

Imaging the Musculoskeletal System

(Part One)

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OBJECTIVE

The main focus and objective of this lecture is to help student to be competent in looking at MSK images and interpreting findings, by learning:

- ✓ Normal radiological anatomic landmarks
- ✓ System of analyzing findings

“Where to look & What to look for”

- ✓ Recognize features of certain disease entity

IMPORTANT SITES

BONE DENSITY & TEXTURE
BONE MARROW
ARTICULAR CORTICES
SOFT TISSUE

OUTLINES

- ✓ Introduce the different imaging modalities utilized in imaging MSK system
- ✓ Define Imaging anatomical landmarks seen in each modality
- ✓ Introduce simplified approach to the interpretation of image findings
- ✓ Identify Imaging findings, importance and correlation in different pathology, trauma
- ✓ Identify Imaging findings, importance and correlation in different pathology, arthritis
- ✓ Identify Imaging findings, importance and correlation in different pathology, metabolic
- ✓ Identify Imaging findings, importance and correlation in different pathology, neoplastic

IMAGING OF MUSCULOSKELETAL SYSTEM

CONVENTIONAL RADIOGRAPHY

Corner Stone

COMPUTED TOMOGRAPHY

MAGNETIC RESONANCE IMAGING

Useful in evaluating bone texture

ULTRASOUND

Useful in bone marrow and soft tissue

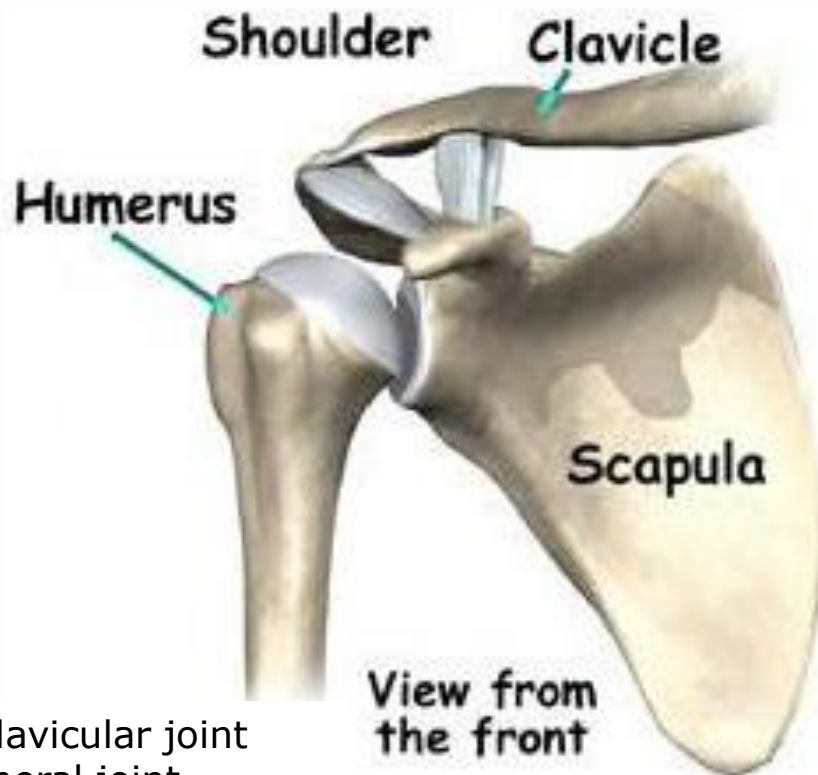
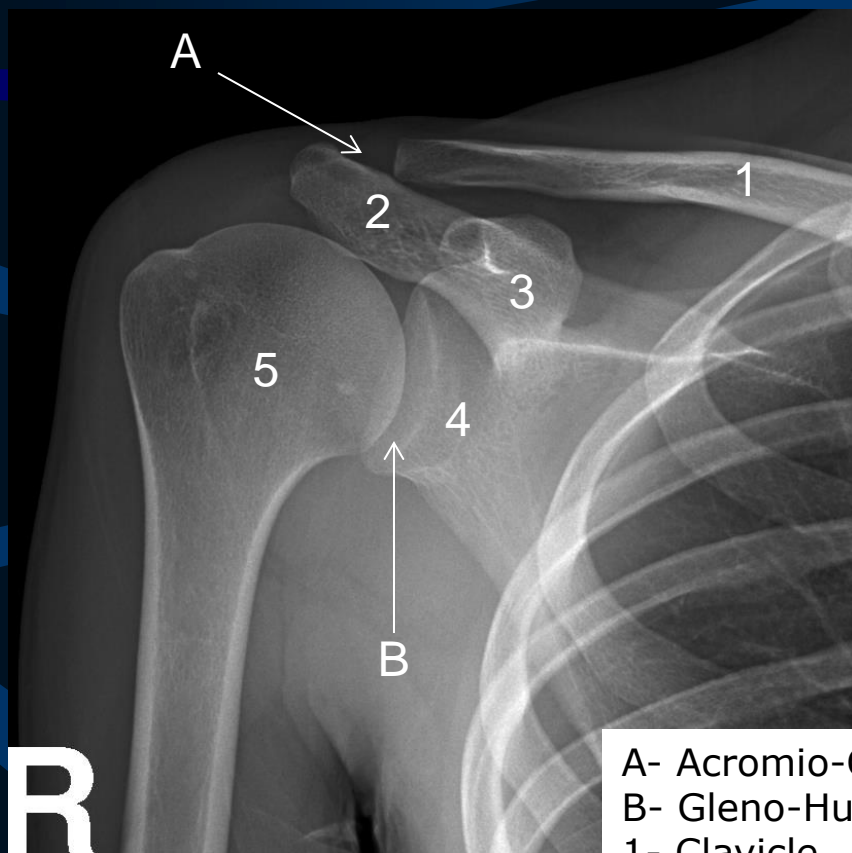
NUCLEAR MEDICINE

bone scan is very sensitive but is relatively non-specific

- Tendons/ligaments/muscles.
- Detect fluid collections around joints or within muscles.
- Soft tissue masses and cysts.

IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY

IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY



- R**
- A- Acromio-Clavicular joint
 - B- Gleno-Humeral joint
 - 1- Clavicle
 - 2- Acromioclavicular joint
 - 3- Coracoclavicular joint
 - 4- Glenoid process
 - 5- Humerus

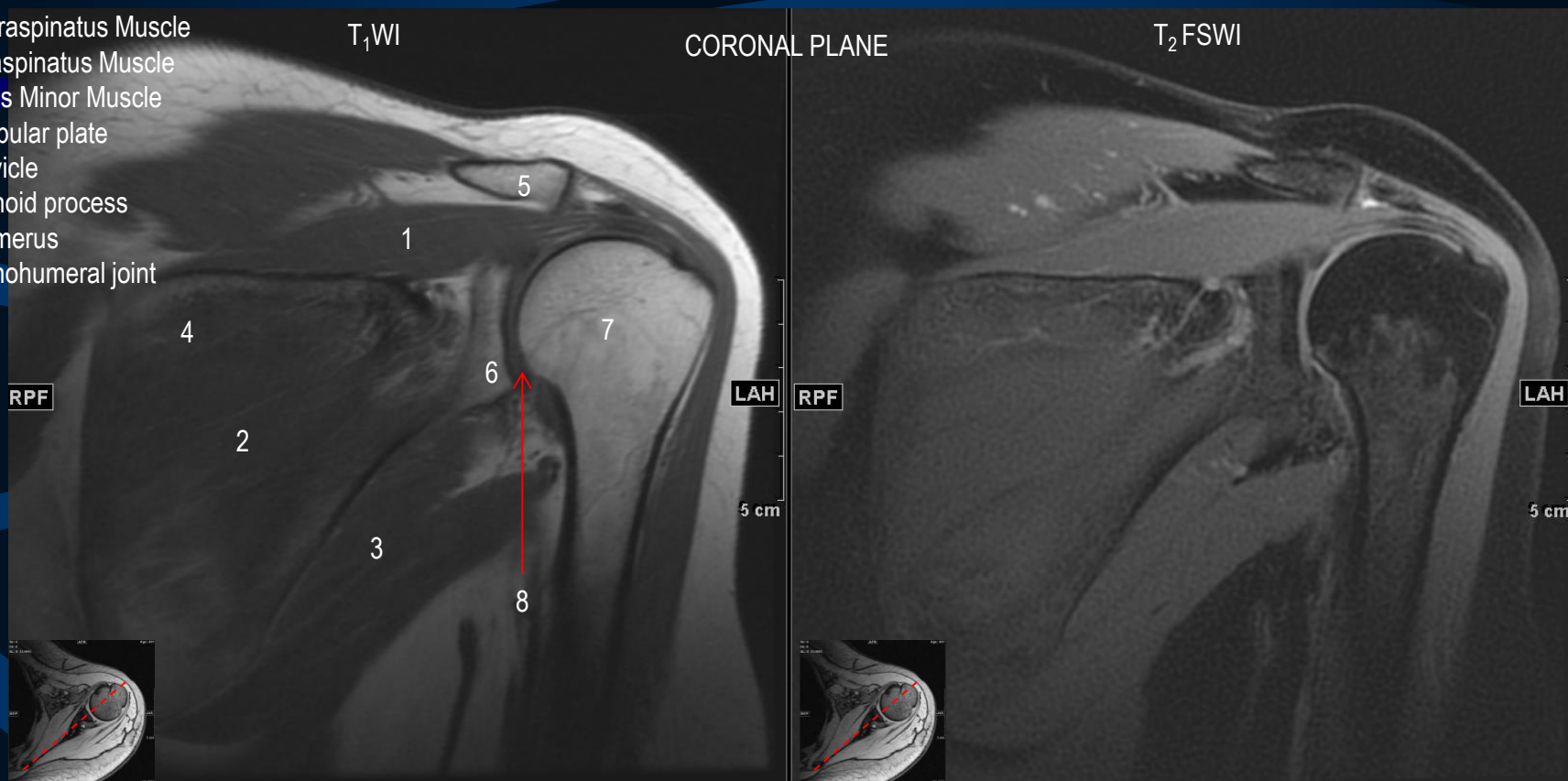
IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY



COMPUTED TOMOGRAPHY

IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY

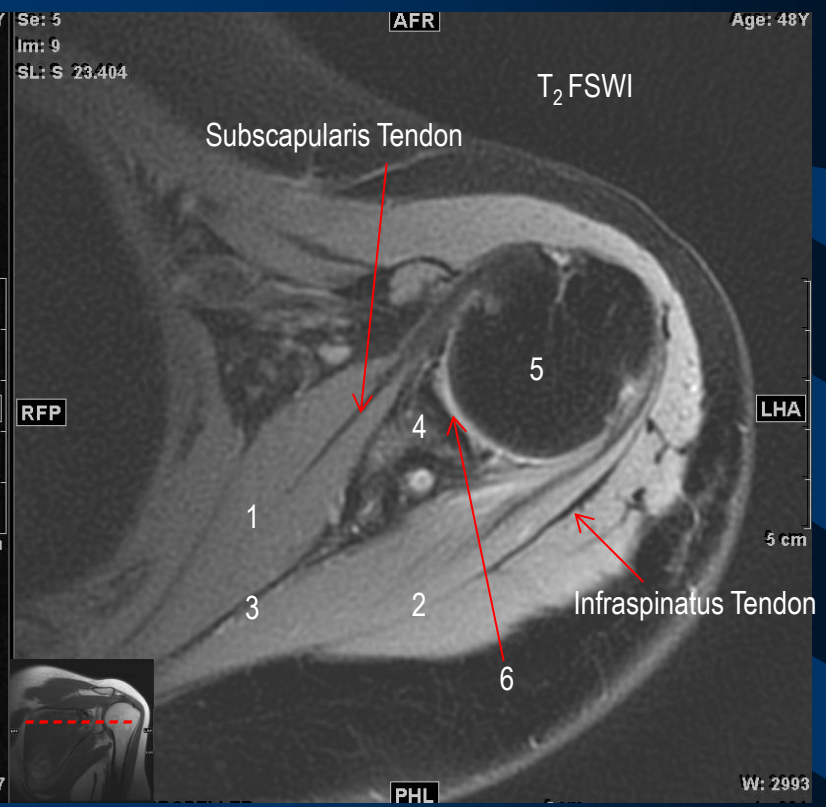
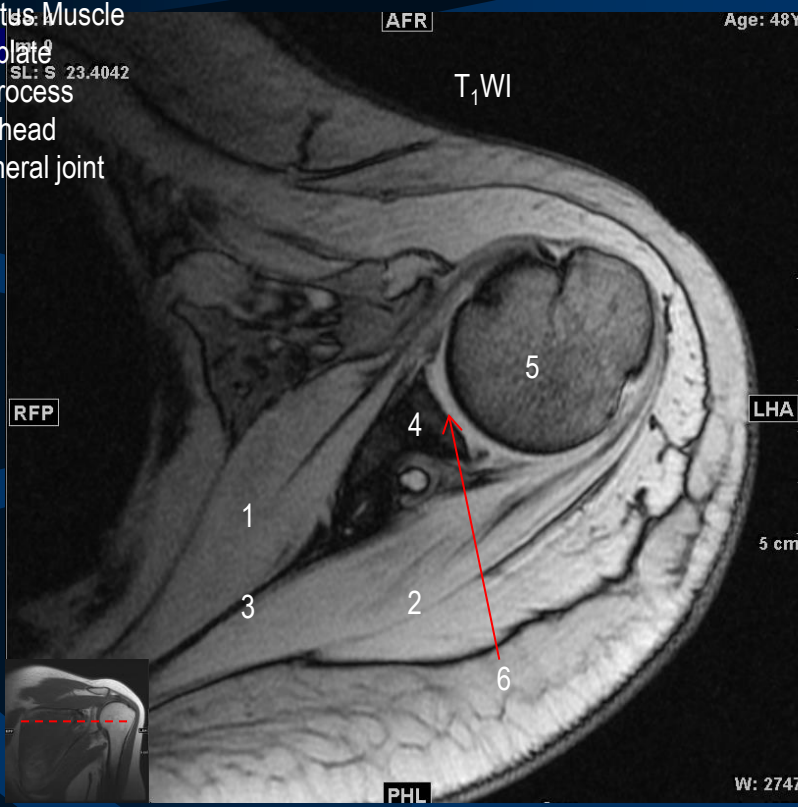
- 1- Supraspinatus Muscle
- 2- Infraspinatus Muscle
- 3- Teres Minor Muscle
- 4- Scapular plate
- 5- Clavicle
- 6- Glenoid process
- 7- Humerus
- 8- Glenohumeral joint



IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY

- 1- Subscapularis Muscle
- 2- Infraspinatus Muscle
- 3- Scapular plate
- 4- Glenoid process
- 5- Humeral head
- 6- Glenohumeral joint

