

Johns Hopkins Radiology

Anatomy Lecture

Spine and Limbs

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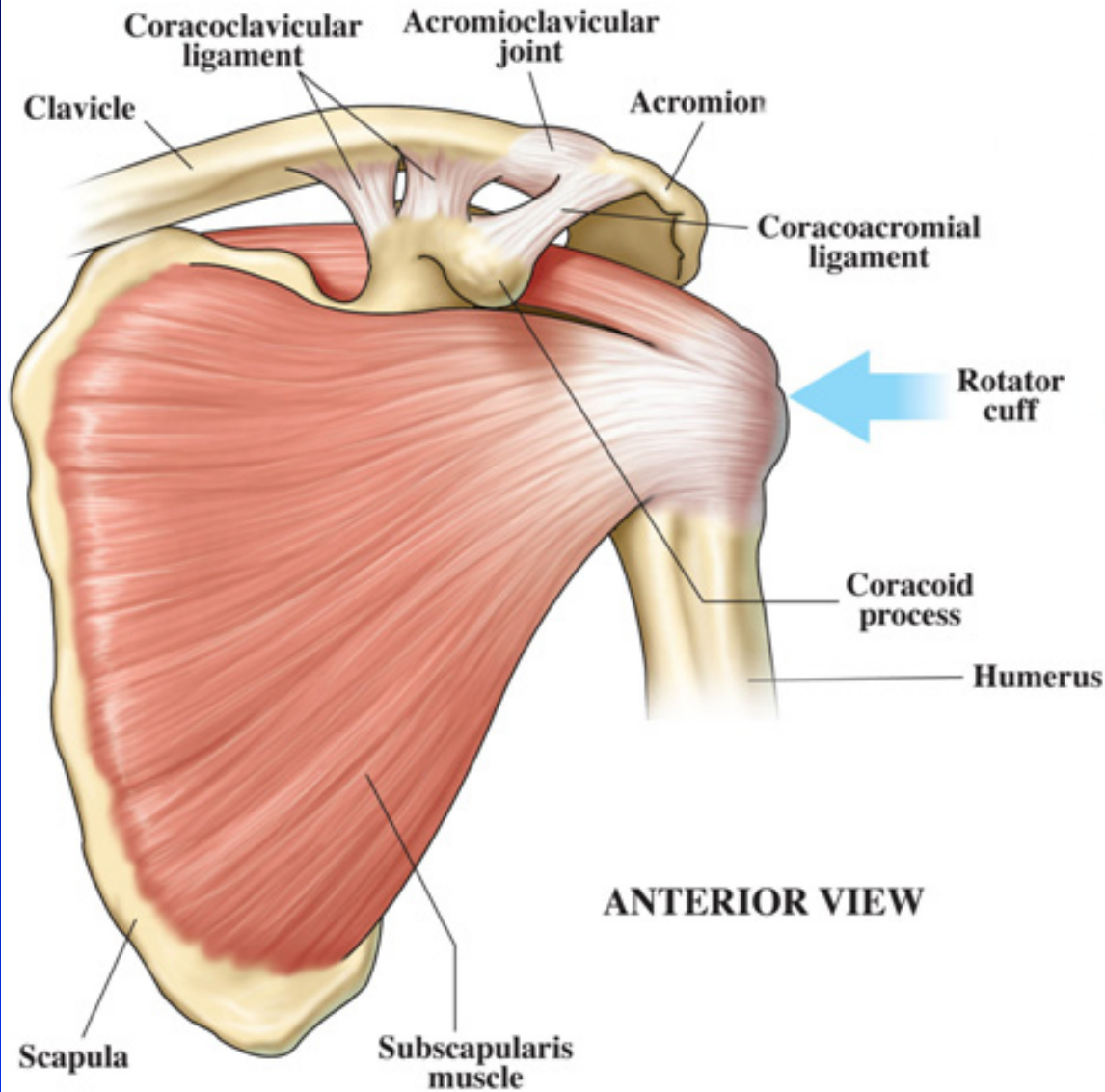
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9/22/2001

Upper Extremity



NORMAL SHOULDER ANATOMY

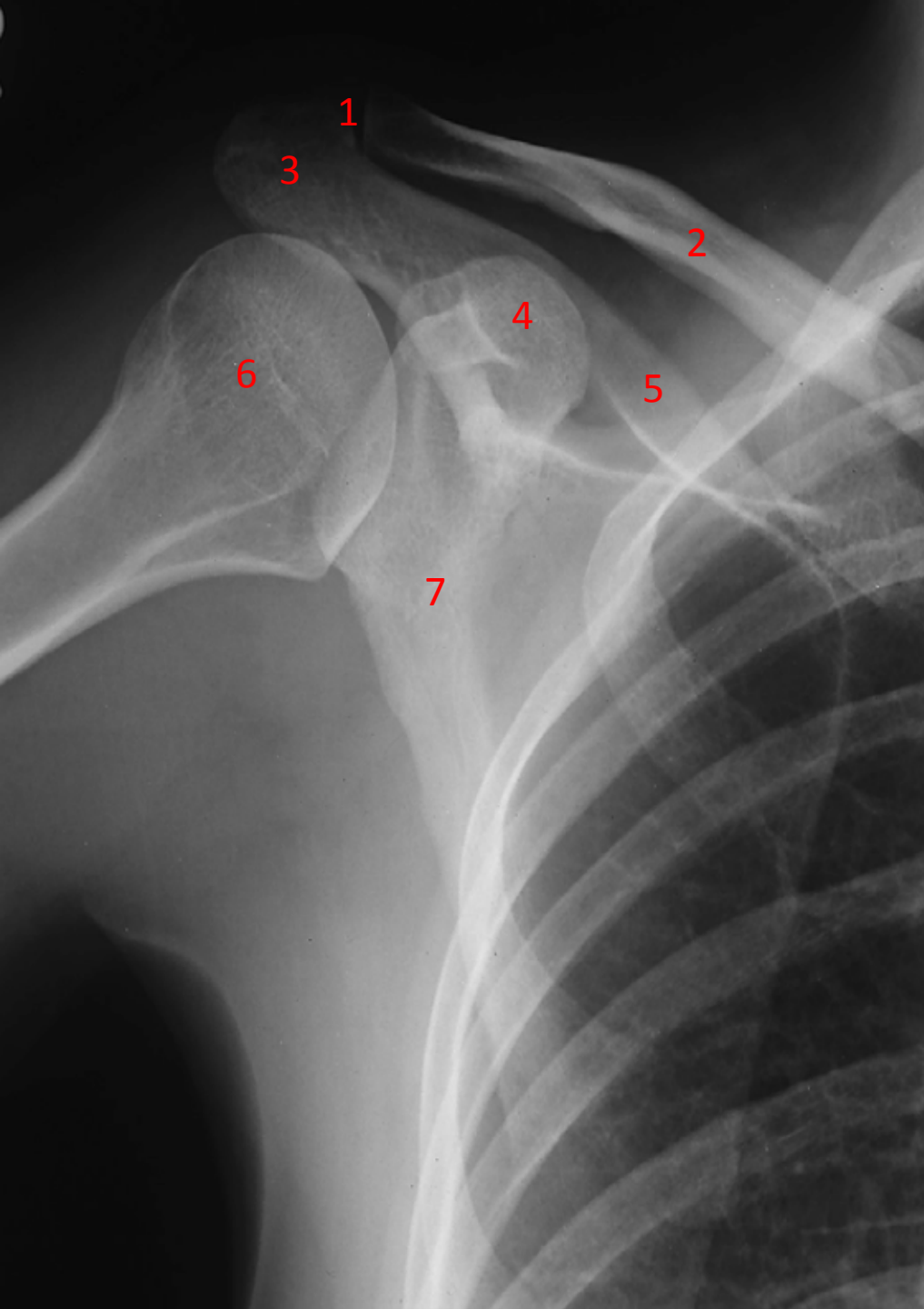


Question:
What is the most commonly torn muscle of the rotator cuff?

