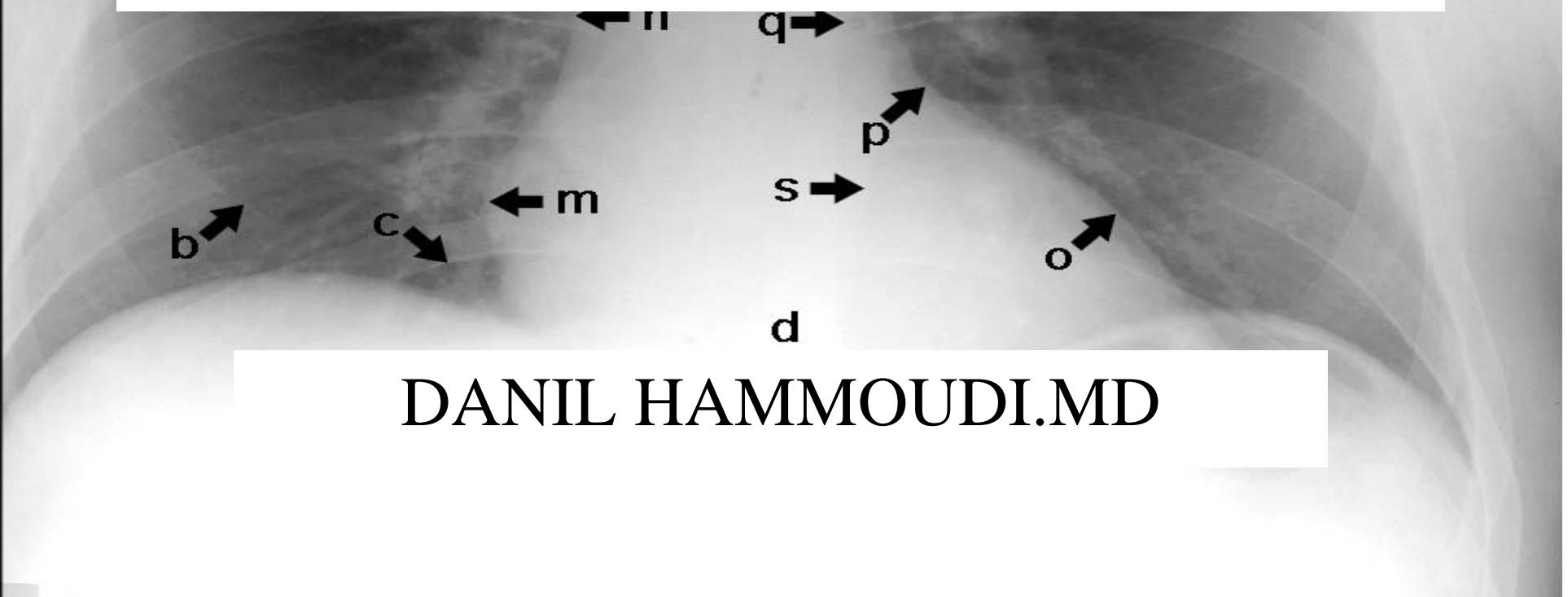


BONE CHALLENGE



DANIL HAMMOUDI.MD

Bone Basic functions ?

- A. support
- B. protection
- C. movement – assistance in
- D. RBC formation-hemopoiesis
- E. mineral homeostasis
+importance of calcium
- F. energy supply -yellow marrow
- G. detoxification

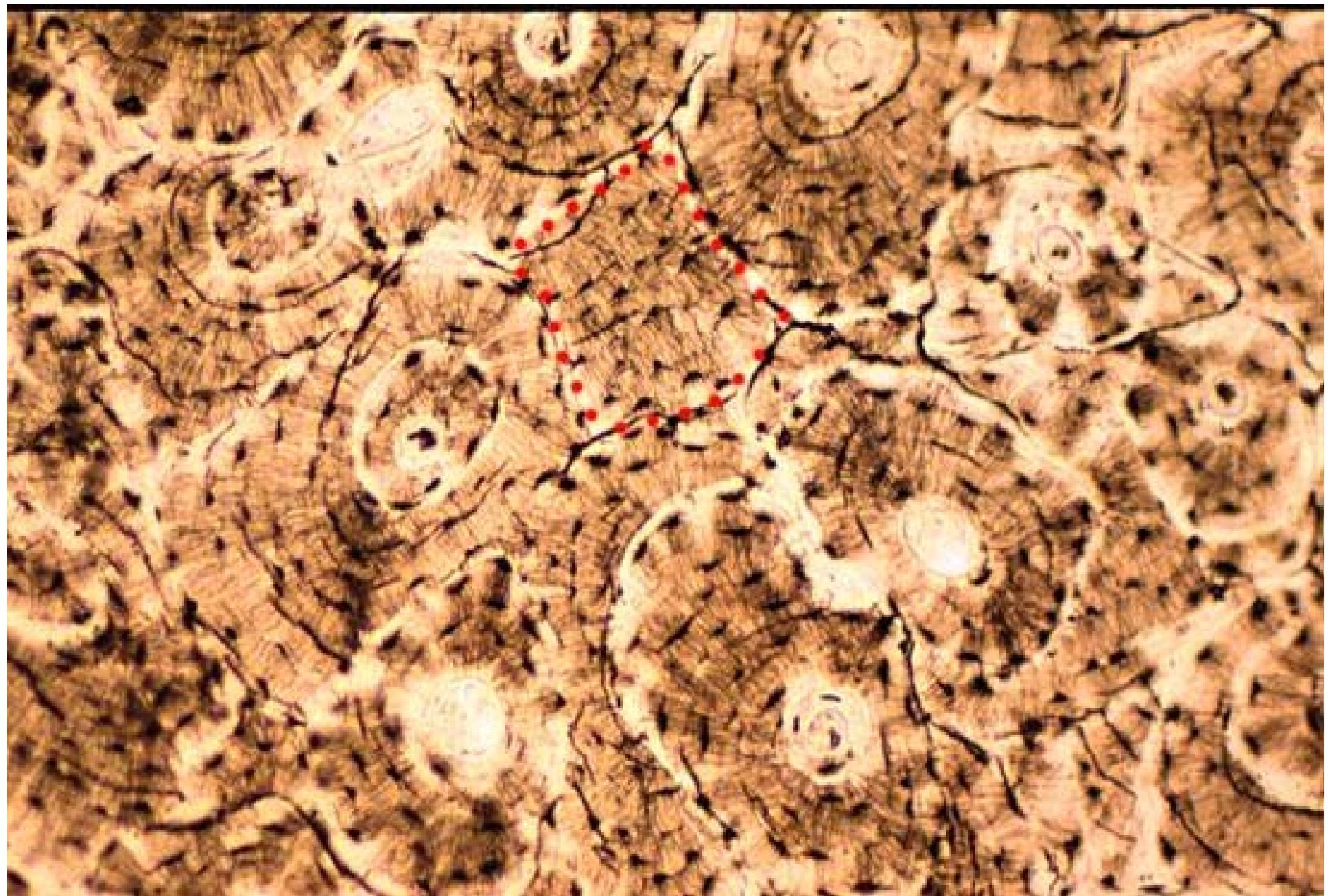
four cell types of bone?

1. osteogenic
2. osteoblasts
3. osteocytes
4. osteoclasts

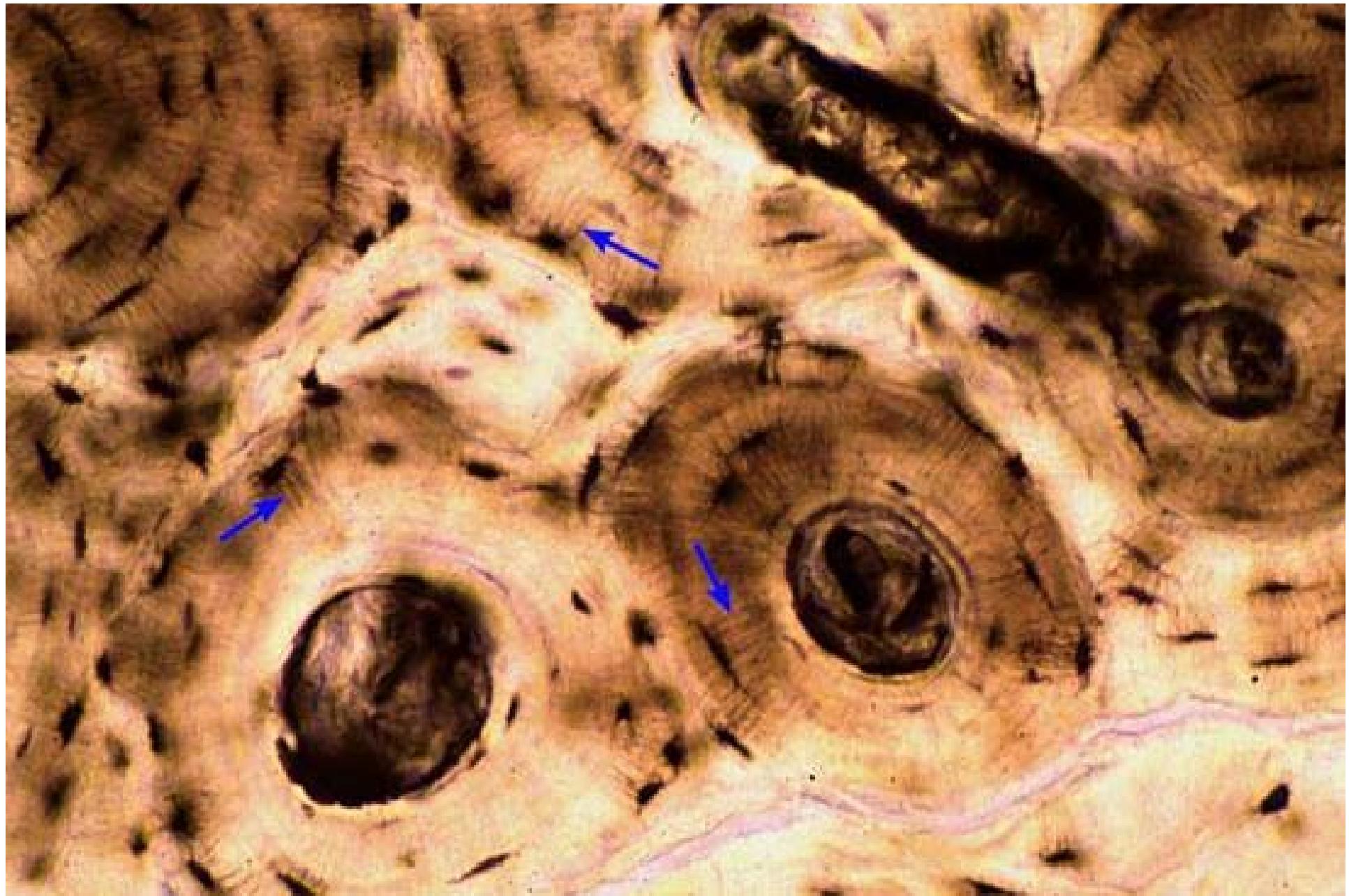
3 Bone disorders ?

1. Fractures
2. diseases
[infection,tumors,others]
3. OSTEOPORESIS

Identify the structure encircled by the red dots:

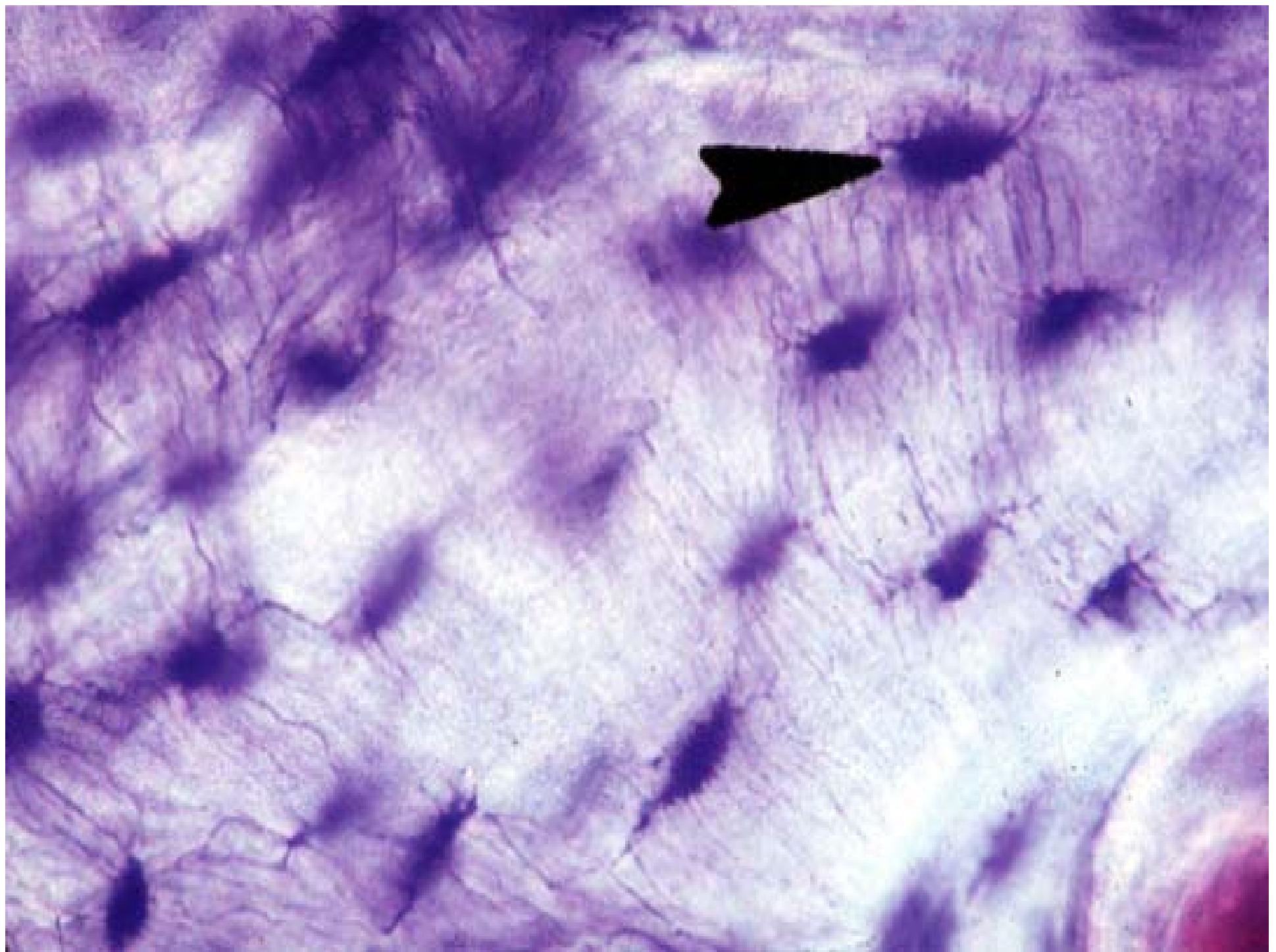


Interstitial lamellae



Identify the structure at the tip of the arrow:

Canaliculi

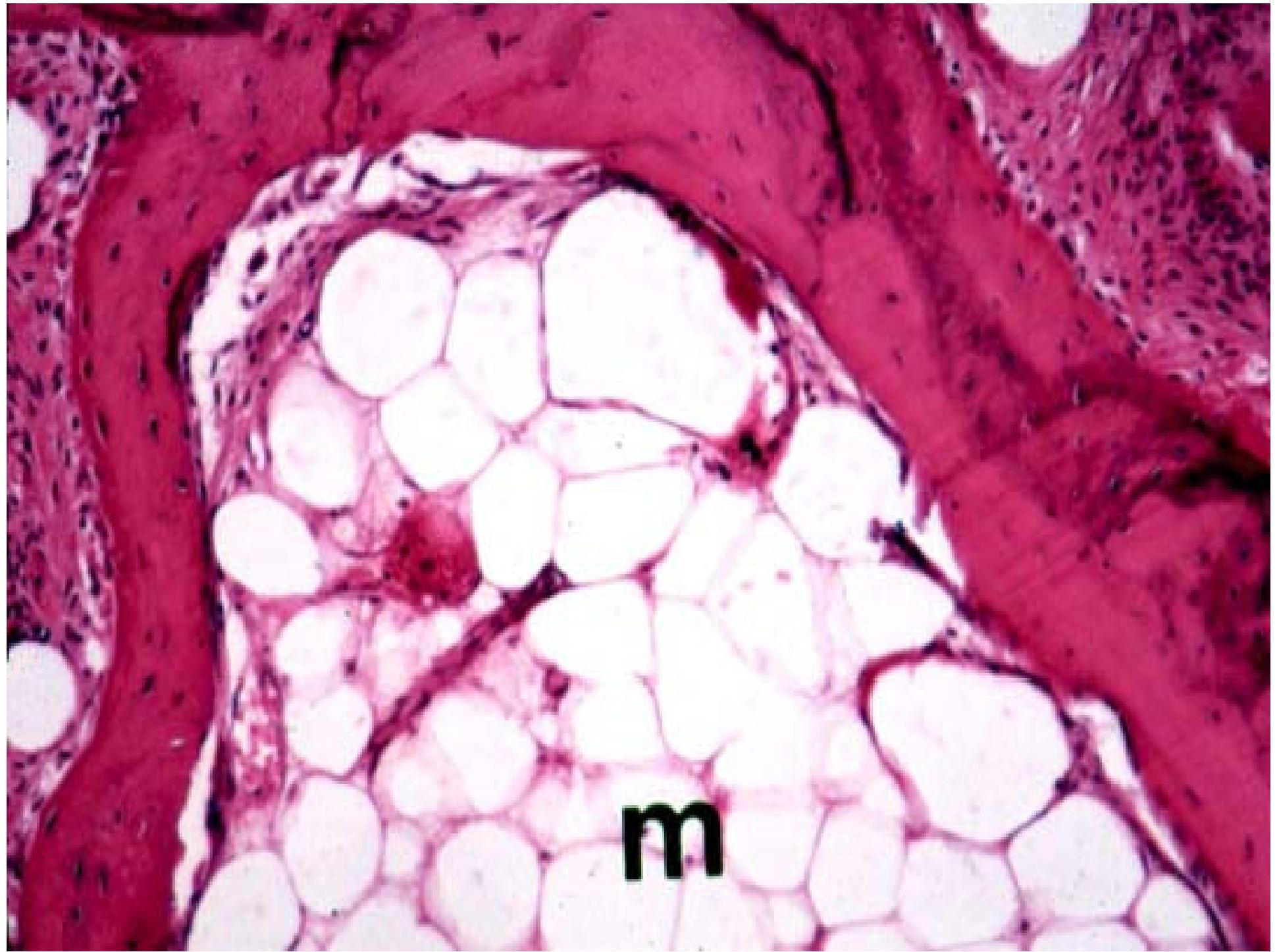


**Lacuna that contained an
osteocyte**

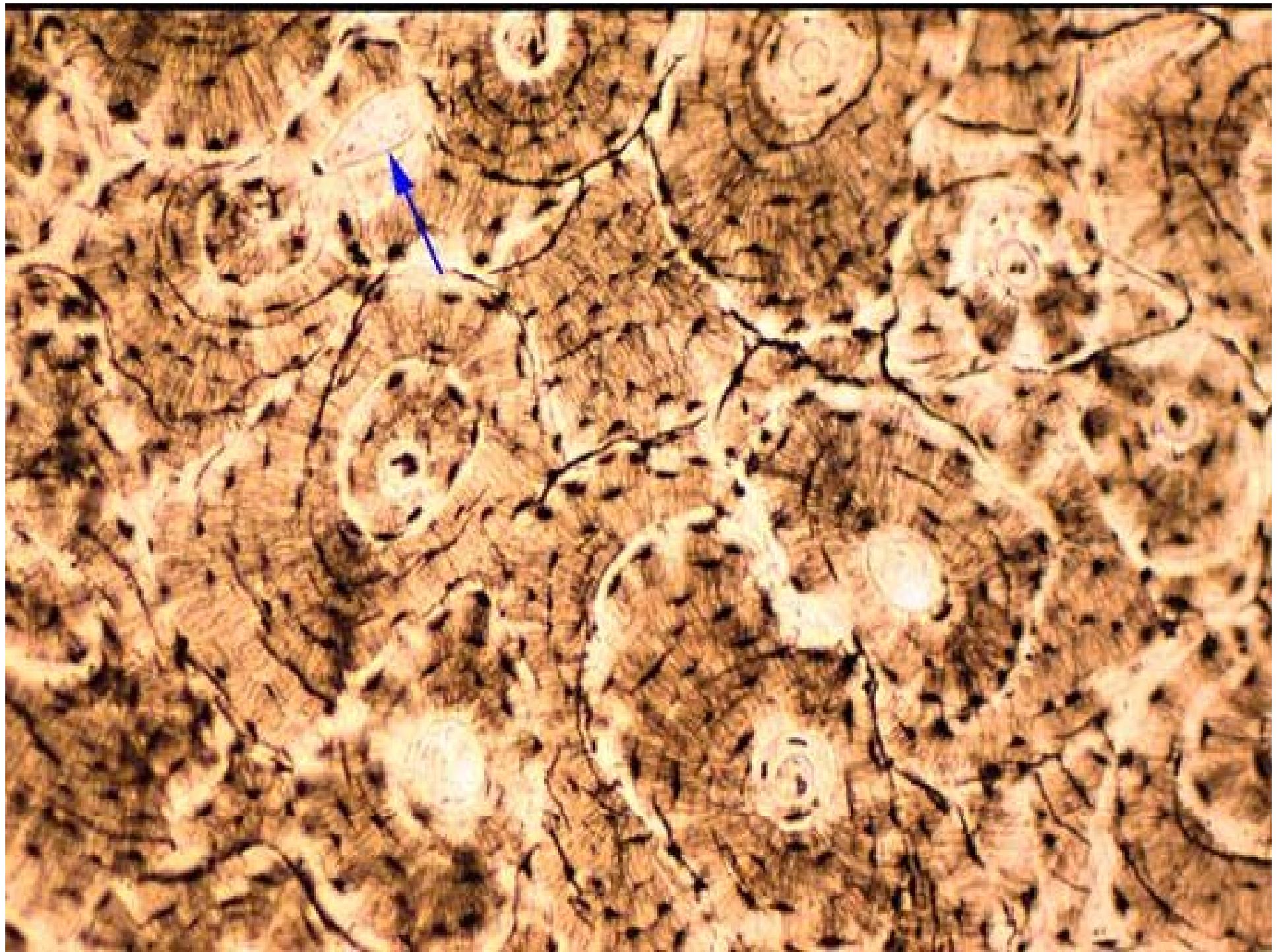


Haversian canal

Concentric lamellae of the Haversian system and a number of osteocytes within their lacunae.



Fatty marrow or yellow marrow, composed of adipose connective tissue. Note the trabeculus of bone.



