

# Module 12 LO2

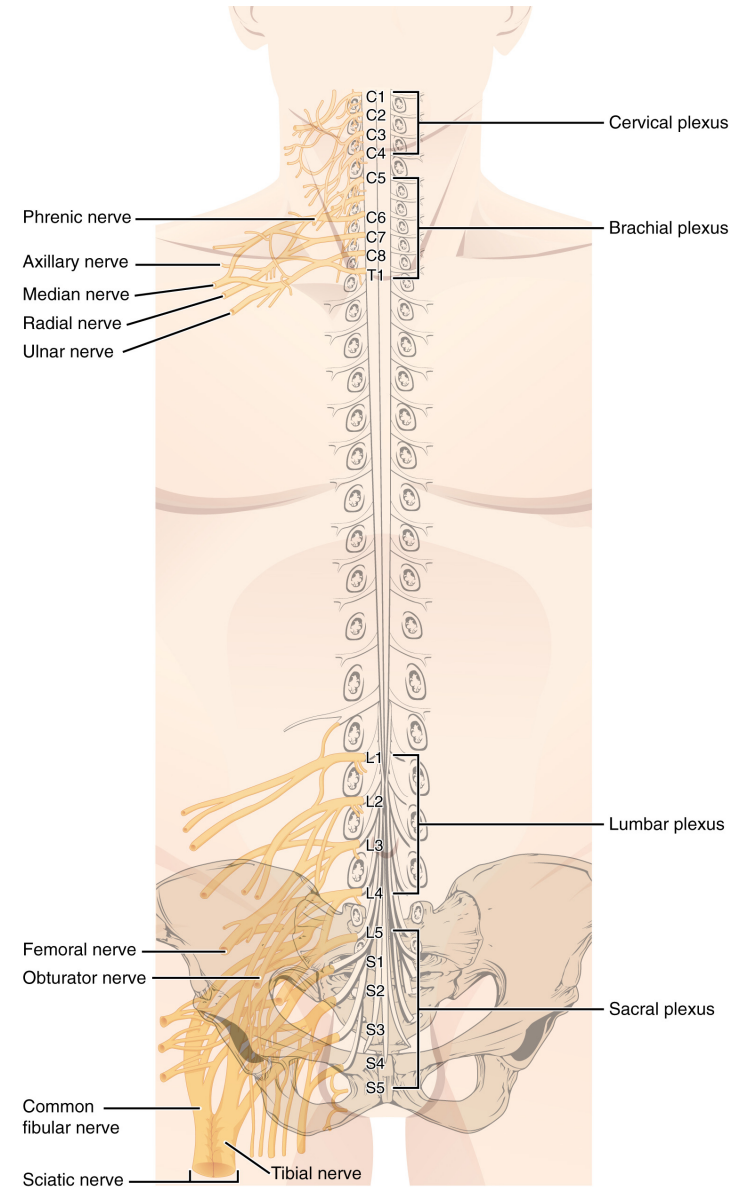
## Spinal Nerves

Dr. Lisa Brinn

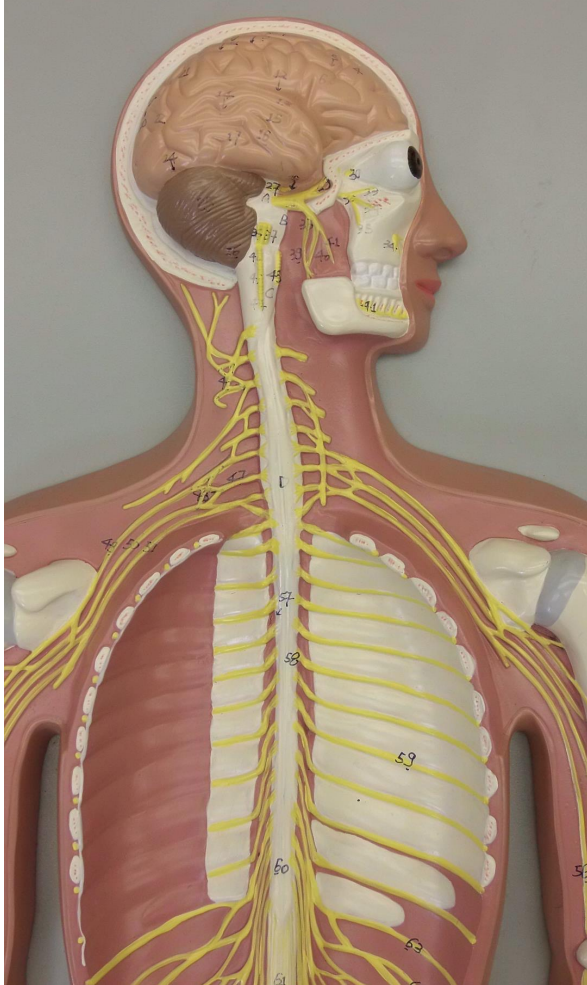
[lbrinn@fiu.edu](mailto:lbrinn@fiu.edu)

## 2. Spinal Nerves

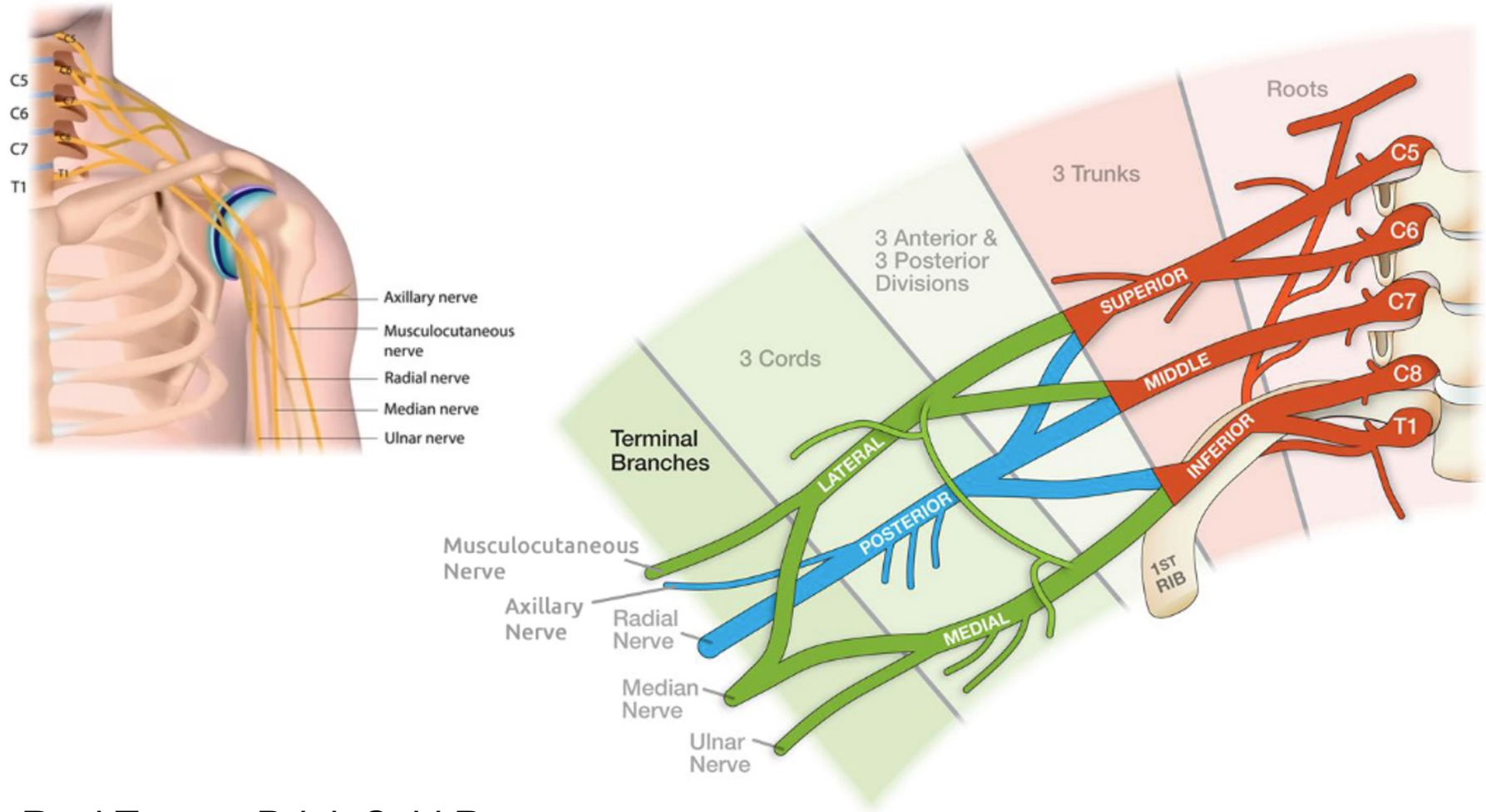
- 31 pairs of spinal nerves
  - Cervical – 8 pairs
    - C1-C8
  - Thoracic – 12 pairs
    - T1-T12
  - Lumbar – 5 pairs
    - L1-L5
  - Sacral – 5 pairs
    - S1-S5
  - Coccygeal – 1 pair
- Nerve plexus
  - Axons from different spinal nerves come together into a systemic nerve
    - A. Cervical plexus
    - B. Brachial plexus
    - C. Lumbar plexus
    - D. Sacral plexus



