

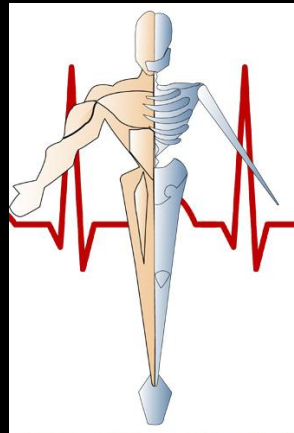
Three Phase CEUs &  
SCS Continuing Education Presents:

*Radiographic Anatomy and  
Pathology of the Skeletal System* ©

**Mastery Test**

by

Shane Smith PTA, RT(R), MBA



*Please scroll down to proceed.*

# Forward:

The premise behind the creation of this tutorial is to provide imaging professionals with access to high quality yet affordable continuing education credits (CEUs).

Our Courses qualify as Category A (technical) points for the following: all ARRT recognized imaging modalities, ARRT-CQR, FDOH –Bureau of Radiation Control, NMTCB, and RCIS.

According to the ARRT, a current license as a general radiographer with the FDOH is required to qualify to complete this course.

*This rule does not apply to either the NMTCB or RCIS credentials.*

*Please scroll down to proceed.*

# Payment Methods:

- Venmo: @Shane-Smith-SCS
- Cash App: \$SCS71
- Zelle: 727-515-9532
- PayPal: @SCSContinuingEd

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# Course Abstract & Objectives:

## Course Abstract:

The objective of this course is to provide the learner with a computer-based tutorial that will provide them with the means to learn the radiographic anatomy and pathology of the skeletal system. This 210-question mastery test will be employed to ensure that competency of the material has been achieved.

*Please scroll down to proceed.*

# Mastery Test Instructions:

Please place an “X” over the correct response on your answer sheet.

If you are unable to print the answer sheet, writing your answers down on a blank sheet a paper is acceptable.

After you complete your answer sheet, snap a picture of it with your cell phone and text it to [Shane Smith at \(727\) 515-9532](tel:7275159532) or email it to [ceuarmy@yahoo.com](mailto:ceuarmy@yahoo.com). Please be sure to include your email and FDOH license number.

We will return your certificate of completion to you via email after we receive your payment and answer sheet. A score of 75% or higher is required to successfully pass this course.

Thank you for your support and please reach out via text message if you encounter any issues.

*Please scroll down to proceed.*

# Question #1:

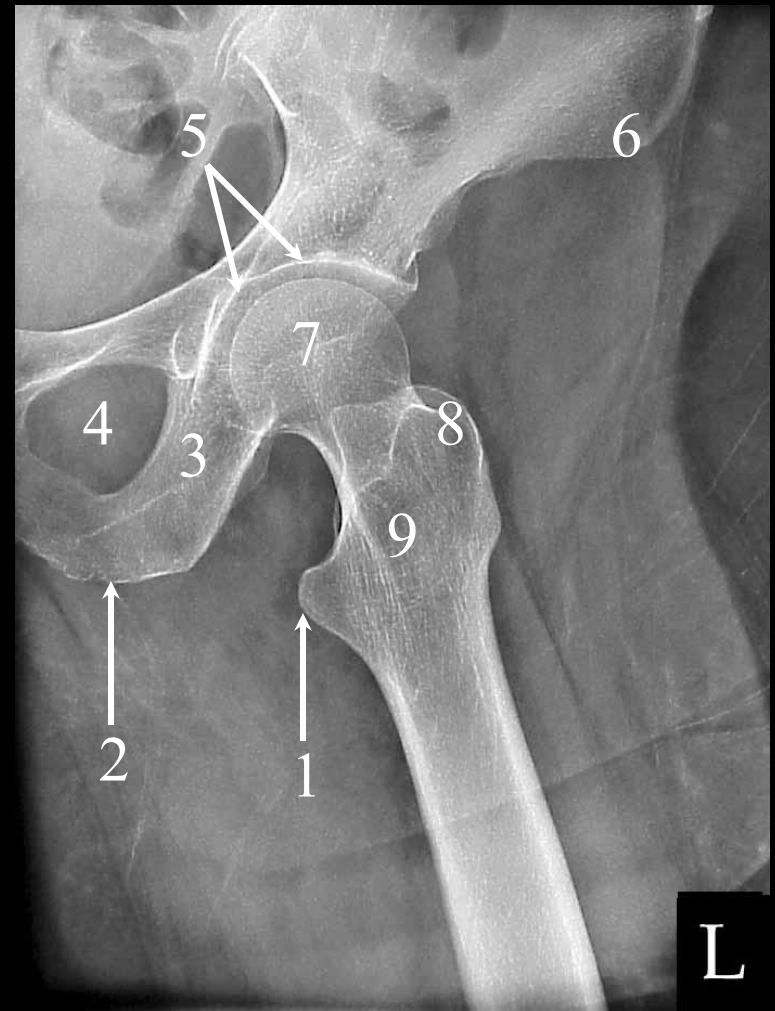
The arrow is pointing to the:

- a. lesser trochanter.
- b. greater trochanter.
- c. intertrochanteric crest.
- d. linea aspera.



# Question #1: **Review**

1. **Lesser Trochanter**
2. Ischial Tuberosity
3. Body of the Ischium
4. Obturator Foramen
5. Acetabulum
6. ASIS
7. Head of the Femur
8. Greater Trochanter
9. Intertrochanteric Crest



# Question #2:

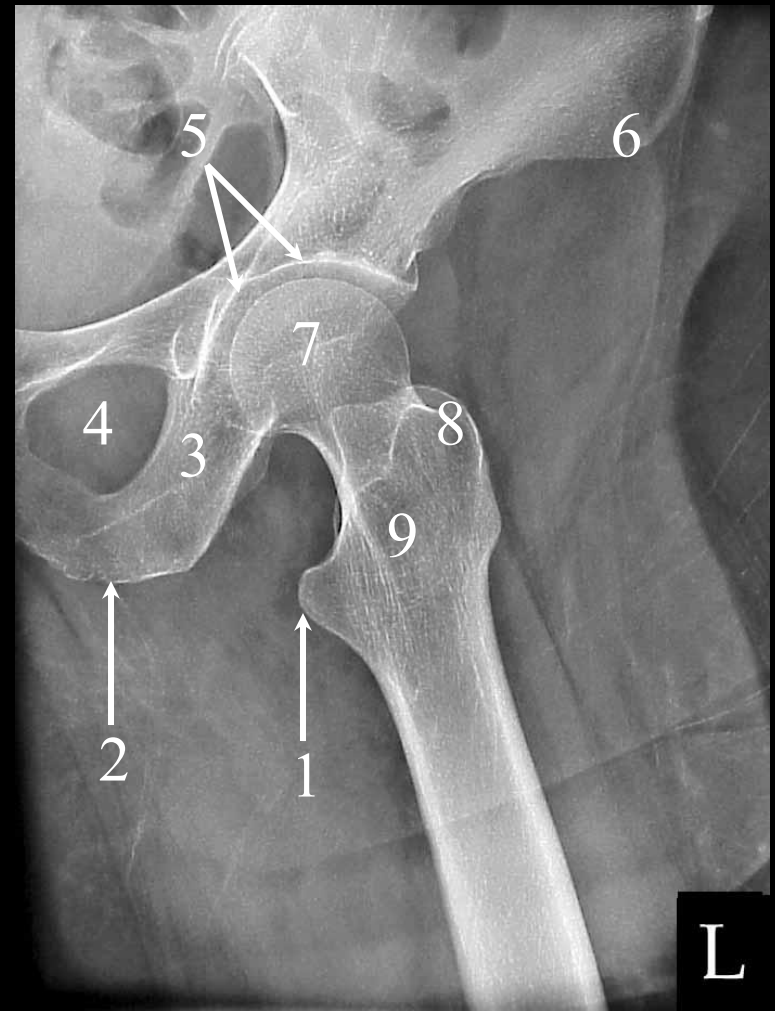
The arrow is pointing to the:

- a. ischial spine.
- b. ala.
- c. ASIS.
- d. greater sciatic notch.



# Question #2: Review

1. Lesser Trochanter
2. Ischial Tuberosity
3. Body of the Ischium
4. Obturator Foramen
5. Acetabulum
6. ASIS
7. Head of the Femur
8. Greater Trochanter
9. Intertrochanteric Crest



# Question #3:

Which of the following terms refers to a condition that is marked by an abnormal disturbance in the function and or structure of the human body as a result of some type of injury or trauma?

- a. etiology
- b. pathology
- c. pathogenesis
- d. disease

# Question #3: Review

## Disease:

- Simply put, pathology is the study of disease.
- Disease is a term that literally refers to a lack of “ease.”
- It is a condition that is marked by an abnormal disturbance in the function and or structure of the human body as a result of some type of injury or trauma.

# Question #4:

Which of the following is not an example of an inflammatory reaction?

- a. ischemia
- b. abscess
- c. ulcer
- d. cellulitis

# Question #4: Review

## Inflammatory Reactions:

### □ Abscess

This type of inflammatory reaction causes the injurious agent to become a walled-off ball of pus. Antibiotics cannot penetrate an abscess. As a result, an abscess must be aspirated with a needle and drained.

### □ Ulcers

This is another type of inflammatory reaction that is the result of a healing wound that is located on the skin or a mucous membrane.

### □ Cellulitis

This is an acute bacterial infection of the skin and is a third example of an inflammatory reaction. A byproduct of bacterial reproduction within the tissue is the excretion of methane. This can sometimes be demonstrated on a radiograph.

# Question #5:

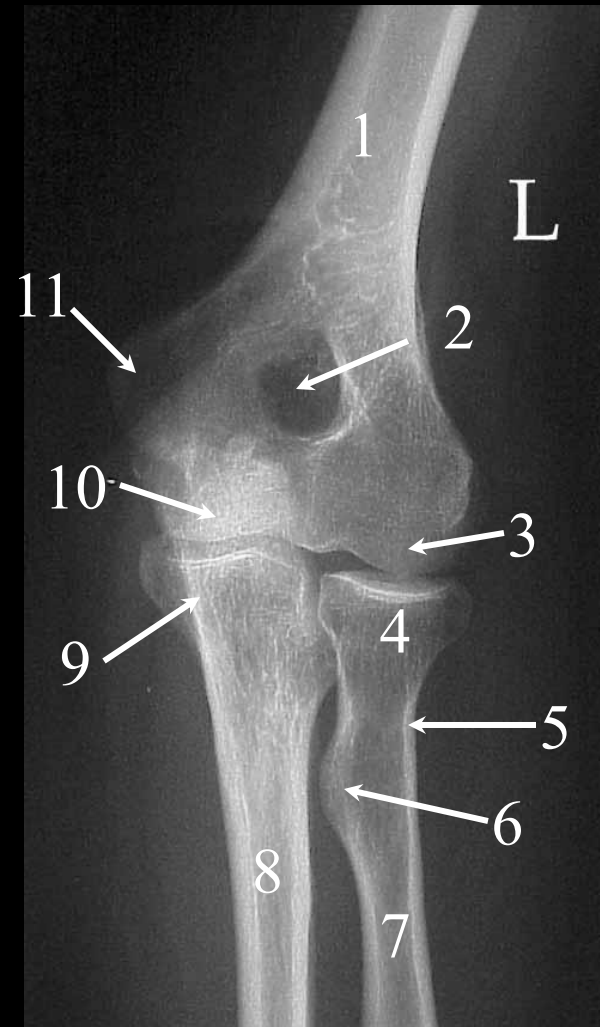
The arrow is pointing to the:

- a. trochlea.
- b. olecranon process.
- c. coronoid process.
- d. olecranon fossa.



# Question #5: Review

1. Shaft of the Humerus
2. Olecranon Fossa
3. Capitulum
4. Head of the Radius
5. Neck of the Radius
6. Radial Tuberosity
7. Shaft of the Radius
8. Shaft of the Ulna
9. Coronoid Process
10. Trochlea
11. Epicondyle



# Question #6:

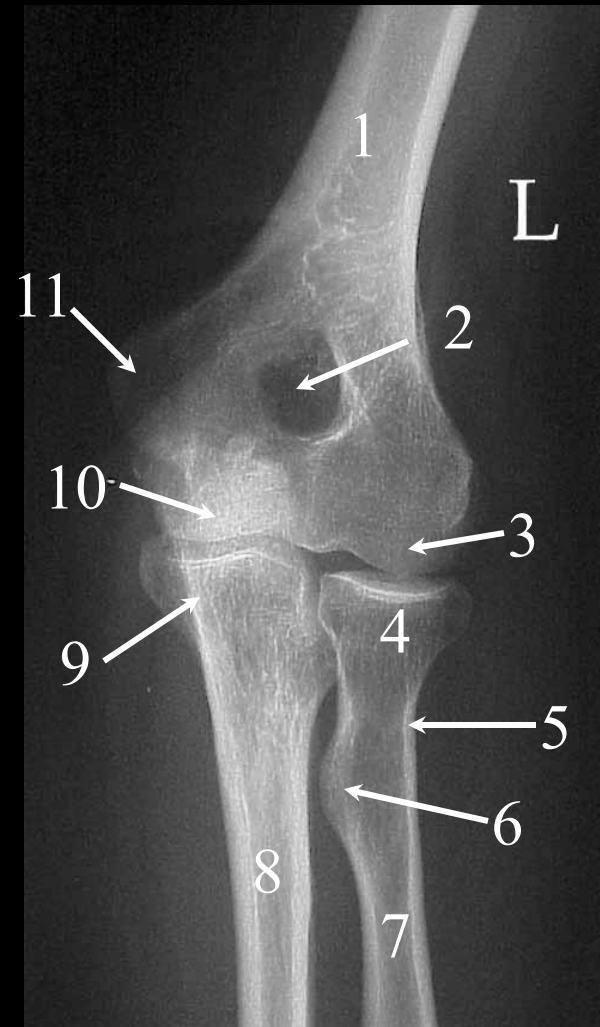
The arrow is pointing to the:

- a. coronoid process.
- b. capitulum.
- c. trochlea.
- d. medial epicondyle.



# Question #6: Review

1. Shaft of the Humerus
2. Olecranon Fossa
3. Capitulum
4. Head of the Radius
5. Neck of the Radius
6. Radial Tuberosity
7. Shaft of the Radius
8. Shaft of the Ulna
9. Coronoid Process
10. Trochlea
11. Epicondyle



# Question #7:

The name of this position or method is the:

- a. Fuch method.
- b. Judd method.
- c. Either “a” or “b”
- d. Neither “a” nor “b”



# Question #7: Review

## Fuch (Judd) Method

The name of this position or method is the:

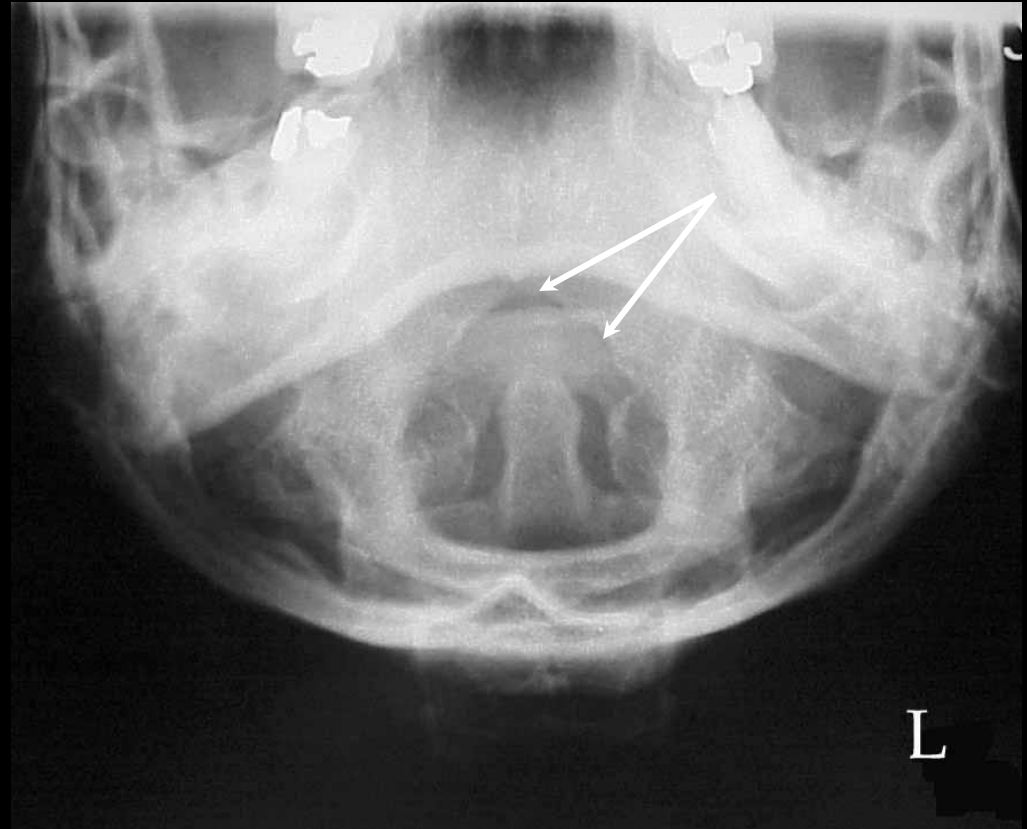
- a. Fuch method.
- b. Judd method.
- c. Either “a” or “b”
- d. Neither “a” nor “b”



# Question #8:

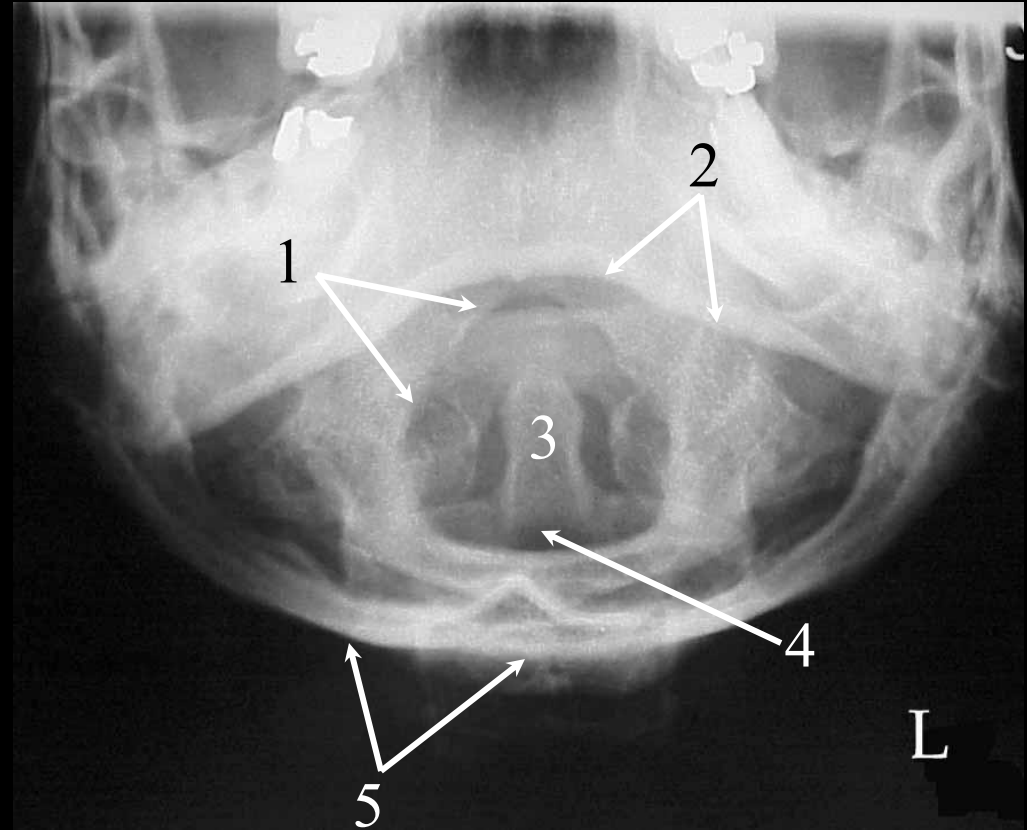
The arrows are pointing to the:

- a. obturator foramen.
- b. foramen ovale.
- c. foramen magnum.
- d. foramen rotundum.



# Question #8: Review

1. Foramen Magnum
2. Mandible
3. Odontoid or Dens
4. Body of C1
5. Occipital Bone



# Question #9:

The most likely cause of the infection (arrows) located on this lateral of the foot would be:

- a. bacteria.
- b. parasite.
- c. virus.
- d. none of the above



# Question #9: Review



The arrows on this image are pointing to an area where the excrement of a **bacterial** infection has resulted in the formation of air within the tissue of this patient's foot. This is an indication of cellulitis.

# Question #10:

What position or projection of the wrist is this?

- a. Lateral
- b. PA Oblique
- c. AP Oblique
- d. Navicular



# Question #10: Review

## PA Oblique Wrist:

1. Lesser Multangular or Trapezoid
2. Capitate or Os Magnum
3. Styloid Process of the Ulna
4. Lunate or Semilunar
5. Navicular or Scaphoid
6. Greater Multangular or Trapezium
7. Shaft of the 1<sup>st</sup> Metacarpal



# Question #11:

The arrow is pointing to the:

- a. trapezoid.
- b. navicular.
- c. capitate.
- d. trapezium.



# Question #11: **Review**

## PA Oblique Wrist:

1. Lesser Multangular or Trapezoid
2. Capitate or Os Magnum
3. Styloid Process of the Ulna
4. Lunate or Semilunar
5. Navicular or Scaphoid
6. **Greater Multangular or Trapezium**
7. Shaft of the 1<sup>st</sup> Metacarpal



# Question #12:

The inability of an organ or structure to form properly is called:

- a. aplasia.
- b. atrophy.
- c. hypertrophy.
- d. ischemia.

# Question #12: Review

## Aplasia:

- This is the inability of an organ or structure to form properly.
- The defective development of an organ can result in the partial or complete loss of an organ.

# Question #13:

An abnormal proliferation of foreign cells that forms a mass of tissue within an organ or structure is called:

- a. edema.
- b. neoplasm.
- c. cachexia.
- d. transudate.

# Question #13: Review

## Neoplasm:

- This is the abnormal proliferation of foreign cells that form a mass of tissue within an organ or structure.
- A neoplasm will compete for nutrients from the cells that normally comprise the host organ and it is often referred to as a mass or tumor.
- Oncology is the study of neoplasms.
- A benign neoplasm is one that is self-limited and will not spread or seed to distant sites within the host organism.

# Question #14:

The arrow is pointing to the \_\_\_\_\_ joint.

- a. proximal interphalangeal
- b. metacarpophalangeal
- c. distal interphalangeal
- d. interphalangeal



# Question #14: Review

1. Tuft
2. Proximal Interphalangeal Joint
3. Middle Phalanx
4. BBs x 2
5. Metacarpophalangeal Joint



PA



Oblique



Lateral

# Question #15:

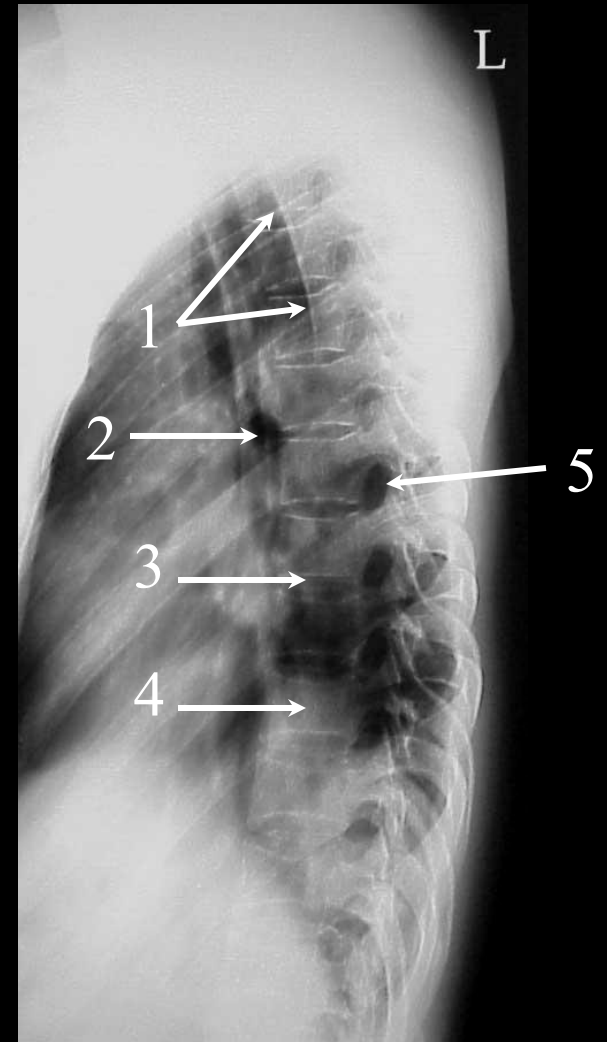
The arrow is pointing to the:

- a. intervertebral disc space.
- b. vertebral body.
- c. intervertebral foramen.
- d. zygapophyseal joint.



# Question #15: Review

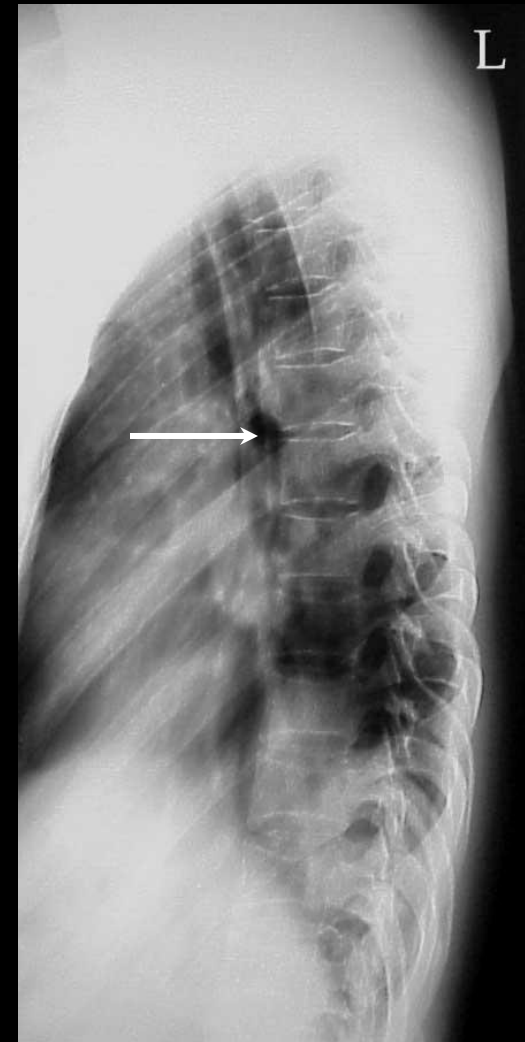
1. Scapula
2. Primary Bronchus
3. Intervertebral Disc
4. Body of Thoracic Vertebra  
(with some compression from osteoporosis)
5. Intervertebral Foramen



# Question #16:

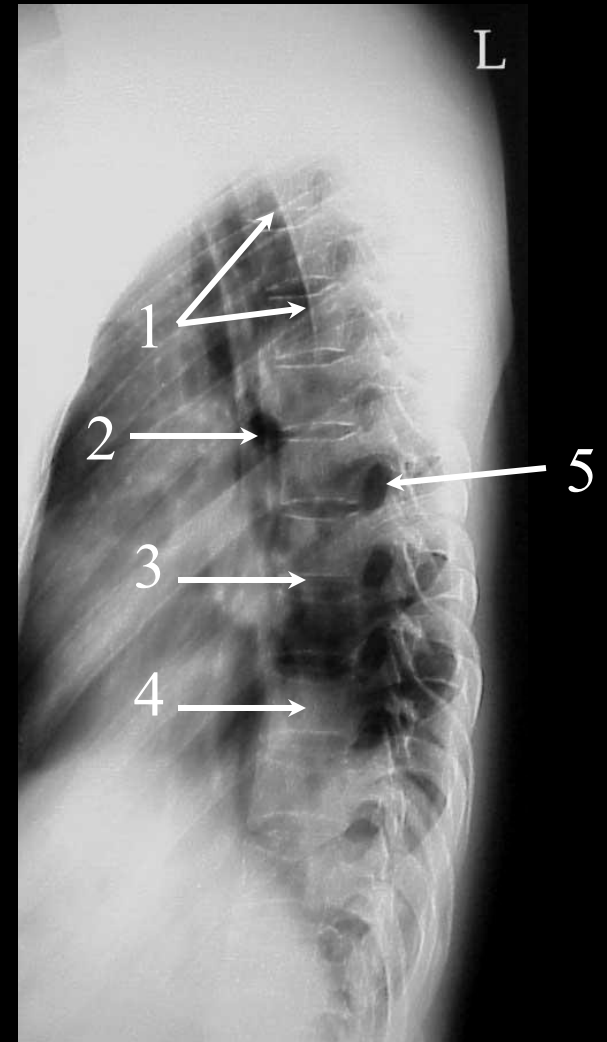
The arrow is pointing to the:

- a. scapula.
- b. intervertebral foramen.
- c. pneumothorax.
- d. primary bronchus.



# Question #16: Review

1. Scapula
2. Primary Bronchus
3. Intervertebral Disc
4. Body of Thoracic Vertebra  
(with some compression from osteoporosis)
5. Intervertebral Foramen



# Question #17:

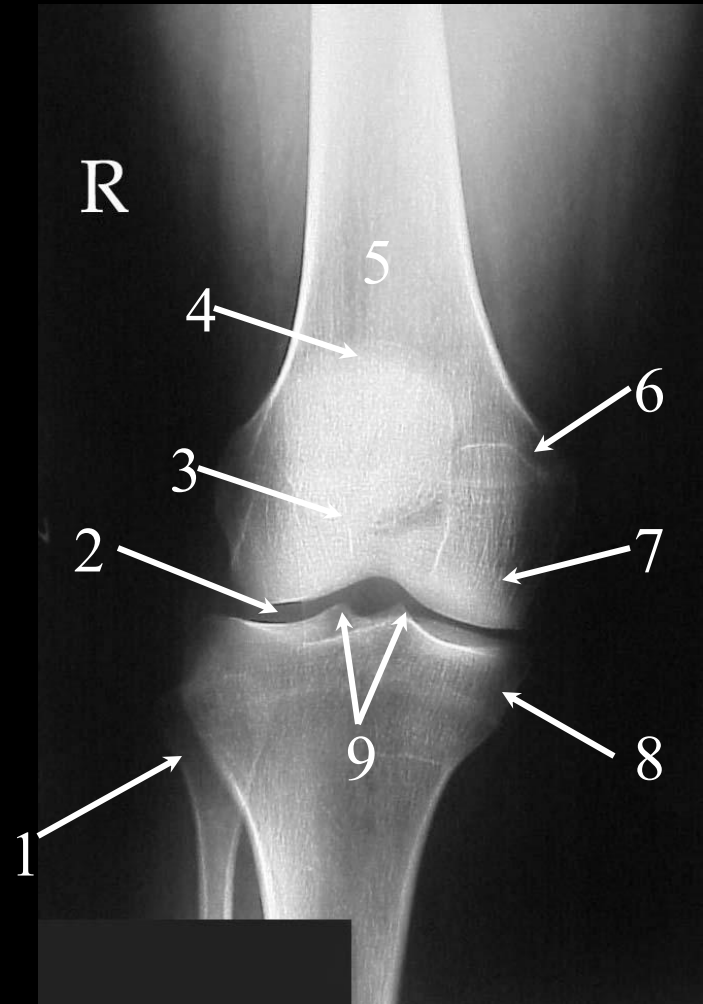
The arrow is pointing to the \_\_\_\_\_ of the tibia.

- a. medial condyle
- b. medial epicondyle
- c. lateral condyle
- d. lateral epicondyle



# Question #17: Review

1. Head of the Fibula
2. Tibial Plateau
3. Apex of the Patella
4. Base of the Patella
5. Shaft of the Femur
6. Medial Epicondyle of the Femur
7. Medial Condyle of the Femur
8. Medial Condyle of the Tibia
9. Intercondylar Eminence



# Question #18:

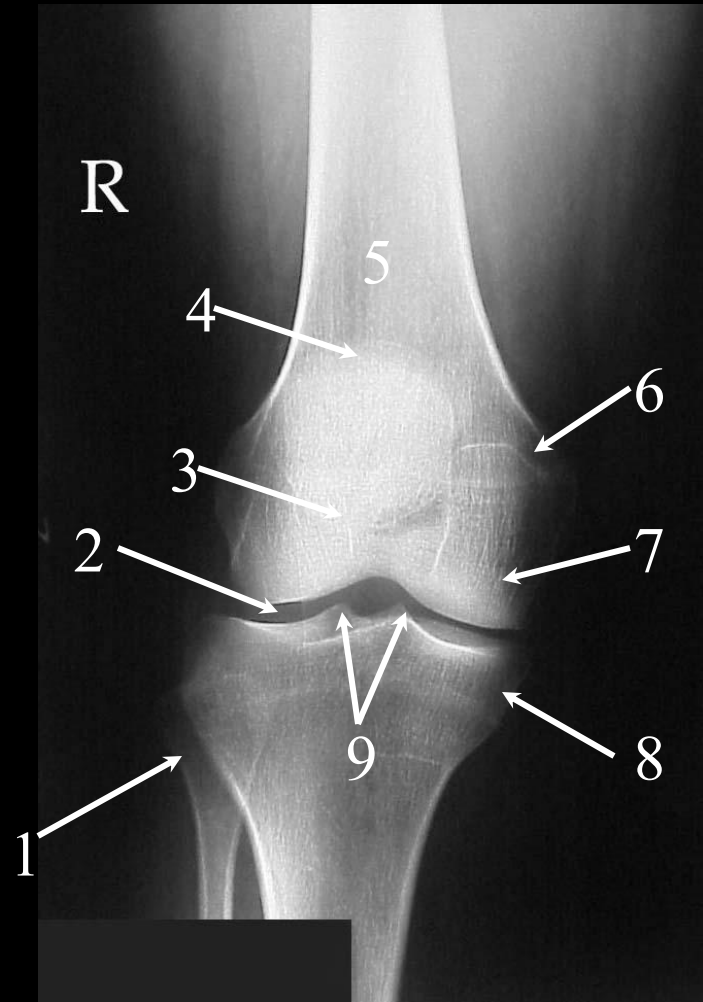
The arrow is pointing to the:

- a. tibial spine.
- b. tibial plateau.
- c. tibial tuberosity.
- d. None of the Above



# Question #18: Review

1. Head of the Fibula
2. Tibial Plateau
3. Apex of the Patella
4. Base of the Patella
5. Shaft of the Femur
6. Medial Epicondyle of the Femur
7. Medial Condyle of the Femur
8. Medial Condyle of the Tibia
9. Intercondylar Eminence



# Question #19:

Cancer of the blood and blood forming tissues is known as:

- a. lymphoma.
- b. adenocarcinoma.
- c. leukemia.
- d. sarcoma.

# Question #19: Review

## Leukemia:

- This is cancer of the blood and blood forming tissues.
- Acute leukemia is characterized by an abnormal proliferation of *immature* blood cells that do not possess the ability to fight infection.
- Chronic leukemia is characterized by an abnormal proliferation of *mature* blood cells that do not possess the ability to fight infection.

# Question #20:

Which of the following is **not** a cardinal sign of inflammation?

- a. pain
- b. redness
- c. swelling
- d. All of the above are cardinal signs of inflammation.

# Question #20: Review

## Inflammation:

- Inflammation refers to the body's ability to wall-off and sequester an injurious agent.
- The ultimate goal of this process is the safe removal of said injurious agents.
- Hyperemia is the process of dilating capillaries to allow fluids and leucocytes to infiltrate the infected area.
- The leucocytes will act to remove cellular debris through a process known as phagocytosis.
- The **cardinal signs of inflammation** include heat (results from hyperemia), redness, pain, and often a decrease in function.

# Question #21:

All of the following would be an example of a sign (as opposed to a symptom) except:

- a. skin rash.
- b. headache.
- c. edema.
- d. cyanosis.

# Question #21: **Review**

## Pathogenesis:

- The study of the origin and development of a disease.
- Pathogenesis will lead to observable changes that are known as manifestations.

### Sign

- This is a manifestation that is observable by the health care worker.
- Examples would be swelling or a skin rash.

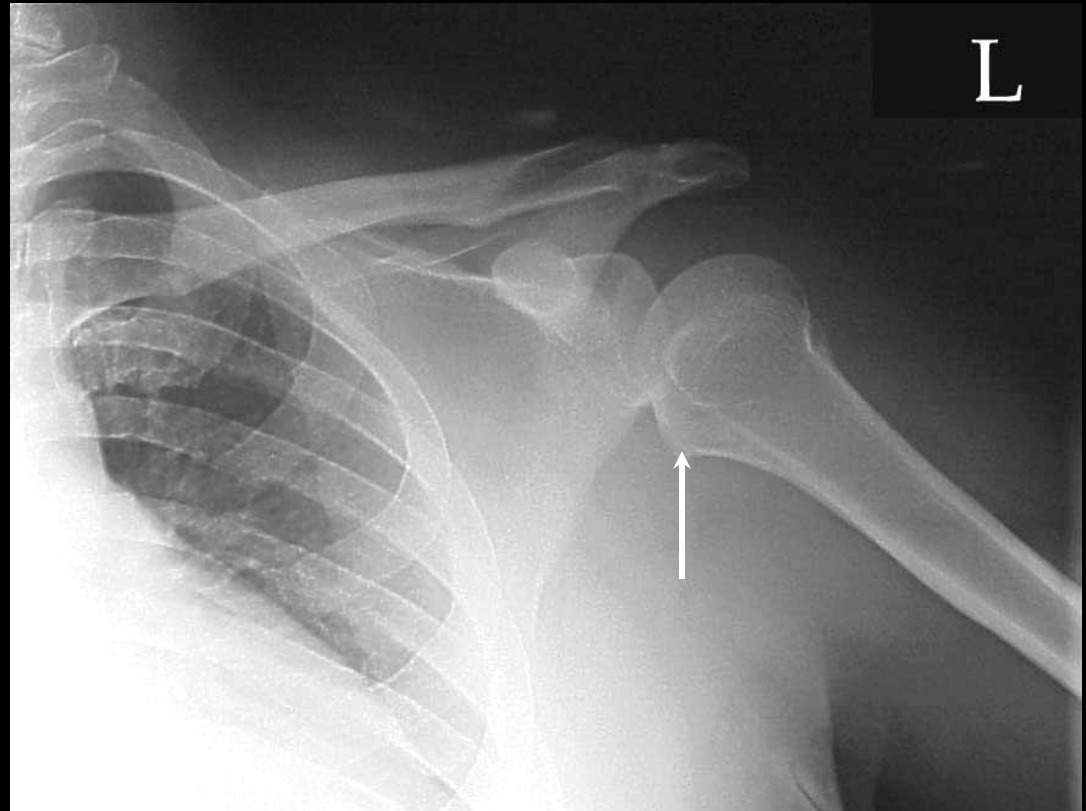
### Symptom

- This pertains to the patient's perception of what is wrong and is subjective.
- An example would be a **headache**.

# Question #22:

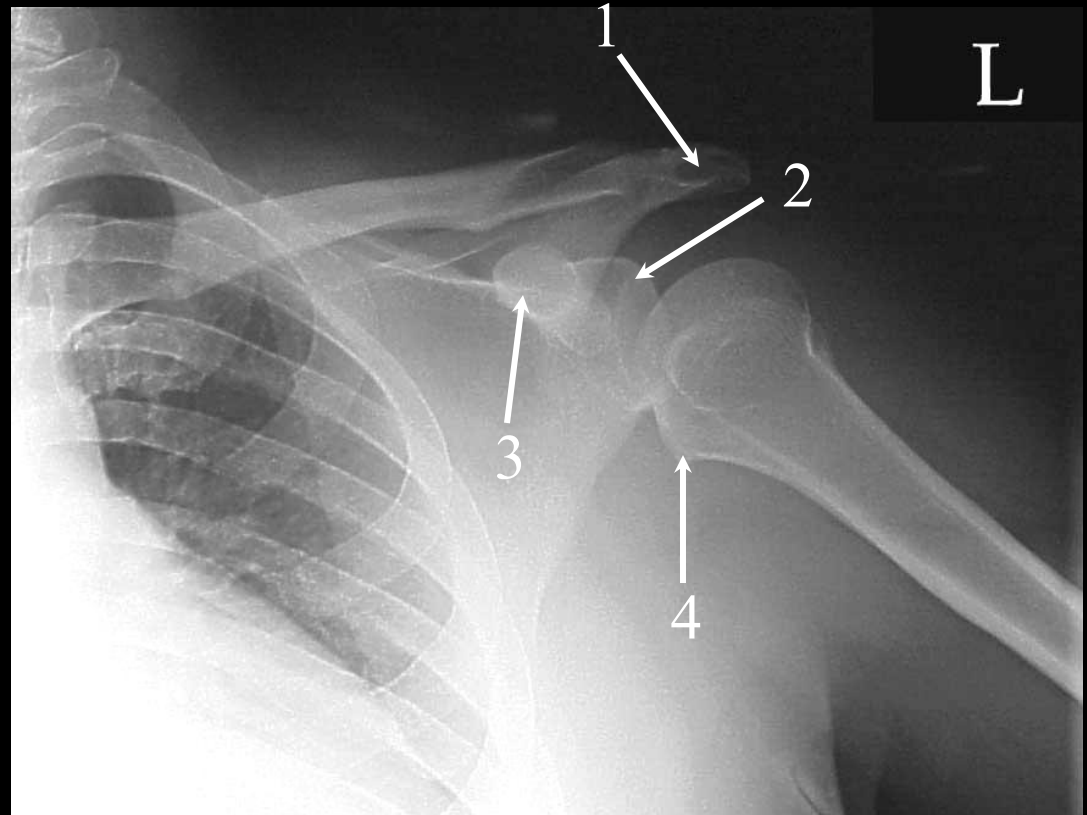
The arrow is pointing to the:

- a. greater tubercle.
- b. lesser tubercle.
- c. surgical neck.
- d. intertubercular groove.