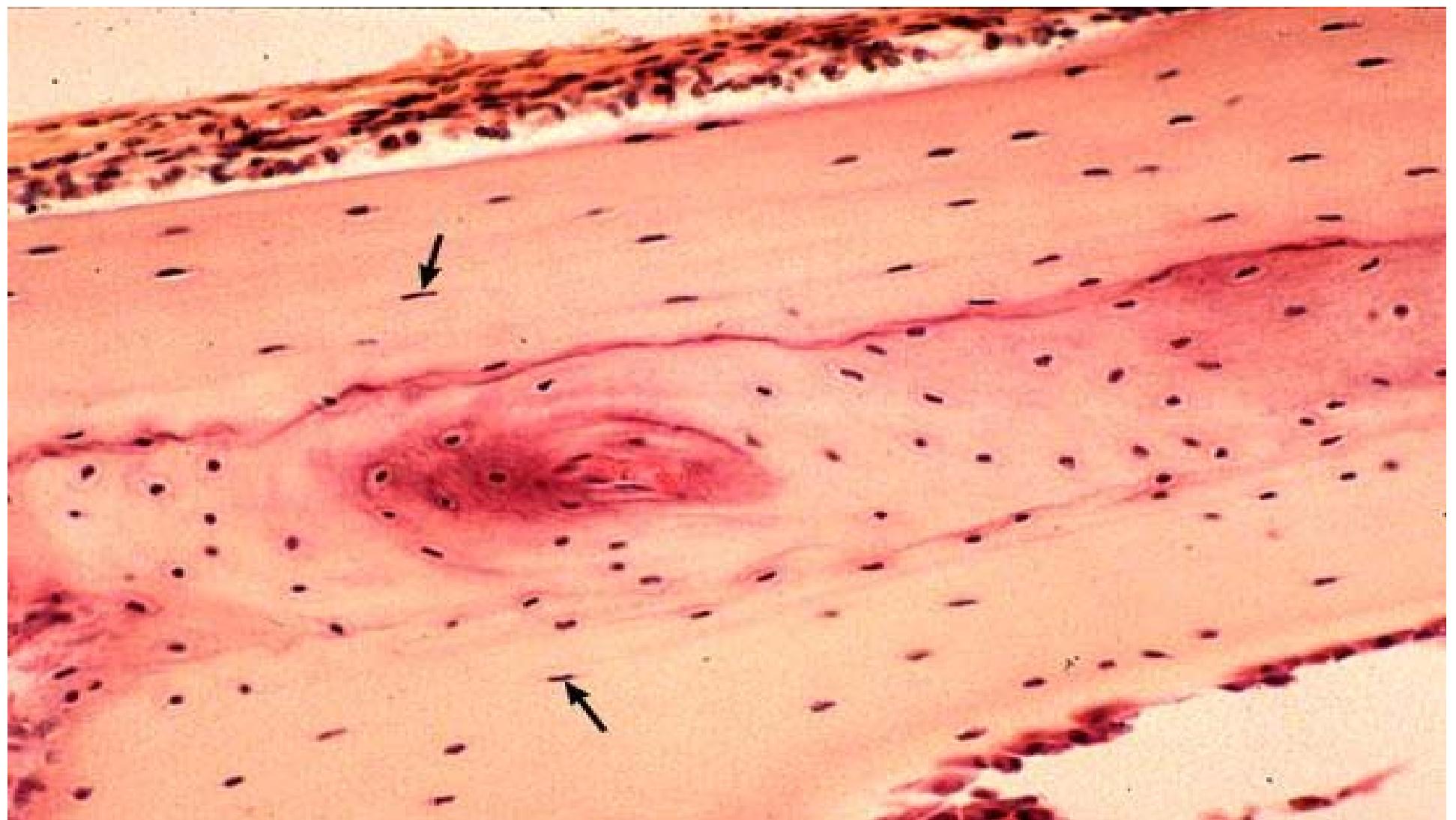
Volkmann's canal

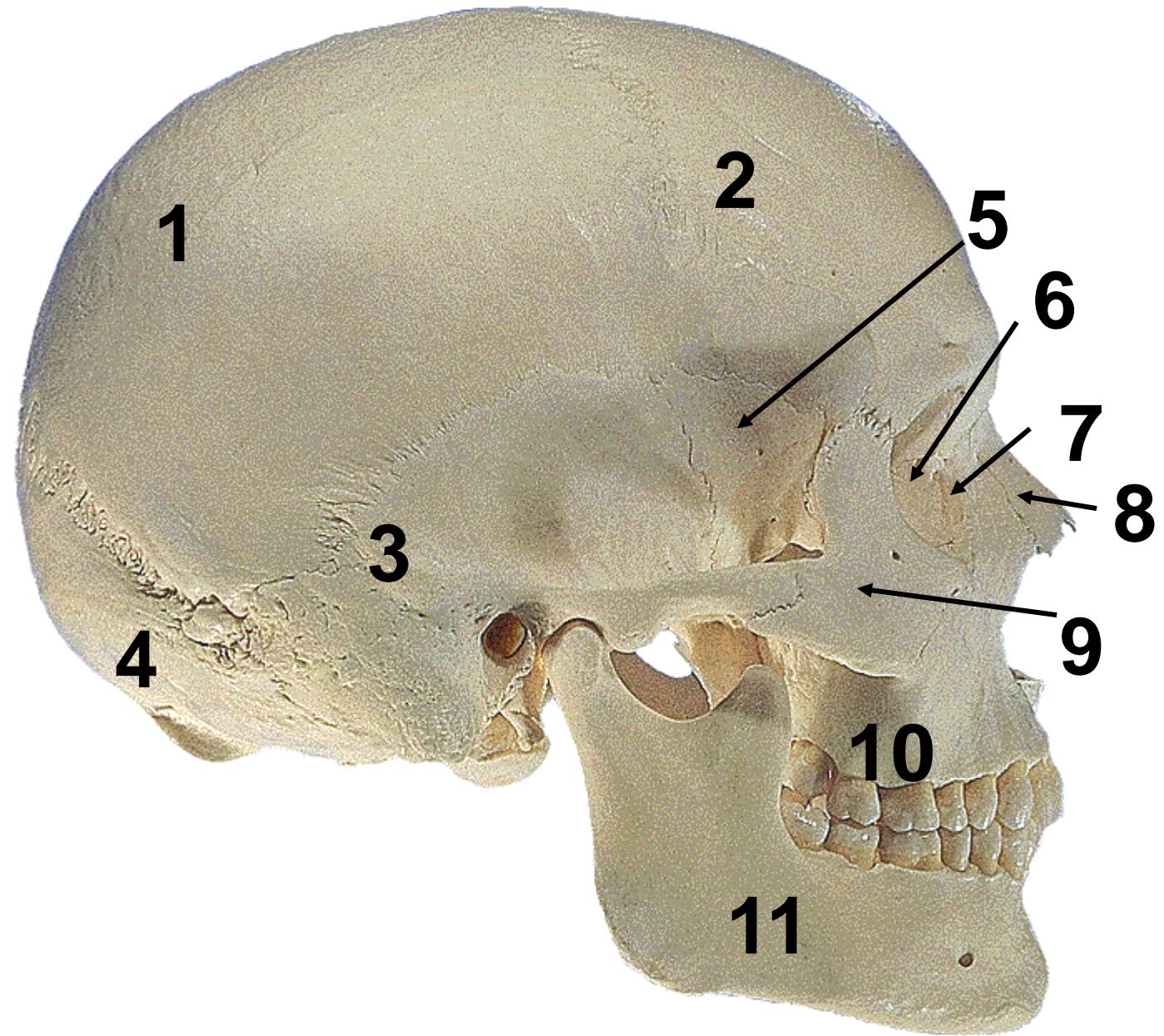
Identify the tissue at the tip of the arrow:



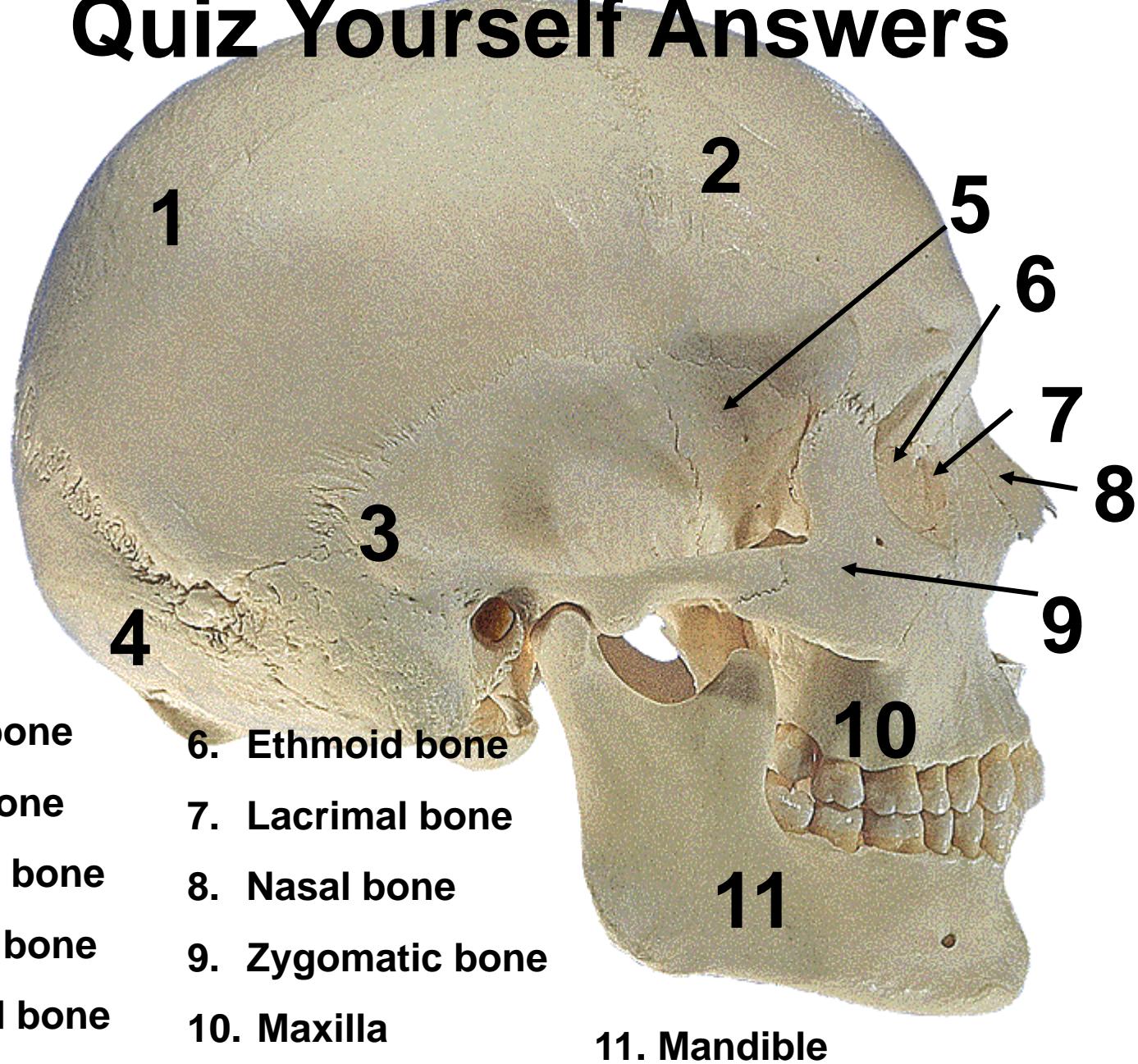
Endosteum

Identify the cell at the tip of the arrow:



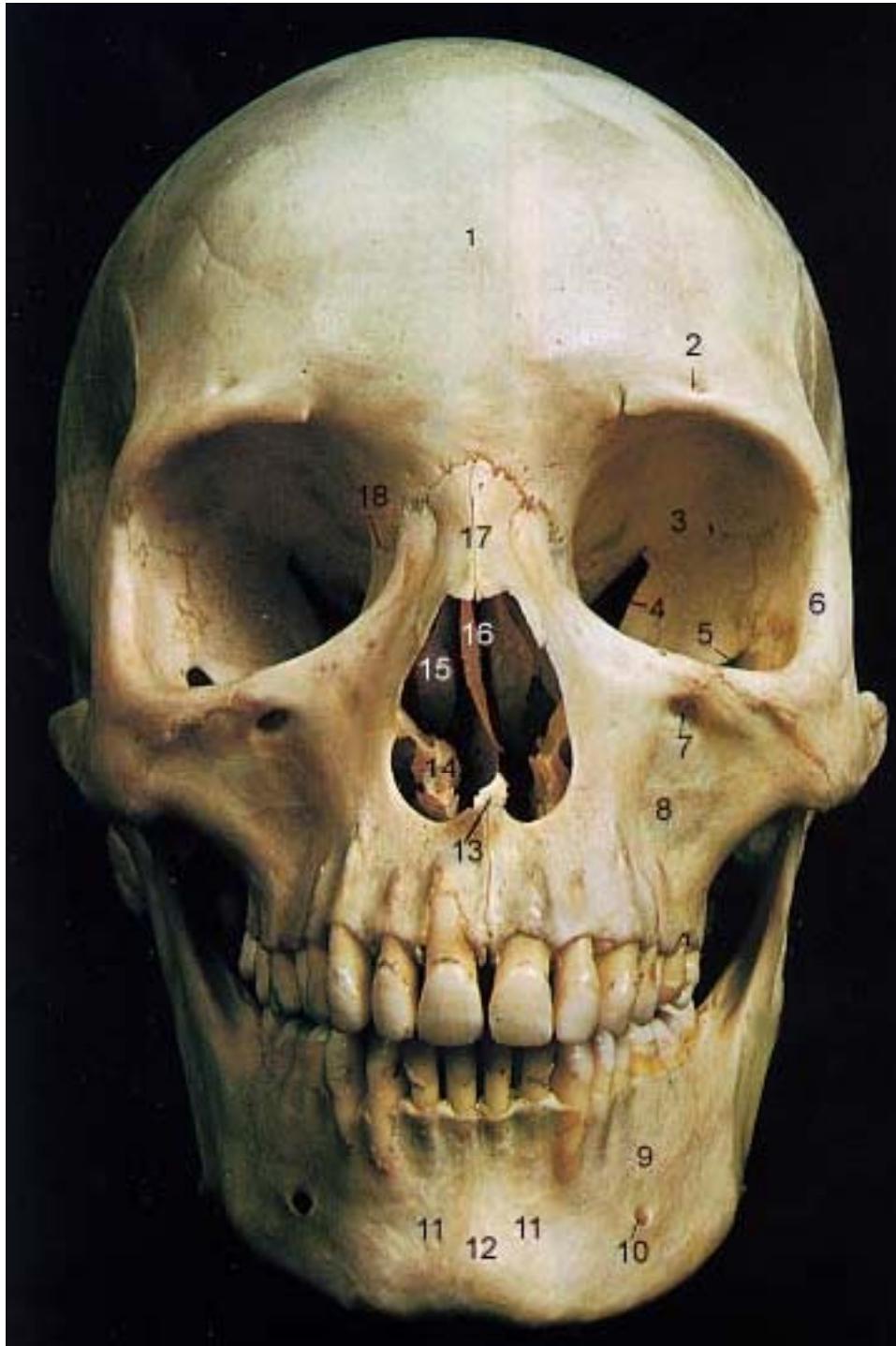


Quiz Yourself Answers



osteocyte





1.	Frontal Bone
2.	Supra-Orbital Foramen
3.	Orbit (Orbital Cavity)
4.	Superior Orbital Fissure
5.	Inferior Orbital Fissure
6.	Zygomatic Bone
7.	Infra-Orbital Foramen
8.	Maxilla
9.	Mandible
10.	Mental Foramen
11.	Incisive Fossa
12.	Symphysis
13.	Vomer
14.	Inferior Nasal Concha
15.	Middle Nasal Concha
16.	Perpendicular Plate of Ethmoid
17.	Nasal Bone
18.	Lacrimal Bone



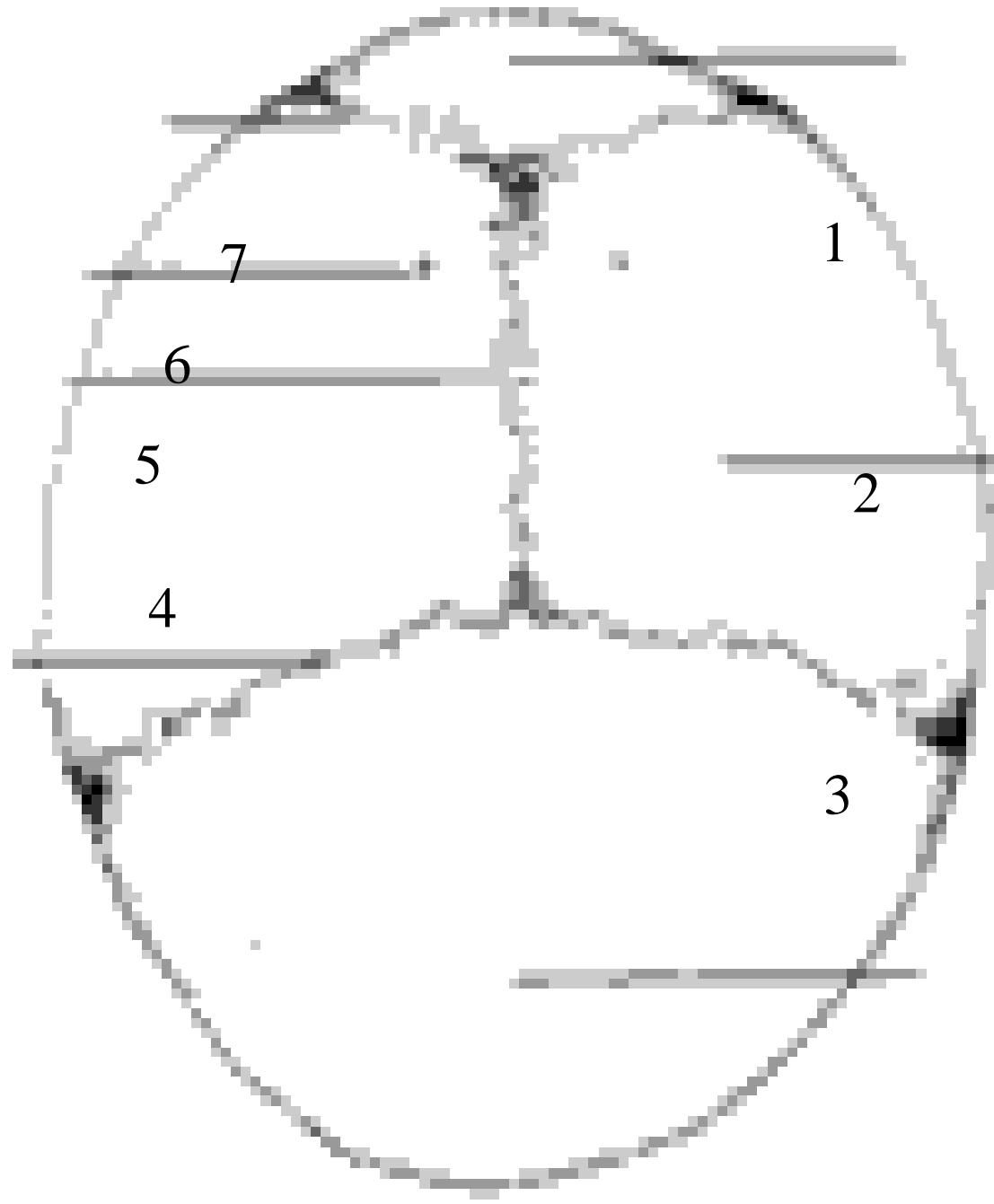


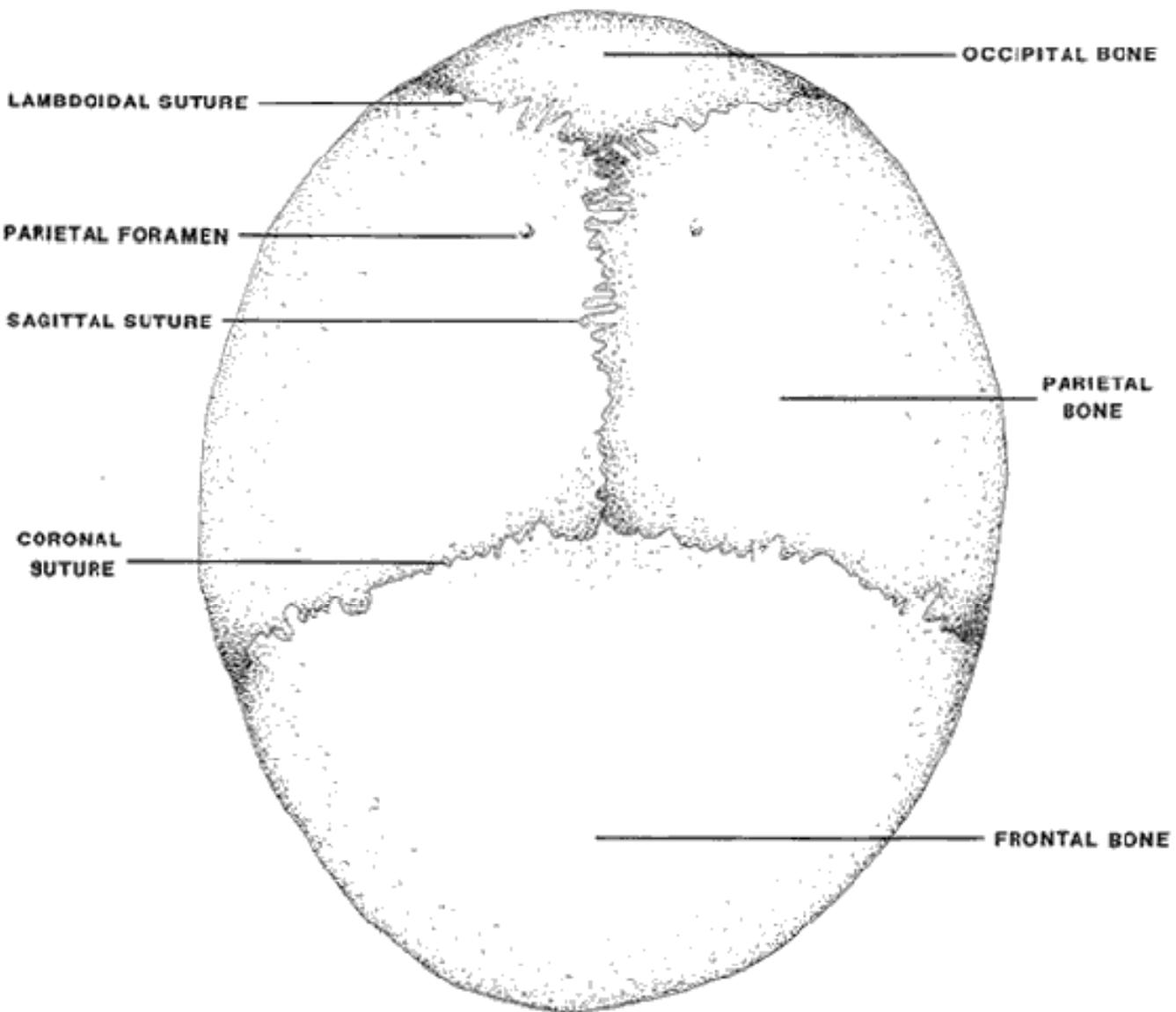
1. Parietal Bone
2. Coronal Suture
3. Frontal Bone
4. Nasal Bone
5. Vomer
6. Lacrimal Bone
7. Orbital Part of Ethmoid
8. Zygomatic Bone
9. Maxilla
10. Body of Mandible
11. Ramus of Mandible
12. Coronoid Process
13. Mandibular Condyle
14. Mental Foramen
15. Styloid Process
16. External Acoustic Meatus
17. Mastoid Process
18. Zygomatic Process
19. Temporal Bone
20. Greater Wing of Sphenoid
21. Inferior Temporal Line
22. Superior Temporal Line
23. Squamosal Suture
24. Lambdoidal Suture
25. Occipital Bone