# A. Cervical Plexus



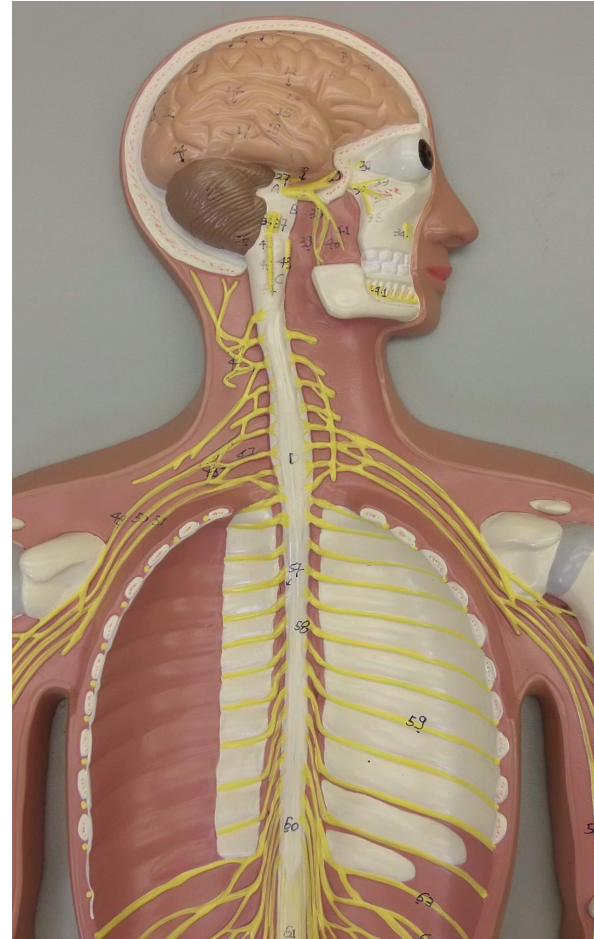
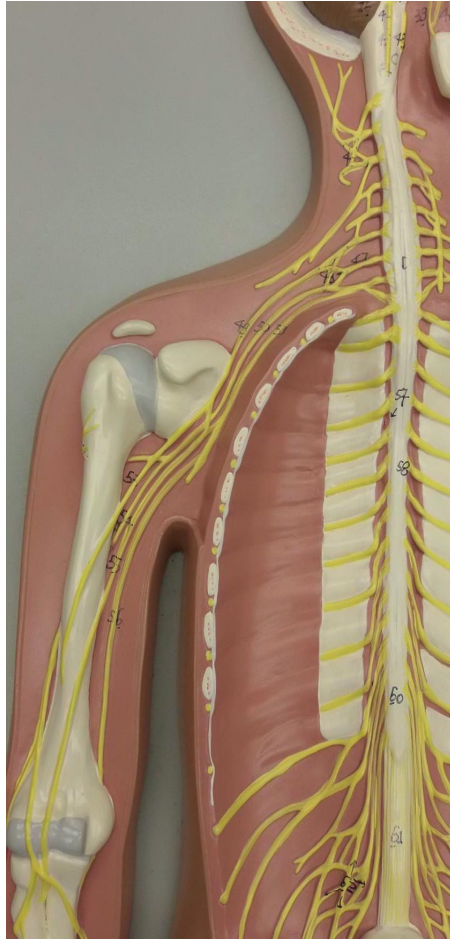
## B. Brachial Plexus



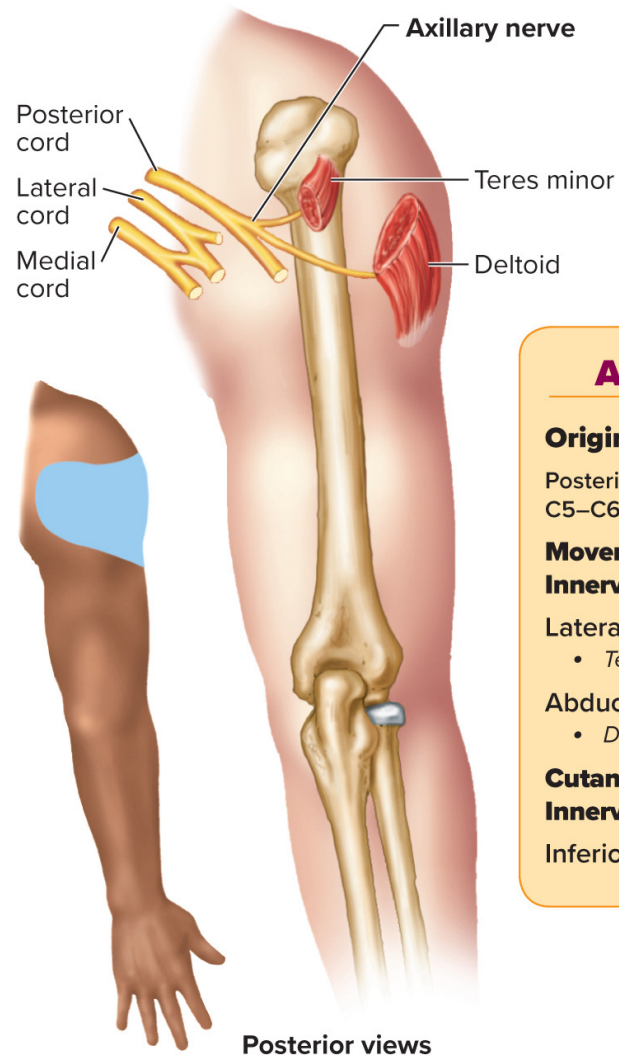
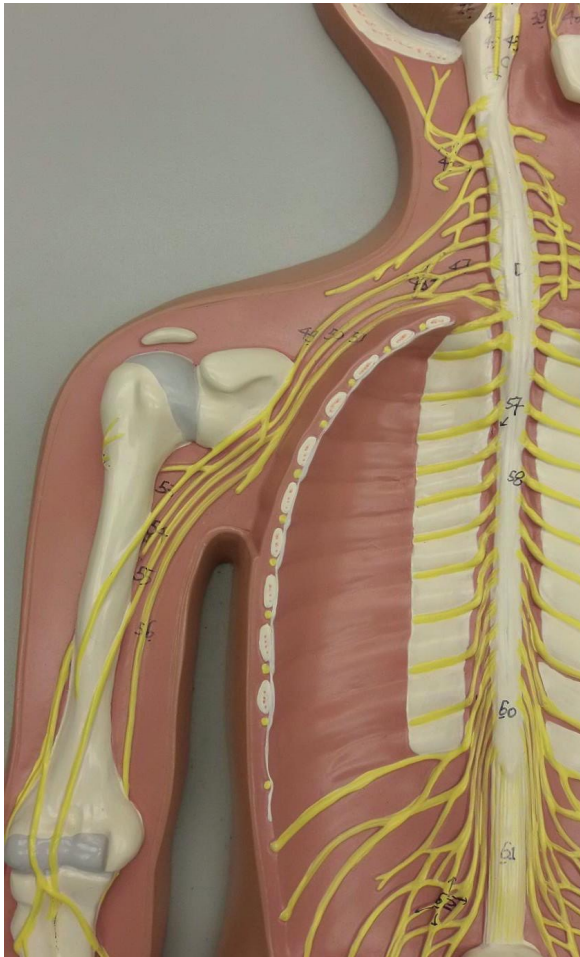
Real Texans Drink Cold Beer



# Brachial Plexus Lab Model



# Axillary Nerve



## Axillary Nerve

### Origin

Posterior cord of brachial plexus, C5–C6

### Movements/Muscles Innervated

Laterally rotates arm

- *Teres minor*

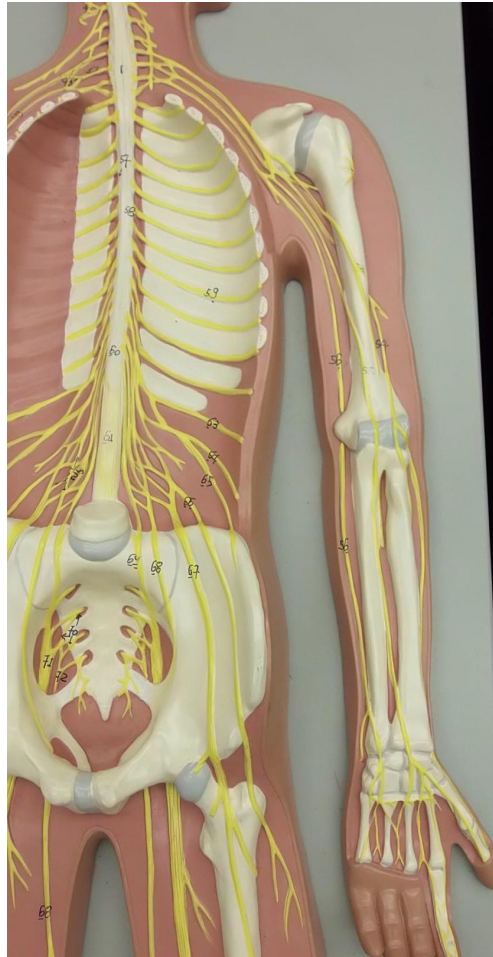
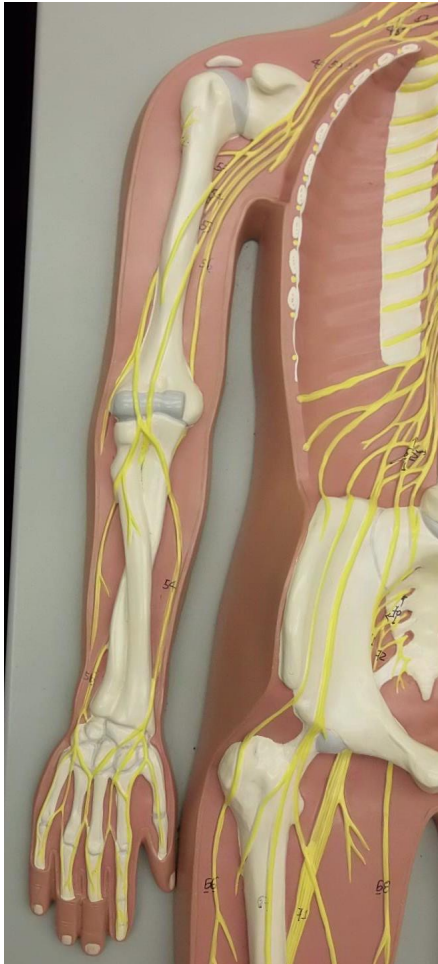
Abducts arm