# Question #22: Review

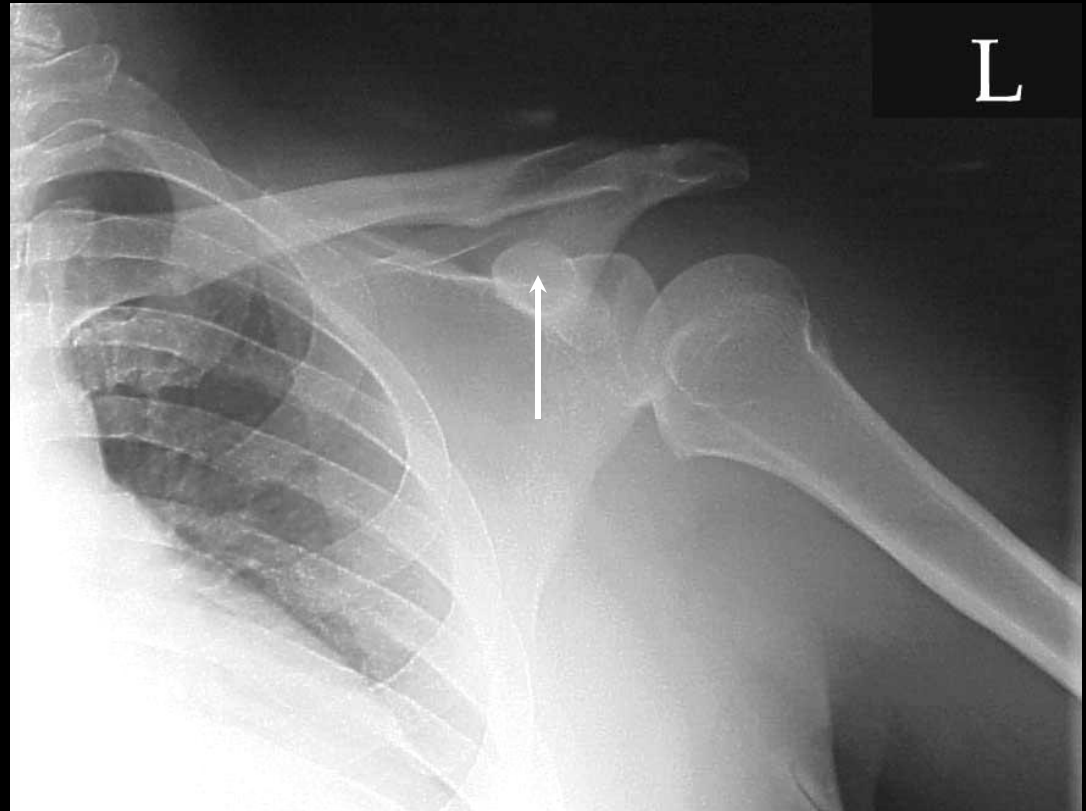
1. Acromion Process
2. Glenoid Fossa
3. Coracoid Process
4. Lesser Tubercle of the Humerus



# Question #23:

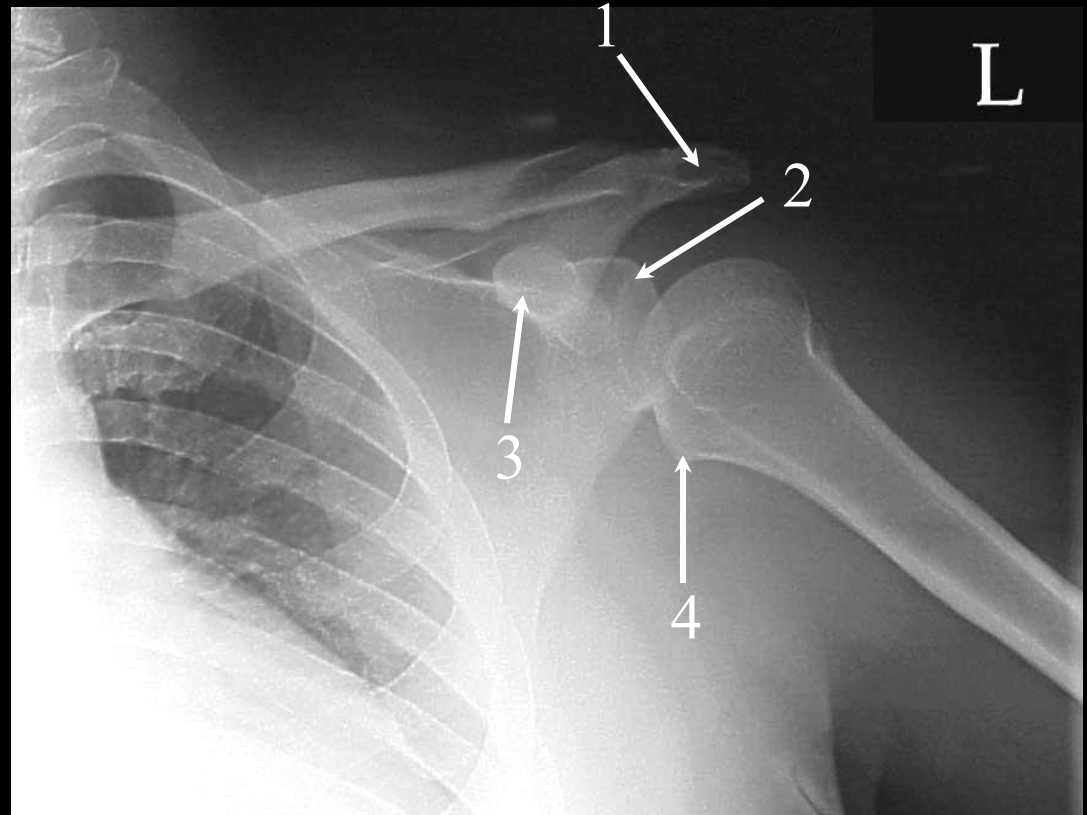
The arrow is pointing to the:

- a. AC joint.
- b. acromion process.
- c. coracoid process.
- d. coronoid process.



# Question #23: **Review**

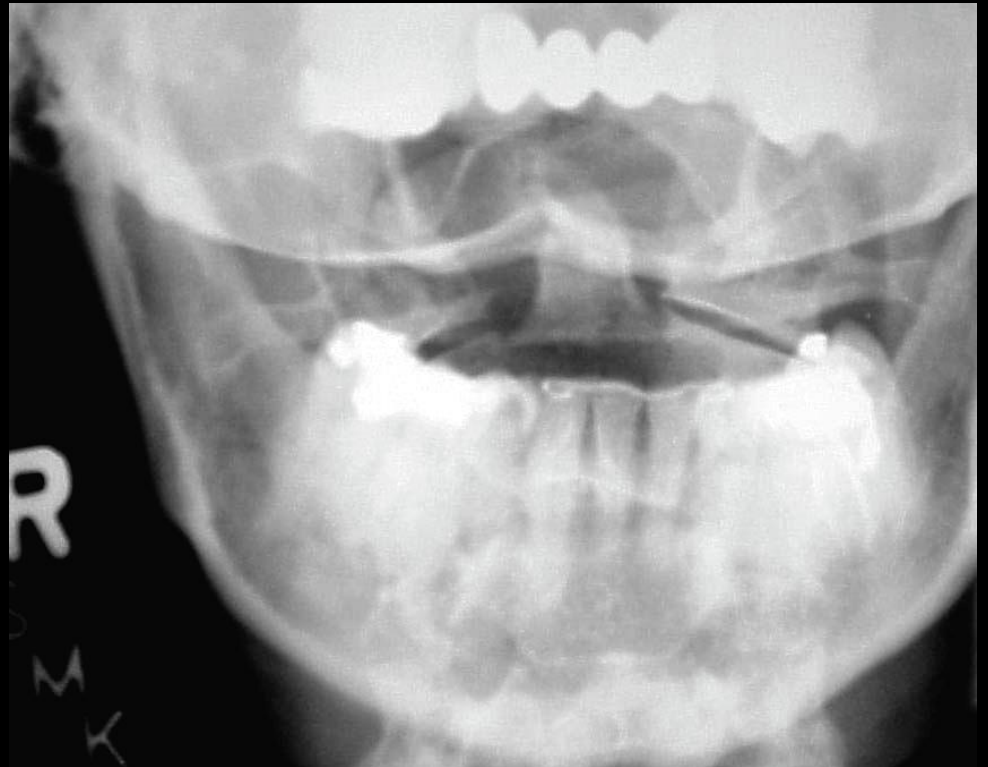
1. Acromion Process
2. Glenoid Fossa
- 3. Coracoid Process**
4. Lesser Tubercle of the Humerus



# Question #24:

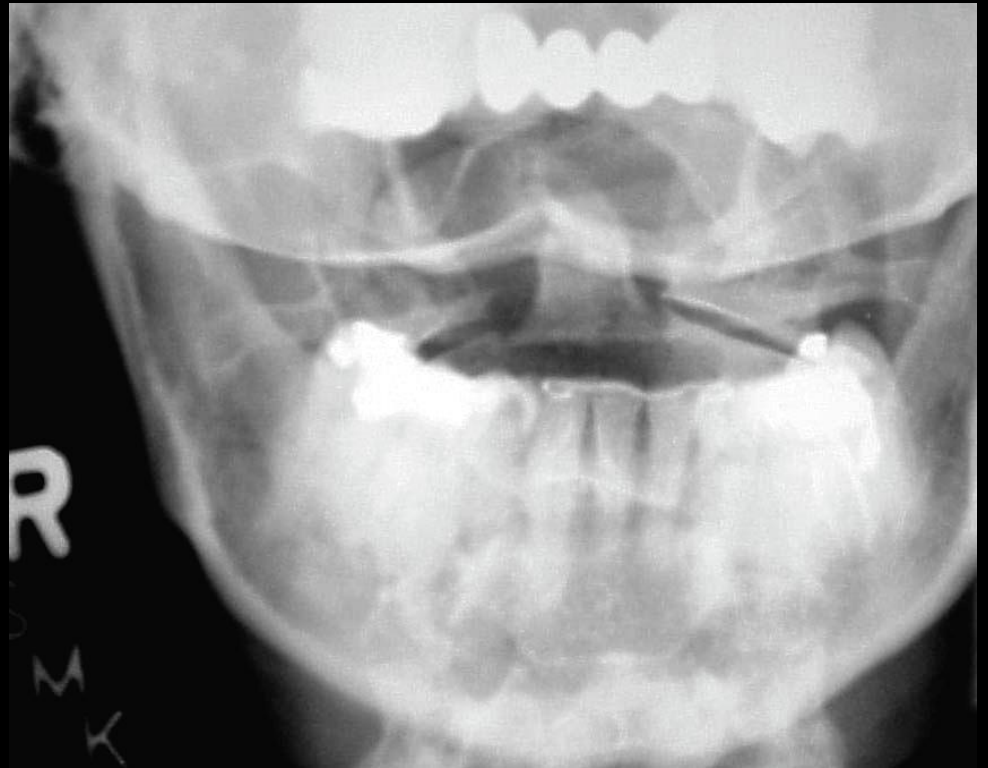
This Open Mouth Odontoid is properly positioned.

- a. True
- b. False



# Question #24: Review

This is a poorly positioned “Open Mouth” position of the odontoid. The arrows are pointing to the occipital bone which is overlying the tip of the odontoid. The patient must tuck their chin in order to achieve the proper position.



# Question #25:

The arrow is pointing to the \_\_\_\_\_ of the mandible.

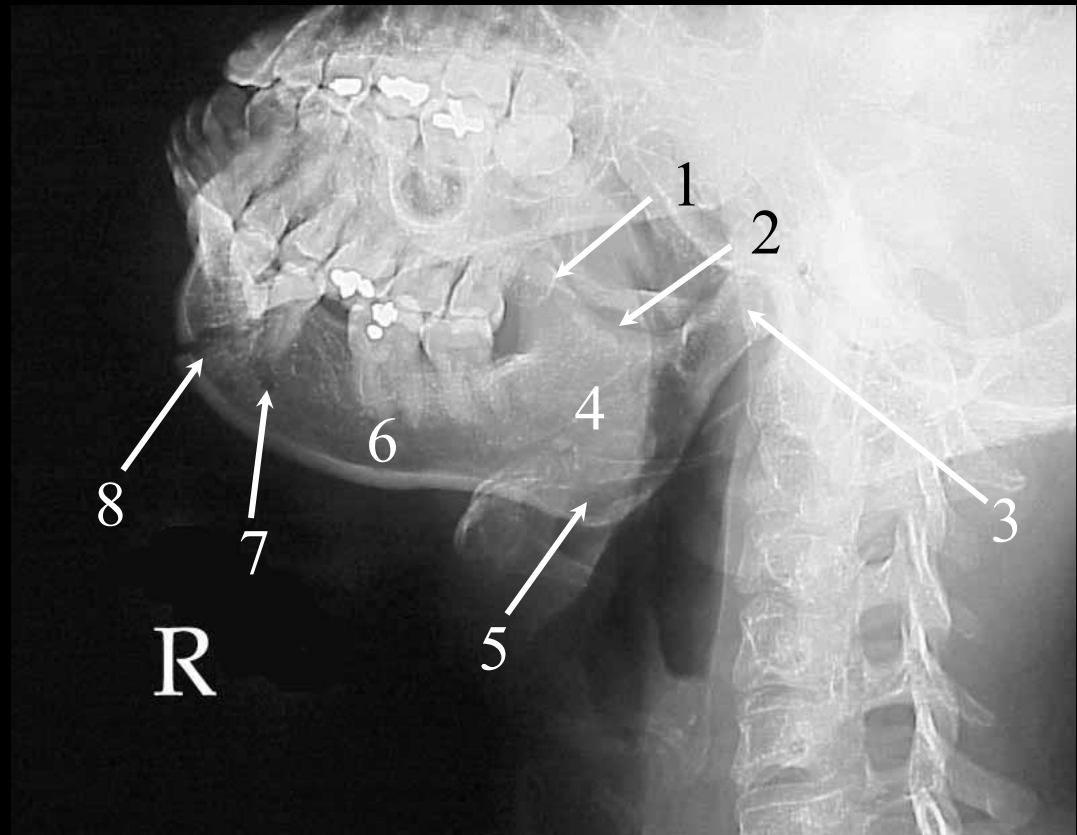
- a. condyle
- b. coronoid process
- c. coracoid process
- d. ramus



# Question #25: Review

This is the same patient  
minus the partial

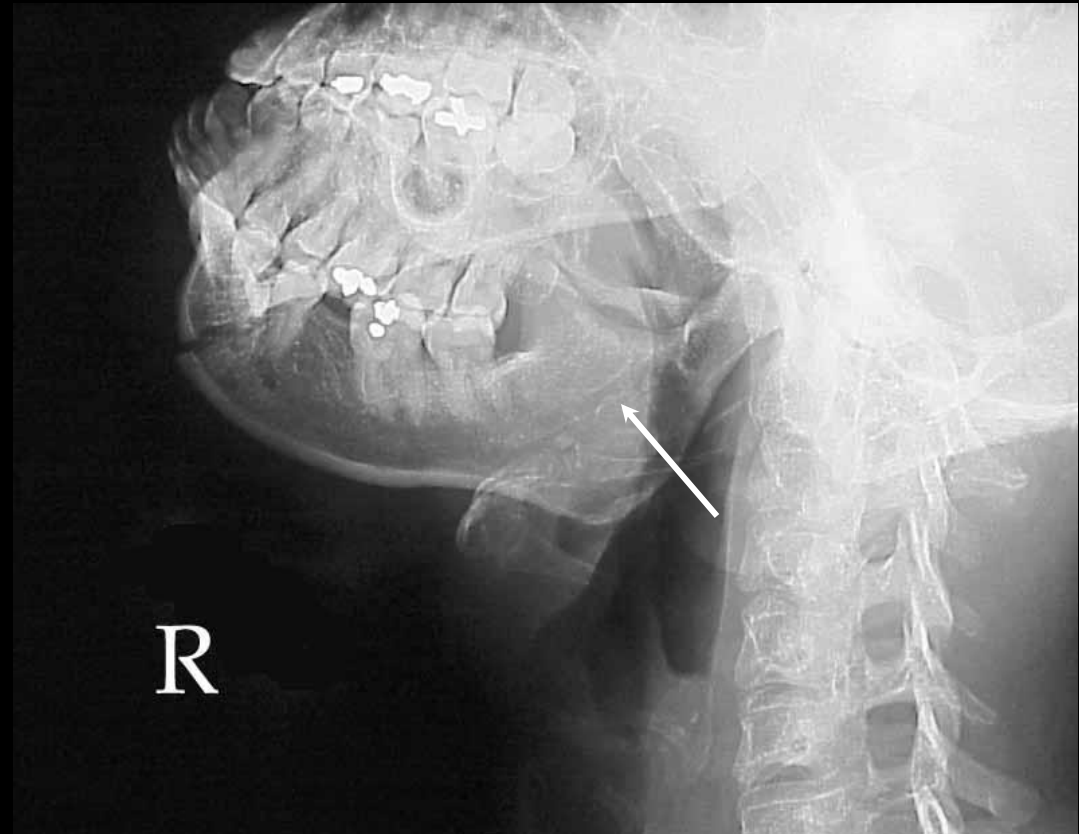
1. **Coronoid Process**
2. Mandibular Notch
3. Condyle of the Mandible
4. Ramus
5. Angle of the Mandible
6. Body
7. Mental Foramen
8. Fracture of the Mentum



# Question #26:

The arrow is pointing to the \_\_\_\_\_ of the mandible.

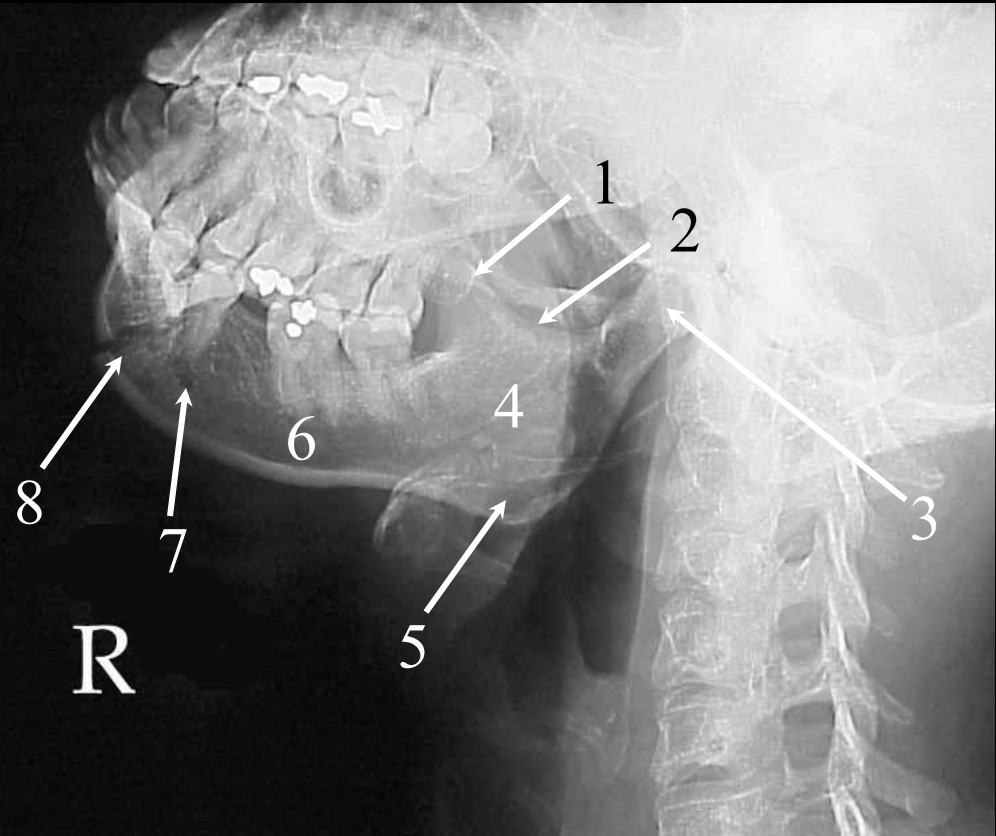
- a. ramus
- b. mentum
- c. angle
- d. None of the Above



# Question #26: Review

This is the same patient  
minus the partial

1. Coronoid Process
2. Mandibular Notch
3. Condyle of the Mandible
4. Ramus
5. Angle of the Mandible
6. Body
7. Mental Foramen
8. Fracture of the Mentum



# Question #27:

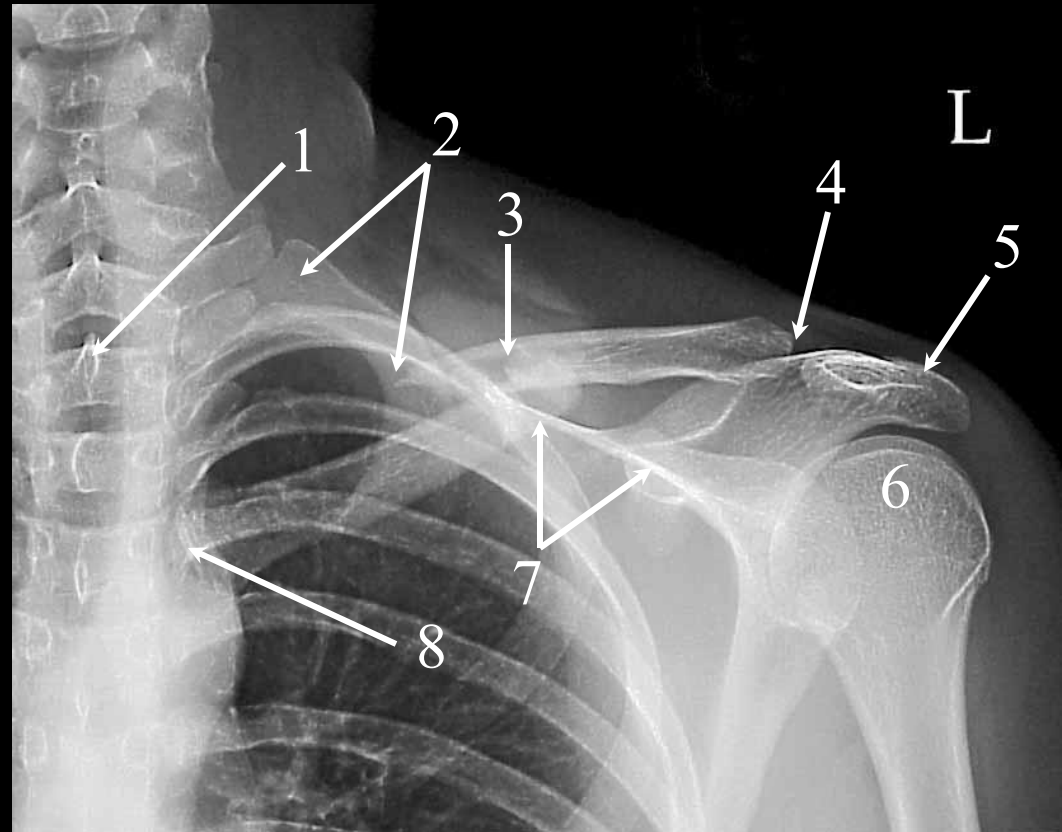
The arrow is pointing to the:

- a. acromion process.
- b. scapular spine.
- c. AC joint.
- d. coracoid process.



# Question #27: **Review**

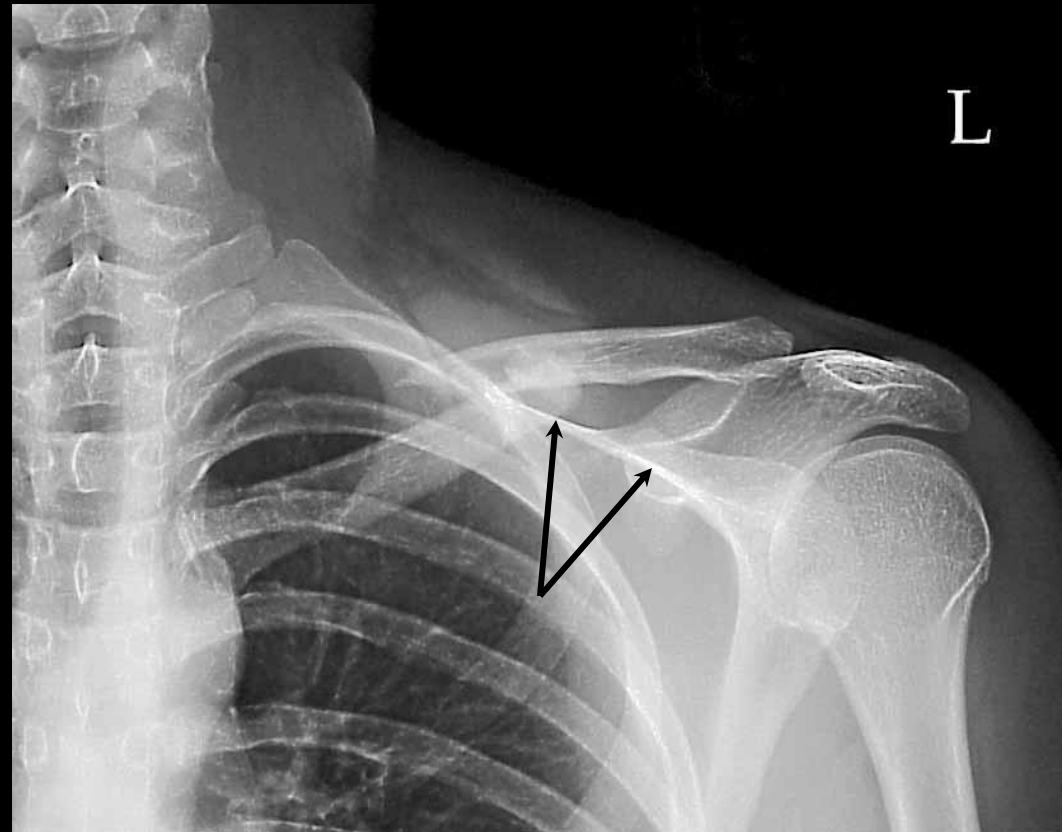
1. Spinous Process
2. 1<sup>st</sup> Rib
3. Fracture Site
4. AC Joint
- 5. Acromion Process**
6. Head of the Humerus
7. Scapular Spine
8. SC Joint



# Question #28:

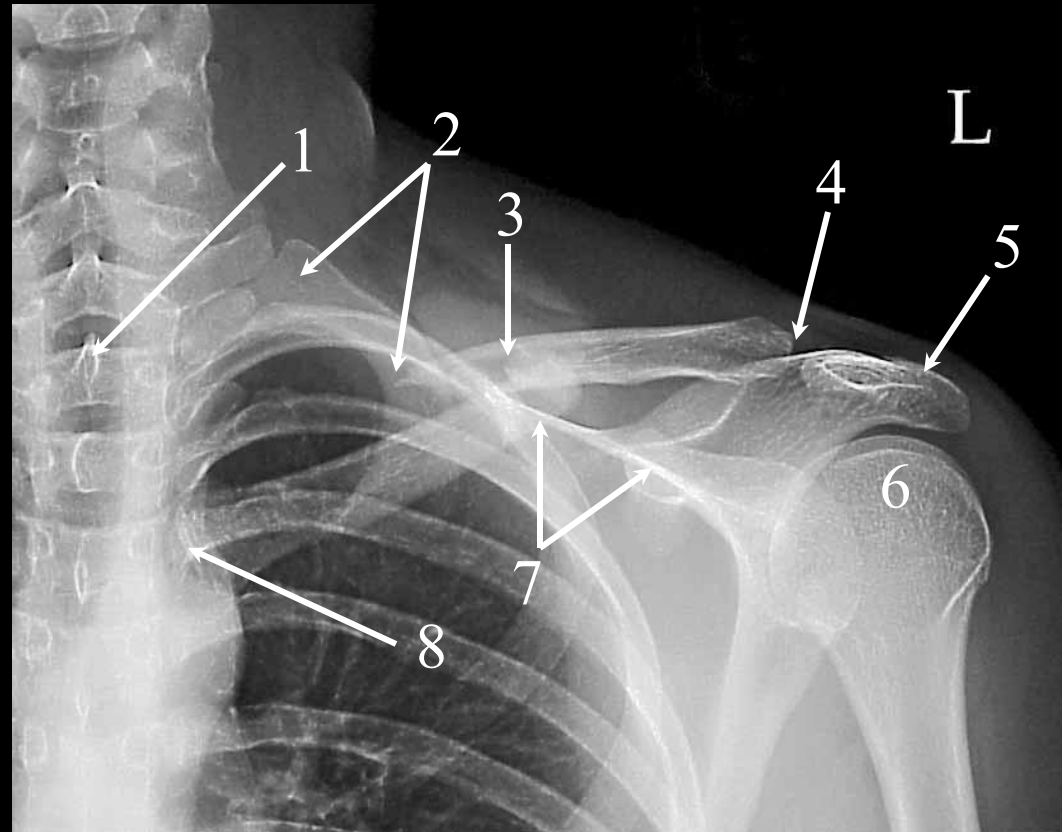
The arrows are pointing to the:

- a. body of the clavicle.
- b. coronoid process.
- c. axillary border.
- d. scapular spine.



# Question #28: **Review**

1. Spinous Process
2. 1<sup>st</sup> Rib
3. Fracture Site
4. AC Joint
5. Acromion Process
6. Head of the Humerus
- 7. Scapular Spine**
8. SC Joint



# Question #29:

The arrow is pointing to the:

- a. cuboid.
- b. base of the 5<sup>th</sup> metatarsal.
- c. medial cuneiform.
- d. navicular.



# Question #29: Review

1. Calcaneus or Os Calcis
2. Cuboid
3. Base of the 5<sup>th</sup> Metatarsal
4. Shaft of the 4<sup>th</sup> Metatarsal
5. 2<sup>nd</sup> Metatarsophalangeal Joint
6. Sesamoid Bones
7. Lateral Cuneiform
8. Navicular
9. Talus



# Question #30:

The arrow is pointing to the:

- a. talus.
- b. navicular.
- c. cuboid.
- d. lateral cuneiform.



# Question #30: Review

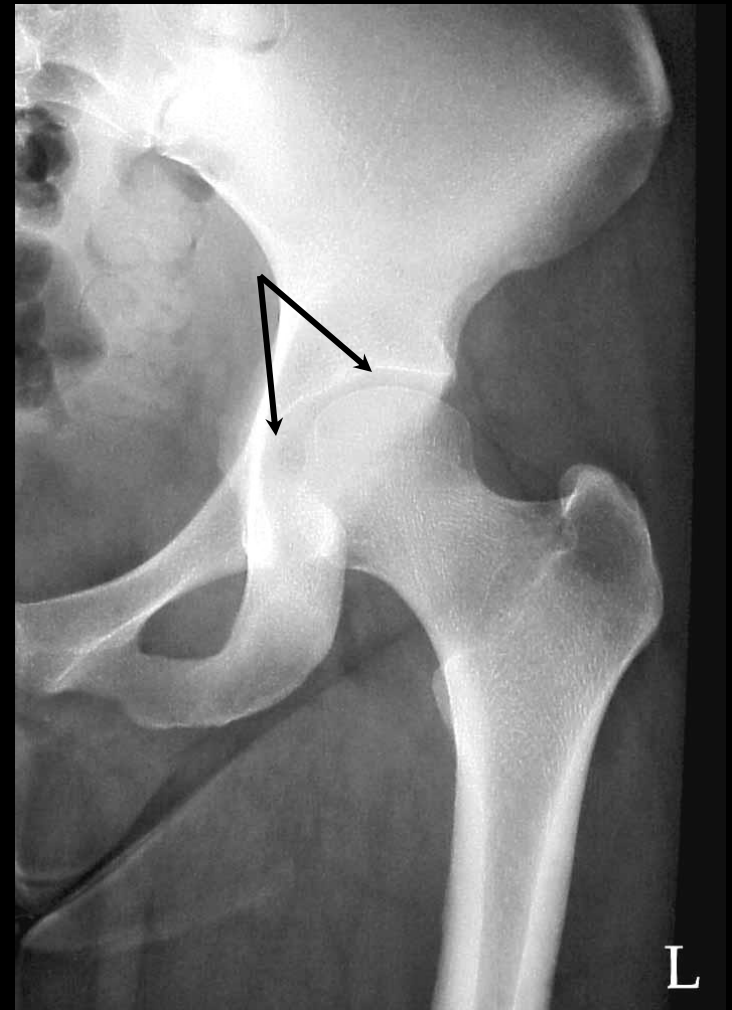
1. Calcaneus or Os Calcis
2. Cuboid
3. Base of the 5<sup>th</sup> Metatarsal
4. Shaft of the 4<sup>th</sup> Metatarsal
5. 2<sup>nd</sup> Metatarsophalangeal Joint
6. Sesamoid Bones
- 7. Lateral Cuneiform**
8. Navicular
9. Talus



# Question #31:

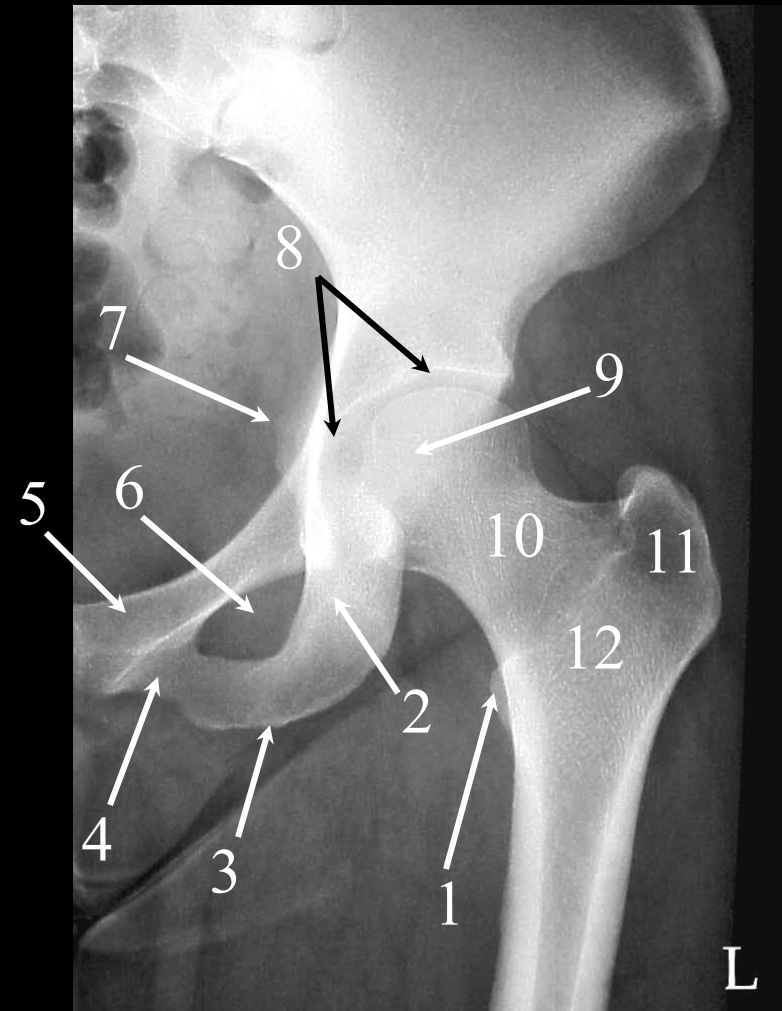
The arrows are pointing to the:

- a. acetabulum.
- b. obturator foramen.
- c. ischial spine.
- d. intertrochanteric crest.



# Question #31: Review

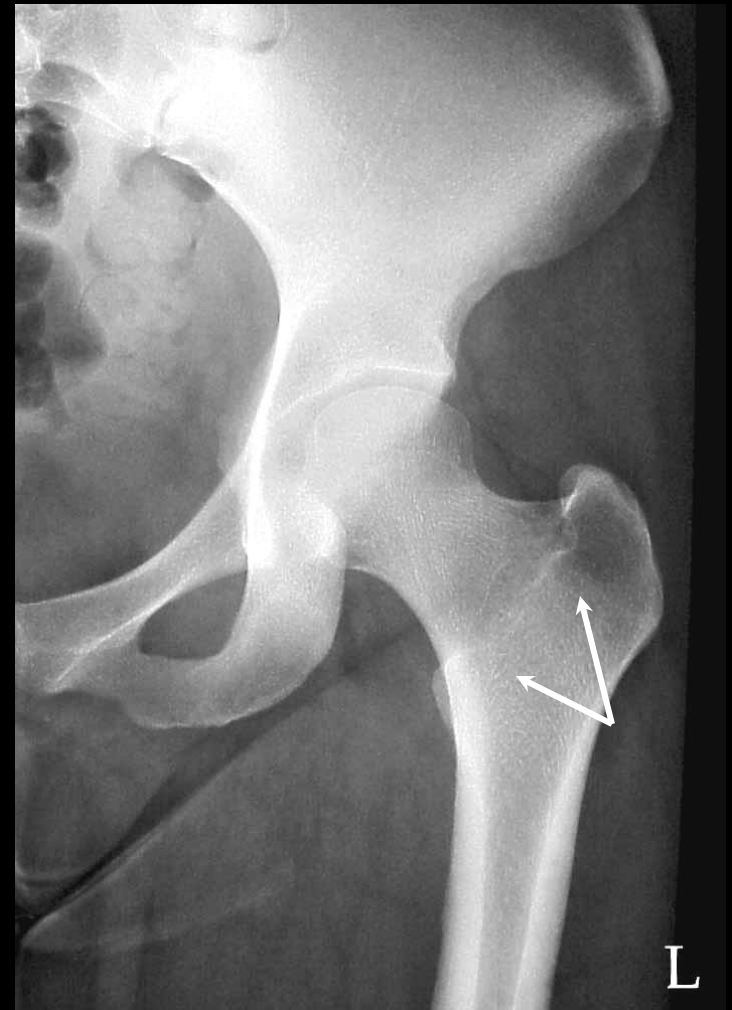
1. Lesser Trochanter
2. Body of the Ischium
3. Ischial Tuberosity
4. Inferior Ramus of the Pubis
5. Superior Ramus of the Pubis
6. Obturator Foramen
7. Ischial Spine
- 8. Acetabulum**
9. Head of the Femur
10. Neck of the Femur
11. Greater Trochanter
12. Intertrochanteric Crest



# Question #32:

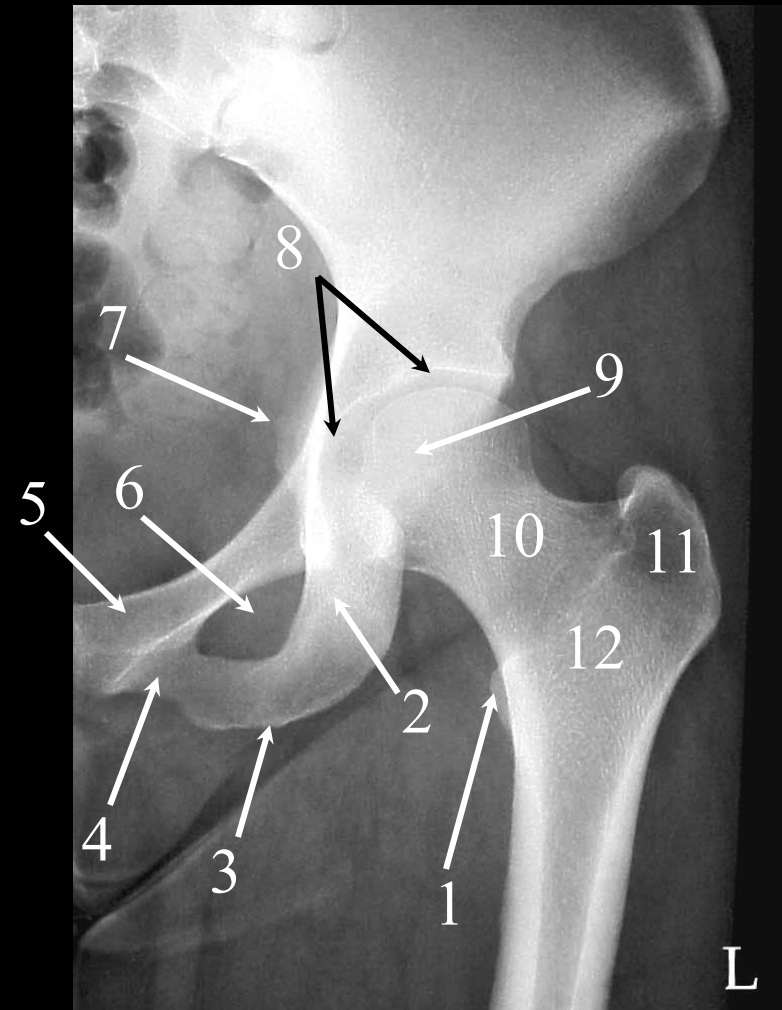
The arrows are pointing to the:

- a. greater trochanter.
- b. intertrochanteric crest.
- c. lesser trochanter.
- d. linea aspera.



# Question #32: Review

1. Lesser Trochanter
2. Body of the Ischium
3. Ischial Tuberosity
4. Inferior Ramus of the Pubis
5. Superior Ramus of the Pubis
6. Obturator Foramen
7. Ischial Spine
8. Acetabulum
9. Head of the Femur
10. Neck of the Femur
11. Greater Trochanter
12. Intertrochanteric Crest



# Question #33:

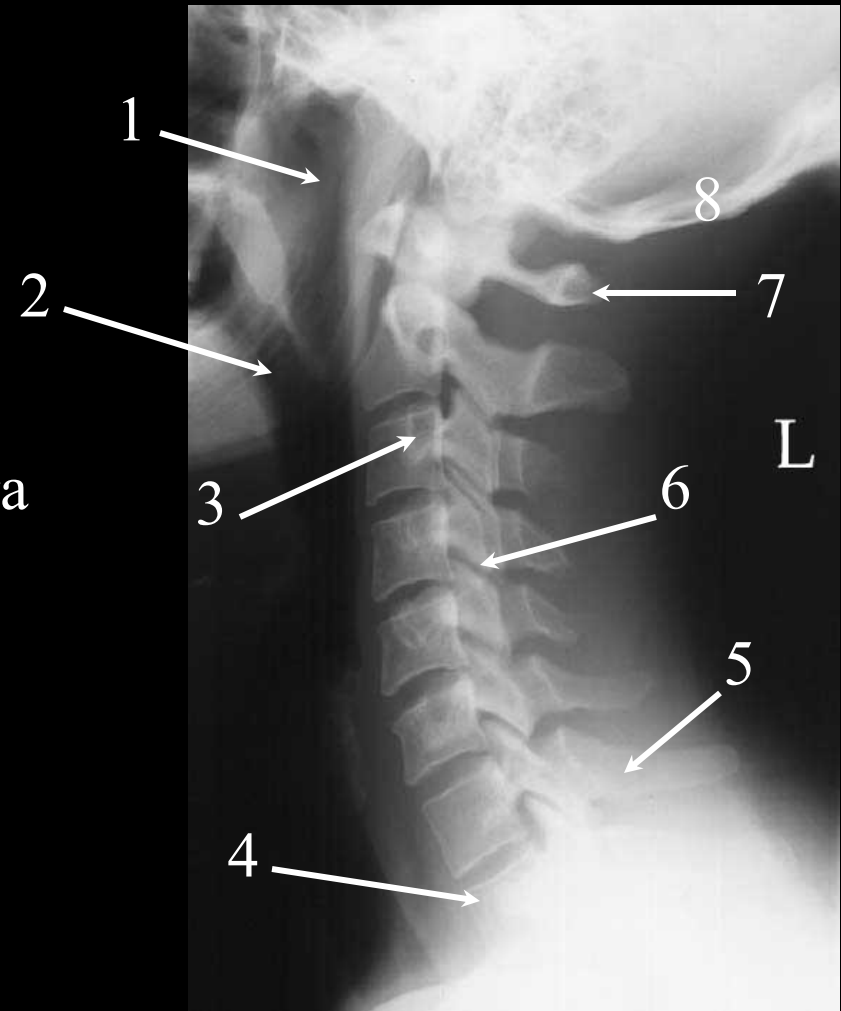
The arrow is pointing to the \_\_\_\_\_ of C1.

- a. posterior arch.
- b. anterior arch.
- c. spinous process.
- d. lamina.