AXIAL PLANE

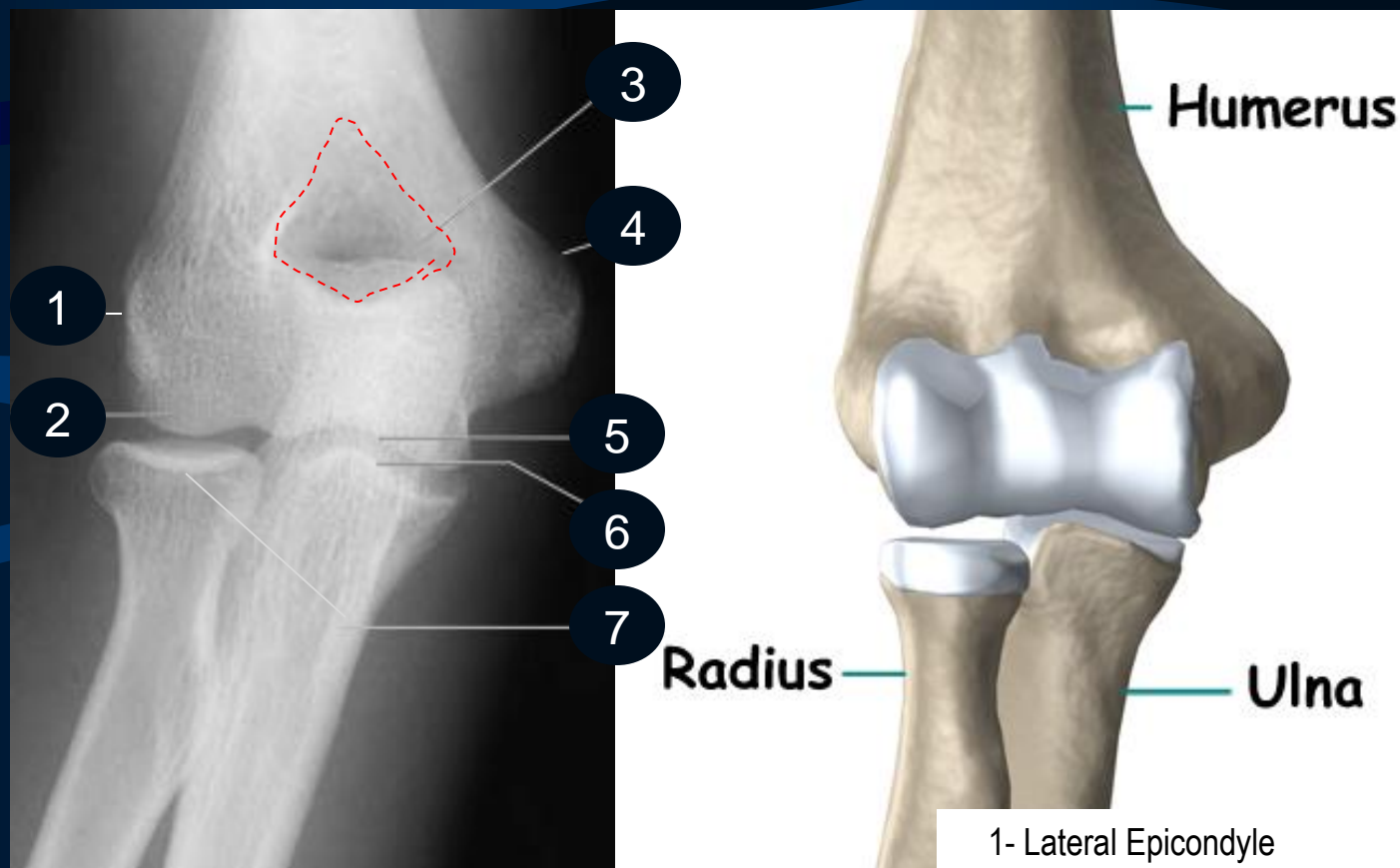


IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY

SAGITTAL PLANE

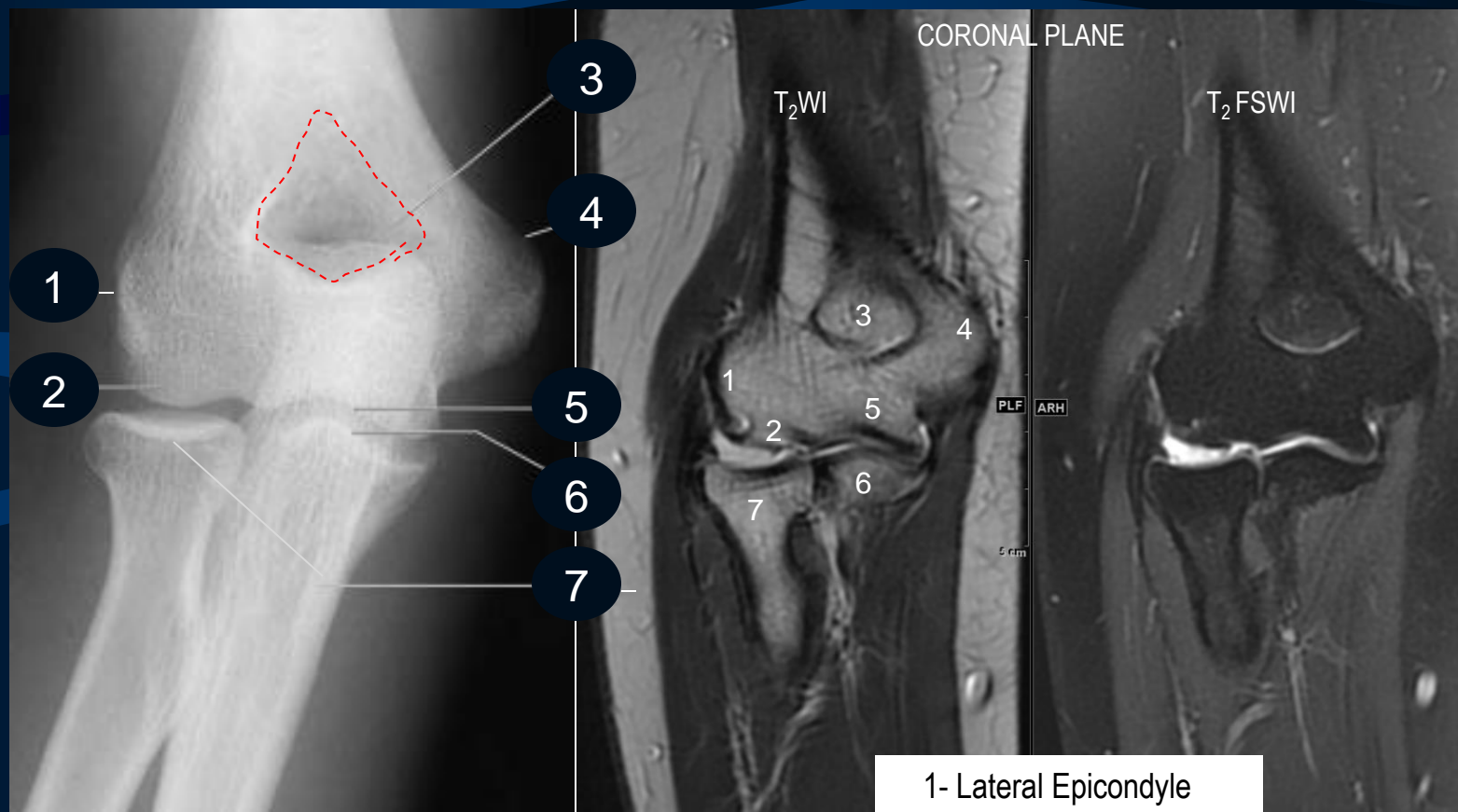


IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY



- 1- Lateral Epicondyle
- 2- Capitulum
- 3- Olecranon Fossa
- 4- Medial Epicondyle
- 5- Trochlea
- 6- Coronoid Process
- 7- Radius Head

IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY

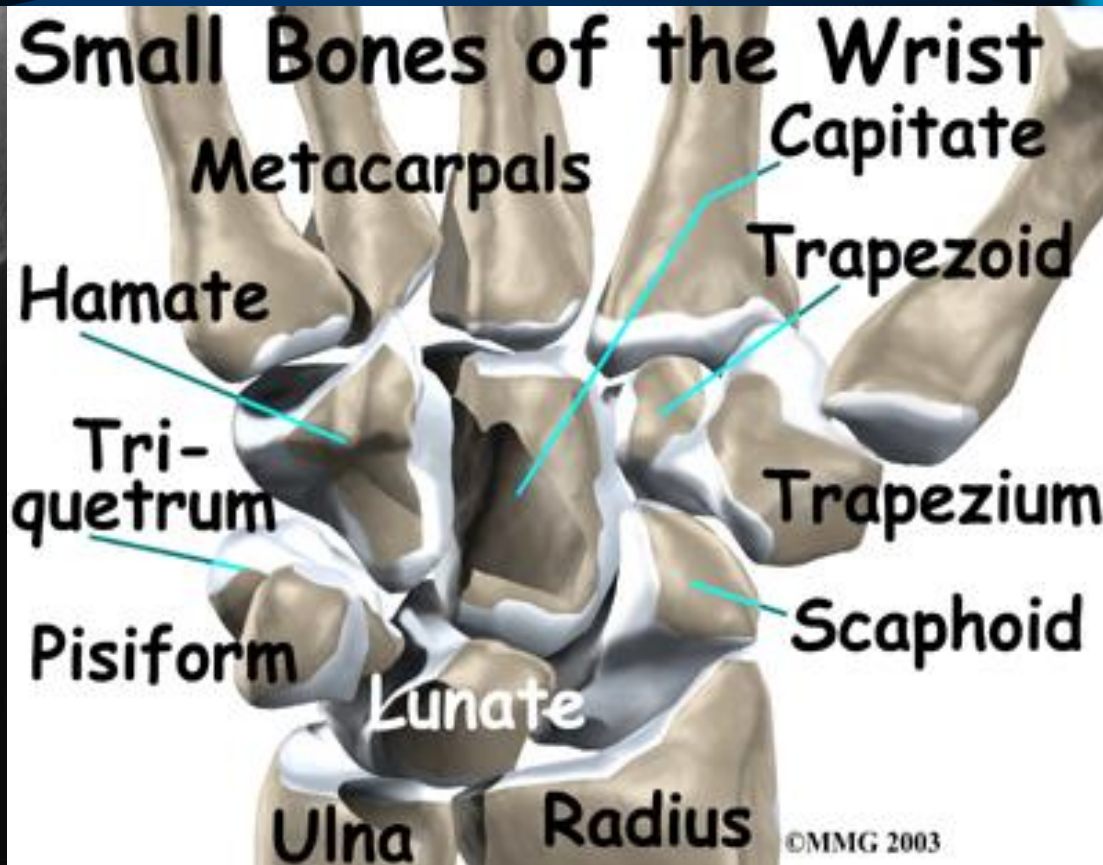


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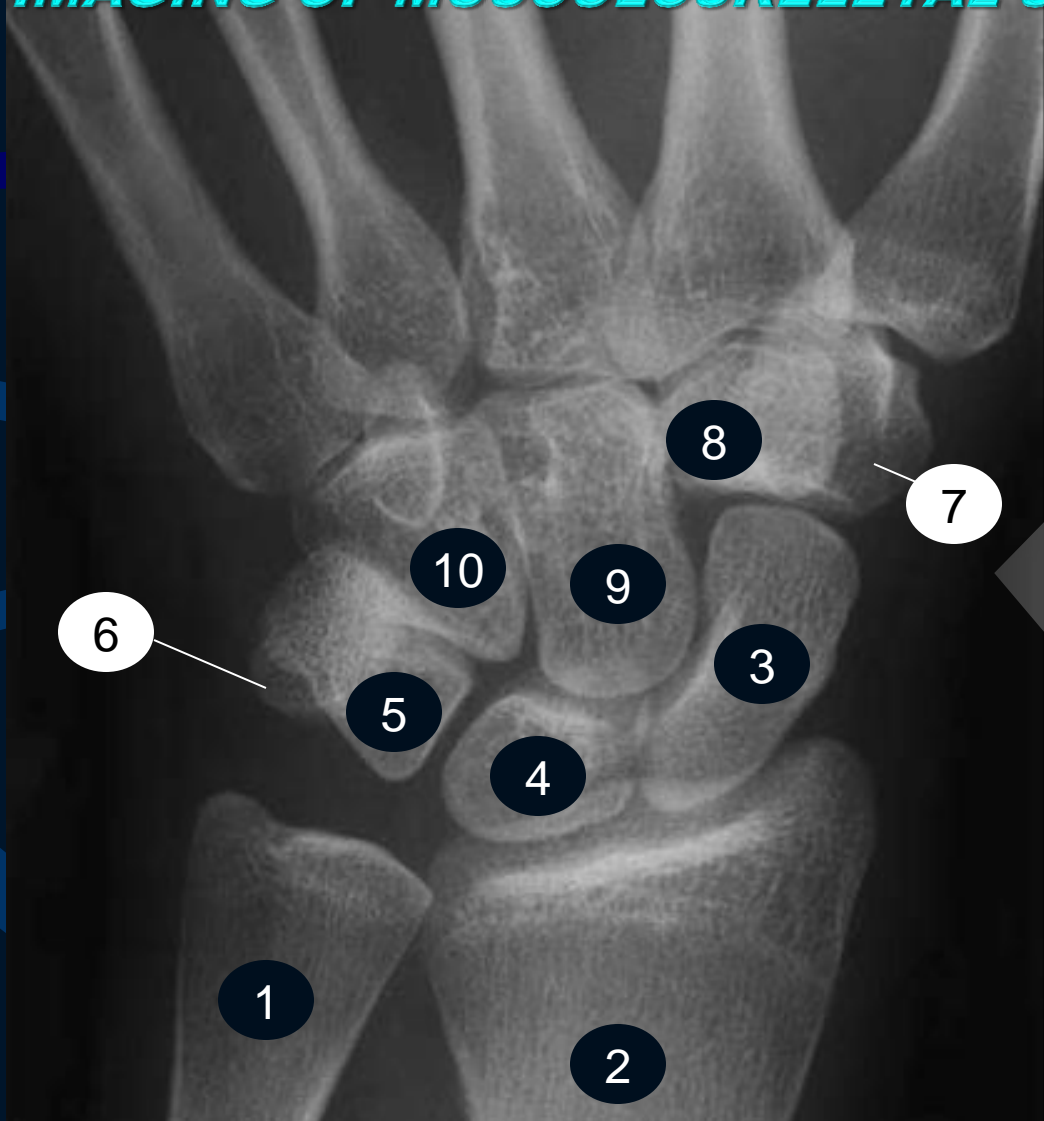
IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY



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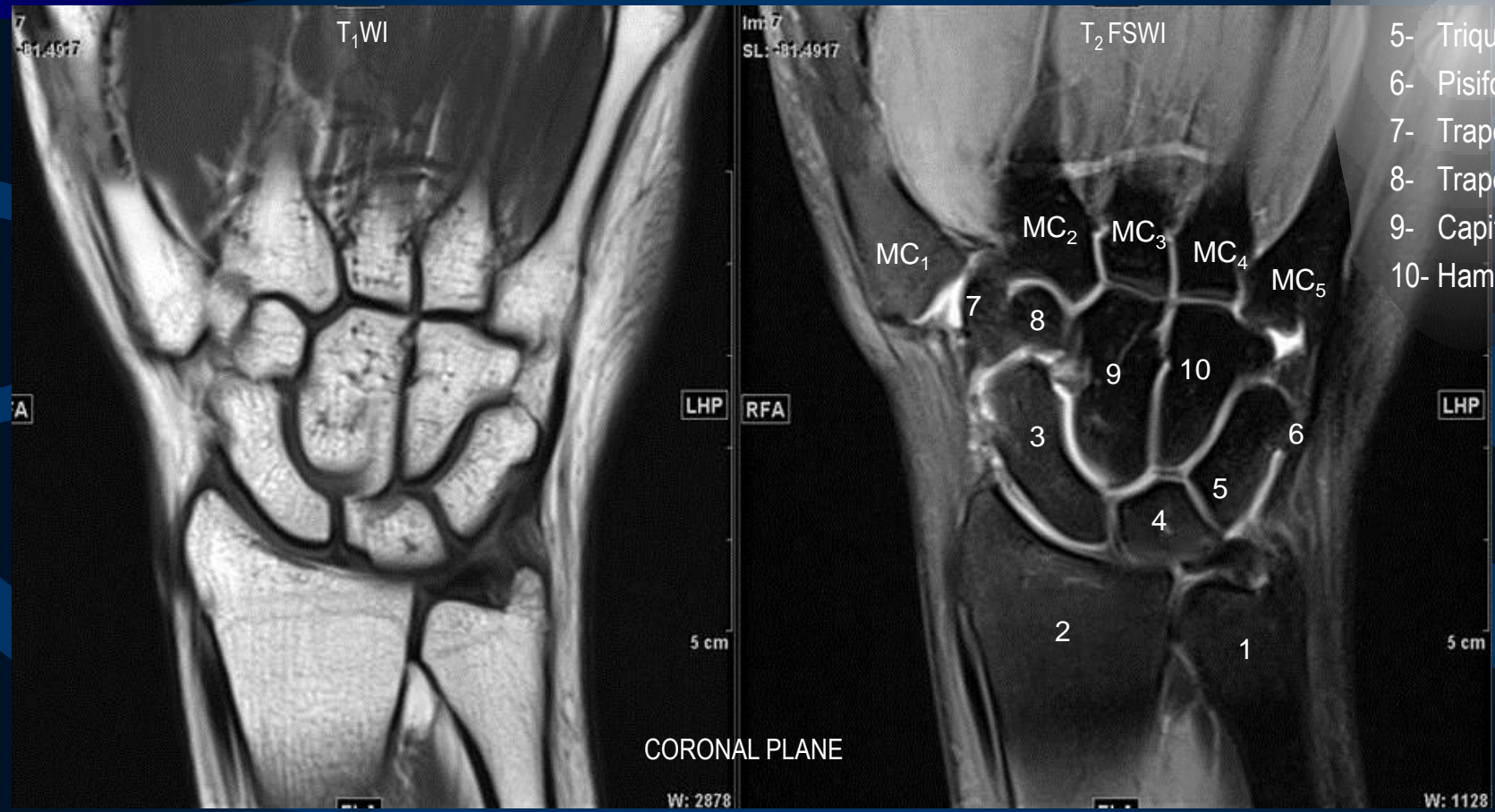
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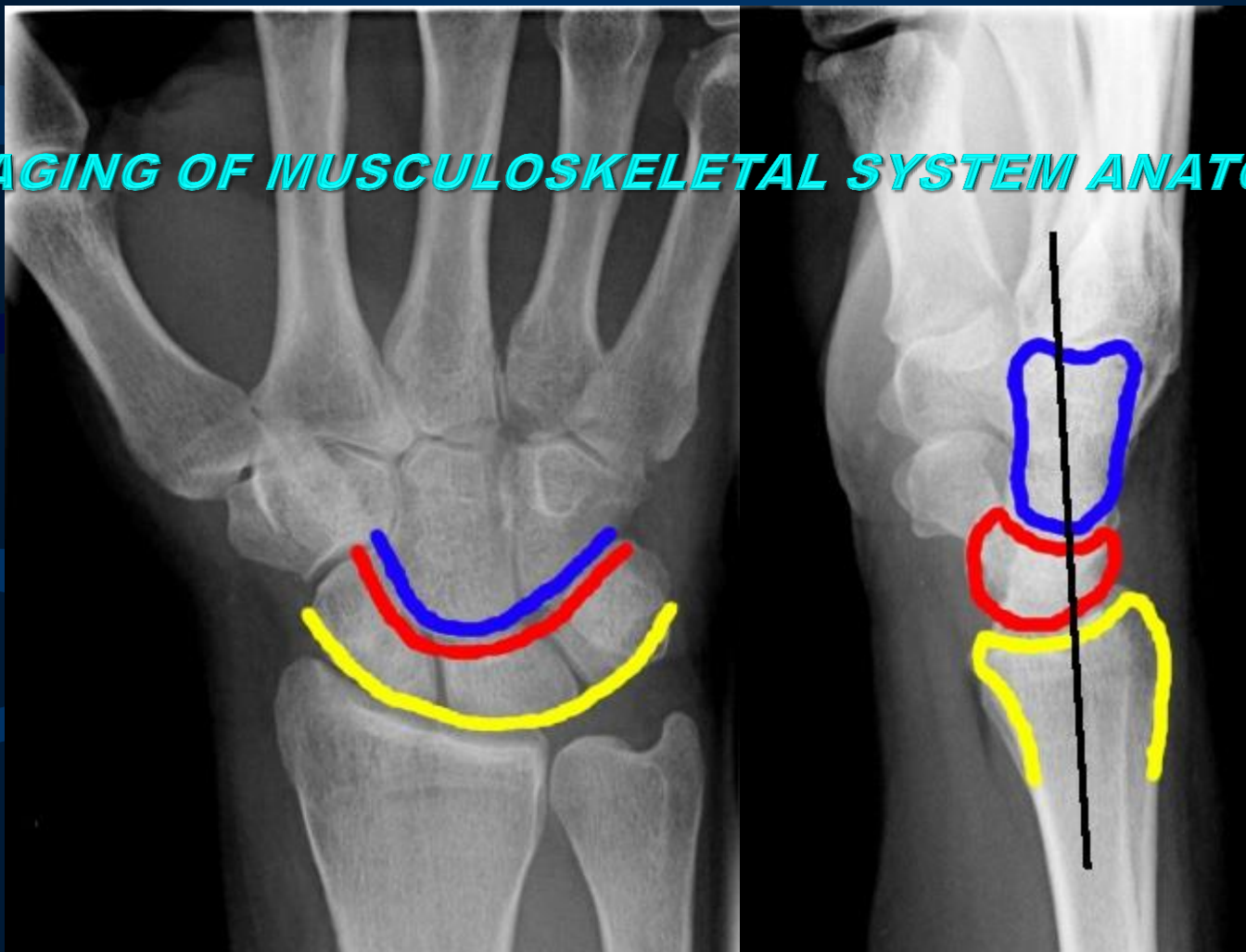
- 1- Ulna
- 2- Radius
- 3- Scaphoid
- 4- Lunate
- 5- Triquetrum
- 6- Pisiform
- 7- Trapezium
- 8- Trapezoid
- 9- Capitate
- 10- Hamate

IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY

- 1- Ulna
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IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY

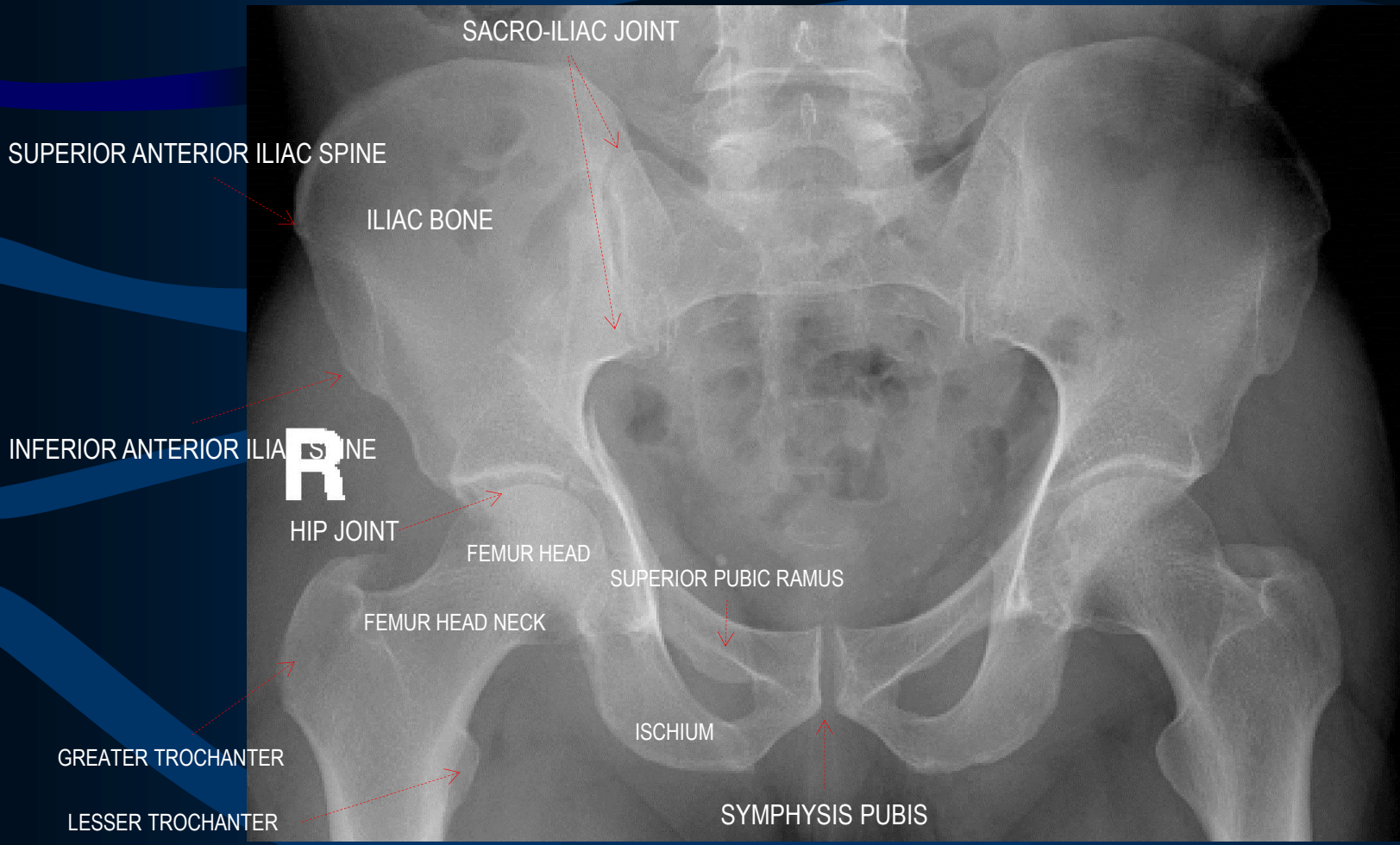


Three carpal arcs should be traced:

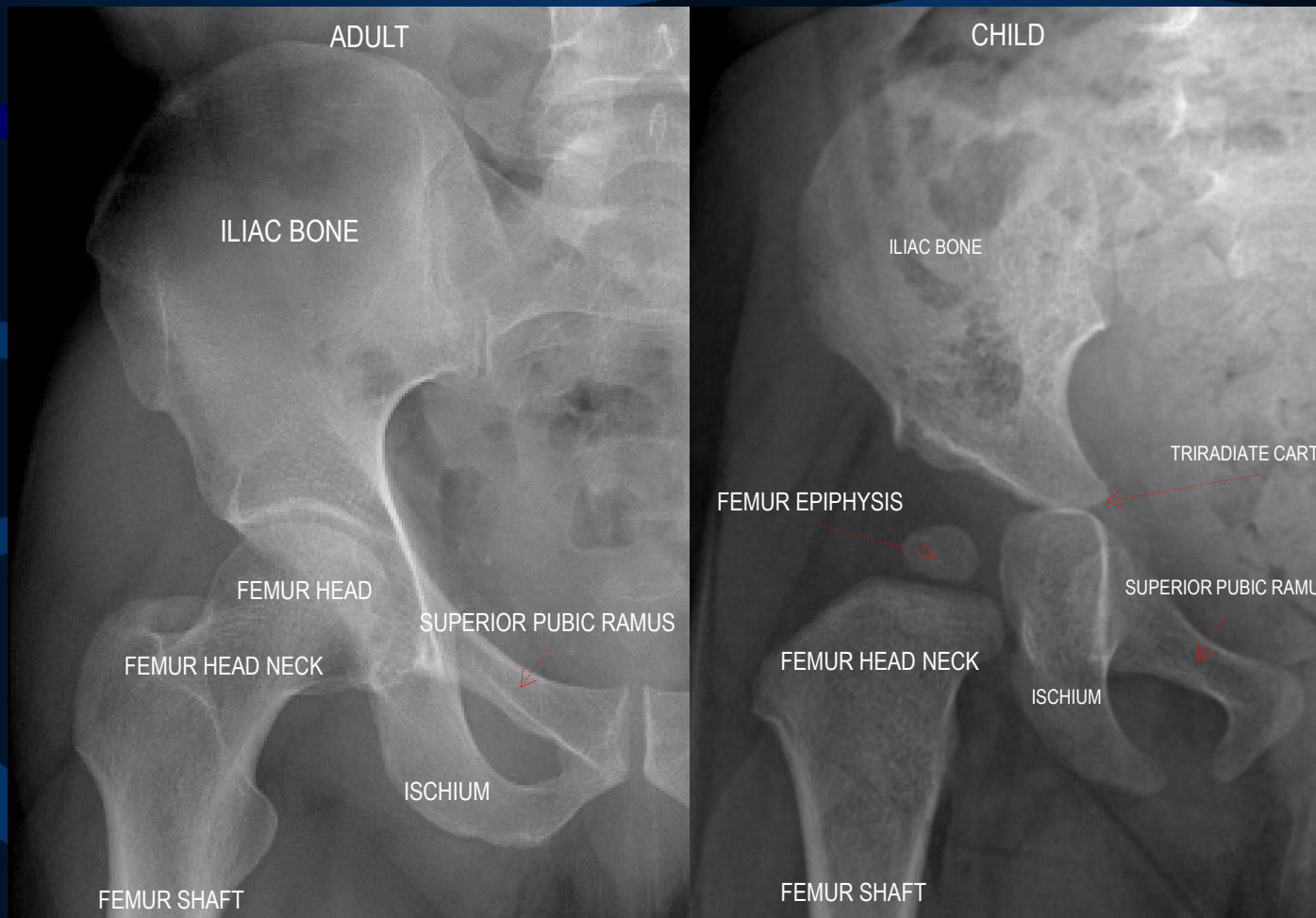
- along the proximal row of carpal bones; proximal aspect.
- along the proximal row of carpal bones; distal aspect.
- along the capitate and hamate proximally.