Answer:
Supraspinatus

<http://www.handsport.us/images/sholanat-antview.jpg>

Shoulder



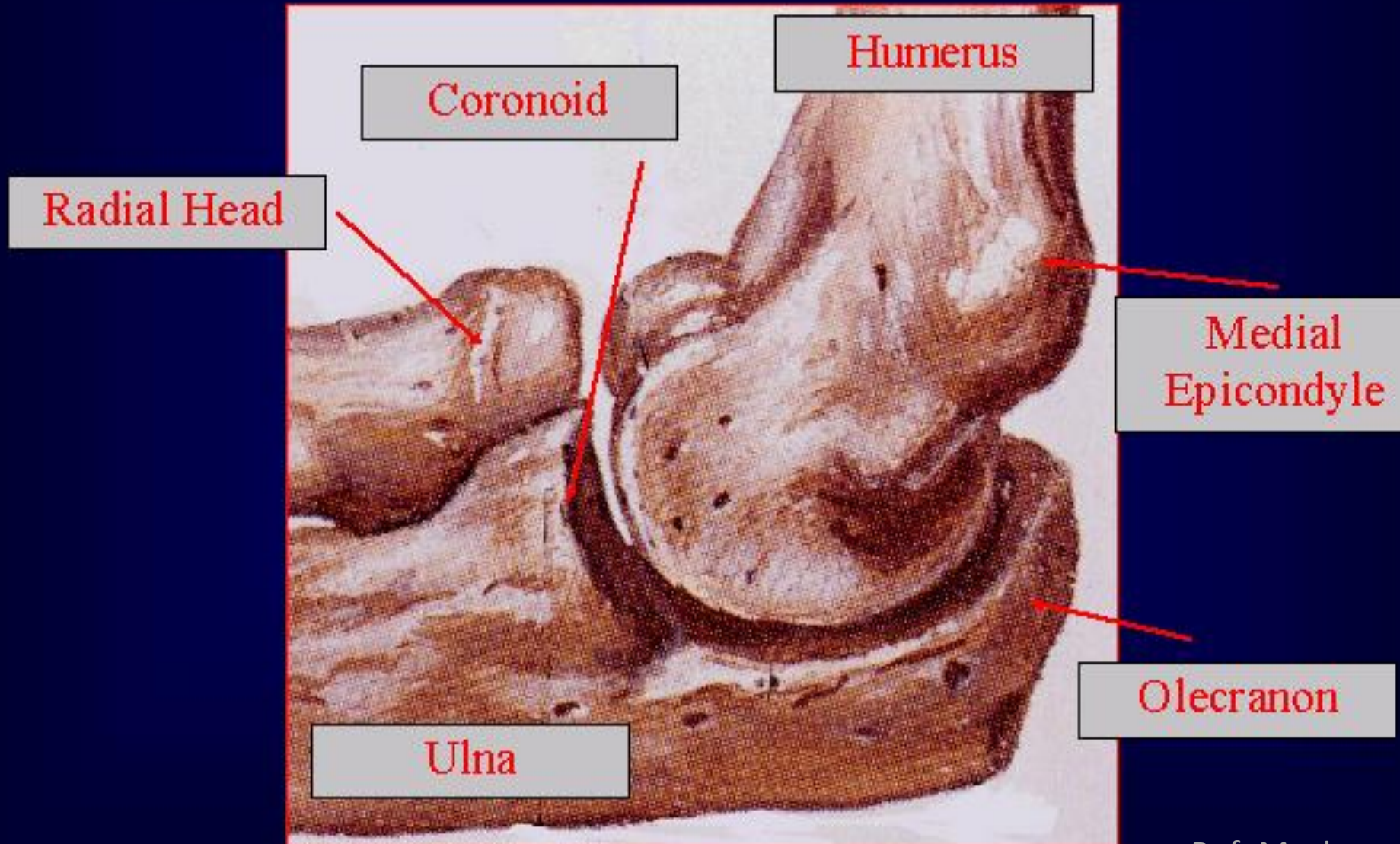
- 1 Acromioclavicular joint
- 2 Clavicle
- 3 Acromion
- 4 Coracoid process
- 5 Spine of the scapula
- 6 Humeral head
- 7 Scapula

Upper Arm

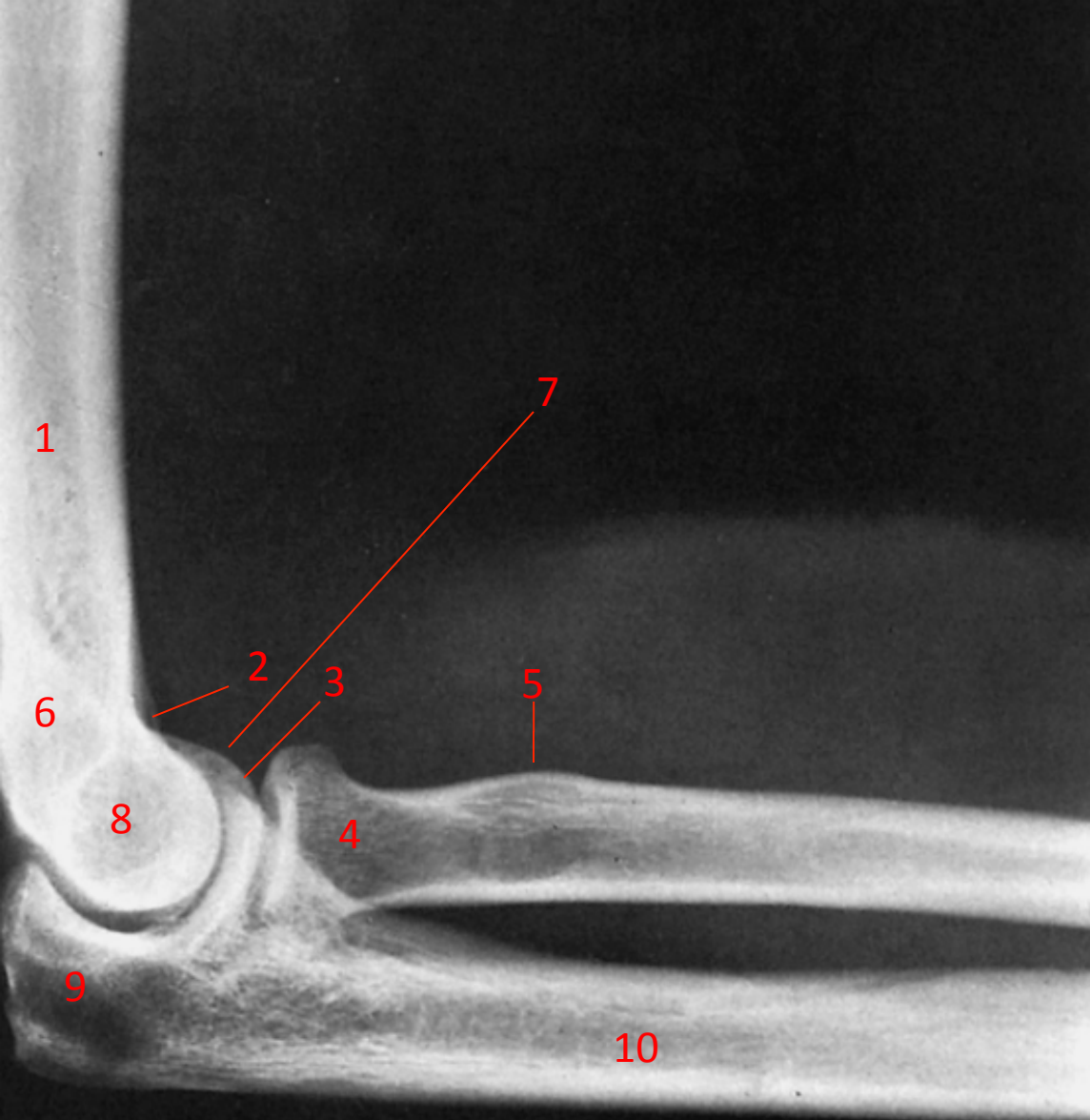


- 7 (the line)
- 1 Clavicle
 - 2 Scapula
 - 3 Acromion
 - 4 Greater tubercle of the humerus (supraspinatus, infraspinatus, teres minor)
 - 5 Lesser tubercle of the humerus (subscapularis)
 - 6 Humeral head
 - 7 Bicipital groove (long tendon of biceps)
 - 8 Humerus
 - 9 Deltoid tuberosity (deltoid muscle -> axillary nerve)
 - 10 Lateral epicondyle
 - 11 Olecranon/olecranon fossa
 - 12 Medial epicondyle

Medial View of Elbow



Elbow



- 1 Humerus
- 2 Coronoid fossa
(receives coronoid process during flexion of ulna)
- 3 Coronoid
- 4 Radial head
- 5 Radial tuberosity
(biceps tendon)
- 6 Olecranon fossa
- 7 Medial epicondyle
- 8 Lateral epicondyle
- 9 Olecranon (into fossa on extension)
- 10 Ulna

Epicondylitis

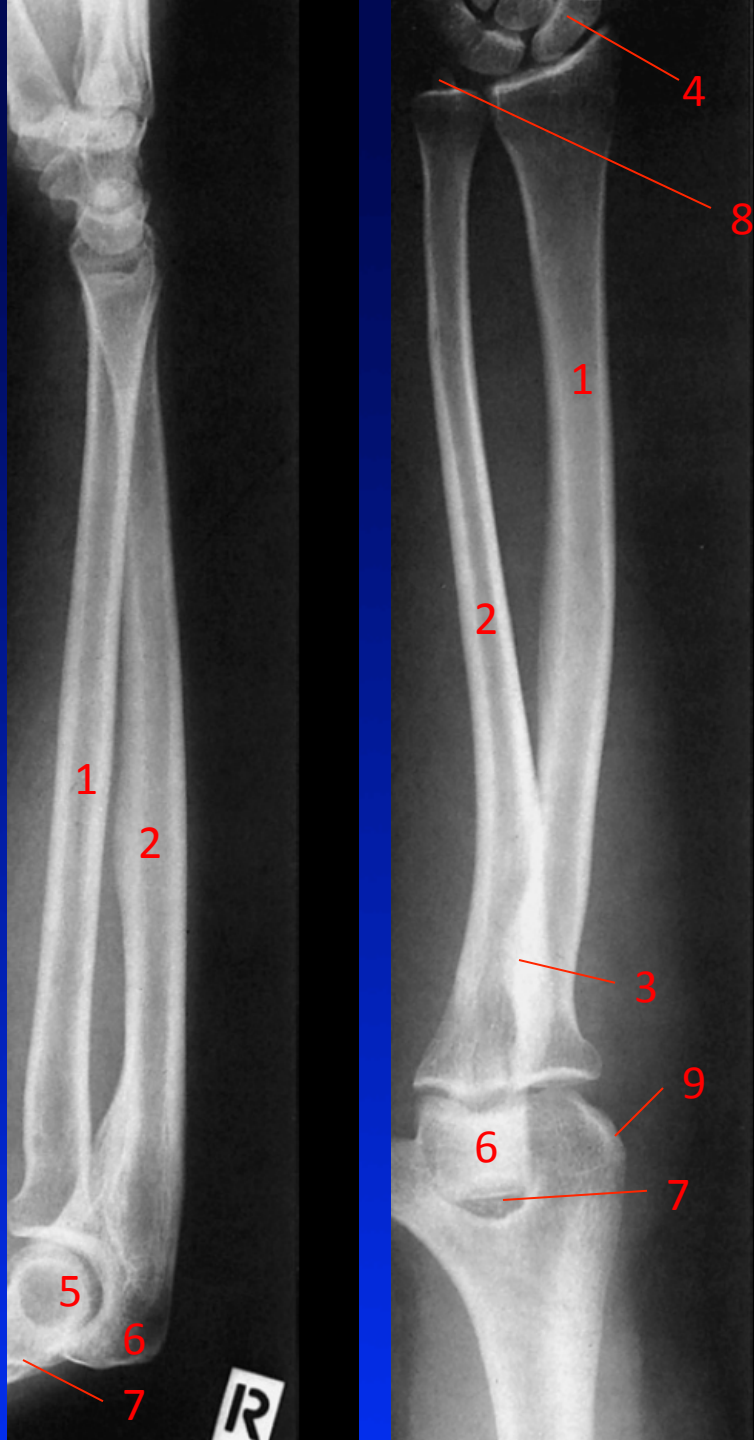
**Medial epicondylitis =
common flexor tendon**