1. Parietal Bone
2. Sagittal Suture
3. Lambdoid Suture
4. Occipital Bone
5. External Occipital Protruberance
6. Superior Nuchal Line
7. Inferior Nuchal Line





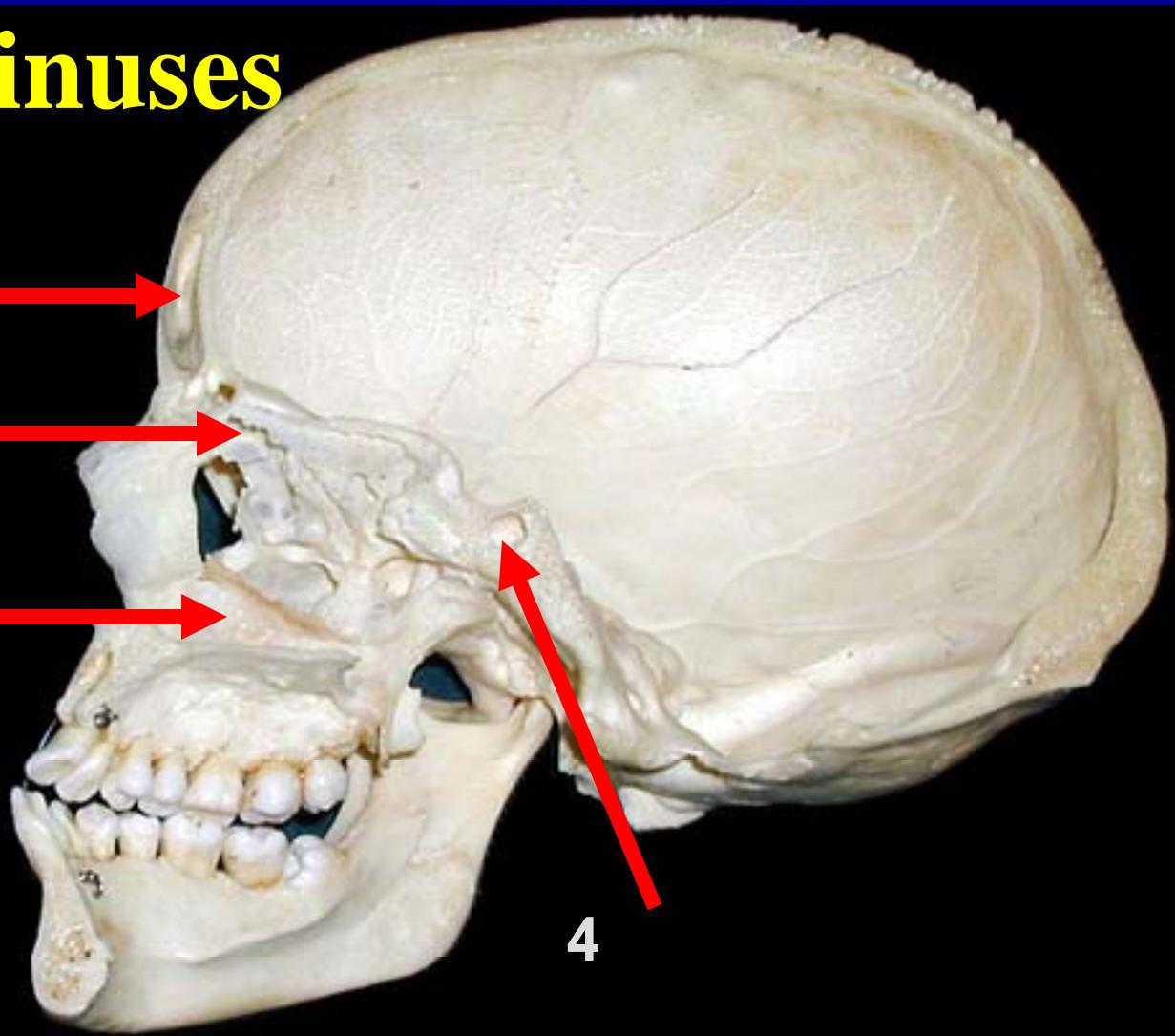
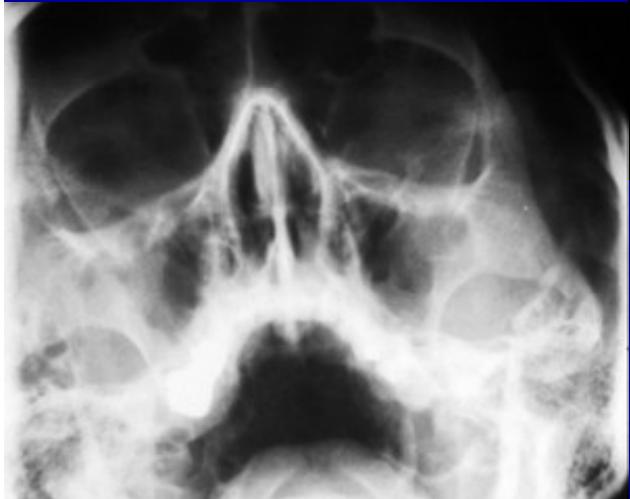
Paranasal Sinuses