These three lines should remain unbroken

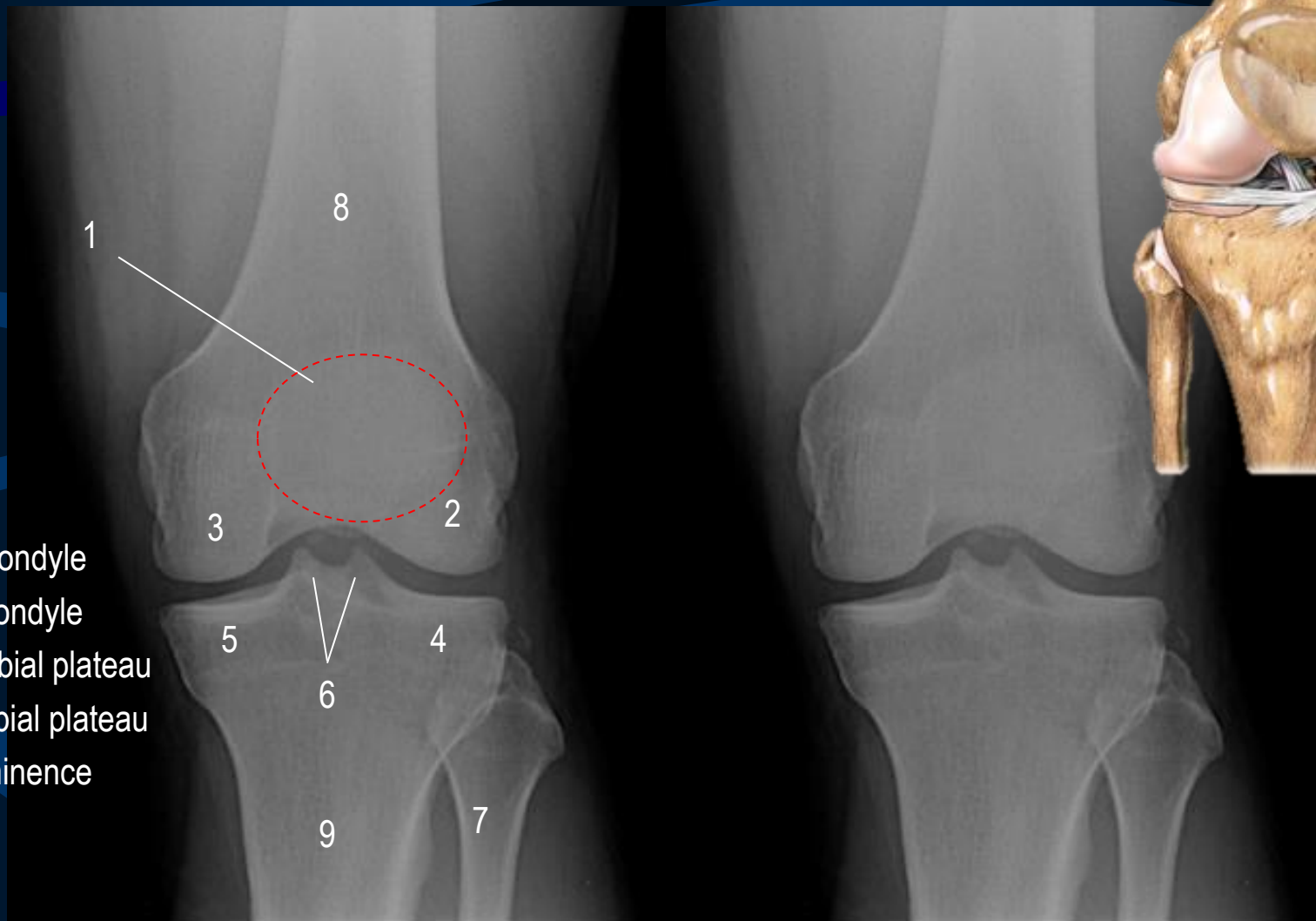
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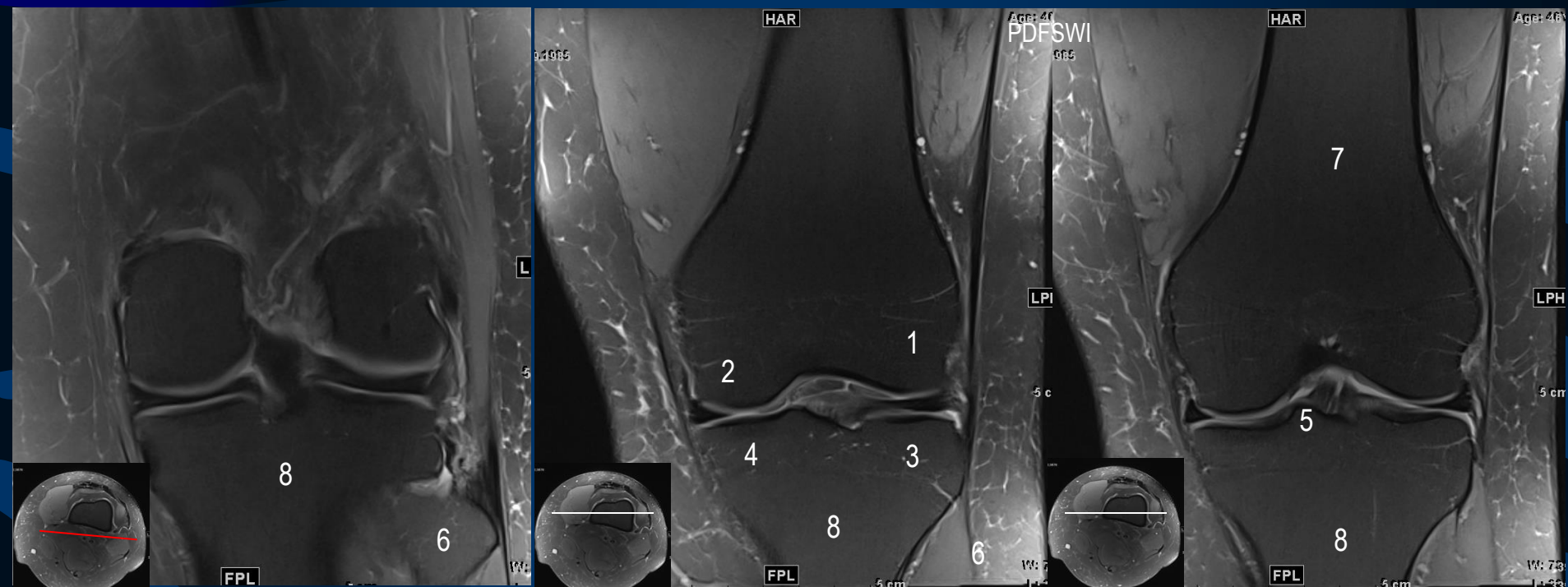


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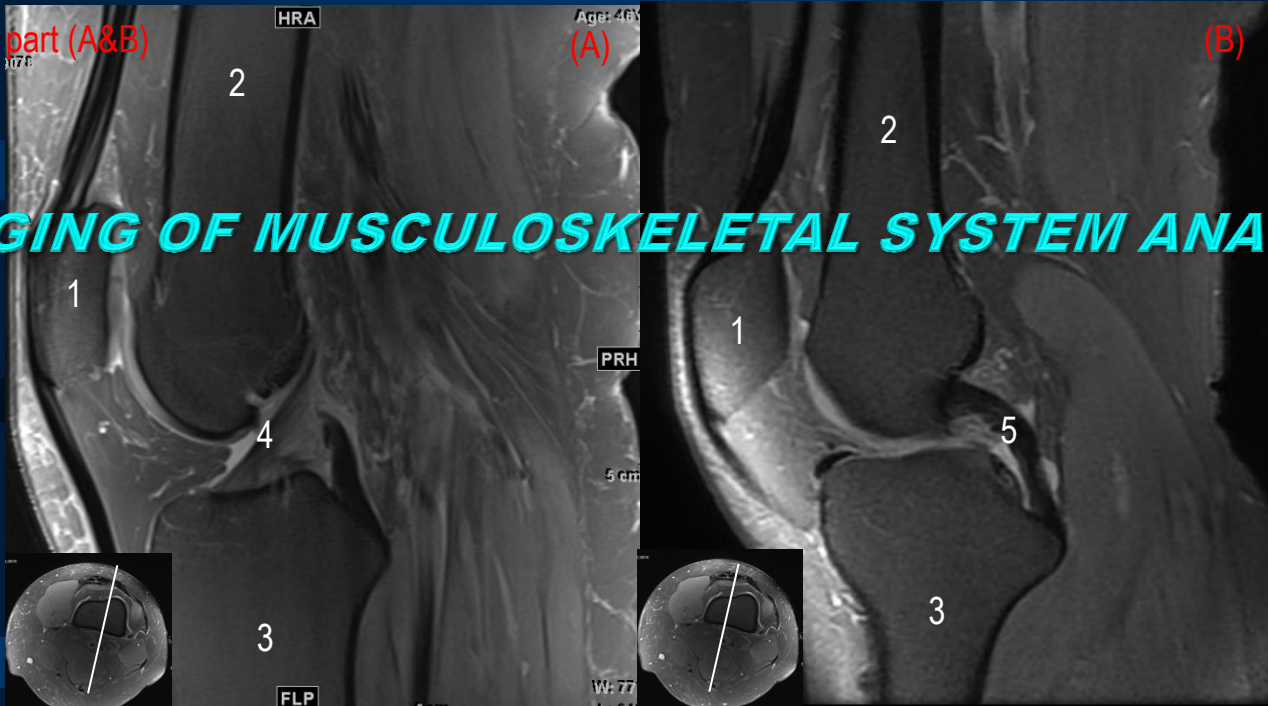
IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY

CORONAL PLANE



- | | |
|---------------------------|--------------------|
| 1- Lateral condyle | 5- Tibial eminence |
| 2- Medial condyle | 6- Fibula |
| 3- Lateral tibial plateau | 7- Femur |
| 4- Medial tibial plateau | 8- Tibia |

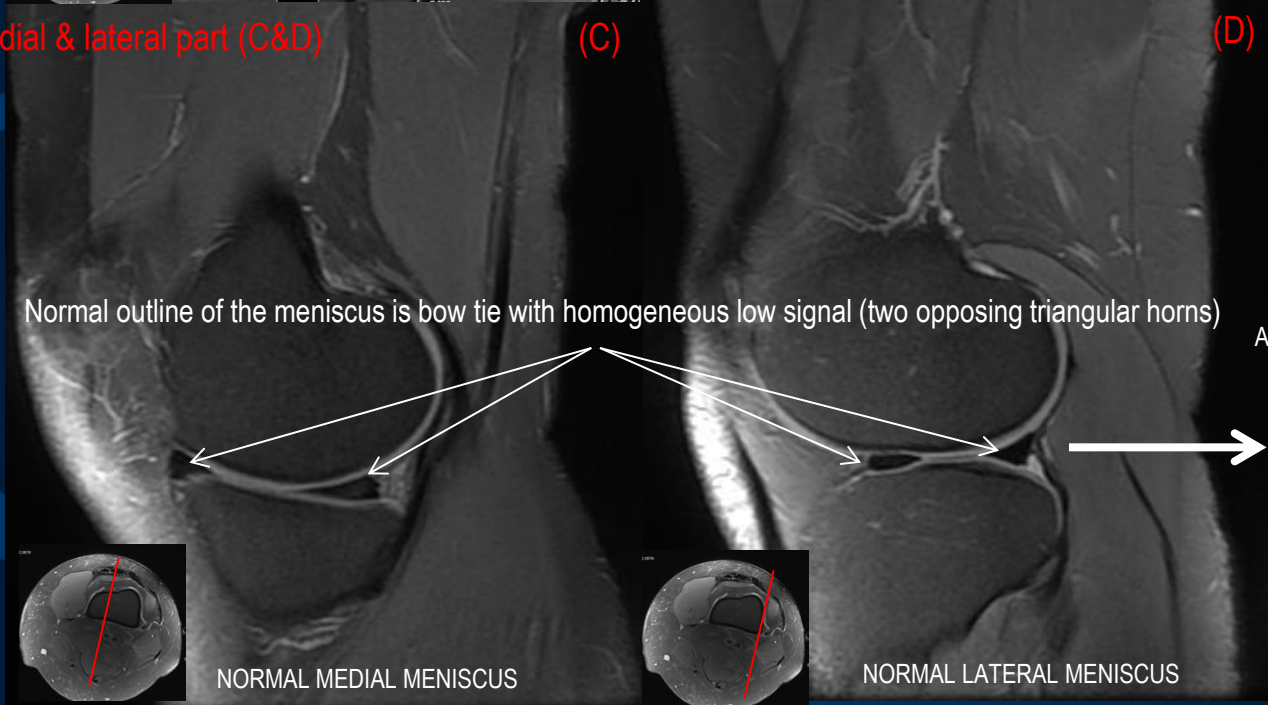
Sagittal plane at mid part (A&B)