**Lateral epicondylitis =
common extensor tendon**



Forearm

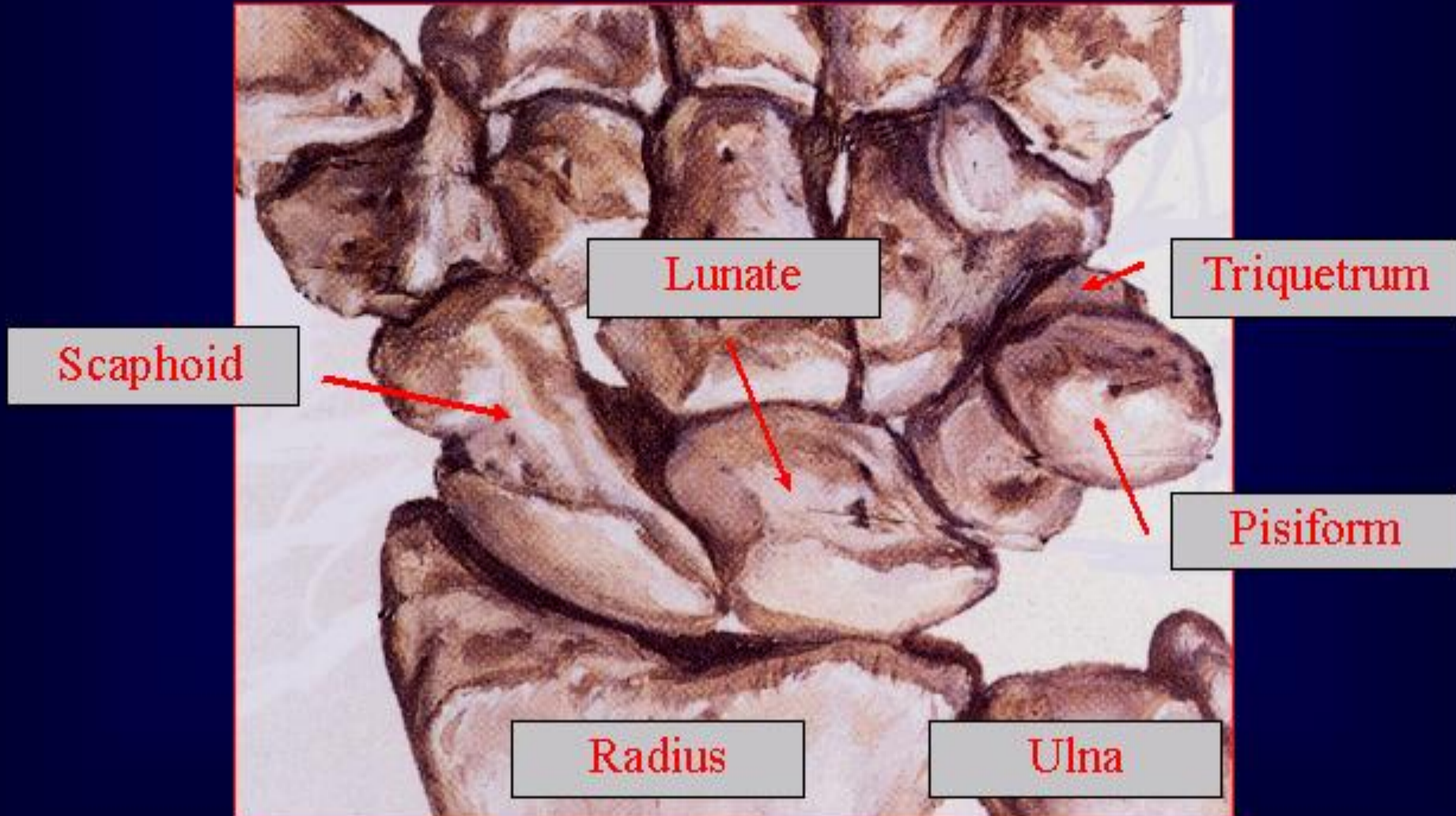


- 1 Radius
- 2 Ulna
- 3 Radial tuberosity (biceps tendon)
- 4 Scaphoid
- 5 Trochlea of the humerus (articulates with ulna)
- 6 Olecranon
- 7 Olecranon fossa (triangular depression, posterior humerus)
- 8 Ulnar styloid
- 9 Capitellum (rounded end of humerus, articulates with radius)

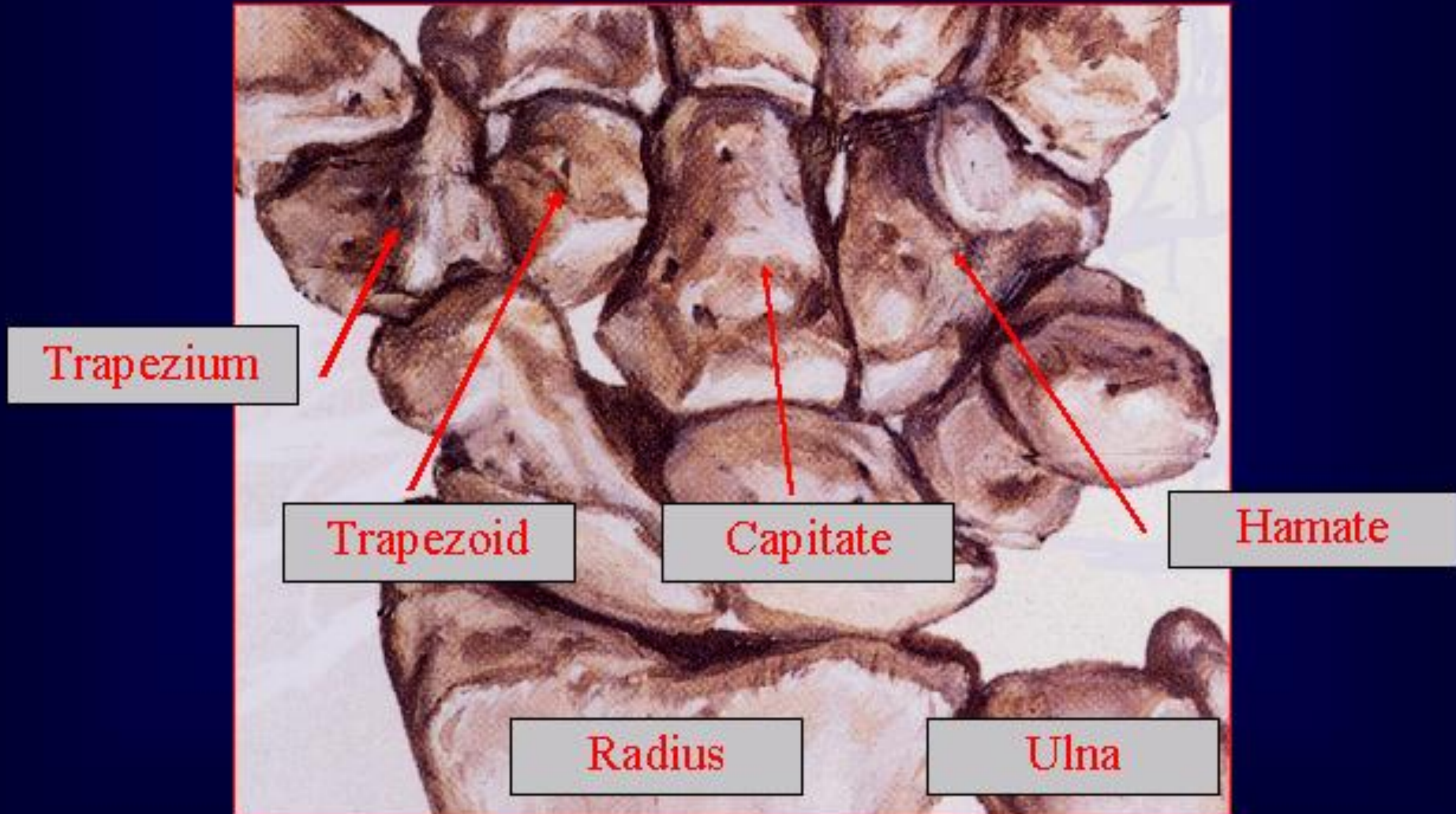


19 yo Male who was
shot in left arm during
Labor Day weekend.