# Question #33: Review

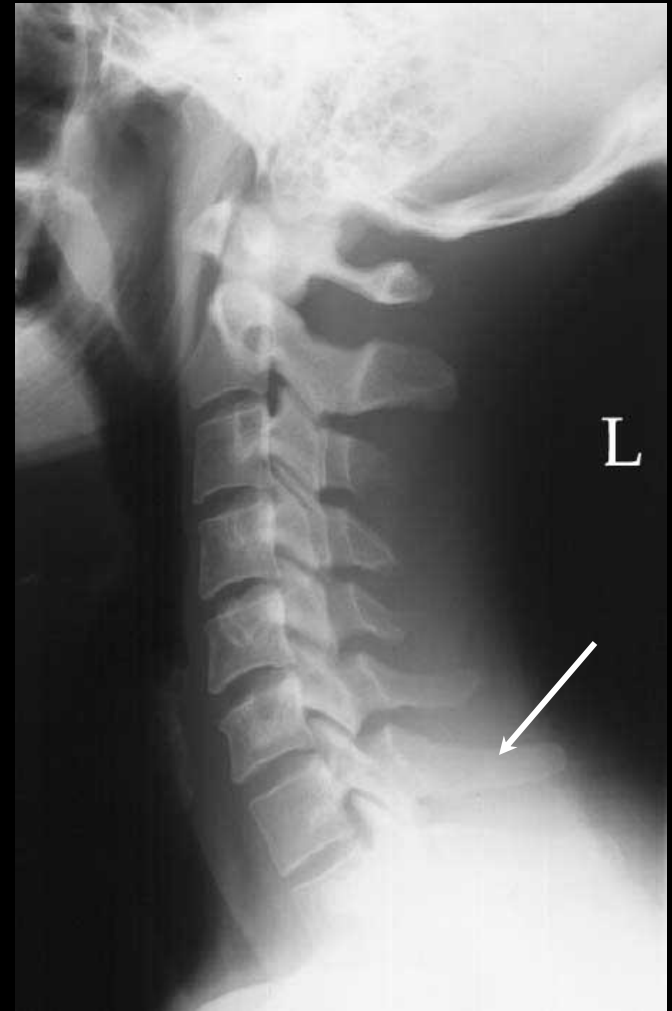
1. Nasopharynx
2. Oropharynx
3. Transverse Process of C3
4. Body of T1
5. Spinous Process of C7 (vertebra prominens)
6. Zygapophyseal Joint of C4-C5
7. Posterior Arch of C1
8. Occipital Bone



# Question #34:

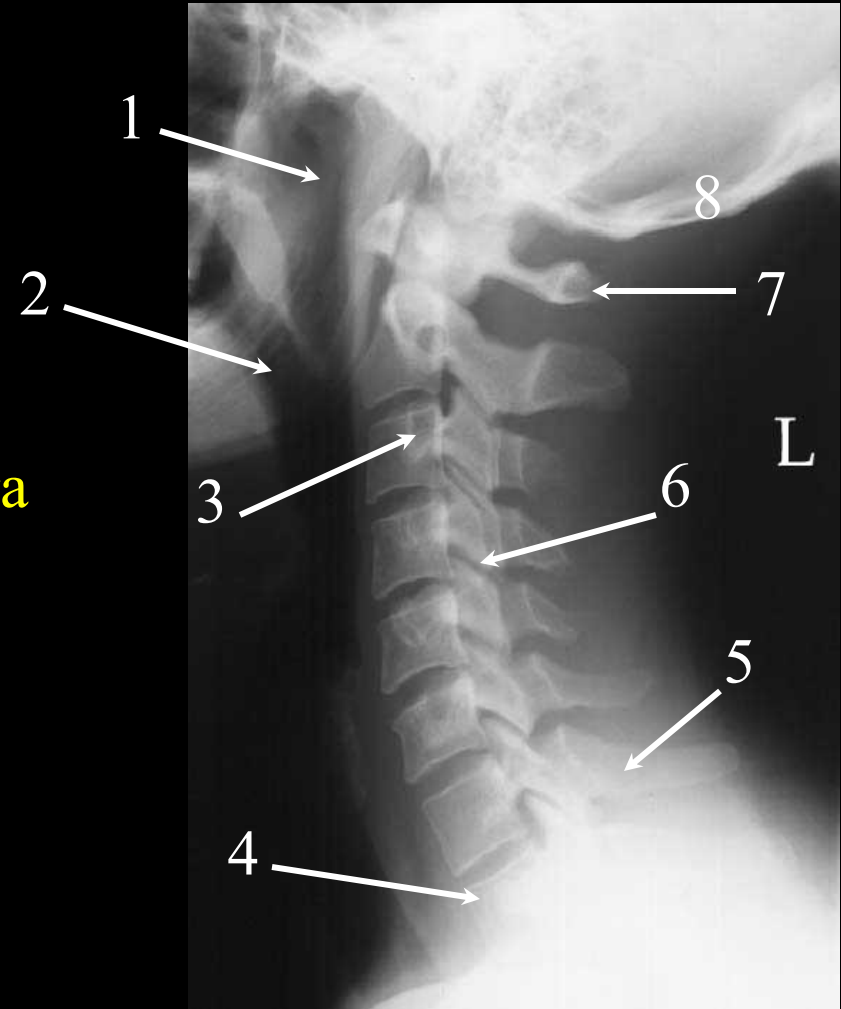
The arrow is pointing to:

- a. a spinous process.
- b. the vertebra prominens.
- c. Both “a” and “b”
- d. Neither “a” nor “b”



# Question #34: Review

1. Nasopharynx
2. Oropharynx
3. Transverse Process of C3
4. Body of T1
- 5. Spinous Process of C7 (vertebra prominens)**
6. Zygapophyseal Joint of C4-C5
7. Posterior Arch of C1
8. Occipital Bone



# Question #35:

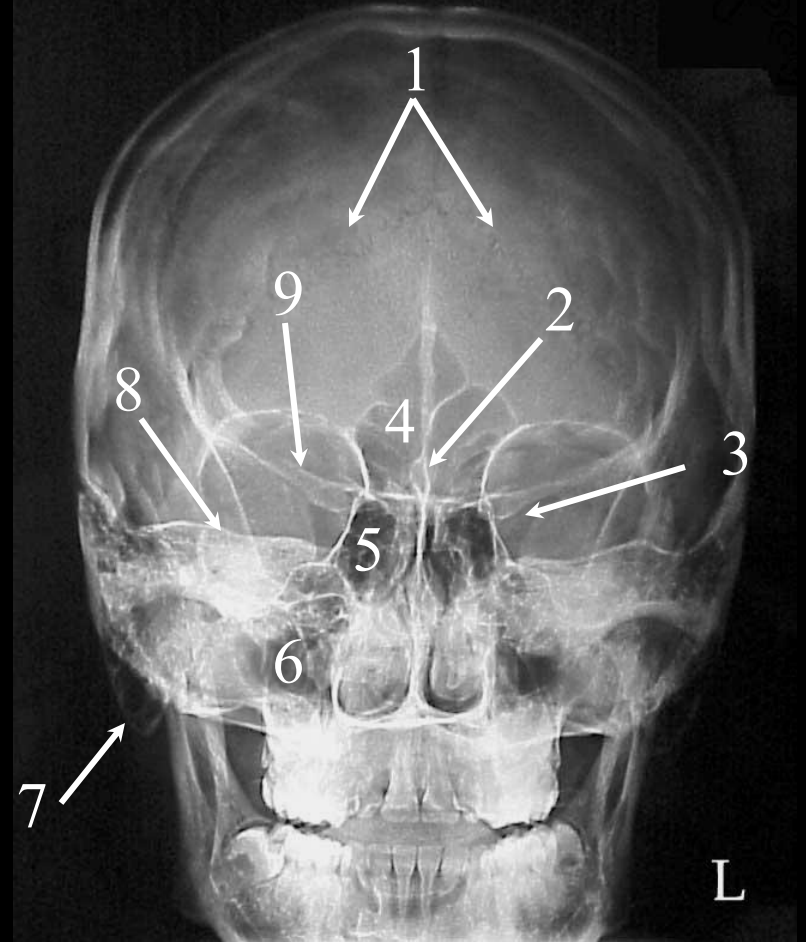
The arrow is pointing to the:

- a. optic canal.
- b. superior orbital fissure.
- c. petrous ridge.
- d. crista galli.



# Question #35: Review

1. Lambdoidal Suture
2. Crista Galli
- 3. Superior Orbital Fissure**
4. Frontal Sinuses
5. Ethmoid Sinuses
6. Maxillary Sinus
7. Mastoid Tip
8. Petrous Ridge
9. Lesser Wing of the Sphenoid



# Question #36:

The most likely cause of the deformity found on this radiograph would be:

- a.. osteomyelitis.
- b. osteopetrosis.
- c. osteogenesis imperfecta.
- d. Osgood-Schlatter disease.



# Question #36: Review



## Osteogenesis Imperfecta (OI):

The severe bowing that has occurred in this patient's humerus and forearm are an indication that the patient is suffering from a condition known as **osteogenesis imperfecta**.

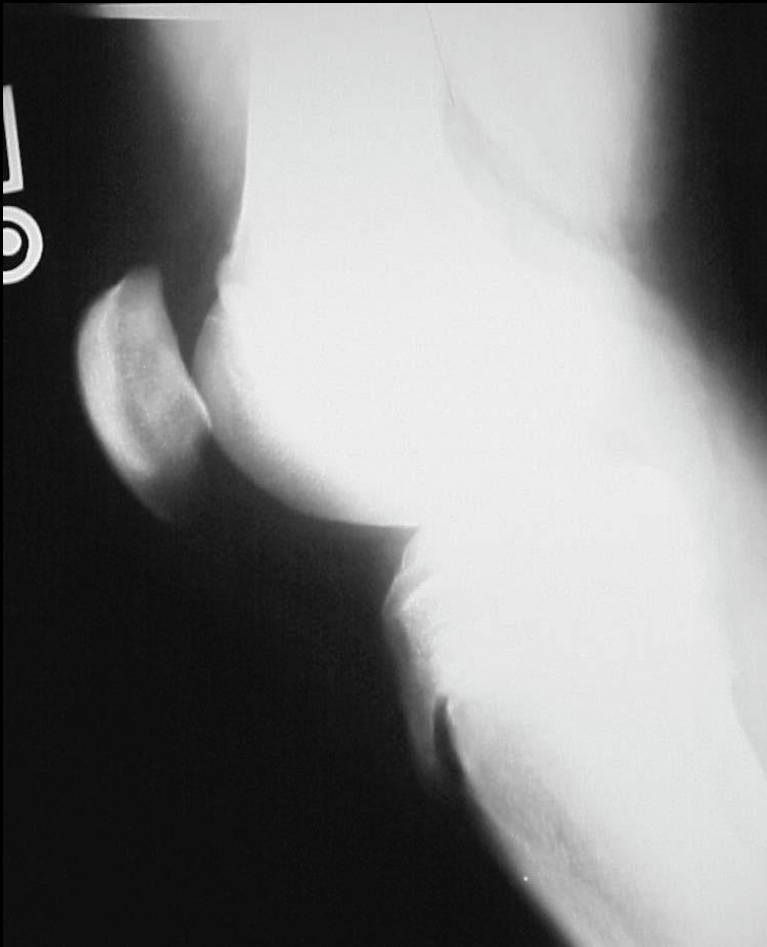
# Question #37:

The most likely cause of the deformity found on this radiograph would be:

- a. Osgood-Schlatter disease.
- b. Paget's Disease.
- c. osteopoikilosis.
- d. avascular necrosis.



# Question #37: Review



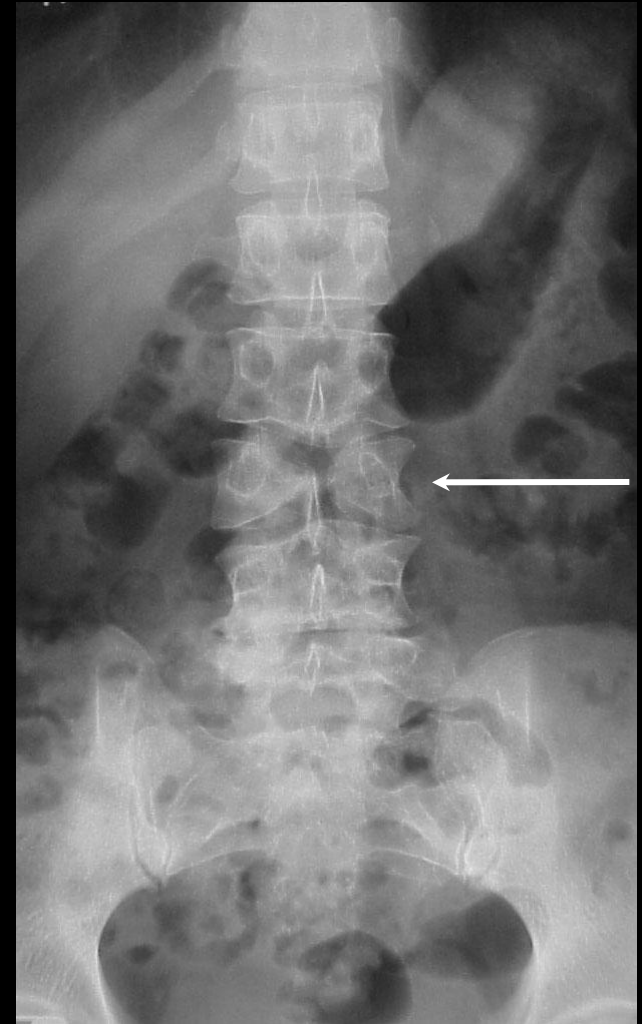
## Osgood-Schlatter Disease:

The arrow on this image depicts how the patellar tendon has avulsed a portion of the tibial tuberosity away from the tibia thus indicating that the patient is suffering from a condition known as **Osgood-Schlatter's Disease**.

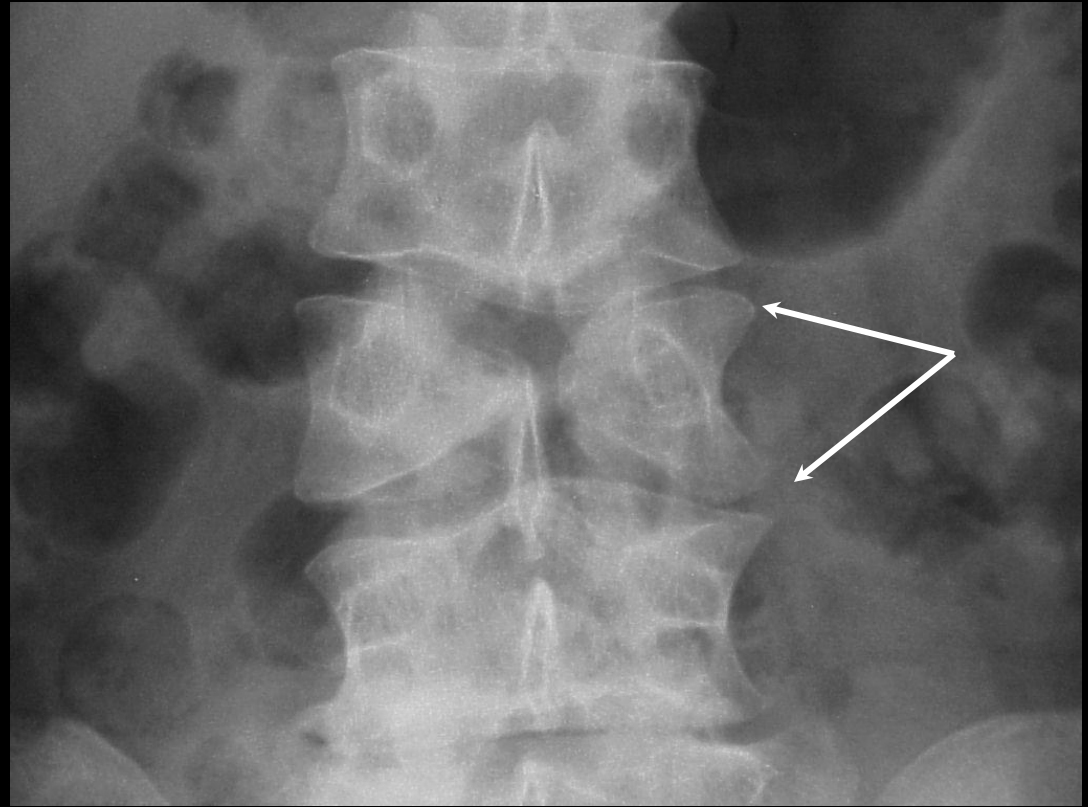
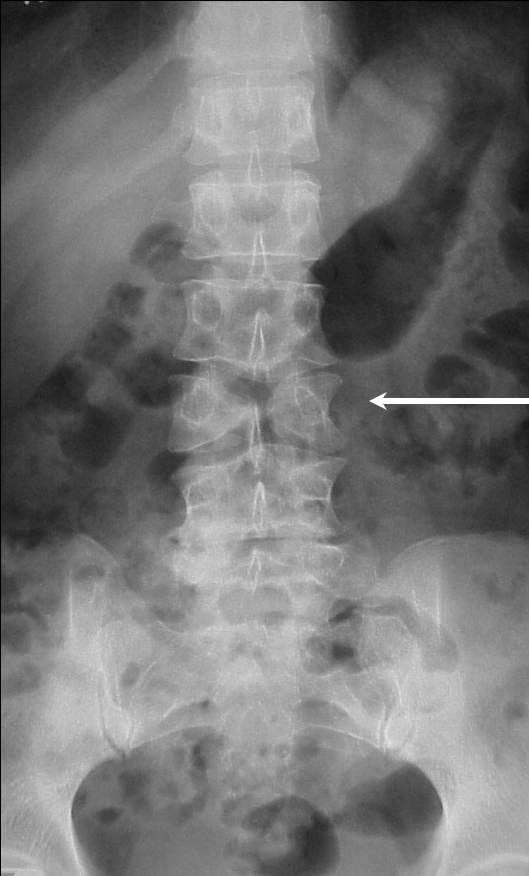
# Question #38:

The most likely cause of the deformity found on this radiograph would be:

- a. spina bifida.
- b. spondylolisthesis.
- c. spondylosis.
- d. butterfly vertebra.



# Question #38: Review

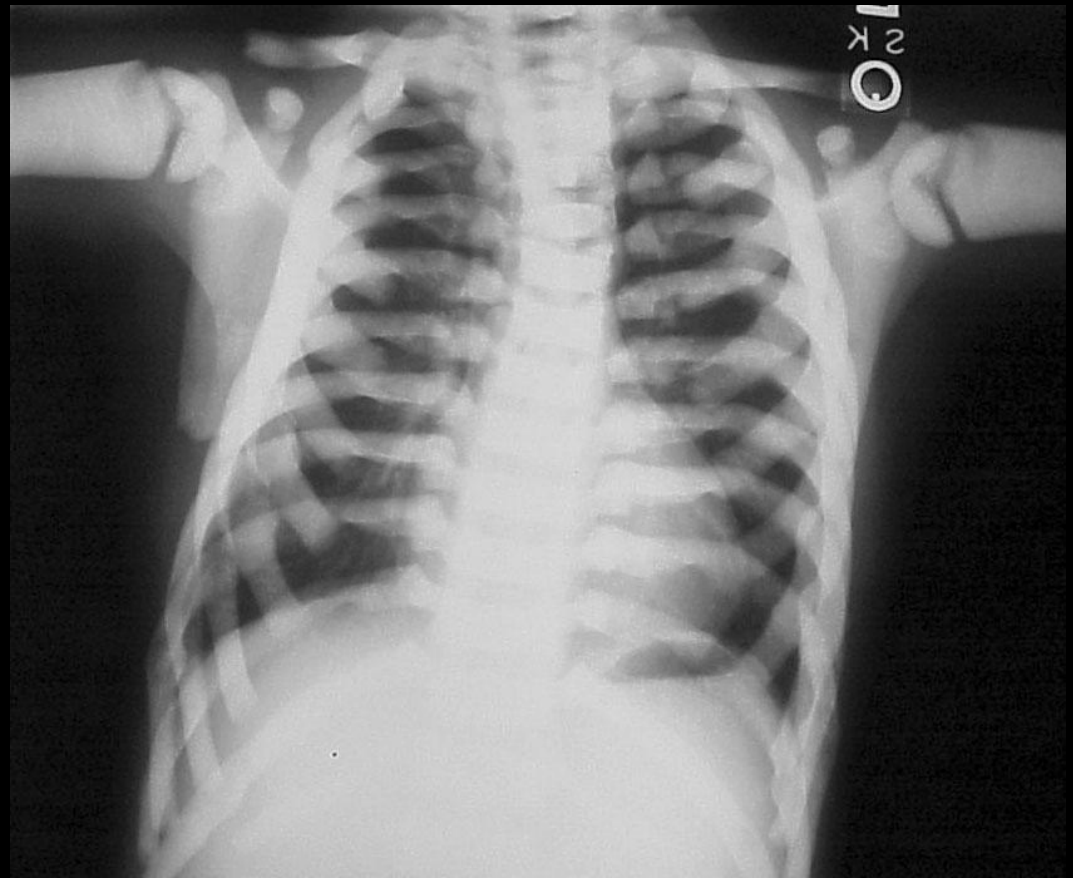


The arrows on this image are pointing to a **butterfly vertebra**. This is a congenital defect that usually has no clinical significance.

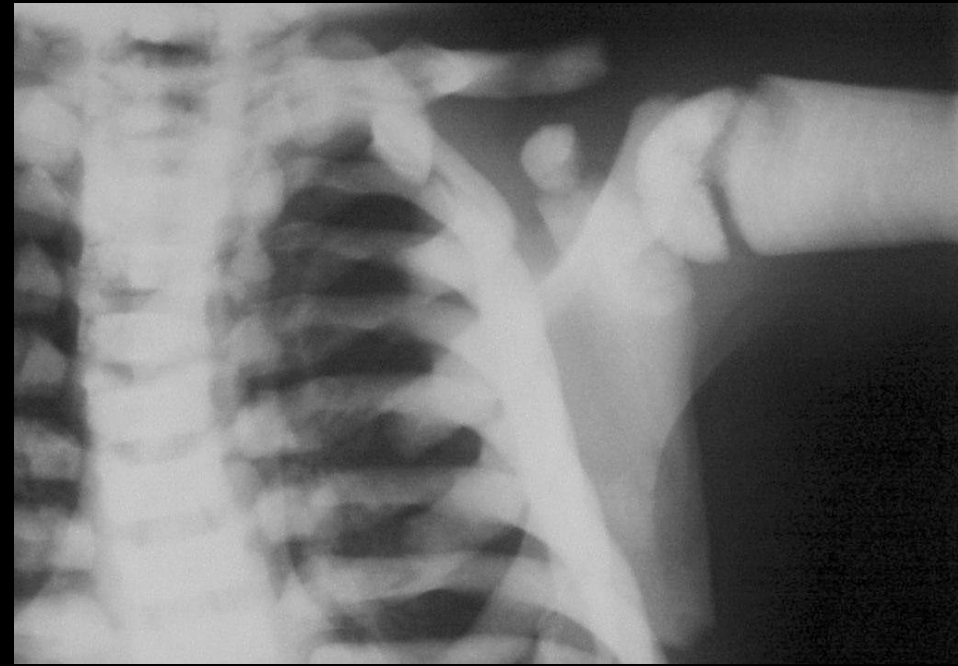
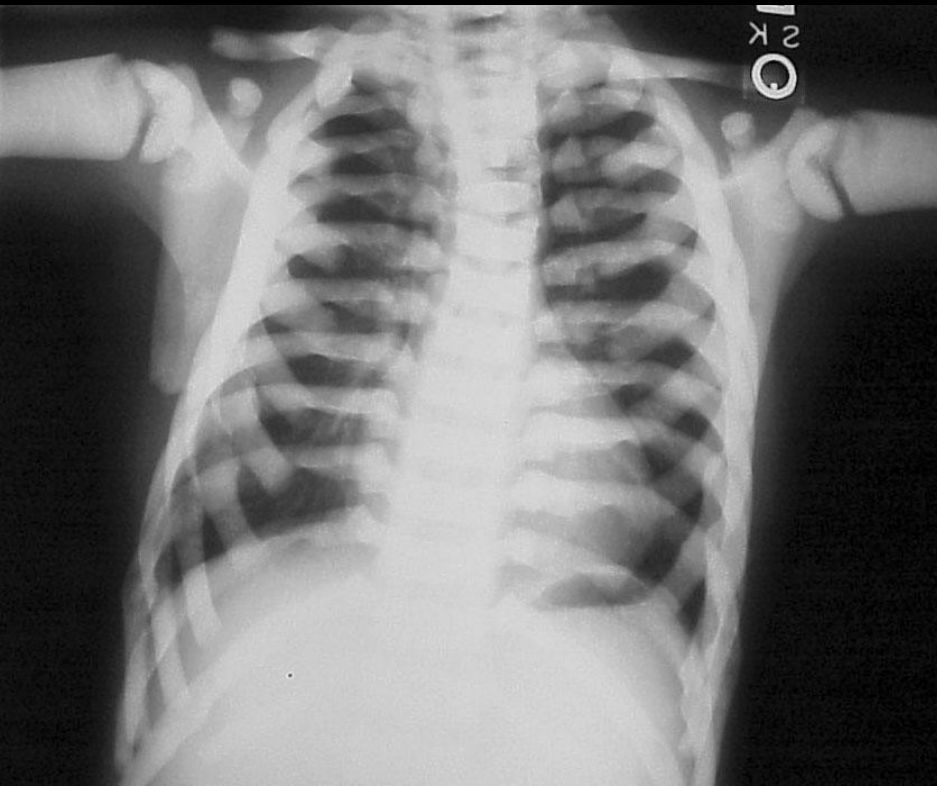
# Question #39:

The most likely cause of the condition found on this radiograph would be:

- a. osteoporosis.
- b. osteopetrosis.
- c. osteomalacia.
- d. ankylosing spondylitis.



# Question #39: Review



The marbled radiographic appearance on these images is an indication that this child has a lethal form of **infantile osteopetrosis**.

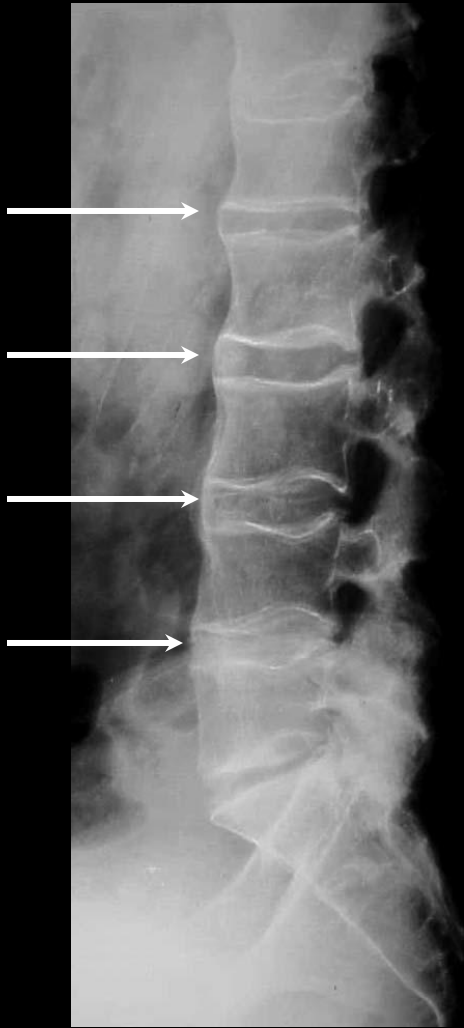
# Question #40:

Which of the following is the most likely cause of the type of arthritis that is depicted on this radiographic image of the lumbar spine?

- a. rheumatoid arthritis
- b. ankylosing spondylitis
- c. osteoarthritis
- d. gout



# Question #40: **Review**



Notice how the vertebral bodies appear washed-out due to calcium deficiencies and how they are becoming fused (arrows). That combined with the lumbar spine losing its concave forward curvature gives it a “bamboo-like” appearance. This is all an indication that the patient has a condition known as **ankylosing spondylitis**.

# Question #41:

The arrow is pointing to the:

- a. trapezoid.
- b. pisiform.
- c. capitate.
- d. lunate.



# Question #41: Review

1. 1<sup>st</sup> Metacarpophalangeal Joint (MP)
2. Greater Multangular or Trapezium
3. Pisiform
4. Navicular or Scaphoid
5. **Lunate or Semilunar**



# Question #42:

The arrow is pointing to the:

- a. navicular.
- b. trapezium.
- c. lunate.
- d. capitate.



# Question #42: Review

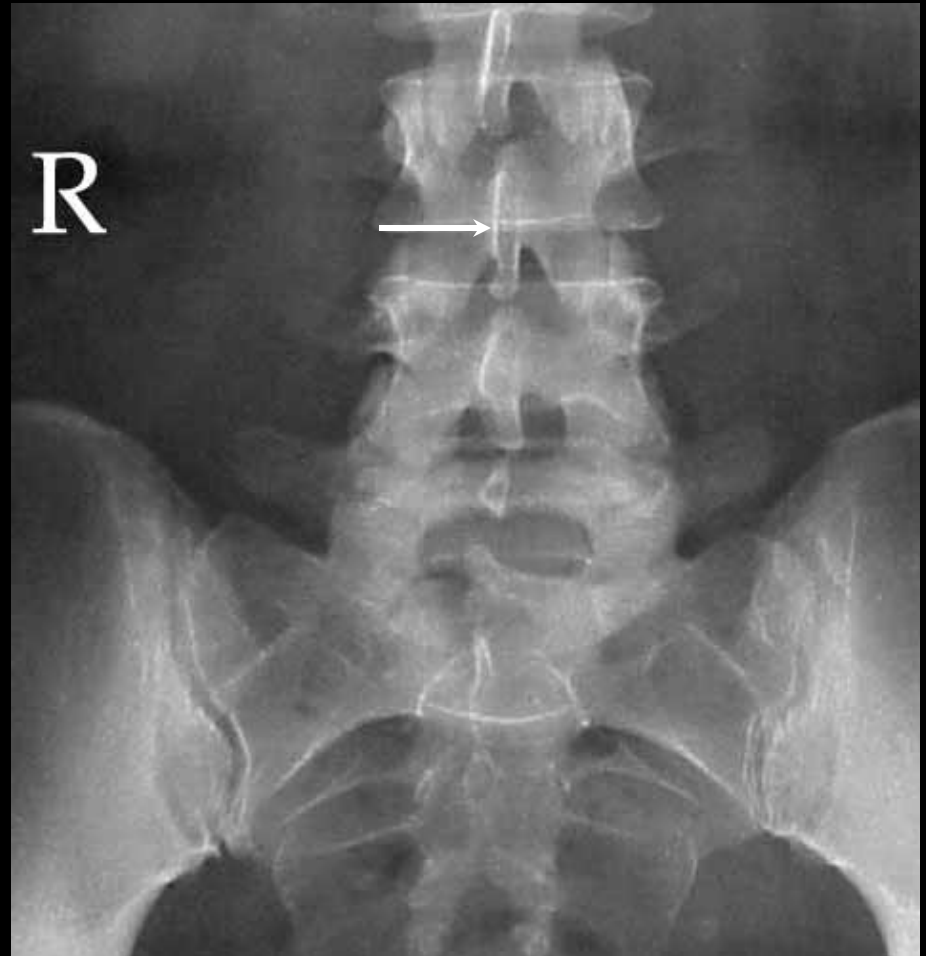
1. 1<sup>st</sup> Metacarpophalangeal Joint (MP)
2. Greater Multangular or Trapezium
3. Pisiform
4. Navicular or Scaphoid
5. Lunate or Semilunar



# Question #43:

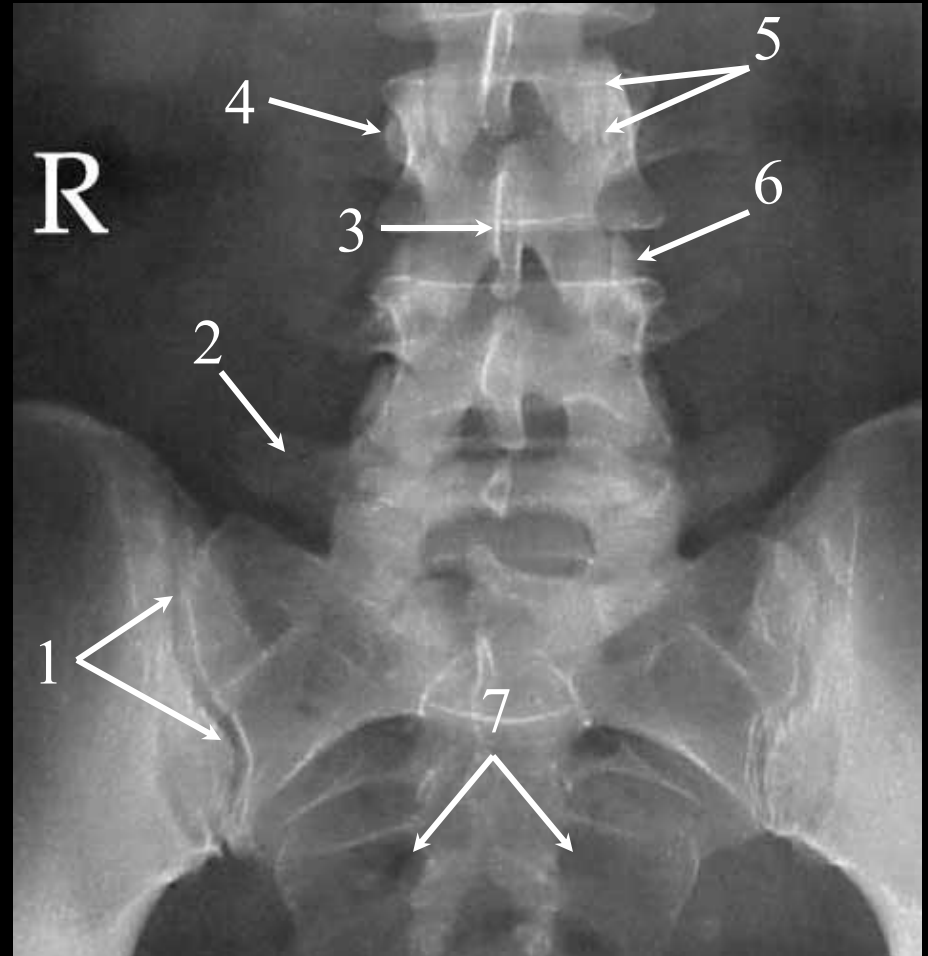
The arrow is pointing to the:

- a. transverse process.
- b. spinous process.
- c. pedicle.
- d. zygapophyseal joint.



# Question #43: Review

1. Sacroiliac (SI) Joint
2. Transverse Process of L5
3. Spinous Process of L3
4. Pedicle of L3
5. Zygapophyseal Joint of L2-L3 (vertical black line)
6. Superior Articular Process of L4
7. Anterior Sacral Foramen



# Question #44:

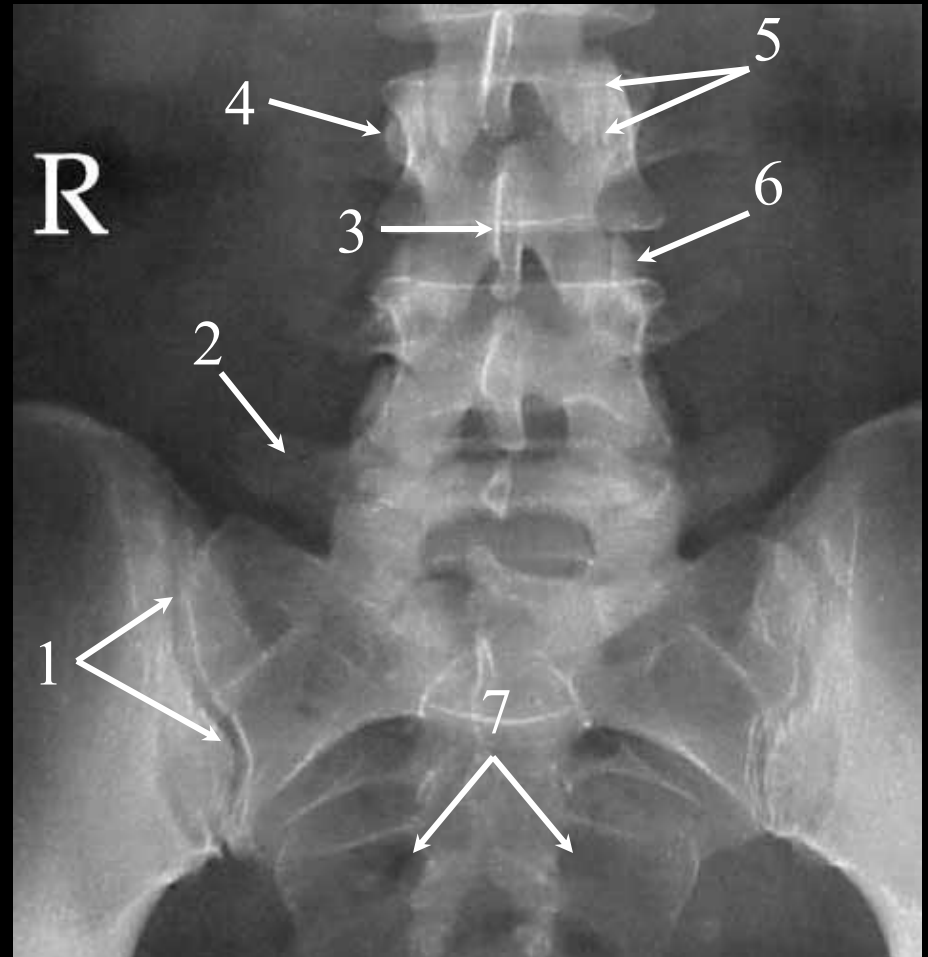
The arrow is pointing to the:

- a. superior articulating process.
- b. spinous process.
- c. zygapophyseal joint.
- d. None of the Above



# Question #44: Review

1. Sacroiliac (SI) Joint
2. Transverse Process of L5
3. Spinous Process of L3
4. Pedicle of L3
5. Zygapophyseal Joint of L2-L3 (vertical black line)
6. Superior Articular Process of L4
7. Anterior Sacral Foramen



# Question #45:

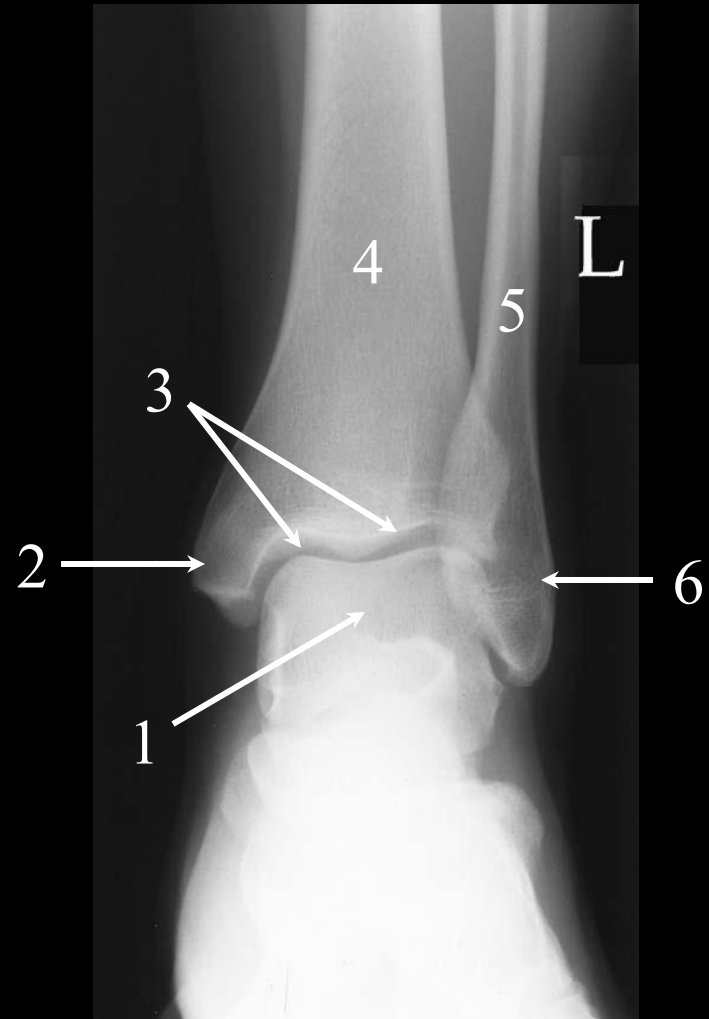
The arrow is pointing to the:

- a. medial malleolus.
- b. lateral malleolus.
- c. talus.
- d. None of the Above



# Question #45: Review

1. Talus
2. Medial Malleolus
3. Ankle Joint or Mortise
4. Shaft of the Tibia
5. Shaft of the Fibula
6. Lateral Malleolus



# Question #46:

The arrow is pointing to the:

- a. talus.
- b. navicular.
- c. calcaneous.
- d. cuboid.



# Question #46: Review

## 1. Talus

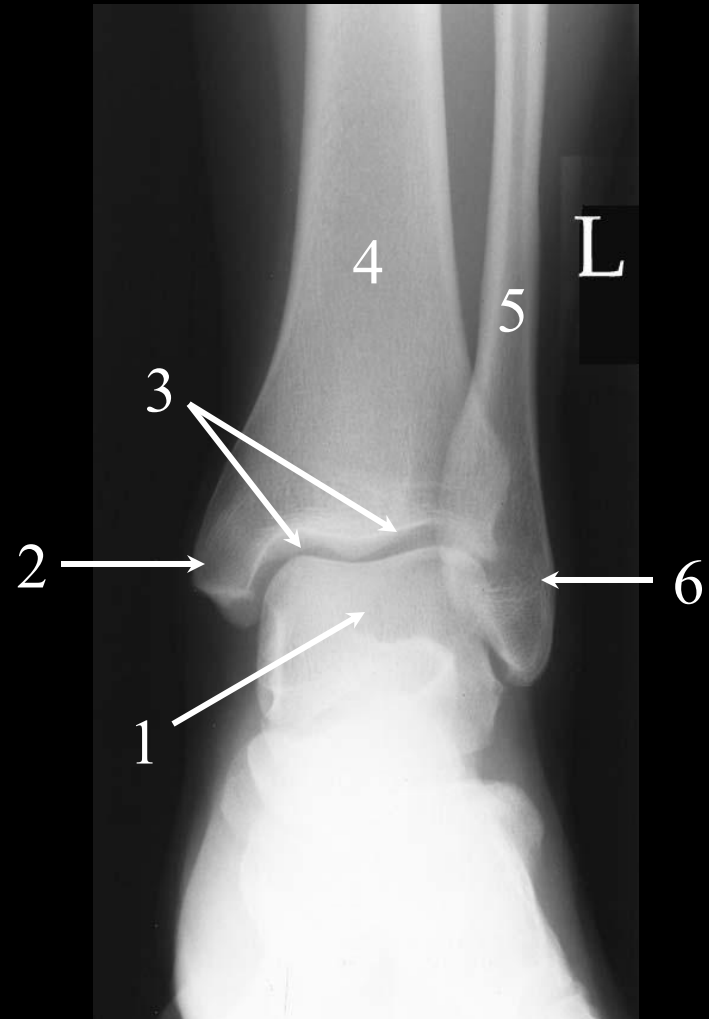
2. Medial Malleolus

3. Ankle Joint or Mortise

4. Shaft of the Tibia

5. Shaft of the Fibula

6. Lateral Malleolus



# Question #47:

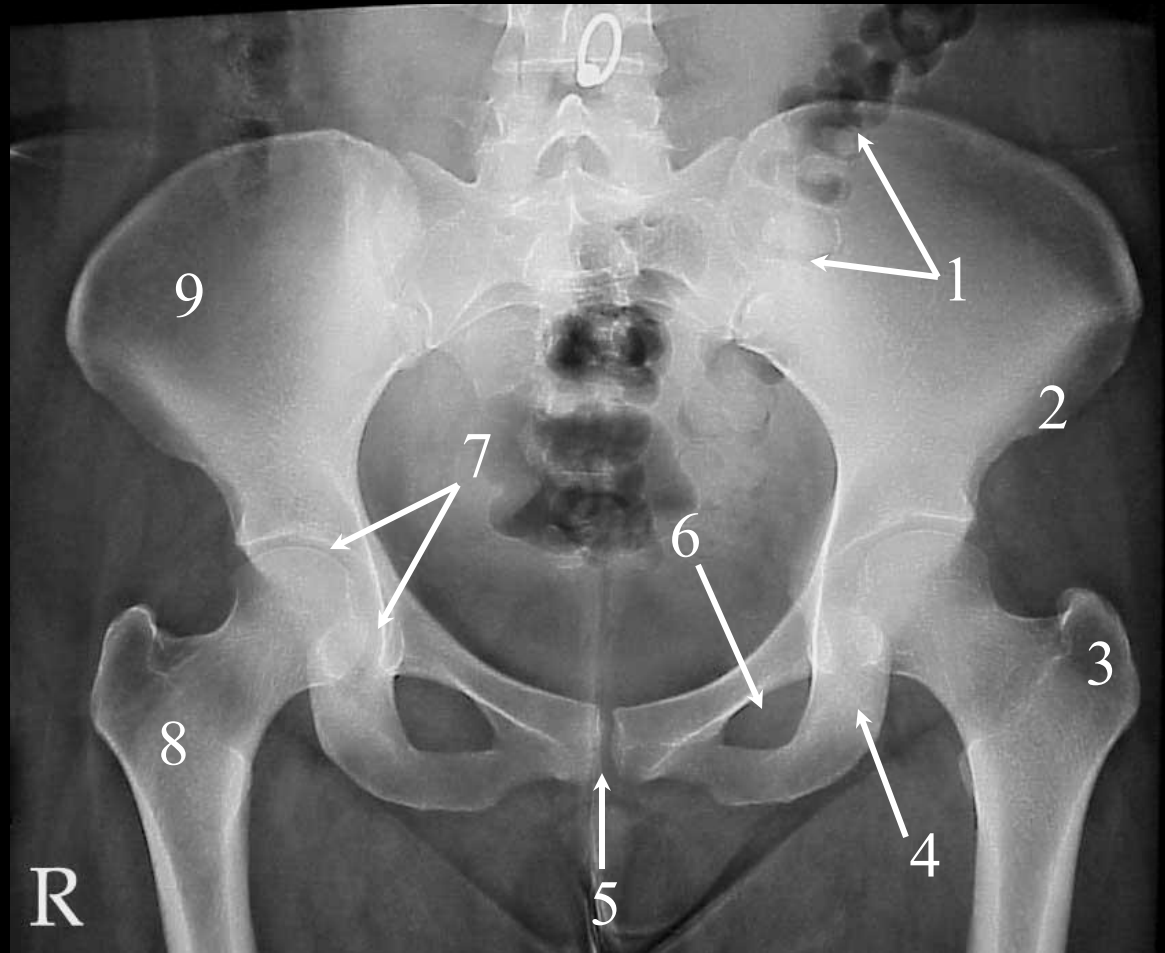
The arrow is pointing to the:

- a. ischial tuberosity.
- b. ischial spine.
- c. inferior ramus of the pubis.
- d. body of the ischium.



