

# Front of Thigh

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## Front of Thigh

### Introduction

- The **front of thigh** extends between the **hip and knee joints**.
- The **superficial fascia** contains:
  - **Great saphenous vein** (largest superficial vein).
  - **Cutaneous nerves, superficial vessels, and lymph nodes**.
- The **upper one-third (medially)** forms the **femoral triangle**.
- The **middle one-third** contains the **femoral vessels** passing through the **adductor canal**.
- Main muscles:
  - **Quadriceps femoris** (four-headed muscle) — main extensor of knee.
  - **Iliopsoas** — flexor of thigh (upper part).
  - **Adductors** — medial side of thigh.
- **Femoral hernia** appears in the **upper medial part** of the front of thigh

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## Surface Landmarks

### 1. Iliac Crest

- Curved upper border of ilium forming the **lower margin of waist**.
- **Hands rest on iliac crests** in relaxed standing position.

### 2. Anterior Superior Iliac Spine (ASIS)

- Anterior end of the iliac crest — **easily palpable** bony point.

### 3. Tubercle of Iliac Crest

- Found about **5 cm behind ASIS** on outer lip of the iliac crest.
- Important reference point for surface anatomy.

### 4. Fold of Groin (Inguinal Fold)

- Shallow curved line separating **front of thigh from anterior abdominal wall**.
- Corresponds to the **inguinal ligament**, which runs from **ASIS to pubic tubercle**.
- The **downward convexity** of the ligament is due to pull by the **fascia lata**

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### 5. Pubic Tubercle

- Bony projection at the **medial end of the inguinal ligament** — **palpable** landmark.

## 6. Pubic Symphysis and Pubic Crest

- **Pubic symphysis** — midline joint between pubic bones.
- **Pubic crest** — ridge between pubic tubercle and symphysis.

## 7. Greater Trochanter of Femur

- Lies about **12.5 cm below the tubercle of iliac crest**.
- Forms a **wide prominence (4–5 cm)** at the lateral aspect of the thigh.
- Its upper border corresponds roughly to the **level of pubic crest**.

## 8. Midinguinal Point

- Midway between **ASIS and pubic symphysis**.
- Lies directly above the **femoral artery** and **head of femur**.

## 9. Midpoint of Inguinal Ligament

- Lies slightly **lateral to midinguinal point**; femoral nerve lies beneath it.

## 10. Patella

- **Largest sesamoid bone**, located within the *quadriceps femoris tendon*.
- Easily seen and felt in front of knee; movable when knee is extended.

## 11. Tibial Tuberosity

- Prominent bump below patella on anterior tibia — attachment for **patellar ligament**

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## Skin and Superficial Fascia

### Skin

- Over the upper medial thigh, the skin is **hair-bearing** (especially near pubic region).
- **Clinical note:** The **upper medial thigh** is commonly used for **embalming incision**, allowing access to femoral artery for fluid injection

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### Superficial Fascia

- Composed of **two layers**:
  1. **Superficial fatty layer (Camper's fascia)**
  2. **Deep membranous layer (Scarpa's fascia)**
    - Both continuous with layers of anterior abdominal wall fascia.
- The two layers are **most distinct near the groin**, where cutaneous **nerves, vessels, and lymph nodes** lie between them.
- **Holden's Line:**

- Firm attachment of the membranous layer to the **deep fascia** near the **inguinal ligament**.
- Extends **horizontally 8 cm from the pubic tubercle**.
- Prevents downward spread of **extravasated urine** into the thigh after urethral injury

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## Contents of Superficial Fascia

- **Cutaneous nerves**
- **Cutaneous arteries and veins (including great saphenous vein)**
- **Superficial inguinal lymph nodes**

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## Clinical Note

- **Urethral injury:** Urine may extravasate beneath membranous layer of superficial fascia and spread to lower abdominal wall, but not below **Holden's line**.

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Would you like me to continue next with **Cutaneous Nerves of Front of Thigh (next subtopic under Skin and Superficial Fascia)** in the same detailed, pointwise style?