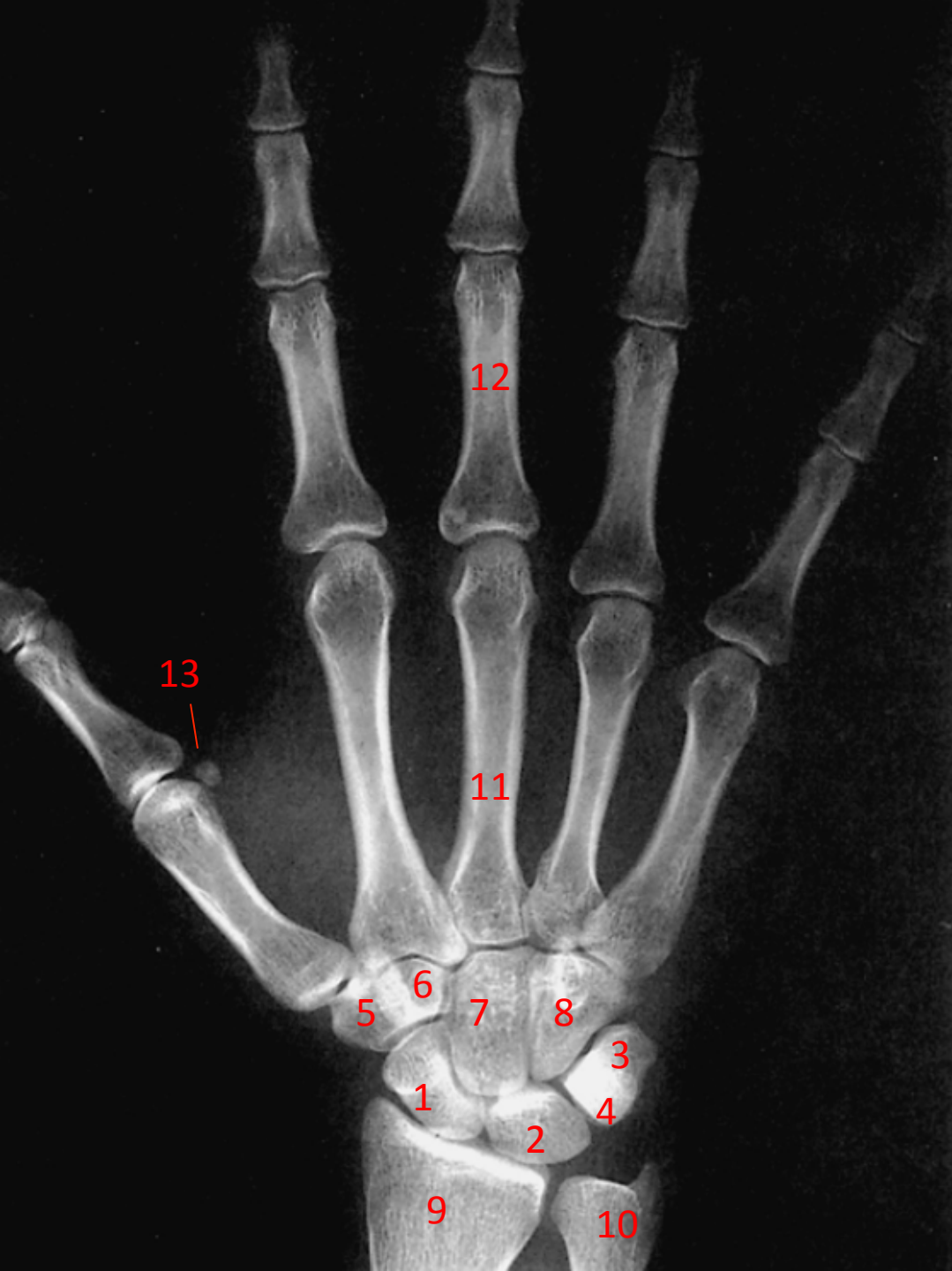
The Wrist Palmar View Carpal Bones (*Proximal Row*)



The Wrist Palmar View Carpal Bones (*Distal Row*)



Hand



- 1 Scaphoid
- 2 Lunate
- 3 Triquetrum
- 4 Pisiform
- 5 Trapezium
- 6 Trapezoid
- 7 Capitate
- 8 Hamate

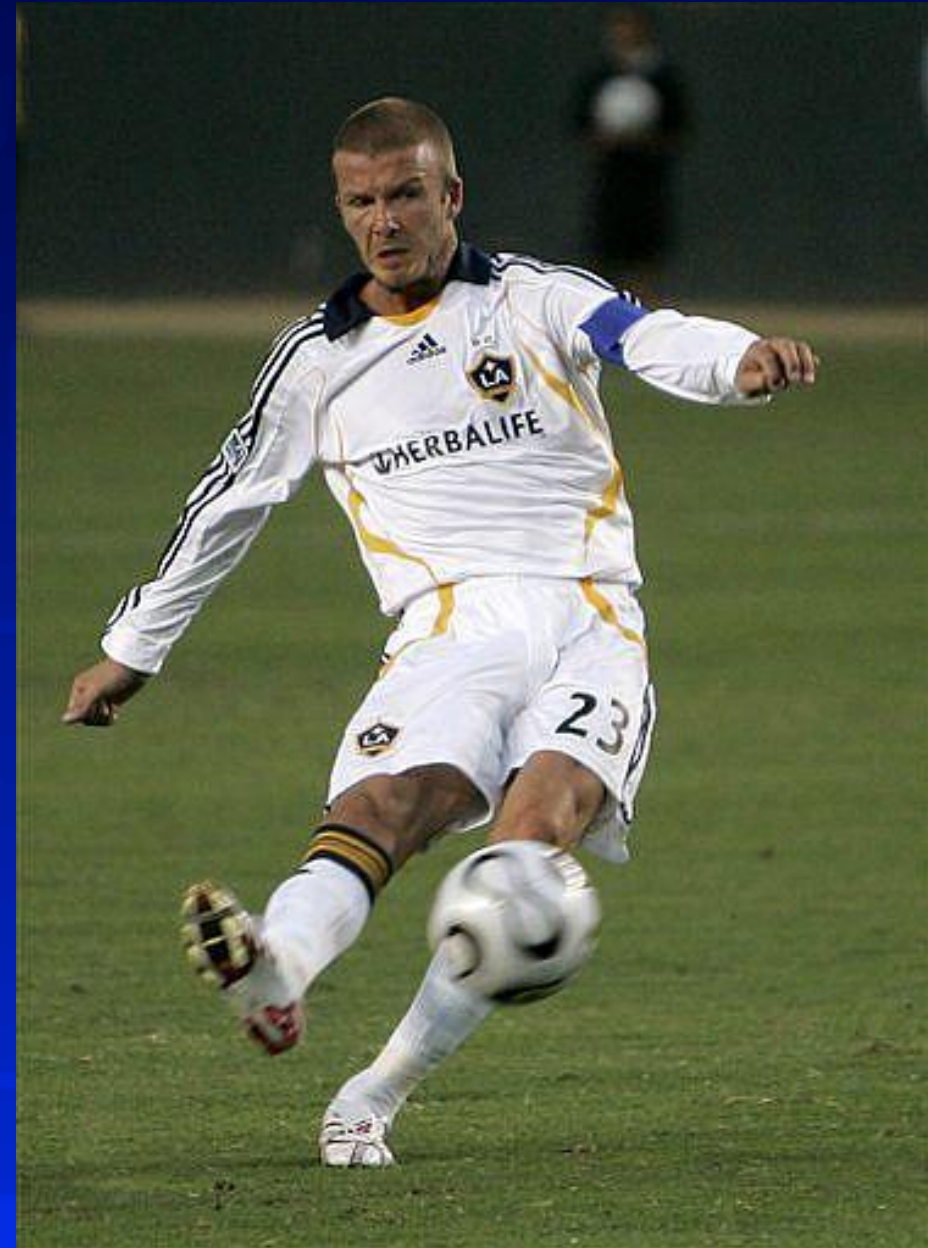
- 9 Radius
- 10 Ulna
- 11 Metacarpal
- 12 Phalanx (proximal)
- 13 Sesamoid (bone within tendon)