# Question #47: Review

1. Air in the Descending Colon
2. ASIS
3. Greater Trochanter
4. **Body of the Ischium**
5. Symphysis Pubis
6. Obturator Foramen
7. Acetabulum
8. Intertrochanteric Crest
9. Ala or Wing of the Ilium



# Question #48:

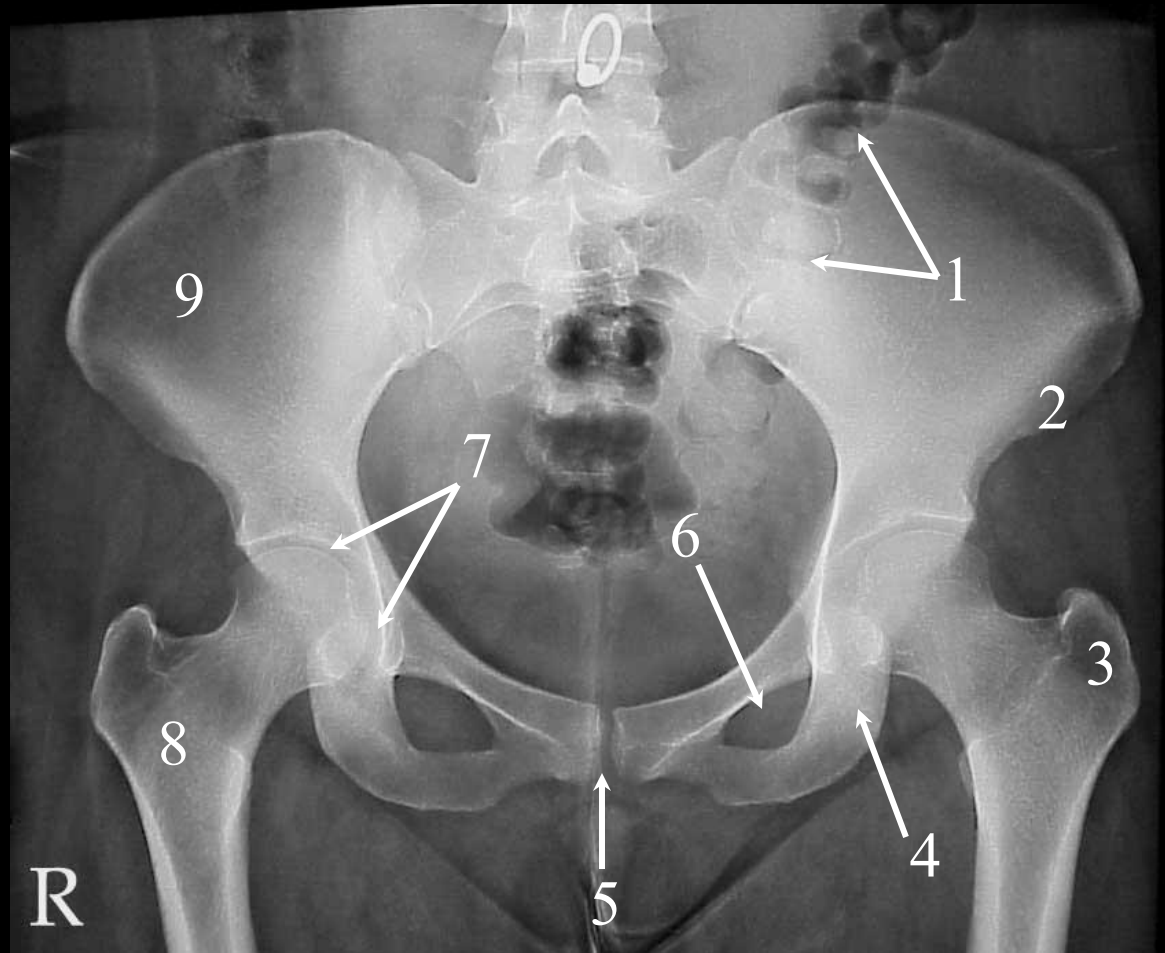
The arrow is pointing to the:

- a. obturator foramen.
- b. foramen magnum.
- c. ischial tuberosity.
- d. None of the Above



# Question #48: **Review**

1. Air in the Descending Colon
2. ASIS
3. Greater Trochanter
4. Body of the Ischium
5. Symphysis Pubis
- 6. Obturator Foramen**
7. Acetabulum
8. Intertrochanteric Crest
9. Ala or Wing of the Ilium



# Question #49:

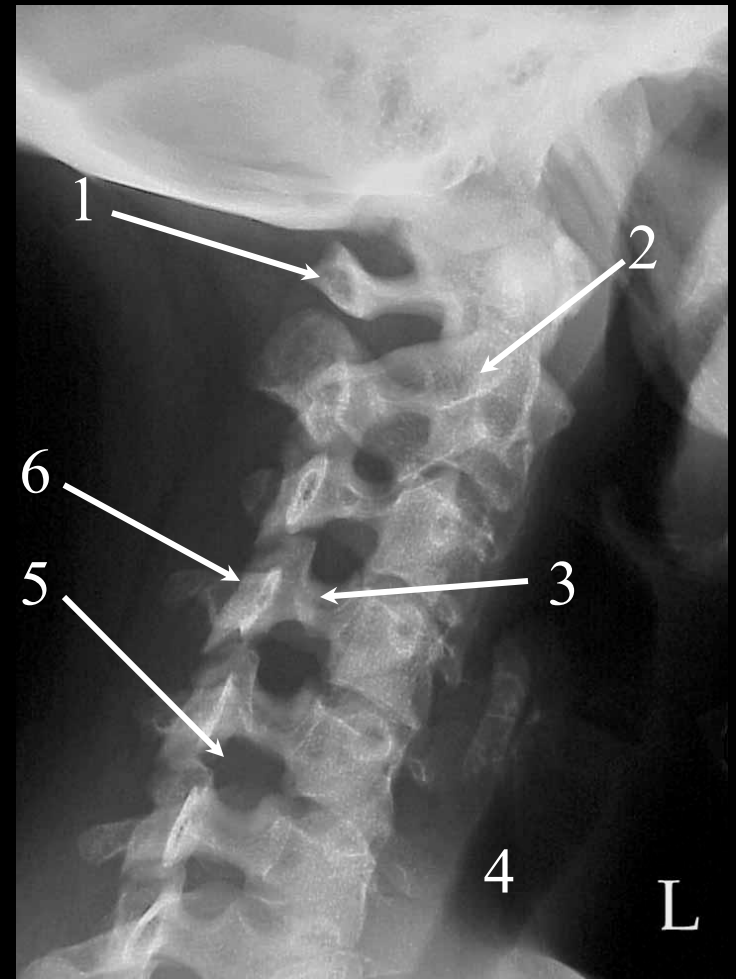
The arrow is pointing to the:

- a. pedicle.
- b. intervertebral foramen.
- c. lamina.
- d. zygapophyseal joint.



# Question #49: Review

1. Posterior Arch of C1
2. Body of the Dens
3. Pedicle of C4
4. Trachea
5. Intervertebral Foramen of C5-C6
6. Superior Articular Process of C4



# Question #50:

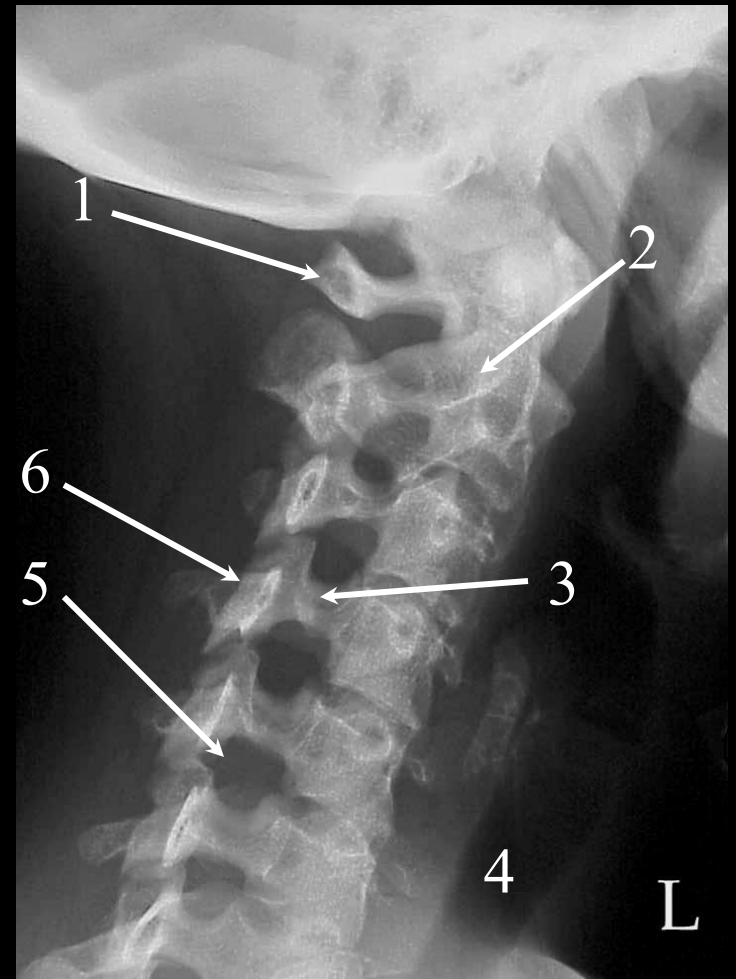
The arrow is pointing to the:

- a. lamina.
- b. spinous process.
- c. superior articular process.
- d. pedicle.



# Question #50: Review

1. Posterior Arch of C1
2. Body of the Dens
3. Pedicle of C4
4. Trachea
5. Intervertebral Foramen of C5-C6
6. Superior Articulating Process of C4



# Question #51:

What is the name of this position or method?

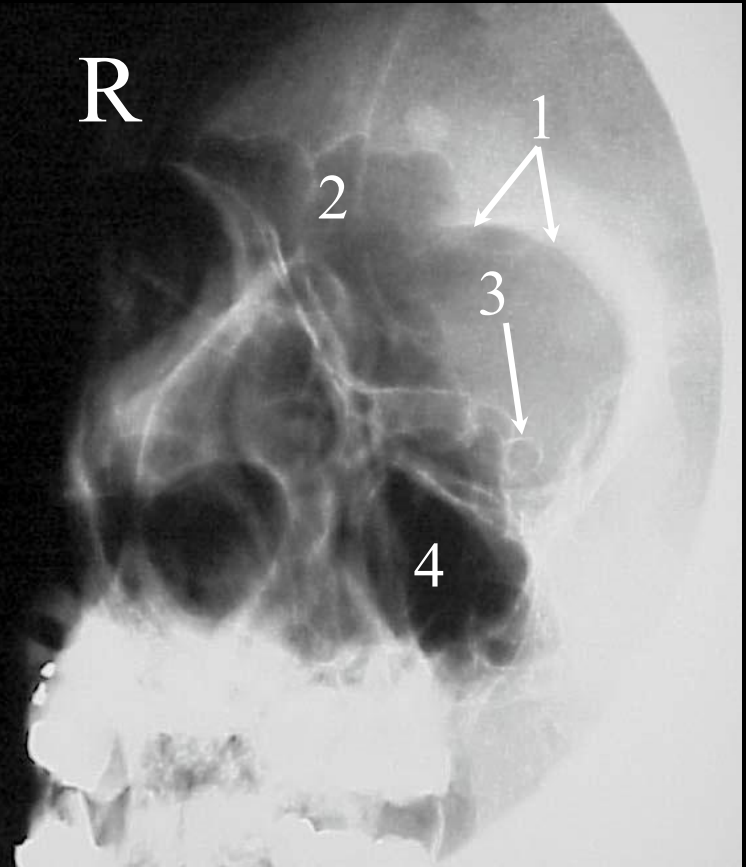
- a. Caldwell
- b. Towne
- c. Rhese
- d. Water's



# Question #51: Review

## These Orbits:

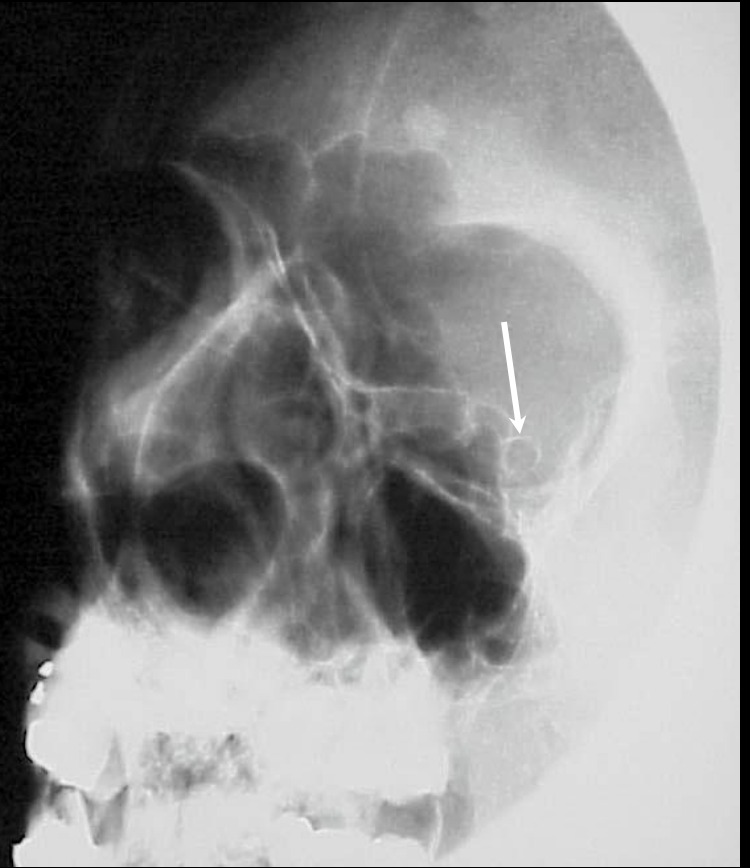
1. Supraorbital Margin
2. Frontal Sinus
3. Optic Canal
4. Maxillary Sinus



# Question #52:

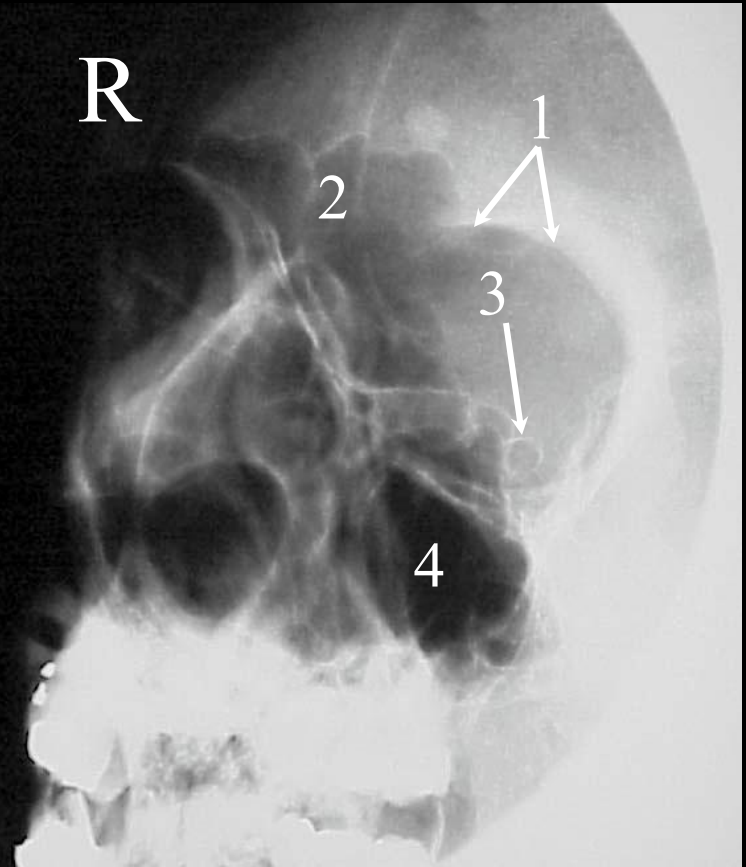
The arrow is pointing to the:

- a. optic canal.
- b. superior orbital fissure.
- c. foramen rotundum.
- d. infraorbital foramen.



# Question #52: Review

1. Supraorbital Margin
2. Frontal Sinus
3. Optic Canal
4. Maxillary Sinus



# Question #53:

This lateral foot is properly positioned.

- a. True
- b. False



# Question #53: Review

## Lateral Foot: (Poorly Positioned)

1. The Tibia and Fibula should be aligned to ensure that they are directly superimposed.
2. The Metatarsals should also be directly superimposed.



# Question #54:

The most likely cause for the multiple, round, radiopaque densities found on this radiograph would be:

- a. Paget's disease.
- b. enchondroma.
- c. osteopoikilosis.
- d. osteochondroma.



# Question #54: **Review**



These images provide another example of an osteosclerotic bone dysplasia known as **osteopoikilosis**.

# Question #55:

The arrow is pointing to the:

- a. pisiform.
- b. trapezoid.
- c. navicular.
- d. cuboid.



# Question #55: Review

This position best demonstrates the pisiform free from bony superimposition.

1. Shaft of the 5<sup>th</sup> Metacarpal
2. Hamulus of Hamate (Unciform)
- 3. Pisiform**
4. Styloid Process of the Ulna
5. Styloid Process of the Radius



# Question #56:

The arrow is pointing to the:

- a. styloid process of the ulna.
- b. pisiform.
- c. styloid process of the radius.
- d. coronoid process.



# Question #56: Review

1. Shaft of the 5<sup>th</sup> Metacarpal
2. Hamulus of Hamate (Unciform)
3. Pisiform
4. Styloid Process of the Ulna
5. Styloid Process of the Radius



# Question #57:

Which of the following is the most likely cause of the benign projection of bone that is depicted on this image of the knee?

- a. enchondroma
- b. osteosarcoma
- c. osteochondroma
- d. fibrosarcoma



# Question #57: **Review**



An **osteochondroma** or **exostosis** is a benign projection of bone with a cartilaginous cap. It is often found in the metaphysis of long bones, ribs, and pelvis.

# Question #58:

Which of the following is the most common type of primary malignant bone tumor?

- a. chondrosarcoma
- b. multiple myeloma
- c. fibrosarcoma
- d. enchondroma

# Question #58: Review

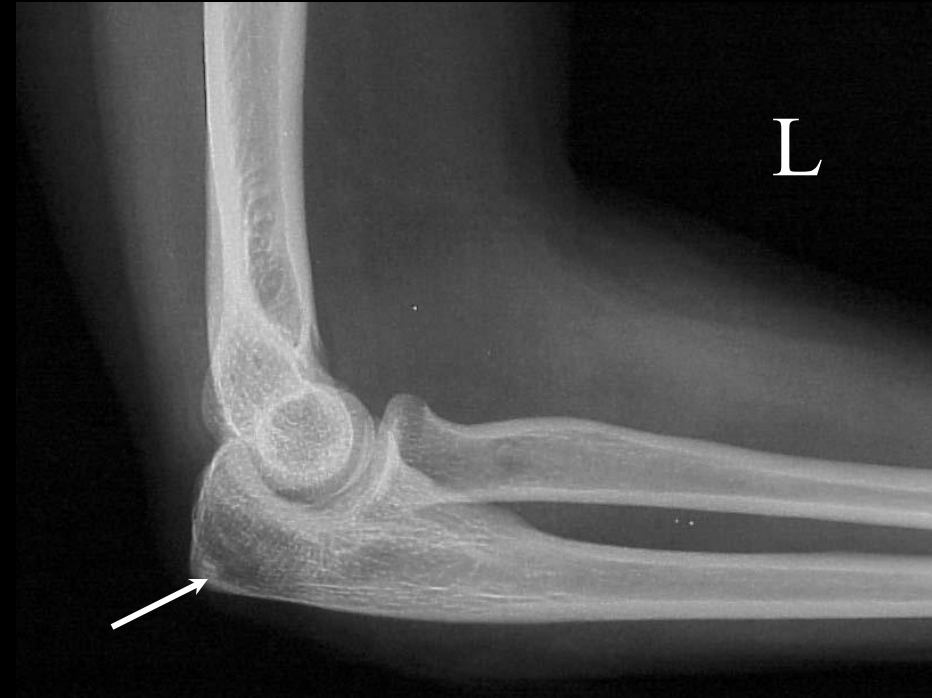
## Multiple Myeloma:

- This is the most common type of primary, malignant bone tumor.
- It is characterized by an increase in plasma cells within RBC producing bones.
  - Plasma cells are immune system cells that are found in the bone marrow and produce antibodies.
- The cardinal signs of multiple myeloma are as follows:
  - Possess “multicentric” or “punched-out” osteolytic lesions.
  - Bence-Jones proteins are found in the urine.
  - Possess marked osteoporosis with compression fractures of the vertebral bodies.

# Question #59:

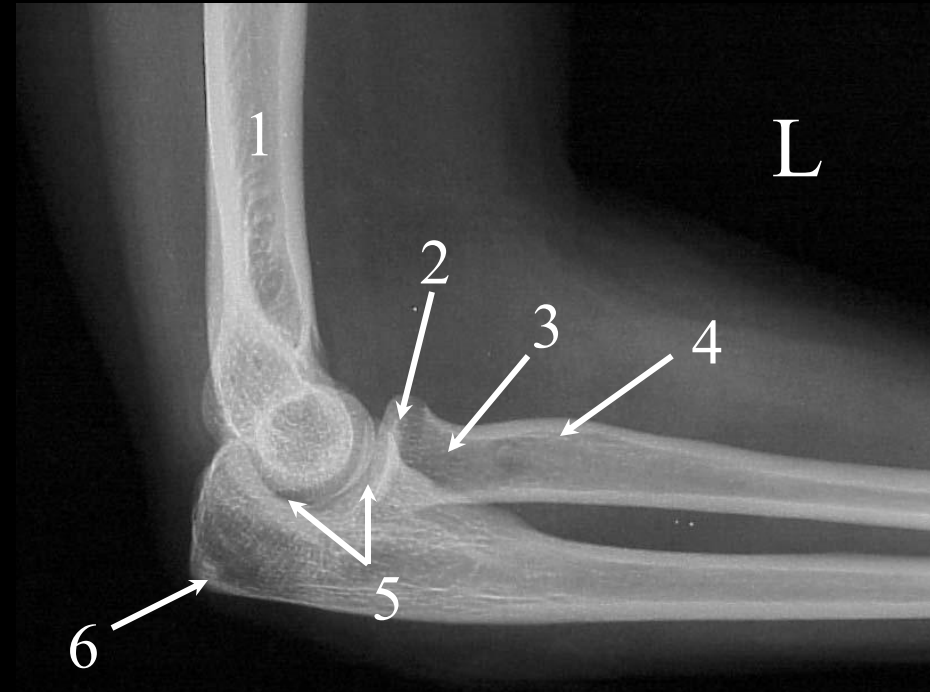
The arrow is pointing to the:

- a. olecranon process.
- b. coronoid process.
- c. coracoid process.
- d. trochlea.



# Question #59: Review

1. Shaft of the Humerus
2. Head of the Radius
3. Neck of the Radius
4. Radial Tuberosity
5. Trochlear or Semilunar Notch
6. Olecranon Process



# Question #60:

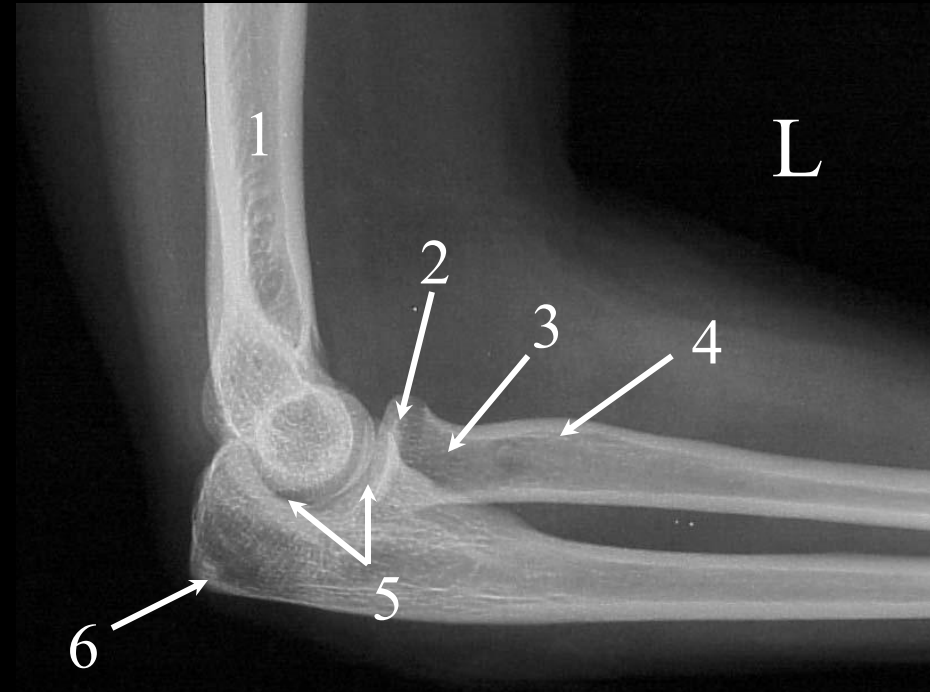
The arrows are pointing to the:

- a. coronoid process.
- b. head of the radius.
- c. trochlear or semilunar notch.
- d. coracoid process.



# Question #60: Review

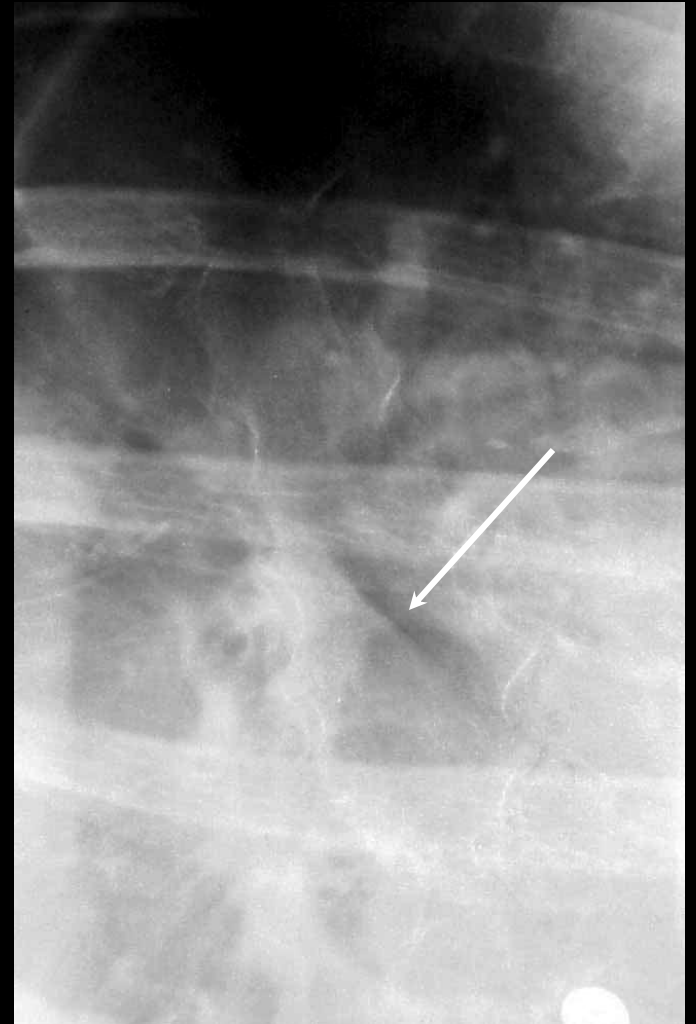
1. Shaft of the Humerus
2. Head of the Radius
3. Neck of the Radius
4. Radial Tuberosity
5. Trochlear or Semilunar Notch
6. Olecranon Process



# Question #61:

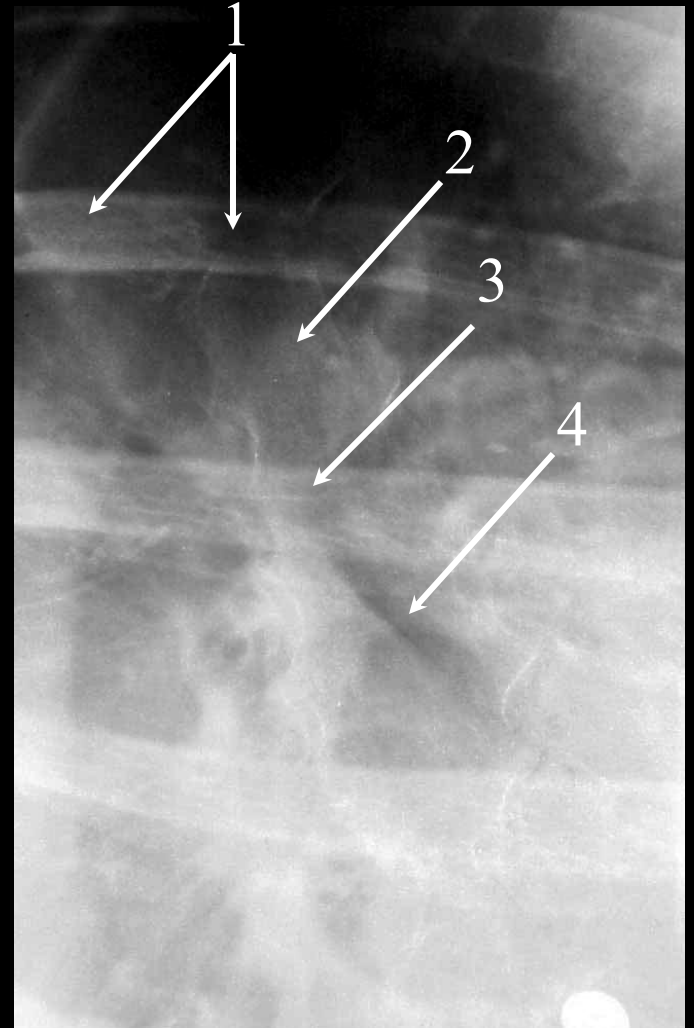
The arrow is pointing to the body of the sternum.

- a. True
- b. False



# Question #61: Review

1. Overlying Posterior Rib
2. Manubrium
3. Sternal Angle
4. Body of sternum



# Question #62:

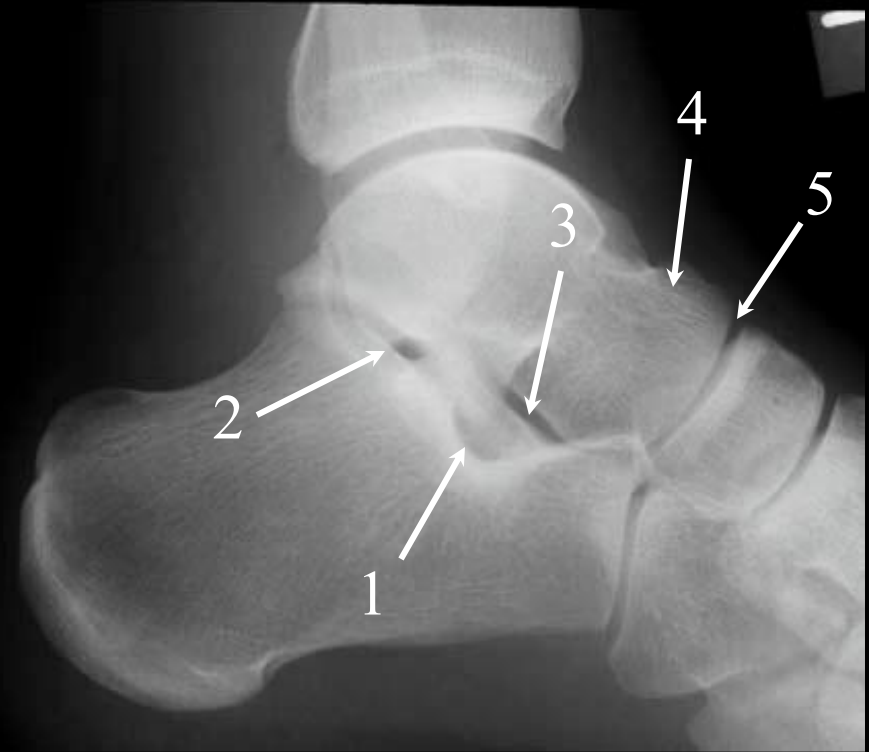
The arrow is pointing to the:

- a. subtalar joint.
- b. tarsal sinus.
- c. ankle joint.
- d. talocalcaneonavicular joint.



# Question #62: Review

1. Tarsal Sinus
2. **Subtalar Joint**
3. Talocalcaneonavicular Joint
4. Head of the Talus
5. Talonavicular Joint



# Question #63:

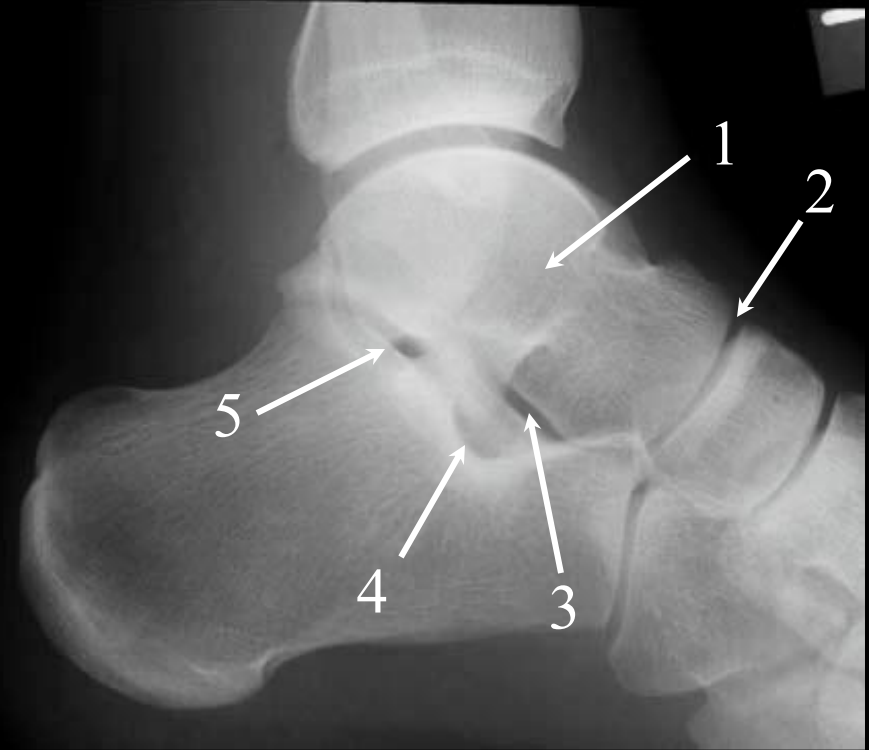
The arrow is pointing to the:

- a. navicular.
- b. calcaneous.
- c. talus.
- d. cuboid.



# Question #63: Review

1. Talus
2. Talonavicular Joint
3. Talocalcaneonavicular Joint
4. Tarsal Sinus
5. Subtalar Joint



# Question #64:

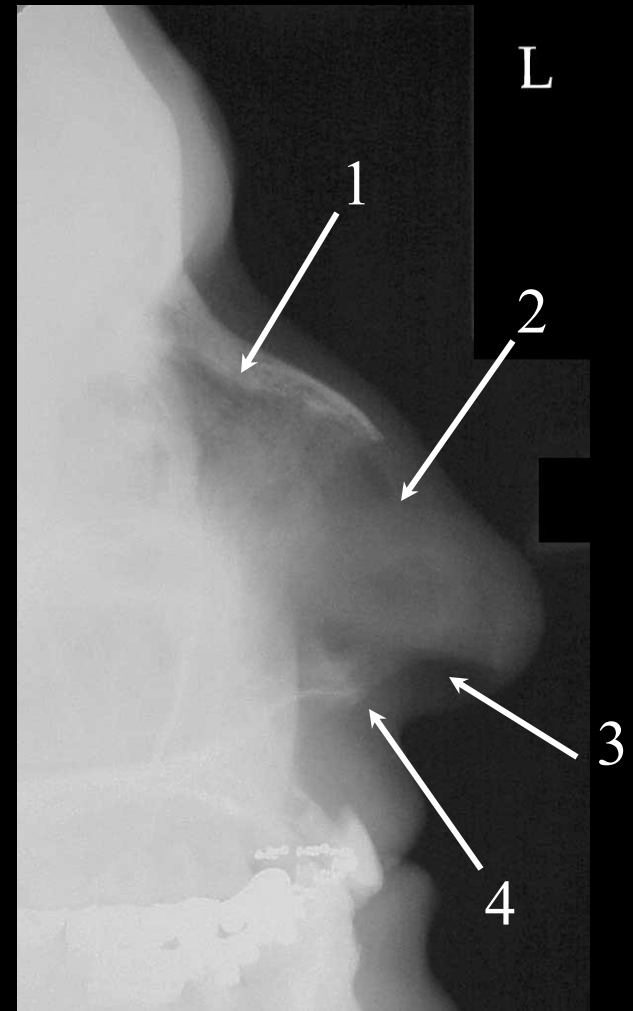
The arrow is pointing to the:

- a. nasal bones.
- b. nasal cartilage.
- c. anterior nasal apine.
- d. naris.



# Question #64: Review

1. Nasal Bones
2. Nasal Cartilage
3. Naris or Nostril
4. Anterior Nasal Spine



# Question #65:

The arrow is pointing to the:

- a. medial condyle of the tibia.
- b. tibial tuberosity.
- c. lateral condyle of the tibia.
- d. Ludloff's spot.



# Question #65: Review

1. Tibial Tuberosity
2. Apex of the Patella
3. Base of the Patella
4. Shaft of the Femur
5. Superimposed Condyles of the Femur
6. Fabella (sesamoid bone)
7. Intercondylar Eminence



# Question #66:

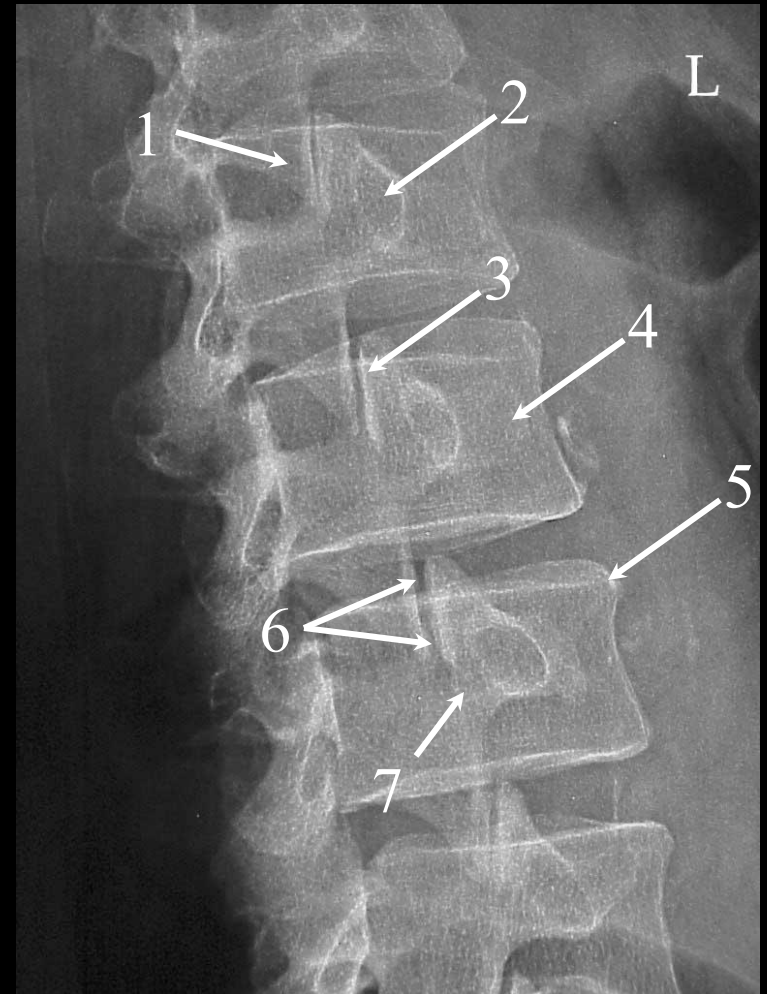
The arrow is pointing to the:

- a. inferior articulating process.
- b. transverse process.
- c. pars interarticularis.
- d. superior articulating process.