## Superficial Fascia (Front of Thigh)

- Consists of **two layers**:
  1. **Superficial fatty layer (Camper's fascia)**
  2. **Deep membranous layer (Scarpa's fascia)**
- Both are **continuous** with the corresponding layers of the **anterior abdominal wall**.
- Layers are **most distinct in the groin region**, where **cutaneous nerves, vessels, and lymph nodes** lie between them

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### Holden's Line

- Firm attachment of the **membranous layer** to the **deep fascia** along a **horizontal line** called **Holden's line**.
- Begins slightly **lateral to the pubic tubercle** and extends **laterally about 8 cm**

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- Prevents downward spread of **extravasated urine** into thigh after **urethral injury**

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### Contents of Superficial Fascia

- **Cutaneous nerves**

- **Cutaneous arteries**
- **Great saphenous vein** and its **tributaries**
- **Superficial inguinal lymph nodes**

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## Cutaneous Nerves of Front of Thigh

### 1. Ilioinguinal Nerve (L1)

- Emerges through the **superficial inguinal ring**.
- Supplies:
  - Skin at the **root of penis** (or **mons pubis** in females).
  - **Anterior one-third** of the scrotum or labium majus.
  - **Superomedial part** of thigh

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### 2. Femoral Branch of Genitofemoral Nerve (L1, L2)

- Pierces the **femoral sheath and deep fascia** about **2 cm below the midinguinal point**.
- Supplies most of the **skin over the femoral triangle**

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### 3. Lateral Cutaneous Nerve of Thigh (L2, L3)

- Branch of **lumbar plexus**.
- Emerges behind **lateral end of inguinal ligament**.
- Divides into **anterior and posterior branches**.
- Supplies **anterolateral thigh** and **anterior part of gluteal region**

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### 4. Intermediate Cutaneous Nerve of Thigh (L2, L3)

- Branch of **anterior division of femoral nerve**.
- Pierces deep fascia at the junction of **upper and middle thirds** of thigh.
- Supplies **anterior surface** of thigh between **sartorius and midline** down to **knee**

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### 5. Medial Cutaneous Nerve of Thigh (L2, L3)

- Branch of **anterior division of femoral nerve**.
- Has **anterior and posterior divisions**.
- Supplies **medial side** of lower two-thirds of thigh

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## 6. Saphenous Nerve (L3, L4)

- Longest cutaneous branch of femoral nerve.
- Pierces deep fascia on **medial side of knee** and runs with **great saphenous vein**.
- Supplies **skin on medial side of leg and foot up to ball of great toe**.
- Gives **infrapatellar branch** to skin over **ligamentum patellae**

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## Patellar Plexus

- Plexus of fine nerves in front of **patella, ligamentum patellae, and upper tibia**.
- Formed by:
  1. Anterior division of **lateral cutaneous nerve of thigh**
  2. **Intermediate cutaneous nerve of thigh**
  3. Anterior division of **medial cutaneous nerve of thigh**
  4. **Infrapatellar branch of saphenous nerve**

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## Cutaneous Arteries

Three small arteries arise from the **femoral artery** just below the **inguinal ligament**:

### 1. Superficial External Pudendal Artery

- Pierces **cribriform fascia**.
- Runs **medially in front of spermatic cord**.
- Supplies **external genitalia**

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### 2. Superficial Epigastric Artery

- Pierces **cribriform fascia**, ascends toward **umbilicus**.
- Supplies **lower part of anterior abdominal wall**

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### 3. Superficial Circumflex Iliac Artery

- (Next part in continuation, described below)
- Runs **laterally**, parallel to the **inguinal ligament**, supplying the **skin of upper lateral thigh and inguinal region**.

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### Clinical Note

- **Holden's line** acts as a **barrier** to spread of urine after **urethral rupture**.

- **Cutaneous nerves** are important for **nerve blocks** in thigh surgeries and for identifying **nerve injury levels**.
- **Superficial arteries** are often seen in dissection near the **femoral triangle** and may be injured during **venous cutdown** procedures.

## Great or Long Saphenous Vein

- **Largest and longest superficial vein** of the lower limb (*saphes* = easily seen).
- **Origin:** Medial end of **dorsal venous arch** of foot.
- **Course:**
  - Begins on **dorsum of foot**, passes **in front of the medial malleolus**.
  - Ascends along **medial side of leg, behind knee**, and then **forwards in thigh**.
  - At the upper thigh, it **pierces the cribriform fascia** at the **saphenous opening** to drain into the **femoral vein**.
- **Tributaries before piercing cribriform fascia:**
  - **Superficial external pudendal vein**
  - **Superficial epigastric vein**
  - **Superficial circumflex iliac vein**
  - Numerous unnamed tributaries

- **Clinical Note:**

- Commonly used for **venous cutdown** and **coronary bypass grafting**.
- **Varicosity** of this vein is a frequent cause of visible tortuous veins on the leg.