Scaphoid Fracture/AVN

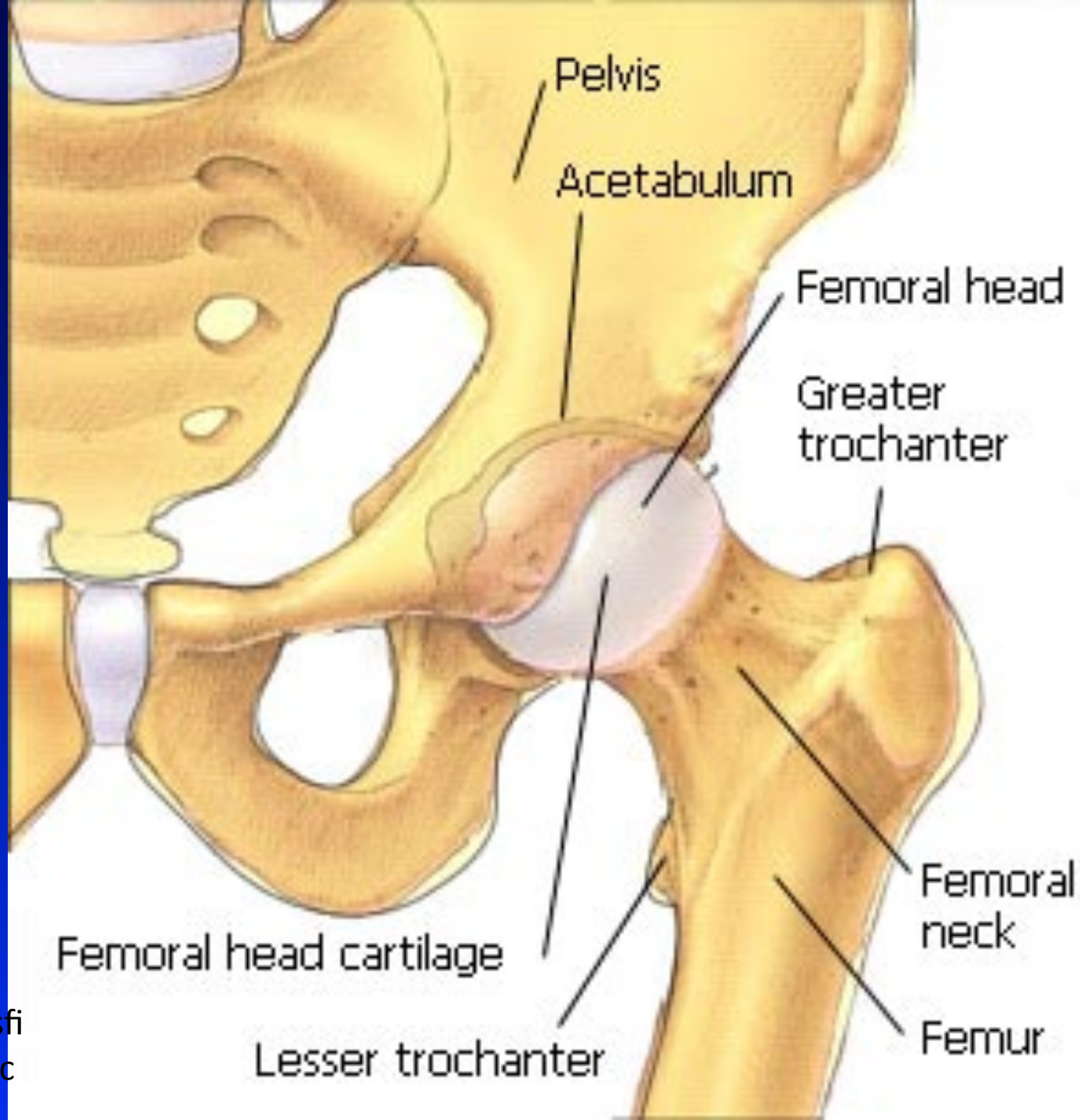


- Most common type of wrist fracture
- High risk for avascular necrosis
- Blood supply = lateral and distal branches of the radial artery
- Check snuffbox for radial arterial pulse!
- Snuffbox is created by tendons of extensor pollicis longus and extensor pollicis brevis

Lower Extremity

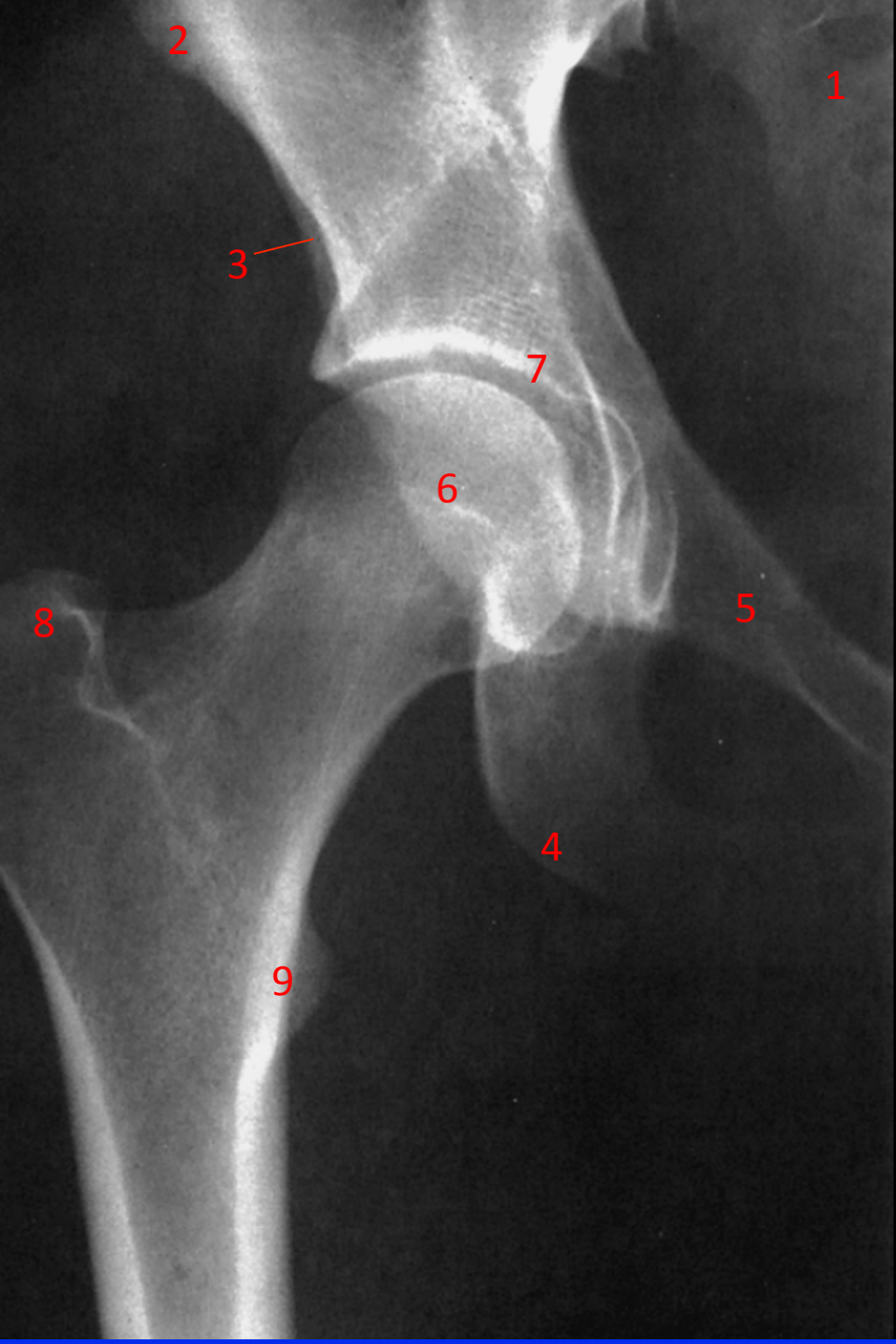


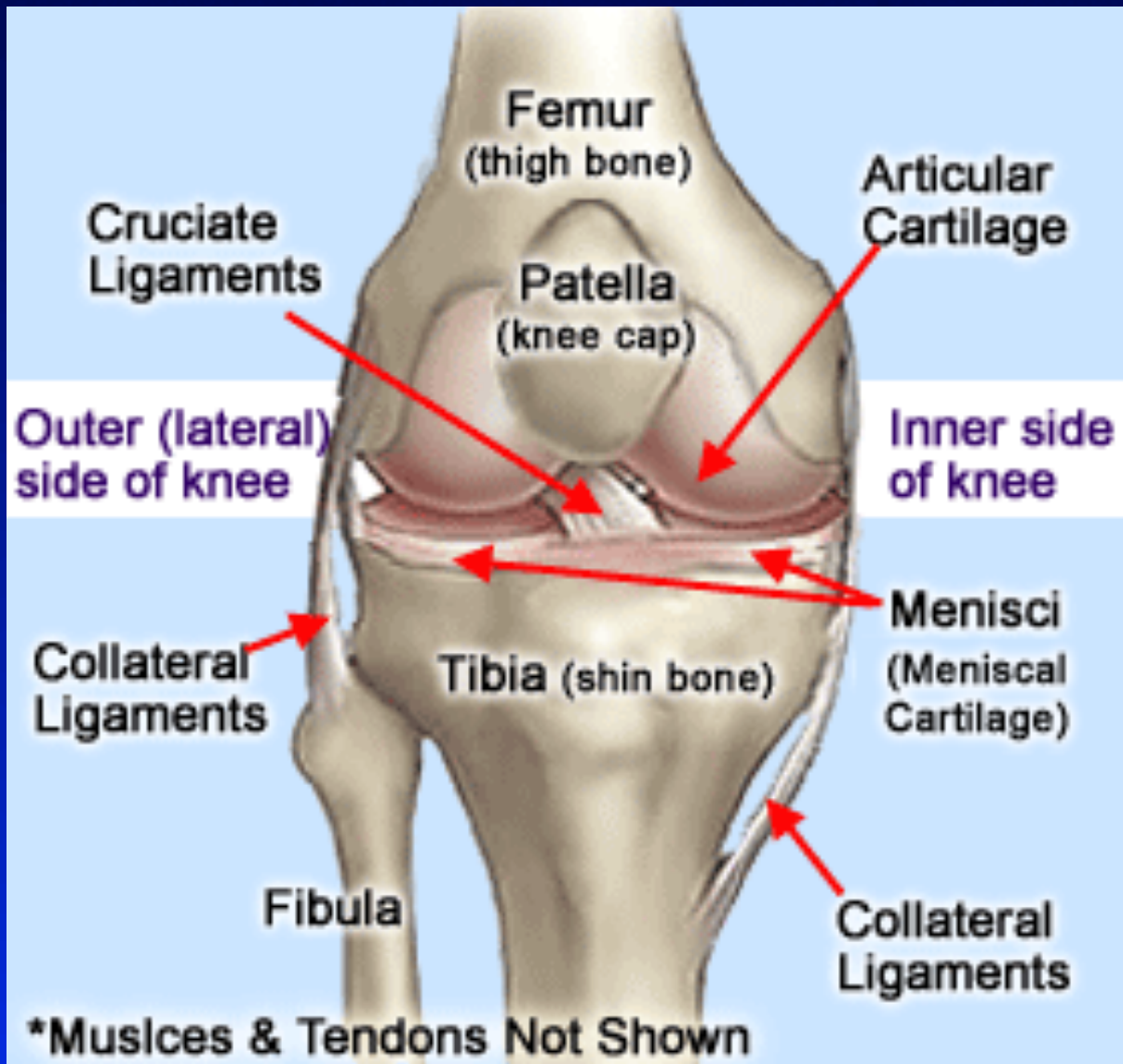
Happy Feet, the Penguin



Hip Joint

- 1 Sacrum
- 2 Anterior Superior Iliac Spine (cut off)
- 3 Anterior Inferior Iliac Spine
- 4 Ischial tuberosity
- 5 Superior pubic ramus
- 6 Femoral head
- 7 Acetabulum (ilium, ischium, and pubis)
- 8 Greater Trochanter of the femur (obturator, gluteus tendons)
- 9 Lesser Trochanter of the femur (psoas tendon)





Question: What is the unhappy triad?