# Question #66: **Review**

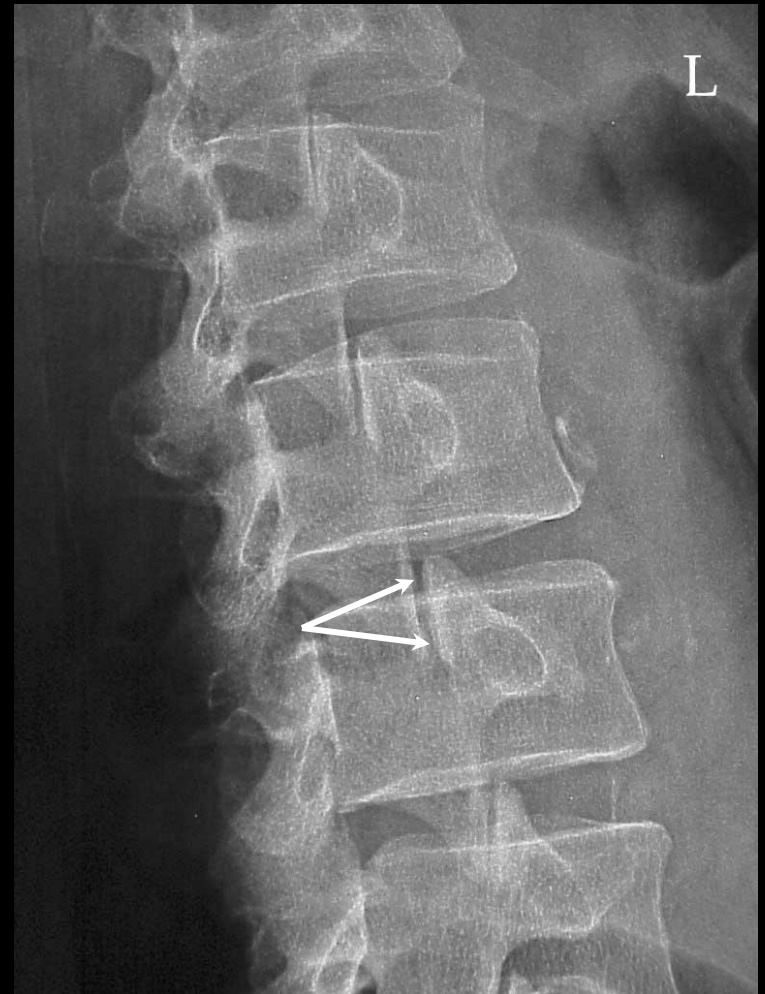
1. Inferior Articulating Process
2. Pedicle
3. Superior Articulating Process
4. Transverse Process
5. Body
6. Zygapophyseal Joint (vertical black line)
7. **Pars Interarticularis**



# Question #67:

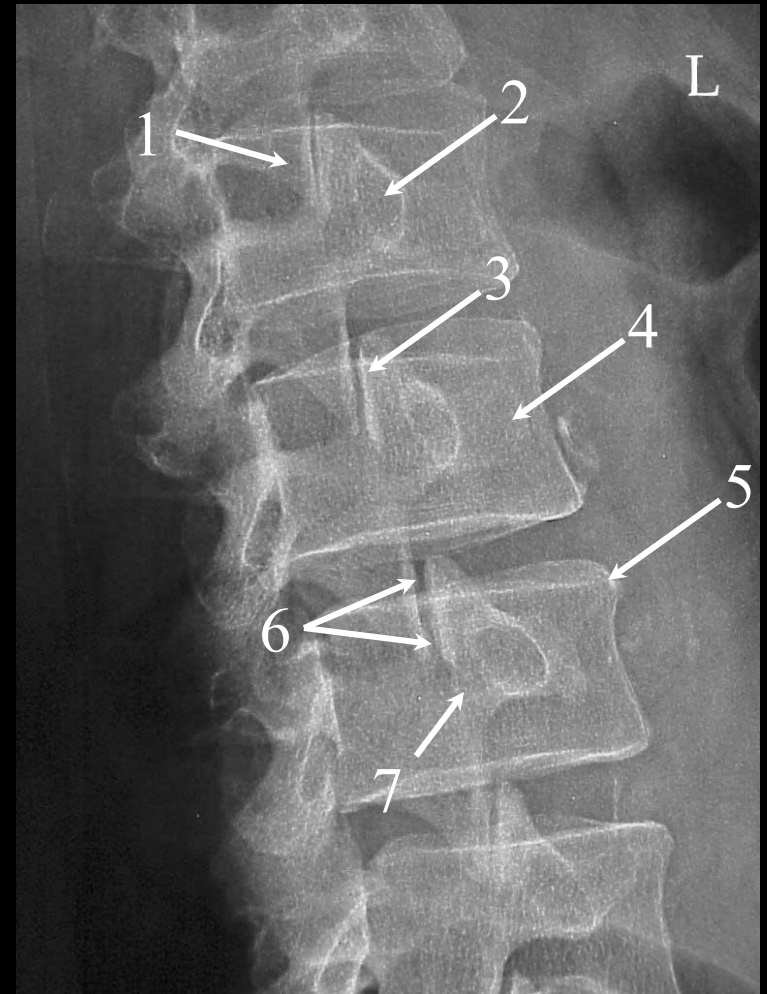
The arrows are pointing to the:

- a. zygapophyseal joint.
- b. pars interarticularis.
- c. transverse process.
- d. pedicle.

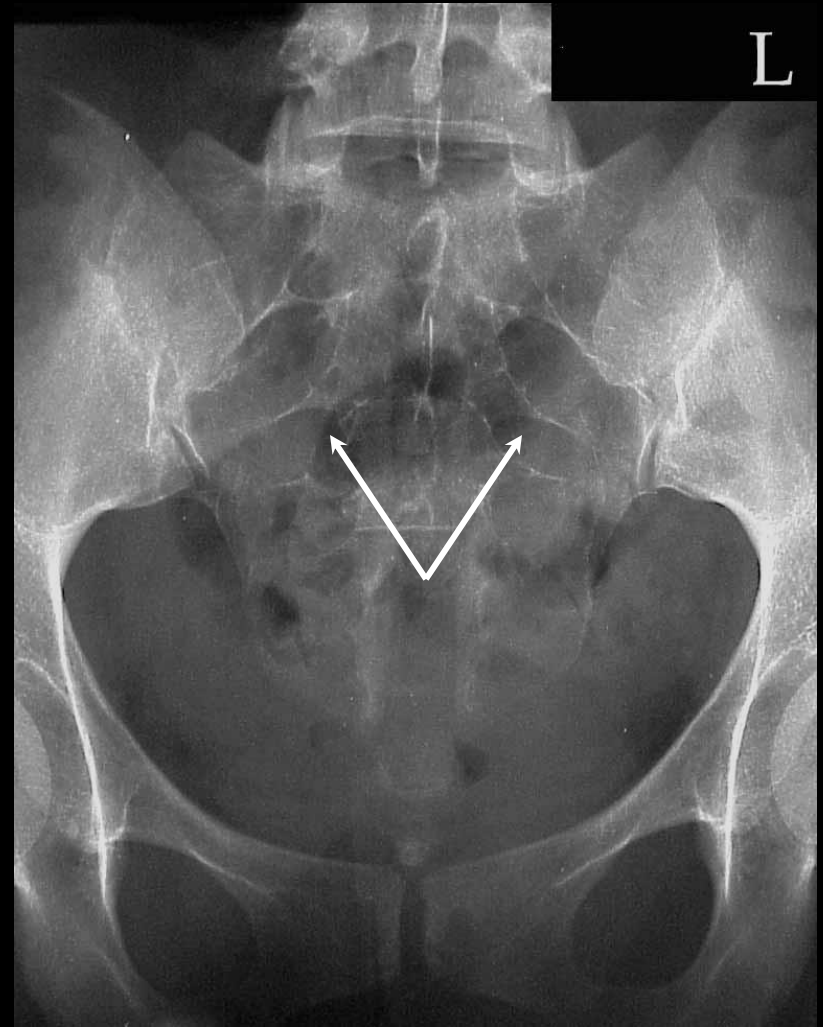


# Question #67: Review

1. Inferior Articulating Process
2. Pedicle
3. Superior Articulating Process
4. Transverse Process
5. Body
6. Zygapophyseal Joint (vertical black line)
7. Pars Interarticularis



# Question #68:

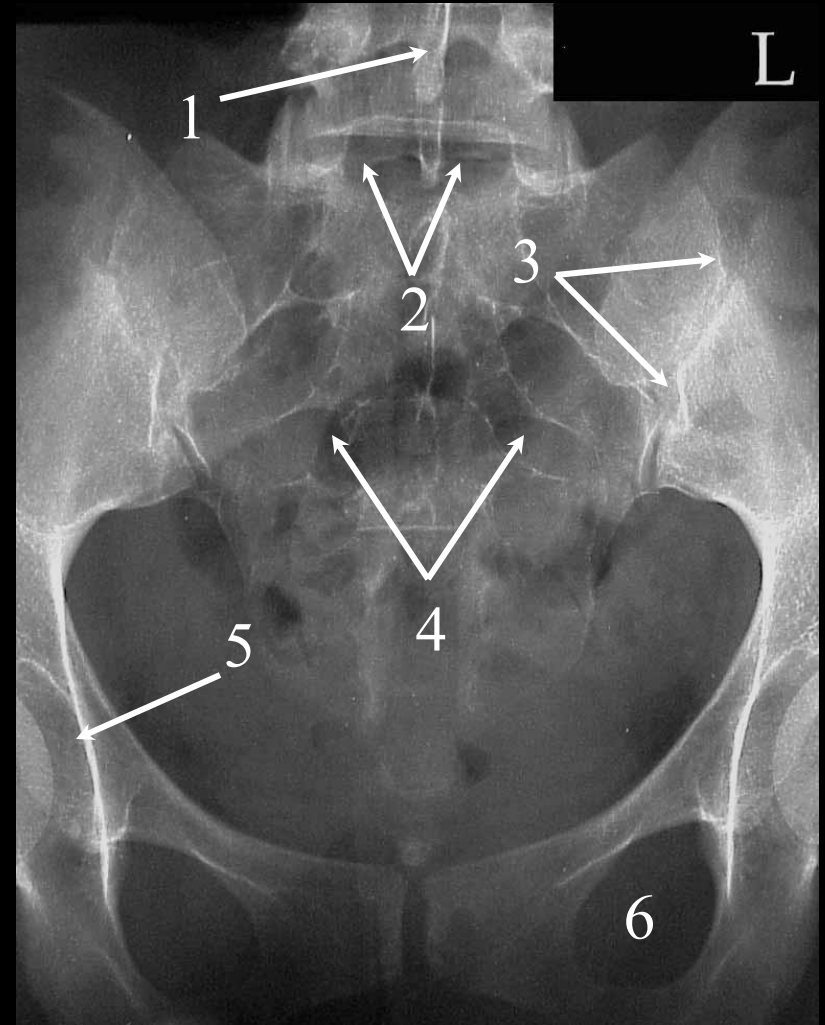


The arrows are pointing to the:

- a. spinous process.
- b. pedicle.
- c. sacral promontory.
- d. anterior sacral foramen.

# Question #68: Review

1. Spinous Process of L5
2. L5-S1 Joint Space
3. Sacroiliac (SI) Joint
4. Anterior Sacral Foramen
5. Acetabulum
6. Obturator Foramen



# Question #69:

Which of the following is the most likely cause of this benign bone lesion (arrow) that is commonly found in young adults?

- a. fibrosarcoma
- b. enchondroma
- c. osteochondroma
- d. osteosarcoma



# Question #69: Review



An **enchondroma** is a benign tumor that is often found in the hands, feet, and ribs of young adults. Note their lucent radiographic appearance.

# Question #70:

Which of the following diseases refers to a destruction of bone mass that makes patients more susceptible to fracture formation?

- a. osteomalacia
- b. osteopetrosis
- c. osteoporosis
- d. osteopoikilosis

# Question #70: Review

## Osteoporosis:

- This disease is characterized by a reduction in bone mass that makes patients with this condition susceptible to fracture formation.

The underlying mechanism in all cases is an imbalance between the body's normal process of bone destruction followed by bone growth.

- There are many factors involved in the pathogenesis of osteoporosis.

The primary causes are aging and postmenopausal hormone changes.

Other causes include steroid use, osteogenesis imperfecta, multiple myeloma, and inactivity.

# Question #71:

Which of the following diseases refers to a bacterial infection that causes bone destruction and abscess formation?

- a. gout
- b. osteomyelitis
- c. osteomalacia
- d. Paget's disease

# Question #71: Review

## Osteomyelitis:

- This condition is the result of a bacterial bone infection that causes bone destruction and abscess formation.

One characteristic is the formation of a Brodie's abscess. It is typically found in the tibia and is an indication of osteomyelitis.

- Another characteristic of osteomyelitis is a sequestrum formation.

This is an avascular "island" of bone that forms within an abscess.

It is commonly referred to as a bone-in-bone formation.

- Osteomyelitis can be acute or chronic.
- It is usually treated with prolonged antibiotic therapy.

# Question #72:

The ivory vertebra demonstrated on this radiograph is an example of an osteoblastic bone tumor.

- a. True
- b. False



# Question #72: **Review**

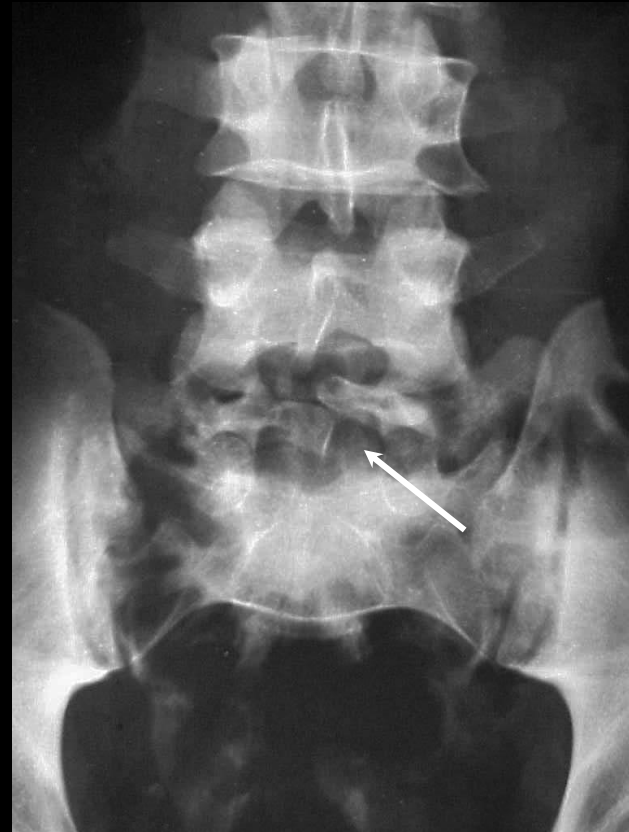


**Osteoblastic** bone tumors cause excessive bone growth and result in an increase in calcium deposits. As a result, they have an opaque radiographic appearance.

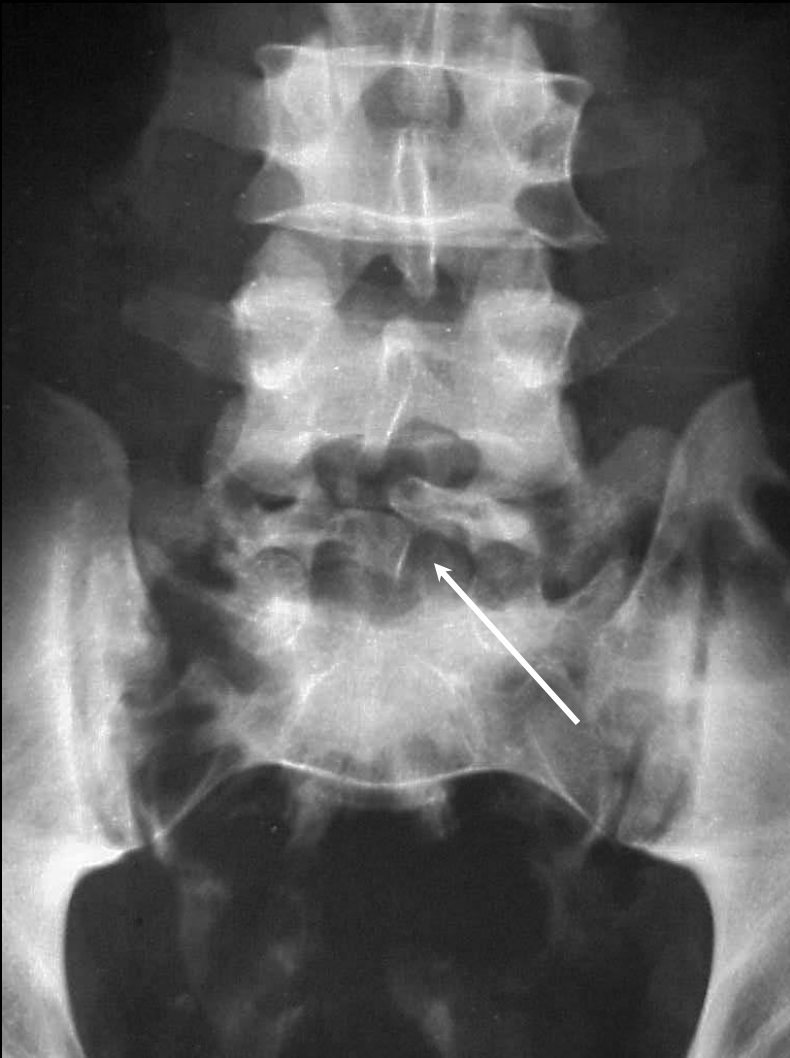
# Question #73:

Which of the following terms would be used to best describe the condition (arrow) depicted on this radiograph of the lumbar spine?

- a. spondylosis
- b. spina bifida occulta
- c. spinal stenosis
- d. spondylolisthesis



# Question #73: Review

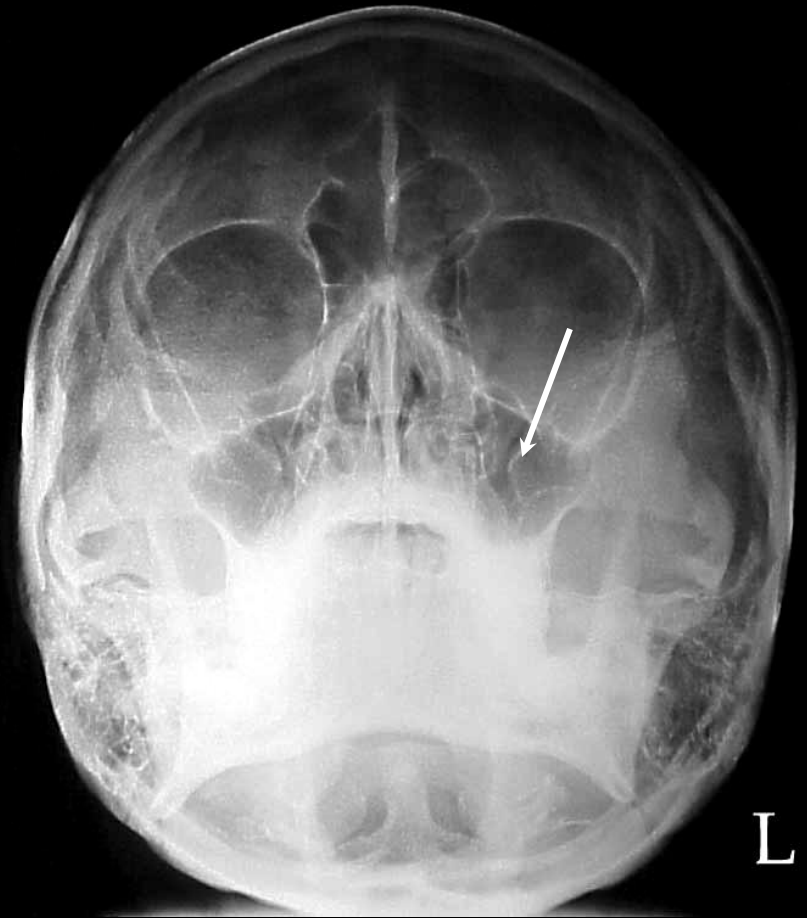


The arrow is pointing to L5 on a patient that has **spina bifida occulta**. Note how the lamina have failed to connect posteriorly to form a proper spinous process.

# Question #74:

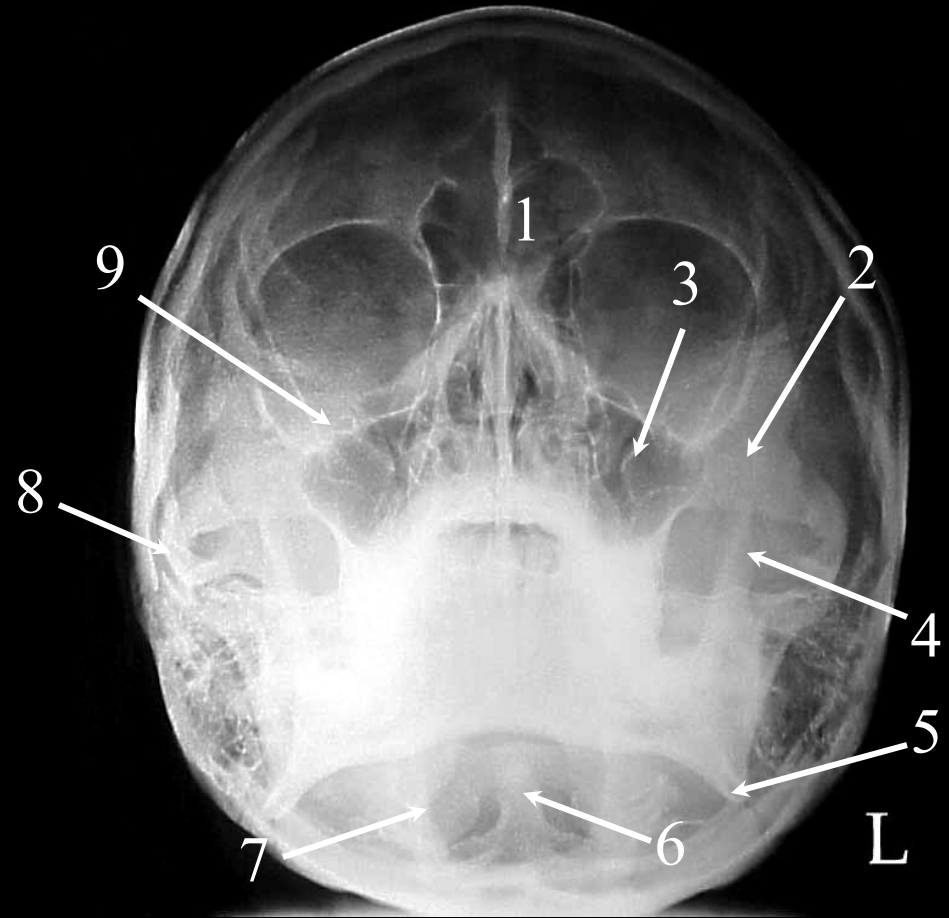
The arrow is pointing to the:

- a. ethmoid sinus.
- b. infraorbital margin.
- c. inferior nasal conchae.
- d. maxillary sinus.



# Question #74: Review

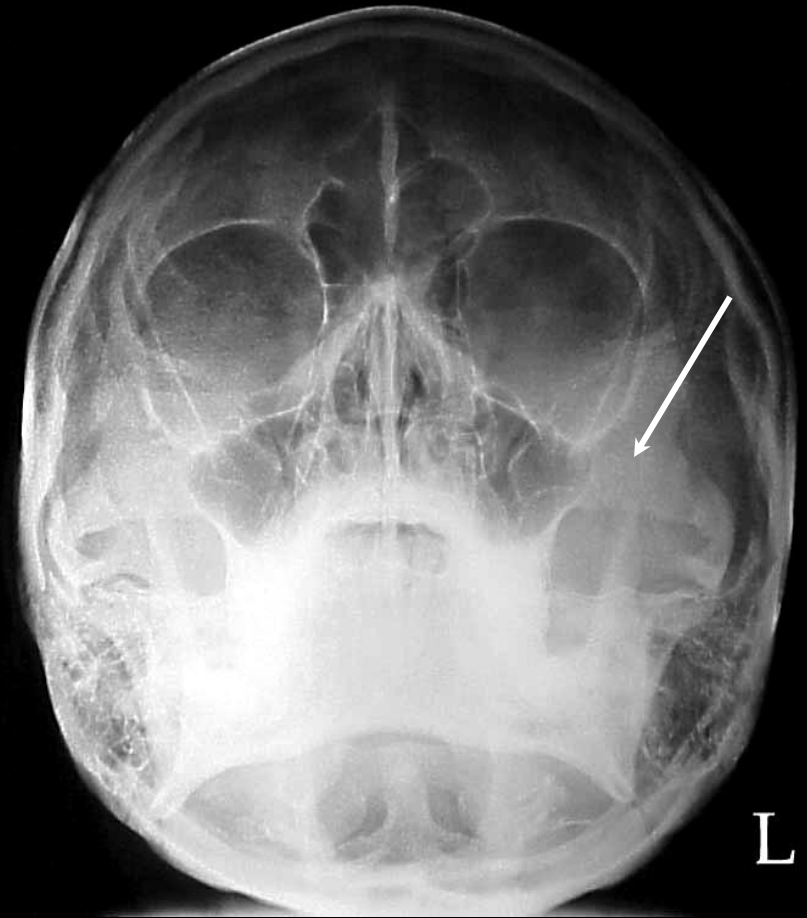
1. Frontal Sinus
2. Zygoma or Malar Bone
- 3. Maxillary Sinus**
4. Coronoid Process of the Mandible
5. Angle of the Mandible
6. Dens or Odontoid
7. Foramen Magnum
8. Zygomatic Arch
9. Infraorbital Foramen



# Question #75:

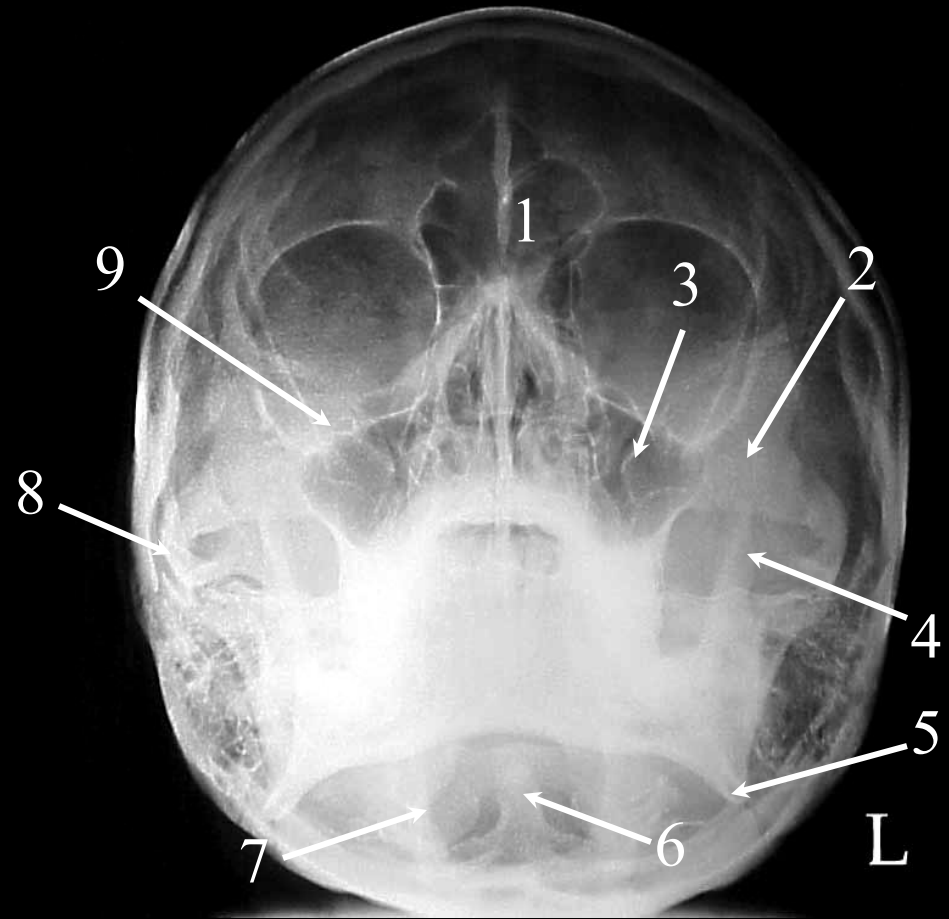
The arrow is pointing to the \_\_\_\_\_ bone.

- a. zygomatic
- b. temporal
- c. maxillary
- d. ethmoid



# Question #75: Review

1. Frontal Sinus
2. Zygoma or Malar Bone
3. Maxillary Sinus
4. Coronoid Process of the Mandible
5. Angle of the Mandible
6. Dens or Odontoid
7. Foramen Magnum
8. Zygomatic Arch
9. Infraorbital Foramen



# Question #76:

Which of the following is the most likely type of the fracture identified by the arrows on this oblique foot radiograph?

- a. Jones fracture
- b. Comminuted fracture
- c. avulsion fracture
- d. torus fracture



# Question #76: Review

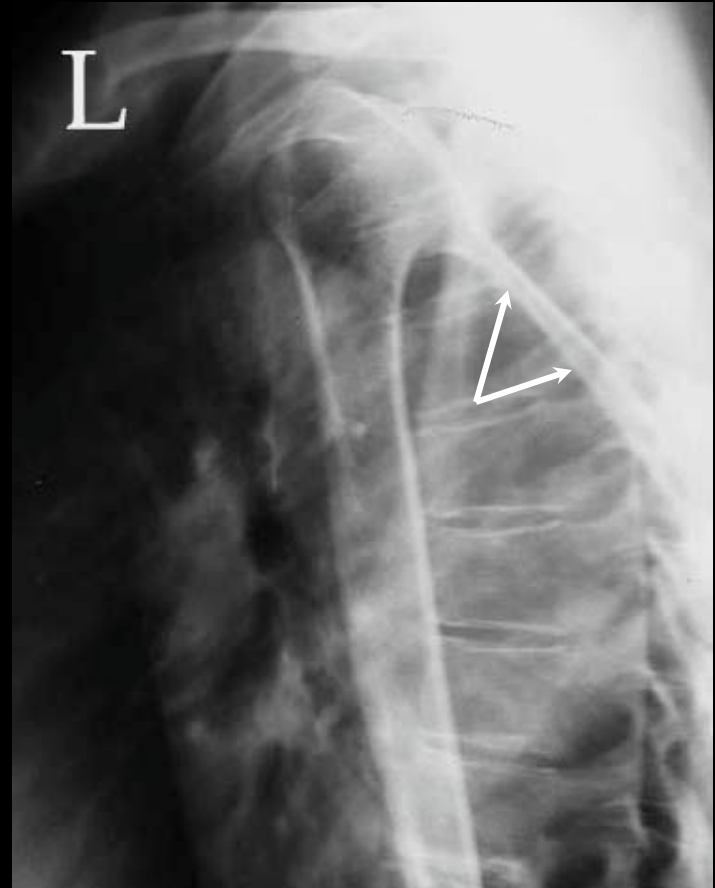


The most common fracture of the 5th metatarsal is called an **avulsion fracture**. This is sometimes called a “**Pseudo-Jones**” fracture, and it occurs when the peroneus brevis tendon tears off a piece of the base of the 5th metatarsal (arrow). It is usually not badly displaced and is often treated with a walking cast or boot.

# Question #77:

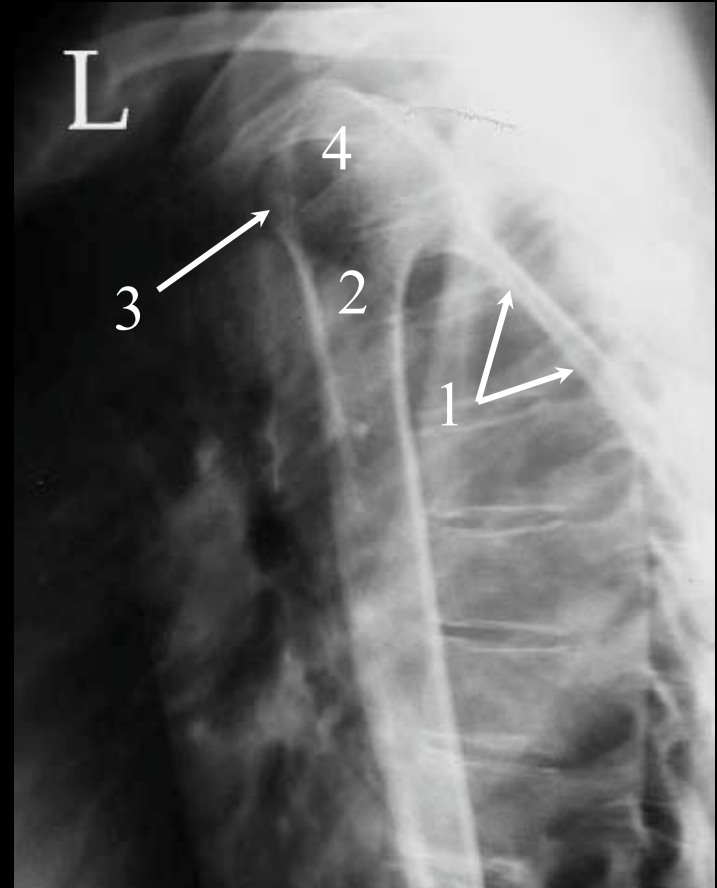
The arrows are pointing to the:

- a. scapula.
- b. trachea.
- c. esophagus.
- d. None of the Above



# Question #77: Review

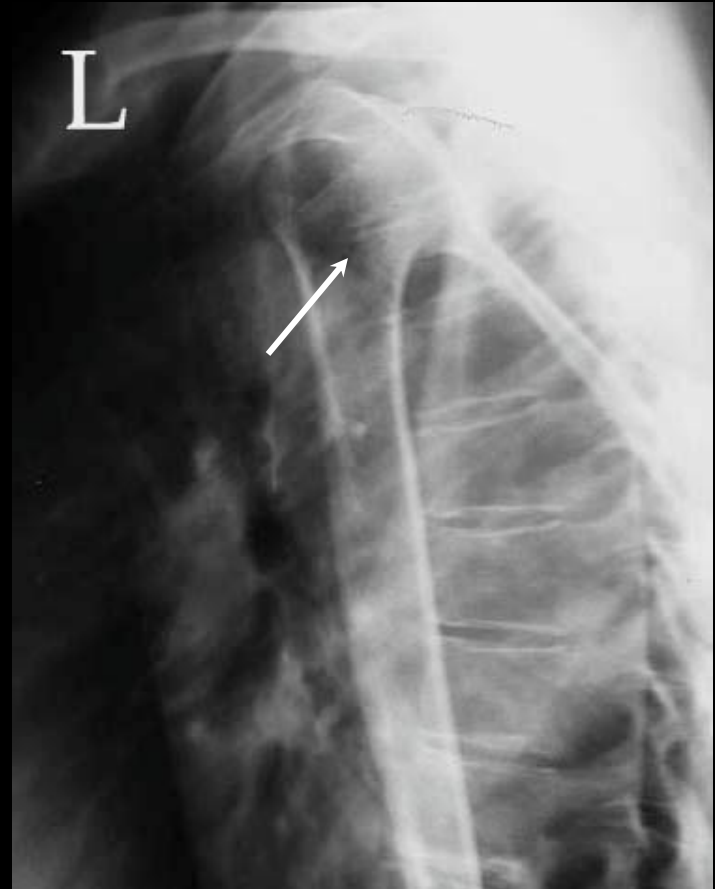
1. Scapula
2. Surgical Neck of the Humerus
3. Greater Tubercle of the Humerus
4. Head of the Humerus



# Question #78:

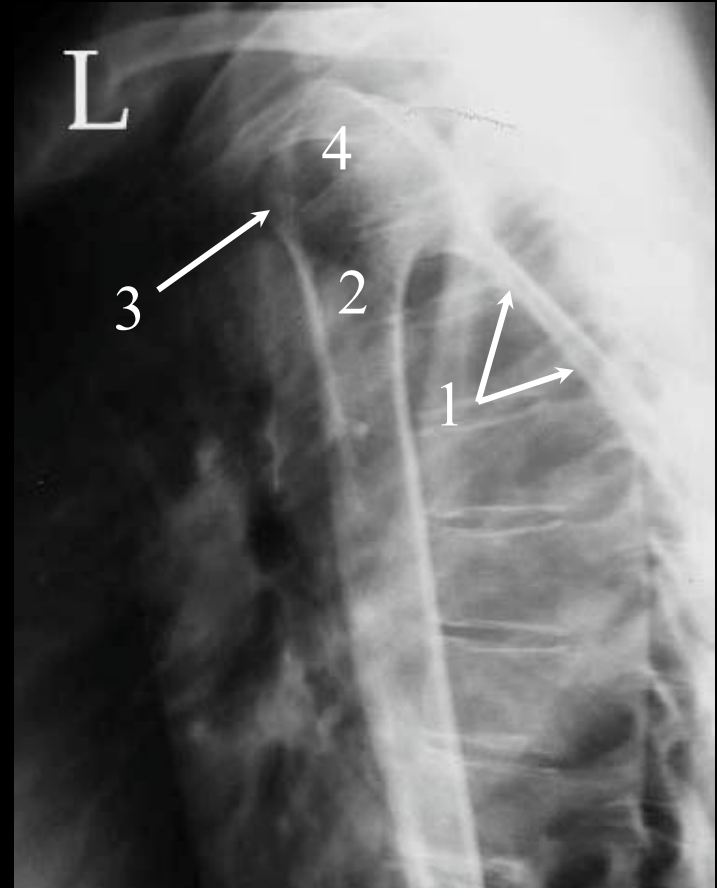
The arrows are pointing to the:

- a. anatomical neck.
- b. surgical neck.
- c. greater tubercle.
- d. intertubercular groove.



# Question #78: **Review**

1. Scapula
- 2. Surgical Neck of the Humerus**
3. Greater Tubercle of the Humerus
4. Head of the Humerus



# Question #79:

The arrows are pointing to the \_\_\_\_\_ of the mandible.

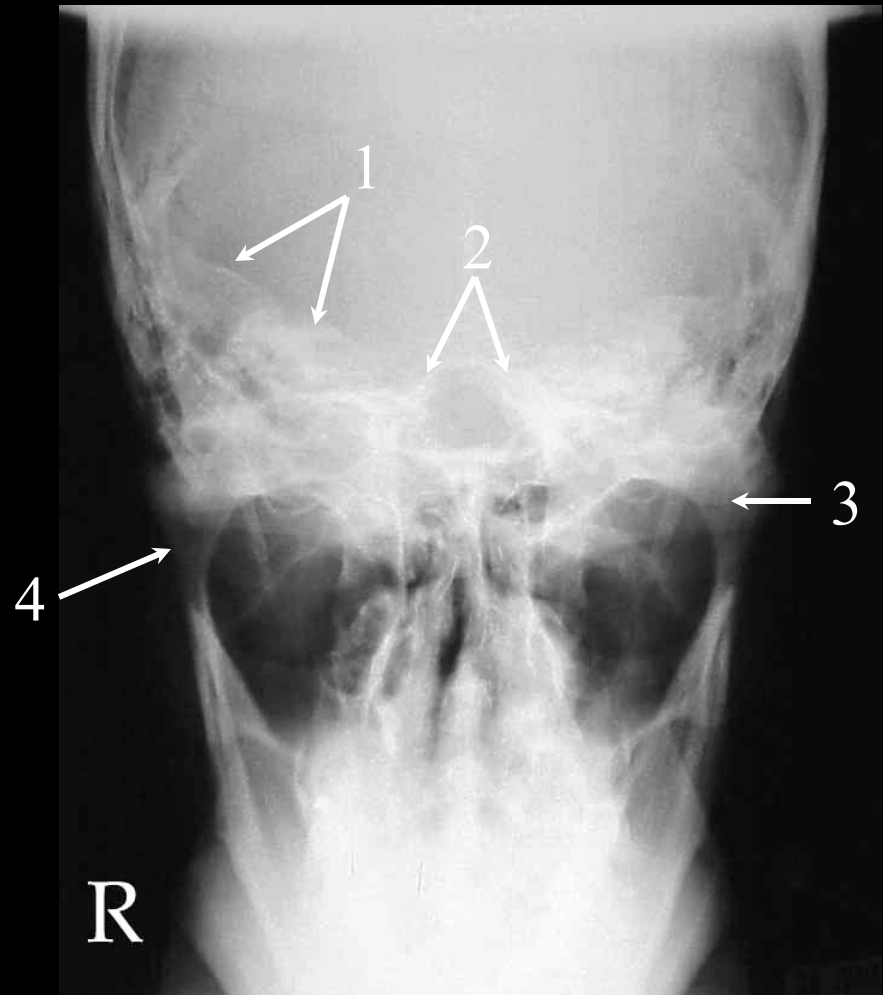
- a. mentum
- b. condyle
- c. coronoid process
- d. ramus



# Question #79: Review

This radiograph is properly positioned. The partial has been removed and the mentum has been collimated off.

1. Petrous Ridges
2. Shadow of the Foramen Magnum
3. Head of the Condyle
4. Neck of the Condyle



# Question #80:

The arrow is pointing to the:

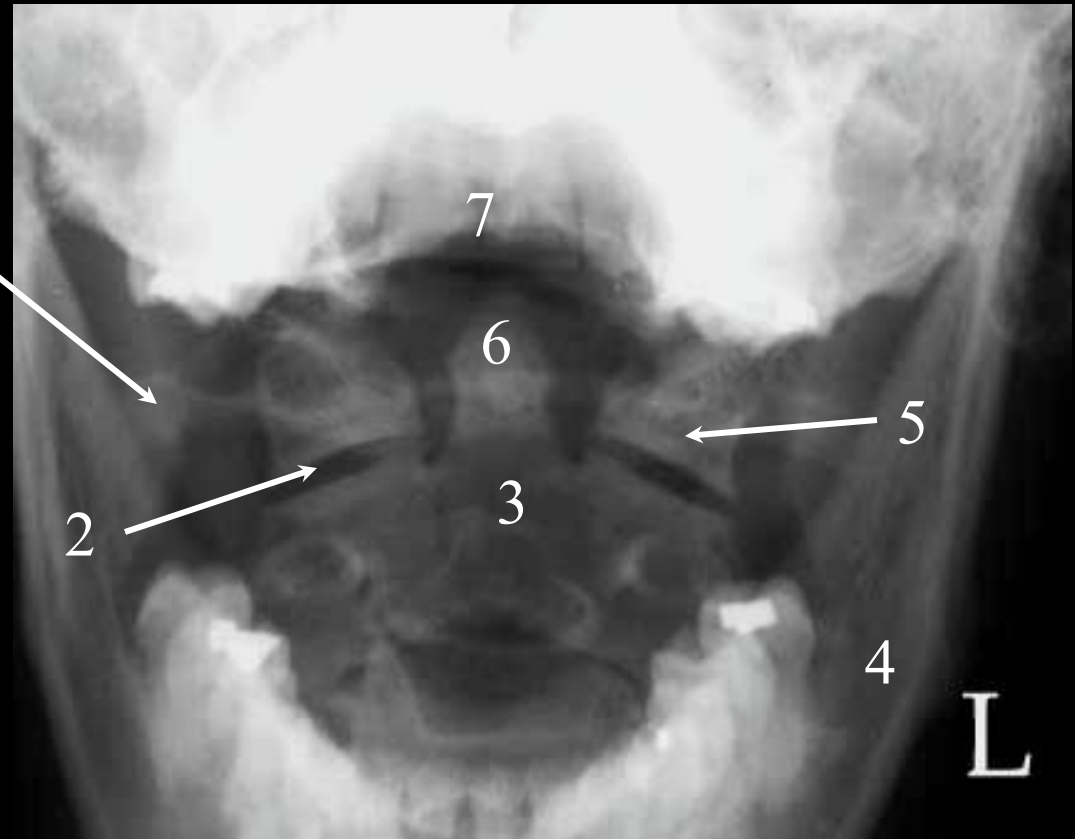
- a. zygapophyseal joint.
- b. transverse process.
- c. anterior arch.
- d. lamina.