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## Superficial Inguinal Lymph Nodes

- **Variable in number and size**, arranged in a **T-shaped pattern** with:
  - **Upper horizontal group**
  - **Lower vertical group**
- **Upper horizontal group** subdivided into:
  - **Upper lateral group** – drains **lateral infraumbilical abdominal wall** and **gluteal region**.
  - **Upper medial group** – drains **medial infraumbilical wall, external genitalia, urethra, vagina, and anal canal**.
- **Lower vertical group** – drains **most of the lower limb**, along the **upper part of great saphenous vein**

- **Clinical Note:**

- Enlarged in **lower limb infections, STDs, and carcinoma of vulva or penis.**

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## Subcutaneous Bursae

- **Definition:** Fluid-filled sacs reducing friction between skin and bone at points of pressure.
- **Function:** Provide lubrication and smooth movement; **excessive pressure** can lead to **bursitis**

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### 1. Prepatellar Bursa

- Lies in front of lower part of patella and upper part of ligamentum patellae.
- **Inflammation:** *Prepatellar bursitis* ? "Housemaid's knee" or "Miner's knee".

### 2. Subcutaneous Infrapatellar Bursa

- Lies in front of lower part of tibial tuberosity and lower part of ligamentum patellae.
- **Inflammation:** *Subcutaneous infrapatellar bursitis* ? "Clergyman's knee".

### 3. Deep Bursae (for reference)

- **Suprapatellar bursa** and **Deep infrapatellar bursa** lie deeper beneath quadriceps tendon and ligamentum patellae

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## Clinical Summary

CONDITION	SITE OF BURSA	COMMON NAME
Prepatellar bursitis	Front of patella	<i>Housemaid's knee</i>
Subcutaneous infrapatellar bursitis	Over tibial tuberosity	<i>Clergyman's knee</i>

## Dissection of the Front of Thigh

- After reflecting the **superficial fascia**, the **deep fascia (fascia lata)** becomes visible.
- Study its **attachments, modifications, and extensions**.
- The **great saphenous vein** is traced through the **cribriform fascia** to the **femoral vein** via the **femoral sheath**:
  - **Medial compartment** of the sheath ? *femoral canal* (contains lymph node).
  - **Intermediate compartment** ? *femoral vein*.
  - **Lateral compartment** ? *femoral artery*.
- A **vertical incision** in the deep fascia from the **iliac tubercle** to the **lateral condyle of femur** exposes:
  - **Tensor fasciae latae** and **gluteus maximus** attaching to the *iliotibial tract*.

- **Quadriceps femoris** with its four distinct heads (rectus femoris, vastus medialis, lateralis, and intermedius).
- Remove deep fascia from the **upper one-third of the front of thigh** to display:
  - **Sartorius muscle** (obliquely crossing from lateral to medial).
  - **Adductor longus** (arising medially, directed laterally).
  - These muscles form the **femoral triangle** —
    - **Base:** inguinal ligament
    - **Lateral boundary:** medial border of sartorius
    - **Medial boundary:** medial border of adductor longus
- Within the femoral triangle, dissect and identify **femoral nerve, artery, vein**, and accompanying lymphatics

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## Clinical Anatomy of Front of Thigh

### 1. Varicose Veins

- Due to **incompetent valves** in the great saphenous vein or its perforators.
- Leads to **venous dilation and tortuosity** along the medial thigh and leg.
- Common in people with **prolonged standing** (shopkeepers, nurses).

- **Saphenofemoral incompetence** can be tested by **Trendelenburg's test**.

## 2. Saphenous Vein Cutdown

- Performed **anterior to the medial malleolus** to access the vein for **intravenous infusion**.
- Must avoid injury to the **saphenous nerve**, which accompanies it in the lower leg.