- *Deltoid*

### Cutaneous (Sensory) Innervation

Inferior lateral shoulder

# Radial Nerve



## Radial Nerve

### Origin

Posterior cord of brachial plexus, C5-T1

### Movements/Muscles Innervated

#### Extends elbow

- *Triceps brachii*
- *Anconeus*

#### Flexes elbow

- *Brachialis* (part: sensory only)
- *Brachioradialis*

#### Extends and abducts wrist

- *Extensor carpi radialis longus*
- *Extensor carpi radialis brevis*

#### Supinates forearm and hand

- *Supinator*

#### Extends fingers

- *Extensor digitorum*
- *Extensor digiti minimi*
- *Extensor indicis*

#### Extends and adducts wrist

- *Extensor carpi ulnaris*

#### Abducts thumb

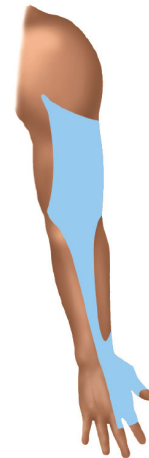
- *Abductor pollicis longus*

#### Extends thumb

- *Extensor pollicis longus*
- *Extensor pollicis brevis*

### Cutaneous (Sensory) Innervation

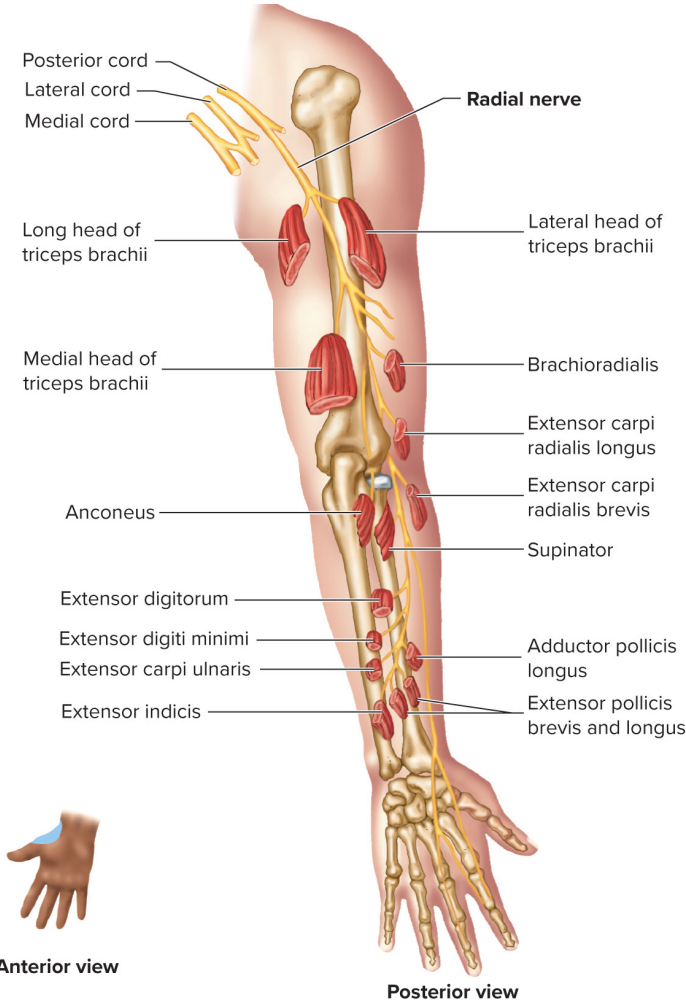
Posterior surface of arm and forearm, lateral two-thirds of dorsum of hand



Posterior view

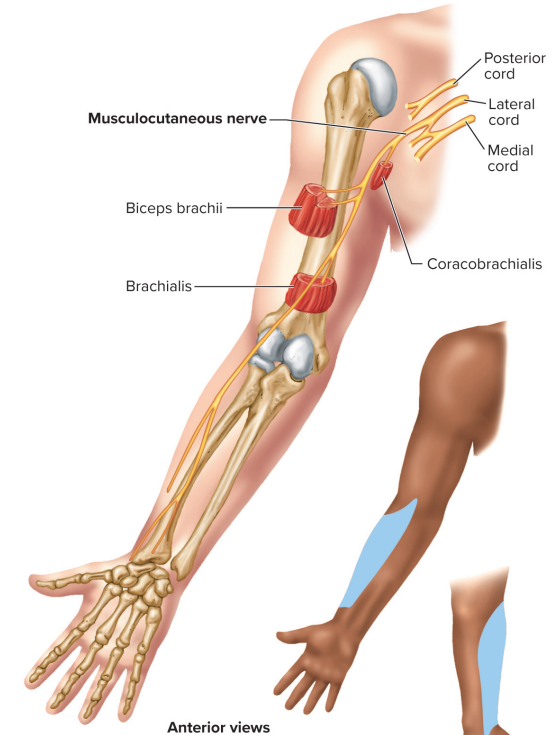


Anterior view





# Musculocutaneous Nerve



## Musculocutaneous Nerve

### Origin

Lateral cord of brachial plexus, C5–C7

### Movements/Muscles Innervated

#### Flexes shoulder

- Biceps brachii
- Coracobrachialis

#### Flexes elbow and supinates forearm and hand

- Biceps brachii

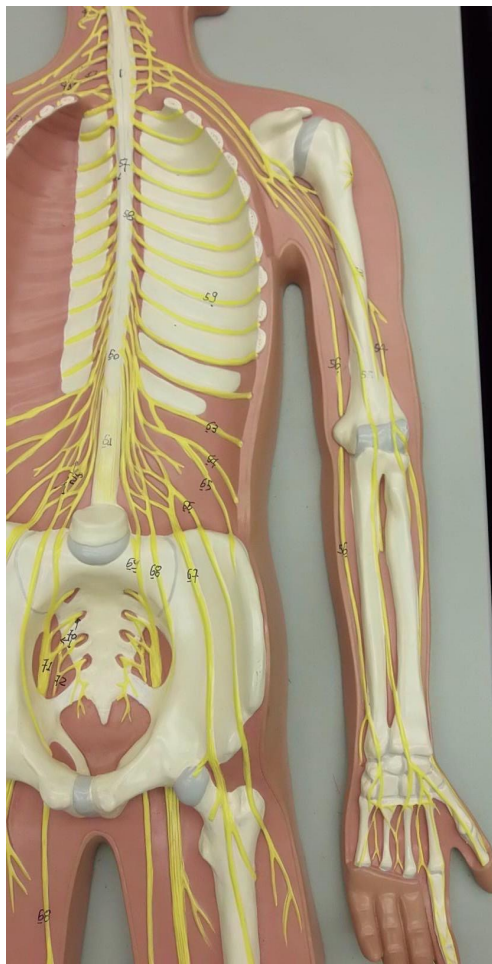
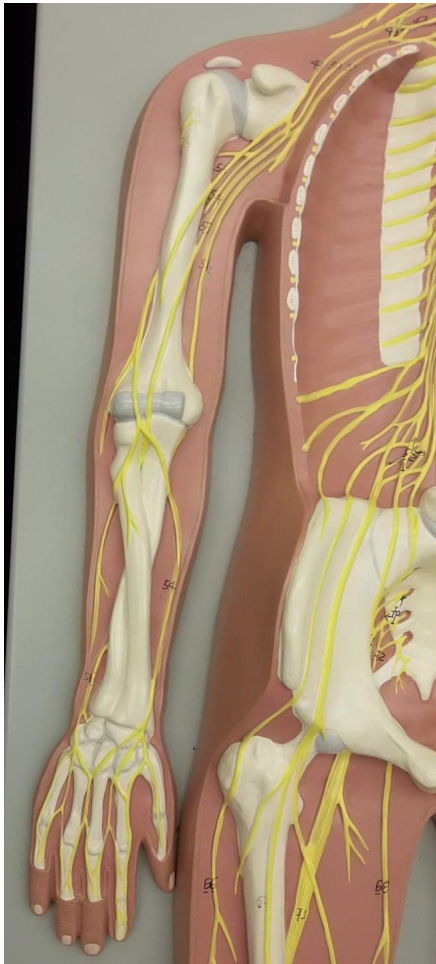
#### Flexes elbow