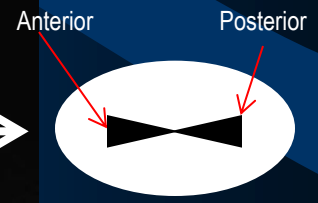
- 1- Patella
- 2- Femur
- 3- Tibia
- 4- ACL
- 5- PCL

IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY

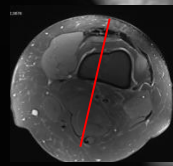
Sagittal plane at medial & lateral part (C&D)



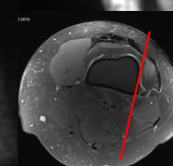
Normal outline of the meniscus is bow tie with homogeneous low signal (two opposing triangular horns)



SAGITTAL PLANE

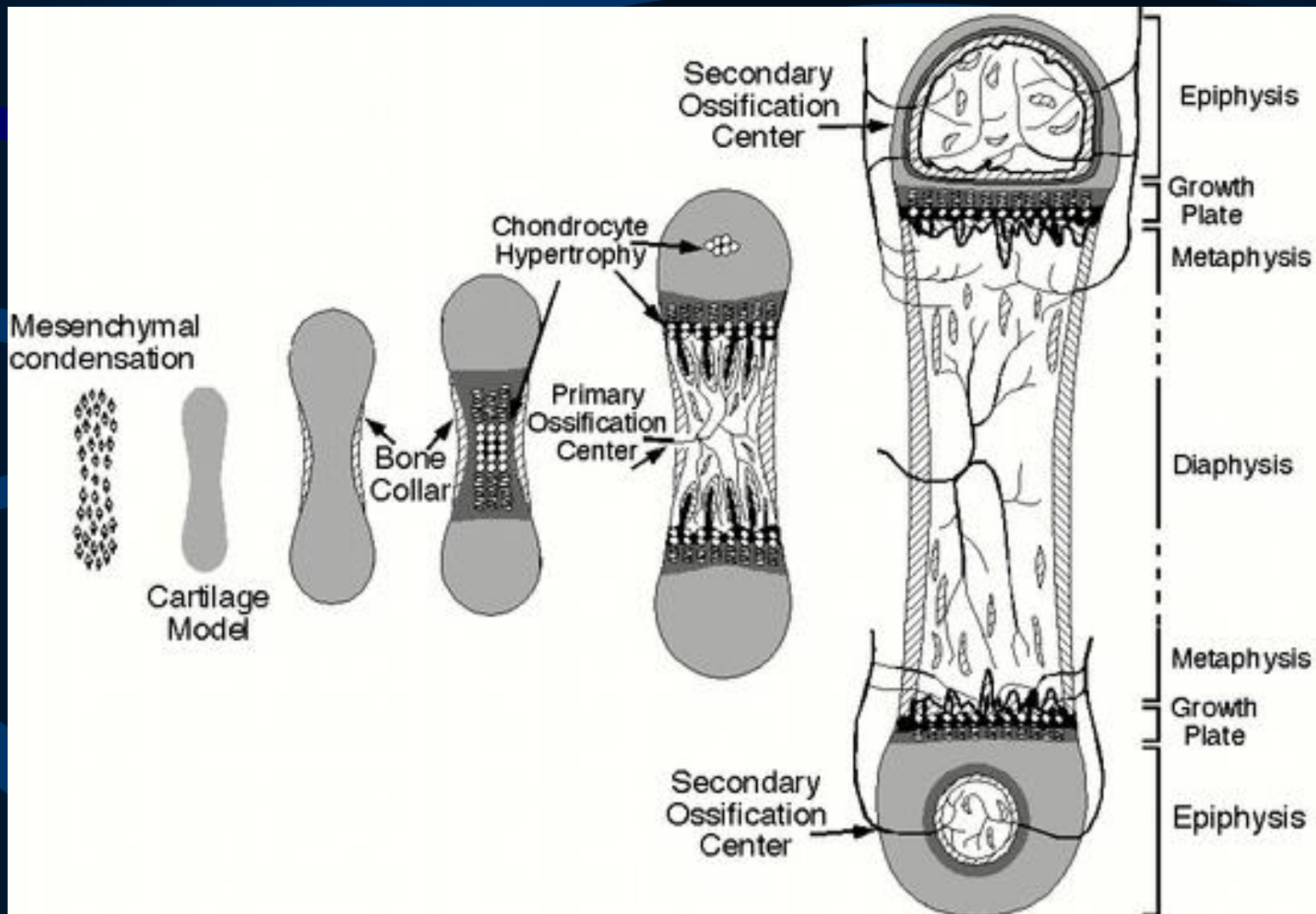


NORMAL MEDIAL MENISCUS



NORMAL LATERAL MENISCUS

IMAGING OF MUSCULOSKELETAL SYSTEM ANATOMY



INTERPRETATION

INTERPRETATION

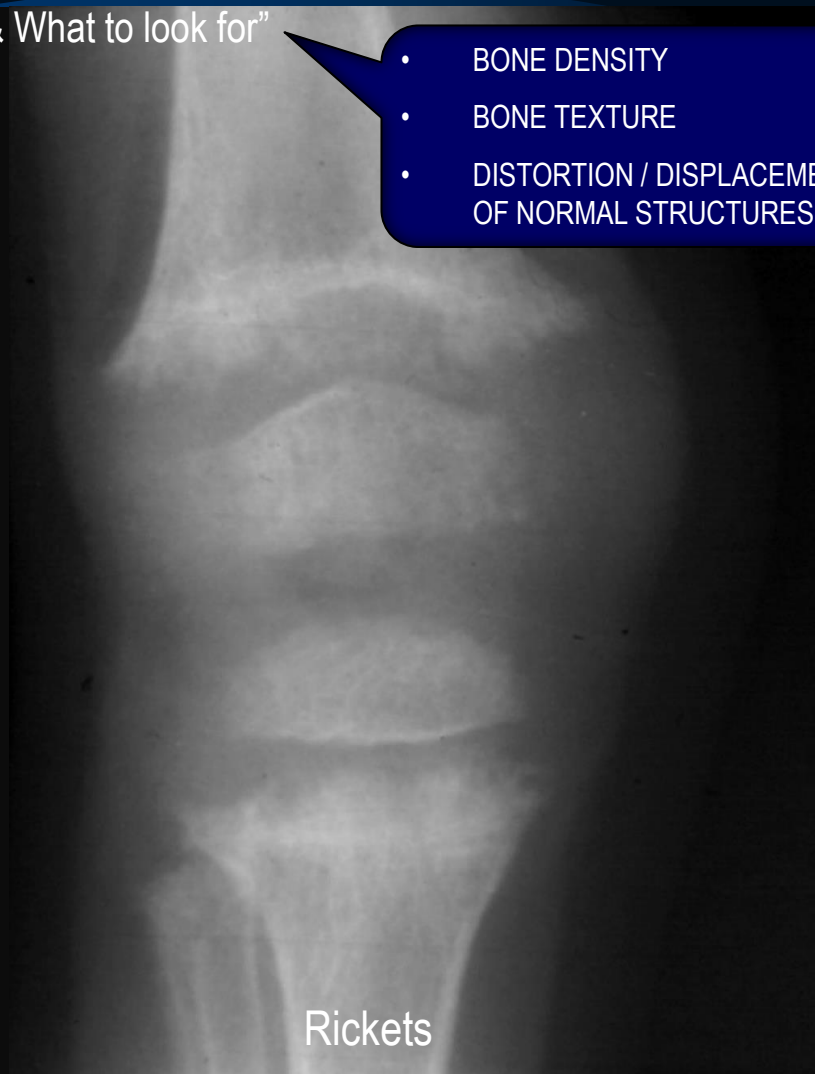
IMPORTANT SITES

“Where to look & What to look for”

- BONE DENSITY
- BONE TEXTURE
- DISTORTION / DISPLACEMENT OF NORMAL STRUCTURES

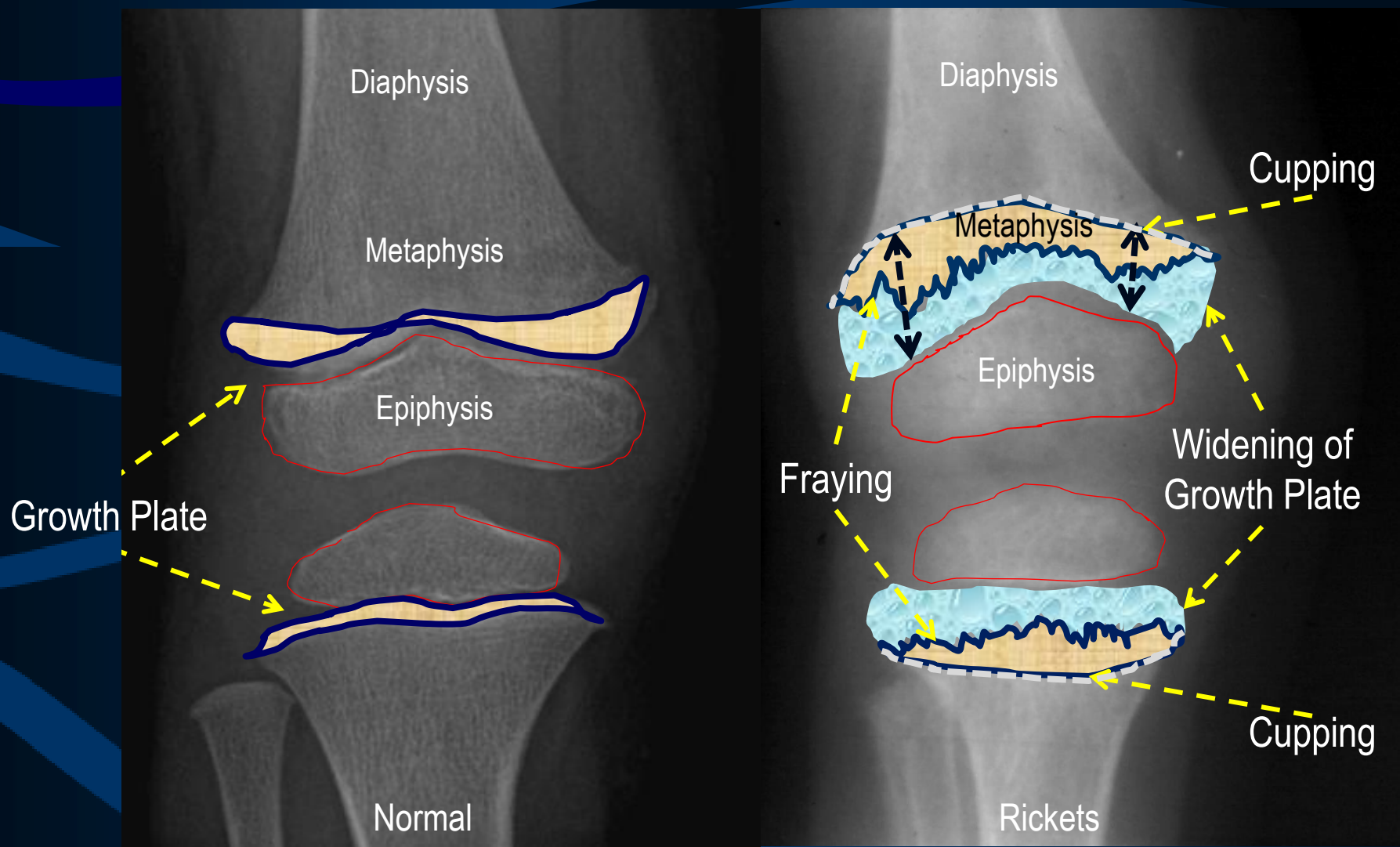


Normal



Rickets

INTERPRETATION



INTERPRETATION

“Where to look & What to look for”

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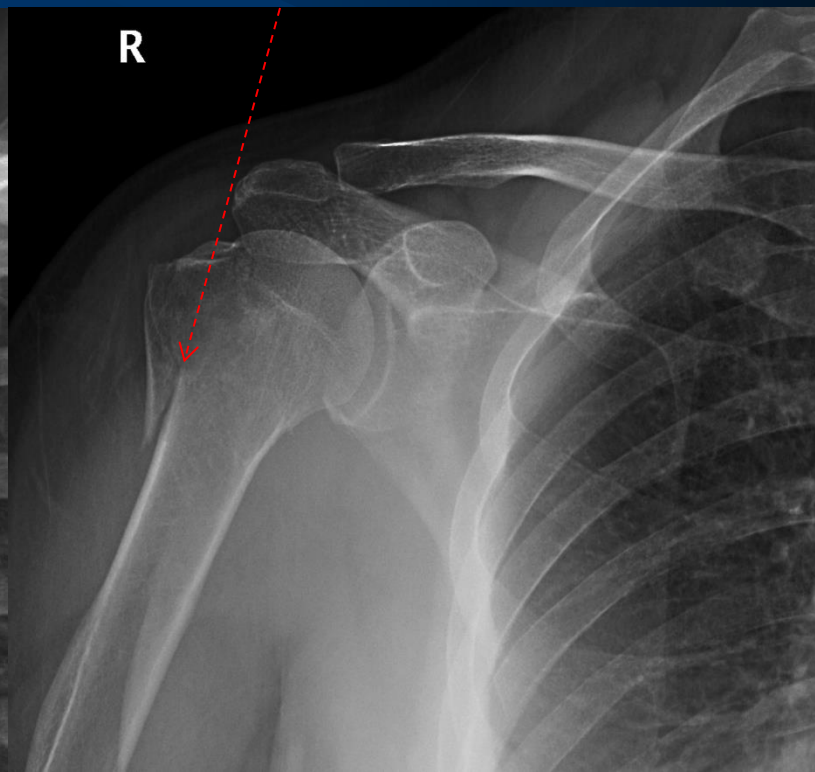


INTERPRETATION

Normal



Fracture Humerus

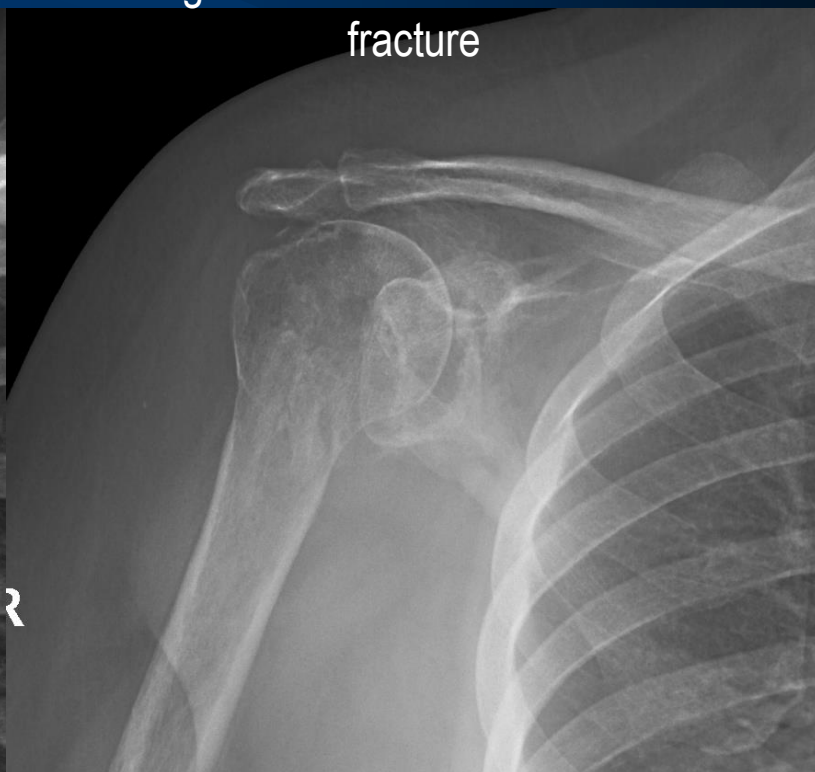


INTERPRETATION

Normal



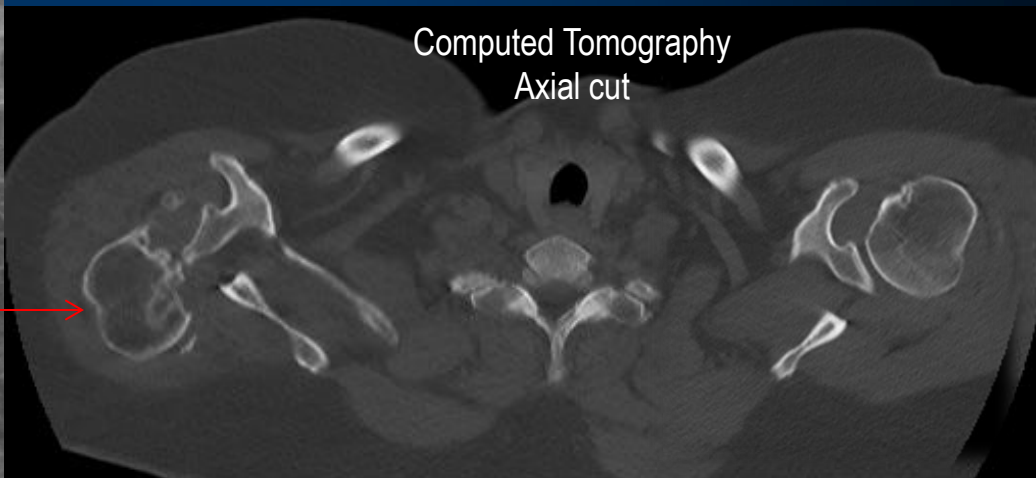
Heterogeneous texture with old humeral fracture



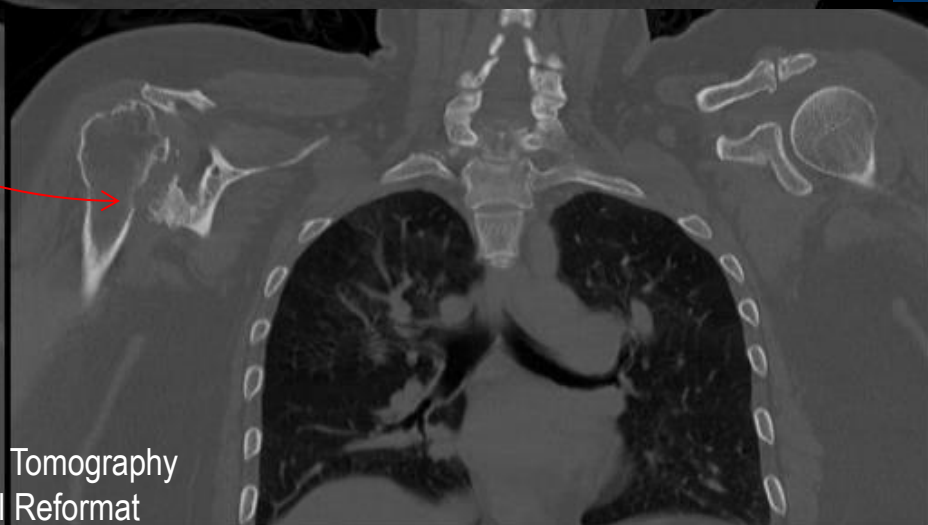
INTERPRETATION



Heterogeneous texture with old humeral fracture



Computed Tomography
Coronal Reformat





THANKS