## 3. Great Saphenous Vein in Surgery

- Used as **graft vessel** in **coronary artery bypass** operations due to its length and superficial accessibility.

## 4. Femoral Triangle Palpation

- The **femoral artery** pulsation can be felt at the **midinguinal point** (between ASIS and pubic symphysis).
- Used for **arterial catheterization** or **pulse assessment**.

## 5. Femoral Hernia

- Occurs through the **femoral canal** (medial compartment of femoral sheath).
- More common in **females** due to wider pelvis.
- Lies **below and lateral to the pubic tubercle** (differentiating from inguinal hernia).

## 6. Superficial Inguinal Lymphadenopathy

- **Infection of lower limb, perineum, or external genitalia** causes enlargement of the **superficial inguinal lymph nodes**.
- **Upper horizontal group** affected in genital infections; **lower vertical group** in leg infections.

## 7. Bursitis

- **Prepatellar bursitis** ? inflammation of bursa anterior to patella (*Housemaid's knee*).
- **Subcutaneous infrapatellar bursitis** ? over tibial tuberosity (*Clergyman's knee*).
- Both result from **chronic friction or kneeling posture**.

## 8. Patellar Reflex

- Tested by tapping the **ligamentum patellae**; a normal reflex indicates **integrity of L2–L4 (femoral nerve)**.
- Absence suggests **femoral nerve lesion or L4 radiculopathy**.

## 9. Cutaneous Nerve Injuries

- **Lateral cutaneous nerve of thigh** ? compressed beneath the **inguinal ligament**, producing **meralgia paraesthetica** (tingling and burning over anterolateral thigh).
- **Saphenous nerve** ? may be injured in **knee surgeries**, causing sensory loss along medial leg.

## 10. Urethral Injury and Holden's Line

- In **straddle injury** with urethral rupture, urine extravasates into the **superficial perineal pouch**, but **cannot descend into the thigh** due to firm attachment of the membranous

layer (Scarpa's fascia) to **deep fascia along Holden's line.**

## Deep Fascia / Fascia Lata

### Definition

- A **tough fibrous sheath** that **encloses the entire thigh like a sleeve.**
- Continuous with **deep fascia of gluteal region above** and **leg below**

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### Attachments of Fascia Lata

- **Superiorly:** Along the line separating thigh from pelvis—
  - **Anteriorly:** Inguinal ligament
  - **Laterally:** Iliac crest
  - **Posteriorly:** Gluteal fascia, sacrum, coccyx, sacrotuberous ligament
  - **Medially:** Pubis, pubic arch, and ischial tuberosity

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- **Inferiorly:**
  - Front and sides ? attached to **bony prominences** and **capsule of knee joint.**

- Posteriorly ? forms **popliteal fascia**, continuous with fascia of back of leg

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## Modifications of Fascia Lata

### 1. Iliotibial Tract (IT Tract)

- Thickened **lateral part** of fascia lata forming a **5 cm wide band**.
- **Superior attachments:** Splits into two laminae—
  - *Superficial lamina* ? tubercle of iliac crest.
  - *Deep lamina* ? capsule of hip joint.
- **Inferior attachment:** Anterior surface of **lateral condyle of tibia**

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### Muscular Insertions:

- Between laminae —
  - **Tensor fasciae latae**
  - **Gluteus maximus (upper three-fourths part)**

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### Functions:

- Stabilizes **knee joint** in **extension and partial flexion**.
- Acts as **support against gravity** during leaning forward or walking

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## 2. Saphenous Opening

- **Oval gap** in fascia lata ? about **2.5 cm long, 2 cm broad**.
- **Position:** 4 cm below and 4 cm lateral to pubic tubercle.
- **Margins:**
  - *Lateral margin:* Sharp and crescentic — **falciform margin**.
  - *Medial margin:* Ill-defined, deeper, formed by fascia over **pectineus muscle**.
- Closed by **cribriform fascia** (specialized part of superficial fascia).
- **Structures passing through:**
  - **Great saphenous vein**
  - **Superficial branches of femoral artery and vein**
  - **Lymphatic vessels**

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### 3. Intermuscular Septa

- The fascia lata sends **three septa** inward to the linea aspera:
  - **Lateral intermuscular septum:** Thickest; separates *anterior* from *posterior* compartment.
  - **Medial intermuscular septum:** Between *anterior* and *medial* compartments.
  - **Posterior intermuscular septum:** Poorly defined; between *medial* and *posterior* compartments

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### Dissection of Fascia Lata

- After removing **superficial fascia**, the **deep fascia (fascia lata)** is seen.
- Identify:
  - **Attachments, iliotibial tract, and saphenous opening.**
- Trace the **great saphenous vein** through the **cribriform fascia** into the **femoral vein** within the **femoral sheath**:
  - *Medial compartment* ? femoral canal (with lymph node).
  - *Intermediate compartment* ? femoral vein.
  - *Lateral compartment* ? femoral artery.