- Brachialis (also small amount of innervation from radial nerve)

### Cutaneous (Sensory) Innervation

Lateral surface of forearm

# Ulnar Nerve



## Ulnar Nerve

### Origin

Medial cord of brachial plexus, C8–T1

### Movements/Muscles Innervated

Flexes and adducts wrist

- *Flexor carpi ulnaris*

### Flexes fingers

- Part of the *flexor digitorum profundus* controlling the distal phalanges of little and ring fingers

### Adducts thumb

- *Adductor pollicis*

### Controls hypothenar muscles

- *Flexor digiti minimi brevis*
- *Adductor digiti minimi*
- *Opponens digiti minimi*

### Flexes metacarpophalangeal joints and extends interphalangeal joints

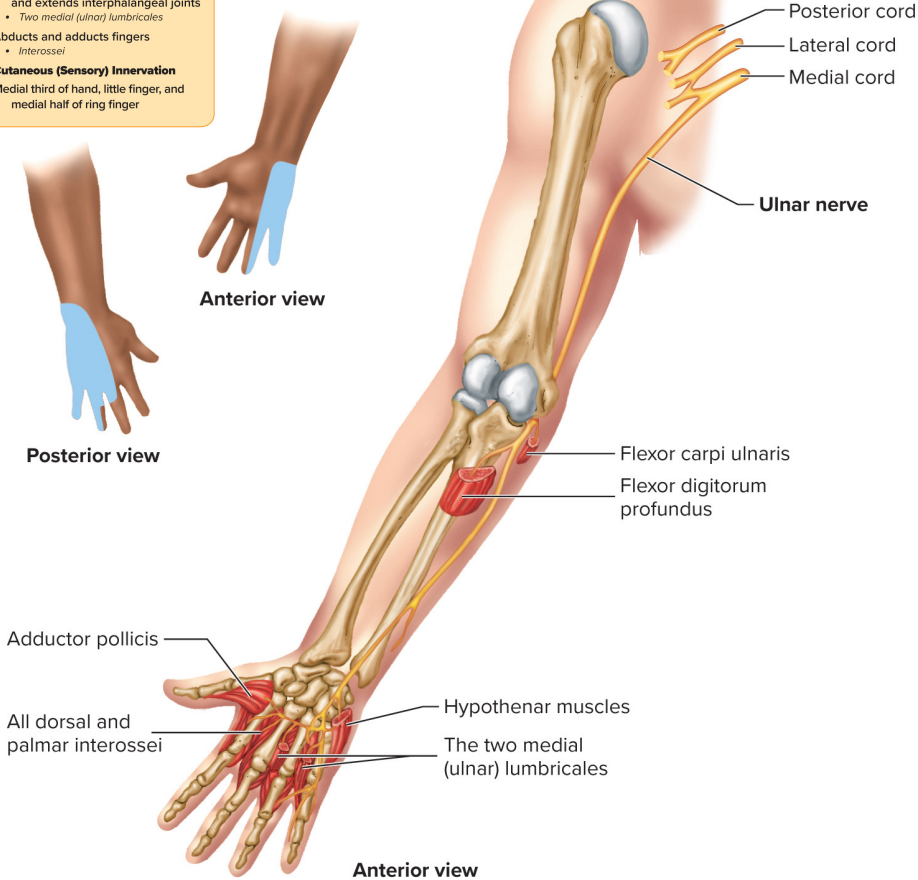
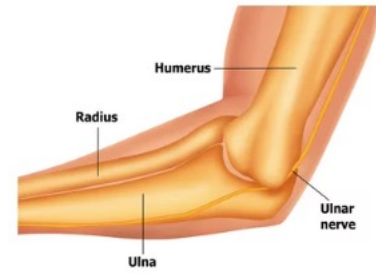
- Two medial (ulnar) lumbricales

### Abducts and adducts fingers

- *Interossei*

### Cutaneous (Sensory) Innervation

Medial third of hand, little finger, and medial half of ring finger





# Median Nerve

## Median Nerve

### Origin

Medial and lateral cords of brachial plexus,  
C5–T1

### Movements/Muscles Innervated

Pronates forearm and hand

- *Pronator teres*
- *Pronator quadratus*

Flexes and abducts wrist

- *Flexor carpi radialis*

Flexes wrist

- *Palmaris longus*

Flexes fingers

- Part of *flexor digitorum profundus* controlling the distal phalanx of the middle and index fingers
- *Flexor digitorum superficialis*

Controls thumb muscle

- *Flexor pollicis longus*

Controls thenar muscles

- *Abductor pollicis brevis*
- *Opponens pollicis*
- *Flexor pollicis brevis*

Flexes metacarpophalangeal joints and extends interphalangeal joints

- Two lateral (radial) lumbricales

**Cutaneous (Sensory) Innervation**

Lateral two-thirds of palm of hand, thumb, index and middle fingers, and the lateral half of ring finger and dorsal tips of the same fingers

# Upper Limb Lab Models



ANTERIOR



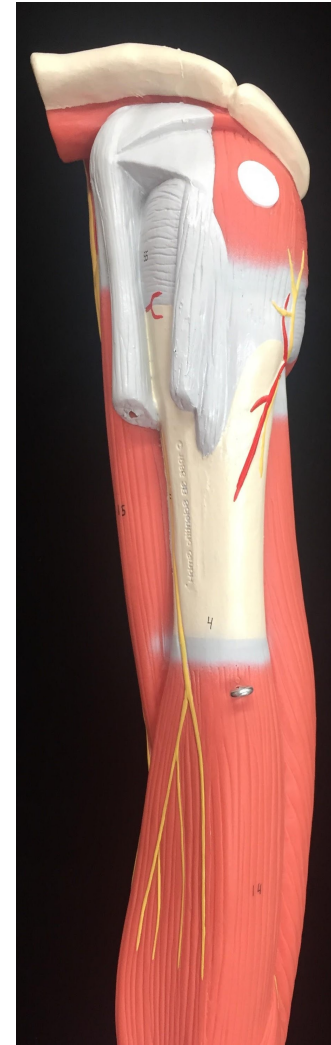
ANTERIOR



LATERAL



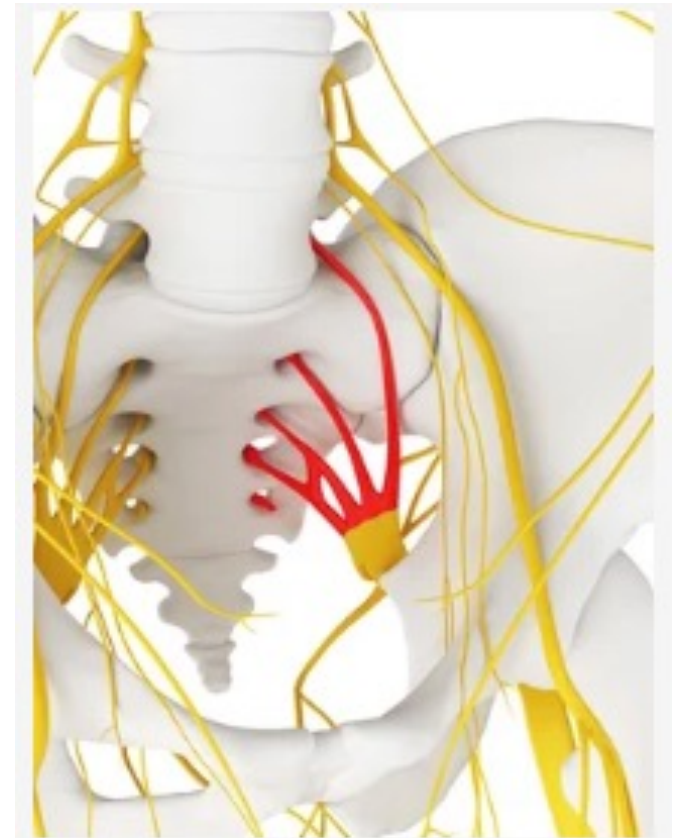
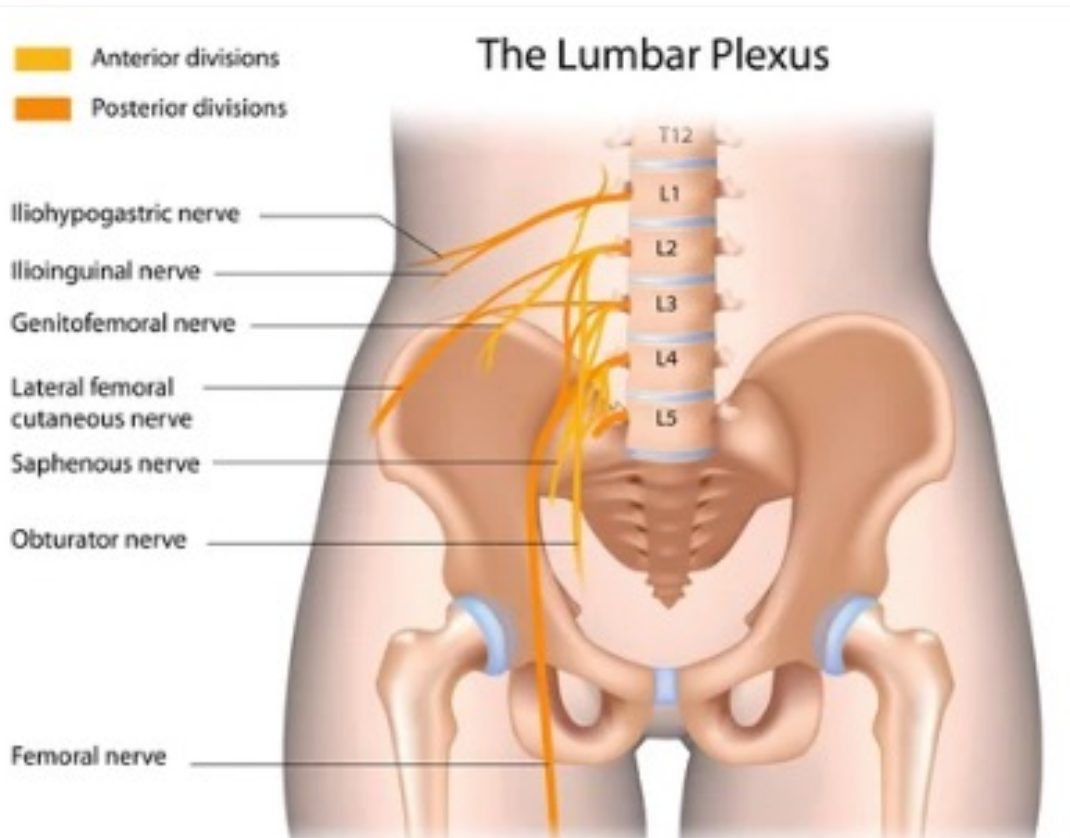
POSTERIOR