1

2

3

4



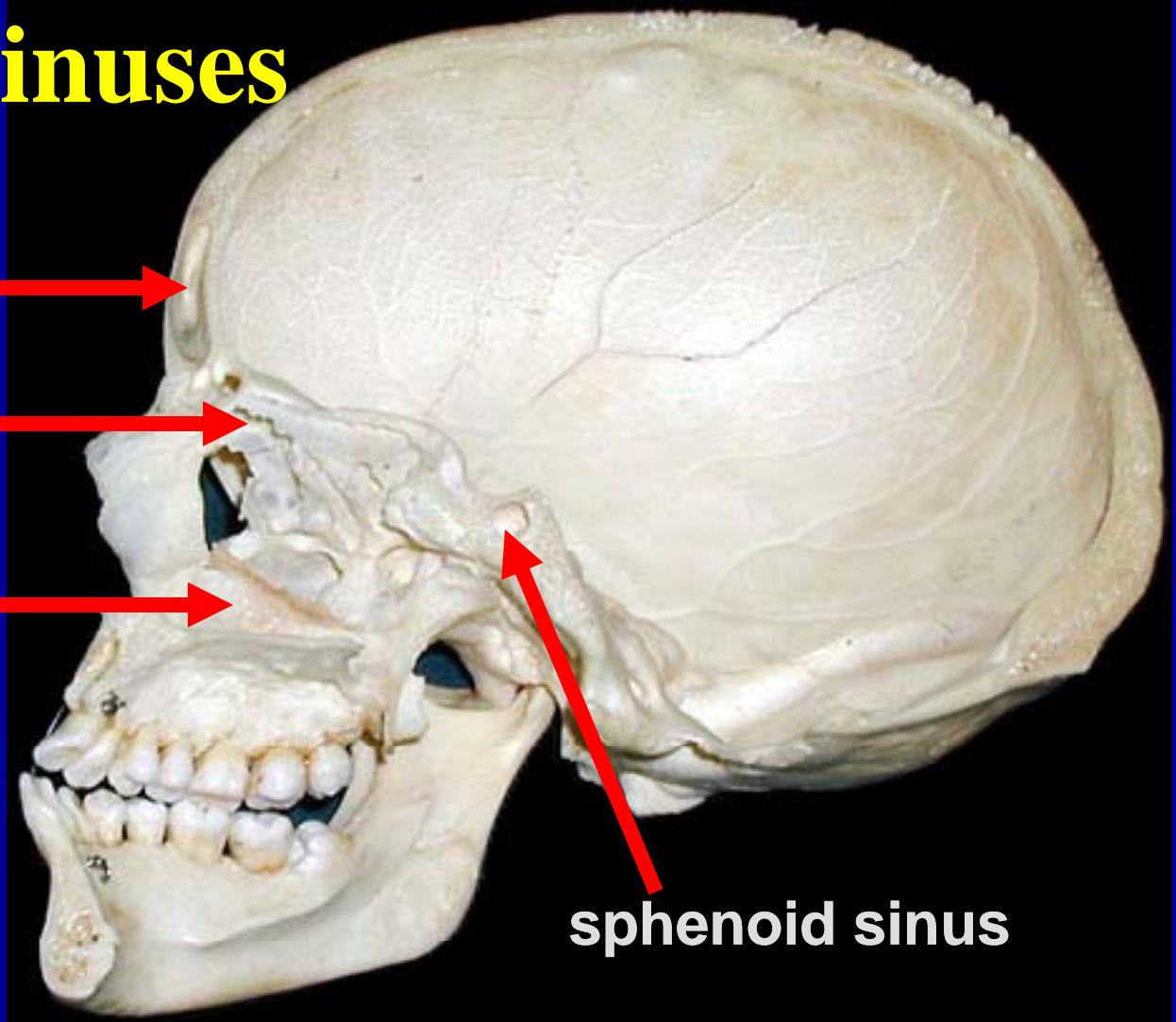
Paranasal Sinuses

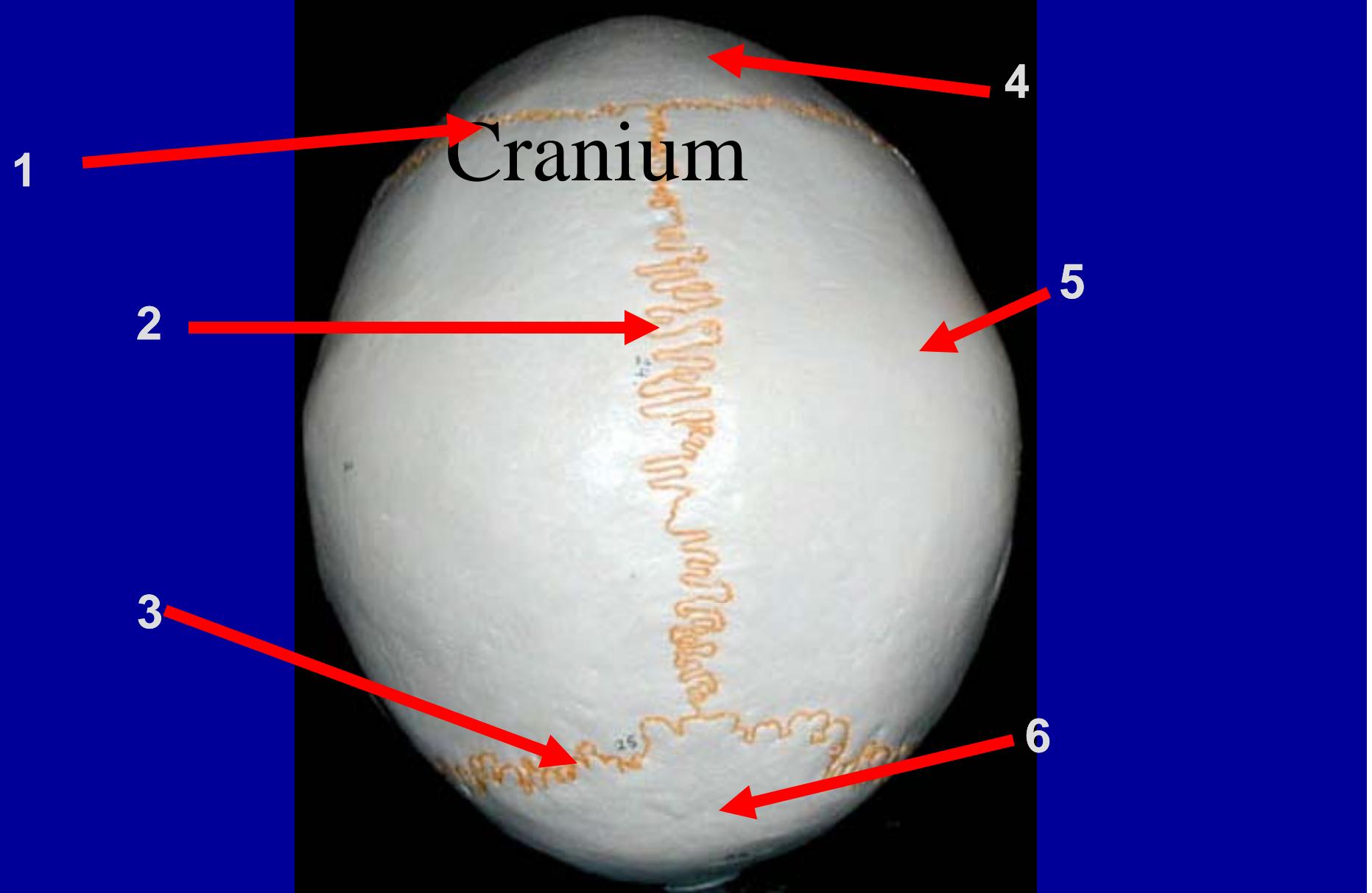
frontal sinus

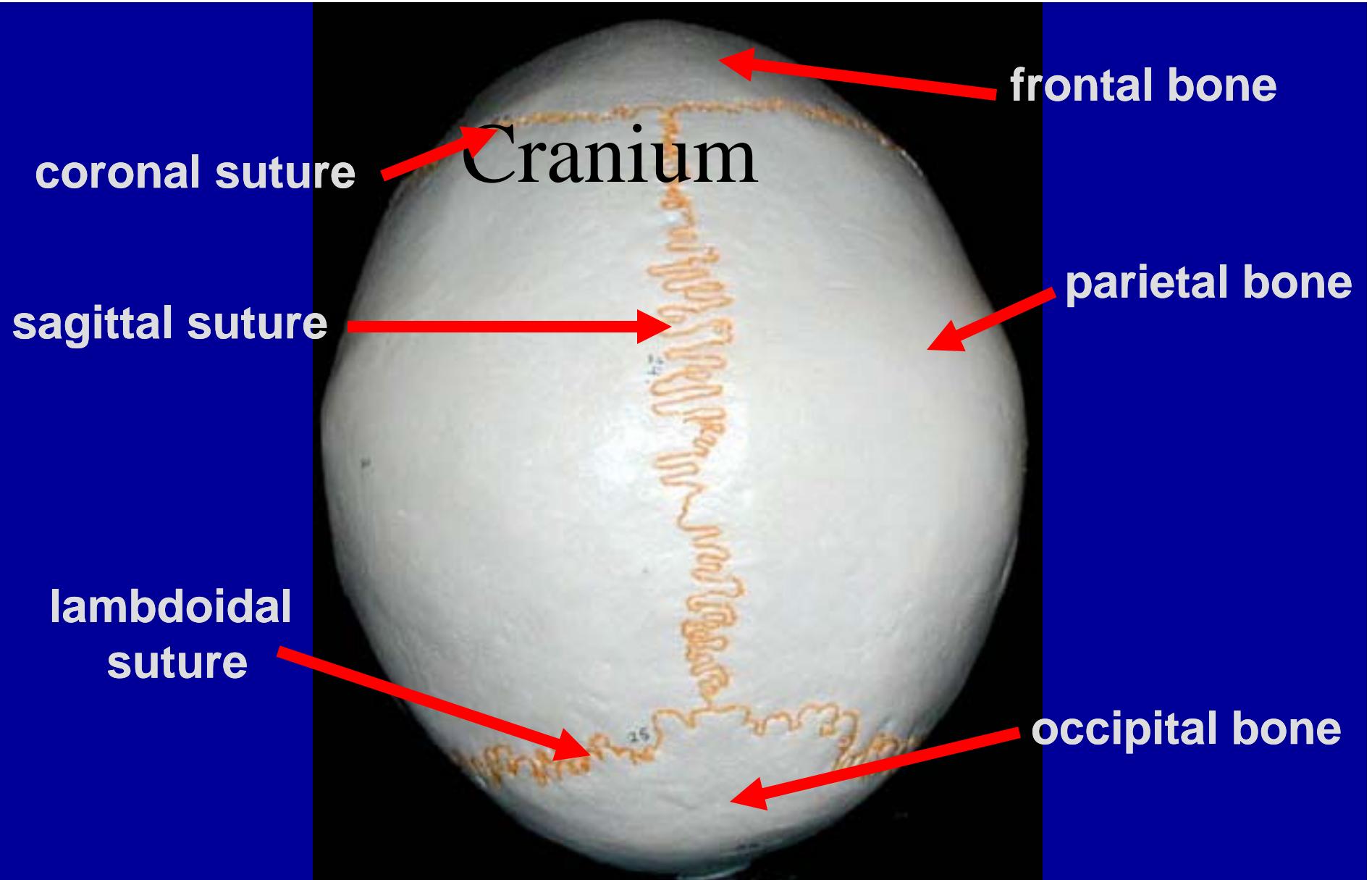
ethmoid sinus

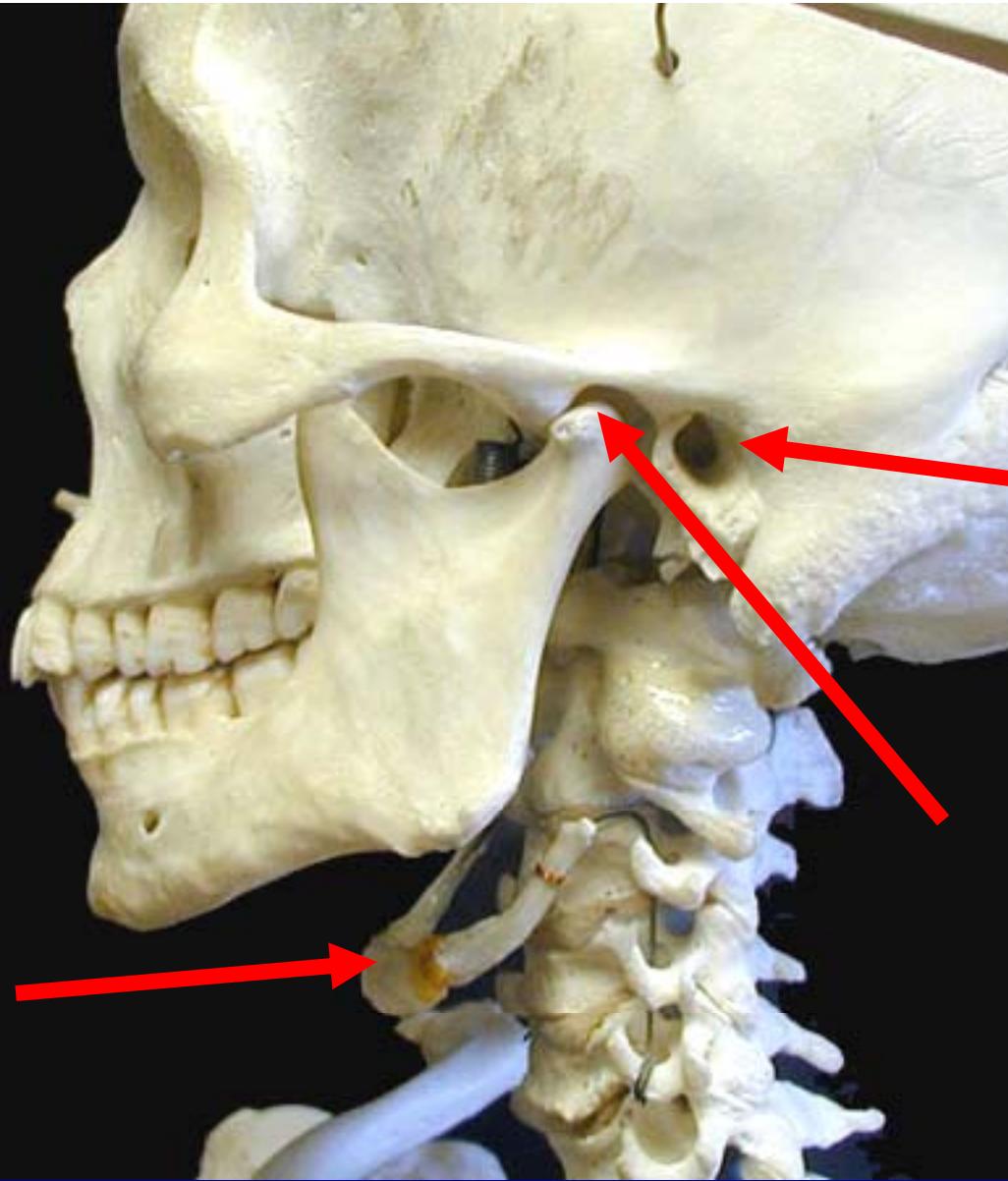
maxillary sinus

sphenoid sinus





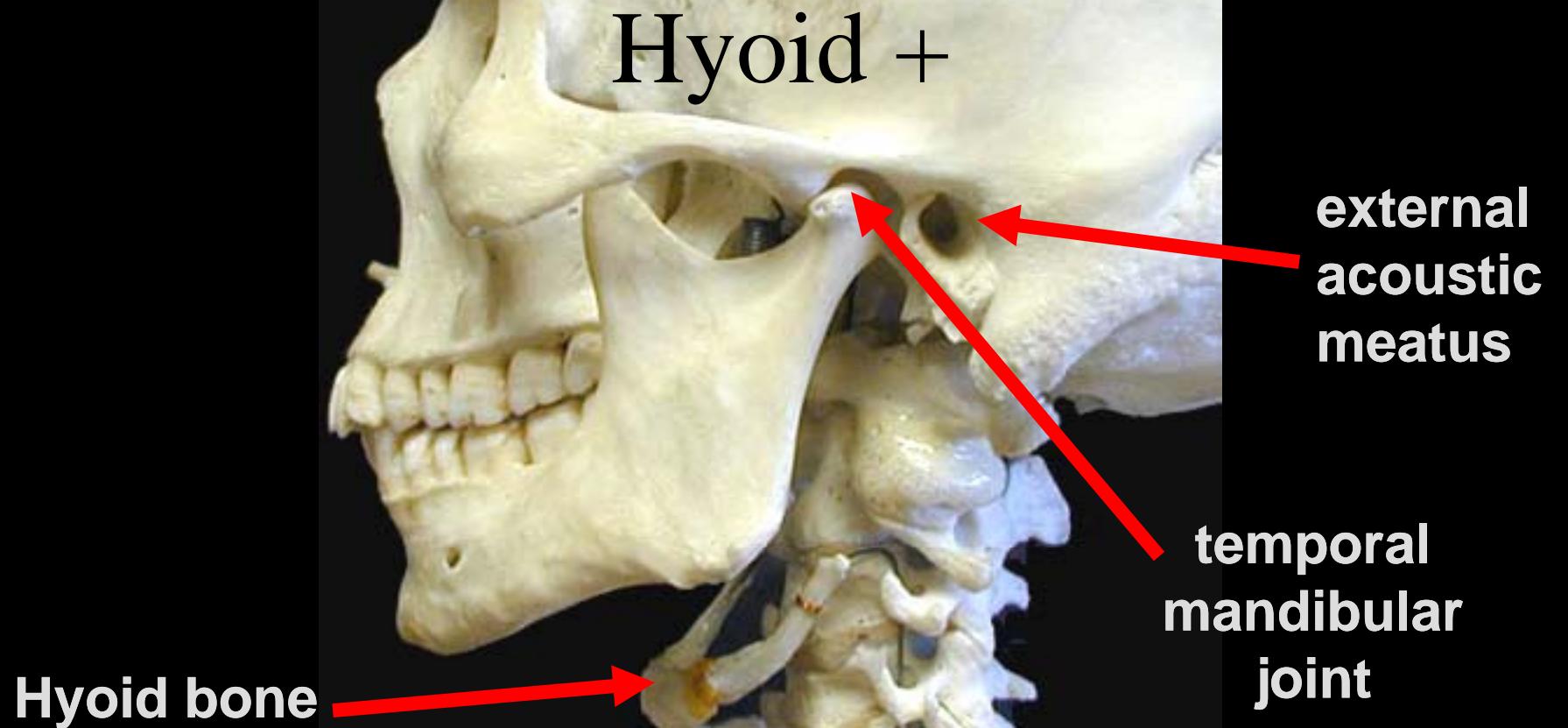


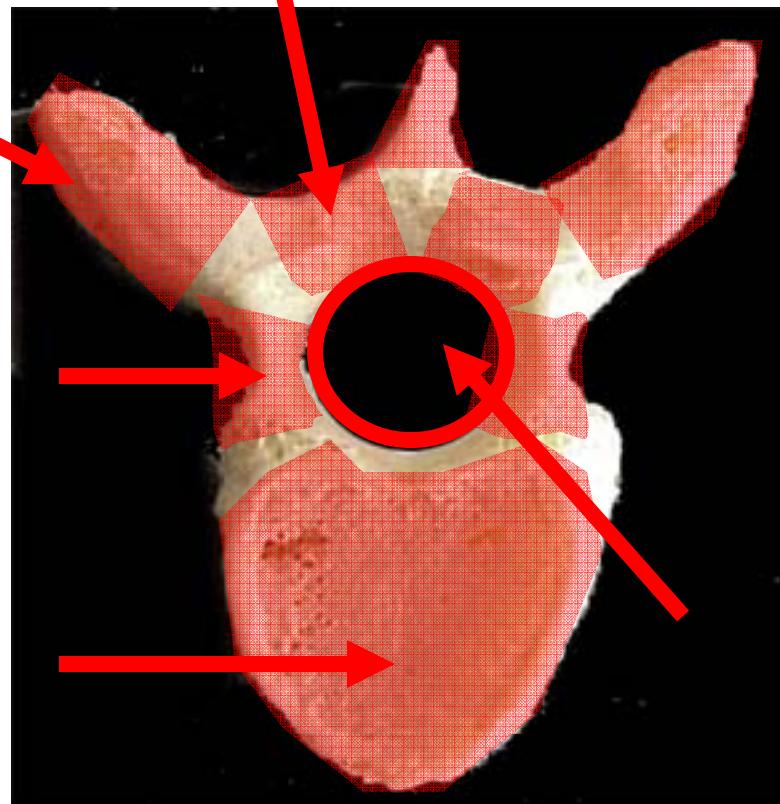
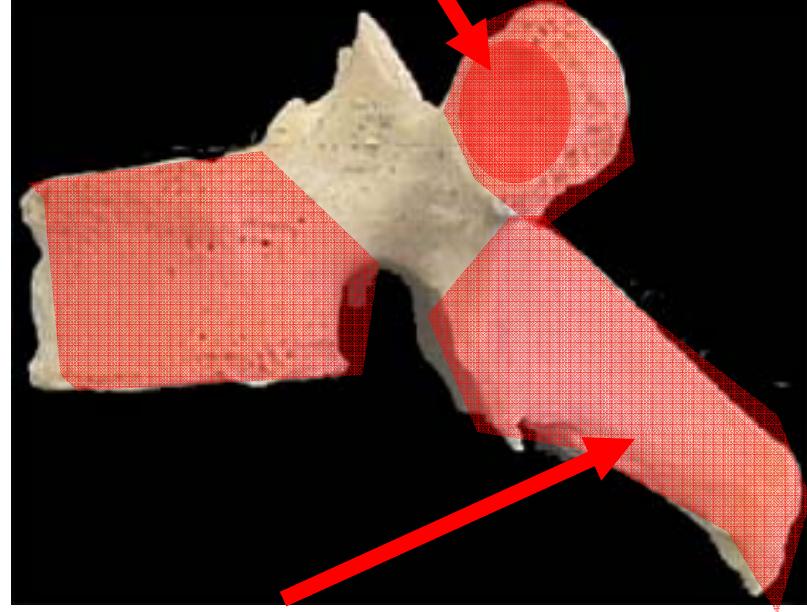


1

2

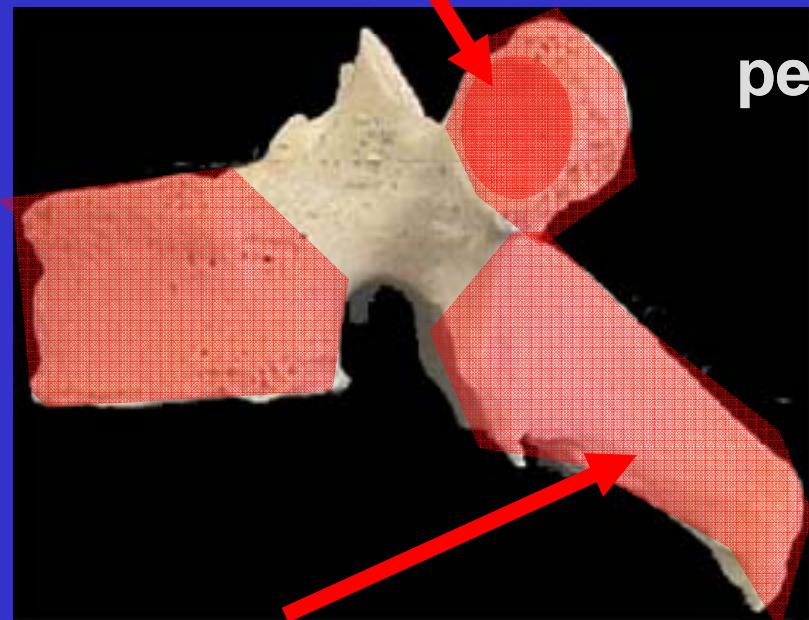
3





Vertebral
Parts

transverse process



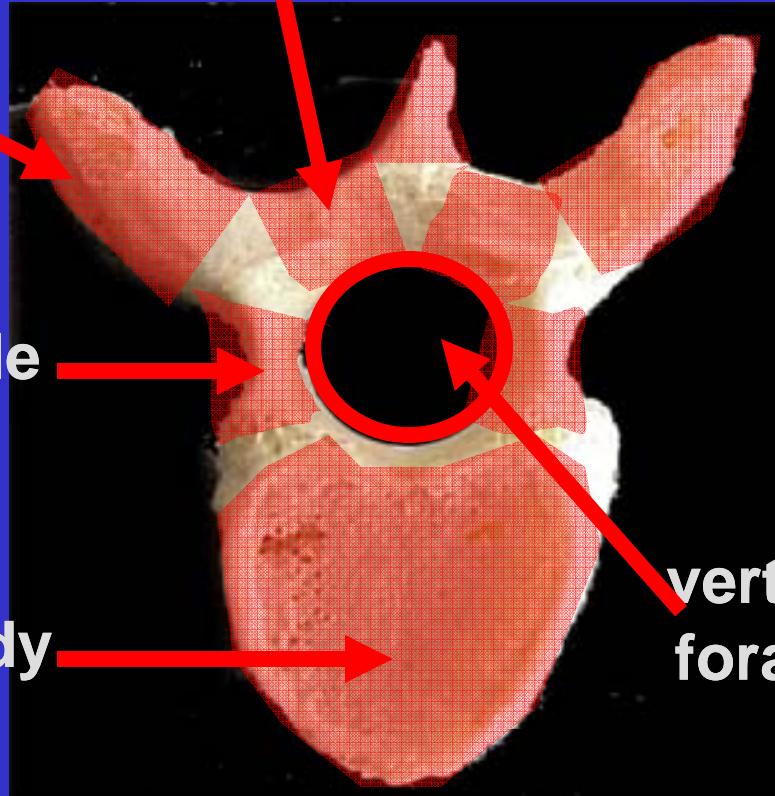
rib facet

lamina

pedicle

body

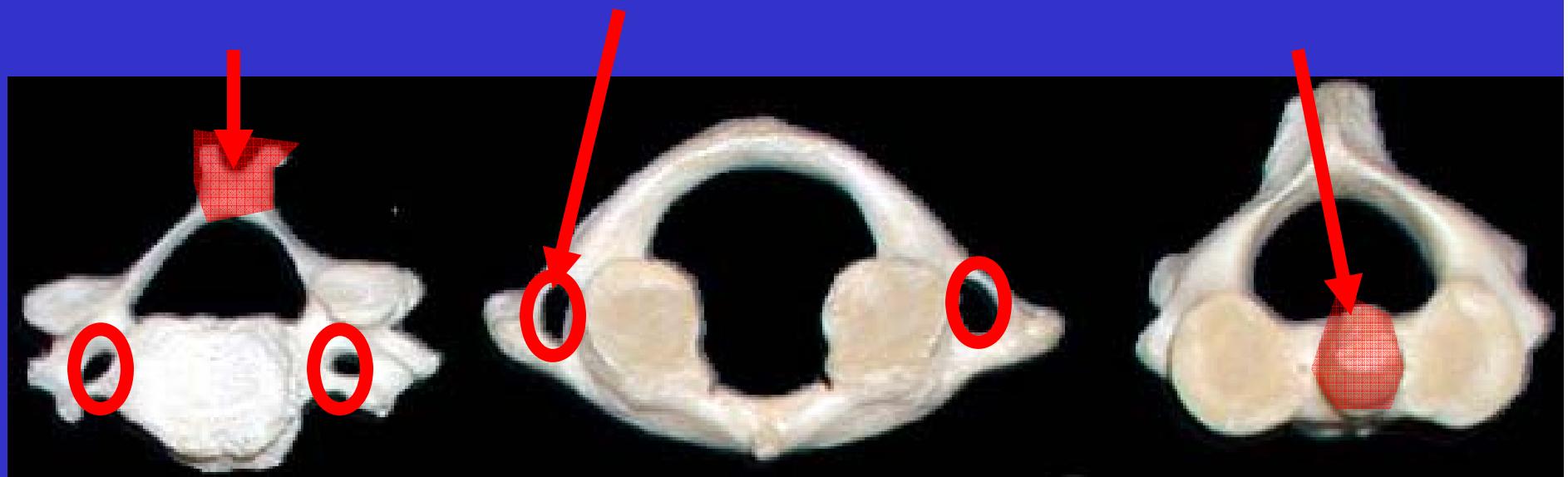
vertebral
foramen



spinous process

Vertebral Parts

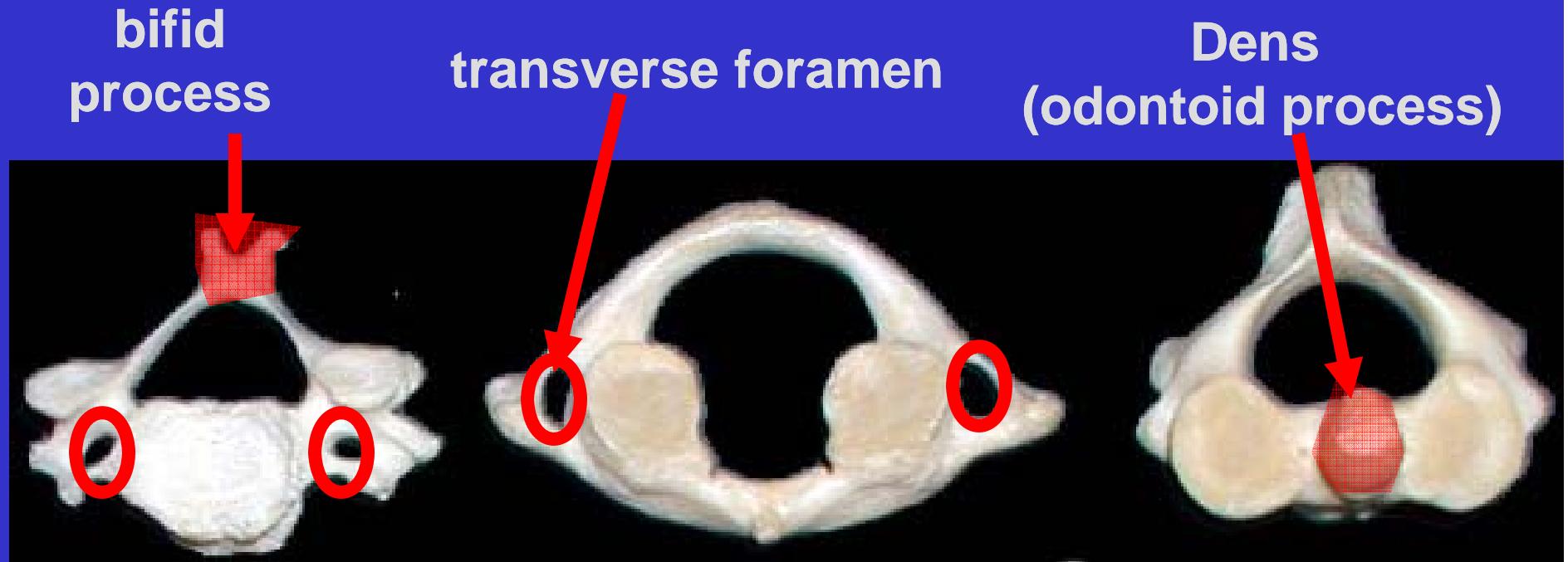
[.....?....]Vertebrae



?

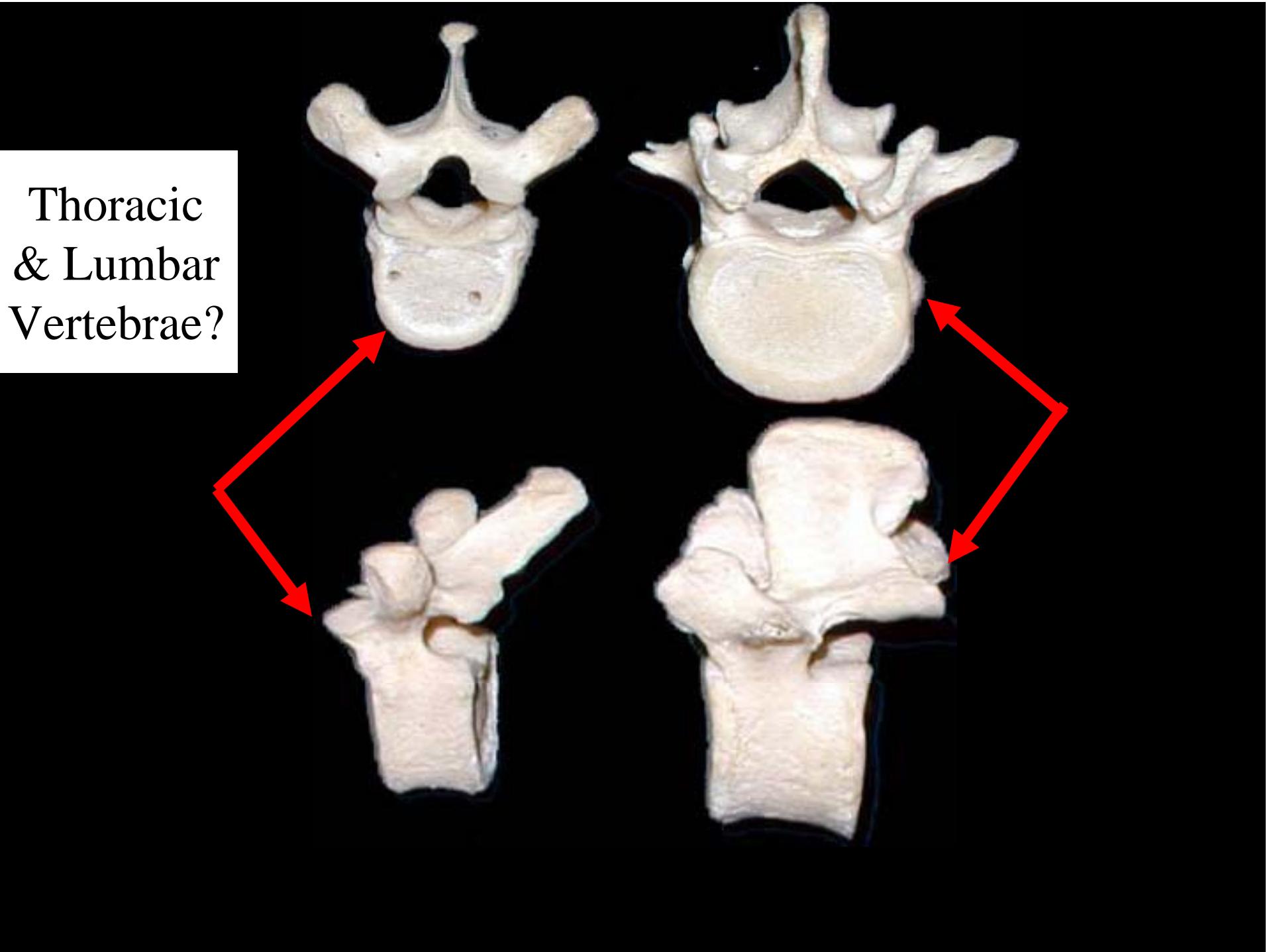
?

Cervical Vertebrae



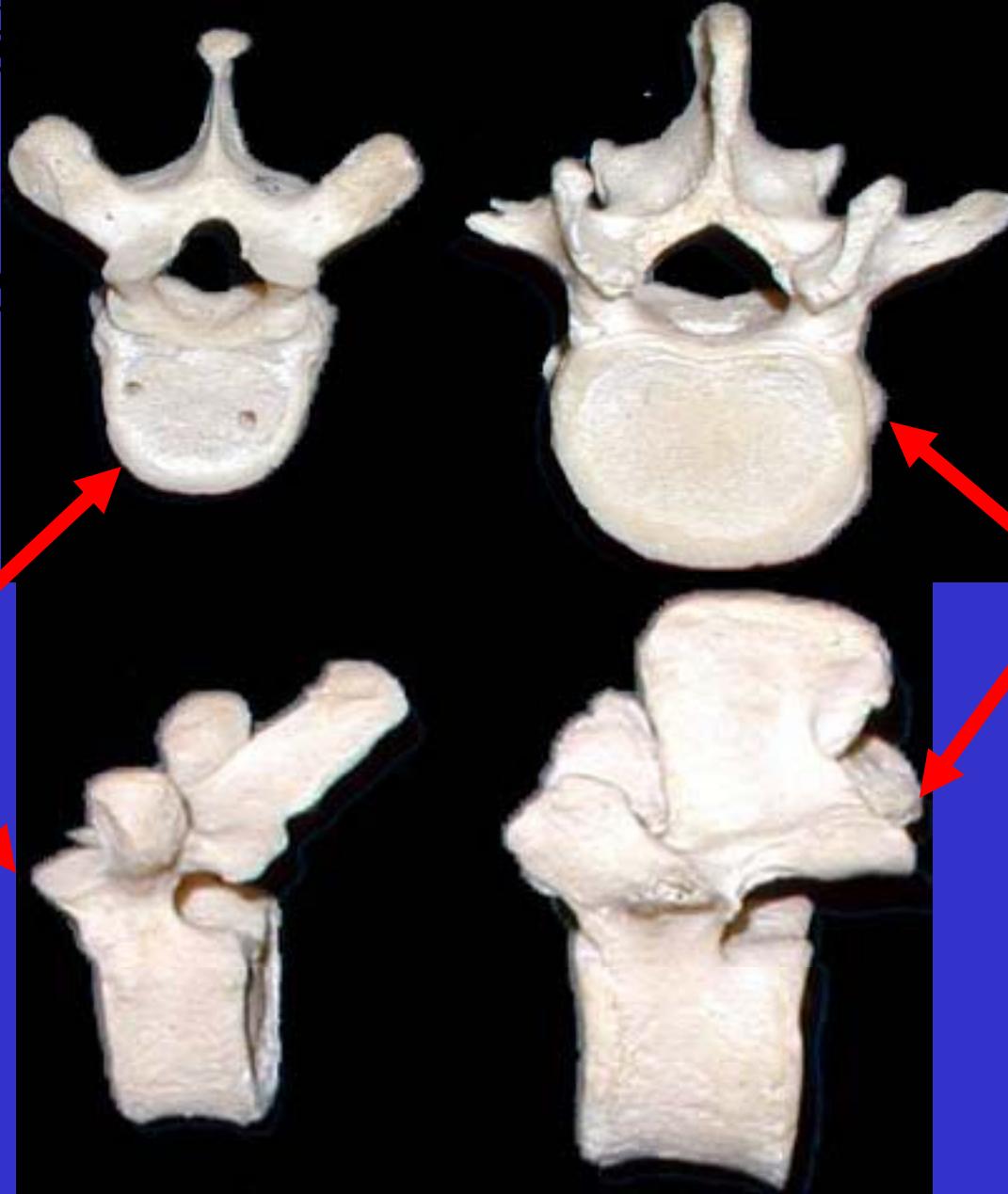
Atlas (C1)

Axis (C2)



Thoracic
& Lumbar
Vertebrae?