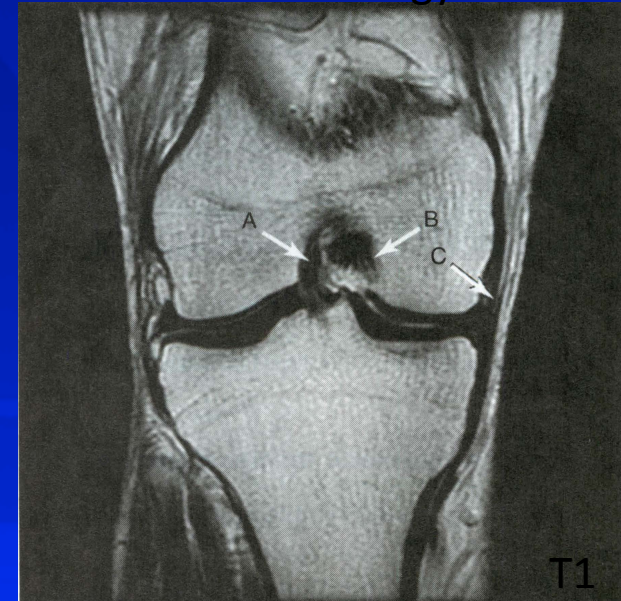
Answer:

1. ACL
2. Medial collateral ligament
3. Medial meniscus

Knee

- 1 Femur
- 2 Patella
- 3 Posterior fat pad
- 4 Lateral femoral condyle
- 5 Tibial plateau
- 6 Tibula
- 7 Fibula

Ref: Radiology Secrets



A = ACL

B = PCL

C = MCL

Ref: Moeller

Leg



- 1 Tibia
- 2 Fibula
- 3 Talus
- 4 Medial Malleolus
- 5 Lateral Malleolus
- 6 Interosseus membrane
- 7 Femur
- 8 Patella

Foot

- 1 Talus
- 2 Calcaneus
- 3 Navicular
- 4 Base of the fifth metatarsal
- 5 Cuboid
- 6 Cuneiforms



Another Foot

- 1 Distal Phalanx
- 2 Middle Phalanx
- 3 Proximal Phalanx
- 4 Sesamoid bone
- 5 Metatarsals
- 6 Cuboid
- 7 Navicular
- 8 Medial Cuneiform
- 9 Middle Cuneiform
- 10 Distal Cuneiform

5th Metatarsal Fracture

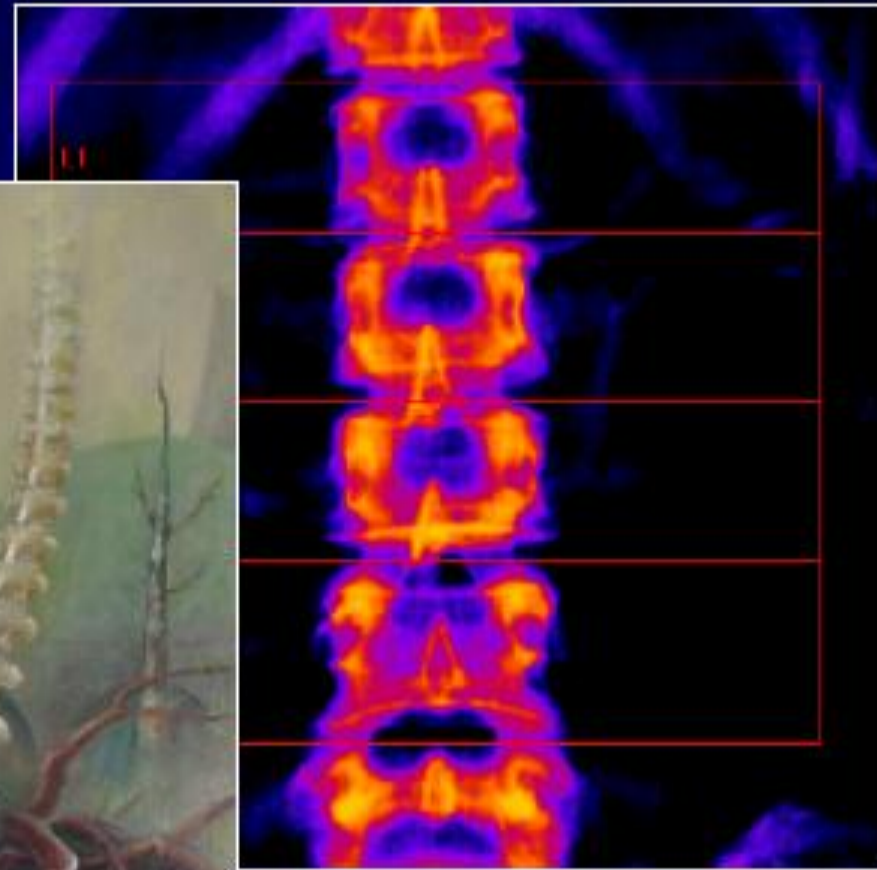


50 year old female who “twisted her ankle” on labor day weekend. ER physician observed point tenderness over base of fifth metatarsal.

Question: What is the most commonly injured ankle tendon?