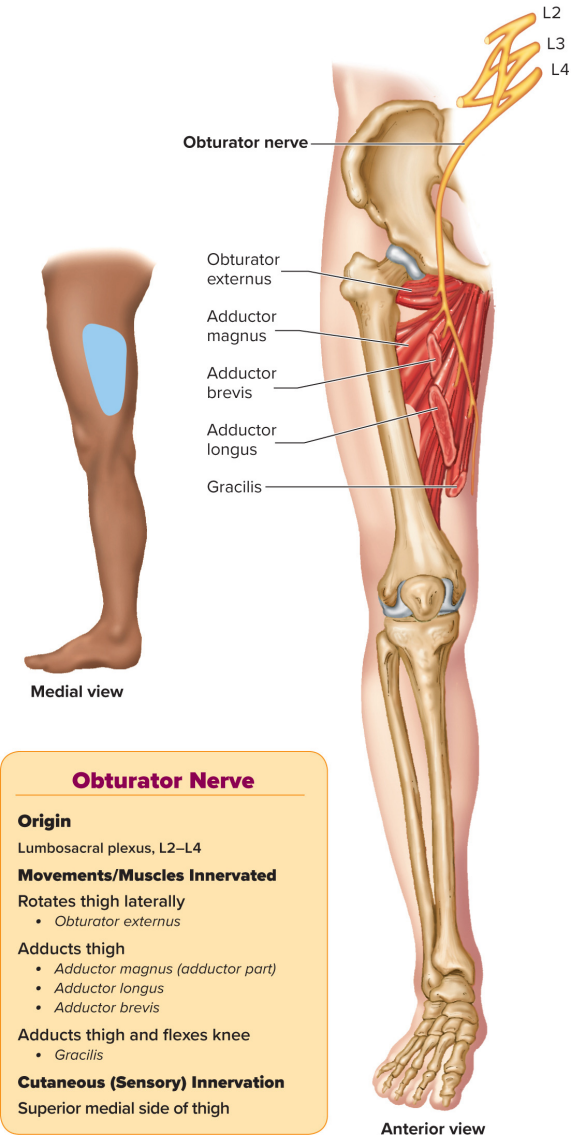
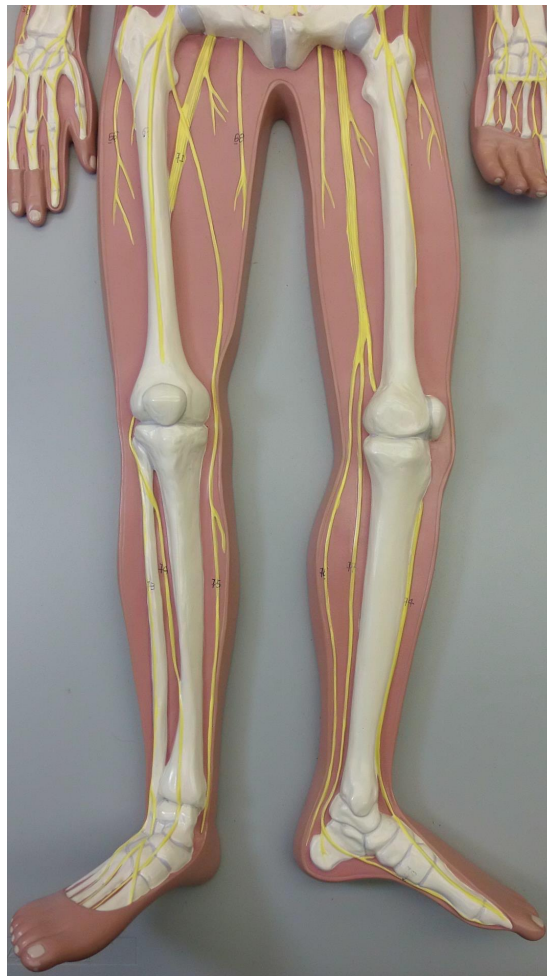
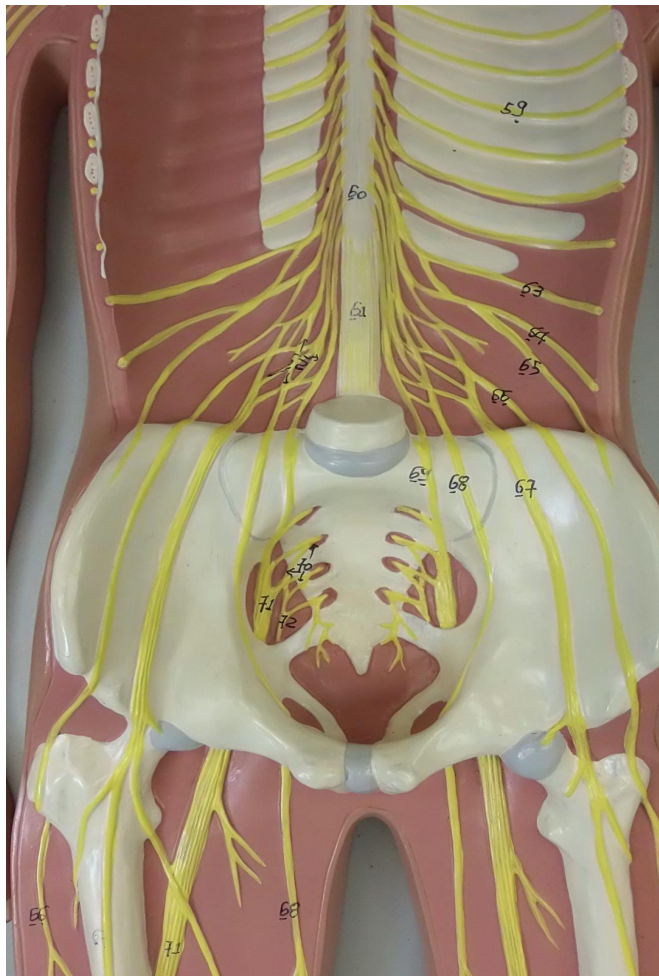
LATERAL



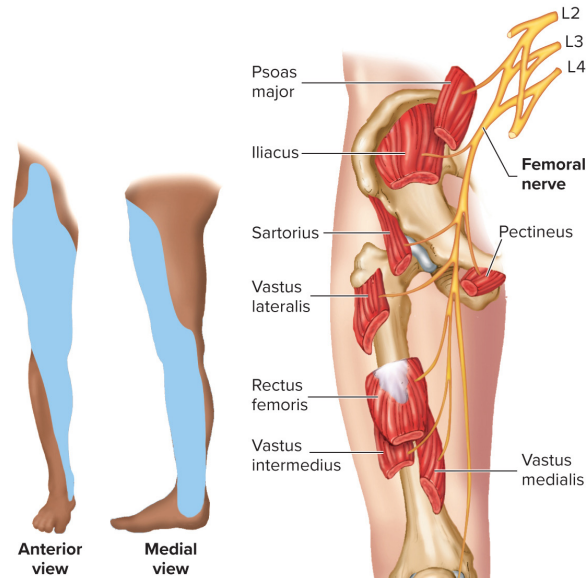
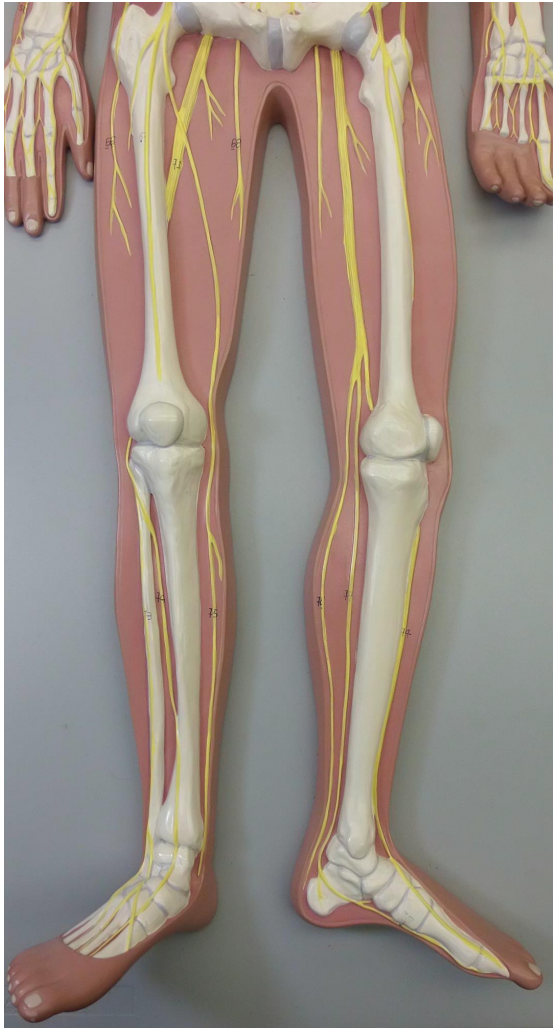
# C and D. Lumbar and Sacral Plexuses