- Make a **vertical incision** in fascia lata from **iliac tubercle** to **lateral condyle of femur**.
  - Expose **tensor fasciae latae**, **gluteus maximus**, and **iliotibial tract**.
- Remove fascia lata from **upper one-third of thigh** to expose **sartorius** (crossing obliquely) and **adductor longus** (forming femoral triangle).
- Identify **femoral nerve, artery, and vein** in the triangle

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## Clinical Anatomy of Fascia Lata

### 1. Femoral Hernia

- Occurs through **femoral canal** (medial compartment of femoral sheath).
- Appears **below and lateral to pubic tubercle**.
- Common in females; may strangulate.

### 2. Varicose Veins

- **Incompetent valves** in the **great saphenous vein** cause **varicosities**.
- Related to **weakness in fascia lata** at the **saphenous opening**.

### 3. Iliotibial Band Syndrome

- Due to **friction** between **IT tract** and **lateral femoral condyle** during repeated knee flexion-extension.

- Common in **runners and cyclists**.

#### 4. Surgical Importance

- **Fascia lata grafts** are used for **reconstructive surgeries** (e.g., dura repair, ptosis correction).

#### 5. Patellar Reflex

- Clinical testing site lies under the **fascia lata**; reflex loss indicates **femoral nerve or L3–L4 lesion**.

## Femoral Triangle

### Definition

- A **triangular depression** on the **front of the upper one-third of thigh**, just below the **inguinal ligament**

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### Boundaries

#### Base (Superior):

- **Inguinal ligament**

#### Apex (Inferior):

- Point where **sartorius** (lateral boundary) and **adductor longus** (medial boundary) meet.
- Continuous below with **adductor canal**

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#### Lateral Boundary:

- **Medial border of sartorius**

#### Medial Boundary:

- **Medial border of adductor longus**

#### Roof:

- **Skin**
- **Superficial fascia** (contains superficial inguinal lymph nodes, femoral branch of genitofemoral nerve, ilioinguinal branches, superficial vessels, upper part of great saphenous vein)
- **Deep fascia** (including cribriform fascia over saphenous opening)

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#### Floor:

- **Medially:** Pectineus and adductor longus
- **Laterally:** Psoas major and iliacus

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## Contents of Femoral Triangle

### 1. Femoral Artery and Branches

- Extends from **midinguinal point** to **apex of triangle**.
  - **Branches (6 total):**
    - *Superficial:* Superficial epigastric, superficial circumflex iliac, superficial external pudendal.
    - *Deep:* Profunda femoris, lateral and medial circumflex femoral arteries
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### 2. Femoral Vein and Tributaries

- Lies **medial to artery at base, posteromedial at apex**.
  - Receives **great saphenous vein, circumflex veins**, and veins corresponding to arterial branches
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### 3. Femoral Sheath

- Encloses **upper 3–4 cm** of femoral vessels.
- Divided into **three compartments:**

- *Lateral*: Femoral artery + femoral branch of genitofemoral nerve
- *Intermediate*: Femoral vein
- *Medial*: Femoral canal

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#### 4. Nerves

- **Femoral nerve** (lateral to artery, outside sheath)
- **Nerve to pectineus** (passes behind sheath to pectineus)
- **Femoral branch of genitofemoral nerve** (within sheath, lateral compartment)
- **Lateral cutaneous nerve of thigh** (crosses lateral angle)

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#### 5. Deep Inguinal Lymph Nodes

- Medial to upper part of **femoral vein**.
- Drain **glans penis or clitoris, deep lower limb lymphatics, and superficial inguinal nodes**

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## Femoral Sheath

- **Funnel-shaped fascial sleeve** enclosing the upper **3–4 cm** of femoral vessels.

- **Formation:**

- *Anterior wall* ? from **fascia transversalis**.
- *Posterior wall* ? from **fascia iliaca**.

- **Inferiorly:** Merges with **connective tissue** around femoral vessels

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- **Asymmetrical shape:**

- *Lateral wall* ? vertical
- *Medial wall* ? oblique (directed downward and laterally)

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- **Compartments:**

1. *Lateral (arterial)* ? Femoral artery + femoral branch of genitofemoral nerve
2. *Intermediate (venous)* ? Femoral vein
3. *Medial (lymphatic)* ? Femoral canal

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## Femoral Canal

- **Medial compartment** of femoral sheath.
- **Shape:** Conical; **wide above, narrow below.**
- **Length:** ~1.5 cm; **Width at base:** ~1.5 cm.
- **Upper end:** *Femoral ring* — the entrance into canal

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### Boundaries of Femoral Ring

- **Anterior:** Inguinal ligament
- **Posterior:** Pectineus + fascia over it
- **Medial:** Lacunar ligament
- **Lateral:** Femoral vein

### Contents of Femoral Canal

- **Areolar tissue**
- **Fat**
- **Deep inguinal lymph node (of Cloquet/Rosenmüller)**
- **Lymphatic vessels** connecting superficial and deep systems

### 1. Femoral Hernia

- Protrusion of abdominal contents through **femoral ring** into **femoral canal**.
- Appears **below and lateral to pubic tubercle** (distinguishes it from inguinal hernia).
- Common in **females** due to wider pelvis and smaller femoral ring.
- **Complication:** May become **strangulated**.

### 2. Femoral Artery Catheterization

- Artery can be **palpated at midinguinal point** — access for **angiography or catheterization**.

### 3. Lymphadenopathy

- **Enlargement of deep or superficial inguinal nodes** in infections of lower limb or genitalia.

### 4. Clinical Surface Marking

- Femoral pulse ? halfway between **ASIS** and **pubic symphysis**.
- Pressure here controls **bleeding** from lower limb injuries.

### 5. Surgical Significance

- Femoral sheath and canal are key landmarks in **hernia repair** and **vascular surgeries** of groin.
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These sections complete the **Femoral Triangle** with its **Boundaries, Contents, Femoral Sheath, Femoral Canal, and Clinical Anatomy** for both practical dissection and exam theory.

## Femoral Artery

### Origin

- Continuation of the **external iliac artery** beyond the **inguinal ligament**, beginning at the **midinguinal point**.
  - Lies in the **femoral triangle**, just **lateral to the femoral vein** and **medial to the femoral nerve**.
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### Course

- Passes downward through the **femoral triangle**, then enters the **adductor canal**.
  - Terminates at the **adductor hiatus**, where it continues as the **popliteal artery**.
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### Relations

- **Anteriorly:** Skin, fasciae, superficial branches, and femoral branch of genitofemoral nerve.
- **Posteriorly:** Psoas major, pectineus, adductor longus, and adductor magnus.

- **Medially:** Femoral vein.
  - **Laterally:** Femoral nerve and its branches.
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## Branches

### In the Femoral Triangle

#### Superficial Branches

1. **Superficial external pudendal artery** – to skin of scrotum/labia and lower abdominal wall.
2. **Superficial epigastric artery** – to lower part of anterior abdominal wall.
3. **Superficial circumflex iliac artery** – to skin and fascia along iliac crest.

#### Deep Branches

1. **Profunda femoris artery** – chief artery of the thigh.
  2. **Deep external pudendal artery** – to external genitalia.
  3. **Muscular branches** – to sartorius, quadriceps, and adductors.
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#### Profunda Femoris Artery

- Arises from the **lateral side of the femoral artery**, about **4 cm below the inguinal ligament**.
- Descends **posterior to the femoral vessels**, passing between adductor muscles.

- Gives off:
    - **Medial circumflex femoral artery** – to head and neck of femur and adductors.
    - **Lateral circumflex femoral artery** – divides into ascending, transverse, and descending branches.
    - **Perforating arteries (4 in total)** – pierce adductor magnus to supply the posterior thigh.
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## Clinical Anatomy of Femoral Artery

- **Pulse:** Felt at the **midinguinal point**, midway between ASIS and pubic symphysis.
  - **Compression:** Can be pressed against the femoral head to control bleeding.
  - **Catheterization:** Common access site for diagnostic and interventional cardiac procedures.
  - **Aneurysm:** Appears as a pulsatile swelling in the upper thigh.
  - **Occlusion:** Causes feeble or absent femoral pulse; may indicate coarctation or thrombosis.
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## Femoral Vein

### Origin

- Continuation of the **popliteal vein** at the **lower end of the adductor canal**.
  - Ends by becoming the **external iliac vein** behind the **inguinal ligament**.
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## Course and Relations

- Lies **medial to the artery** in upper thigh, **posterior** to it at the apex of femoral triangle, and **lateral** at the lower end.

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## Tributaries

1. **Great saphenous vein.**
2. Veins accompanying **profunda femoris**, **deep external pudendal**, and **muscular branches.**
3. **Lateral and medial circumflex femoral veins.**
4. **Descending genicular vein.**

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## Clinical Notes

- Used for **intravenous infusion** in infants and in adults with **collapsed peripheral veins.**
- Injury may occur during venous puncture at the femoral triangle.

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## Femoral Nerve

### Origin and Root Value

- Arises from **posterior divisions of L2, L3, and L4** spinal nerves of the **lumbar plexus.**
- It is the **largest branch** of the lumbar plexus.

## Course

- Enters the thigh **behind the inguinal ligament, lateral to the femoral artery.**
  - Lies in the groove between **psoas major** and **iliacus.**
  - Divides into **anterior and posterior divisions** about 2.5 cm below the inguinal ligament.
  - The **lateral circumflex femoral artery** passes between these two divisions.
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## Branches and Distribution

### 1. Muscular Branches

- **From the trunk:** To iliacus and pectineus.
- **From anterior division:** To sartorius.
- **From posterior division:** To rectus femoris, vastus lateralis, vastus intermedius, vastus medialis, and articularis genu.
  - Nerve to vastus medialis carries **proprioceptive fibers** for the knee joint.

### 2. Cutaneous Branches

- **From anterior division:** Intermediate and medial cutaneous nerves of thigh.
- **From posterior division:** Saphenous nerve (continues to leg and foot).

### 3. Articular Branches

- **Hip joint:** From nerve to rectus femoris.

- **Knee joint:** From nerves to vasti muscles.
  - Follows *Hilton's Law* – a nerve supplying a muscle also supplies the joint the muscle acts upon.

#### 4. Vascular Branches

- Small branches to the **femoral artery and its branches.**
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### Clinical Anatomy of Femoral Nerve

- **Injury:**
    - Causes paralysis of **quadriceps femoris** ? loss of **knee extension**.
    - **Patellar reflex** is absent.
    - **Sensory loss** over anterior and medial thigh and medial leg (via saphenous nerve).
  - **Femoral nerve block:**
    - Performed for surgeries on the **knee joint** or **anterior thigh** to achieve regional anesthesia.
  - **Palsy:**
    - Results in difficulty **climbing stairs** or **rising from sitting position** due to weak quadriceps.
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#### Summary Table

STRUCTURE	KEY FEATURES	CLINICAL RELEVANCE
<b>Femoral artery</b>	Continuation of external iliac artery through femoral triangle	Pulse, catheterization, aneurysm
<b>Femoral vein</b>	Upward continuation of popliteal vein	IV access in infants, circulation collapse
<b>Femoral nerve</b>	L2–L4; divides into anterior and posterior divisions	Injury ? loss of knee extension, sensory loss

## Muscles of the Front of Thigh

### Main Muscles

#### 1. Sartorius

- Longest muscle in the body.
- **Origin:** Anterior superior iliac spine (ASIS).
- **Insertion:** Upper part of medial surface of tibia.
- **Nerve supply:** Femoral nerve.
- **Action:** Flexes thigh and leg, abducts and laterally rotates thigh.

#### 2. Quadriceps Femoris

- Large extensor muscle with **four heads:**

- **Rectus femoris:** From AIIIS; flexes thigh and extends leg.
- **Vastus lateralis:** From greater trochanter and linea aspera; extends leg.
- **Vastus medialis:** From intertrochanteric line and linea aspera; extends leg and prevents lateral patellar displacement.
- **Vastus intermedius:** From anterior femoral shaft; extends leg.
- **Nerve supply:** Femoral nerve.
- **Insertion:** Common tendon into the base of patella; via ligamentum patellae to tibial tuberosity.

### 3. Articularis Genu

- Small flat muscle deep to vastus intermedius.
- **Action:** Pulls synovial membrane of knee joint upward during extension to prevent pinching.

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## Iliacus and Psoas Major (Iliopsoas)

### Psoas Major

- **Origin:** Anterior surfaces and lower borders of transverse processes of lumbar vertebrae (T12–L5).
- **Insertion:** Joins tendon of iliacus to insert on **lesser trochanter of femur**.
- **Nerve supply:** Ventral rami of L1–L3.

- **Action:** Flexes thigh at hip joint; assists in flexion of trunk.

## Iliacus

- **Origin:** Upper two-thirds of iliac fossa, inner lip of iliac crest, and ventral sacroiliac ligaments.
  - **Insertion:** Lateral part of anterior surface of **lesser trochanter** (with psoas).
  - **Nerve supply:** Femoral nerve.
  - **Action:** Chief flexor of thigh; stabilizes hip joint during walking and standing.
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## Clinical Anatomy

### 1. Psoas Abscess

- Tubercular infection of lumbar vertebrae may spread along the psoas sheath into the **femoral triangle**, presenting as a swelling that mimics an enlarged lymph node.
- Flexion of thigh causes pain.

### 2. Patellar Reflex (Knee Jerk)

- Reflex contraction of quadriceps when **ligamentum patellae** is tapped.
- Tests **L3–L4 spinal segments** and integrity of **femoral nerve**.

### 3. Intramuscular Injection Site

- **Vastus lateralis** is a safe and preferred muscle for **IM injections** in infants and adults.

#### 4. Quadriceps Paralysis

- Injury to femoral nerve results in **loss of knee extension** and **absent patellar reflex**.

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## Adductor / Hunter's / Subsartorial Canal

### Overview

- Intermuscular passage on the **medial side of the middle one-third of thigh**.
- Also called **Hunter's canal** after John Hunter, who performed femoral artery ligation here for popliteal aneurysm

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### Extent

- **Superior limit:** Apex of femoral triangle.
- **Inferior limit:** Tendinous opening in adductor magnus.

### Shape

- **Triangular** in cross-section.

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### Boundaries

- **Anterolateral wall:** Vastus medialis.
  - **Posteromedial wall (floor):** Adductor longus (above) and adductor magnus (below).
  - **Medial wall (roof):** Strong fibrous membrane joining the other two walls; covered by sartorius muscle.
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## Contents

### 1. Femoral artery

- Gives muscular branches and **descending genicular artery** (divides into superficial and deep branches).
- Continues as **popliteal artery** through adductor hiatus.

### 2. Femoral vein – lies **posterior in upper part, lateral in lower part.**

### 3. Saphenous nerve – crosses artery from lateral to medial, exits through roof.

### 4. Nerve to vastus medialis – lateral to artery, enters muscle.

### 5. Branches of obturator nerve:

- *Anterior division ?* joins subsartorial plexus and supplies femoral artery.
  - *Posterior division ?* accompanies femoral vessels to the knee joint.
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## Subsartorial Plexus

- Lies on the fibrous roof under sartorius.

- Formed by branches of:
  - Medial cutaneous nerve of thigh
  - Saphenous nerve
  - Anterior division of obturator nerve
- Supplies skin and fascia over medial thigh

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## Dissection of Adductor Canal

- Reflect sartorius laterally to expose the **fibrous roof**.
- Identify:
  - **Femoral artery** and its **descending genicular branch**.
  - **Femoral vein** and its position relative to artery.
  - **Saphenous nerve** crossing artery from lateral to medial.
  - **Nerve to vastus medialis** entering muscle laterally.
- The canal opens distally into the **popliteal fossa** through the **adductor hiatus**.

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This completes the section on the **Muscles of the Front of Thigh, Iliopsoas Complex**, and **Adductor Canal** with its **Dissection and Clinical Correlations** — ideal for both dissection hall and exam revision.