branch of the deep femoral a. and medial and lateral circumflex femoral aa.
- 2.) Supplies: gluteus maximus, obturator internus, quadratus femoris, and superior parts of hamstrings
 - iii. Internal pudendal artery: enters into gluteal region by greater sciatic foramen but does not supply gluteal region (external genitalia and perineal muscles)
 - iv. Obturator artery: (supplies thigh not gluteal region)
 - 1.) Course: passes through obturator foramen, enters medial compartment of thigh, and divides into anterior and posterior branches
 - 2.) Supplies: obturator externus, pectineus, adductors of thigh, and Gracilis (anterior branch); muscles attached to ischial tuberosity (posterior branch)
- C). Thigh arterial supply:
- i. Common iliac a. → external iliac a. →
 - 1.) Femoral artery: continuation of external iliac a. distal to inguinal ligament
 - a. Course: descends through femoral triangle, enters adductor canal at adductor hiatus; becomes popliteal a.
 - b. Supplies: anterior and anteromedial surfaces of thigh
 - ii. Femoral a. →
 - 1.) Deep artery of thigh:
 - a. Course: from femoral a. 4 cm distal to inguinal ligament and passes inferiorly deep to adductor longus
 - b. Supplies: 4 perforating branches pierce adductor magnus to posterior and lateral compartments of thigh
 - iii. Femoral a. or Deep artery of thigh →
 - 1.) Lateral circumflex femoral artery:
 - a. Course: passes laterally deep to Sartorius and rectus femoris and divides into three branches
 - b. Supplies: ascending branch supplies anterior part of gluteal region; transverse branch winds around the femur; descending branch descends to knee and joins genicular anastomoses
 - 2.) Medial circumflex femoral artery:
 - a. Course: passes medially and posteriorly b/ pectineus and iliopsoas, enters gluteal region, and divides into two branches
 - b. Supplies: most blood to head and neck of femur; transverse branch takes part in cruciate anastomosis of thigh; ascending branch joins gluteal artery
- C). **Popliteal artery**:
- i. 2 superior, 2 inferior, and 1 middle genicular arteries branch off of popliteal artery and participate in the **genicular anastomosis** around the knee
 - ii. **Superior muscular branches** have anastomoses with terminal part of the deep artery of thigh and with gluteal arteries
- D). **Cruciate anastomosis of the thigh**:
- i. Ascending branch of the first perforating artery
 - ii. Medial and lateral circumflex femoral arteries (transverse branches)
 - iii. Inferior gluteal artery
- E). **Trochanteric anastomosis of the hip**:
- i. Descending branches from superior and inferior gluteal arteries
 - ii. Ascending branches of lateral and medial femoral circumflex arteries
- F). **Genicular anastomosis of the knee**:
- i. Genicular branches of femoral and popliteal arteries

- ii. Anterior and posterior recurrent branches of anterior tibial recurrent and circumflex fibular artery
- G). **Venous return to inferior venous cava:**
- i. **Great saphenous vein** coming from the foot runs along the medial side of leg and thigh and empties into **femoral vein** at the saphenous opening. The **small saphenous vein** arises from the lateral side of the foot and empties into the **popliteal vein** in the popliteal fossa. **Perforating veins and deep veins** accompany the major arteries and their branches.
 - ii. **Popliteal vein gives rise to the femoral vein** after passing up through the adductor hiatus. **3. Deep vein of thigh arises from** union of 3-4 perforating veins and enters the femoral vein inferior to inguinal ligament. **Femoral vein becomes the external iliac vein** at the inguinal ligament and receives blood from deep vein of thigh, great saphenous vein and other tributaries.
 - iii. **Inferior and superior gluteal veins and internal pudendal veins** accompany their corresponding arteries. Gluteal veins communicate with tributaries of femoral vein. Gluteal and pudendal veins give rise to the **internal iliac vein**. The **internal iliac vein** merges with the **external iliac vein** to give rise to the **common iliac vein**, which then leads to the **inferior vena cava**.

Objective 6)

Identify the femoral sheath, its fascial origins, and its contents, including the anatomical location of different groups of lymph nodes (whether or not they are actually present in your cadaver), and afferent sources and efferent targets of each group. Indicate the relationship of the sheath and femoral hernias.

- A). The **femoral triangle** is a triangular depressed area in the proximal-medial aspect of the thigh. The base, or superior boundary, is the inguinal ligament. The lateral boundary is the sartorius and the medial boundary is the adductor longus. The floor of the femoral triangle is the iliopsoas and pectineus. Roof is fascia lata, cribiform fascia, subcutaneous tissue, and skin
- B). The **femoral sheath** is a downward protrusion into the thigh of the fascial envelope lining the abdominal walls. Anterior wall is continuous above with the fascia transversalis and its posterior wall with the fascia iliaca. Sheath surrounds femoral vessels and lymphatics for about one inch below the inguinal ligament. Femoral artery occupies the **lateral compartment** and is separated from the femoral vein located in the **intermediate compartment** by a fibrous septum. The efferent deep inguinal lymph vessels, fatty connective tissue and one of the deep inguinal lymph nodes occupy the **medial compartment (femoral canal)** separated from the femoral vein by a fibrous septum. Upper opening of the femoral canal is the femoral ring and the femoral septum (a condensation of extraperitoneal tissue) closes the ring. The sheath sticks to the walls of the blood vessels and inferiorly blends with the tunica adventitia of these vessels. The part of the sheath forming the femoral canal does not stick to the walls of the lymph vessels and so forms a weak area in the abdomen. A protrusion of peritoneum could be forced down the femoral canal, pushing the femoral septum before it. This is known as a **femoral hernia**.
- C). **Superficial Inguinal Lymph Nodes** – lie in superficial fascia below inguinal ligament; two groups:
 - i. Horizontal group – just below and parallel to inguinal ligament; medial members receive superficial lymph vessels from ant abdominal wall below umbilicus and from the perineum; lateral members receive superficial lymph vessels from the back below the iliac crests

- ii. Vertical group – lie along the terminal part of the great saphenous vein and receive most of the superficial lymph vessels of the lower limb
The *efferent lymph vessels* from the superficial inguinal nodes can pass through the saphenous opening in the deep fascia and join the deep inguinal nodes, but most passes to the external iliac nodes
- D). **Deep Inguinal Lymph Nodes** – located beneath deep fascia and lie along the medial side of the femoral vein
 - i. The *efferent vessels* from these nodes enter the abdomen by passing through the femoral canal to lymph nodes along the external iliac artery
- E). **Gluteal Lymph Nodes** – drain the deep gluteal tissues.
 - i. The *efferent vessels* go to the internal, external and then common iliac nodes. Common iliac nodes lead to lumbar nodes.