# Obturator Nerve



# Femoral Nerve



## Femoral Nerve

### Origin

Lumbosacral plexus, L2–L4

### Movements/Muscles Innervated

#### Flexes hip

- *Psoas major*
- *Iliacus*
- *Pectineus*

#### Flexes hip and flexes knee

- *Sartorius*

#### Extends knee

- *Vastus lateralis*
- *Vastus intermedius*
- *Vastus medialis*

#### Extends knee and flexes hip

- *Rectus femoris*

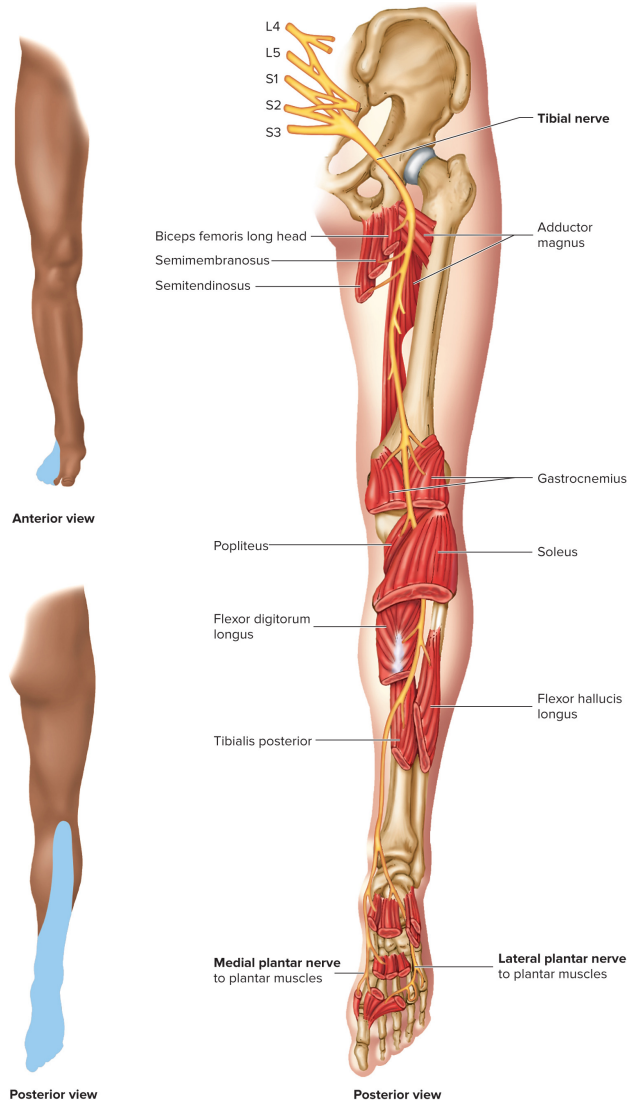
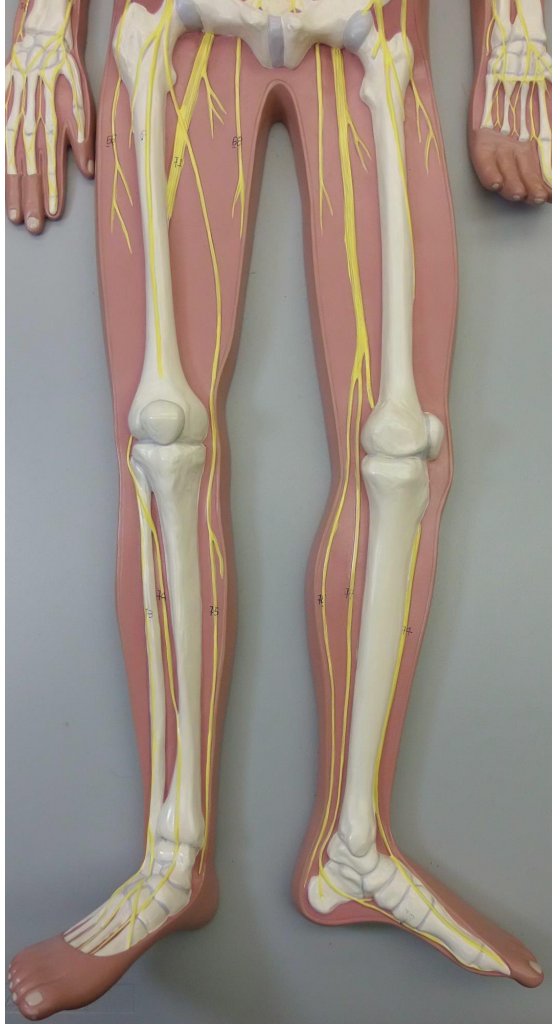
### Cutaneous (Sensory) Innervation

Anterior and lateral branches supply the anterior and lateral thigh; saphenous branch supplies the medial leg and foot