# Question #80: Review

Properly Positioned

1. Transverse Process of C1
2. Zygapophyseal Joint of C1-C2
3. Body of C2
4. Body of the Mandible
5. Lateral Mass of C1
6. Odontoid or Dens
7. Upper Incisors



# Question #81:

The arrow is pointing to the:

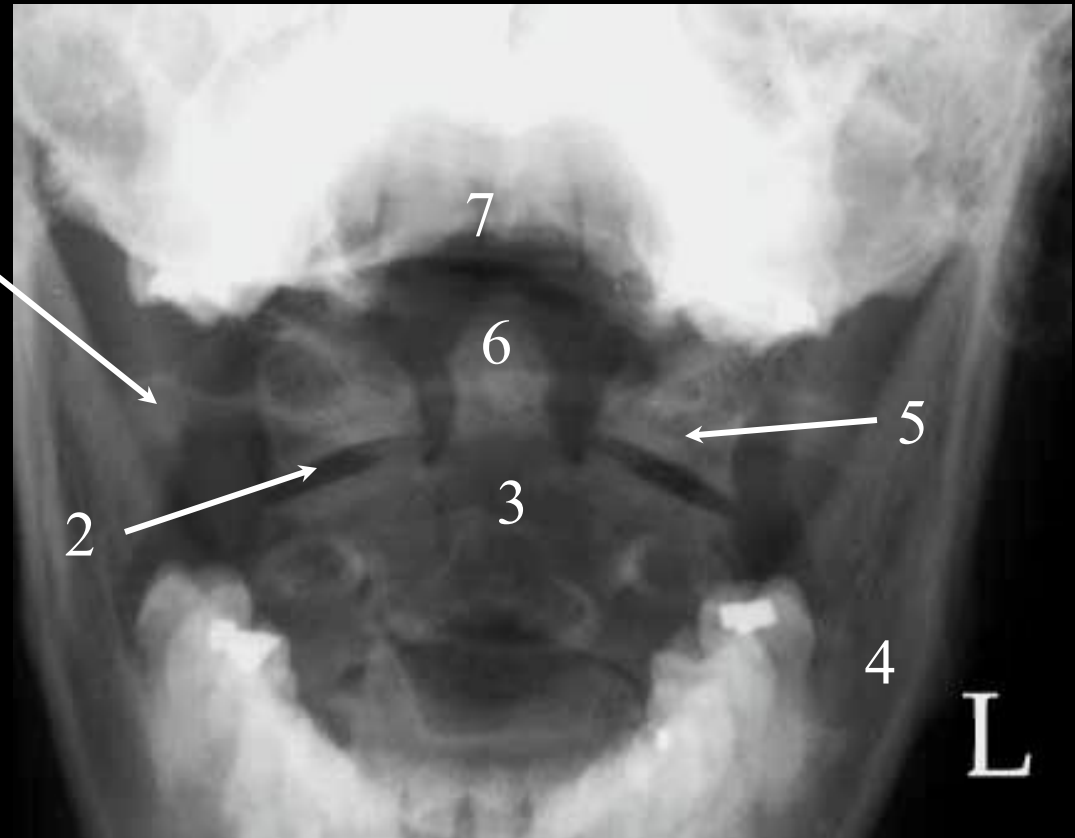
- a. transverse process.
- b. anterior arch.
- c. lateral mass.
- d. zygapophyseal joint.



# Question #81: Review

Properly Positioned

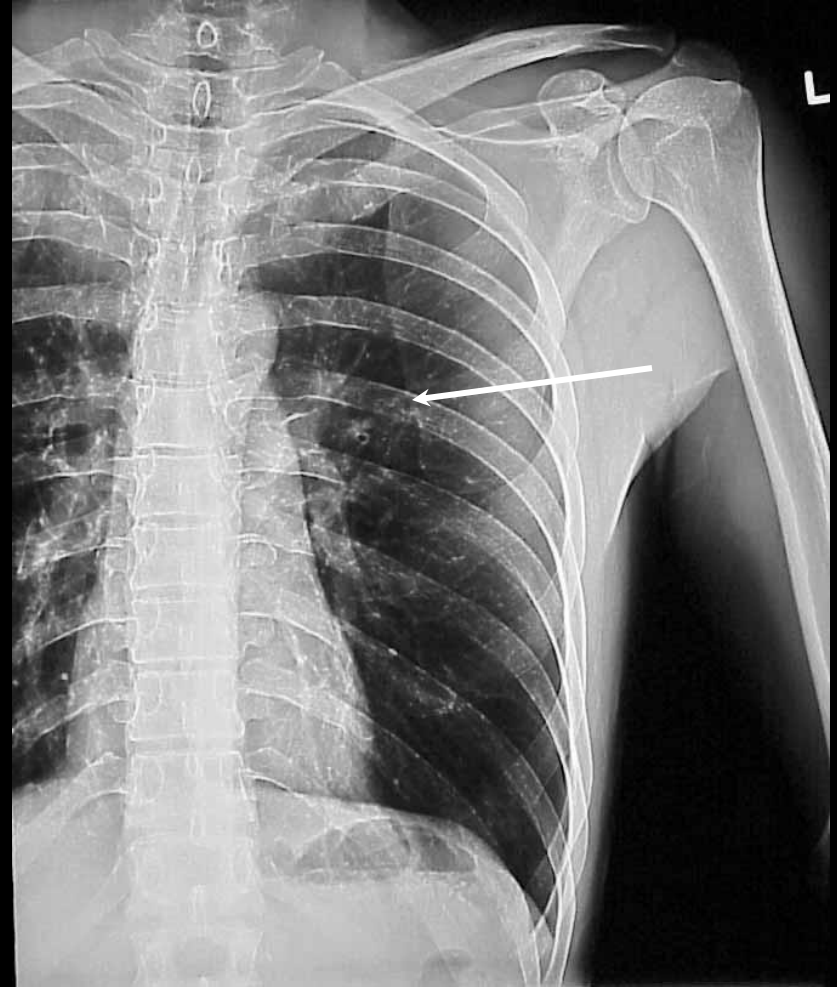
1. Transverse Process of C1
2. Zygapophyseal Joint of C1-C2
3. Body of C2
4. Body of the Mandible
- 5. Lateral Mass of C1**
6. Odontoid or Dens
7. Upper Incisors



# Question #82:

The arrow is pointing to the 6<sup>th</sup> posterior rib.

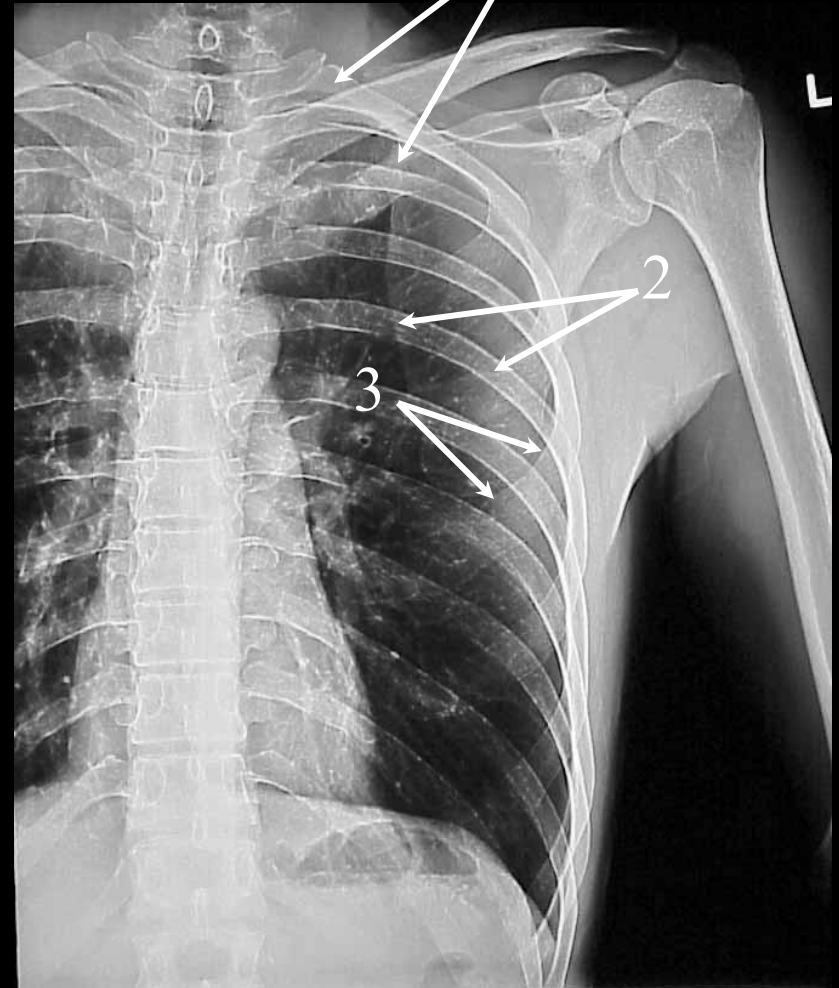
- a. True
- b. False



# Question #82: Review<sup>1</sup>

Above the diaphragm rib technique includes using 65 to 75 kVp and the film must be taken on inspiration.

1. 1<sup>st</sup> Rib
2. Posterior Aspect of the 5<sup>th</sup> Rib
3. Axillary Aspect of the 4<sup>th</sup> Rib



# Question #83:

Which of the following is the most likely type of the fracture identified by the arrows on this cone down of an oblique hand?

- a. Monteggia fracture
- b. boxer's fracture
- c. Salter-Harris fracture
- d. Jones fracture



# Question #83: **Review**

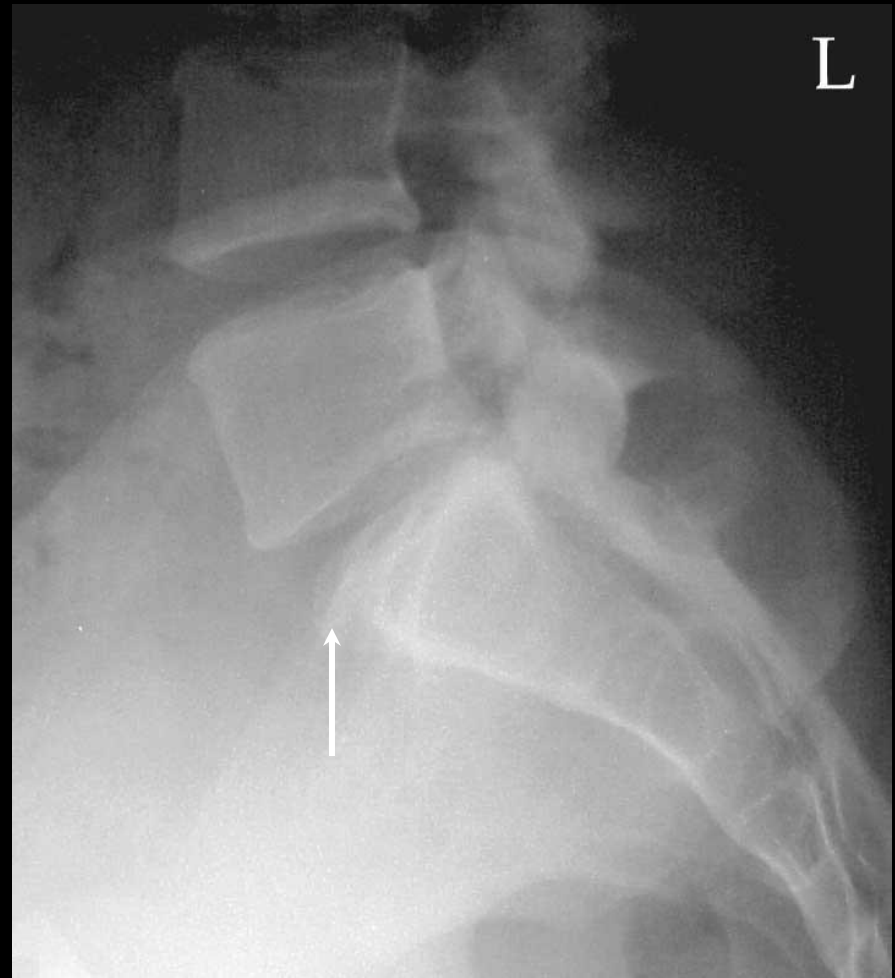


This **boxer's fracture** occurred at the head of the 5th metacarpal (arrow) and it is almost always the result of the patient striking another person or a wall. Surgery may be indicated to reduce this fracture in severe cases.

# Question #84:

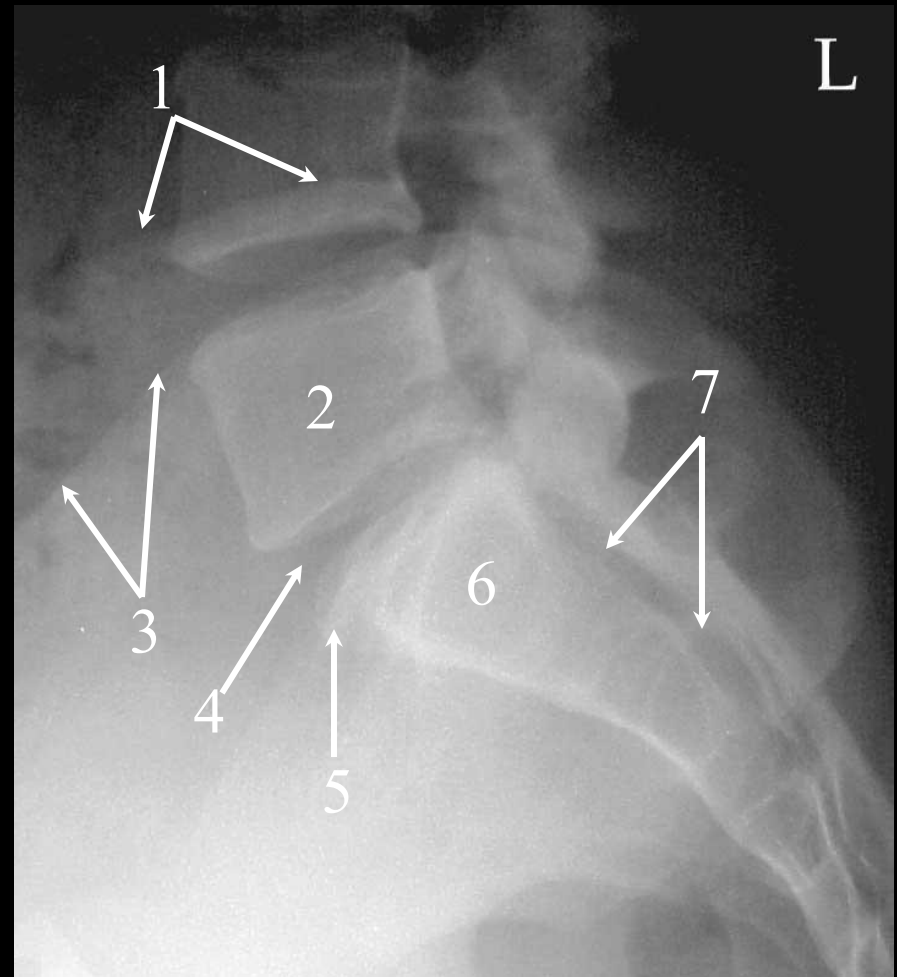
The arrow is pointing to the:

- a. ASIS.
- b. L5/S1 joint space.
- c. sacral promontory.
- d. None of the Above



# Question #84: Review

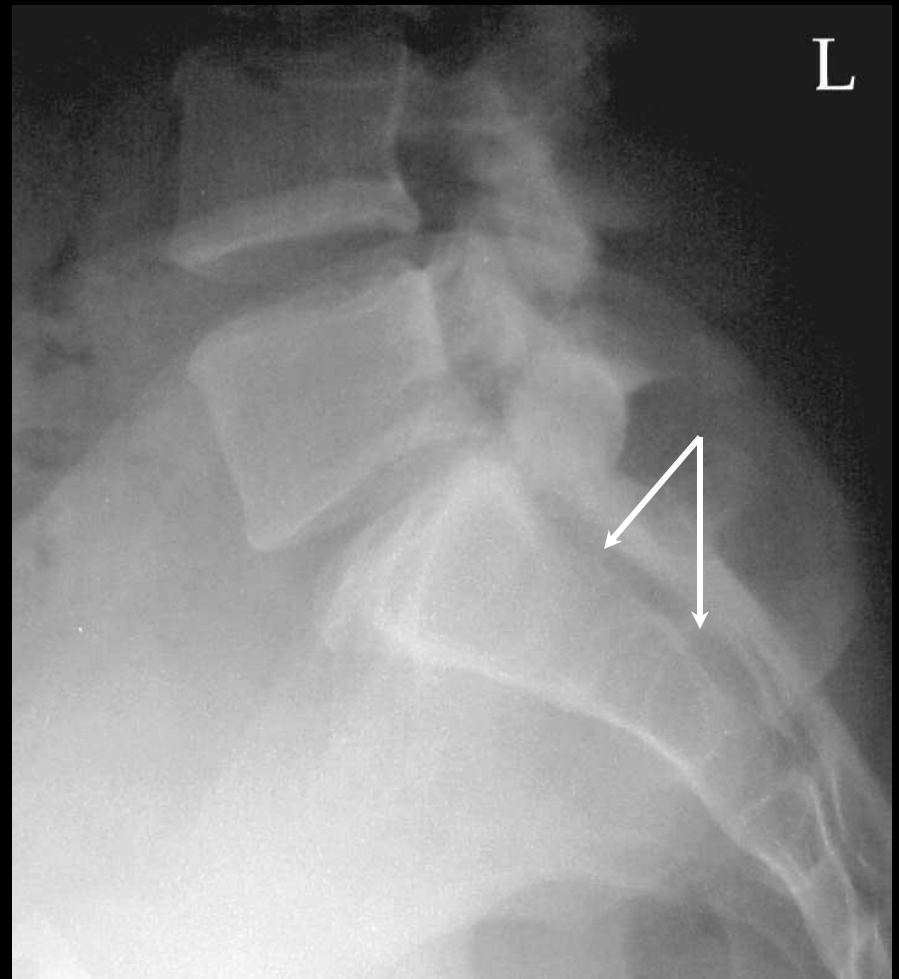
1. Top of the Right Iliac Crest  
(magnified due to OID)
2. Body of L5
3. Top of the Left Iliac Crest
4. L5-S1 Joint Space
- 5. Sacral Promontory**
6. 1<sup>st</sup> Sacral Segment
7. Sacral Canal



# Question #85:

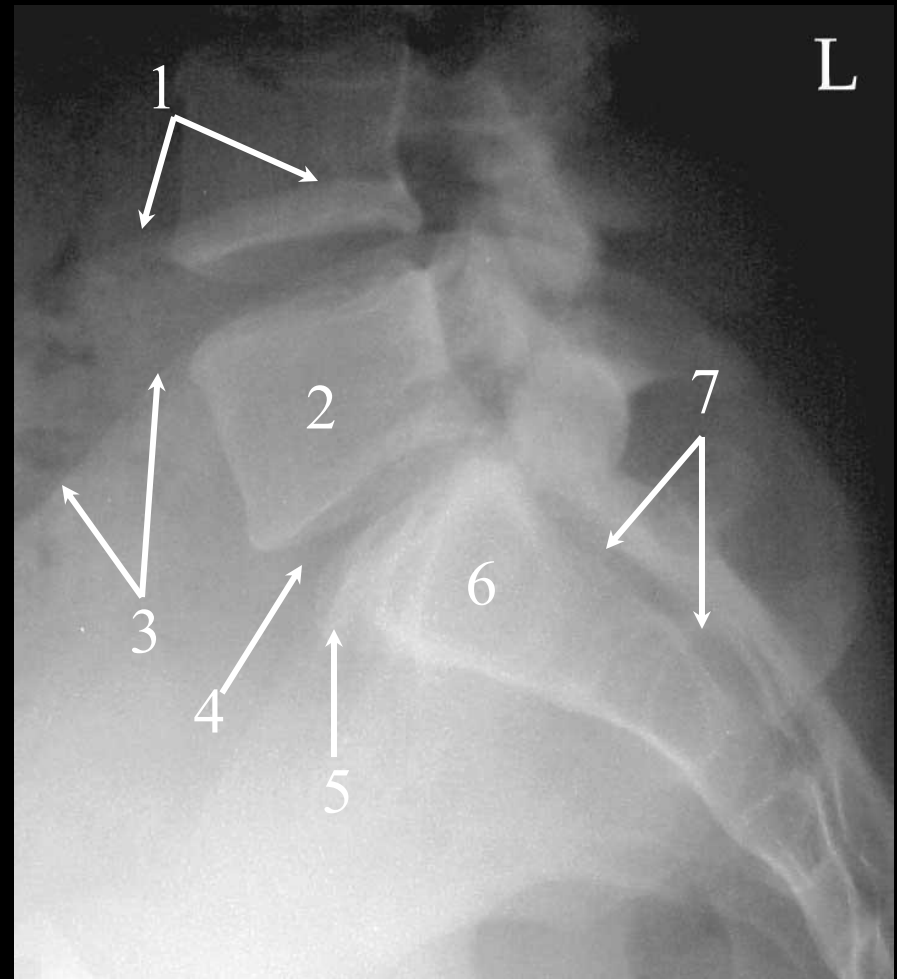
The arrows are pointing to the:

- a. sacral canal.
- b. anterior sacral foramen.
- c. posterior sacral foramen.
- d. spinous process.



# Question #85: Review

1. Top of the Right Iliac Crest  
(magnified due to OID)
2. Body of L5
3. Top of the Left Iliac Crest
4. L5-S1 Joint Space
5. Sacral Promontory
6. 1<sup>st</sup> Sacral Segment
7. Sacral Canal



# Question #86:

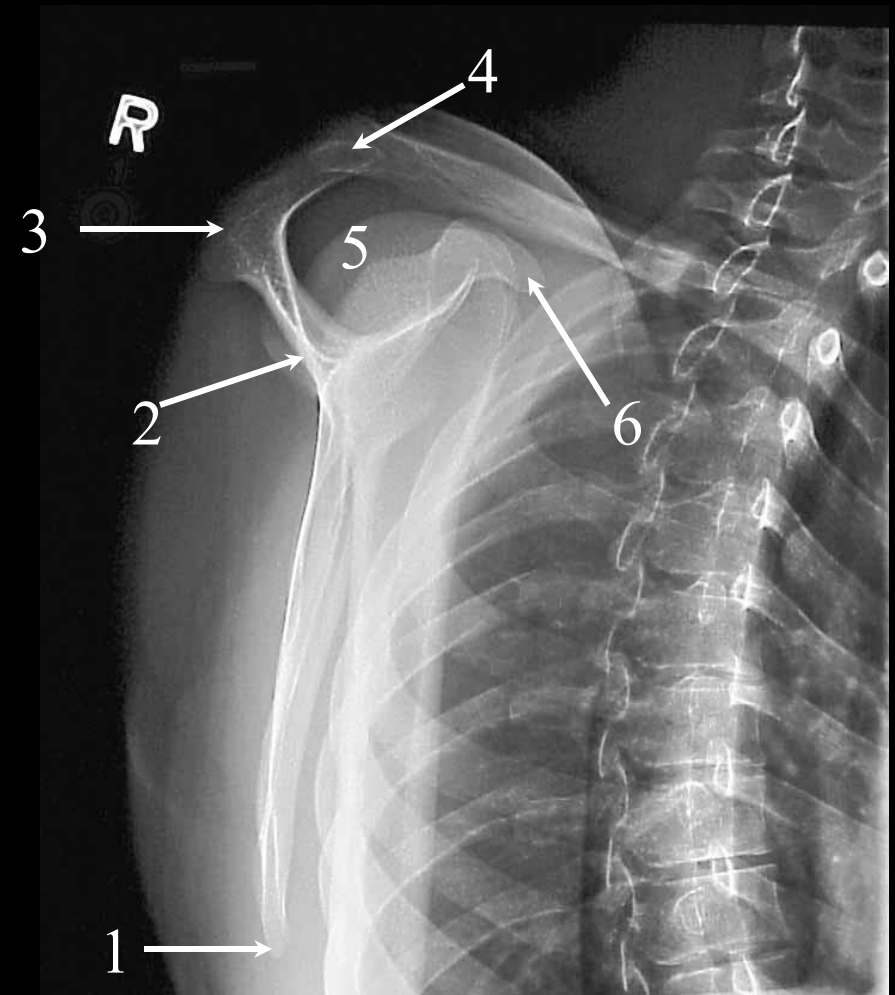
The arrow is pointing to the:

- a. AC joint.
- b. scapular spine.
- c. acromion process.
- d. coracoid process.



# Question #86: **Review**

1. Inferior Angle of the Scapula
2. Spine of the Scapula
- 3. Acromion Process**
4. AC Joint
5. Head of the Humerus
6. Coracoid Process



# Question #87:

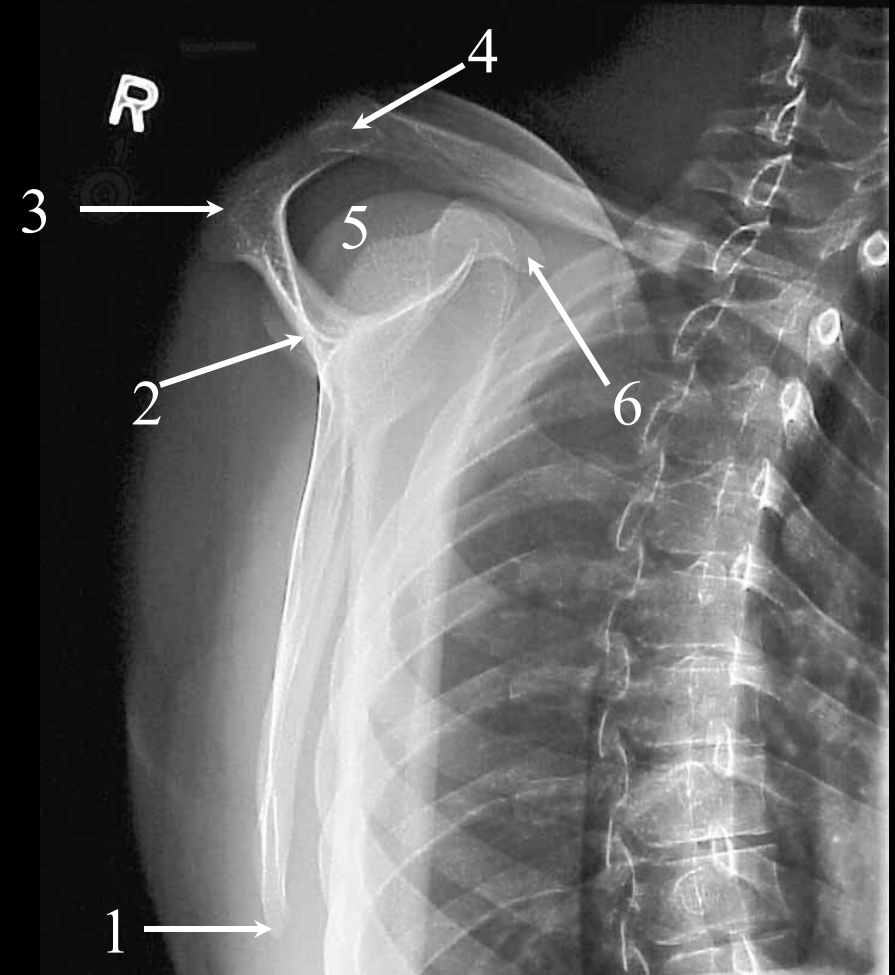
The arrow is pointing to the:

- a. coracoid process.
- b. acromion process.
- c. scapular spine.
- d. AC joint.



# Question #87: Review

1. Inferior Angle of the Scapula
2. Spine of the Scapula
3. Acromion Process
4. AC Joint
5. Head of the Humerus
6. Coracoid Process



# Question #88:

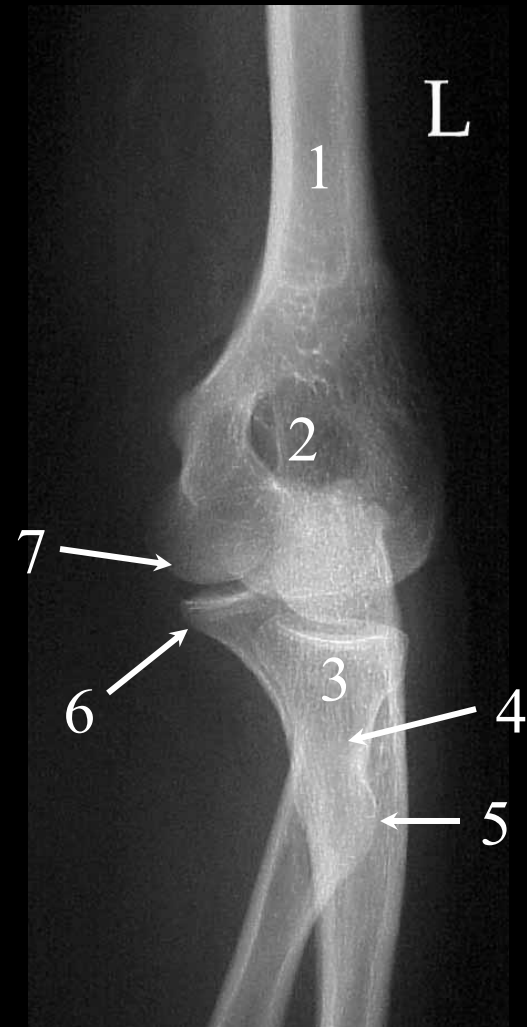
The arrow is pointing to the \_\_\_\_\_ of the radius.

- a. trochlea
- b. capitulum
- c. coronoid process
- d. head



# Question #88: Review

1. Shaft of the Humerus
2. Olecranon Fossa
3. Head of the Radius
4. Neck of the Radius
5. Radial Tuberosity
6. Coronoid Process
7. Trochlea



# Question #89:

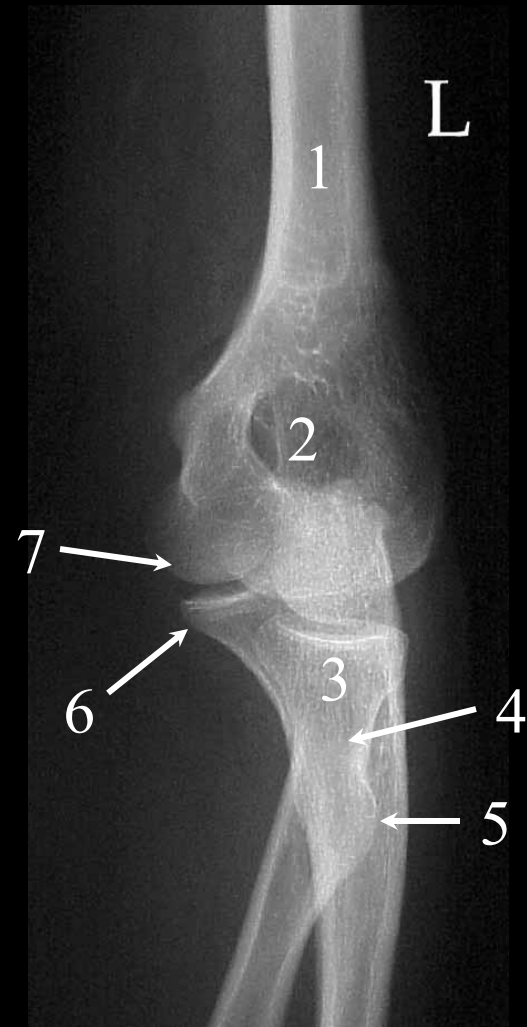
The arrow is pointing to the \_\_\_\_\_ of the radius.

- a. tuberosity
- b. neck
- c. head
- d. capitulum



# Question #89: Review

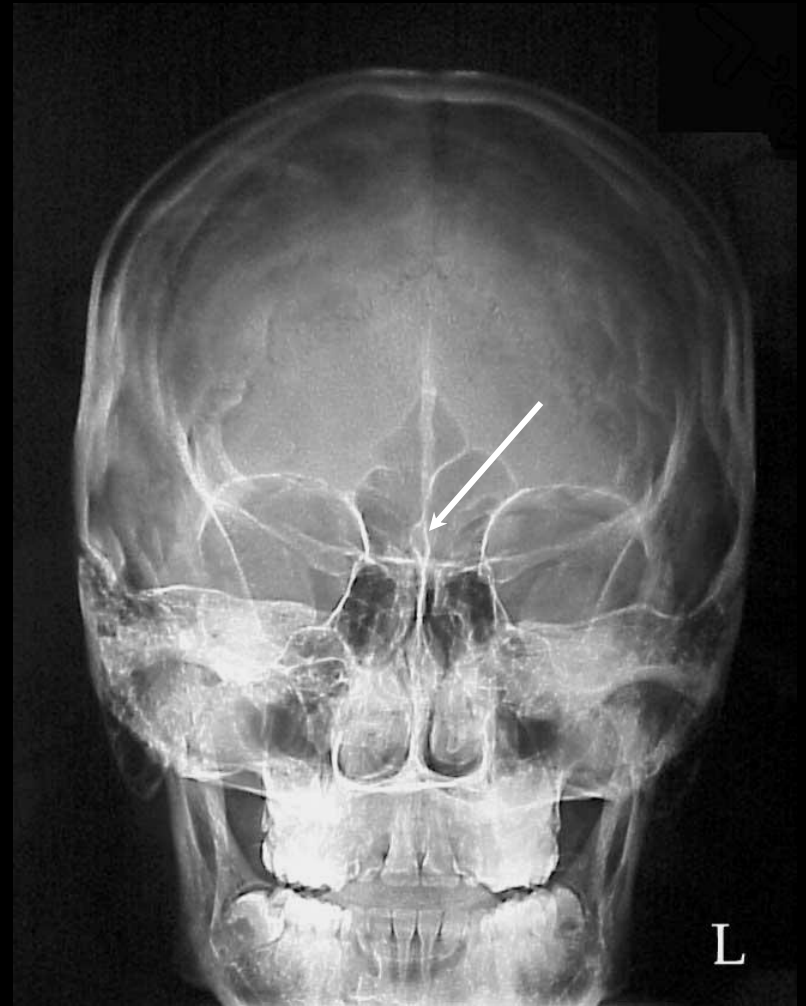
1. Shaft of the Humerus
2. Olecranon Fossa
3. Head of the Radius
4. Neck of the Radius
5. Radial Tuberosity
6. Coronoid Process
7. Trochlea



# Question #90:

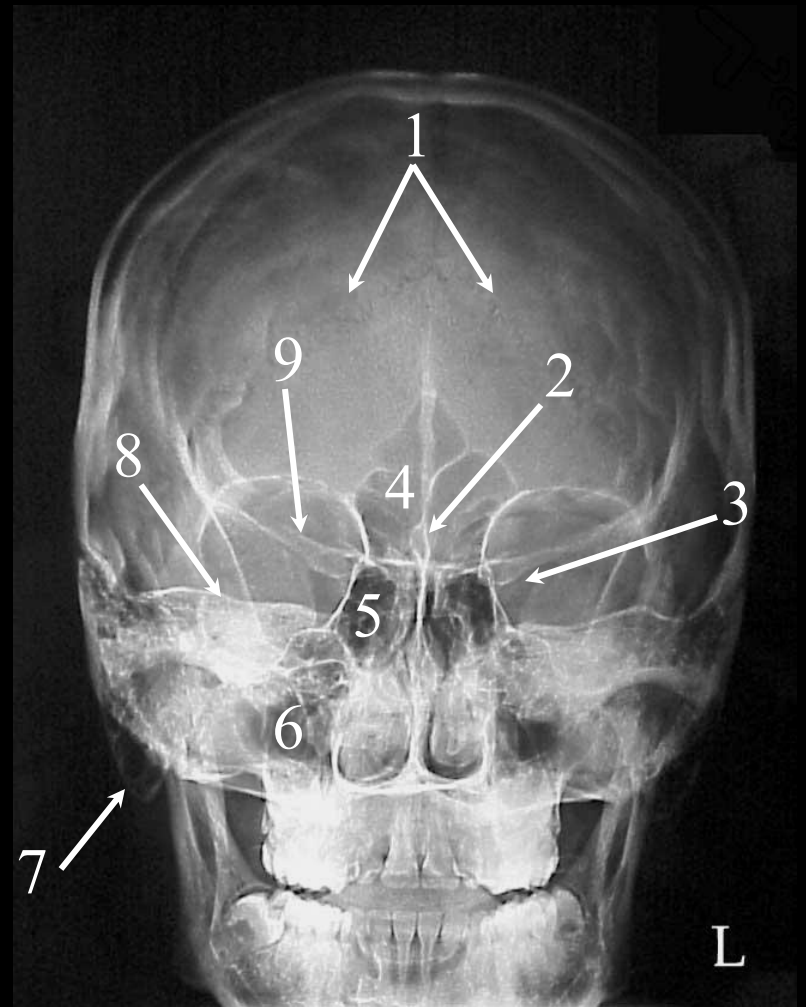
The arrow is pointing to the:

- a. optic canal.
- b. crista galli.
- c. greater wing of the sphenoid.
- d. anterior nasal spine.



# Question #90: Review

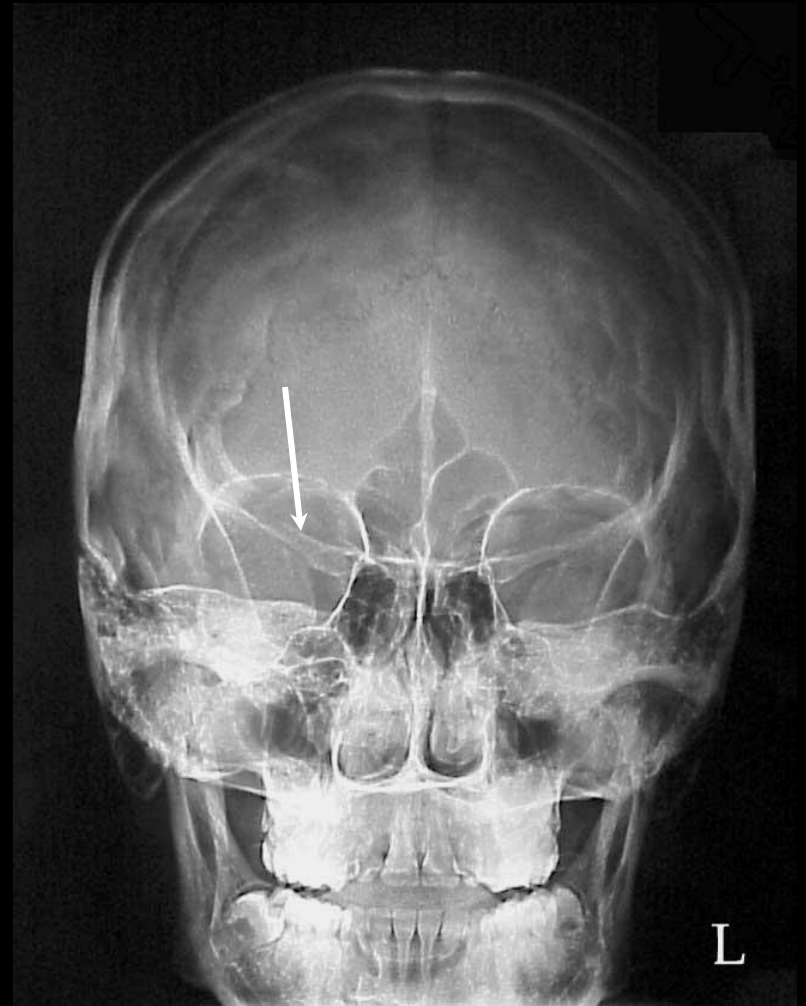
1. Lambdoidal Suture
2. **Crista Galli**
3. Superior Orbital Fissure
4. Frontal Sinuses
5. Ethmoid Sinuses
6. Maxillary Sinus
7. Mastoid Tip
8. Petrous Ridge
9. Lesser Wing of the Sphenoid



# Question #91:

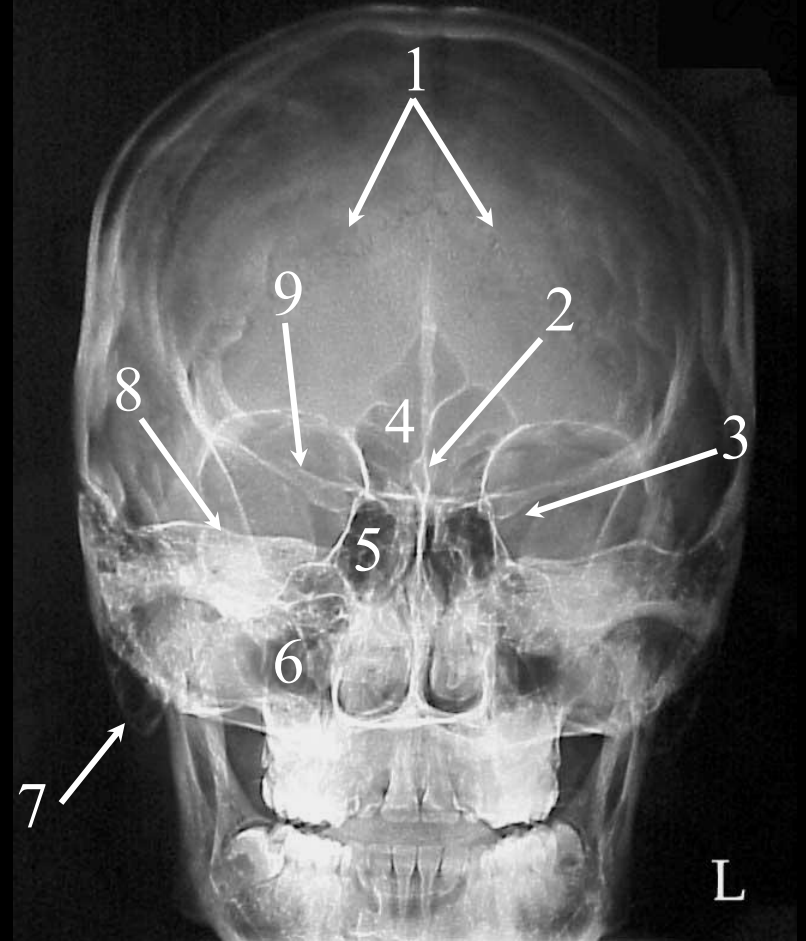
The arrow is pointing to the:

- a. lesser wing of the sphenoid.
- b. superior orbital fissure.
- c. ethmoid sinus.
- d. crista galli.



# Question #91: Review

1. Lambdoidal Suture
2. Crista Galli
3. Superior Orbital Fissure
4. Frontal Sinuses
5. Ethmoid Sinuses
6. Maxillary Sinus
7. Mastoid Tip
8. Petrous Ridge
9. Lesser Wing of the Sphenoid



# Question #92:

L

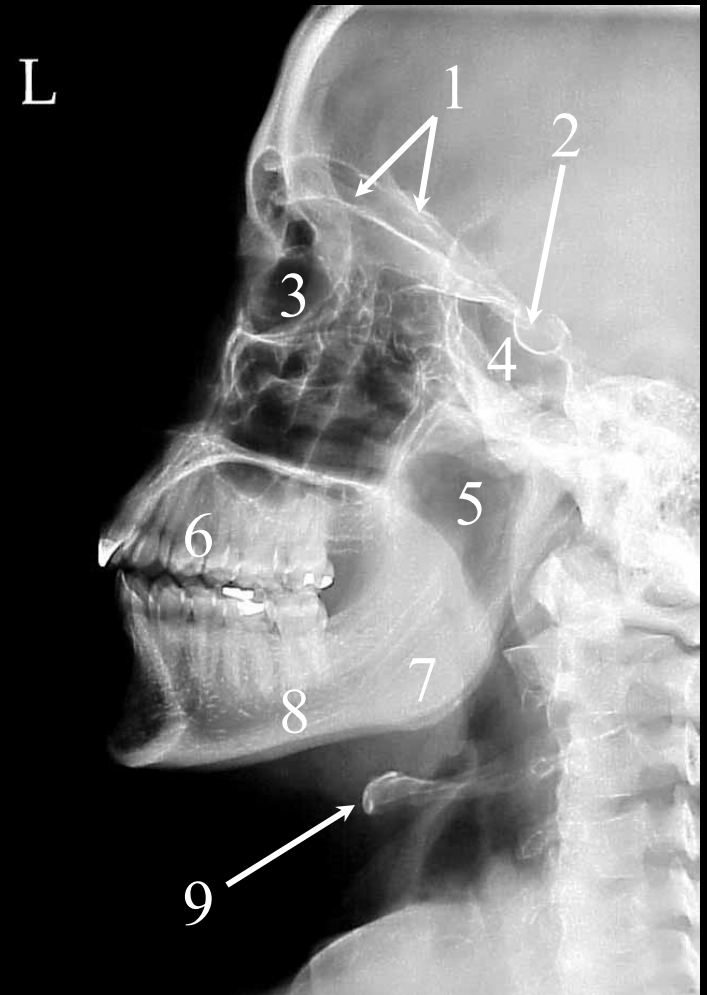
The arrows are pointing to the:

- a. ethmoid sinus.
- b. greater wing of the sphenoid.
- c. inferior nasal conchae.
- d. orbital plates of the frontal bone.