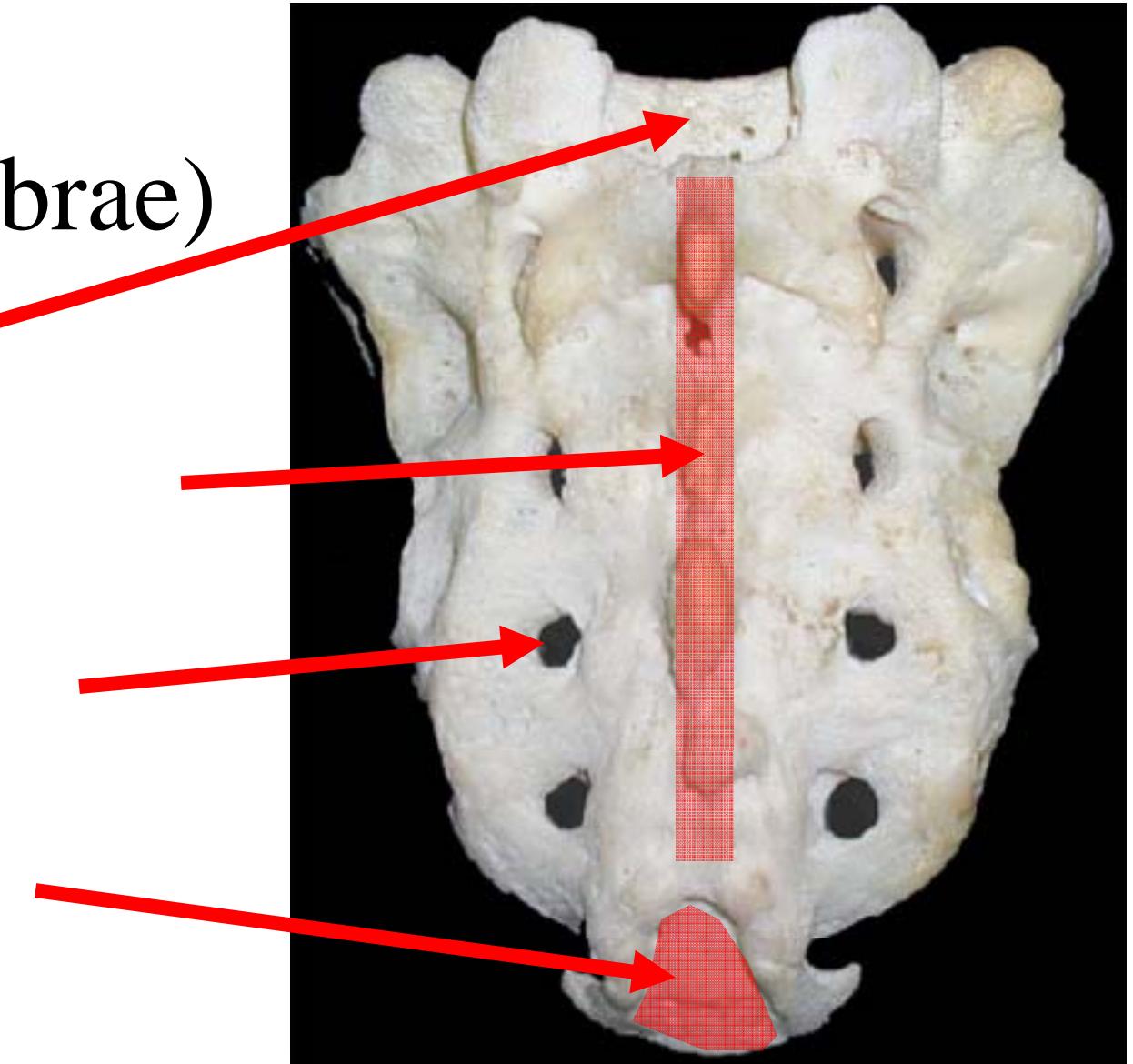
Thoracic & Lumbar Vertebrae



thoracic
vertebrae

lumbar
vertebrae

Sacrum (? fused vertebrae)



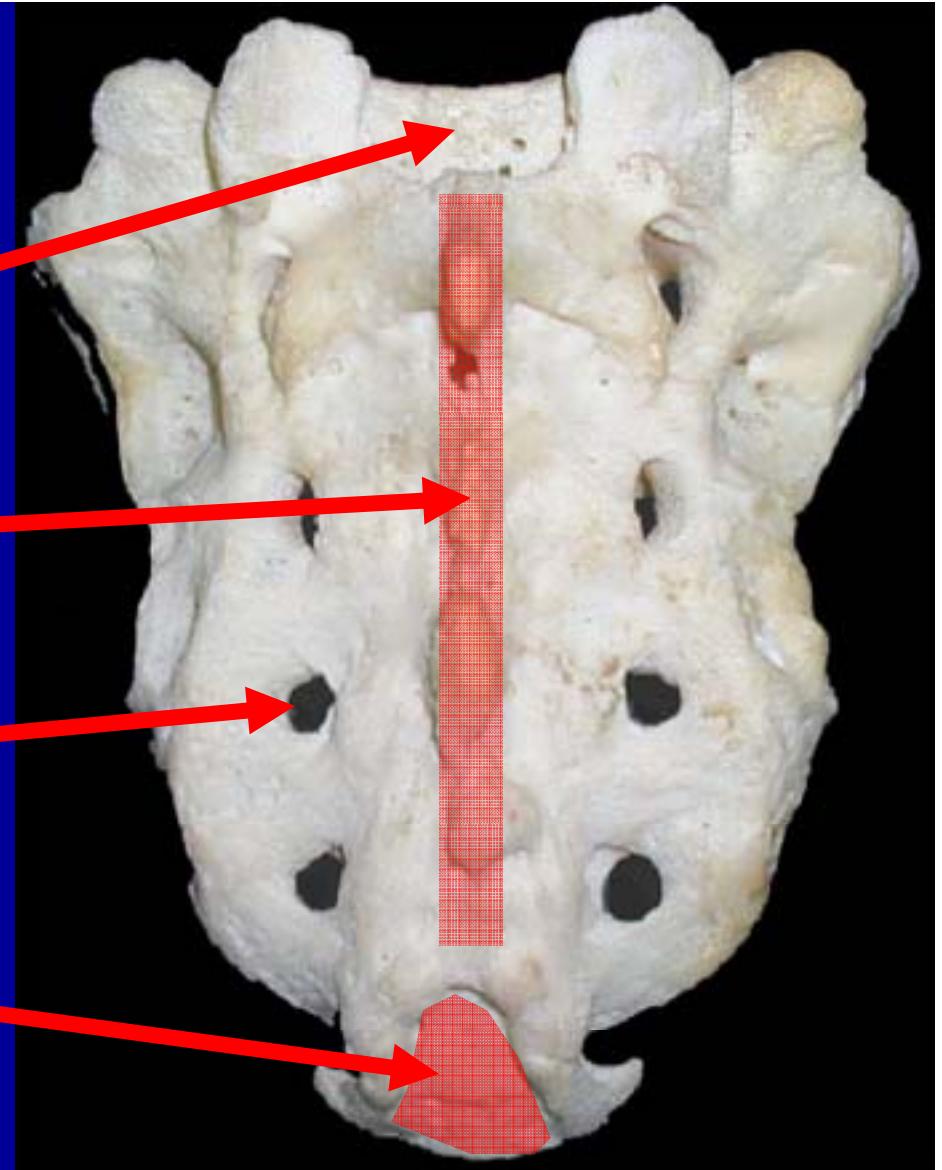
Sacrum (5 fused vertebrae)

sacral canal

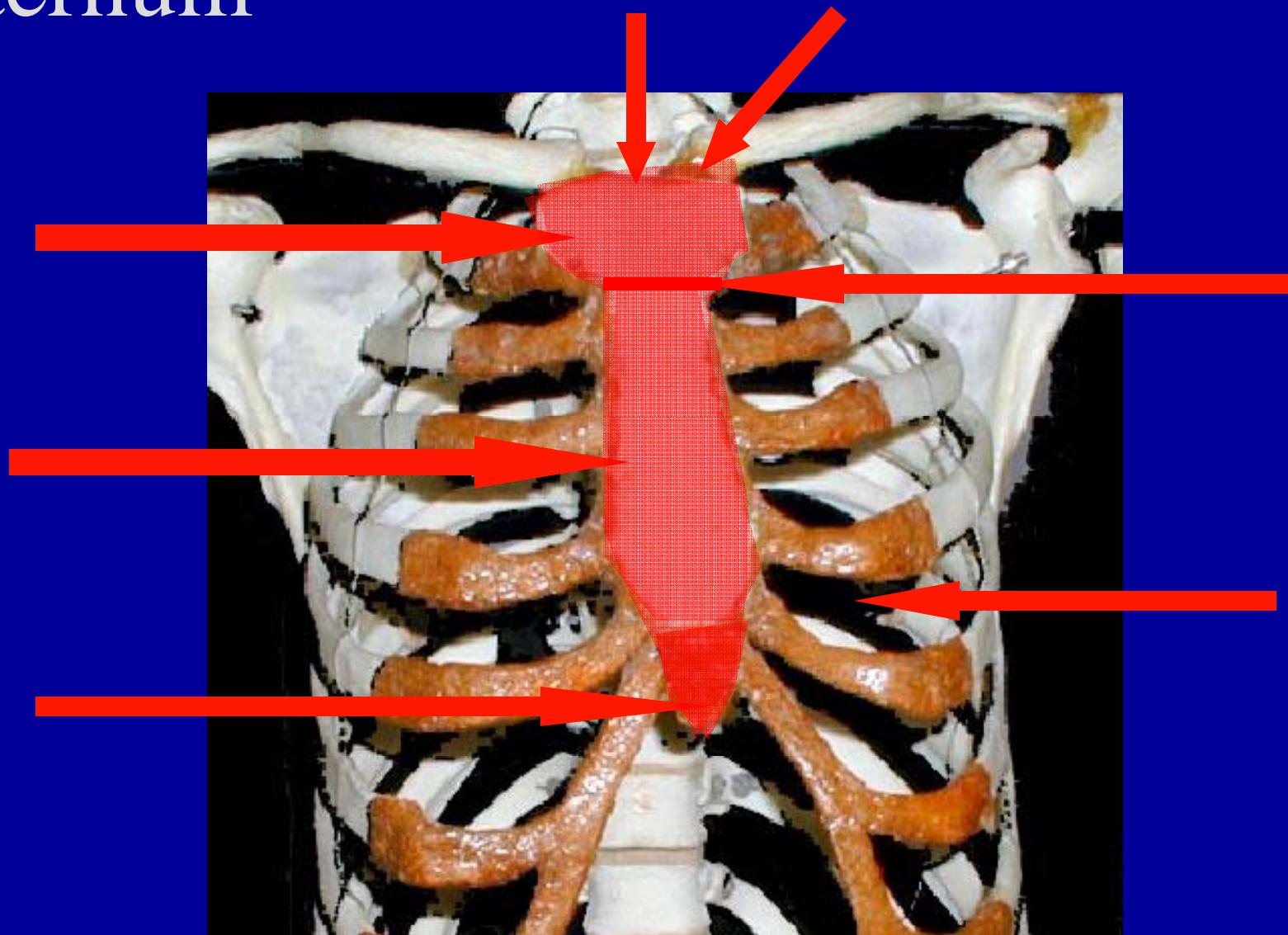
medial sacral
crest

sacral foramen

sacral hiatus



Sternum



Sternum

sternal
notch

clavicular
notch

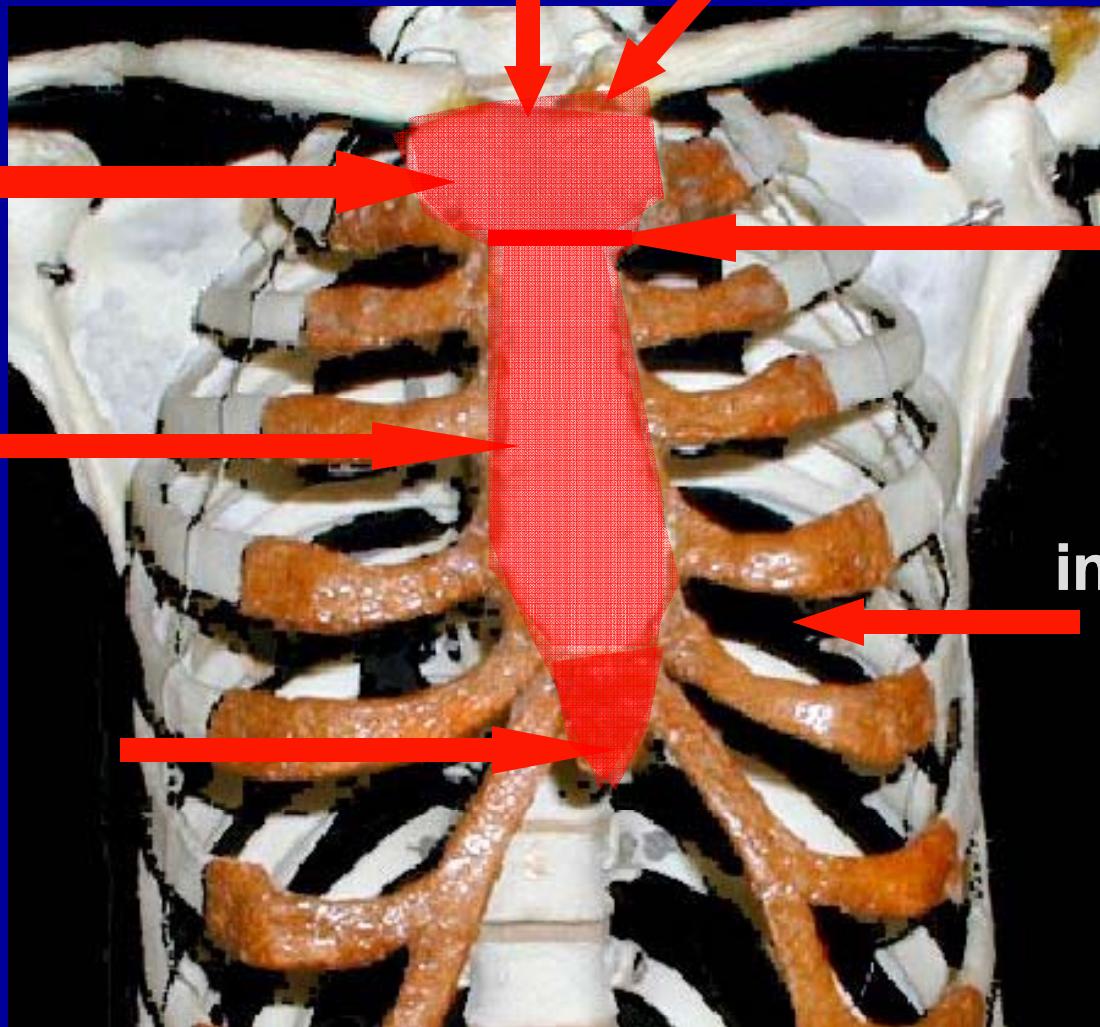
manubrium

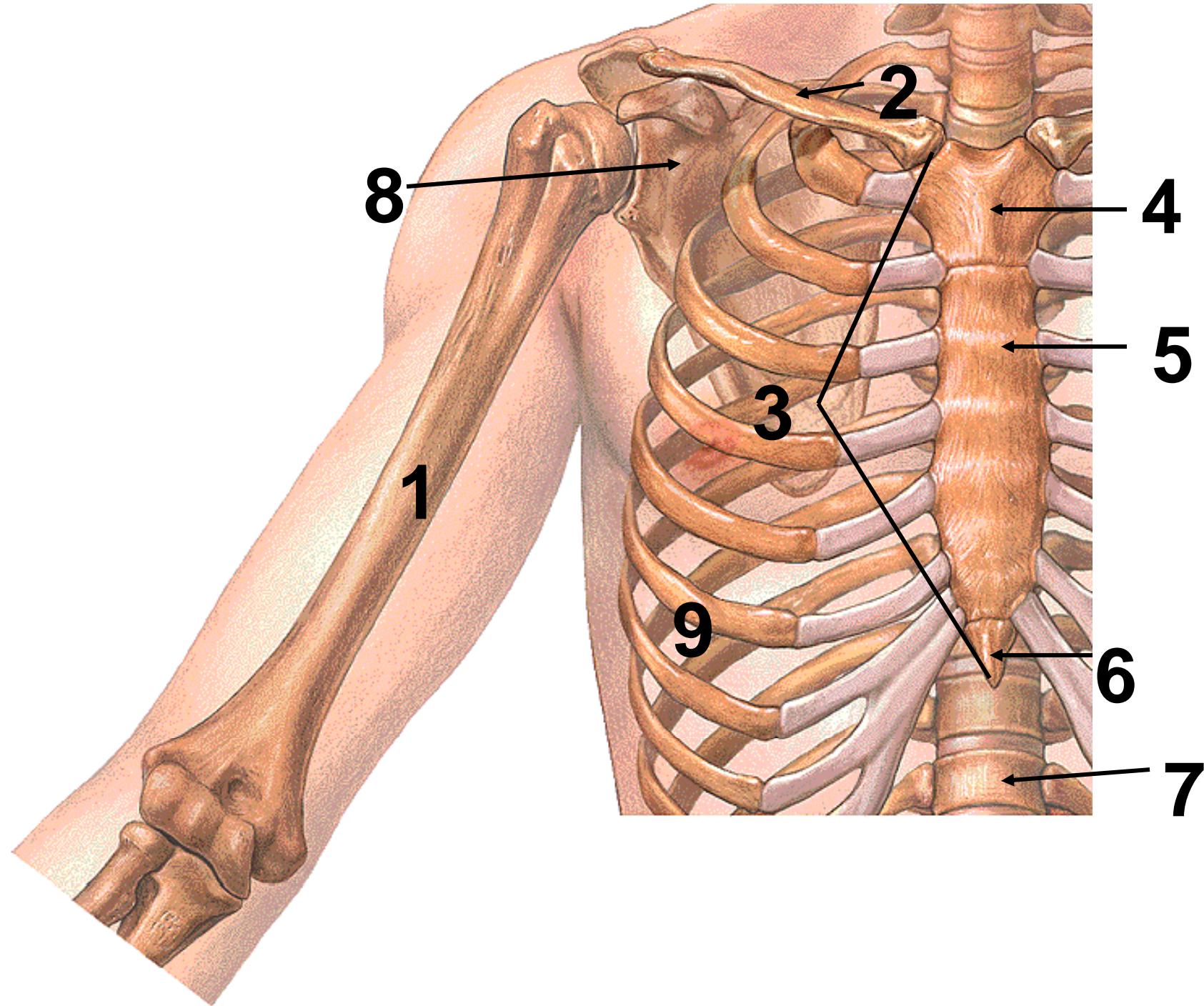
body

xiphoid
process

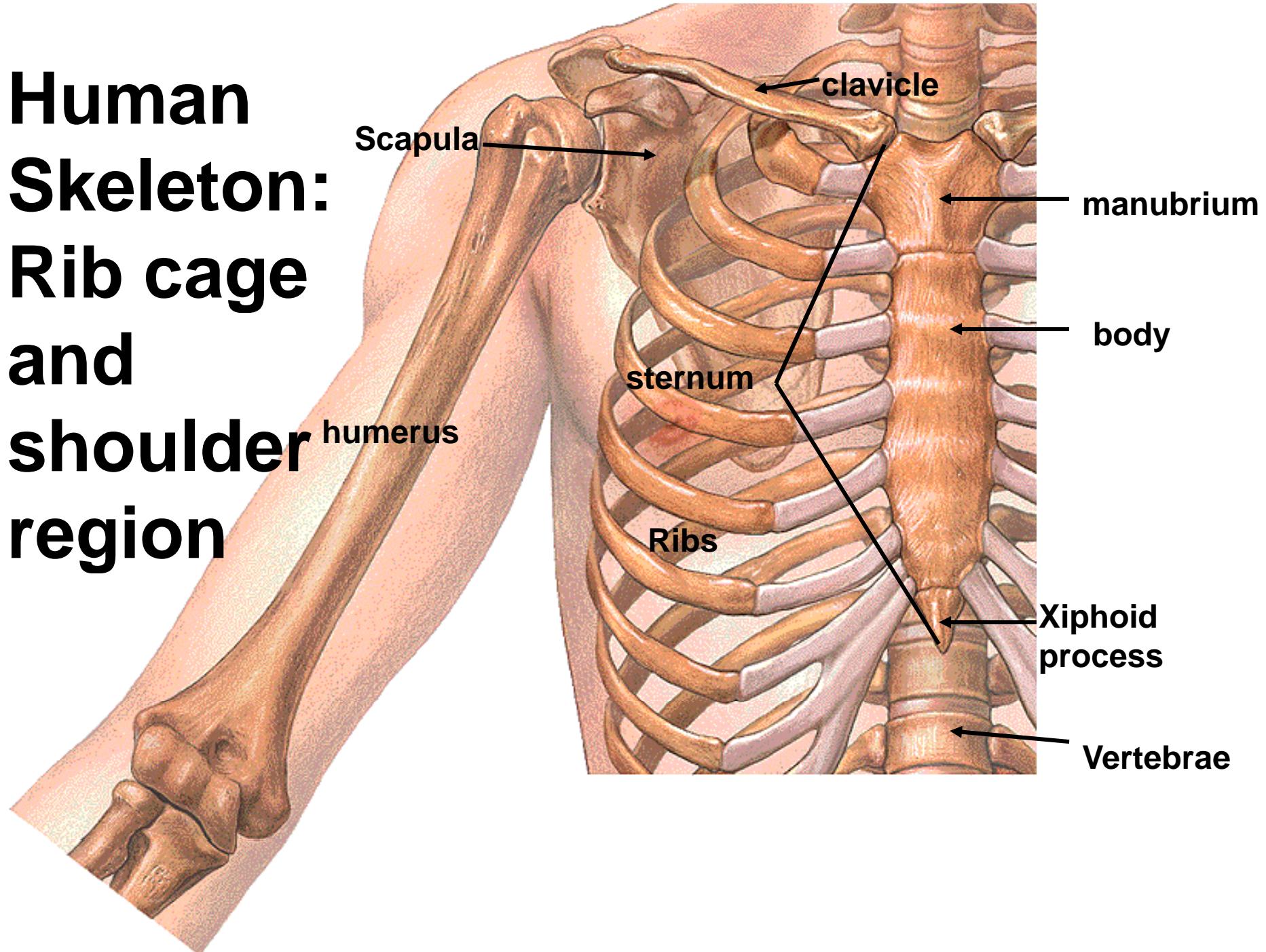
sternal
angle

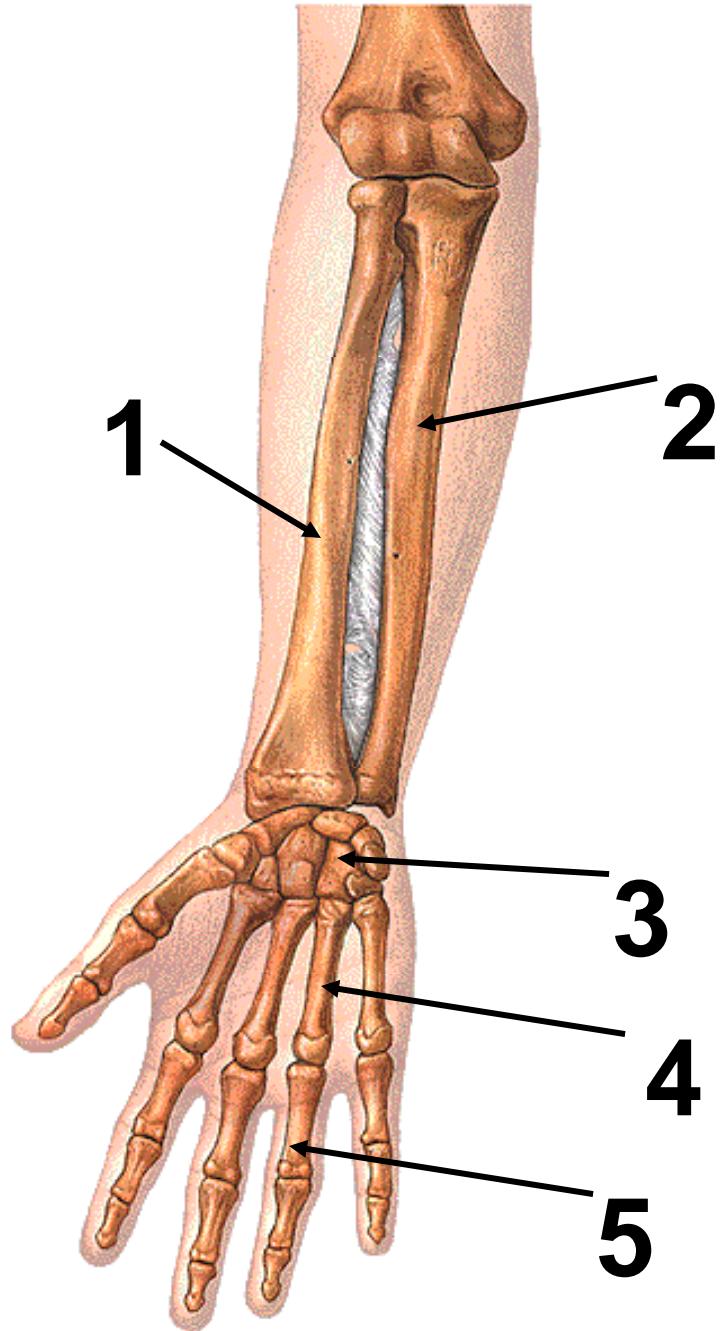
intercostal
space



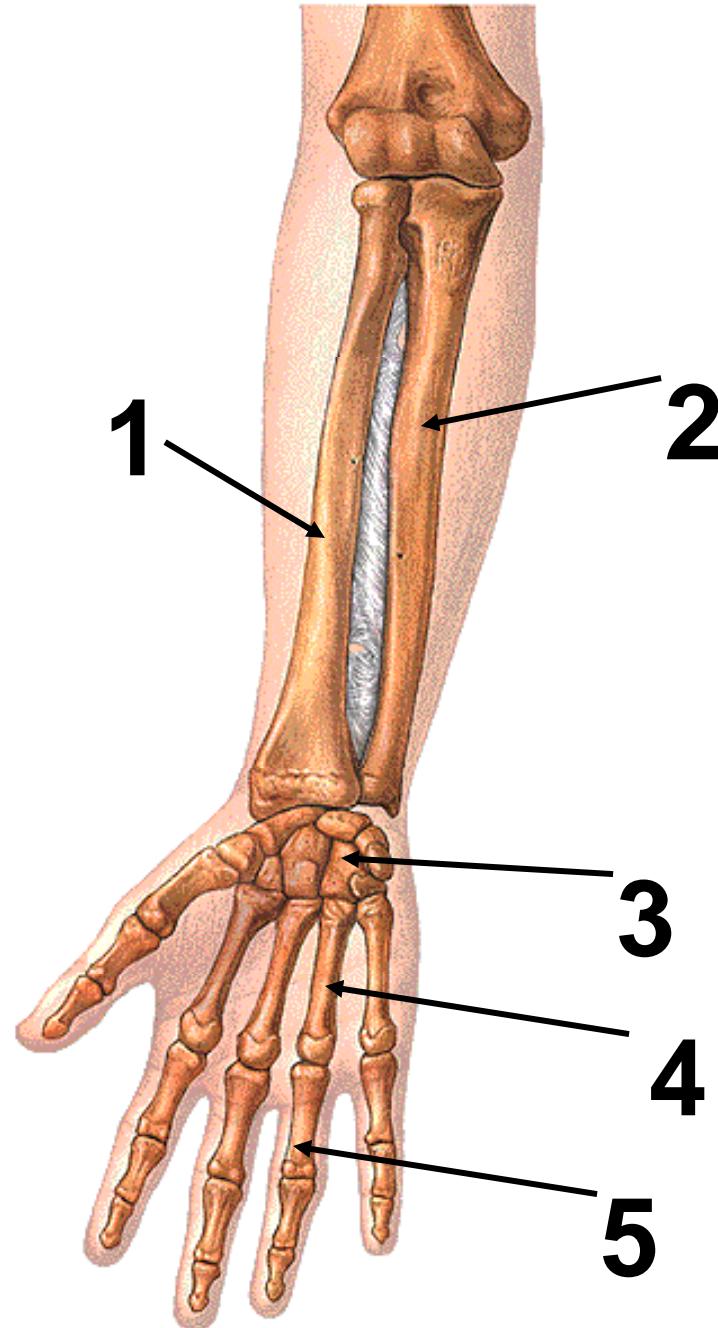


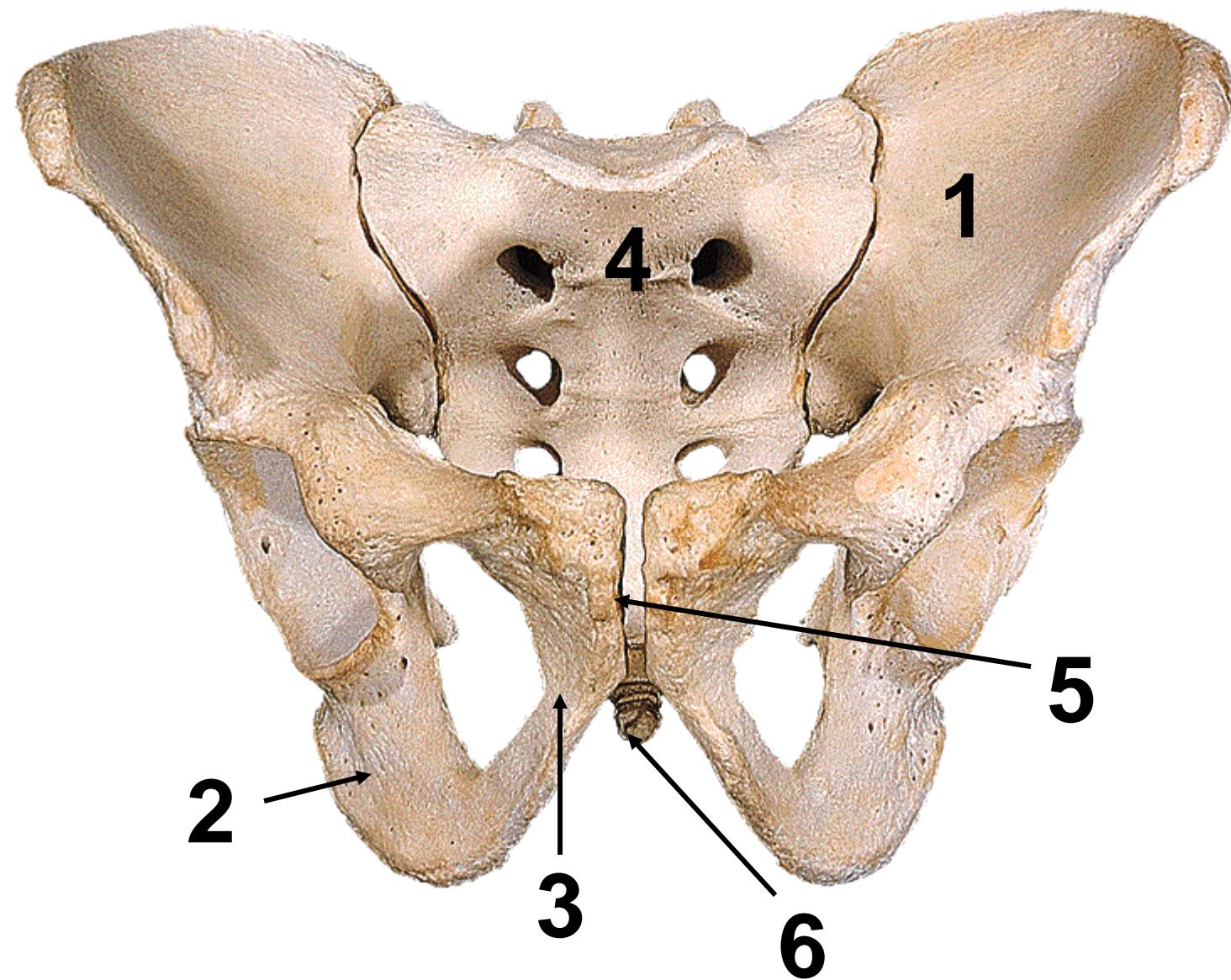
Human Skeleton: Rib cage and shoulder region

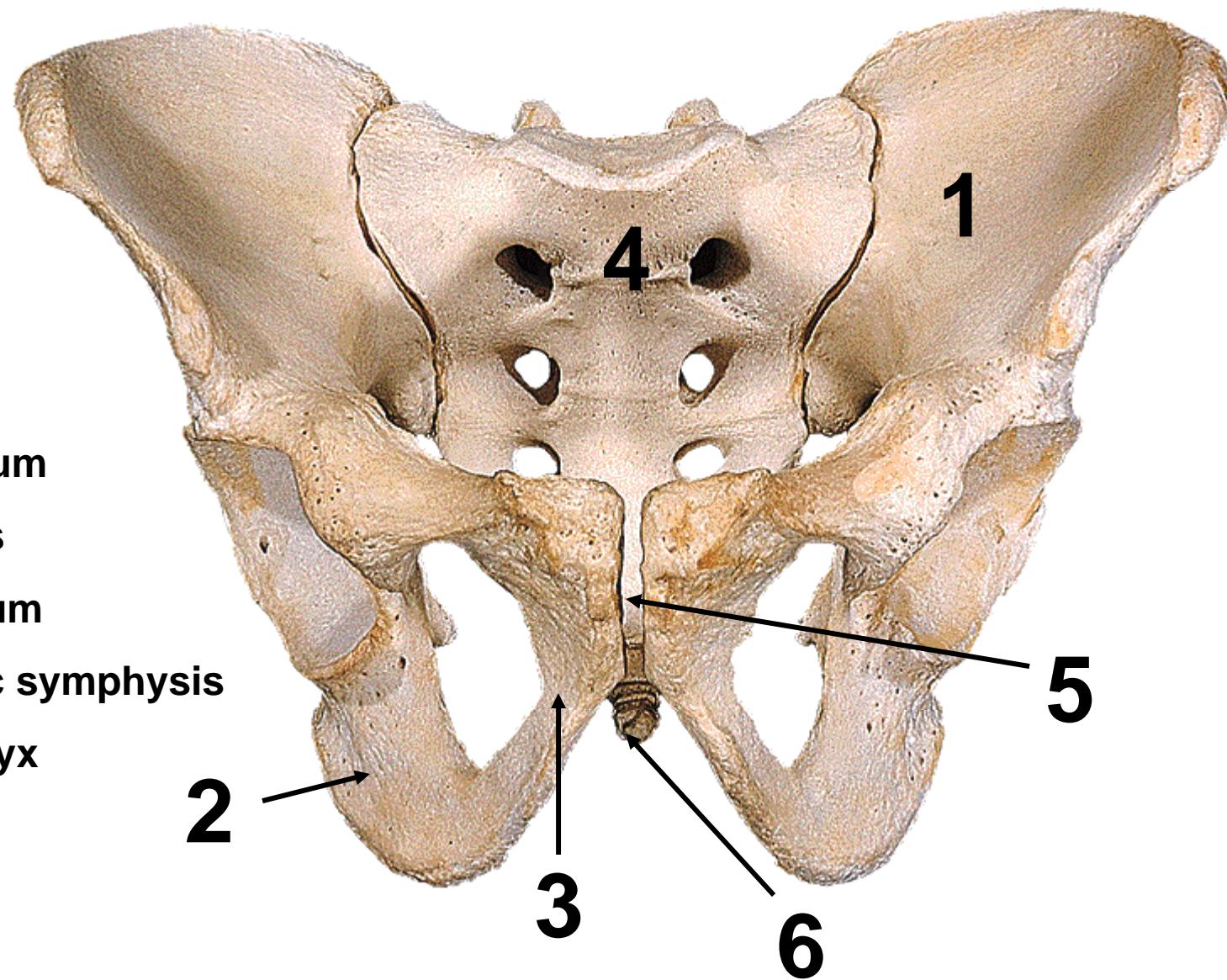




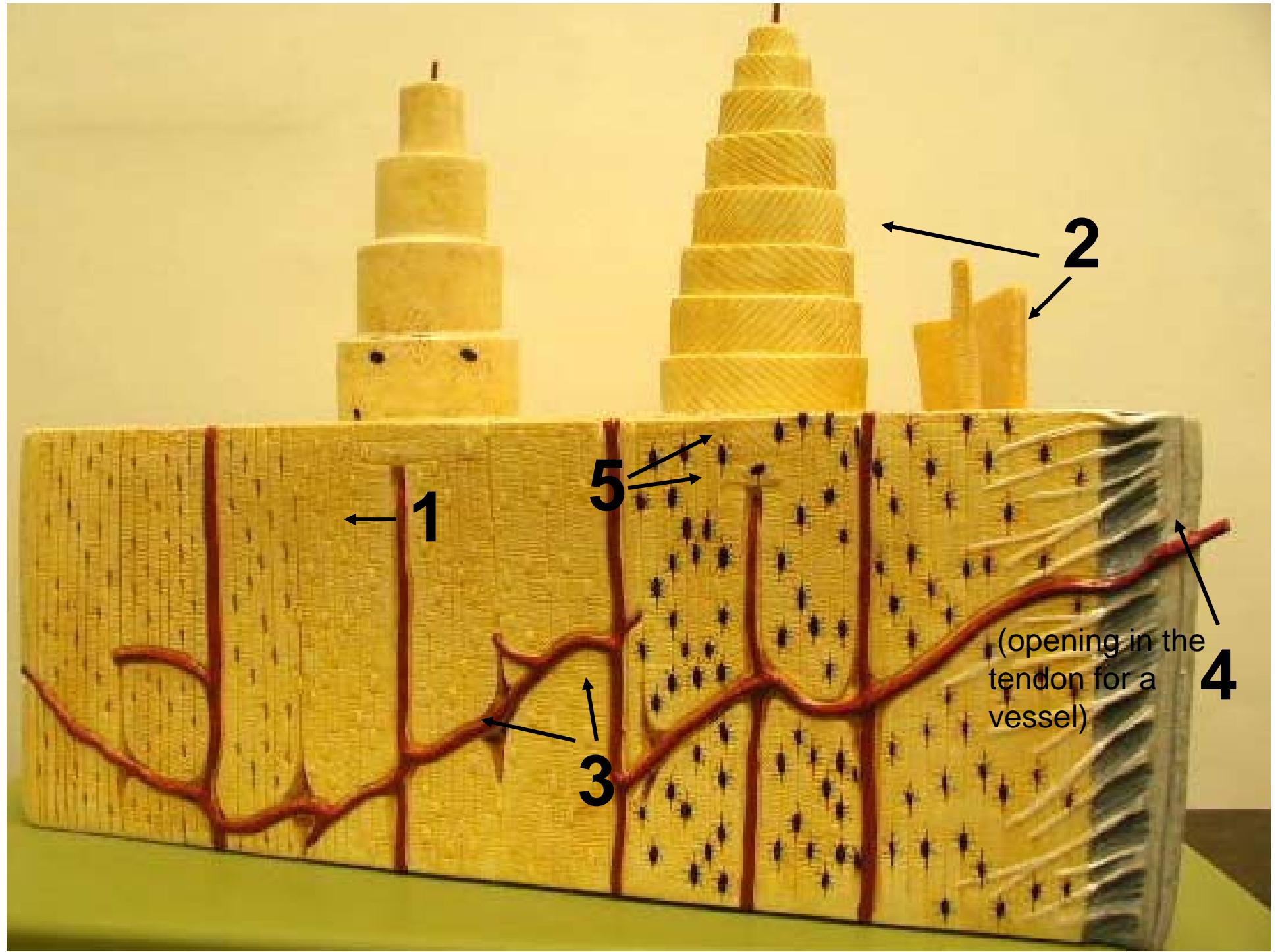
1. Radius
2. Ulna
3. Carpals
4. Metacarpals
5. Phalanges



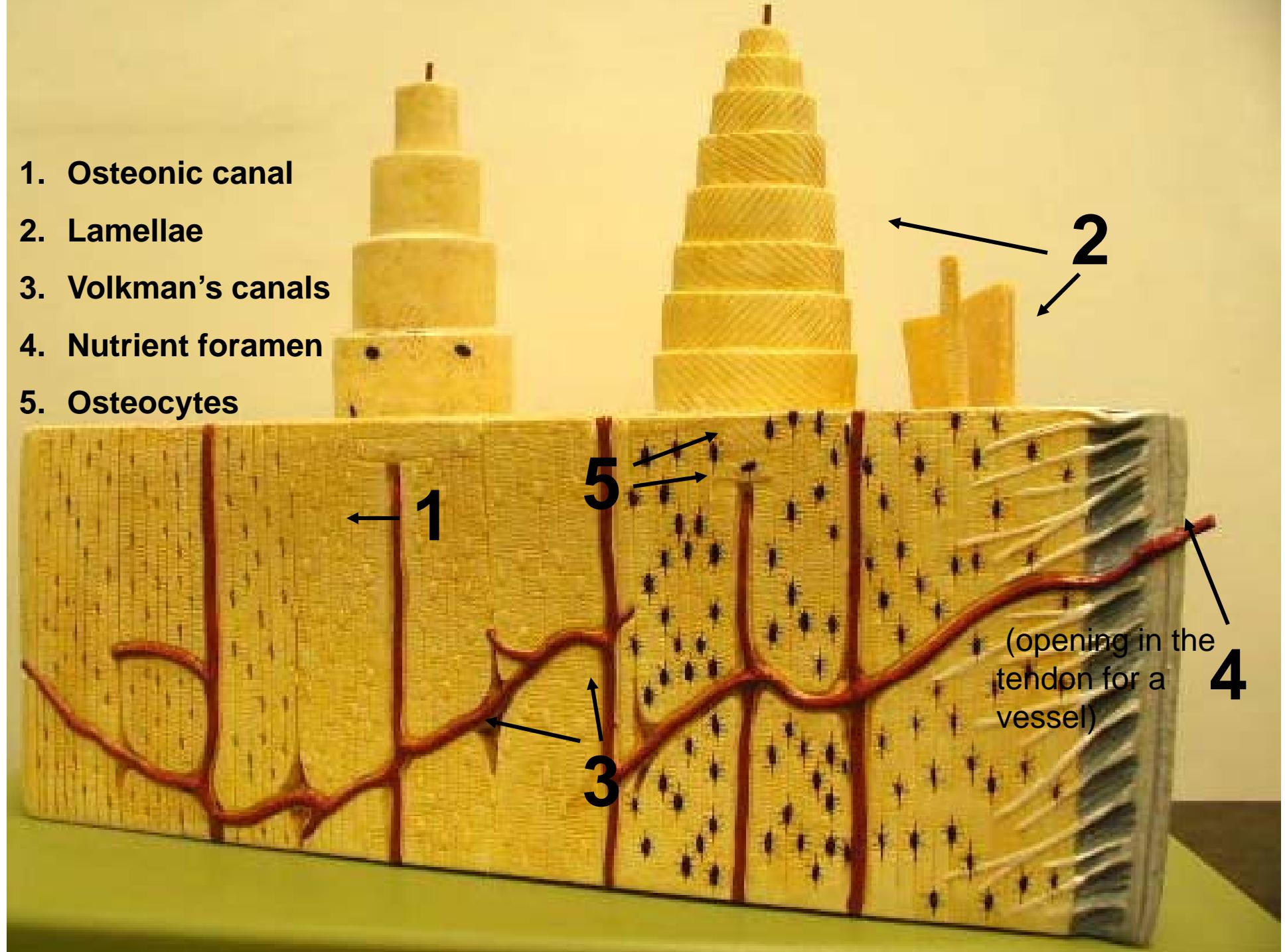




1. Ileum
2. Ischium
3. Pubis
4. Sacrum
5. Pubic symphysis
6. Coccyx



1. Osteonic canal
2. Lamellae
3. Volkman's canals
4. Nutrient foramen
5. Osteocytes



Definition of:

- *spine*
- *Suture*
- *malleolus*

- *spine*
 - A relatively long, thin projection or bump.
- *suture*
 - Articulation between cranial bones.
- *malleolus*
 - One of two specific protuberances of bones in the ankle.

- THE SKULL
- ? BONES
- ALL FUSED EXCEPT ONE.:?
- JOINTS = ?
- CRANIAL CAVITY ? BONES=CRANIAL BONES
- ? LEFT = FACIAL BONES
- ? MORE IN THE EARS

- THE SKULL
- = 22 BONES
- ALL FUSED EXCEPT ONE.:HYOID BONE
- JOINTS = SUTURES
- CRANIAL CAVITY 8 BONES=CRANIAL BONES
- 14 LEFT = FACIAL BONES
- 3 MORE IN THE EARS

Paired Cranial Bones:

Unpaired Cranial Bones:

Paired Cranial Bones:

- Parietals
- Temporals

Unpaired Cranial Bones:

- Frontal
- Occipital
- Sphenoid
- Ethmoid

Paired Facial Bones:?

-

Paired Facial Bones:

- Lacrimals
- Nasals
- Zygomatics
- Maxillae
- Palatines
- Inferior Nasal Conchae

Unpaired Facial Bones:

Unpaired Facial Bones:

- Vomer
- Mandible
- Hyoid

- *In the middle ears bones(6):*

middle ears

- *In the (6):*
 - malleus** (2)
 - incus** (2)
 - stapes** (2

- What **bone** articulates with:

Ulna?

Radius?

- What **bone** articulates with:

ulna (articulates with trochlea)

radius (articulates with capitulum)

- function of a lacunae?

- function of a lacunae?

It houses osteocytes

- hip bone is composed of:
- which fuse at the?

The hip bone is composed of three elements:

- the ilium
- ischium
- and pubis

which fuse at the acetabulum (the socket of the hip joint).

1. sagittal suture—?
- coronal suture—?
- lambdoidal suture—?
- squamous suture—?

1. sagittal suture—left and right parietal bones
- coronal suture—frontal bone and both parietal bones
- lambdoidal suture—occipital bone and both parietal bones
- squamous suture—temporal bone and parietal bone

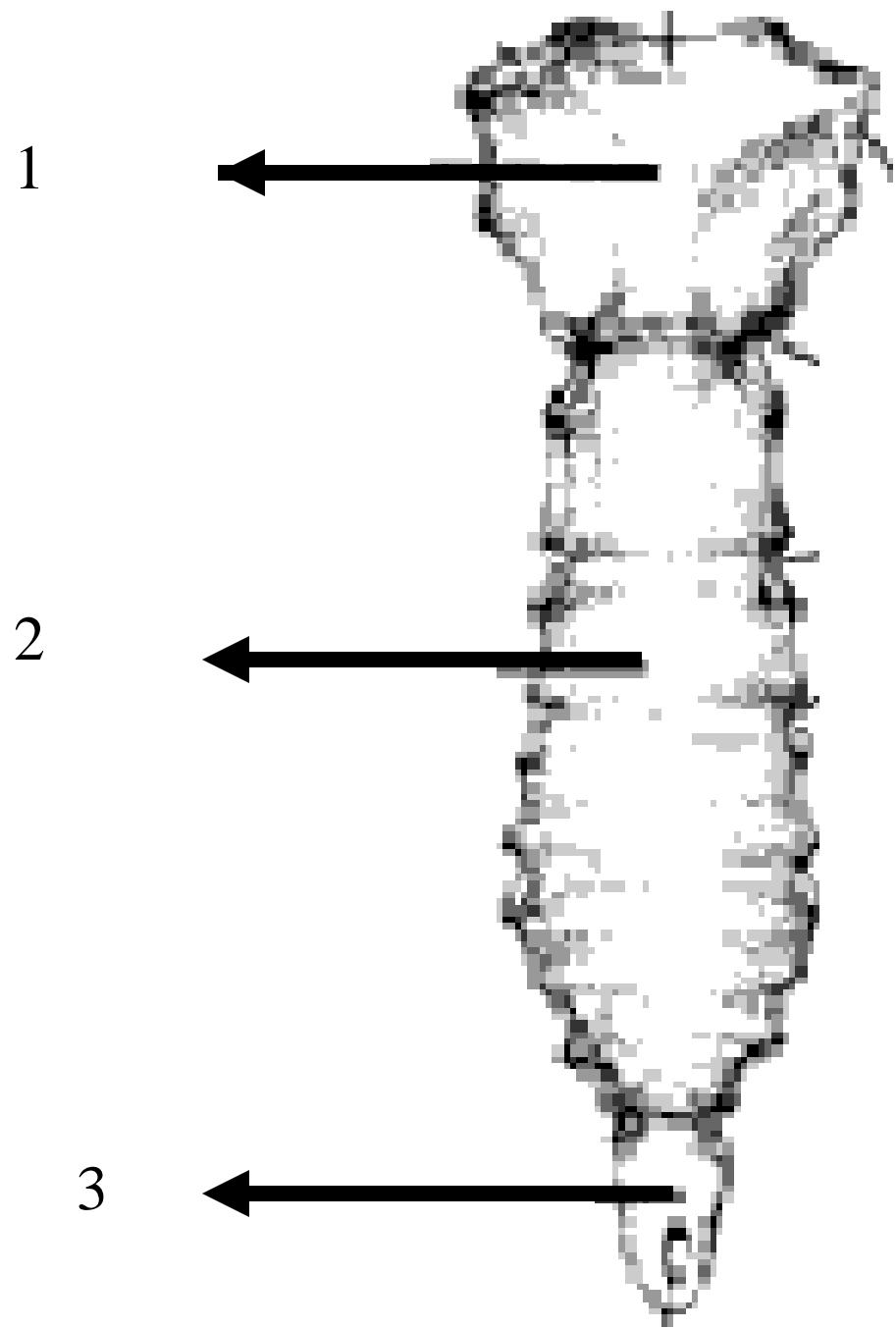
Olecranon process ?

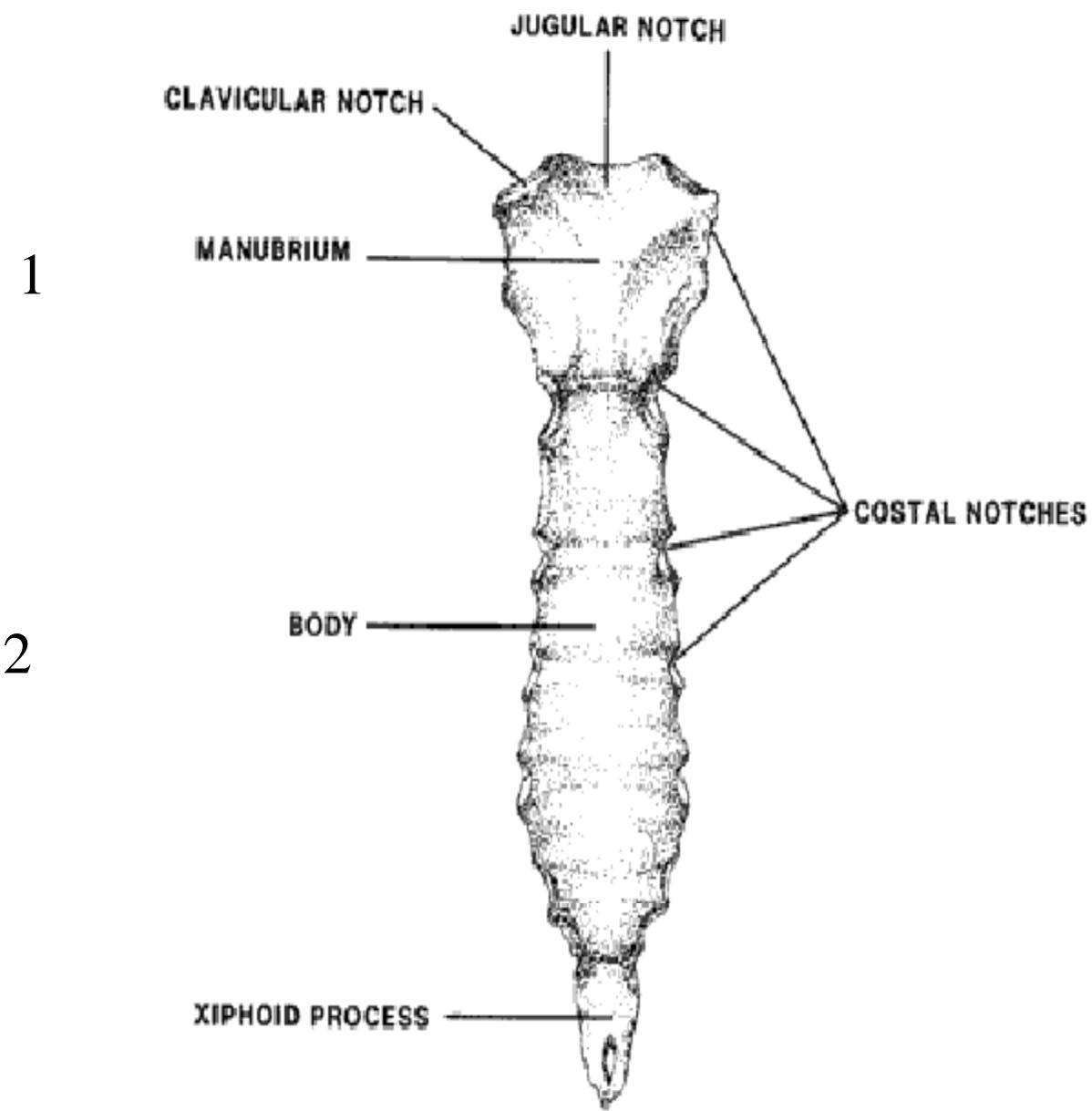
prominent bump elbow

What's wrong with this picture?



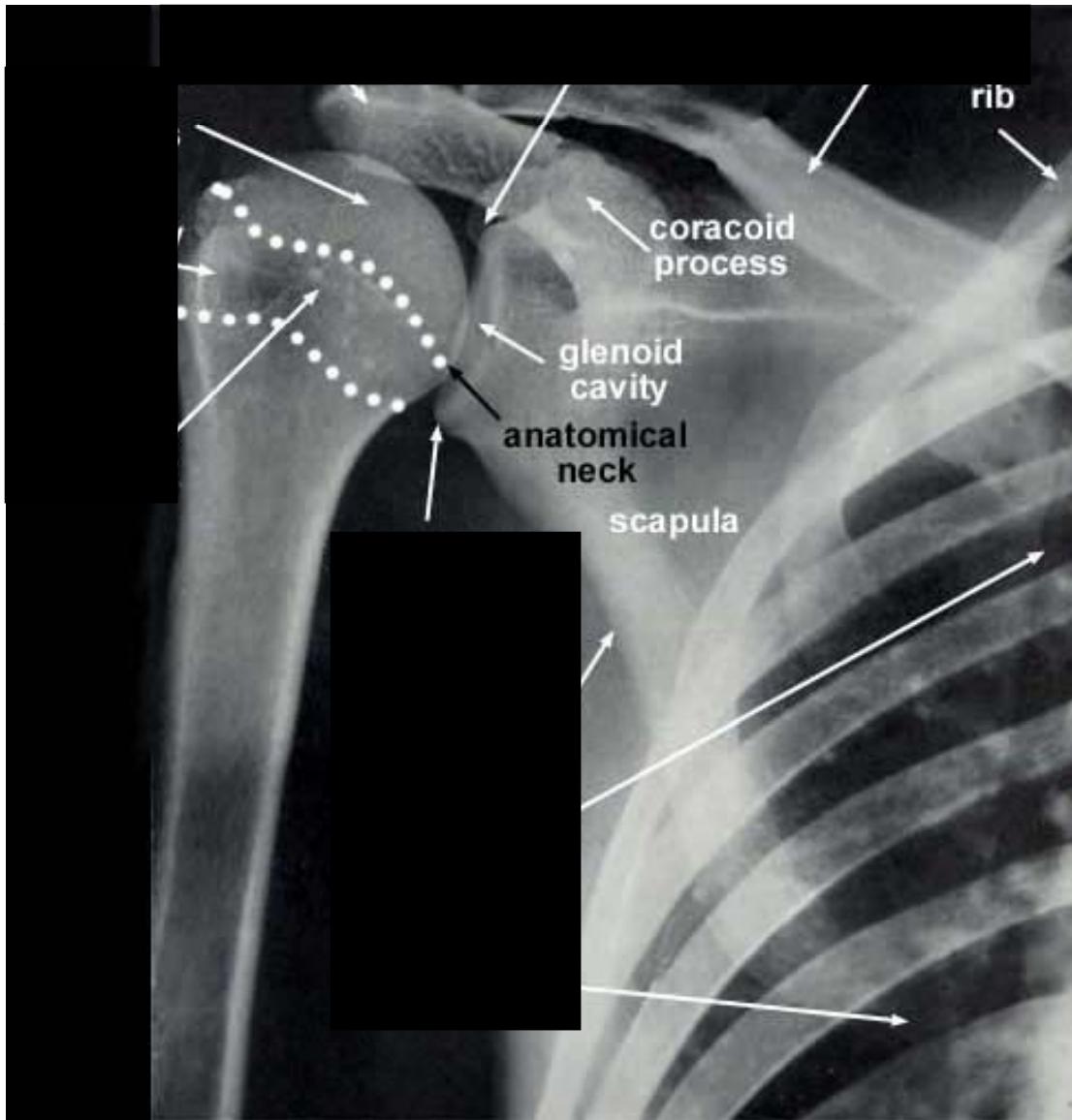
Fracture of the olecranon

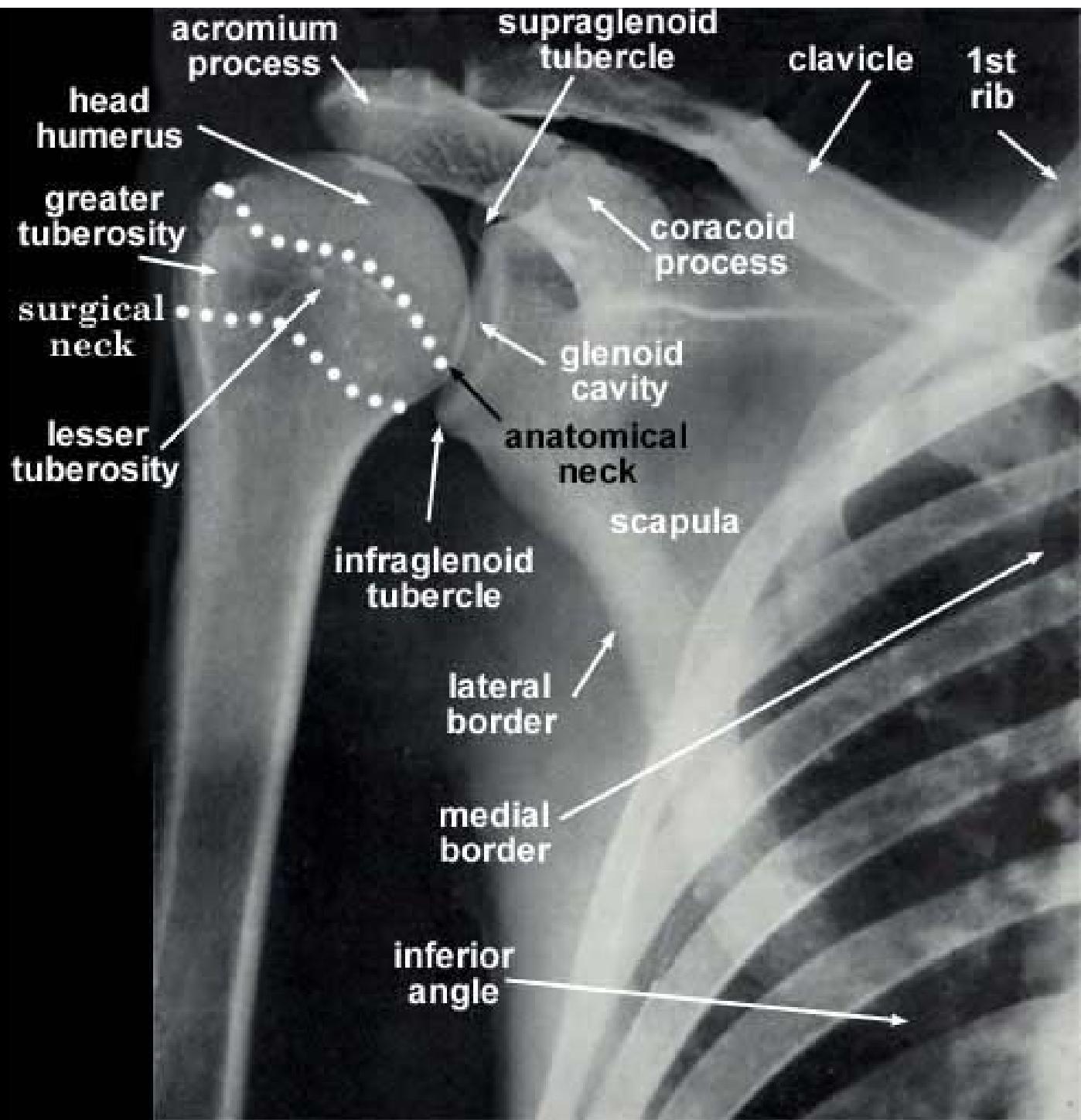


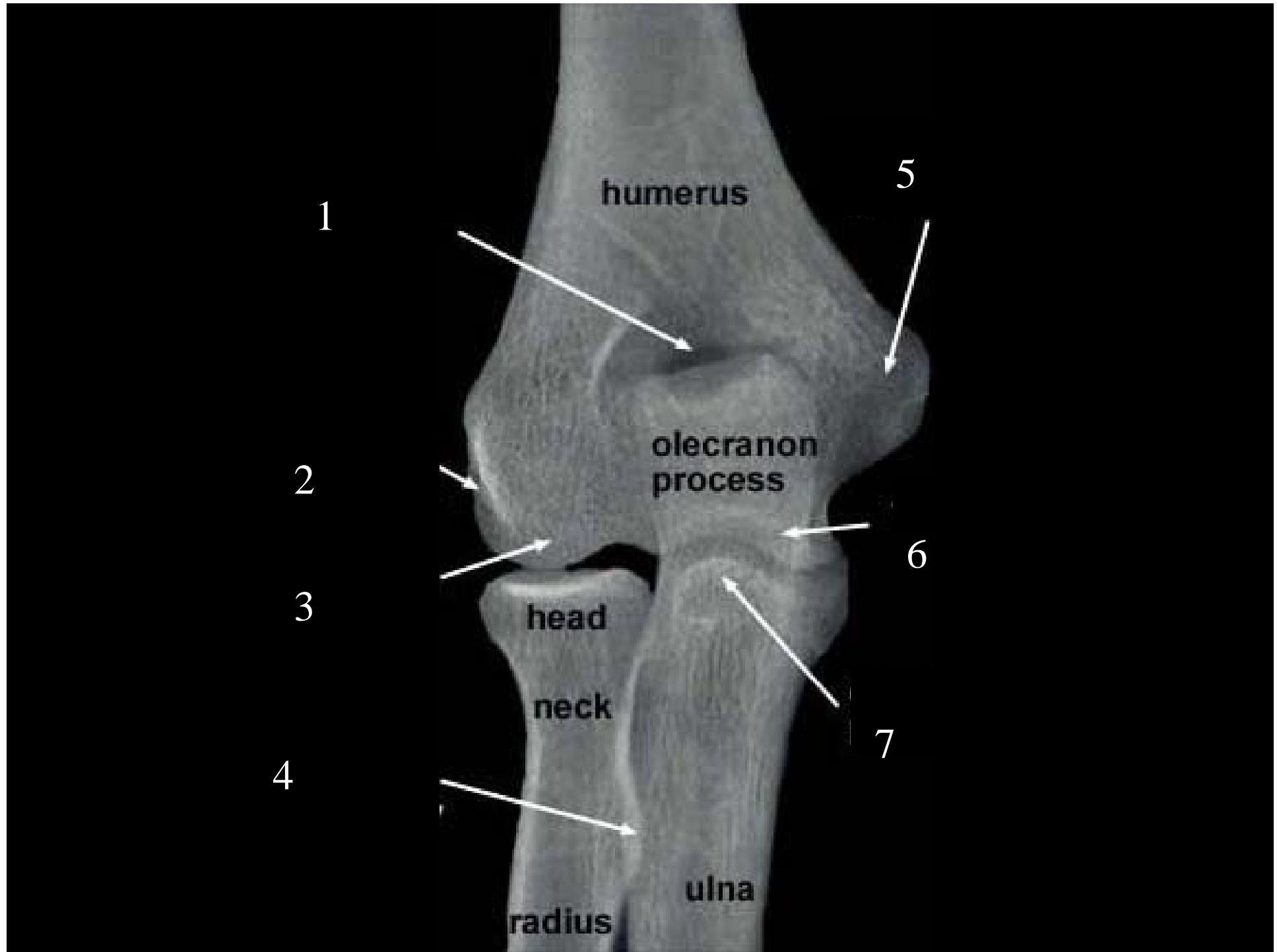


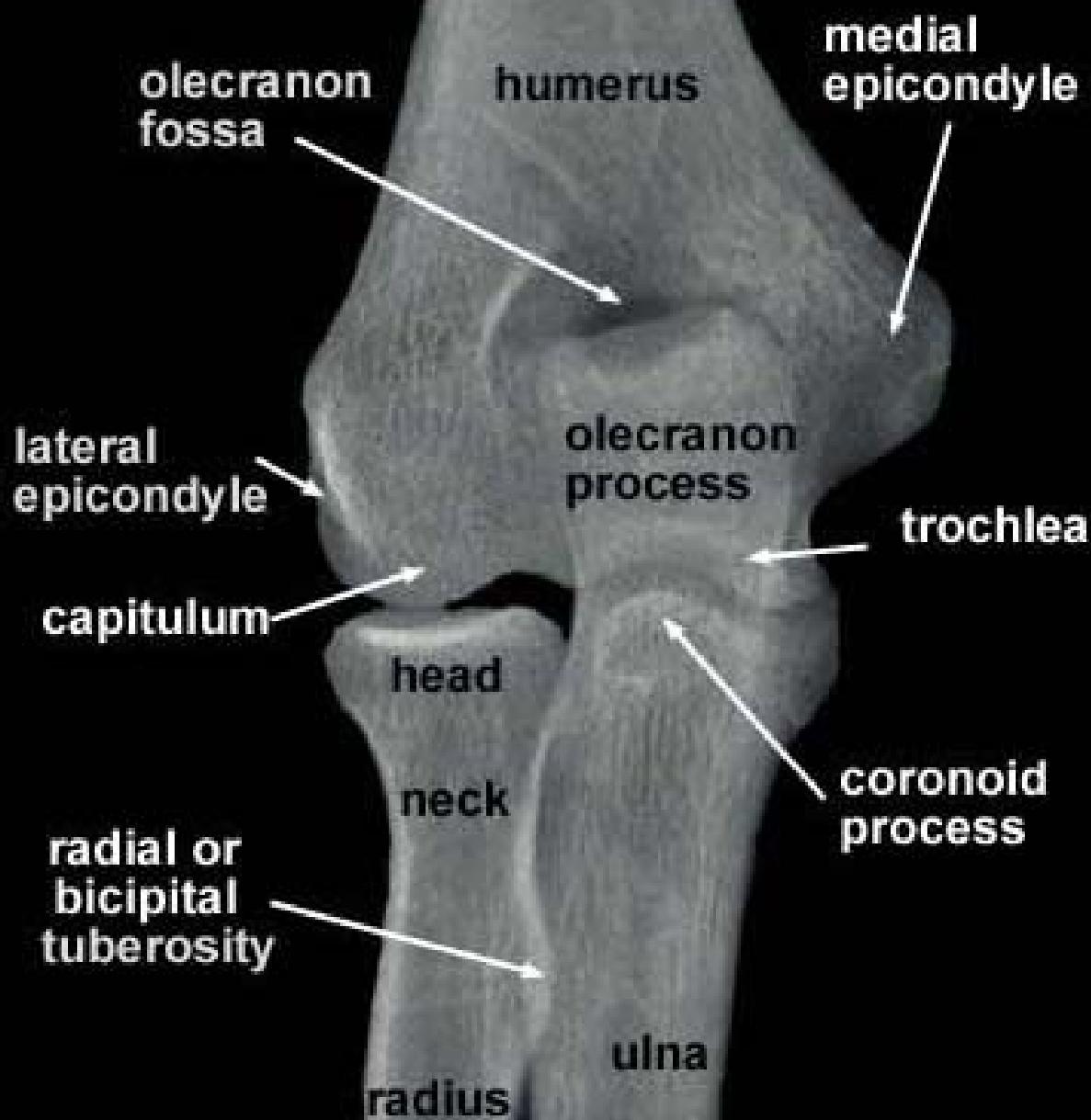
A more complete set up

Do you recognize any bone?





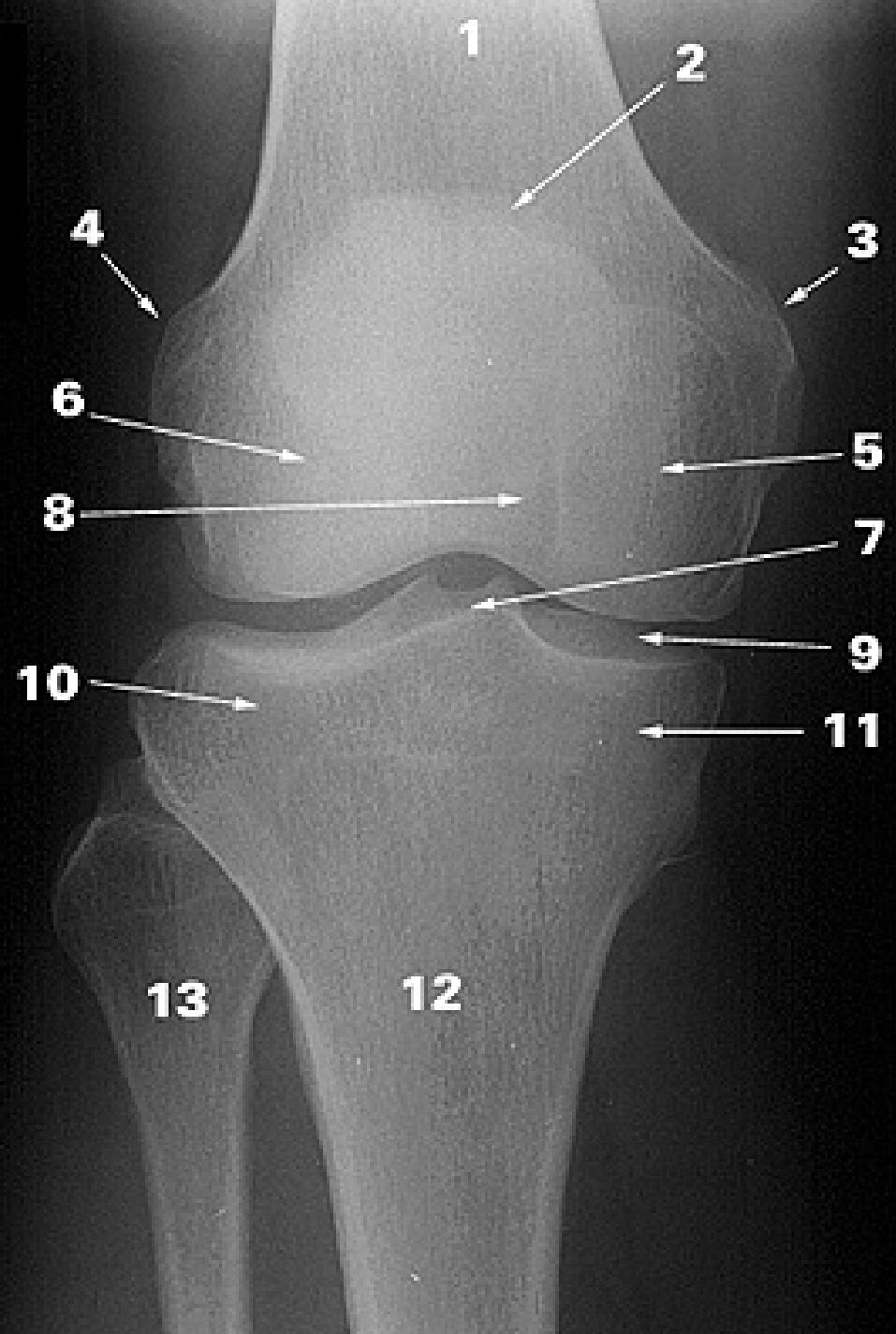




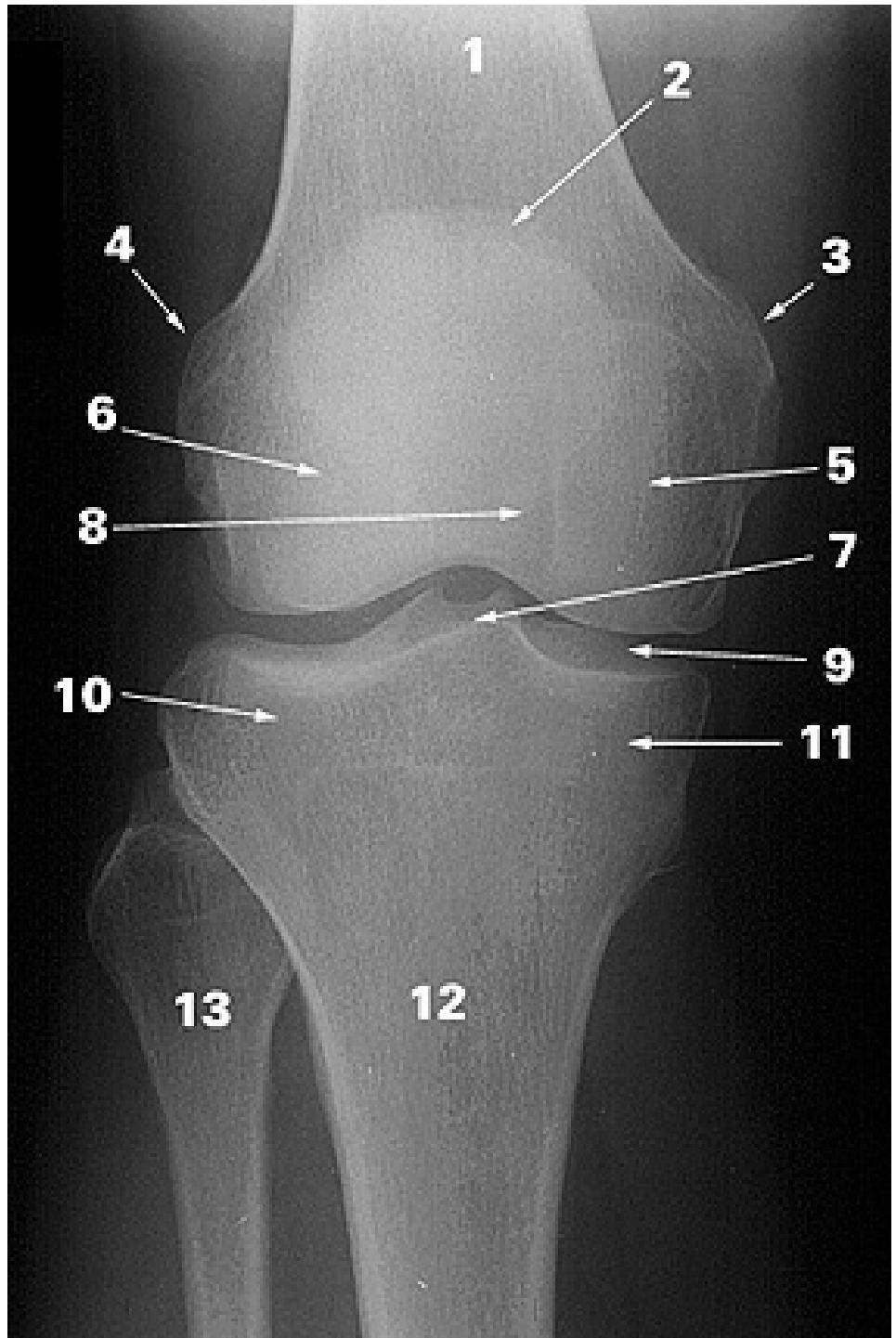


What bone are these?

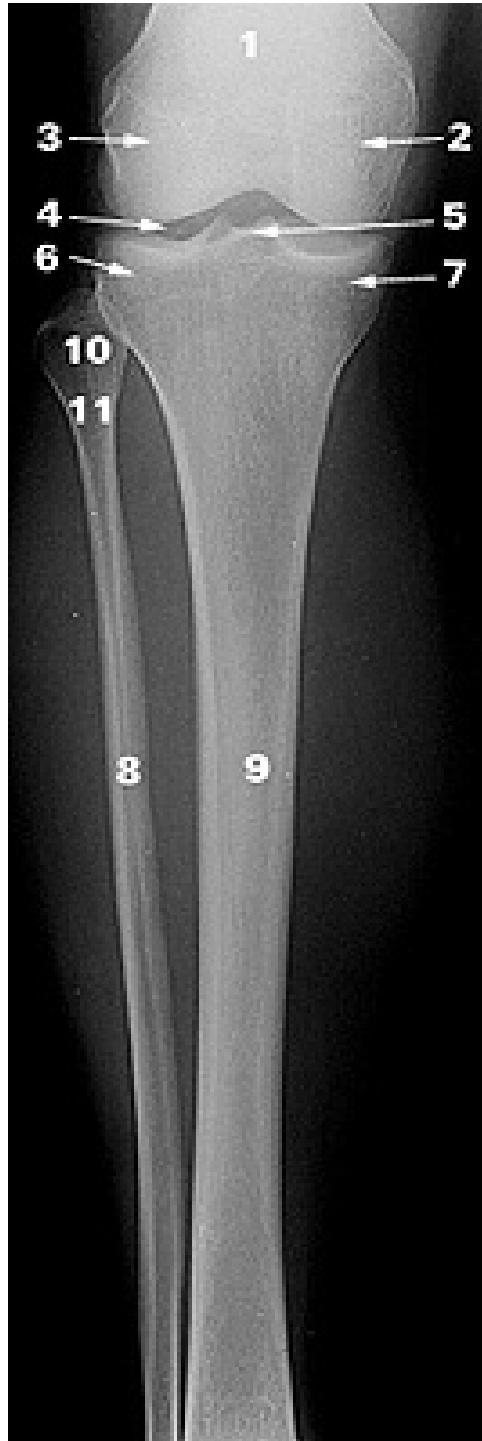
Elbow ,



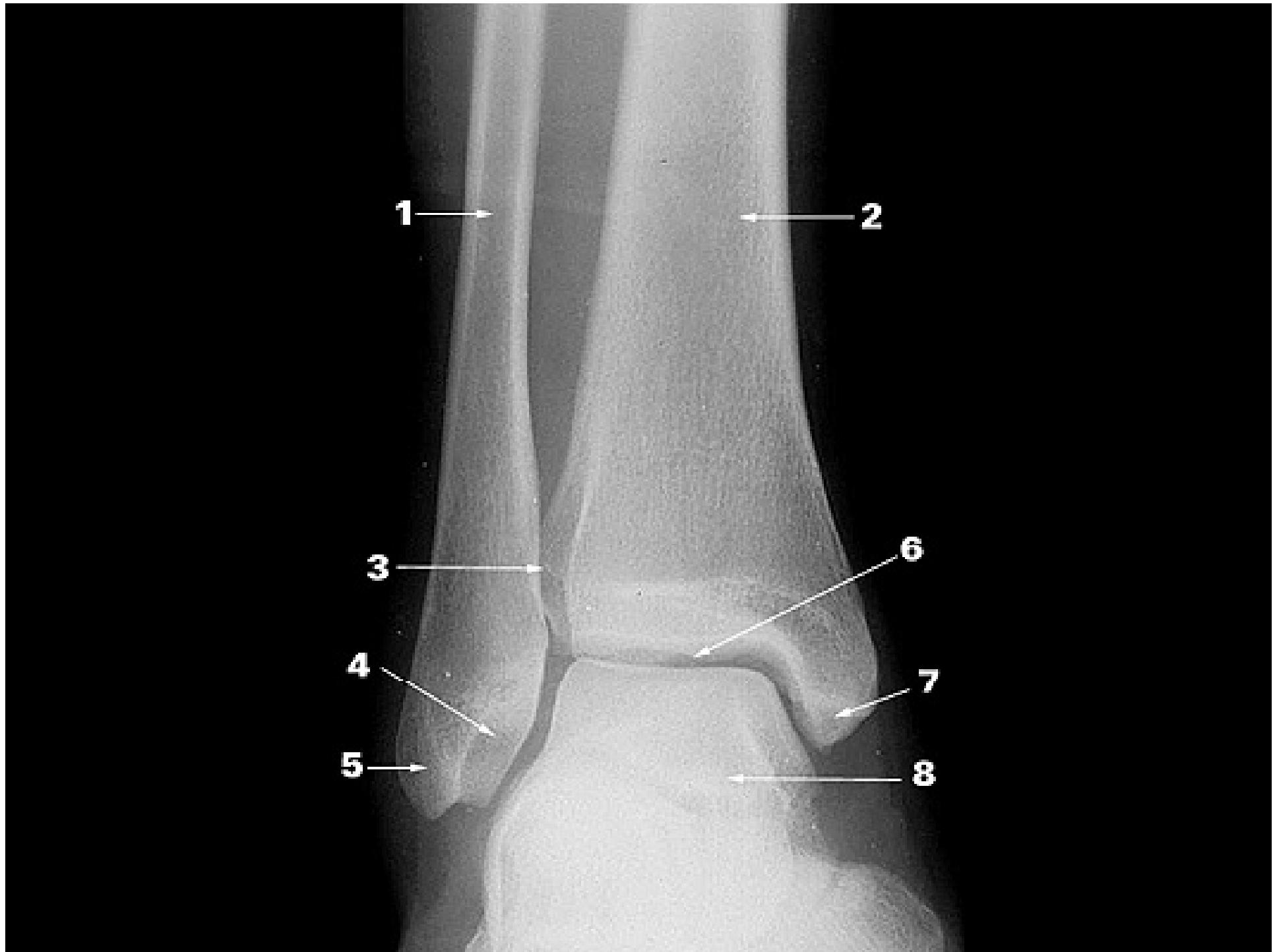
1. Femur
2. Patella
3. Medial epicondyle of femur
4. Lateral epicondyle of femur
5. Medial condyle of femur
6. Lateral condyle of femur
7. Intercondylar eminence
8. Intercondylar notch
9. Knee joint
10. Lateral condyle of tibia
11. Medial condyle of tibia
12. Tibia
13. Fibula



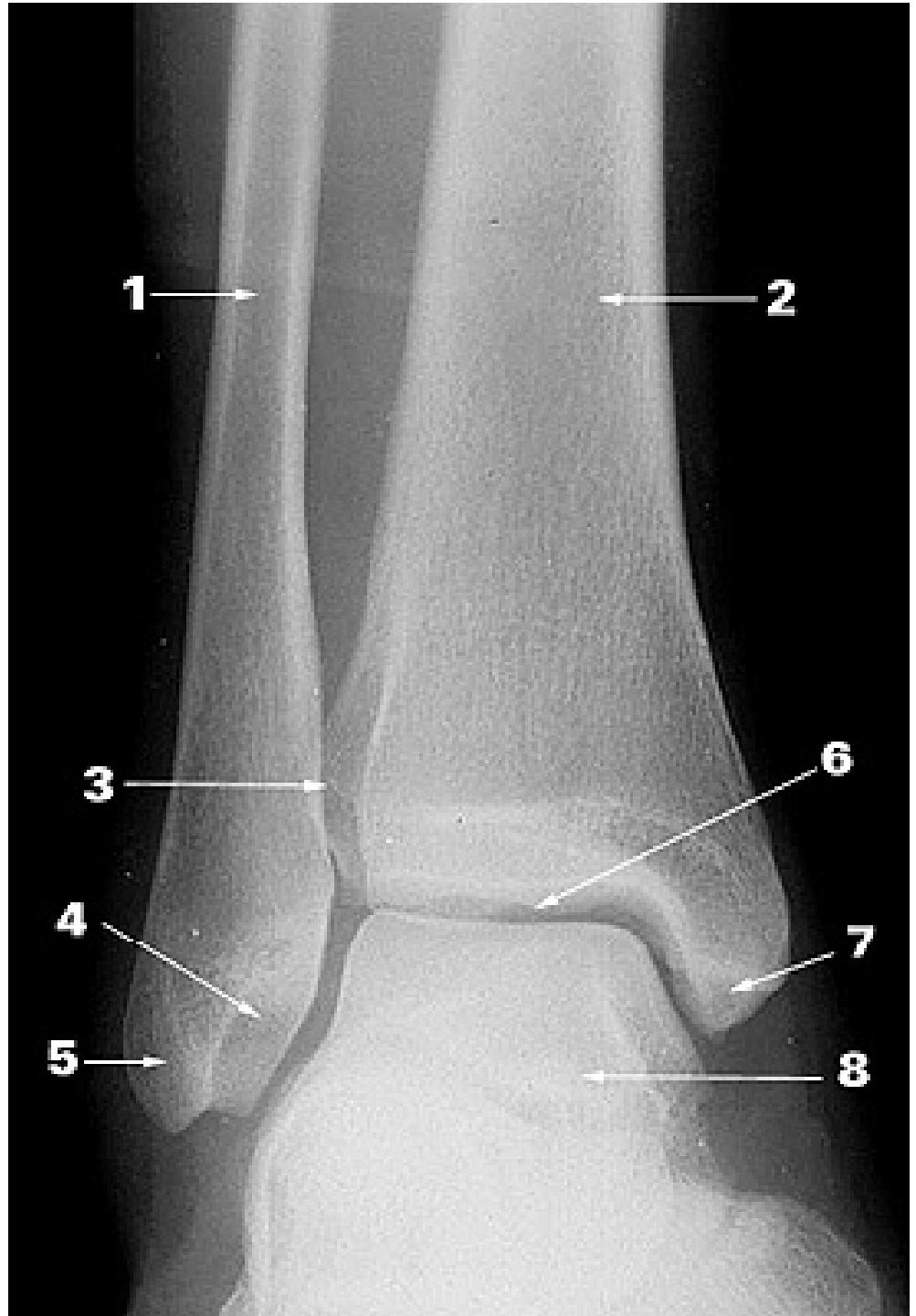


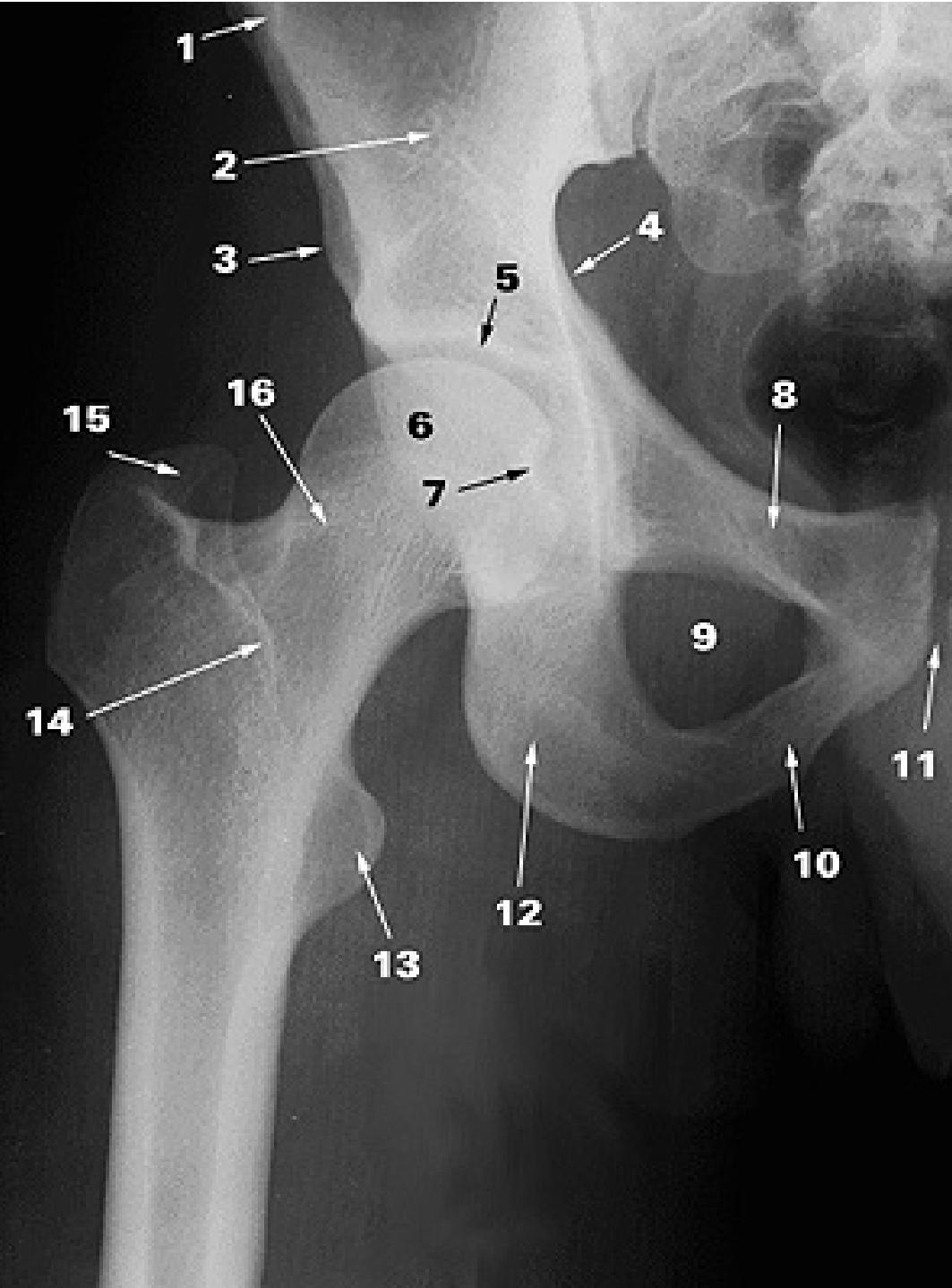


1. Femur
2. Medial condyle of femur
3. Lateral condyle of femur
4. Knee joint
5. Intercondylar eminence
6. Lateral condyle of tibia
7. Medial condyle of tibia
8. Fibula
9. Tibia
10. Head of fibula
11. Neck of fibula



1. Fibula
2. Tibia
3. Distal tibiofibular joint
4. Malleolar fossa
5. Lateral malleolus
6. Ankle joint
7. Medial malleolus
8. Talus





1. Anterior superior iliac spine
2. Ilium
3. Anterior inferior iliac spine
4. Pelvic brim
5. Acetabular fossa
6. Head of femur
7. Fovea
8. Superior ramus of pubis
9. Obturator foramen
10. Inferior ramus of pubis
11. Pubic symphysis
12. Ischium
13. Lesser trochanter
14. Intertrochanteric crest
15. Greater trochanter
16. Neck of femur