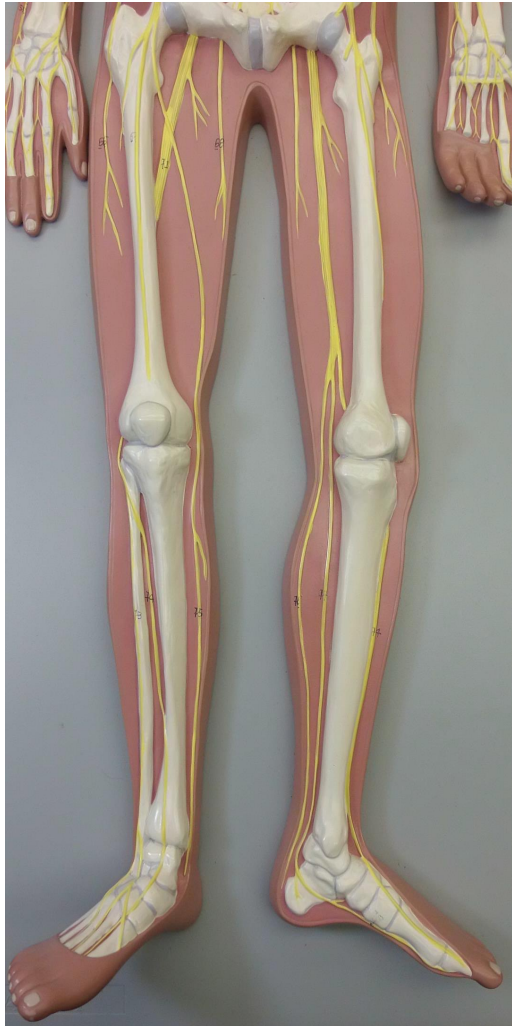
Anterior view



# Sciatic Nerve



# Tibial Nerve



## Tibial Nerve

### Origin

Lumbosacral plexus, L4–S3

### Movements/Muscles Innervated

**Extends hip and flexes knee**

- *Biceps femoris (long head)*
- *Semitendinosus*
- *Semimembranosus*

**Extends hip and adducts thigh**

- *Adductor magnus (hamstring part)*

**Plantar flexes foot**

- *Plantaris*
- *Gastrocnemius*
- *Soleus*
- *Tibialis posterior*

**Flexes knee**

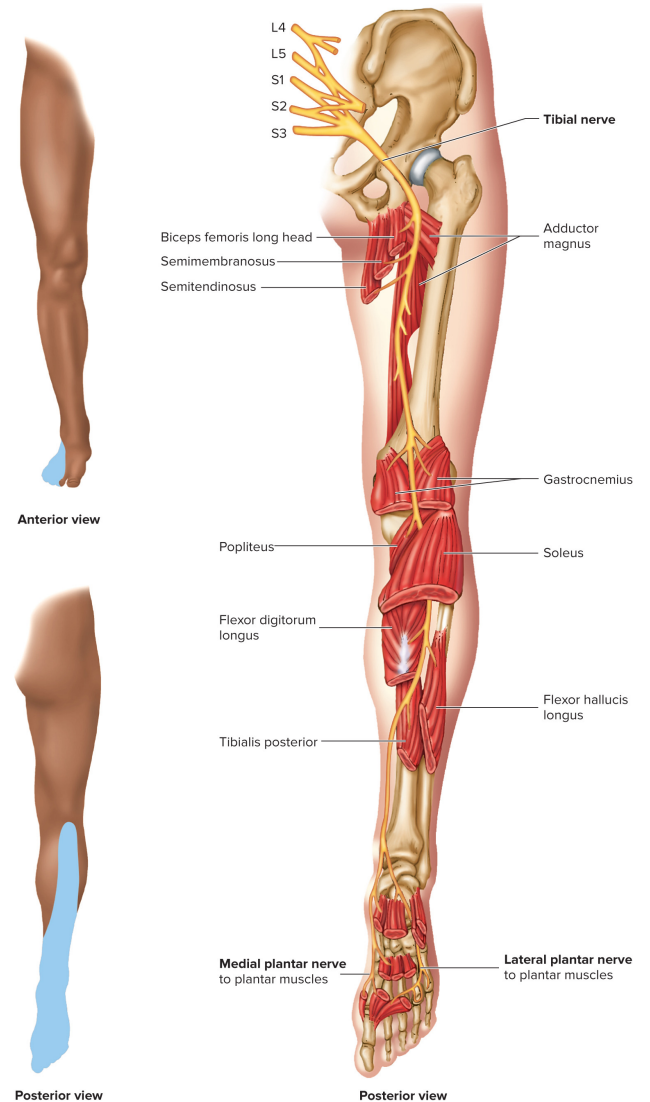
- *Popliteus*

**Flexes toes**

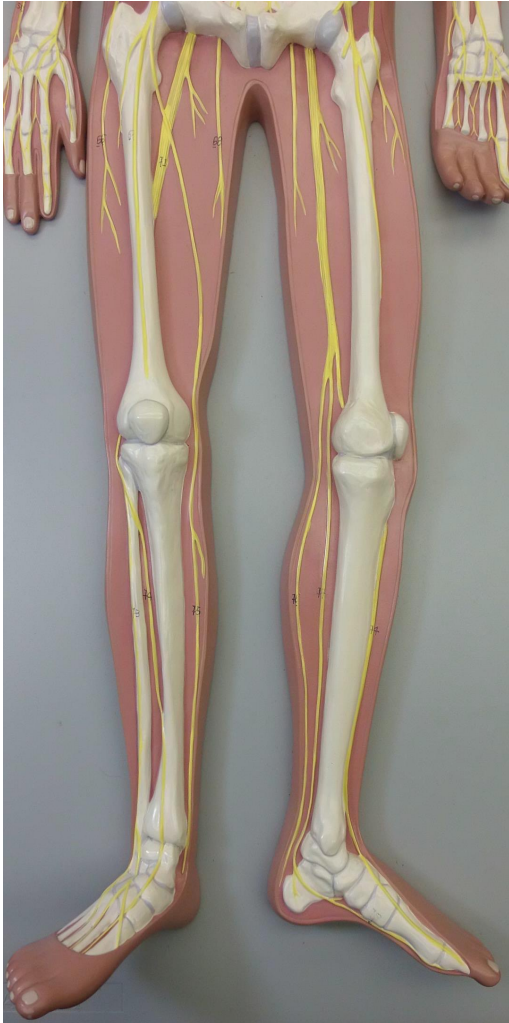
- *Flexor digitorum longus*
- *Flexor hallucis longus*

**Cutaneous (Sensory) Innervation**

None



# Common Fibular Nerve



## Common Fibular (Peroneal) Nerve

### Origin

Lumbosacral plexus, L4–S2

### Movements/Muscles Innervated

Extends hip and flexes knee

- *Biceps femoris (short head)*

### Cutaneous (Sensory) Innervation

Lateral surface of knee

## Deep Fibular (Peroneal) Nerve

### Origin

Common fibular (peroneal) nerve

### Movements/Muscles Innervated

Dorsiflexes foot

- *Tibialis anterior*
- *Fibularis tertius*

Extends toes

- *Extensor digitorum longus*
- *Extensor hallucis longus*
- *Extensor digitorum brevis*

### Cutaneous (Sensory) Innervation

Great and second toes

## Superficial Fibular (Peroneal) Nerve

### Origin

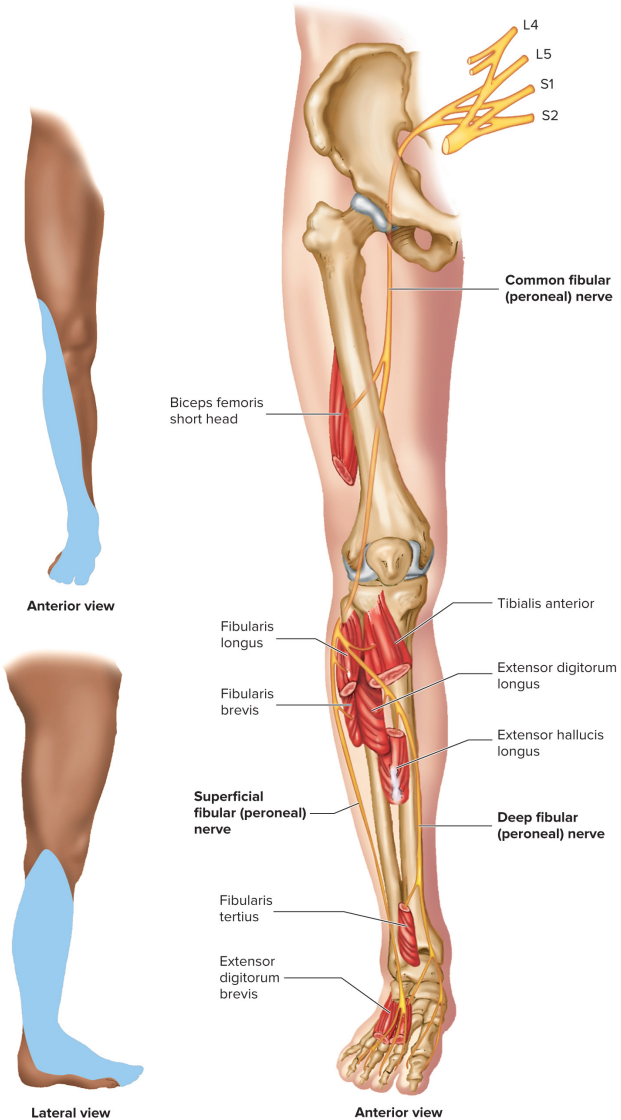
Common fibular (peroneal) nerve

### Movements/Muscles Innervated

Plantar flexes and everts foot

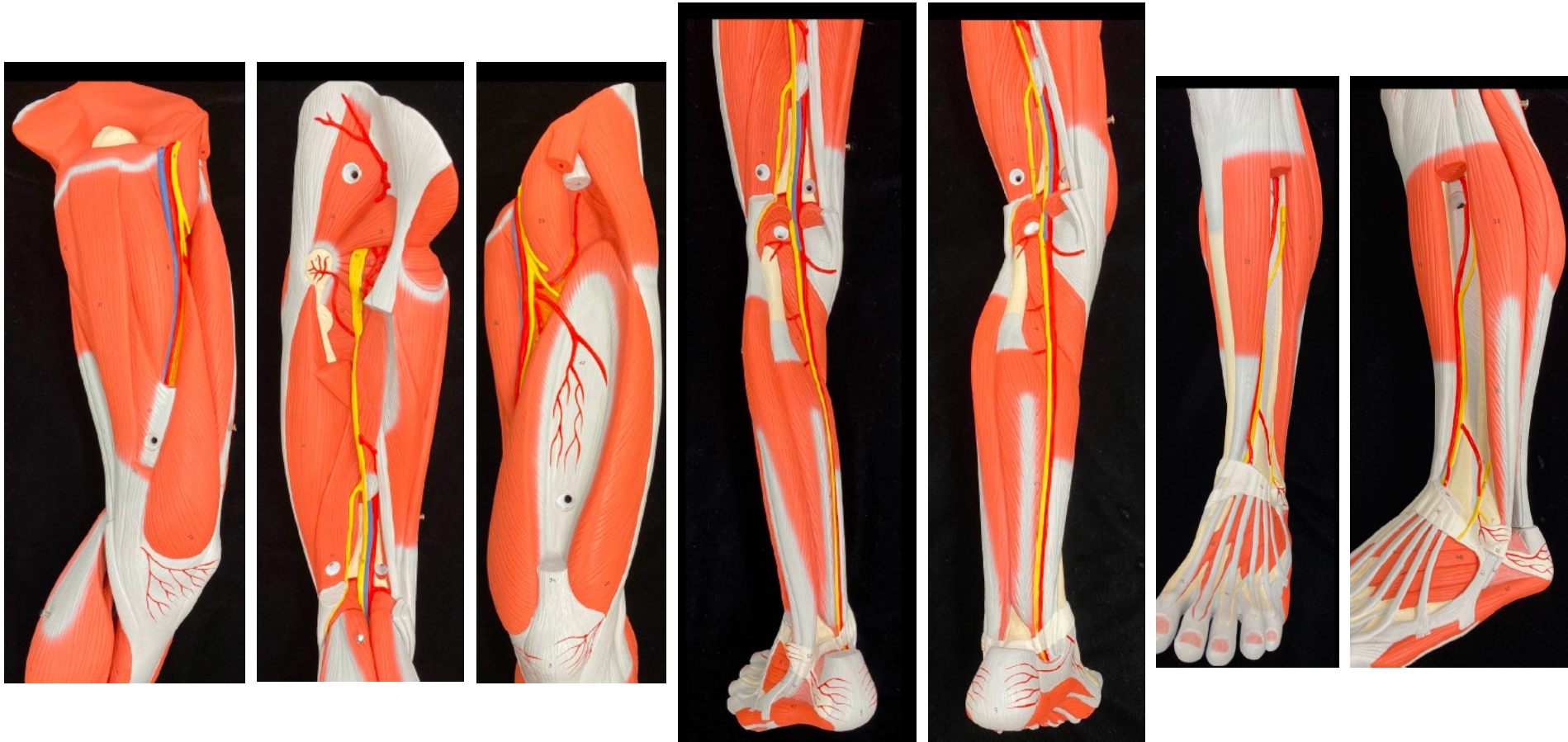
- *Fibularis longus*
- *Fibularis brevis*