# Question #92: Review

1. Orbital Plates of the Frontal Bone
2. Sella Turcica
3. Ethmoid Sinus
4. Sphenoid Sinus
5. Oropharynx
6. Alveolar Process of the Maxillary Bone
7. Angle of the Mandible
8. Body of the Mandible
9. Hyoid Bone

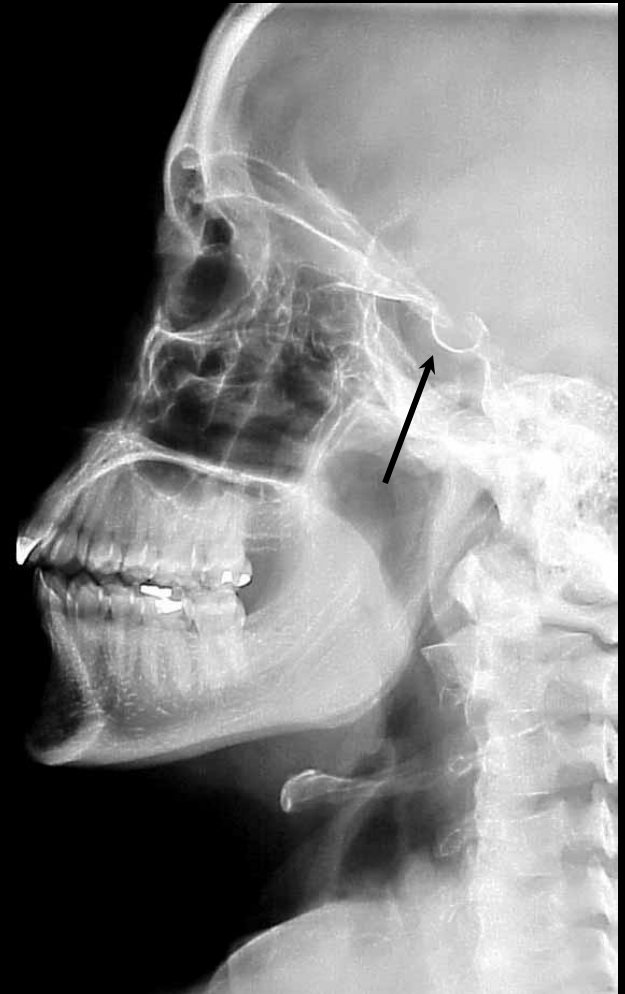


# Question #93:

L

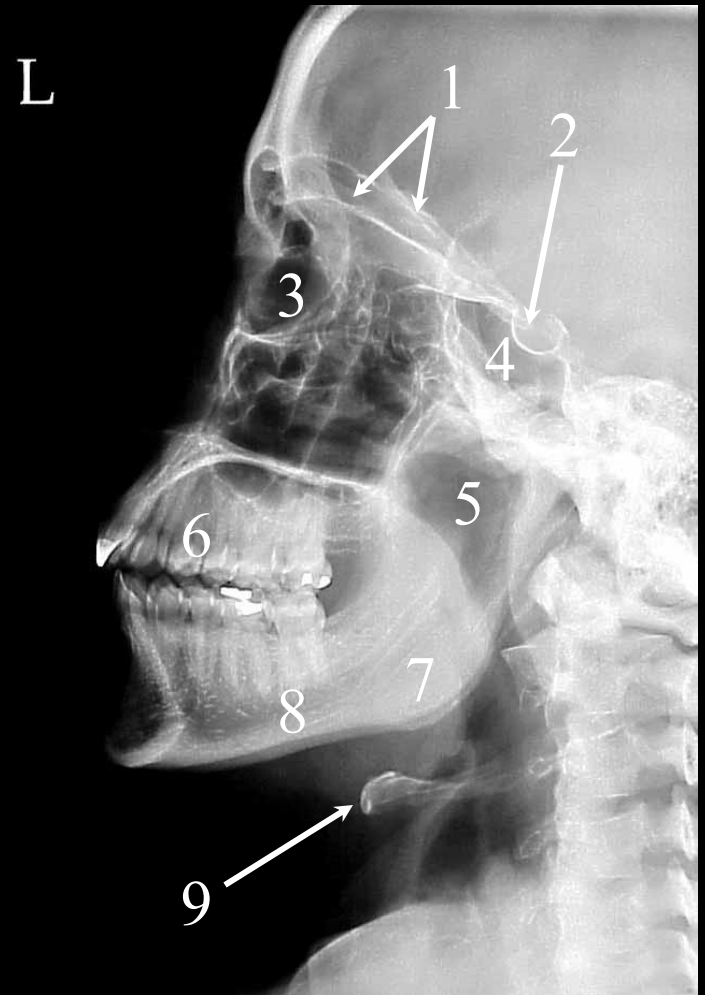
The arrow is pointing to the:

- a. sphenoid sinus.
- b. frontal sinus.
- c. ethmoid sinus.
- d. maxillary sinus.



# Question #93: Review

1. Orbital Plates of the Frontal Bone
2. Sella Turcica
3. Ethmoid Sinus
4. Sphenoid Sinus
5. Oropharynx
6. Alveolar Process of the Maxillary Bone
7. Angle of the Mandible
8. Body of the Mandible
9. Hyoid Bone



# Question #94:

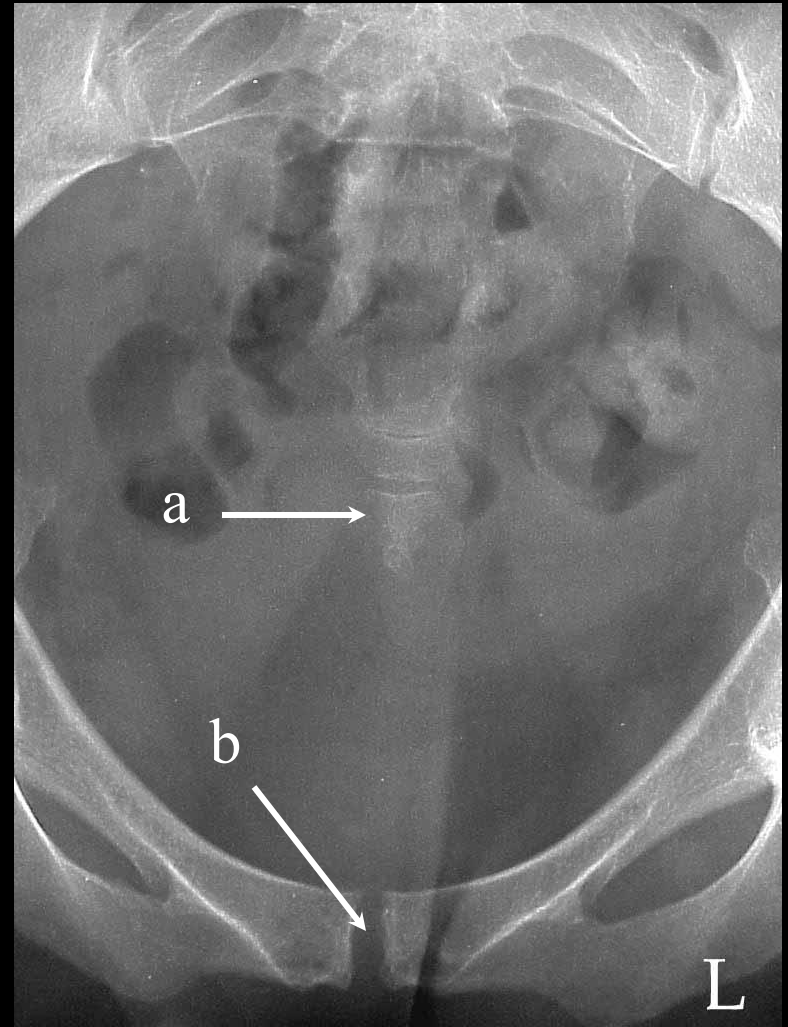
The arrow is pointing to the:

- a. superior ramus of the pubis.
- b. inferior ramus of the pubis.
- c. ischial tuberosity.
- d. symphysis pubis.



# Question #94: Review

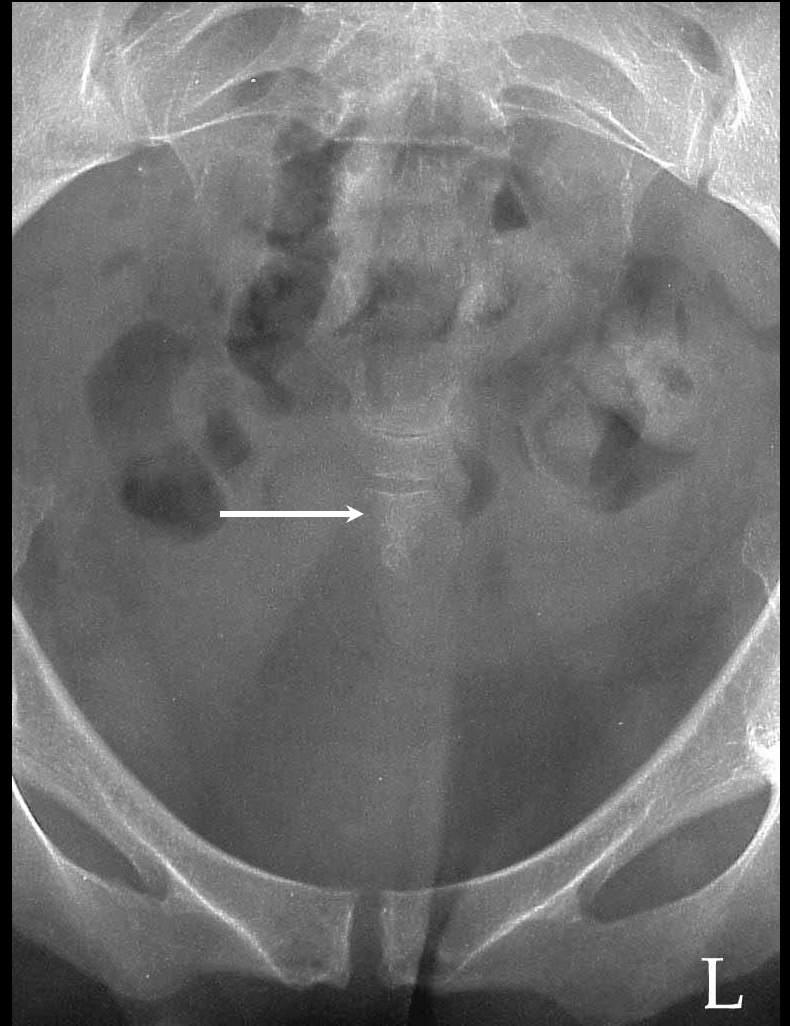
A 10 degree caudal tube angle will desuperimpose the coccyx (a) and the **symphysis pubis** (b). This position will best demonstrate a lateral displacement of the coccyx.



# Question #95:

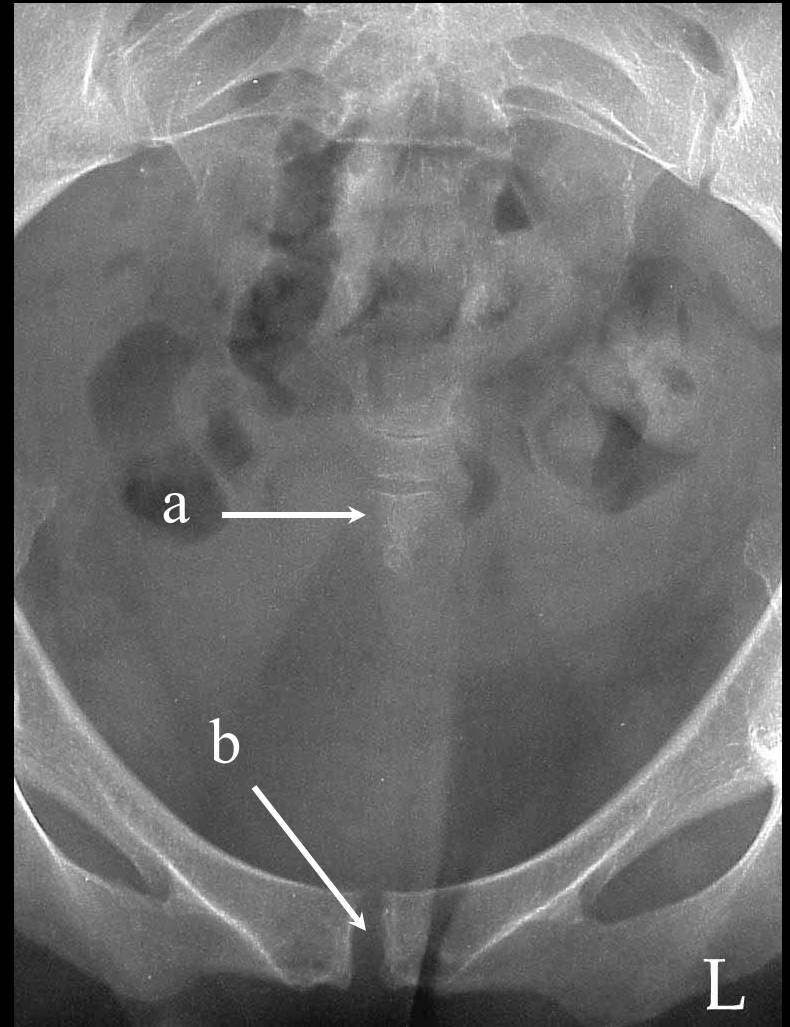
The arrow is pointing to the:

- a. coccyx.
- b. sacrum.
- c. phlebolith.
- d. None of the Above



# Question #95: Review

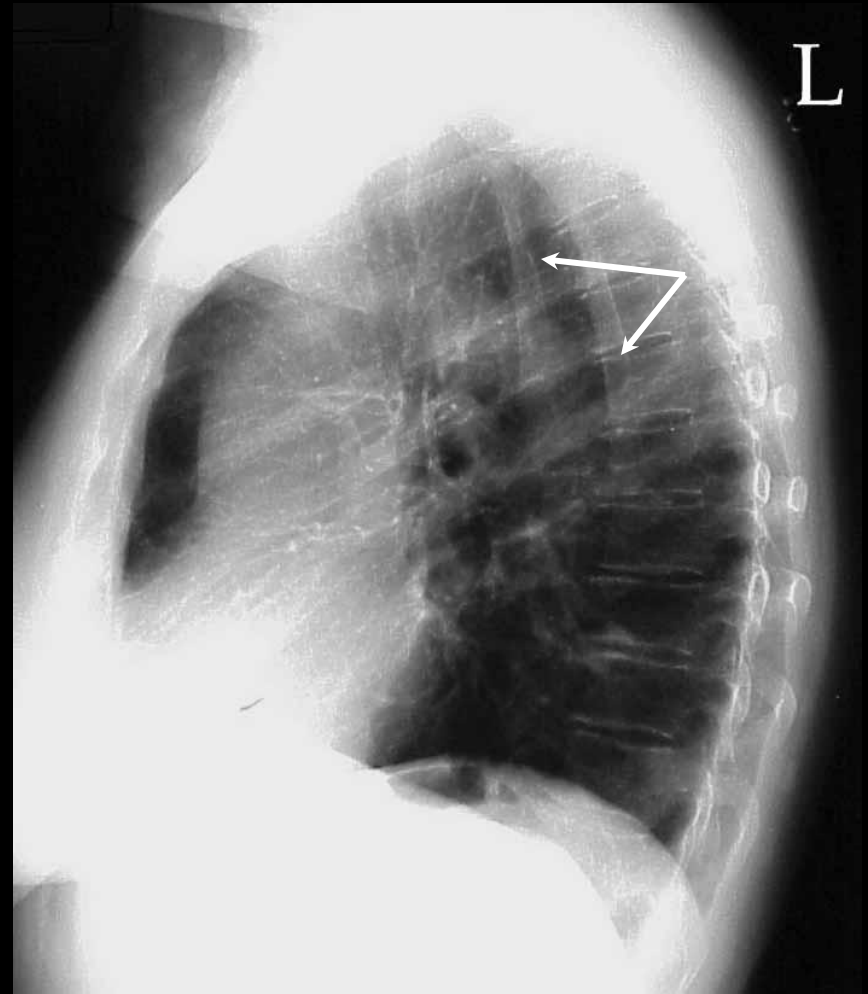
A 10 degree caudal tube angle will desuperimpose the **coccyx** (a) and the symphysis pubis (b). This position will best demonstrate a lateral displacement of the coccyx.



# Question #96:

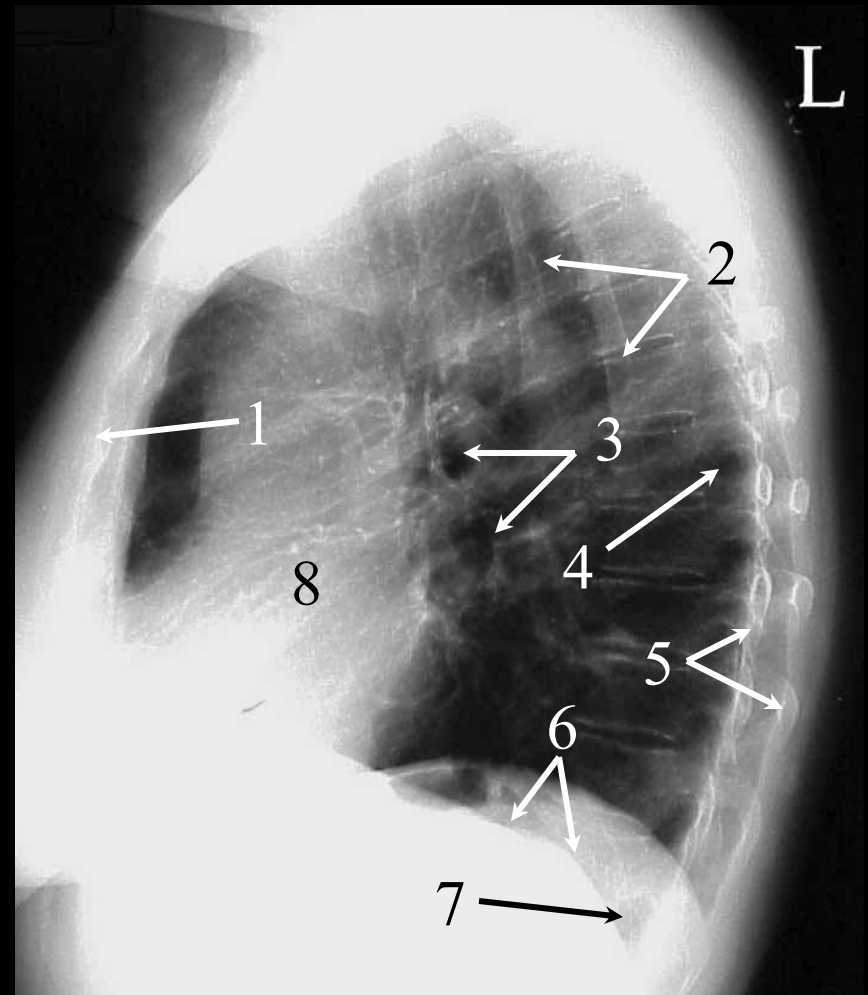
The arrows are pointing to the:

- a. esophagus.
- b. trachea.
- c. scapulae.
- d. primary bronchus.



# Question #96: Review

1. Body of the Sternum
2. Right & Left Scapula
3. Primary Bronchi Seen on End
4. Thoracic Intervertebral Foramen
5. Slightly Rotated Posterior Ribs
6. Left Diaphragm
7. Left Costophrenic Angle
8. Shadow of the Heart



# Question #97:

Which of the following is the most likely type of the fracture identified by the arrow on this patient's distal radius?

- a. Pott's fracture
- b. Colles' fracture
- c. torus fracture
- d. compression fracture



# Question #97: Review



A **Colles' fracture** occurs in the wrist and is most often the result of falling backwards on an outstretched hand. It is characterized by a posterior fracture of the distal radius and may require surgery if badly displaced.

# Question #98:

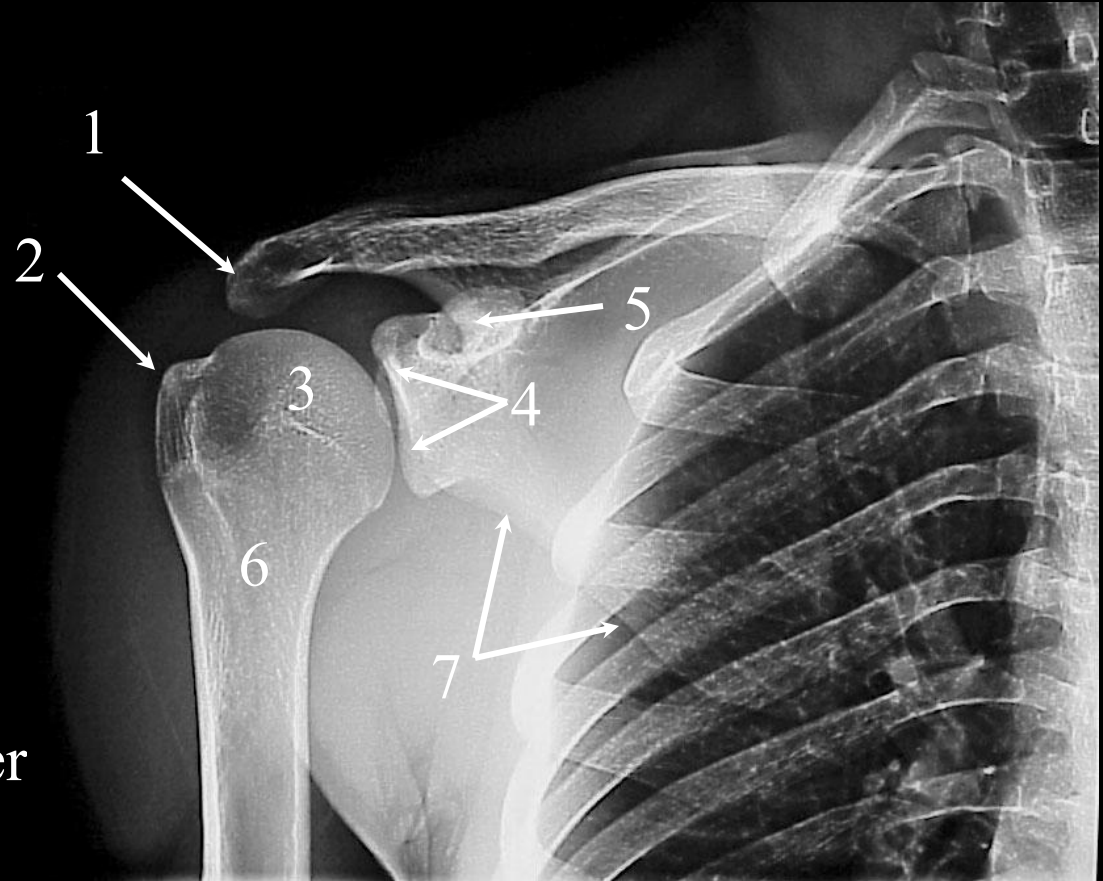
The arrow is pointing to the:

- a. intertubercular groove.
- b. lesser tubercle.
- c. anatomical neck.
- d. greater tubercle.



# Question #98: Review

1. Acromion Process
2. Greater Tubercle of the Humerus
3. Head of the Humerus
4. Glenoid Fossa
5. Coracoid Process
6. Surgical Neck of the Humerus
7. Lateral or Axillary Border of the Scapula



# Question #99:

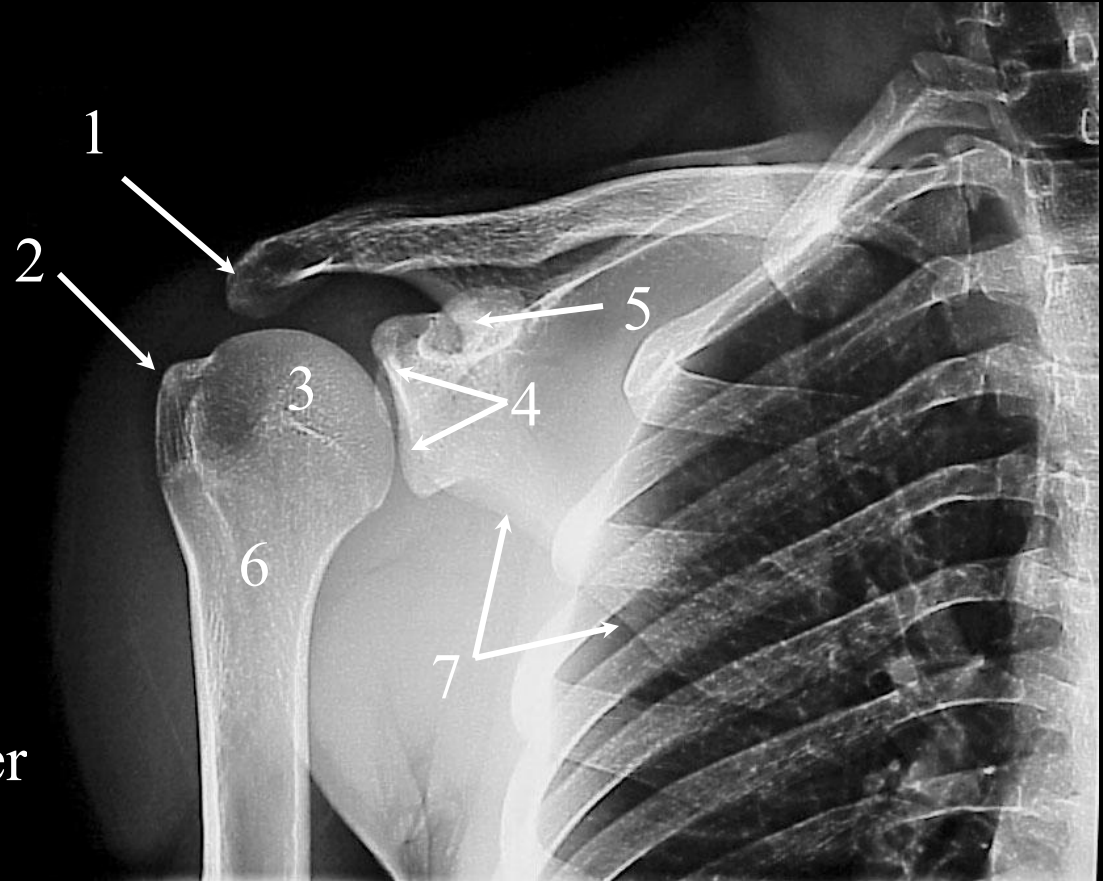
The arrow is pointing to the:

- a. anatomical neck.
- b. surgical neck.
- c. lesser tubercle.
- d. greater tubercle.



# Question #99: Review

1. Acromion Process
2. Greater Tubercle of the Humerus
3. Head of the Humerus
4. Glenoid Fossa
5. Coracoid Process
6. **Surgical Neck of the Humerus**
7. Lateral or Axillary Border of the Scapula



# Question #100:

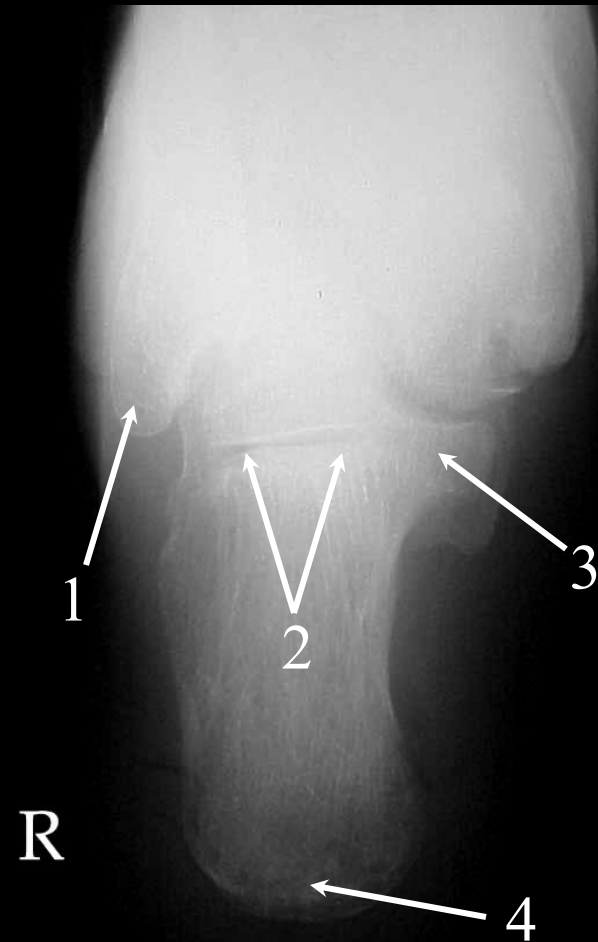
The arrows are pointing to the:

- a. sustentaculum tali.
- b. tuberosity of the calcaneus.
- c. talocalcaneal joint.
- d. cuboid.



# Question #100: Review

1. Fibula
2. Talocalcaneal Joint
3. Sustentaculum Tali
4. Tuberosity of the Calcaneous



# Question #101:

The arrow is pointing to the:

- a. trapezium.
- b. head of the 1<sup>st</sup> metacarpal.
- c. base of the 1<sup>st</sup> metacarpal.
- d. trapezoid.



# Question #101:

## Review

The arrow is pointing to the:

- a. trapezium.
- b. head of the 1<sup>st</sup> metacarpal.
- c. base of the 1<sup>st</sup> metacarpal.
- d. trapezoid.



# Question #102:

The arrow is pointing to the:

- a. hamate.
- b. capitate.
- c. trapezoid.
- d. trapezium.



# Question #102:

## Review

The arrow is pointing to the:

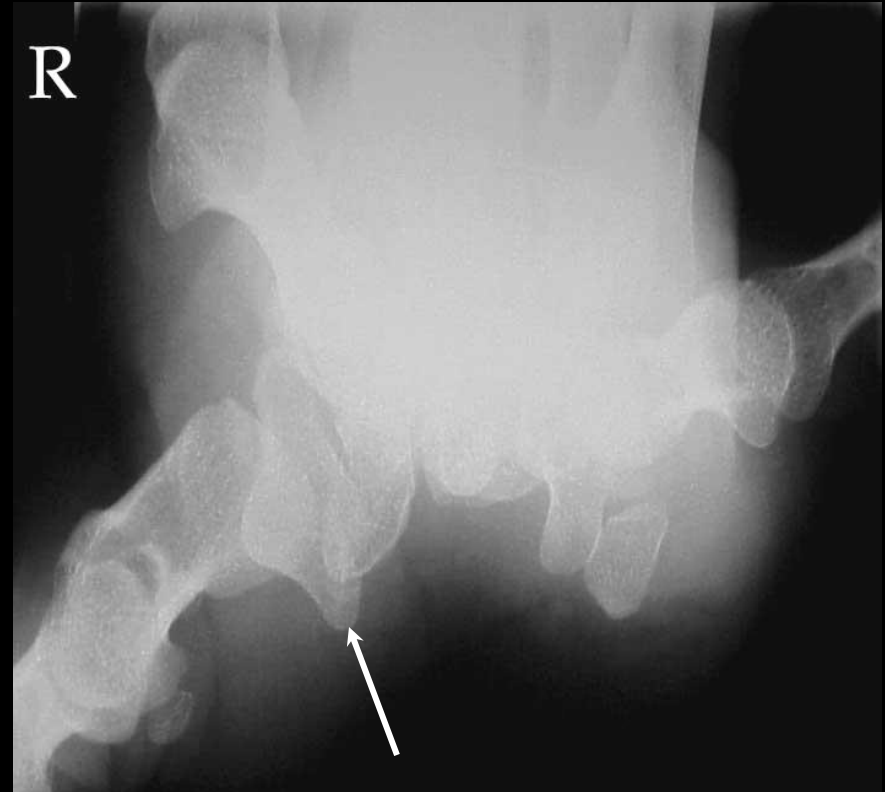
- a. hamate.
- b. capitate.**
- c. trapezoid.
- d. trapezium.



# Question #103:

The arrow is pointing to the:

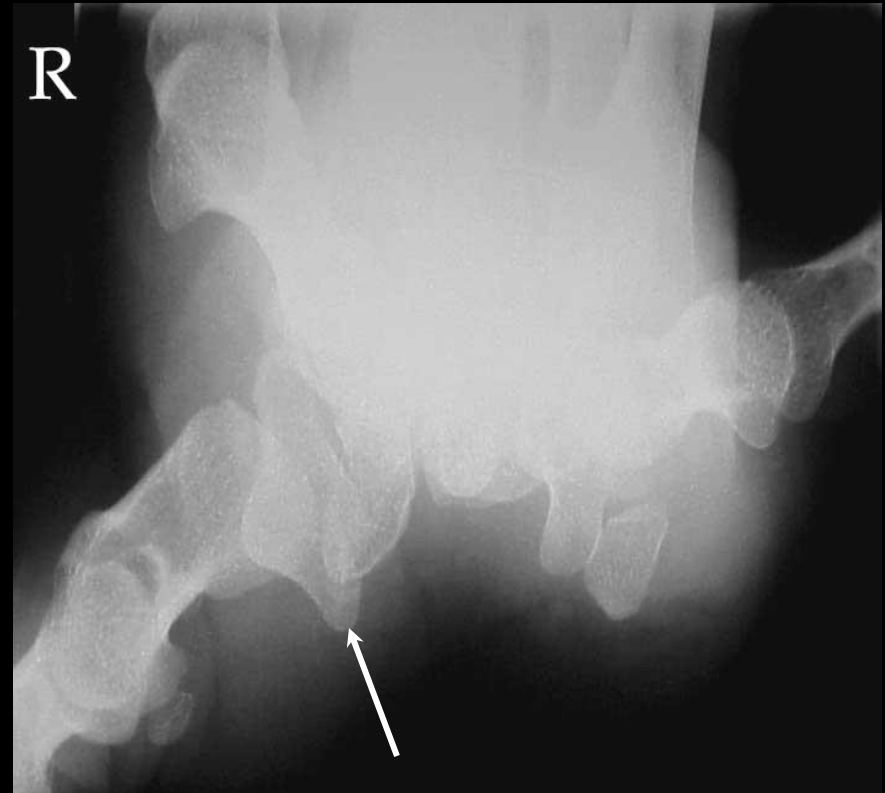
- a. navicular.
- b. trapezium.
- c. hamulus of the hamate.
- d. pisiform.



# Question #103: Review

The arrow is pointing to the:

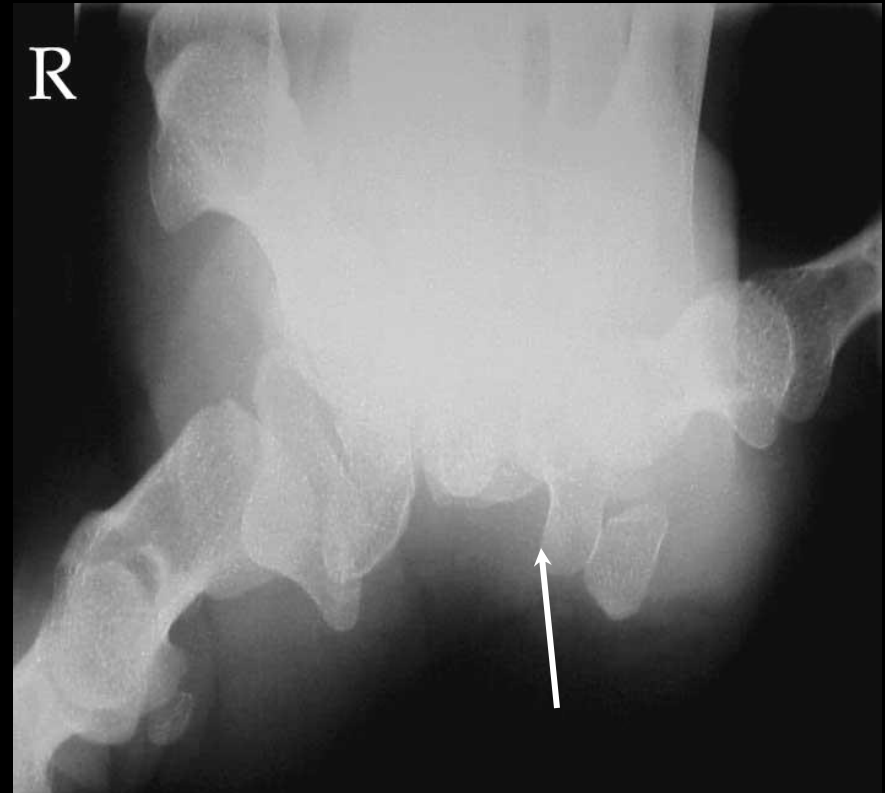
- a. navicular.
- b. trapezium.**
- c. hamulus of the hamate.
- d. pisiform.



# Question #104:

The arrow is pointing to the:

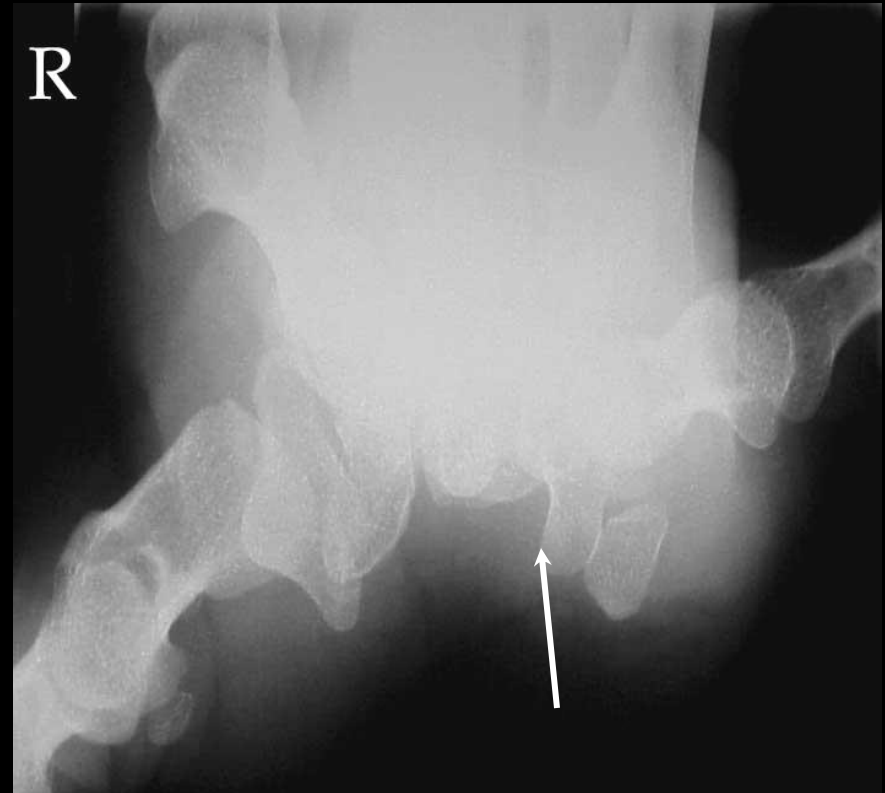
- a. hamulus of the hamate.
- b. pisiform.
- c. navicular.
- d. trapezium.



# Question #104: Review

The arrow is pointing to the:

- a. hamulus of the hamate.
- b. pisiform.
- c. navicular.
- d. trapezium.



# Question #105:

The arrow is pointing to the:

- a. tarsal sinus.
- b. cuboid.
- c. calcaneous.
- d. navicular.



# Question #105: Review

The arrow is pointing to the:

- a. tarsal sinus.
- b. cuboid.
- c. calcaneous.
- d. navicular.



# Question #106:

The arrow is pointing to the:

- a. tarsal sinus.
- b. cuboid.
- c. calcaneous.
- d. navicular.



# Question #106: Review

The arrow is pointing to the:

- a. cuboid
- b. tarsal sinus.**
- c. calcaneous.
- d. navicular.



# Question #107:

The arrow is pointing to the:

- a. superior articulating process.
- b. transverse foramina.
- c. spinous process.
- d. posterior arch.



# Question #107: Review

The arrow is pointing to the:

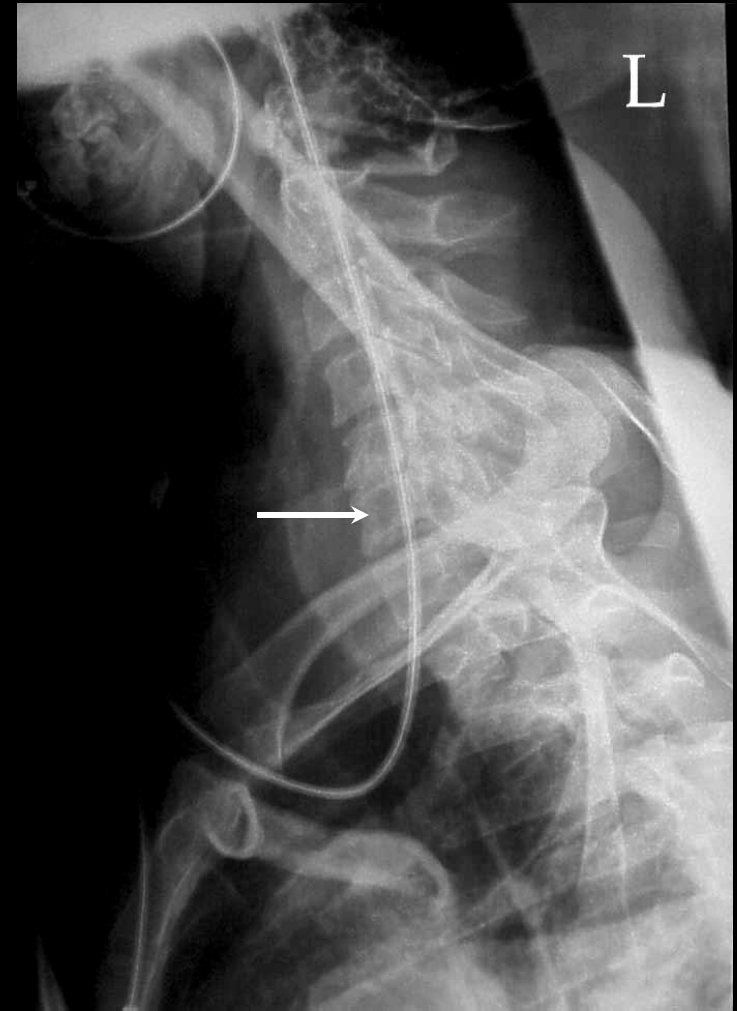
- a. superior articulating process.
- b. transverse foramina.
- c. spinous process.
- d. posterior arch.**



# Question #108:

The arrow is pointing to the body of:

- a. T1.
- b. C5.
- c. C6.
- d. C7.



# Question #108: Review

The arrow is pointing to the body of:

- a. T1.
- b. C5.
- c. C6.
- d. C7.



# Question #109:

The arrows are pointing to the:

- a. lambdoidal suture.
- b. frontal bone.
- c. coronal suture.
- d. frontal protuberance.



# Question #109: Review

The arrows are pointing to the:

- a. lambdoidal suture.
- b. frontal bone.
- c. coronal suture.
- d. frontal protuberance.



# Question #110:

The arrow is pointing to the:

- a. anterior clinoid process.
- b. sella turcica.
- c. dorsum sella.
- d. foramen magnum.



# Question #110: Review

The arrow is pointing to the:

- a. anterior clinoid process.
- b. sella turcica.
- c. dorsum sella.**
- d. foramen magnum.



# Question #111:

The arrows are pointing to the:

- a. petrous ridge.
- b. mastoid air cells.
- c. greater wing of the sphenoid.
- d. squamosal suture.



# Question #111: Review

The arrows are pointing to the:

- a. petrous ridge.
- b. mastoid air cells.
- c. greater wing of the sphenoid.
- d. squamosal suture.



# Question #112:

The arrows are pointing to the:

- a. maxillary sinus.
- b. sphenoid sinus.
- c. ethmoid sinuses.
- d. mastoid air cells.



# Question #112: Review

The arrows are pointing to the:

- a. maxillary sinus.
- b. sphenoid sinus.**
- c. ethmoid sinuses.
- d. mastoid air cells.



# Question #113:

Which of the following bones is **not** involved in a tripod fracture?

- a. temporal bone
- b. malar or zygomatic
- c. sphenoid bone
- d. maxillary bone

# Question #113: Review

Which of the following bones is **not** involved in a tripod fracture?

