



MED437  
KING SAUD UNIVERSITY



# OSPE ANATOMY

Musculoskeletal Block

# CASE STUDIES

**Q1:** A 23-year-old soldier presents with a shrapnel wound in the lateral wall of his chest. A few months later, his physical therapist observed his scapula moves away from the chest.

**-Which nerve is likely damaged?**

[Long thoracic nerve](#) or [nerve to Serratus Anterior](#) or [nerve of bell](#)

**-What is the root value of this nerve?**

C5, C6, and C7

**-Which muscle is most likely affected?**

Serratus Anterior

*Extra info*

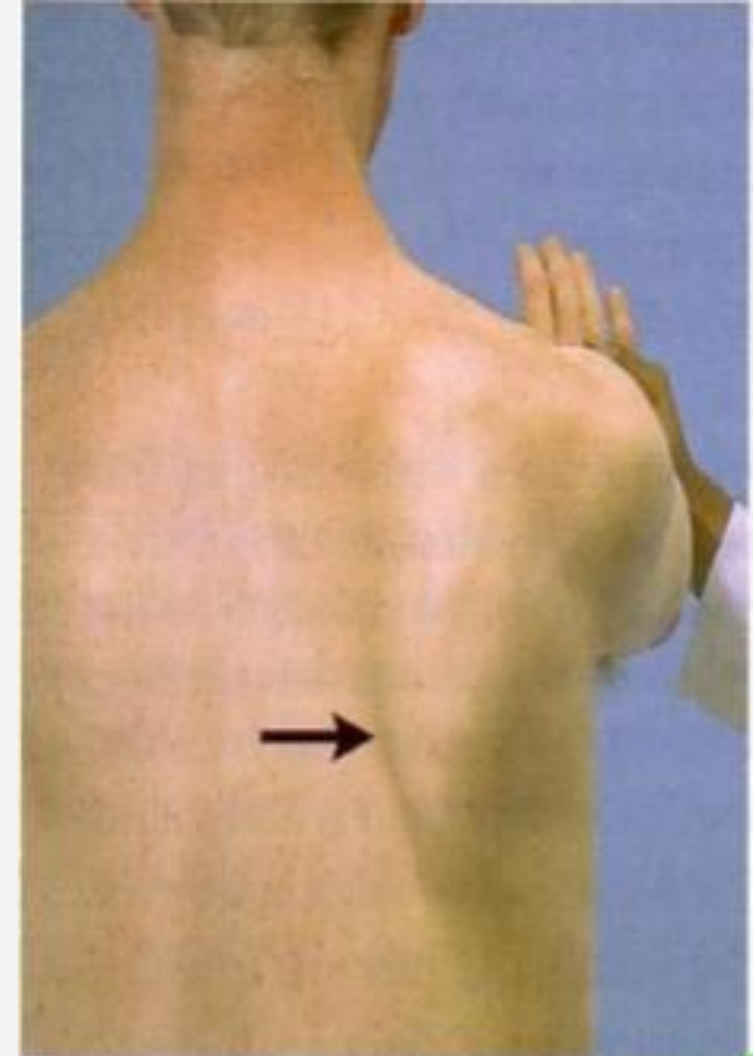
**-Action of Serratus Anterior:**

(Boxer muscle): causes protraction of the scapula

Also rotates the scapula upwards and forwards when raising the arm above 90 degrees

**-Origin:** upper eight ribs

**-Insertion:** Medial border of scapula



**Q2:** A 17-year-old student examined by his family physician as he has severe pain in the root of his left thumb, after a basketball game. The physician exacerbates his pain as he applied pressure in the anatomical snuff box as shown in the photo

**-Which bones does the physician suspect injury?**

Styloid process of the radius (proximal)

Scaphoid bone (distal)

**-Which artery runs in the floor of this area?**

Radial artery

**-There are two tendons in the snuff box:**

Medial: extensor pollicis longus

Lateral: extensor pollicis brevis & abductor pollicis longus



**Q3:** On evaluation of the hand function, the physician 3 fingers in extended position and asked the patient to flex the proximal interphalangeal joint of the middle finger.

**-Which muscle is the doctor testing?**

Flexor digitorum superficialis

**-Which nerve is supplying this muscle?**

Median nerve (C5,C6, C7, C8, T1) *Only if they asked for root value*

**All flexor muscles in the forearm are supplied by:**

-Median nerve

**EXCEPT:** Flexor carpi ulnaris and medial ½ of Flexor digitorum profundus which is supplied by ulnar nerve



**Q4:** A 33-year-old male had a fracture on his left humerus at the level of the spiral groove. Two months later, he cannot extend his wrist or the left fingers

**-Which nerve is most likely injured?**

Radial nerve

(C5, C6, C7, C8, T1)

( arising from posterior cord of brachial plexuses)

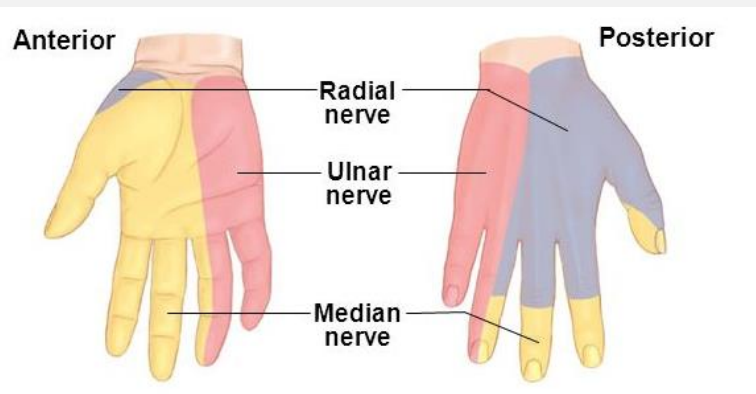
**-Describe the are of cutaneous loss:**

Lateral 2/3 of the dorsal surface of the hand

Lateral 3 ½ fingers up to the middle phalanx



For understanding



**Q5:** A physician performs a tendon reflex

**-Which tendon is he testing for?**

Biceps reflex

**-What is the nerve supply of the tested muscle?**

Musculocutaneous nerve

**-Which cord gives this nerve?**

Lateral cord with a root value of (C5, C6, C7)

**What muscles are also supplied by this nerve?**

- Coracobrachialis
- Brachialis (Medial Fibers)



**Q6:** On evaluation of the hand function, the physician asked the patient to flex the terminal phalanax of the right index finger.

**-Which muscle is the physician testing?**

Flexor digitorum profundus

**-What is the nerve that supplies this muscle?**

Median nerve (anterior interosseus branch)

**Flexor digitorum profundus**

is inserted into the base of the distal phalanages of the 4 medial fingers





**Q7:** On evaluation of the peripheral circulation of a diabetic patient, the physician put his fingers as shown in the photo:

**-Which artery is the physician trying to feel?**

Dorsalis pedis artery

(main supply of blood for the toes)

**-Which tendons descend on both sides of the artery in this area?**

Medially: Extensor hallucis longus

Laterally: Extensor digitorum longus



**QS:** On evaluation of the foot function, the physician asked the patient to raise his heel from the ground as shown in the photo:

**-Enumerate two muscles that perform his action**

1. Soleus (initiates it)
2. Gastrocnimius (maintains it)
3. Plantaris
4. Tibialis posterior
5. Flexor digitorum longus

**-What is the nerve supply of each?**

Tibial nerve (Gastrocnimius & Soleus)



**Q9:** On evaluation of the knee function, the physician asked the patient to flex the knee against resistance as shown in the photo:

**-Which group of muscles perform this action?**

Hamstrings group along with the Sartorius and Gracialis muscle

**-What is the nerve that supplies this group?**

Sciatic nerve (L4+L5+S1+S2+S3)



Surgery for restoring blood flow  
to a blocked artery



**Q10:** A 67-year-old man recently went a **coronary bypass operation**. After he recovered, he experienced a burning sensation in the marked area in the photo:

**-Which nerve supplies this area?**

Saphenous nerve

**-Which nerve does it originate from?**

Femoral nerve

**-Which vein is used in the bypass operation?**

Great saphenous vein (superficial)



**Q11:** A 75-year-old man recently has coronary a bypass. After recovery, he noticed numbness and paresthesia in the marked area:

**-Which vein was used in this coronary bypass operation?**

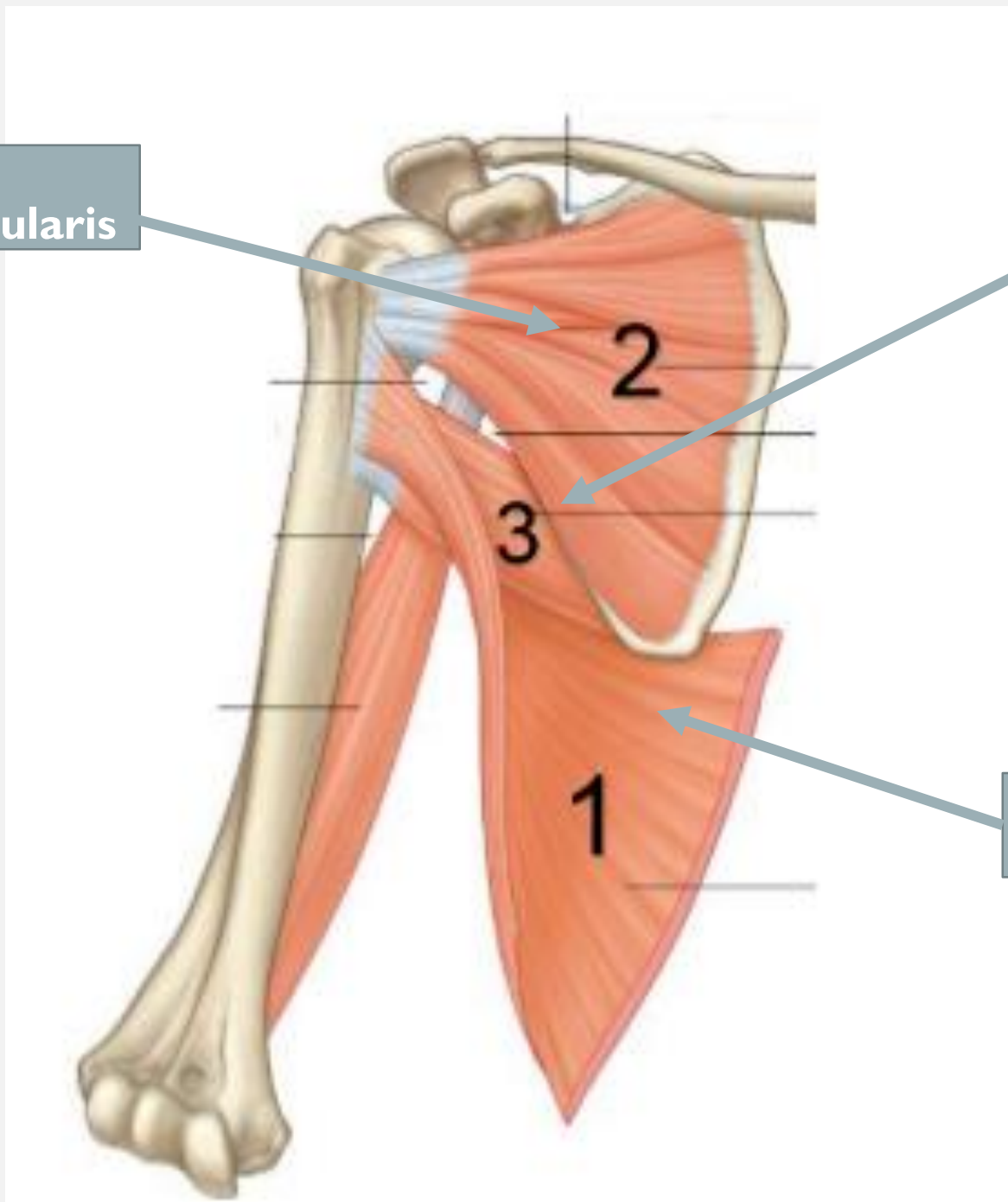
Small saphenous vein

**-Which nerve supplies the skin in this area?**

Sural nerve (branch of tibial nerve)



**LABELING**



2.  
Subscapularis

**Nerve supply:**  
Upper & lower  
subscapular nerves

C5, C6

3. Teres Major

**Nerve supply:**  
lower subscapular  
nerve

C5, C6

1. Latissimus Dorsi

C6, C7, C8

**Nerve supply:**  
Thoracodorsal nerve  
OR  
Nerve to latissimus  
dorsi

## 1. Deltoid

### **Nerve supply:**

Axillary nerve

Posterior chord of Brachial Plexuses

Root value: (C5, C6)

### **Action:**

1-Anterior fibers:

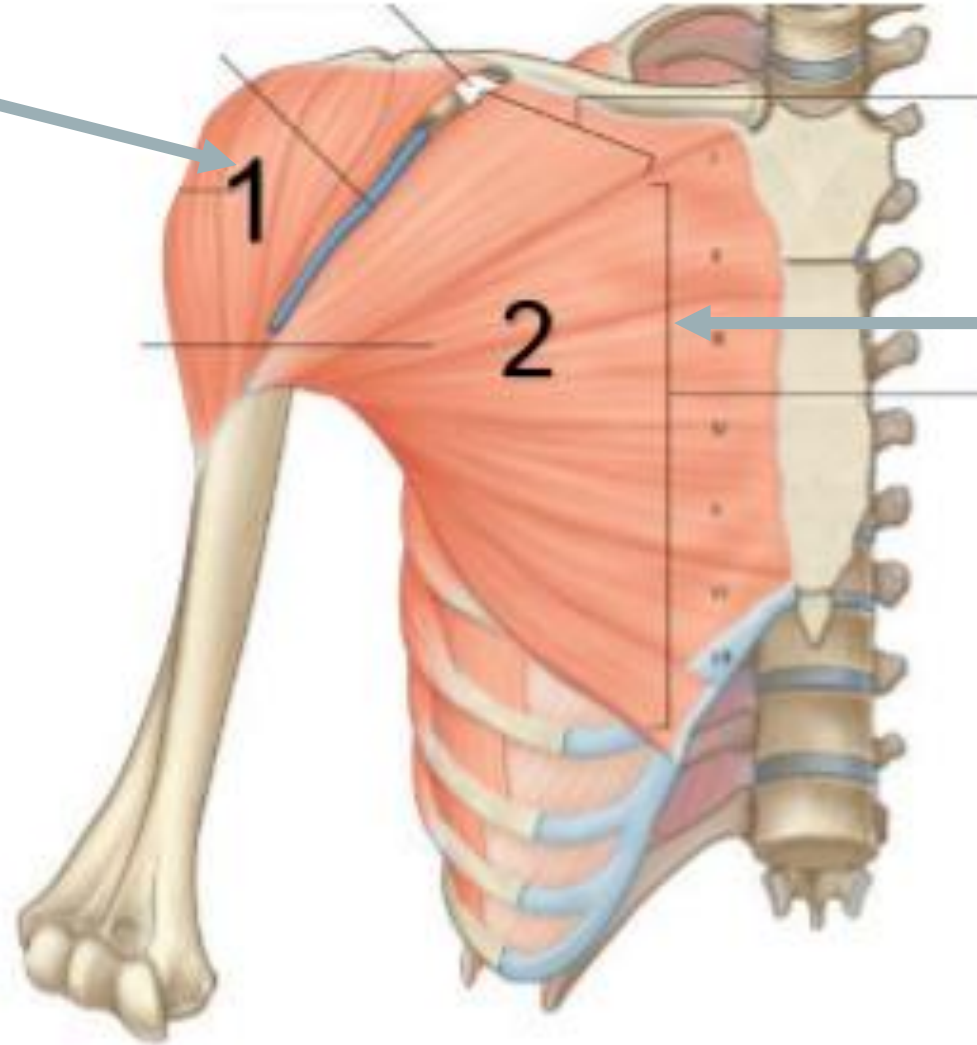
Flexion & medial rotation of shoulder (or arm) .

2-Middle fibers:

Abduction of humerus (15°-90°)

3-Posterior fibers:

Extension & lateral rotation of shoulder (or arm).



## 2. Pectoralis major

### **Nerve supply:**

*Medial pectoral nerve*  
(Medial chord of Brachial Plexuses)

(Root value: C8, T1)

*Lateral pectoral nerve*  
(Lateral chord of Brachial Plexuses)

(Root value: C5, C6, C7)

### **Action:**

Adduction & medial rotation of shoulder (or arm)



**-Identify the muscle attached to the marked area:**

Subscapularis

**-What nerve enervates this muscle?**

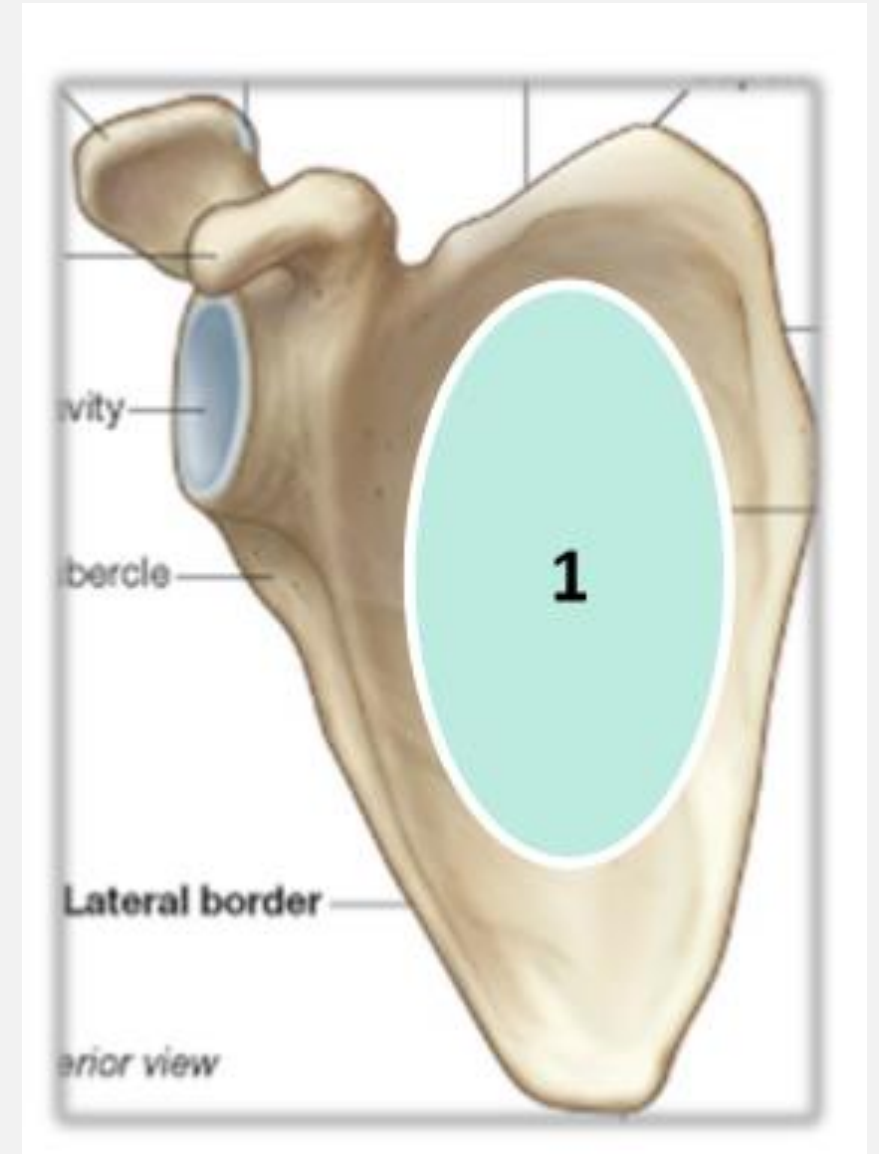
Upper & lower subscapular nerve

**-Where is it inserted?**

Lesser tubercle of the humerus

**-What is its function?**

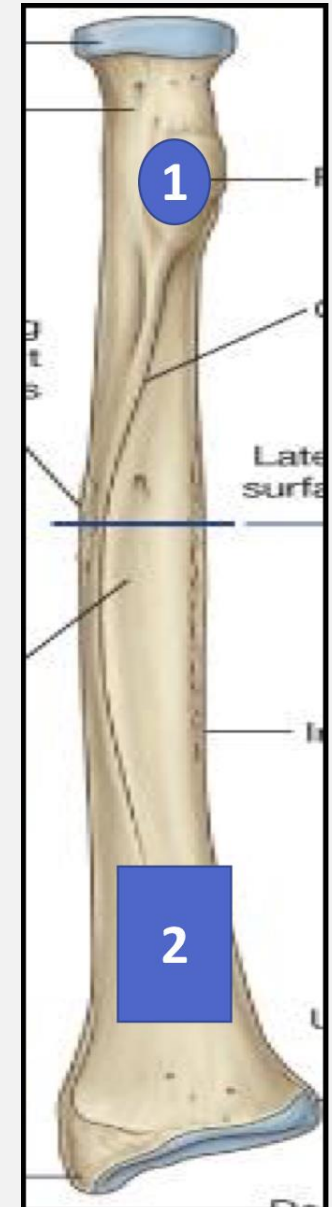
Medial rotation of shoulder (or arm).



**-Identify the muscles attached in the marked areas and their nerve supplies:**

1. Biceps brachii → **-Nerve supply:**  
Musculocutaneous  
Lateral Cord of Brachial  
plexuses  
Root value: (C5,C6,C7)

2. Pronator  
quadratus → **-Nerve supply:**  
Anterior interosseus  
nerve from Median  
nerve



## **-Identify the muscles attached to the marked areas and their nerve supplies:**

1. Flexor digitorum profundus



**-Nerve supply:**

Ulnar nerve → Medial two fingers (little and ring finger)

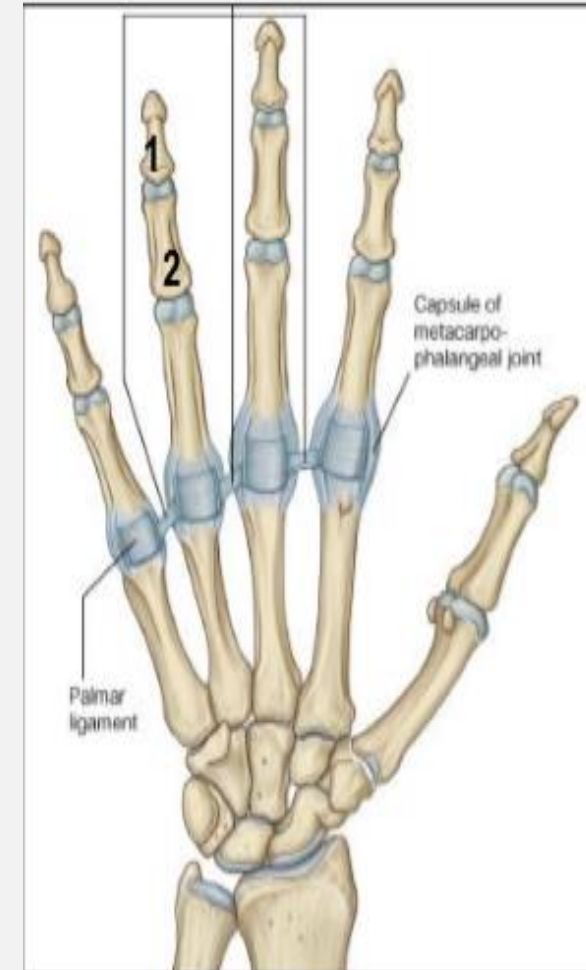
Median nerve (anterior interosseus branch) → Lateral two fingers (index and middle finger)

2. Flexor digitorum superficialis



**-Nerve supply:**

Median nerve → All four medial fingers (index/middle/ring/little)

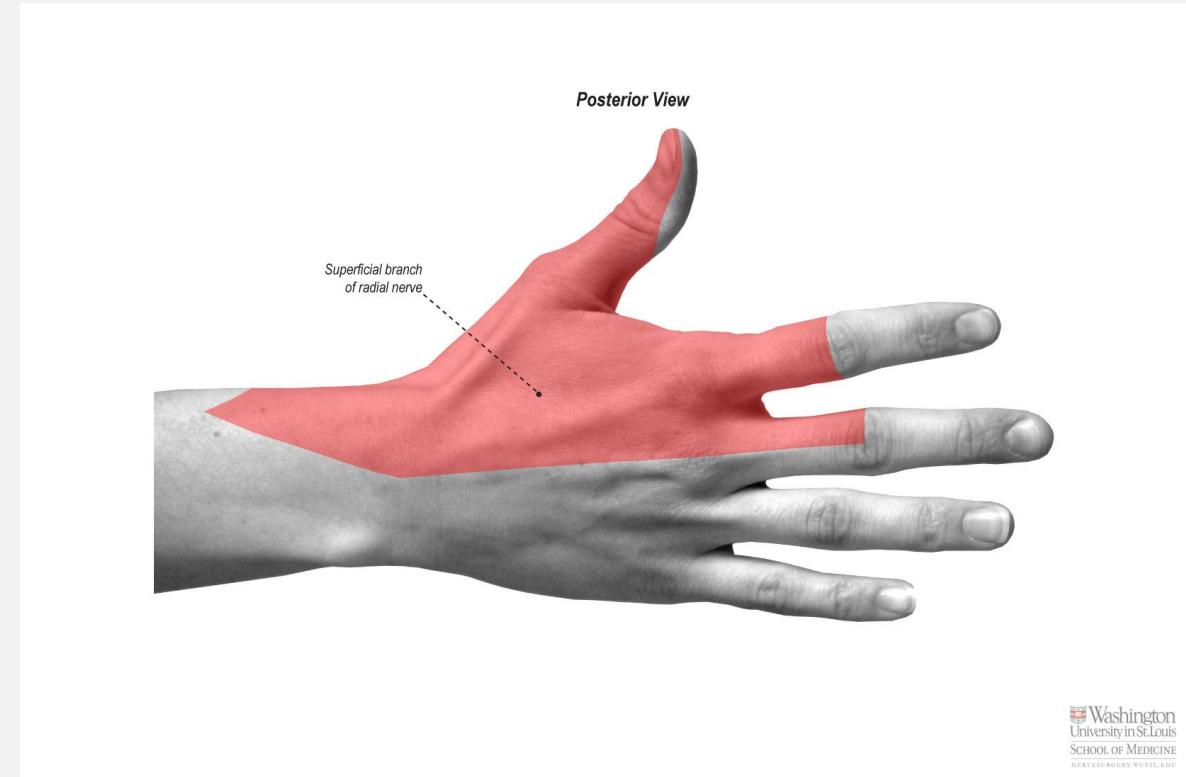


**-What is the nerve that is supplies the skin this shaded area?**

Radial nerve

Posterior cord of Brachial Plexuses

Root value: (C5,C6,C7,C8,T1)



**-Identify the muscle attached to the marked area**

Medial head of triceps

**-Where is it inserted?**

Olecranon process of ulna

**-What is its nerve supply?**

Radial nerve

**-Main action?**

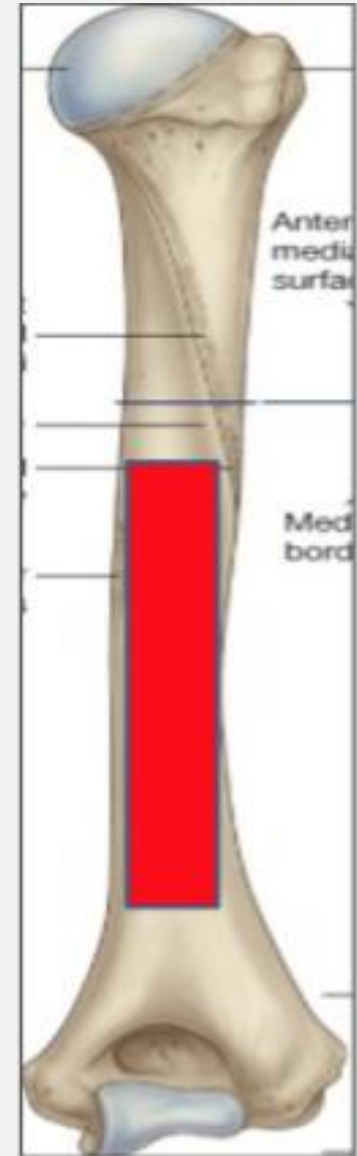
Extension of the elbow

Extra info:

Lateral head of triceps attached above spiral groove

Long head of triceps attached to infraglenoidal tubercle

Brachialis: corresponding to the medial head from the anterior aspect, it's inserted in the coronoid process of the ulna.



## Q1- Identify the structure “A”

Flexor retinaculum .

## Q2-Enumerate 2 nerves passing superficial & 2 tendons deep to it.

Superficial nerve:

- 1- Ulnar nerve. (also the ulnar artery)
- 2- Palmar cutaneous branch of ulnar and median nerves.  
(also the tendon of palmaris longus)

Deep tendons:

- 1- Flexor digitorum superficialis and profundus.
- 2- Flexor pollicis longus.

Medial to flexor retinaculum:

Pisiform & Hook of Hamate

Lateral to flexor retinaculum:

Scaphoid & Trapezium



**Q1- Identify the marked areas**

**Q2- Identify one structure attached to each area.**

1- Shaft of femur:

Muscle attached: vastus intermedius → Nerve supply: femoral nerve

2- Greater trochanter :

Muscles attached:

-Anterior surface → gluteus minimus. } Nerve supply: superior gluteal nerve

-Lateral surface → gluteus medius. }

- Medial surface → Obturator internus. → Nerve supply: obturator internus.

3-upper part of medial surface of Tibia:

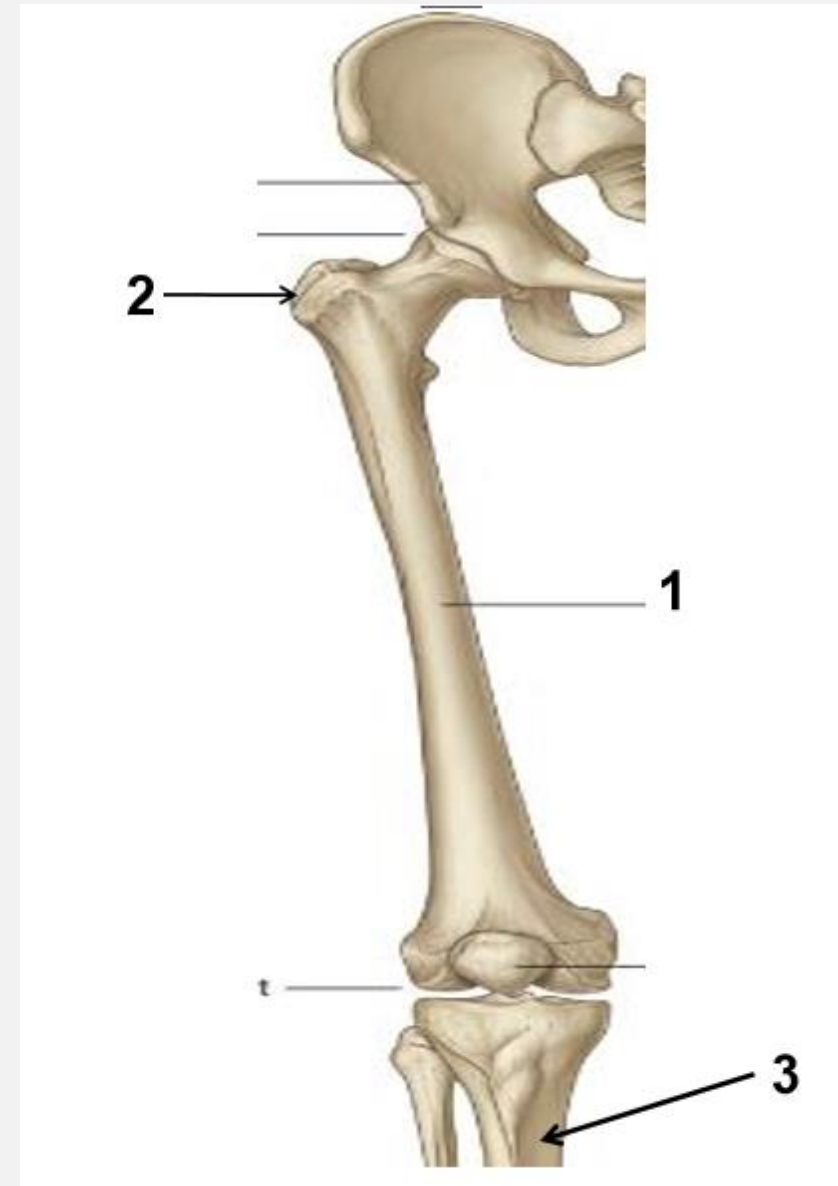
(SGS )

Sartorius → femoral nerve (L2+L3+L4)

Gracilis → obturator nerve (L2+L3+L4)

Semitendinosus → tibial portion of sciatic nerve.

(L4+L5+S1+S2+S3)



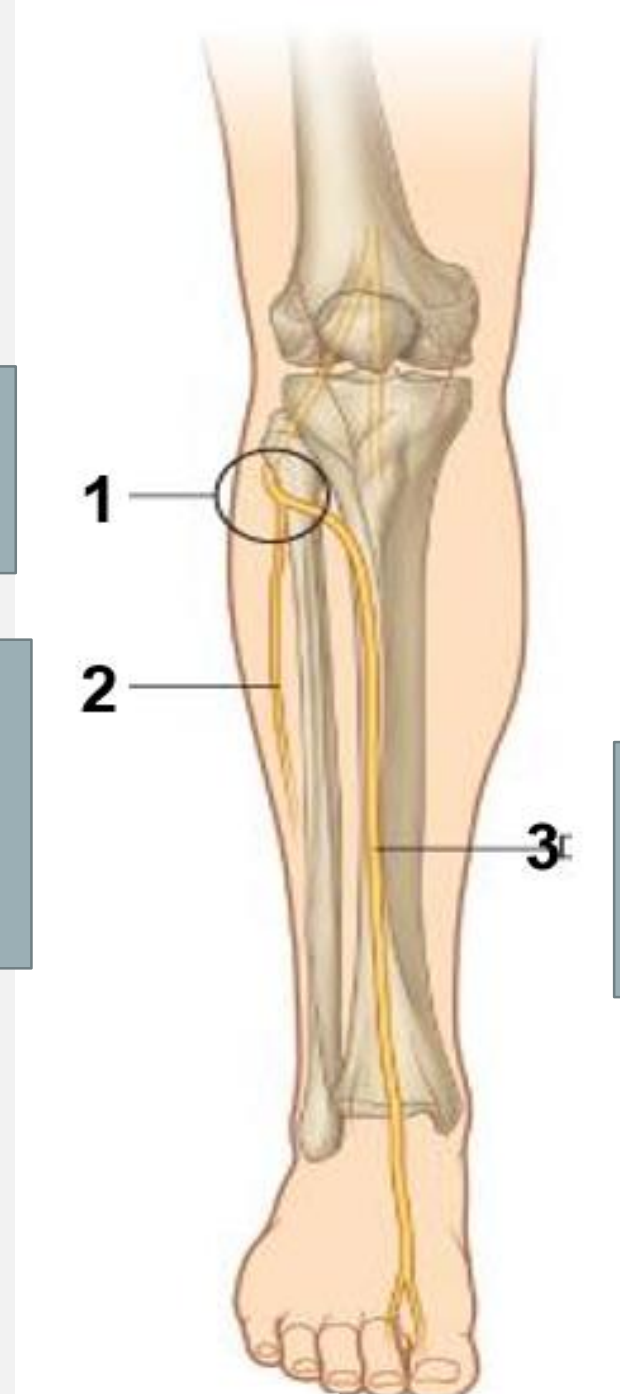
**- What is the nerve that supplies the lateral side of the foot?**

Sural nerve

1. Common peroneal nerve

2. Musculocutaneous nerve  
Or  
Superficial peroneal nerve

3. Deep peroneal  
OR  
Anterior tibial



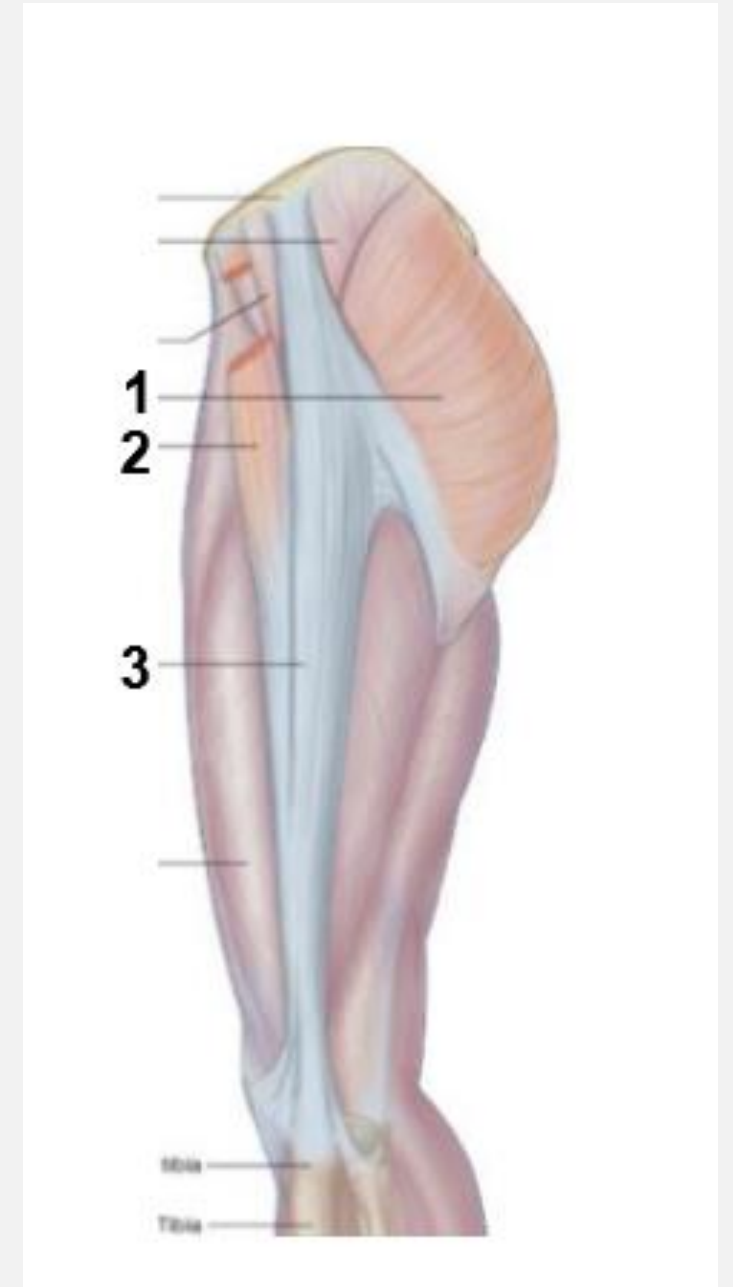


**Q1-Identify these structures:**

- 1-Glutes maximus.
- 2-Tensor fascia lata.
- 3-Iliotibial tract.

**Q2-What is the nerve supply for 1 & 2.**

1. Inferior gluteal nerve.
2. Superior gluteal nerve



## **-Identify the muscles and their nerve supply**

1- Piriformis muscle.

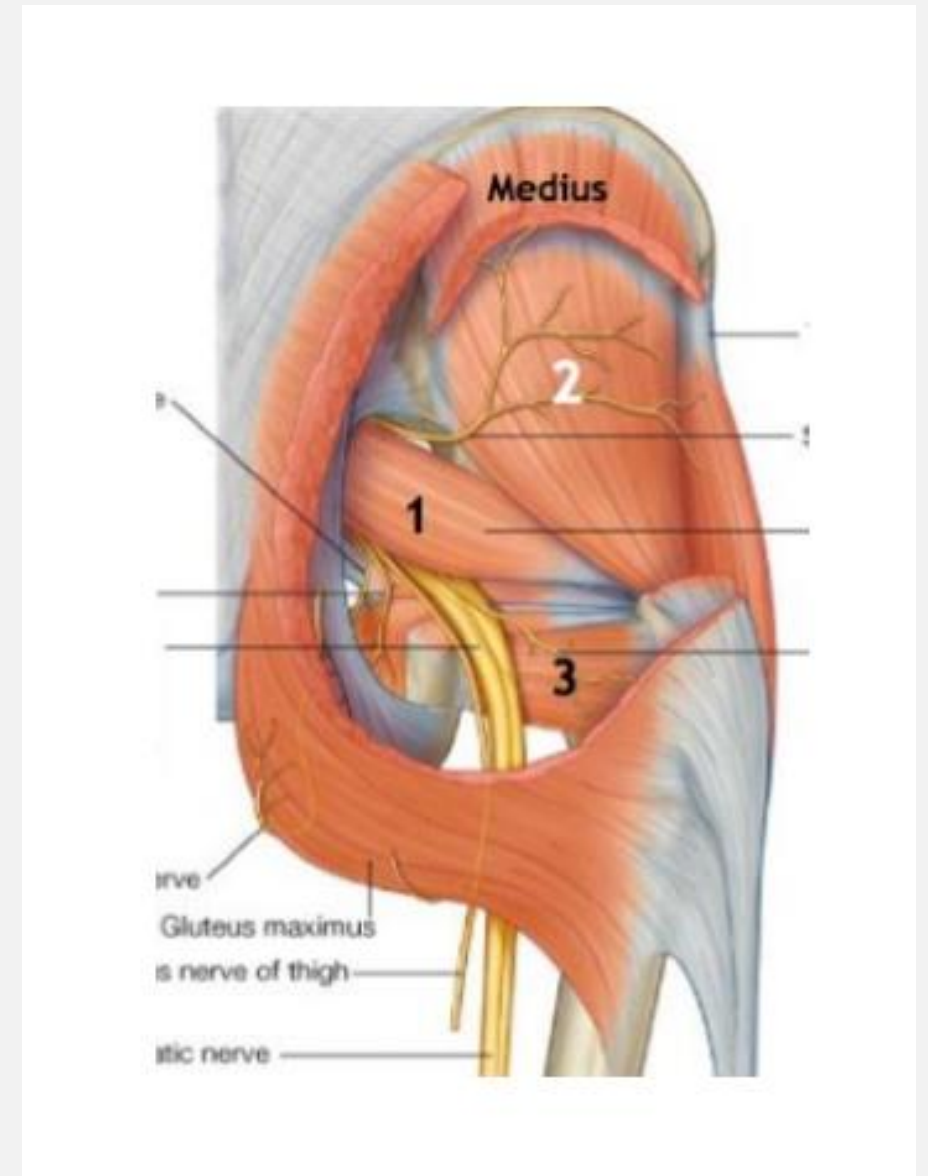
Nerve: S1 &2.

2- Gluteus minimus.

Nerve: superior Gluteal nerve.

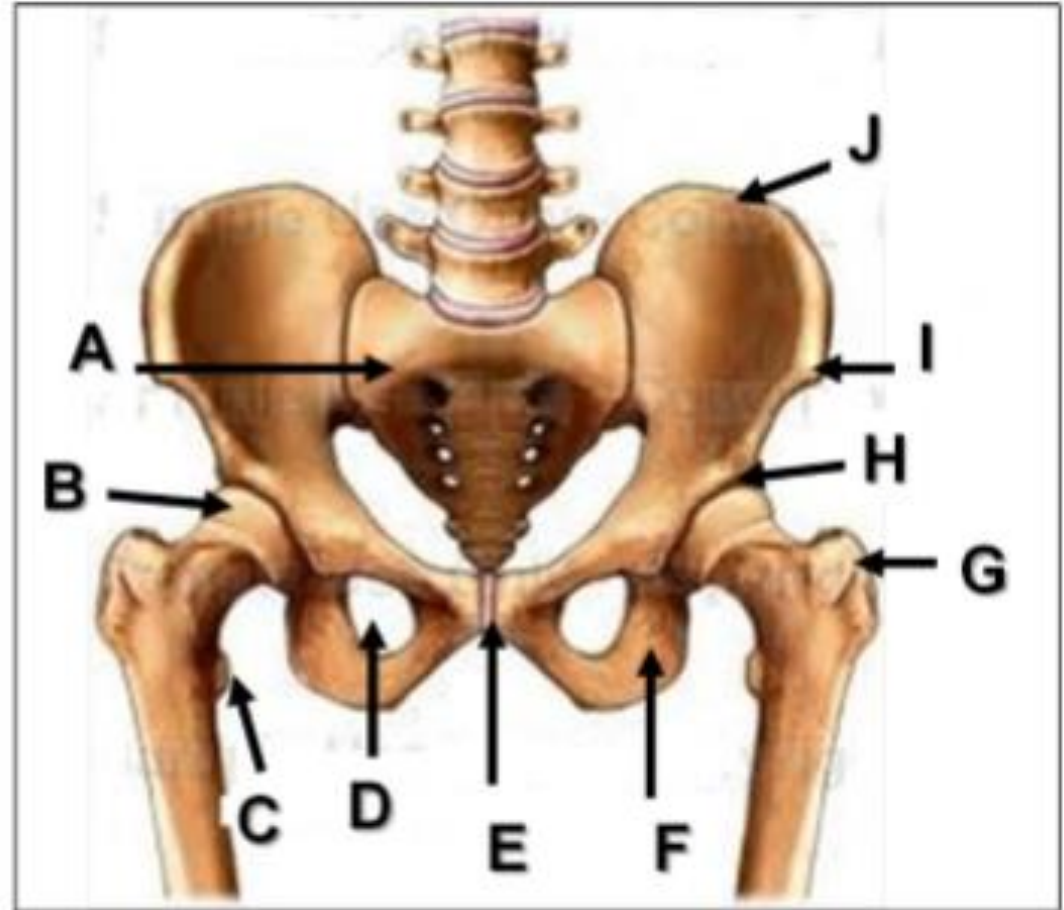
3- Quadratus femoris.

Nerve: Nerve to quadratus femoris



# - Identify

- A: Sacrum
- B: Head of femur
- C: Lesser trochanter
- D: Obturator foramen
- E: Pubic symphysis
- F: Ischial tuberosity
- G: Greater trochanter
- H: Acetabulum
- I: Anterior superior iliac spine
- J: Iliac crest



## - Identify

A: Superficial peroneal nerve

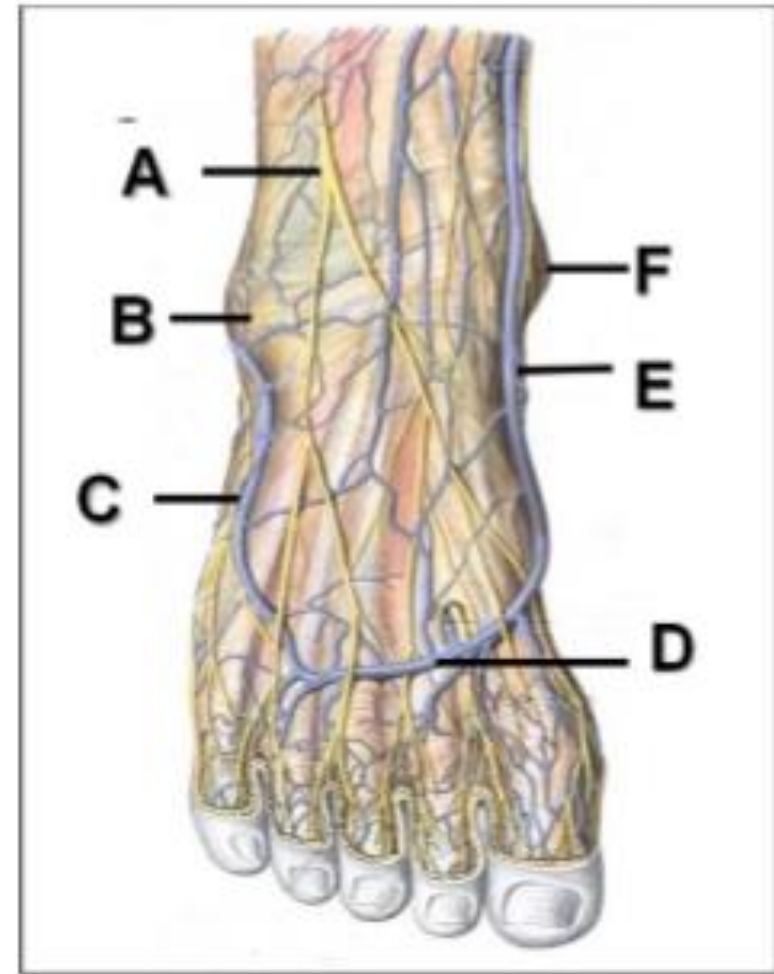
B: Lateral malleolus

C: Small saphenous vein

D: Dorsal venous arch

E: Great saphenous vein

F: Medial malleolus



# - Identify

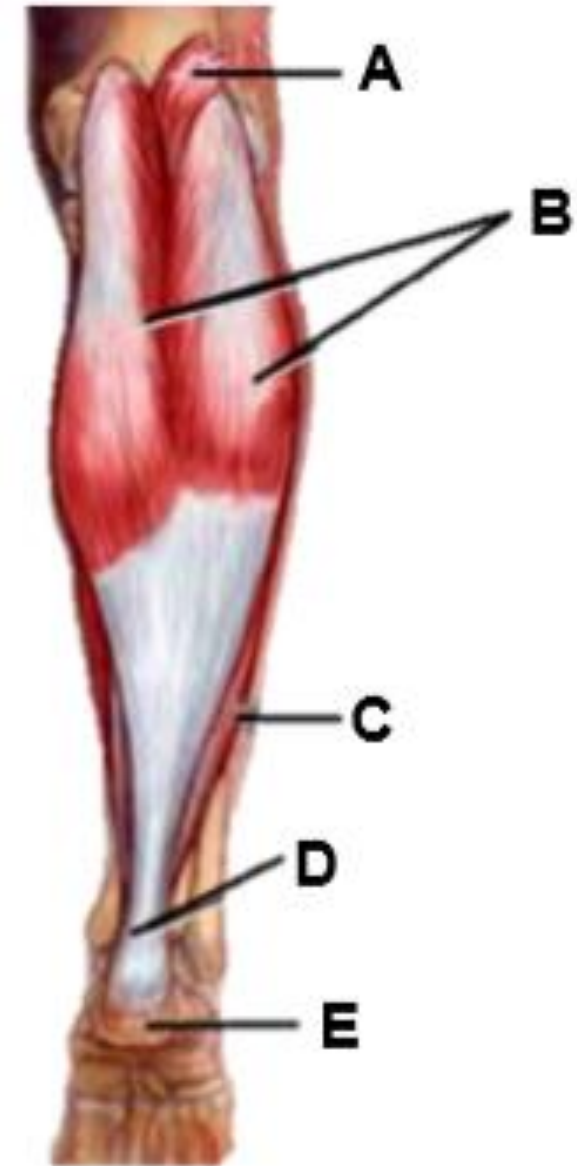
A: Plantaris

B: Gastrocnemius

C: Soleus

D: Achilles tendon

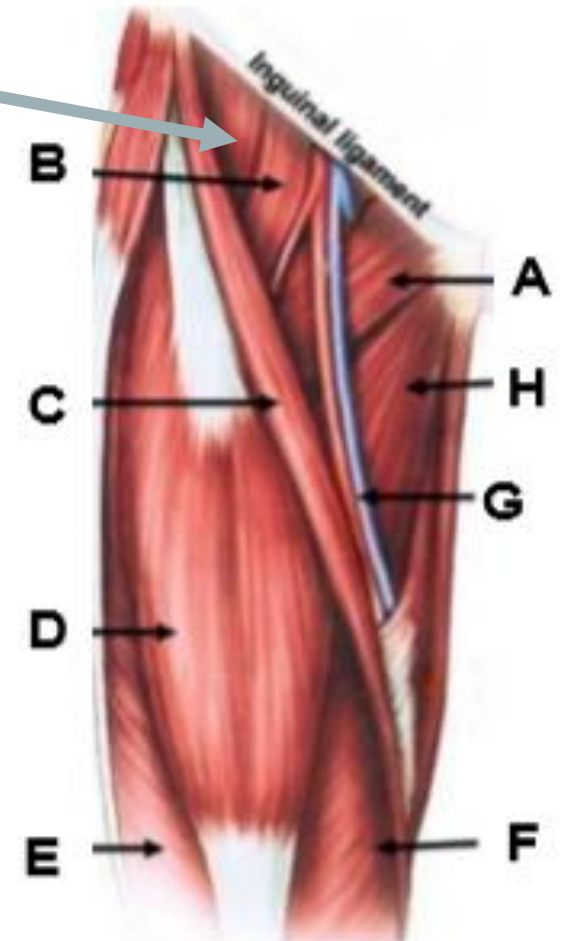
E: Calcaneum



# -Identify

- A: Pectineus
- B: Psoas major
- C: Sartorius
- D: Rectus femoris
- E: Vastus lateralis
- F: Vastus Medialis
- G: Femoral vessels
- H: Adductor longus

Iliacus



# -Identify

A: Ulnar artery

B: Radial artery

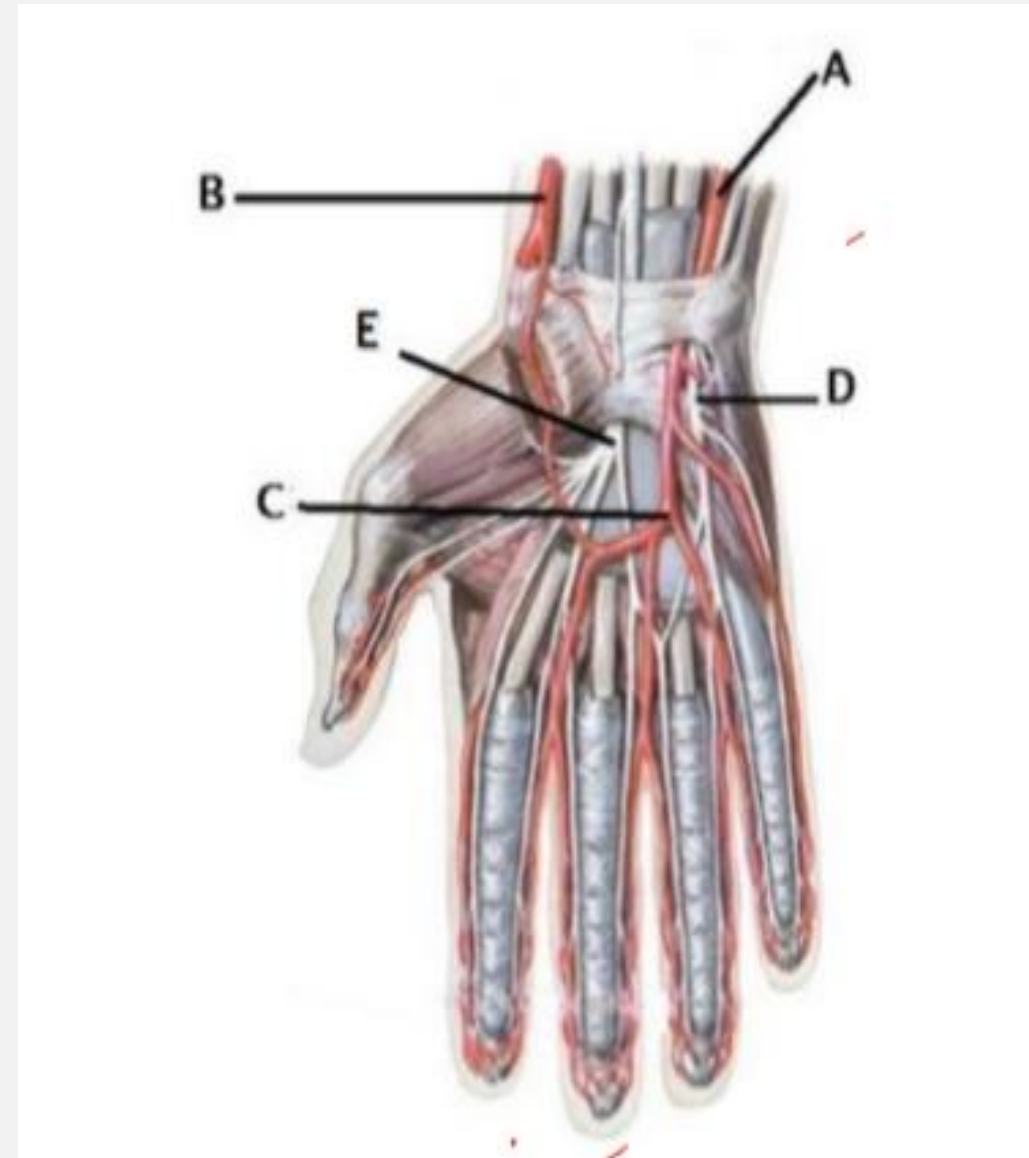
C: Superficial palmar arch

D: Ulnar nerve

E: Median nerve

**-NOTE:**

The picture is incorrect because A (ULNAR ARTERY) & D (ULNAR NERVE) go above the flexor retinaculum  
**HOWEVER THE LABELING IS CORRECT**

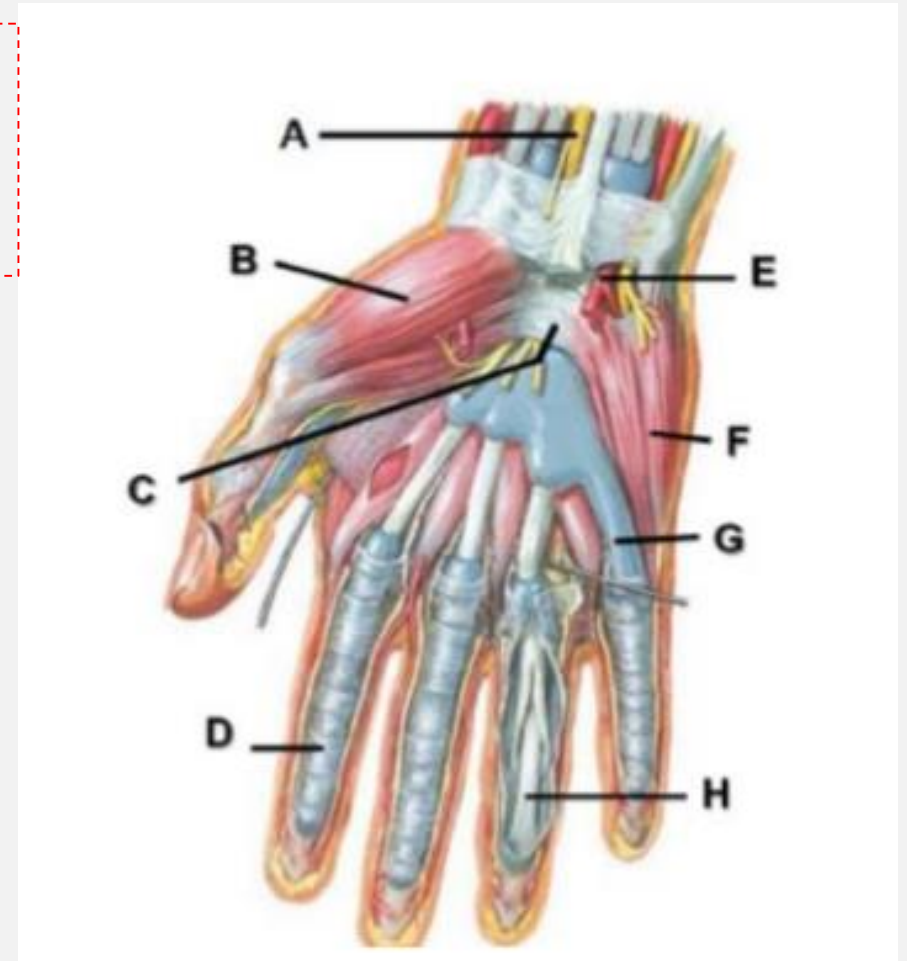




# -Identify

- A: Median nerve
- B: Thenar muscles
- C: Flexor retinaculum
- D: Fibrous flexor sheath
- E: Ulnar artery
- F: Hypothenar eminence
- G: Flexor synovial sheath
- H: Tendon of flexor digitorum profundus

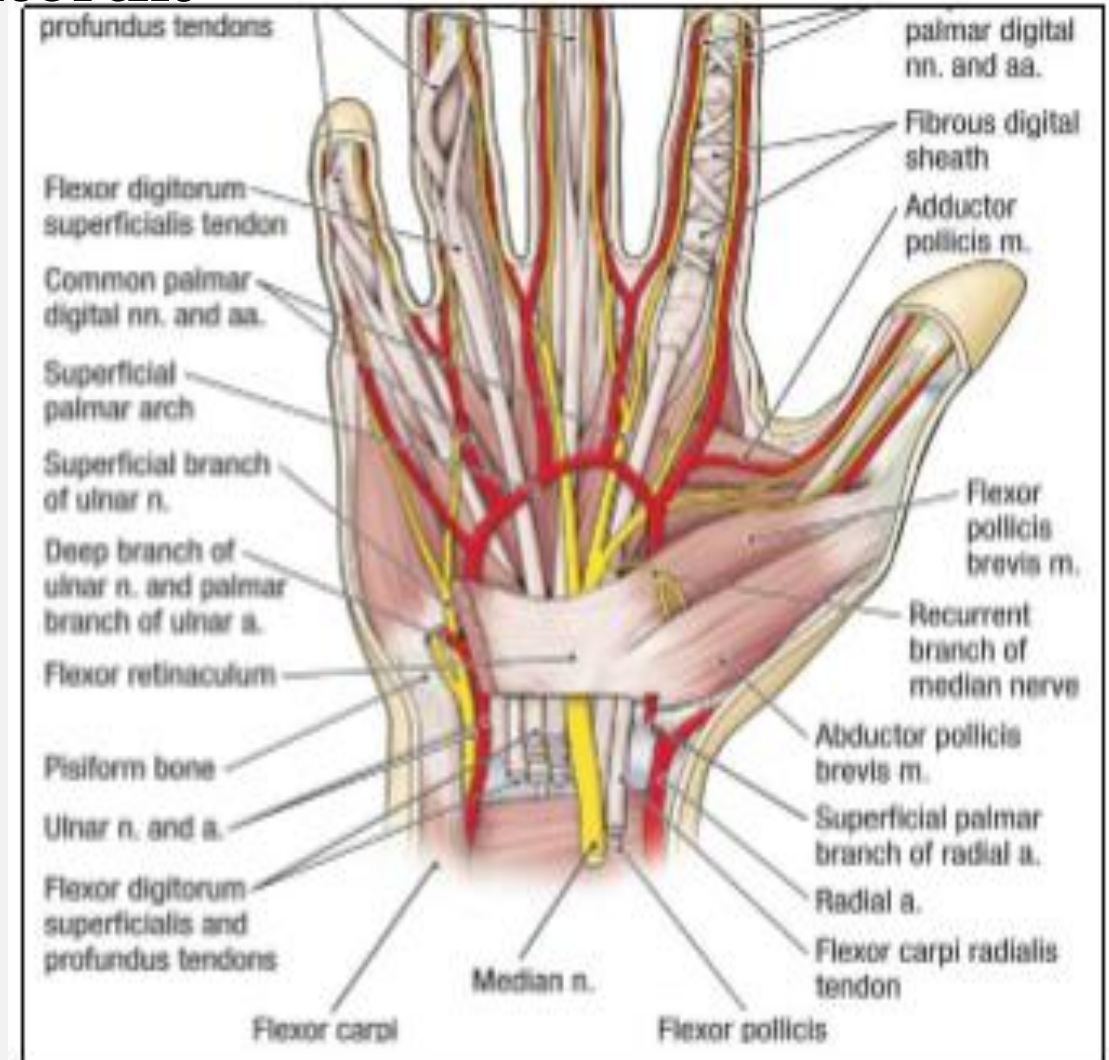
**-NOTE:  
E (ULNAR ARTERY)  
should go above the  
flexor retinaculum**





## **-Structures that run superficially above the Flexor Retinaculum from medial to lateral:**

- 1- Tendon of Flexor carpi ulnaris.
- 2- Ulnar nerve.
- 3- Ulnar artery.
- 4- Palmar cutaneous branch of ulnar nerve.
- 5- Palmaris longus tendon.
- 6- Palmar cutaneous branch of median nerve

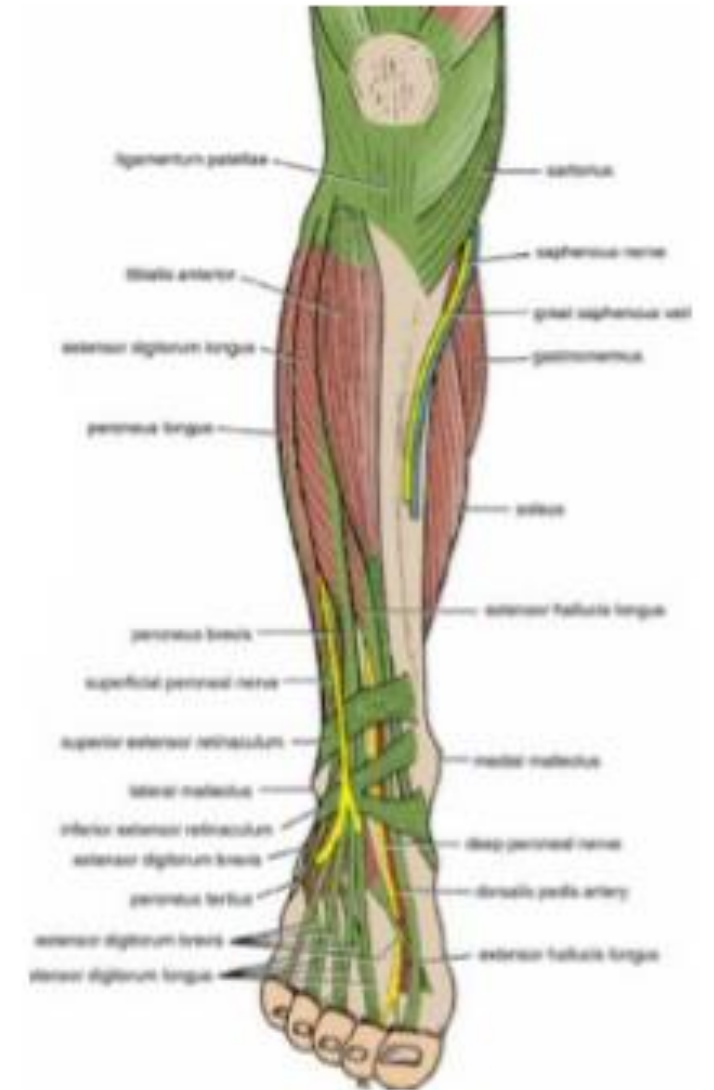


## **-Structures of Extensor Retinaculum from medial to lateral**

1. Tibialis anterior
2. Extensor hallucis longus
3. Anterior tibial vessels
4. Deep peroneal nerve
5. Extensor digitorum longus
6. Peroneus tertius

**Mnemonic:**

**Tom Has Very Nice Dog and Pig**

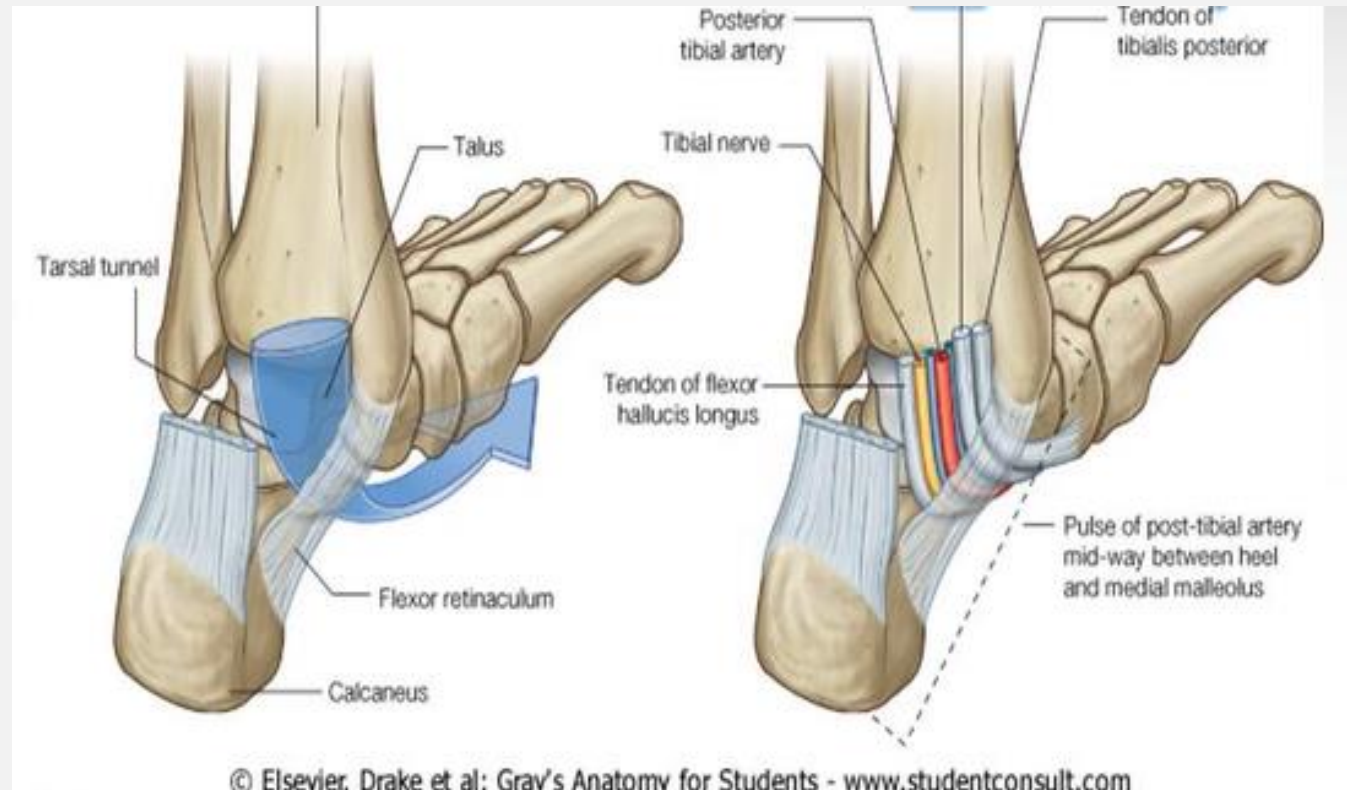


## **From medial to lateral**

1. Tibialis posterior
2. Flexor Digitorum longus
3. Posterior tibial artery & vena comitantes
4. Posterior tibial nerve
5. Flexor hallucis longus

**Mnemonic:**

**Tom, Dick and Nervous Harry**



**X-RAY**

## -What nerve is in danger in the case of this fracture?

Radial nerve

(profunda artery) if asked for vessel

## -Common fractures of the humerus:

- Surgical neck: axillary nerve.
- Medial epicondyle: ulnar nerve.
- Spiral groove: radial nerve.
- Distal end (supracondylar fracture) : median nerve.



# Lateral elbow X-Ray

1-Coronoid process.

2-Ulna.

3-Radial tuberosity.

4-Humerus.

5-Olecranon process

6-Radial head



# Frontal knee X-Ray

1-Femur.

2-Interchondylar notch.

3-Medial femoral condyle

4-Medial tibial spine ( medial tibial eminence)

5-Tibia (or tibial tuberosity)

6-Fibula

7-Lateral tibial spine ( lateral tibial eminence )

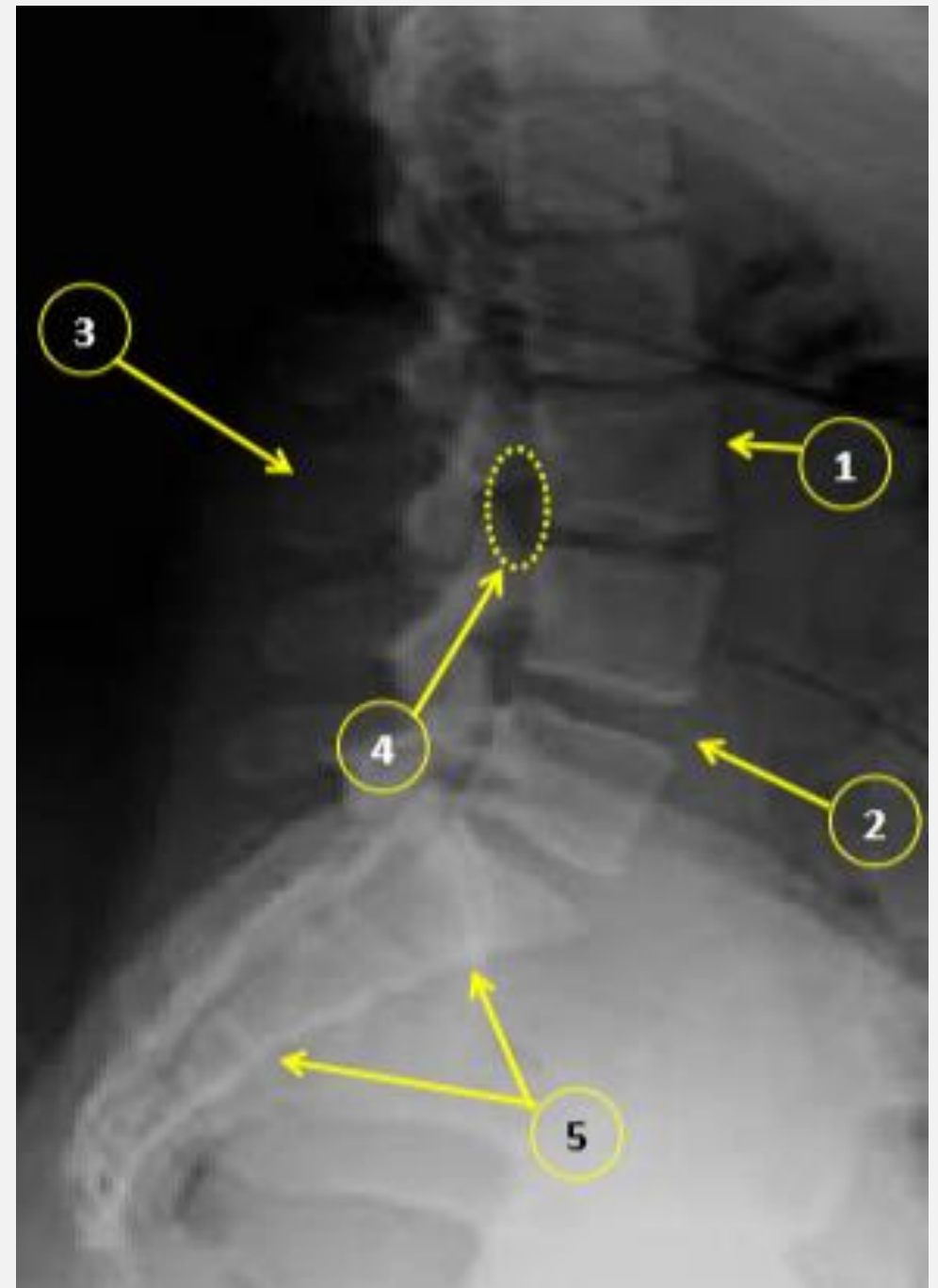
8-Lateral femoral condyle.





# Identify:

- 1. Vertebral body (L3)
- 2. Intervertebral disk
- 3. Spinous process
- 4. Neural foramen
- 5. Sacrum





# Identify:

- 1- Distal phalanx
- 2- Middle phalanx
- 3- Proximal phalanx
- 4- Distal interphalangeal joint
- 5- Proximal interphalangeal joint
- 6- Metacarpophalangeal joint





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GOOD LUCK!

SPECIAL THANKS FOR TEAM 436.