**Cutaneous (Sensory) Innervation**  
Dorsal anterior third of leg and dorsum of foot





# Lower Limb Lab Models



MEDIAL

POSTERIOR

ANTERIOR

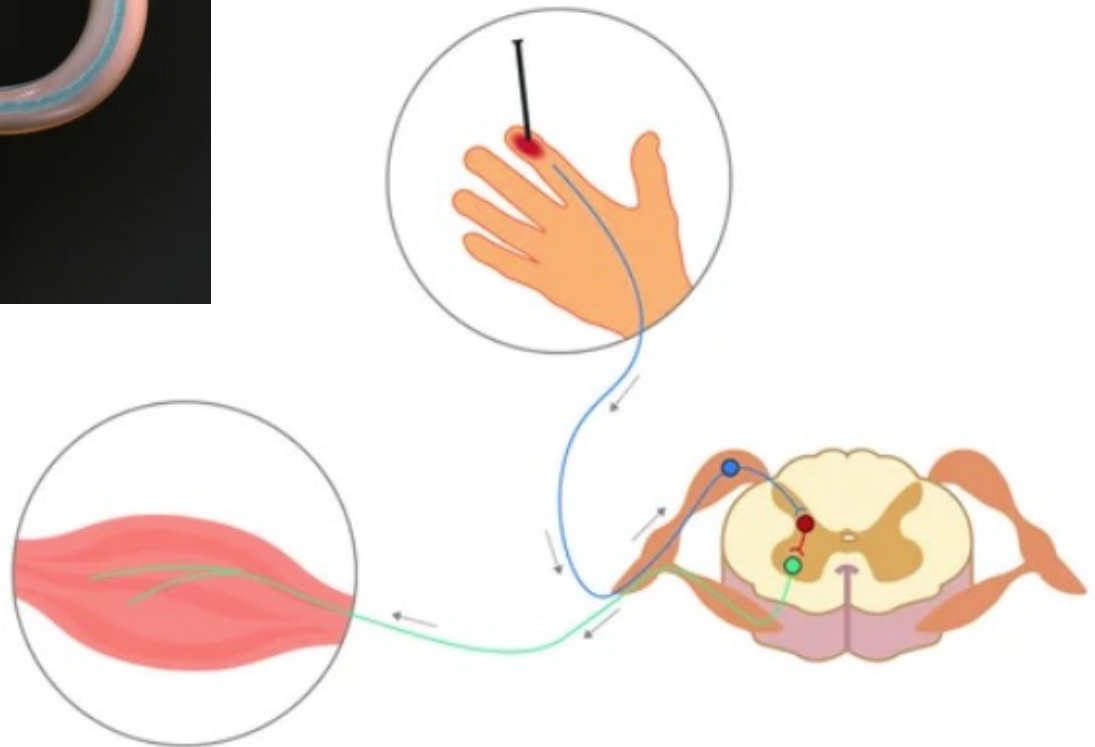
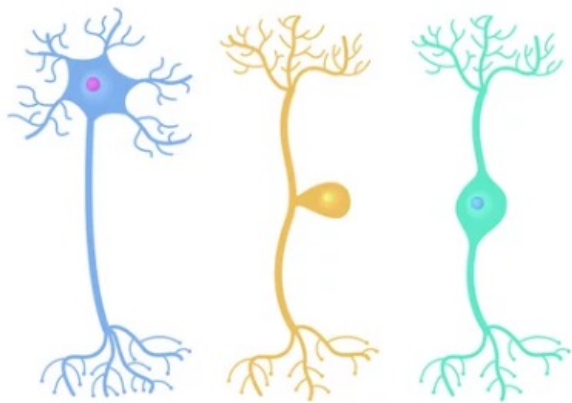
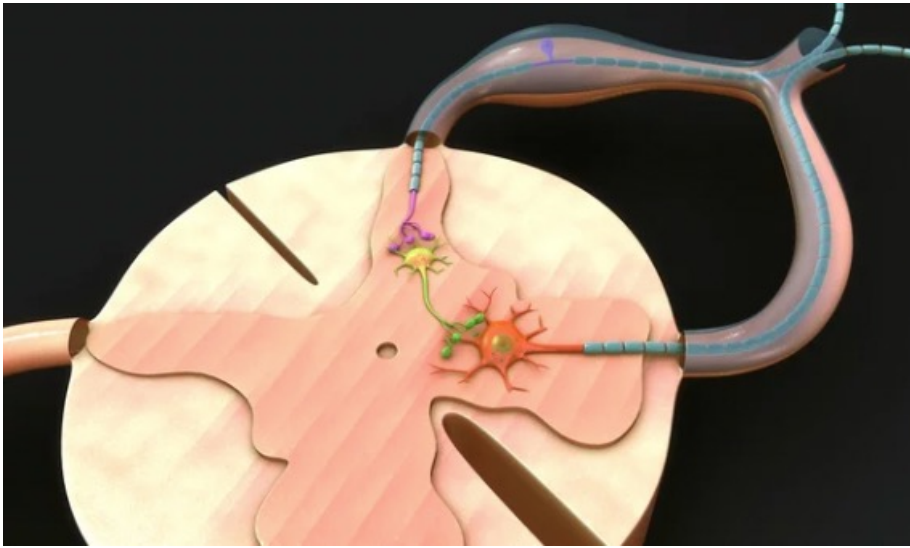
POSTERIOR

POSTERIOR

ANTERIOR

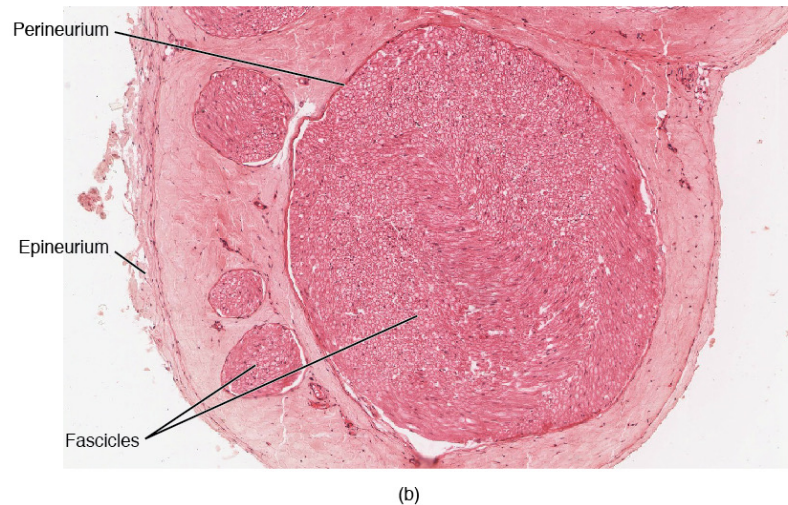
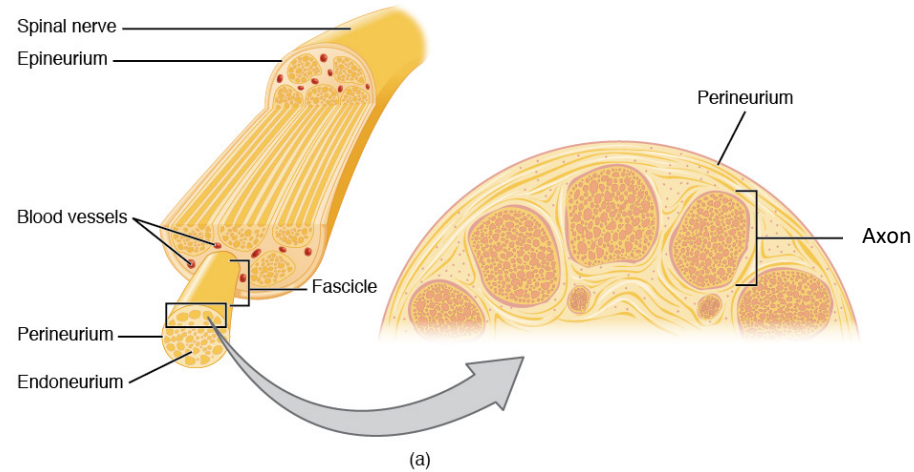
LATERAL

# Sensory and Motor Neurons





# Peripheral Nerve Anatomy



# Peripheral Nerves and Dermatomes