Answer: Achilles

SPINE



Visual Human Sagittal View



7 Cervical Vertebra

12 Thoracic Vertebra

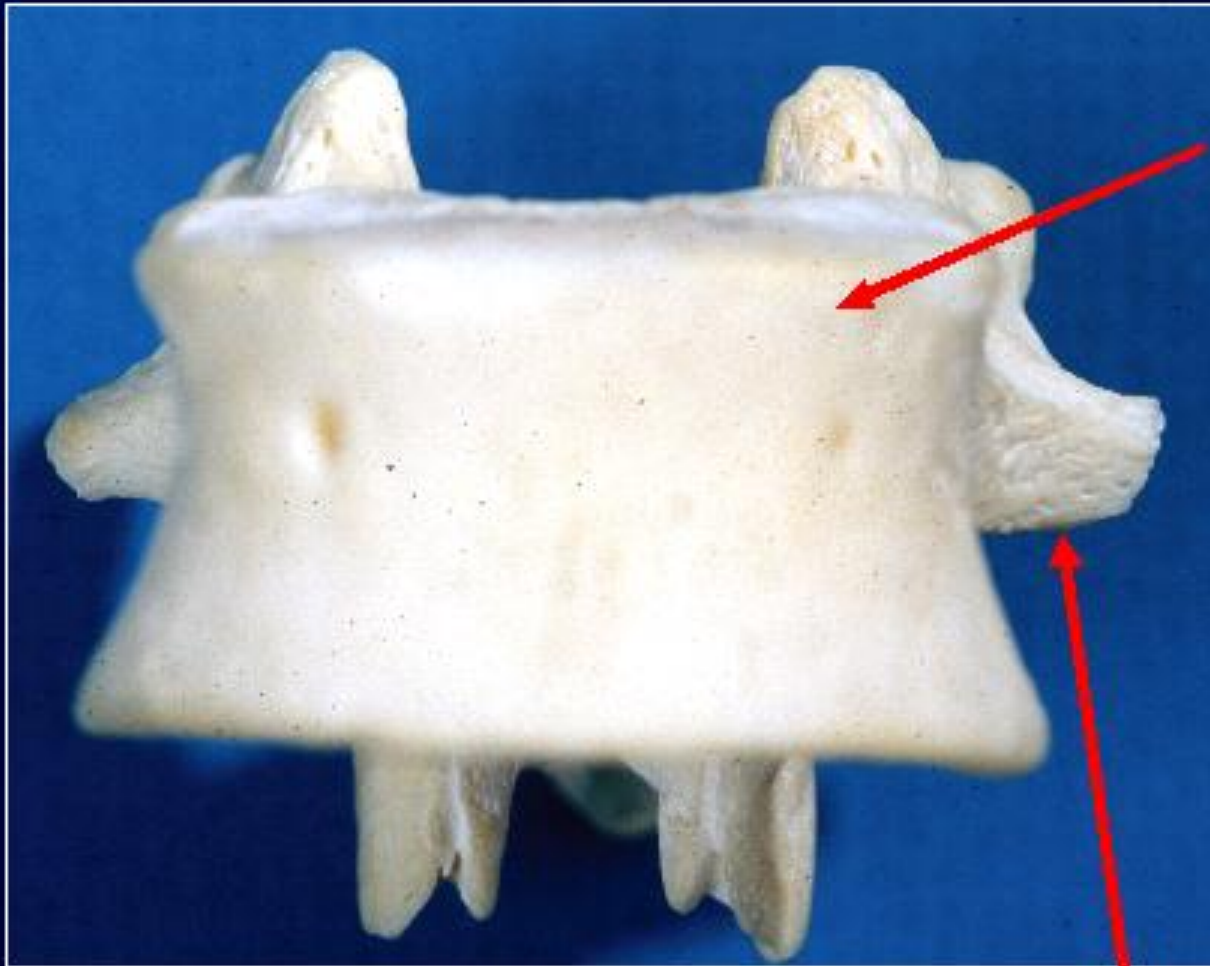
5 Lumbar Vertebra

5 Sacral Vertebra (fused)

3 Coccygeal Vertebra (fused)



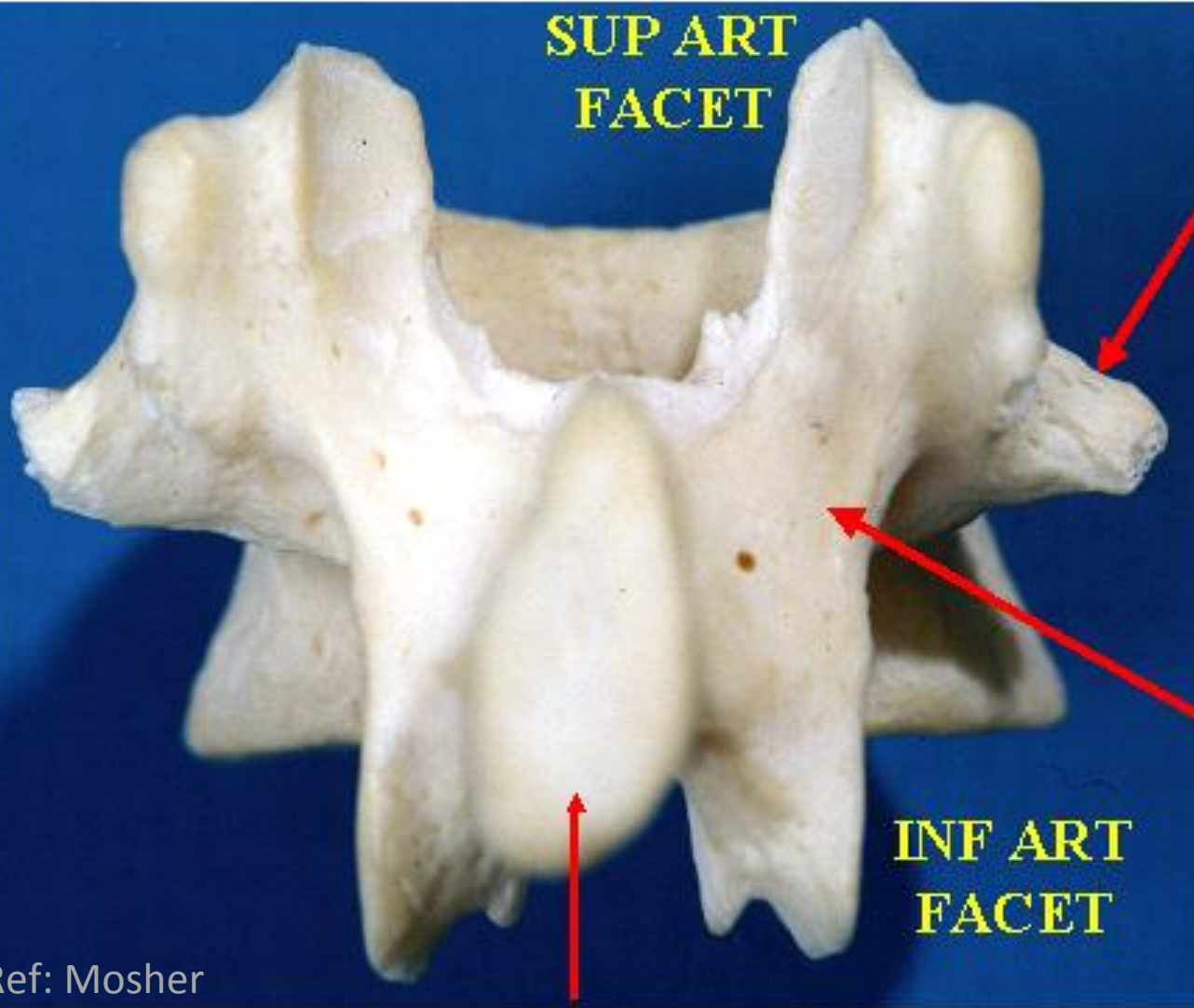
SPINE FROM THE FRONT



BODY

**TRANSVERSE
PROCESS**

SPINE FROM THE BACK

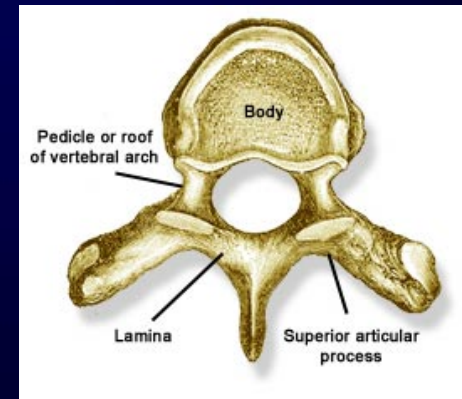


**TRANSVERSE
PROCESS**

LAMINA

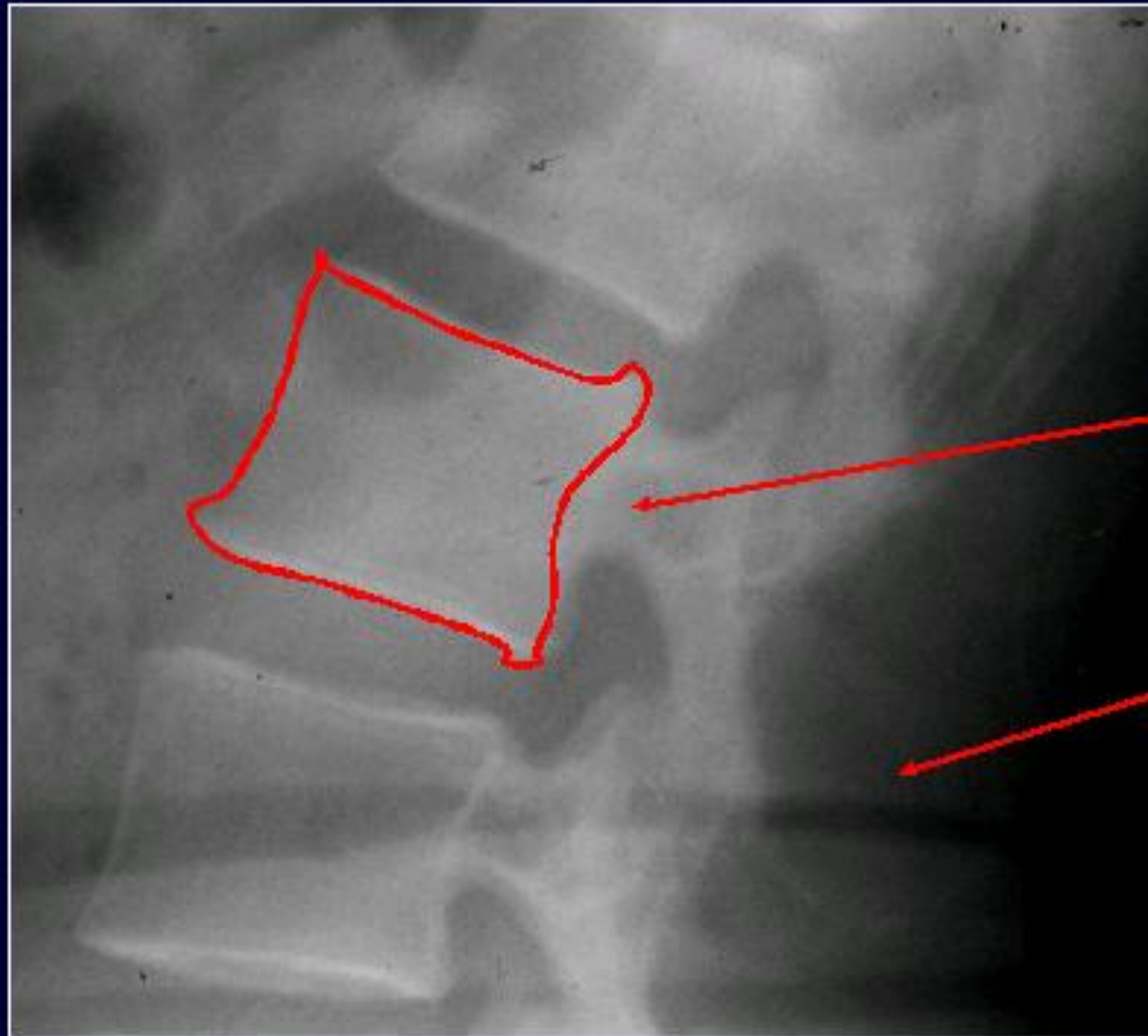
**INF ART
FACET**

SPINOUS PROCESS



Ref: Mosher

Lateral Lumbar Spine



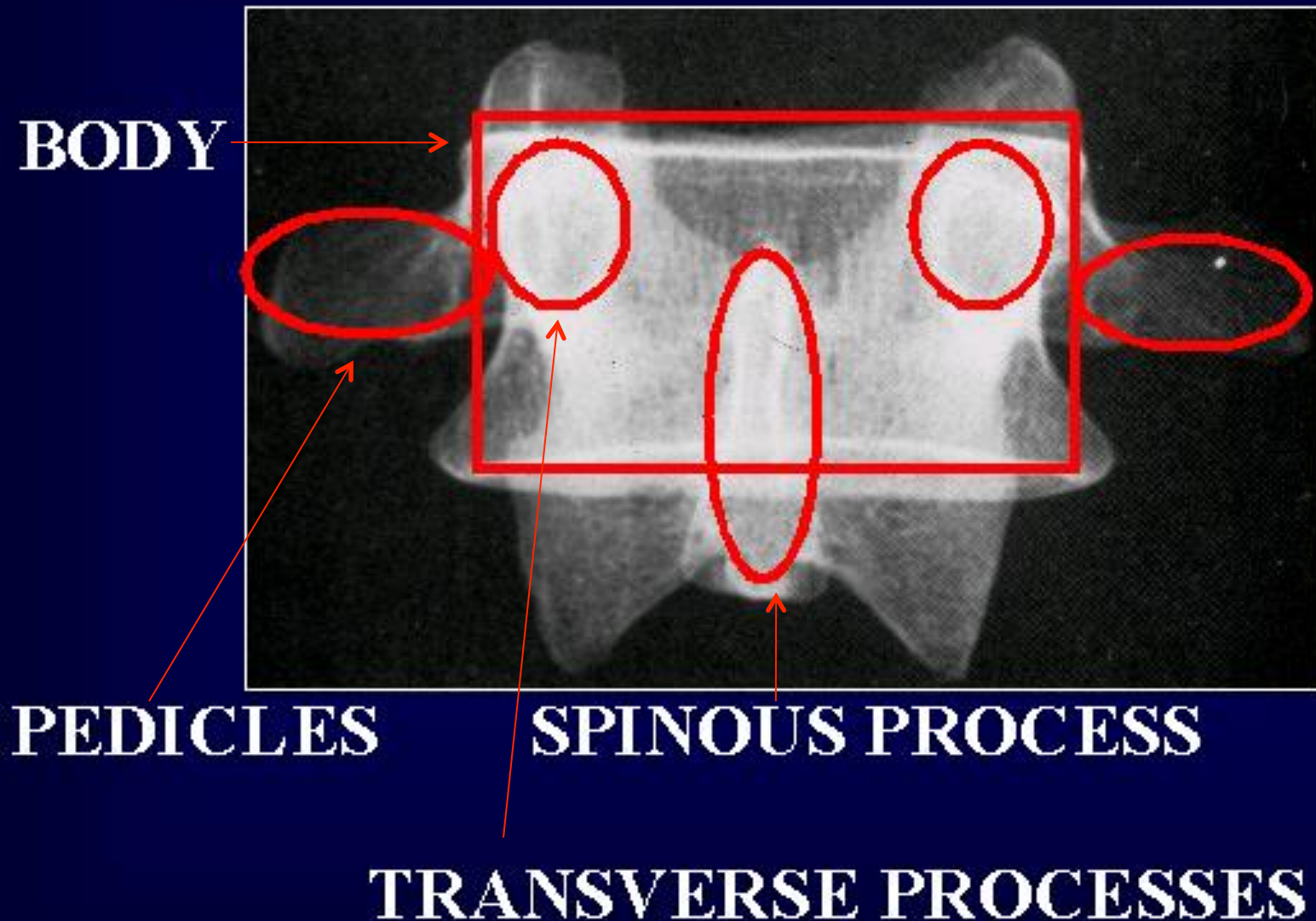
BODY



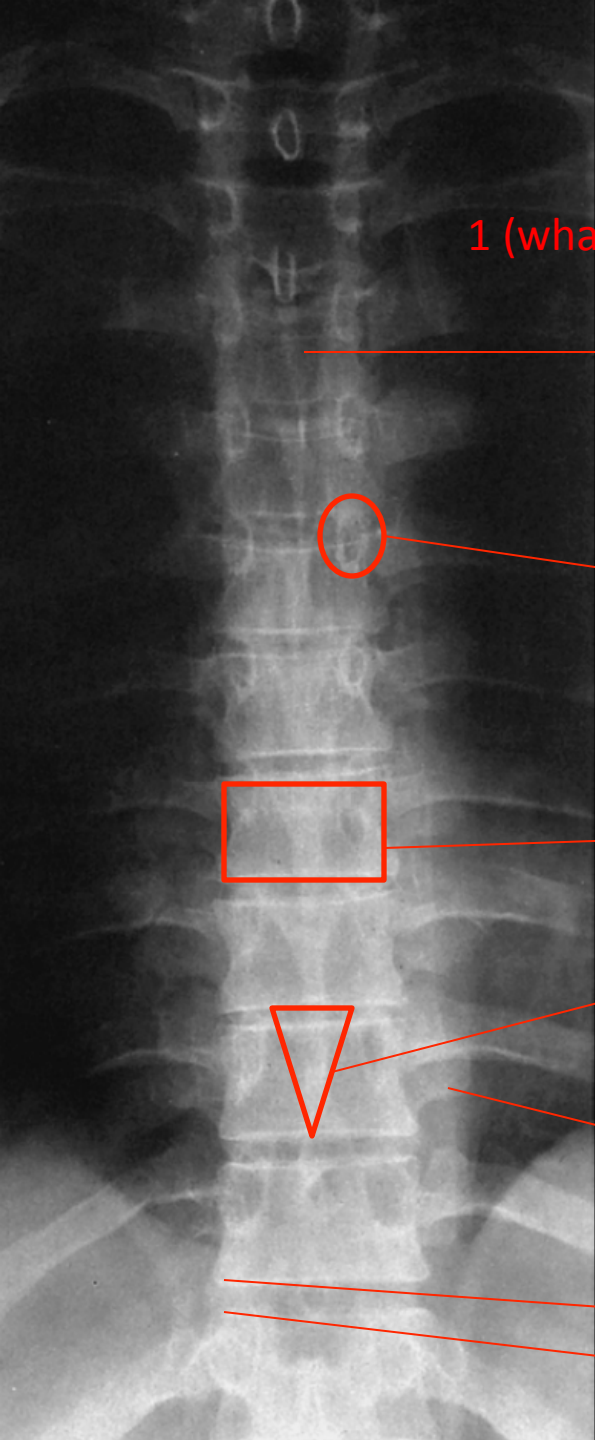
PEDICLE

**SPINOUS
PROCESS**

SPECIMEN RADIOGRAPH L4



Thoracic Spine



1 (what bone?)

2 (what lucency?)

5 (what process?)

3

6 (what process?)

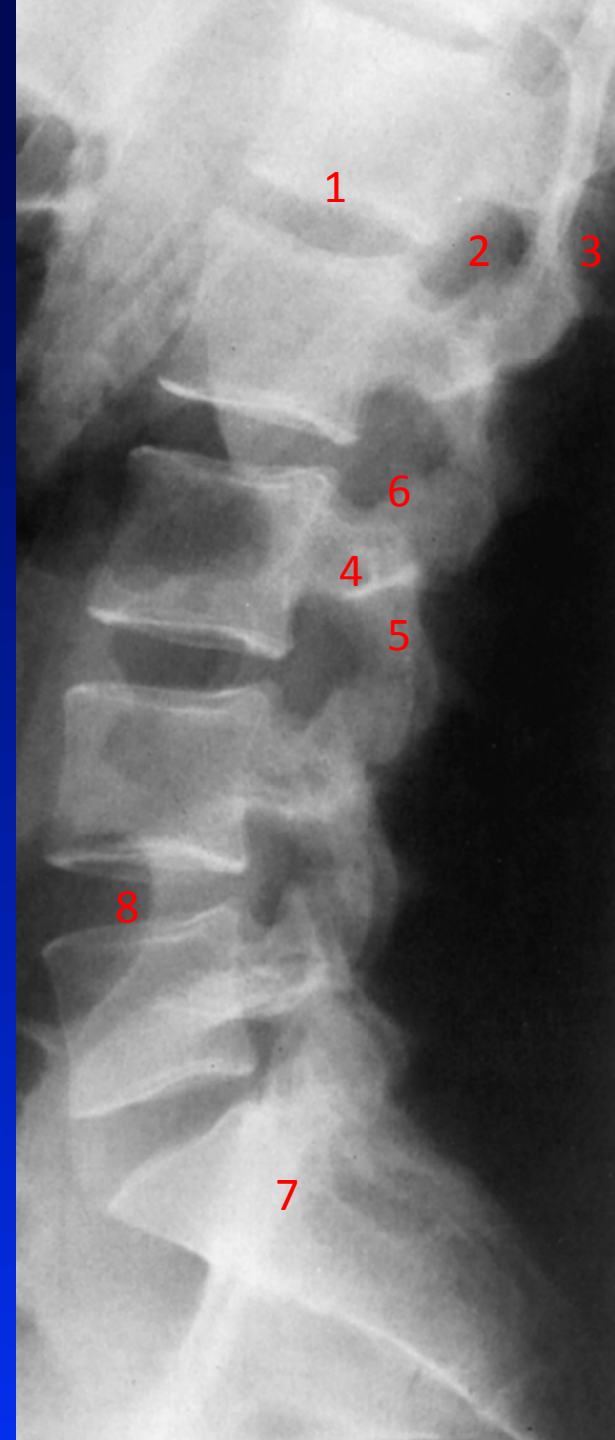
4 (what process?)

7 (what process?)

8 (what process?)

- 1 Clavicle
- 2 Trachea
- 3 Body of Vertebra (top and bottom are called endplates)
- 4 Transverse Process (muscle attachment)
- 5 Pedicle (project posteriorly)
- 6 Spinous Process
- 7 Inferior articular process
- 8 Superior articular process

Lumbar Spine



- 1 Endplate of vertebral body
- 2 Intervertebral foramen
- 3 Spinous process
- 4 Transverse process
- 5 Inferior articular process
- 6 Superior articular process
- 7 Sacrum
- 8 Intervertebral disk space

References:

- Moeller Pocket Atlas of Radiographic Anatomy
- Radiology Secrets
- Mosher ppt: <http://www.humangrossanatomy.us/radiology/upperextremityback/mosher04/siframes.html>

Interested in Radiology?

- Consider a small research project
- Take the radiology elective early in 3rd year
- Check out the Hopkins Radiology website
- Talk to current residents or 4th years who are applying now

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