- a. temporal bone
- b. malar or zygomatic
- c. **sphenoid bone**
- d. maxillary bone

# Question #114:

Which of the following bones has a retrograde blood supply that if damaged due to trauma could lead to a condition called avascular necrosis?

- a. scaphoid
- b. 5th metatarsal
- c. cuboid
- d. hamate

# Question #114: Review

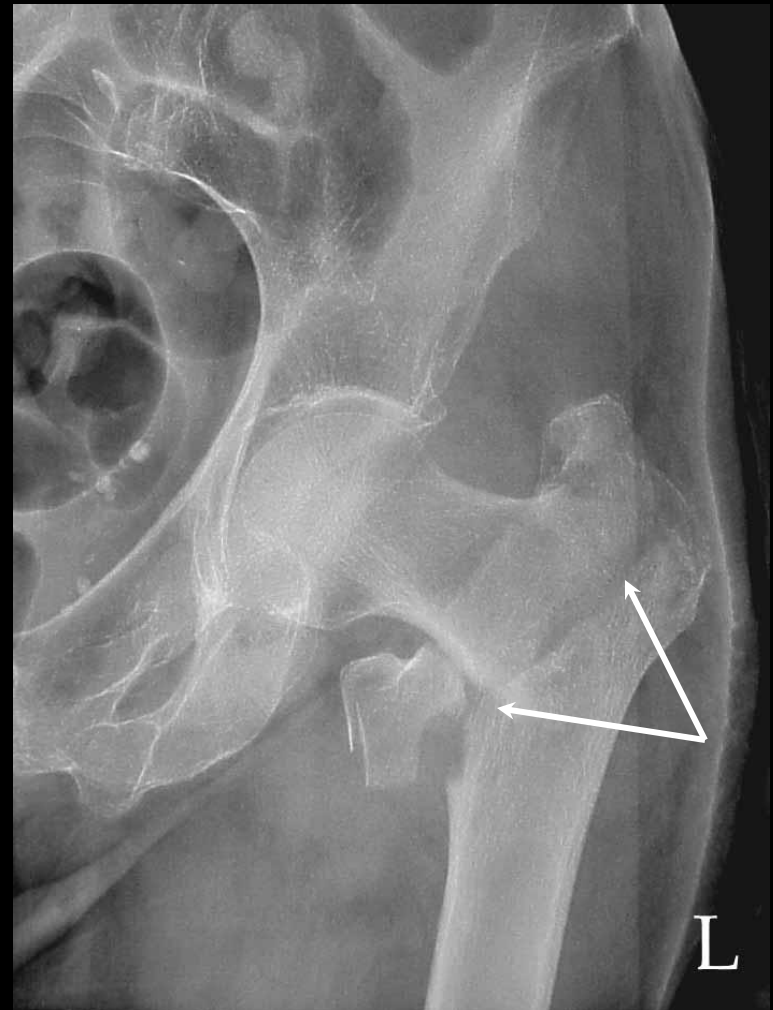
Which of the following bones has a retrograde blood supply that if damaged due to trauma could lead to a condition called avascular necrosis?

- a. scaphoid
- b. 5th metatarsal
- c. cuboid
- d. hamate

# Question #115:

Which of the following is the most likely type of fracture identified by the arrows on this patient's hip?

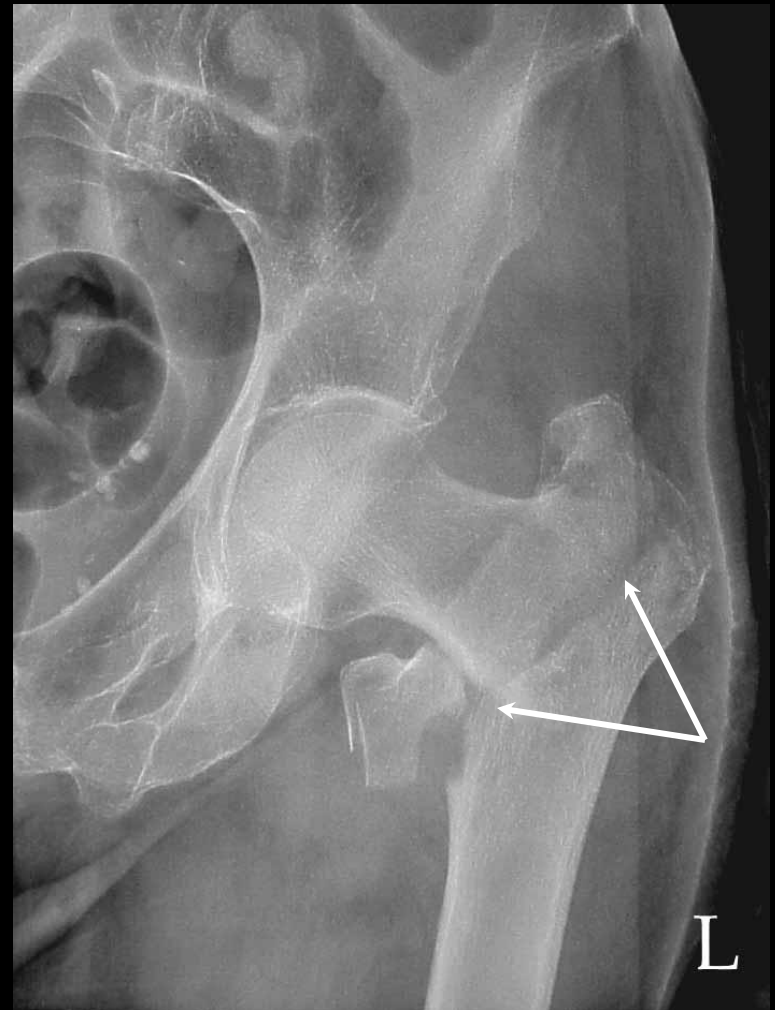
- a. femoral neck
- b. subtrochanteric
- c. femoral head
- d. intertrochanteric fracture



# Question #115: Review

Which of the following is the most likely type of fracture identified by the arrows on this patient's hip?

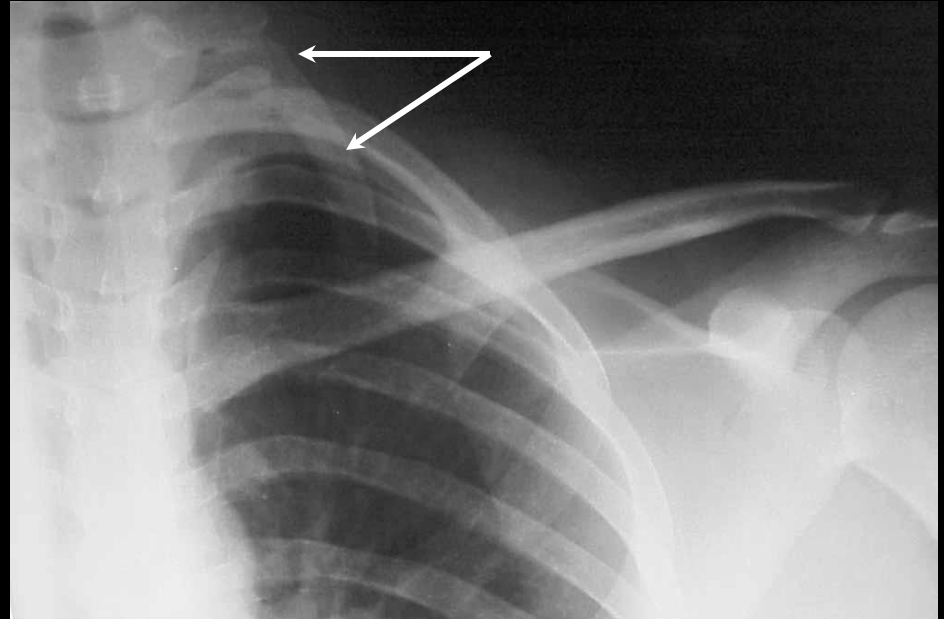
- a. femoral neck
- b. subtrochanteric
- c. femoral head
- d. intertrochanteric fracture



# Question #116:

The arrows on this radiograph are pointing to:

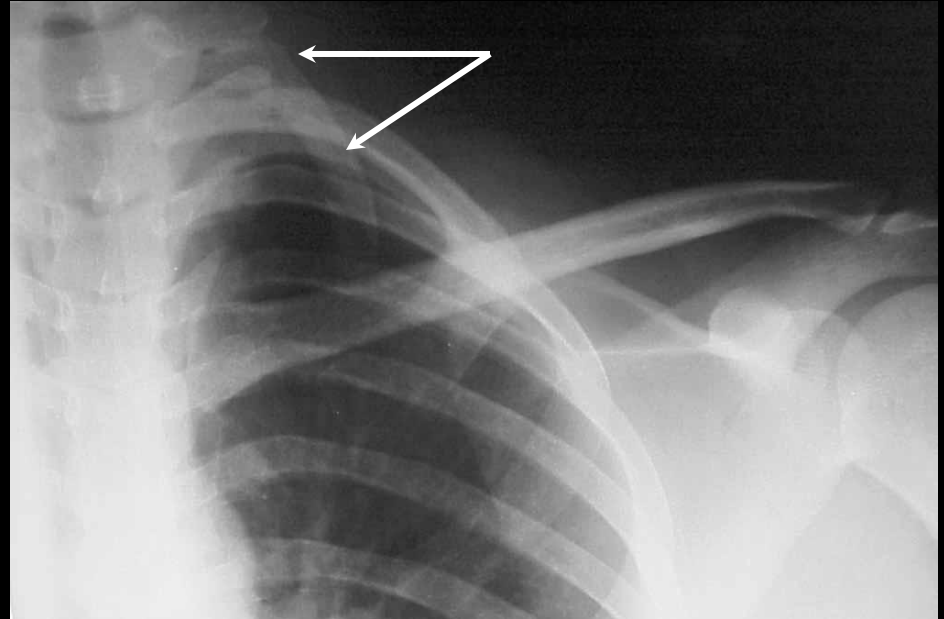
- a. an enchondroma.
- b. a cervical rib.
- c. a fibrosarcoma.
- d. an osteosarcoma.



# Question #116: Review

The arrows on this radiograph are pointing to:

- a. an enchondroma.
- b. a cervical rib.**
- c. a fibrosarcoma.
- d. an osteosarcoma.



# Question #117:

The arrow on this radiograph is pointing to a type of arthritis. It is caused by excess uric acid production that is commonly deposited in the great toe. Which of the following is most likely the type of arthritis depicted on this image?

- a. Gout
- b. Osteoarthritis
- c. Rheumatoid Arthritis
- d. Ankylosing Spondylitis



# Question #117: Review

The arrow on this radiograph is pointing to a type of arthritis. It is caused by excess uric acid production that is commonly deposited in the great toe. Which of the following is most likely the type of arthritis depicted on this image?

- a. Gout
- b. Osteoarthritis
- c. Rheumatoid Arthritis
- d. Ankylosing Spondylitis



# Question #118:

The arrows on this radiograph of a PA wrist are pointing to a fracture that involves the growth plates. Which of the following is used to describe these types of fractures?

- a. Monteggia
- b. Jones
- c. Torus
- d. Salter-Harris



# Question #118: Review

The arrows on this radiograph of a PA wrist are pointing to a fracture that involves the growth plates. Which of the following is used to describe these types of fractures?

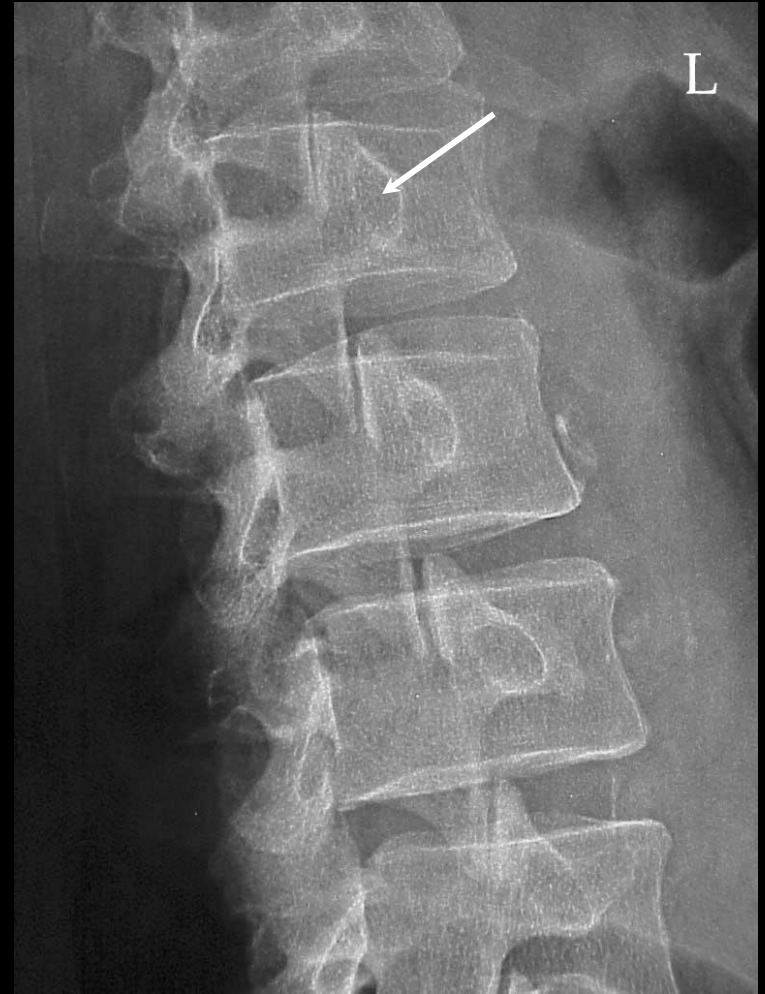
- a. Monteggia
- b. Jones
- c. Torus
- d. Salter-Harris



# Question #119:

The arrow is pointing to the:

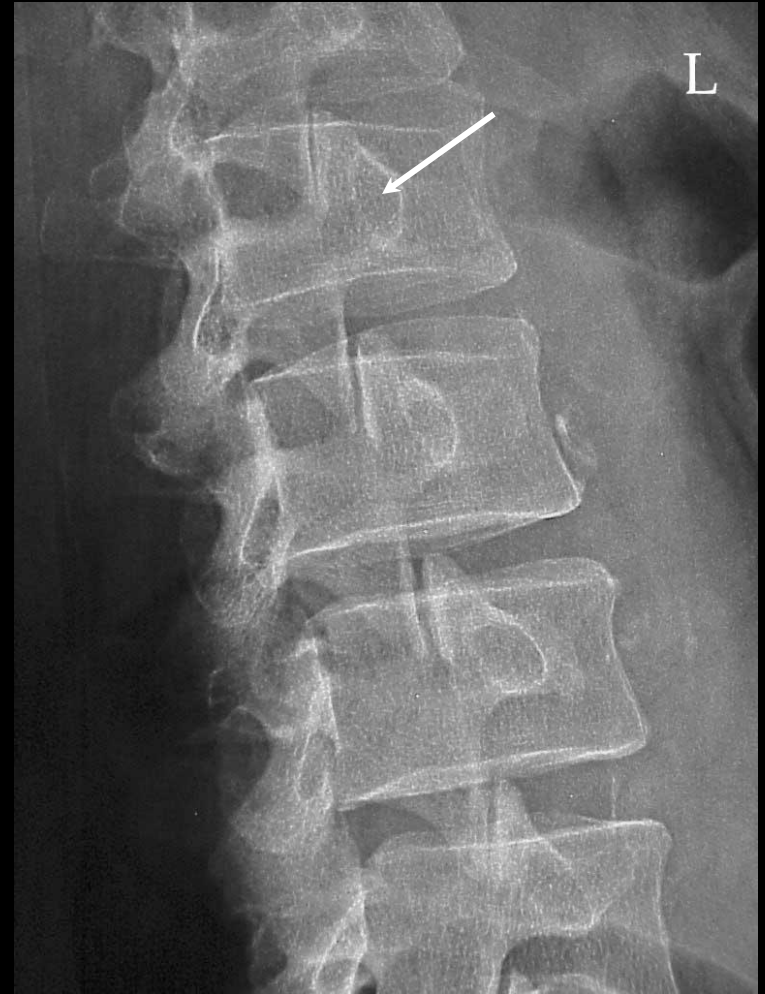
- a. pars interarticularis.
- b. transverse process.
- c. pedicle.
- d. inferior articulating process.



# Question #119: Review

The arrow is pointing to the:

- a. pars interarticularis.
- b. transverse process.
- c. pedicle.
- d. inferior articulating process.



# Question #120:

The arrow is pointing to the:

- a. pars interarticularis.
- b. transverse process.
- c. inferior articulating process.
- d. superior articulating process.



# Question #120: Review

The arrow is pointing to the:

- a. pars interarticularis.
- b. transverse process.
- c. inferior articulating process.**
- d. superior articulating process.



# Question #121:

Which of the following types of fractures is demonstrated on this patient's calcaneus?

- a. comminuted
- b. spiral
- c. greenstick
- d. Pott's



# Question #121: Review

Which of the following types of fractures is demonstrated on this patient's calcaneus?

- a. comminuted
- b. spiral
- c. greenstick
- d. Pott's



# Question #122:

Which of the following types of fractures is demonstrated on this patient's humerus?

- a. transverse
- b. greenstick
- c. incomplete
- d. spiral



# Question #122: Review

Which of the following types of fractures is demonstrated on this patient's humerus?

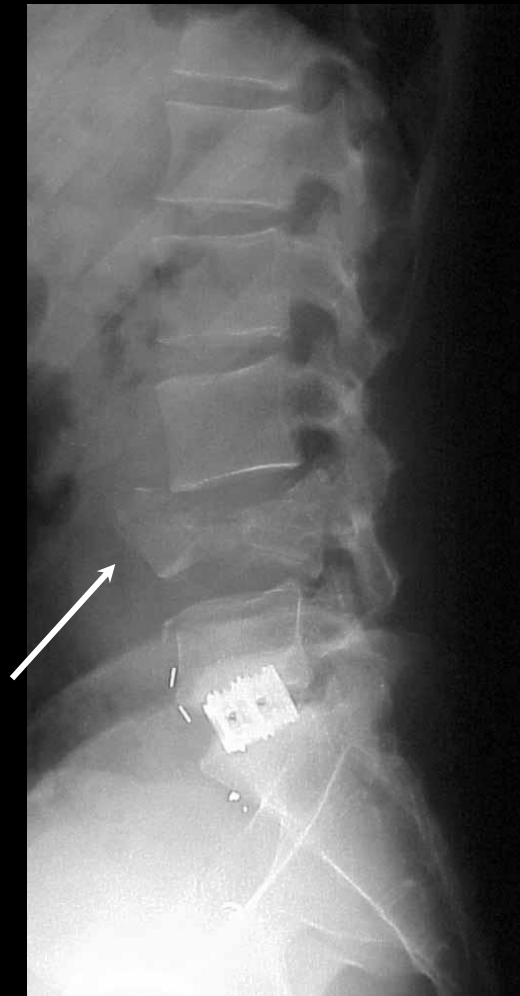
- a. transverse
- b. greenstick
- c. incomplete
- d. spiral



# Question #123:

Which of the following is the most likely type of the fracture identified by the arrow on this patient's lumbar spine?

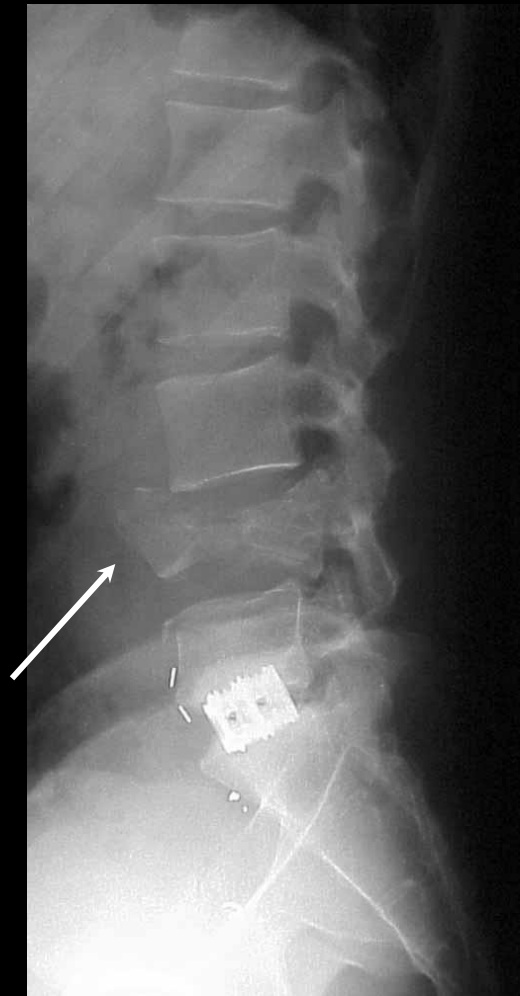
- a. Jones fracture
- b. compression fracture
- c. torus
- d. Salter-Harris Type II



# Question #123: Review

Which of the following is the most likely type of the fracture identified by the arrow on this patient's lumbar spine?

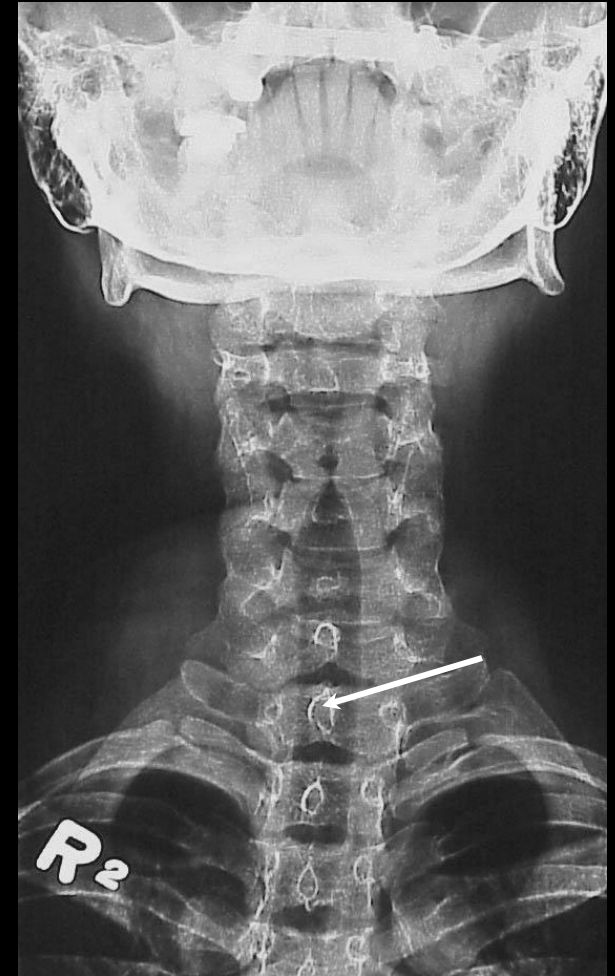
- a. Jones fracture
- b. compression fracture**
- c. torus
- d. Salter-Harris Type II



# Question #124:

The arrow is pointing to the:

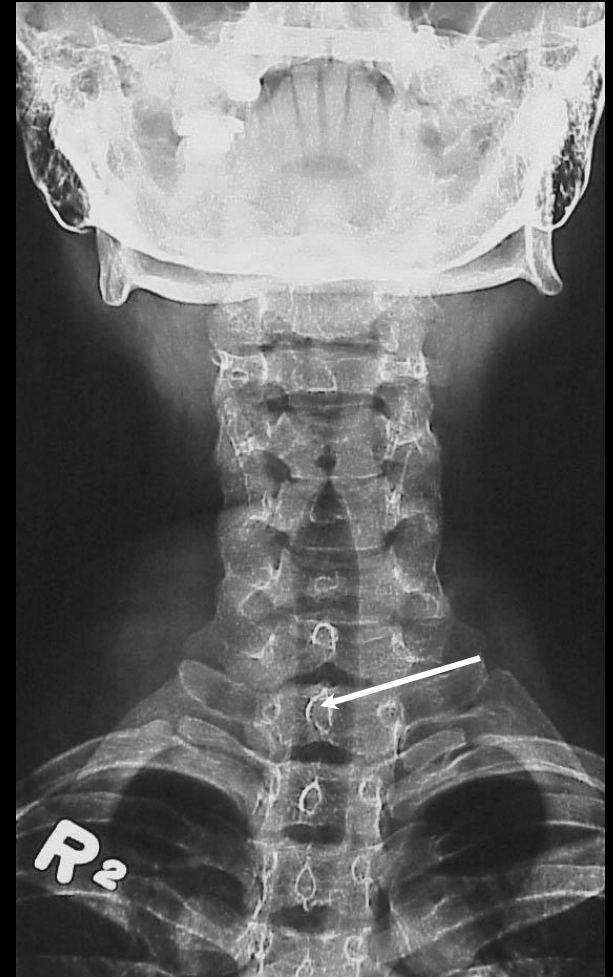
- a. pedicle.
- b. vertebral foramen.
- c. lamina.
- d. spinous process.



# Question #124: Review

The arrow is pointing to the:

- a. pedicle.
- b. vertebral foramen.
- c. lamina.
- d. spinous process.



# Question #125:

A positive fat pad sign is an indication of a fracture for which of the following?

- a. elbow
- b. wrist
- c. ankle
- d. hip

# Question #125: Review

A positive fat pad sign is an indication of a fracture for which of the following?

- a. elbow
- b. wrist
- c. ankle
- d. hip

# Question #126:

What is the name of the fracture that occurs on the shaft of the 5th metatarsal?

- a. Jones fracture
- b. Salter-Harris fracture
- c. Monteggia fracture
- d. Pott's fracture

# Question #126: Review

What is the name of the fracture that occurs on the shaft of the 5th metatarsal?

- a. Jones fracture
- b. Salter-Harris fracture
- c. Monteggia fracture
- d. Pott's fracture

# Question #127:

The arrow is pointing to the:

- a. anterior nasal spine.
- b. nasal bones.
- c. alveolar process.
- d. styloid process.



# Question #127: Review

The arrow is pointing to the:

- a. anterior nasal spine.
- b. nasal bones.**
- c. alveolar process.
- d. styloid process.



# Question #128:

The arrow is pointing to the:

- a. maxillary bone.
- b. zygomatic process of the temporal bone.
- c. coronoid process.
- d. zygoma.



# Question #128: Review

The arrow is pointing to the:

- a. maxillary bone.
- b. zygomatic process of the temporal bone.
- c. coronoid process.
- d. zygoma.



# Question #129:

The arrows are pointing to the:

- a. scapular notch.
- b. body of the scapula.
- c. spine of the scapula.
- d. superior border of the scapula.



# Question #129: Review

The arrows are pointing to the:

- a. scapular notch.
- b. body of the scapula.
- c. spine of the scapula.**
- d. superior border of the scapula.



# Question #130:

The arrows are pointing to the:

- a. intercondylar fossa.
- b. glenoid fossa.
- c. tibial plateau.
- d. intercondylar eminence.



# Question #130: Review

The arrows are pointing to the:

- a. intercondylar fossa.
- b. glenoid fossa.
- c. tibial plateau.
- d. intercondylar eminence.



# Question #131:

The arrows are pointing to the:

- a. intercondylar fossa.
- b. glenoid fossa.
- c. tibial plateau.
- d. intercondylar eminence.



# Question #131: Review

The arrows are pointing to the:

- a. intercondylar fossa.
- b. glenoid fossa.
- c. tibial plateau.
- d. intercondylar eminence.



# Question #132:

Common modalities employing x-rays include all except:

- a. CT
- b. conventional x-ray
- c. MRI.
- d. digital radiography

# Question #132: Review

Common modalities employing x-rays include all except:

- a. CT
- b. conventional x-ray
- c. MRI.
- d. digital radiography

# Question #133:

Lungs and other tissues can be visualized using x-rays

- a. True
- b. False

# Question #133: Review

- X-ray imaging is a non-invasive diagnostic technique that uses ionizing radiation to create images of the internal structures of the body. Since its discovery in 1895, x-ray technology has become a cornerstone of medical diagnostics, enabling visualization of bones, lungs, and other tissues. Conventional radiography, computed tomography (CT), and digital radiography are common modalities employing x-rays.

# Question #134:

X-rays were discovered in:

- a. 1938
- b. 1971
- c. 1895
- d. 1901

# Question #134: Review

- X-ray imaging is a non-invasive diagnostic technique that uses ionizing radiation to create images of the internal structures of the body. Since its discovery in 1895, x-ray technology has become a cornerstone of medical diagnostics, enabling visualization of bones, lungs, and other tissues. Conventional radiography, computed tomography (CT), and digital radiography are common modalities employing x-rays.

# Question #135:

Fluoroscopy provides real-time, dynamic imaging which enhances procedural accuracy but also increases potential radiation exposure due to prolonged use.

- a. True
- b. False

# Question #135: Review

- Fluoroscopy provides real-time, dynamic imaging by transmitting a continuous x-ray beam through the patient, producing moving images on a monitor. It is invaluable in interventional procedures, cardiac catheterizations, gastrointestinal studies, and orthopedic surgeries. The ability to visualize physiological processes and device placement in **real time** enhances procedural accuracy but also increases potential radiation exposure due to prolonged use.

# Question #136:

Uses for fluoroscopy include:

- a. interventional procedures
- b. cardiac cath
- c. GI studies
- d. All of the above

# Question #136: Review

- Fluoroscopy provides real-time, dynamic imaging by transmitting a continuous x-ray beam through the patient, producing moving images on a monitor. It is invaluable in interventional procedures, cardiac catheterizations, gastrointestinal studies, and orthopedic surgeries. The ability to visualize physiological processes and device placement in real time enhances procedural accuracy but also increases potential radiation exposure due to prolonged use.

# Question #137:

Cancer is a potential long-term effect of ionizing radiation exposure:

- a. True
- b. False

# Question #137: Review

- The benefits of x-ray and fluoroscopy must be balanced against the risks associated with ionizing radiation exposure. Radiation can cause cellular damage, increasing the risk of acute injuries and long-term effects such as cancer. Therefore, radiation safety is critical to protect patients and staff, ensure regulatory compliance, and promote a culture of safety in healthcare settings.

# Question #138:

Types of ionizing radiation in medical imaging include all except:

- a. x-rays
- b. gamma rays
- c. alpha particles
- d. solar

# Question #138: Review

- Ionizing radiation encompasses particles or electromagnetic waves energetic enough to remove electrons from atoms, thereby creating ions. The primary types relevant to medical imaging are:
- X-rays: Electromagnetic waves with high energy, produced by x-ray tubes, capable of penetrating tissues and generating diagnostic images.
- Gamma rays: Similar to x-rays but originating from radioactive decay; less commonly used in diagnostic imaging.
- Alpha and beta particles: Not typically involved in x-ray or fluoroscopic procedures but relevant in nuclear medicine.

# Question #139:

Key parameters affecting x-ray production include:

- a. kvp
- b. mA
- c. time
- d. All of the above

# Question #139: Review

Key parameters affecting x-ray production include:

Tube voltage (kVp): Determines the energy (penetrating power) of the x-rays.

Tube current (mA): Controls the number of x-ray photons produced.

Exposure time: The duration for which the x-ray is generated.

# Question #140:

X-rays are produced when high-speed \_\_\_\_\_, generated by heating a cathode filament, collide with a metal anode (usually tungsten) within the x-ray tube.

- a. protons
- b. neutrons
- c. electrons
- d. betas

# Question #140: Review

X-rays are produced when high-speed electrons, generated by heating a cathode filament, collide with a metal anode (usually tungsten) within the x-ray tube.

- a. protons
- b. neutrons
- c. electrons
- d. betas

# Question #141:

The primary mechanisms of biological damage are:

- a. direct action
- b. indirect action
- c. a and b
- d. None of these

# Question #141: Review

Ionizing radiation interacts with biological tissues, causing ionization of atoms and molecules. The primary mechanisms of biological damage are:

- Direct action: Radiation directly ionizes DNA molecules, leading to breaks in the DNA strand.
- Indirect action: Radiation ionizes water molecules, producing free radicals that subsequently damage DNA and other cellular structures.

# Question #142:

Effects of acute radiation include:

- a. skin erythema
- b. bruising
- c. rash
- d. swelling

# Question #142: Review

- Acute radiation effects, or deterministic effects, manifest shortly after exposure to high doses. In medical imaging, such exposures are rare but can occur with equipment malfunction or improper use. Examples include:
  - Radiation burns: Skin erythema, ulceration, or necrosis at high local doses.
  - Acute radiation syndrome: Systemic effects at extremely high whole-body doses, not typical in diagnostic imaging.

# Question #143:

Acute radiation syndrome is defined as a systemic effects at extremely high whole-body doses, not typical in diagnostic imaging.

- a. True
- b. False

# Question #143: Review

Acute radiation syndrome:  
Systemic effects at extremely high  
whole-body doses, not typical in  
diagnostic imaging.

# Question #144:

Chronic or stochastic effects arise from cumulative \_\_\_\_\_ dose exposures over time.

- a. high dose
- b. linear dose
- c. low dose
- d. None of the above

# Question #144: Review

Chronic or stochastic effects arise from cumulative low-dose exposures over time

# Question #145:

Cancer, genetic mutations, and cataracts can be caused by acute exposures to radiation.

- a. True
- b. False

# Question #145: Review

- Chronic or stochastic effects arise from cumulative low-dose exposures over time. These include:
- Cancer: Increased risk of leukemia, thyroid cancer, and other malignancies.
- Genetic mutations: Potential heritable effects, although evidence in humans is limited.
- Cataracts: Particularly relevant for staff exposed to scattered radiation during fluoroscopy.

# Question #146:

Certain groups are more susceptible to radiation-induced harm. These groups include:

- a. Caucasian
- b. Pediatric
- c. Young adults
- d. Males between 20-30

# Question #146: Review

- Certain groups are more susceptible to radiation-induced harm:
- Pediatric patients: Rapid cell division and longer life expectancy increase risk.
- Pregnant patients: Potential for teratogenic effects, especially during organogenesis.
- Staff with repeated exposure: Cumulative effects necessitate stringent protective measures.

# Question #147:

Which governing body oversees safety and efficacy of radiologic equipment?

- a. OSHA.
- b. FDA
- c. WHO
- d. ARRT

# Question #147: Review

- Countries adopt and adapt international guidance to local contexts. In the United States, key regulatory bodies include:
- Nuclear Regulatory Commission (NRC): Regulates radioactive materials and certain medical uses.
- Food and Drug Administration (FDA): Oversees safety and efficacy of radiological equipment.
- Occupational Safety and Health Administration (OSHA): Sets standards for workplace safety, including radiation protection.
- State health departments: Enforce licensing, registration, and inspection of x-ray facilities.

# Question #148:

Regulates radioactive materials and certain medical uses.

- a. NRC
- b. FDOH
- c. OSHA
- d. FDA

# Question #148: Review

- Countries adopt and adapt international guidance to local contexts. In the United States, key regulatory bodies include:
- Nuclear Regulatory Commission (NRC): Regulates radioactive materials and certain medical uses.
- Food and Drug Administration (FDA): Oversees safety and efficacy of radiological equipment.
- Occupational Safety and Health Administration (OSHA): Sets standards for workplace safety, including radiation protection.
- State health departments: Enforce licensing, registration, and inspection of x-ray facilities.

# Question #149:

Sets standards for workplace safety, including radiation protection.

- a. OSHA
- b. ASRT
- c. NRC
- d. FDA

# Question #149: Review

- Countries adopt and adapt international guidance to local contexts. In the United States, key regulatory bodies include:
- Nuclear Regulatory Commission (NRC): Regulates radioactive materials and certain medical uses.
- Food and Drug Administration (FDA): Oversees safety and efficacy of radiological equipment.
- Occupational Safety and Health Administration (OSHA): Sets standards for workplace safety, including radiation protection.
- State health departments: Enforce licensing, registration, and inspection of x-ray facilities.

# Question #150:

Enforce licensing, registration, and inspection of x-ray facilities.

- a. FDA
- b. ARRT
- c. FDOH
- d. CMS

# Question #150: Review

- Countries adopt and adapt international guidance to local contexts. In the United States, key regulatory bodies include:
- Nuclear Regulatory Commission (NRC): Regulates radioactive materials and certain medical uses.
- Food and Drug Administration (FDA): Oversees safety and efficacy of radiological equipment.
- Occupational Safety and Health Administration (OSHA): Sets standards for workplace safety, including radiation protection.
- State health departments: Enforce licensing, registration, and inspection of x-ray facilities.

# Question #151:

Radiation safety compliance requirements include:

- a. Annual inspections
- b. Equipment registration
- c. Dose reporting
- d. All of the above

# Question #151: Review

## Compliance Requirements

- Facilities must adhere to:
- Annual and periodic inspections.
- Equipment registration and maintenance records.
- Personnel monitoring and dose reporting.
- Implementation of quality assurance and safety programs.
- Ongoing staff education and certification.

# Question #152:

Shielding is a physical barrier to reduce primary radiation only.

- a. True
- b. False

# Question #152: Review

**Shielding:** a physical barriers reduce exposure to primary and scattered radiation.

# Question #153:

Lead-lined walls, windows, and doors are examples of shielding.

- a. True
- b. False

# Question #153: Review

- Physical barriers reduce exposure to primary and scattered radiation. Key elements are:
- Lead aprons and thyroid shields: Personal protective equipment for staff and patients.
- Lead-lined walls, windows, and doors: Structural shielding in procedure rooms.
- Mobile shields: Movable barriers positioned between staff and the radiation source.
- Proper maintenance and regular inspection of shielding are essential to ensure efficacy.

# Question #154:

Personal protective equipment includes all except:

- a. Mobile barriers
- b. Lead Apron
- c. Thyroid Shield
- d. Lead Gloves

# Question #154: Review

- Staff must don appropriate PPE during fluoroscopic and x-ray procedures. Standard items include:
- Lead aprons (0.5 mm lead equivalent or higher).
- Thyroid collars.
- Lead glasses to protect the lens of the eye.
- Lead gloves for manual positioning or close proximity work.

# Question #155:

Lead aprons should be \_\_\_\_ .mm of lead or higher.

- a. .5
- b. .7
- c. .9
- d. 1.0

# Question #155: Review

- Staff must don appropriate PPE during fluoroscopic and x-ray procedures. Standard items include:
- Lead aprons (0.5 mm lead equivalent or higher).
- Thyroid collars.
- Lead glasses to protect the lens of the eye.
- Lead gloves for manual positioning or close proximity work.

# Question #156:

In addition to shielding, distance is an effective way to reduce exposure. This is an example of:

- a. Inverse Square Law
- b. Concave/Convex Rule
- c. Murphy's Law
- d. None of the above

# Question #156: Review

- Radiation intensity decreases with the square of the distance from the source (inverse square law). Maximizing distance is one of the most effective protective strategies. Staff should:
- Stand as far as practicable from the x-ray beam and patient during exposure.
- Utilize remote controls and positioning devices.

# Question #157:

Using pulsed rather than continuous fluoroscopy when possible, reduces cumulative dose.

- a. True
- b. False

# Question #157: Review

- Minimizing the time spent exposed to radiation reduces cumulative dose. Strategies include:
- Limiting fluoroscopy time to the shortest necessary duration.
- Using pulsed rather than continuous fluoroscopy when possible.
- Coordinating procedures efficiently to avoid unnecessary repeat exposures.

# Question #158:

Collimation is used to:

- a. restrict x-ray beam
- b. focus on the area of interest
- c. both a and b
- d. None of the above

# Question #158: Review

- Proper operation of x-ray and fluoroscopy equipment is critical for radiation safety. Key practices include:
- Following manufacturer guidelines for use and safety features.
- Ensuring all users are adequately trained and credentialed.
- Verifying correct patient identification and site prior to exposure.
- Utilizing collimation to restrict the beam to the area of interest.
- Employing automatic exposure control (AEC) systems to optimize dose.

# Question #159:

Regular equipment maintenance ensures optimal performance and safety. Essential elements are:

- a. Routine preventive maintenance by qualified service personnel.
- b. Annual physics testing and calibration of output parameters.
- c. Timely repair of malfunctioning components.
- d. All of the above

# Question #159: Review

- Regular equipment maintenance ensures optimal performance and safety. Essential elements are:
- Routine preventive maintenance by qualified service personnel.
- Annual physics testing and calibration of output parameters.
- Timely repair of malfunctioning components.
- Documentation of maintenance and calibration activities.

# Question #160:

Optimizing technical parameters for patient size and clinical indication include:

- a. kVp
- b. mA
- c. time
- d. All of the above

# Question #160: Review

- The ALARA principle (As Low As Reasonably Achievable) guides efforts to minimize patient exposure. Techniques include:
- Justifying all procedures; avoiding unnecessary imaging.
- Optimizing technical parameters (kVp, mA, exposure time) for patient size and clinical indication.
- Using shielding for radiosensitive organs (e.g., gonads, thyroid) when appropriate and not interfering with the clinical objective.
- Employing dose-saving technologies such as pulsed fluoroscopy and last-image hold.

# Question #161:

Guiding principles to minimize patient exposure:

- a. ALARA
- b. Image Gently
- c. Image Wisely
- d. None of the above

# Question #161: Review

- The ALARA principle (As Low As Reasonably Achievable) guides efforts to minimize patient exposure. Techniques include:
  - Justifying all procedures; avoiding unnecessary imaging.
  - Optimizing technical parameters (kVp, mA, exposure time) for patient size and clinical indication.
  - Using shielding for radiosensitive organs (e.g., gonads, thyroid) when appropriate and not interfering with the clinical objective.
  - Employing dose-saving technologies such as pulsed fluoroscopy and last-image hold.

# Question #162:

Radiosensitive organs include but are not limited to:

- a. gonads
- b. thyroid
- c. both a and b
- d. Non of the above

# Question #162: Review

- The ALARA principle (As Low As Reasonably Achievable) guides efforts to minimize patient exposure. Techniques include:
  - Justifying all procedures; avoiding unnecessary imaging.
  - Optimizing technical parameters (kVp, mA, exposure time) for patient size and clinical indication.
  - Using shielding for radiosensitive organs (e.g., gonads, thyroid) when appropriate and not interfering with the clinical objective.
  - Employing dose-saving technologies such as pulsed fluoroscopy and last-image hold.

# Question #163:

A discussion regarding potential radiation risks should occur after the procedure.

- a. True
- b. False

# Question #163: Review

- Patients must be informed of the benefits, risks, and alternatives to procedures involving ionizing radiation. Informed consent should include:
  - A clear explanation of the clinical need.
  - A discussion of potential radiation risks, especially for high-dose or repeated procedures.
  - Consideration of patient questions and concerns.

# Question #164:

Special considerations should be taken with pregnant patients including the considerations for other modalities such as:

- a. CT
- b. Nuc Med
- c. Interventional Radiology
- d. MRI

# Question #164: Review

- Certain populations require tailored approaches:
- Pediatrics: Use pediatric protocols with lower dose settings; avoid adult default parameters.
- Pregnant patients: Assess necessity, consider alternative modalities (e.g., ultrasound, MRI), and apply fetal shielding when indicated.
- Repeat imaging: Review prior studies to avoid unnecessary duplication.

# Question #165:

It is acceptable to use adult protocol settings on pediatric patients.

- a. True
- b. False

# Question #165: Review

- Certain populations require tailored approaches:
- Pediatrics: Use pediatric protocols with lower dose settings; avoid adult default parameters.
- Pregnant patients: Assess necessity, consider alternative modalities (e.g., ultrasound, MRI), and apply fetal shielding when indicated.
- Repeat imaging: Review prior studies to avoid unnecessary duplication.

# Question #166:

Repeat imaging should be kept to a minimum to reduce radiation exposure.

- a. True
- b. False

# Question #166: Review

- Certain populations require tailored approaches:
- Pediatrics: Use pediatric protocols with lower dose settings; avoid adult default parameters.
- Pregnant patients: Assess necessity, consider alternative modalities (e.g., ultrasound, MRI), and apply fetal shielding when indicated.
- Repeat imaging: Review prior studies to avoid unnecessary duplication.

# