It’s week 7 which means only one more week until spring break!! Keep pushing through this week so you can get some much-deserved rest next week. The resource is going to be a little longer this week because Dr. Parizi is covering lower limb musculature and two major nerve plexuses.

Remember: The tutoring center offers free individual and group tutoring for this course. Our group tutoring session will be Thursdays from 6:45-7:45 PM in the basement of Sid Rich, room 74. You can reserve your spot at https://baylor.edu/tutoring. Hope to see you there!

Keywords: Gluteal muscles, Lateral hip rotators, Muscles of the thigh and leg, Muscles of the foot, Brachial plexus, Lumbar plexus, Sciatic nerve, Cutaneous fields, Peripheral nerves

**Topics of the Week: Lower Limb Musculature, Brachial Plexus, and Lumbosacral Plexus**

**Gluteal muscles:**
Gluteus maximus – *inferior gluteal nerve*
Origin: ilium, sacrum, coccyx, and sacrotuberous ligament
Insertion: fascia lata, gluteal tuberosity
Action: *extends*, laterally rotates, and abducts hip joint

Gluteus medius and minimus – *superior gluteal nerve*
Origin: ilium
Insertion: greater trochanter
Action: hip abduction and pelvic stabilization

**Lateral hip rotators: PGOGO**

All of the lateral hip rotators are innervated by *lower lumbar nerves*. They all insert on the greater trochanter of the humerus.
**Muscles of the medial thigh compartment:** all function to adduct the thigh

Innervations:
- All adductors are innervated by **obturator nerve**.
  - 2 of these have **dual innervation**:
    - **Pectineus** is dually innervated by obturator and femoral nerves.
    - **Adductor magnus** is dually innervated by obturator and tibial nerves.

Origins: all adductors originate from the **pubic bone**
Insertions: all adductors insert onto **linea aspera except gracilis**: medial aspect of proximal tibia
- This is because gracilis does more than just adduct the thigh! It flexes and medially rotates the leg at the knee joint.

Link to Dr. Acland’s video on the hip adductors:

**Anterior thigh muscles:** all innervated by **femoral nerve**

**Quadriceps muscles:**

**Rectus femoris:**
- **Origin:** anterior inferior iliac spine (AIIS) – only quadricep muscle that originates from ABOVE the hip joint!
- **Insertion:** tibial tuberosity
- **Action:** flexes hip and extends the leg

**Vastus lateralis:**
- **Origin:** greater trochanter
- **Insertion:** tibial tuberosity
- **Action:** extends the leg

**Vastus medialis:**
- **Origin:** intertrochanteric line/linea aspera
- **Insertion:** tibial tuberosity
- **Action:** extends the leg

**Sartorius:** not a quadriceps muscle
- **Origin:** anterior superior iliac spine (ASIS)
- **Insertion:** medial tibia
- **Action:** flexes the hip
**Posterior thigh muscles:** hip extensors and leg flexors

All originate from the **ischial tuberosity** except for the **short head of biceps femoris** which originates from the femur.

All are innervated by **tibial nerve** except for the **short head of biceps femoris** which is innervated by common fibular nerve.

**Anterior muscles of the leg:** all innervated by **deep fibular nerve**

**Anterior tibialis (Tom)**
Insertion: first cuneiform and first metatarsal
Action: dorsiflexion and inversion of the foot

**Extensor digitorum longus (Dick)**
Insertion: dorsal aspect of middle and distal phalanges 2, 3, 4, and 5
Action: extension of lesser toes and dorsiflexion of the foot

**Extensor hallucis longus (Harry)**
Insertion: dorsal aspect of distal phalanx of hallux (big toe)
Action: extension of hallux and dorsiflexion of ankle

**Posterior muscles of the leg:** all innervated by **tibial nerve**

**Gastrocnemius**
Origin: medial and lateral condyles of the femur
Insertion: posterior surface of calcaneus via calcaneal tendon
Action: plantarflexes the foot and extends the knee

**Soleus**
Origin: head of fibula, soleal line, and medial border of the tibia
Insertion: posterior surface of calcaneus via calcaneal tendon
Action: plantarflexes the foot

**Posterior tibialis (Tom)**
Insertion: navicular
Action: inverts and plantarflexes foot

**Flexor digitorum longus (Dick)**
Insertion: plantar aspect of middle and distal phalanges 2, 3, 4, and 5
Action: flexes lesser toes and plantar flexes foot

**Flexor hallucis longus (Harry)**
Insertion: plantar aspect of distal phalanx of hallux
Action: flexes hallux and plantar flexes foot
Lateral muscles of the leg:
Fibularis brevis
Insertion: 5th metatarsal
Action: everts foot and assists in plantarflexion
Innervation: superficial fibular nerve
Fibularis longus
Insertion: 1st metatarsal
Action: everts foot and assists in plantarflexion
Innervation: superficial fibular nerve
Fibularis tertius (found in the anterior compartment, but everts the foot)
Insertion: 1st metatarsal
Action: everts foot; weak dorsiflexor
Innervation: deep fibular nerve

Muscles of the foot:
Extensor digitorum brevis and extensor hallucis brevis: both innervated by deep fibular nerve and extend the digits
Plantar foot muscles innervation: LAFF
L = first lumbrical
A = abductor hallucis
F = flexor digitorum brevis
F = flexor hallucis brevis
All others are innervated by lateral plantar nerve.

Brachial plexus: the best thing you can do to study the brachial plexus is to draw it from memory!
This is the brachial plexus diagram I drew as a study tool when I was taking the class.

**Lumbar plexus:** L1 – L4  
Important nerves:  
- Genitofemoral (L1-L2)  
- Lateral femoral cutaneous (L2-L3)  
- Obturator (L2-L4)  
- Femoral (L2-L4)  
*the muscles these nerves innervate are mentioned in the topics above, or will be mentioned later on in the course*

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**Highlight #1: Sciatic Nerve**

![Sciatic Nerve Diagram](https://miro.com)

**Tibial Nerve:** posterior thigh and leg (except for short head of biceps femoris)  
**Common Fibular Nerve:** short head of biceps femoris  
**Medial Plantar Nerve:** L.A.F.F.  
**Lateral Plantar Nerve:** all other plantar foot muscles  
**Superficial Fibular Nerve:** fibularis longus and fibularis brevis  
**Deep Fibular Nerve:** anterior leg and foot, fibularis tertius

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**Highlight #2: Dermatomes and Cutaneous Fields**

The following information is from the Noted Anatomist’s video on dermatomes and cutaneous fields: [https://www.youtube.com/watch?v=FpdL24OUYMs](https://www.youtube.com/watch?v=FpdL24OUYMs)

**Overview:**  
A dermatome is an area of skin supplied by sensory neurons from a single spinal cord level. To lose sensation in an entire dermatome, an injury has to occur to a ventral ramus (i.e., C5, C6, etc.).
A **cutaneous field** is an area of skin supplied by sensory neurons from a single **peripheral nerve** which may be distributed by more than one spinal cord level (i.e., radial nerve comes from C5-T1). Injury to a **peripheral nerve** results in loss of sensation in the corresponding cutaneous field.

The cutaneous fields:

1. Lateral side of the shoulder → **axillary nerve**
2. Posterior side of the arm → **radial nerve**
3. Posterior side of the forearm → **radial nerve**
4. Medial side of the forearm → **medial cutaneous nerve of forearm**
5. Lateral side of forearm → **musculocutaneous**
6. The hand:
   a. Medial anterior and posterior surface → **ulnar nerve**
   b. Digits 1, 2, and 3, and medial half of 4 → **median nerve**
   c. Posterior surface of the thumb → **radial nerve**
7. Medial side of the thigh → **anterior femoral cutaneous nerve**
8. Lateral side of the thigh → **lateral femoral cutaneous nerve**
9. Medial side of the leg → **saphenous nerve**
10. Lateral side of the leg → **sural nerve**
11. Anterior side of the leg and dorsal side of the foot → **superficial fibular nerve**
12. Skin between the first and second toes → **deep fibular nerve**
13. Plantar surface of the foot → **medial plantar nerve, lateral plantar nerve, saphenous nerve, sural nerve, and tibial nerve**

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**Highlight #3: Myotomes and Peripheral Nerves**

The following information is from the Noted Anatomist’s video on myotomes and peripheral nerves: [https://www.youtube.com/watch?v=4fMgypHEozo](https://www.youtube.com/watch?v=4fMgypHEozo)

Overview:

A **myotome** is a muscle supplied by motor neurons at a **single spinal cord level**. The muscle can be supplied by more than one nerve (i.e., how the median and radial nerves both come room C6). Injury to a **nerve root or trunk** results in strength loss in that corresponding myotome.

Muscles can be supplied by motor neurons from a single **peripheral nerve**. Peripheral nerves can arise from more than one spinal cord level (i.e., radial nerve C5-T1). Injury to a **peripheral nerve** results in strength loss in all muscles supplied by that nerve.

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**Week 7 Knowledge Checkpoint:**

1. Which nerve innervates the Gluteus Maximus?
   a. Sciatic nerve
   b. Inferior Gluteal nerve
   c. Superior Gluteal nerve
   d. Tibial nerve
2. If a patient presents with Sciatic nerve damage, which of the following muscles may be weakened?
   a. Biceps brachii
   b. Tibialis Anterior
   c. Piriformis
   d. Plantaris

3. Using the following screenshot from the Noted Anatomist, identify the corresponding letters to the area(s) of skin that would lose sensation if the indicated nerve on the branchial plexus was injured.

4. Identify the indicated nerve.

THINGS YOU MAY STRUGGLE WITH!

1. **Myotomes v. peripheral nerves and dermatomes v. cutaneous fields:** This concept is typically challenging. Make sure you watch the Noted Anatomist’s videos on these two topics to really get them down!
2. *The brachial plexus:* As I mentioned earlier, drawing the brachial plexus by memory is the best way to solidify the information. Once you can do that, you’ll be able to answer any test question with confidence!
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Answers
1. b
2. b
3. d and e
4. radial nerve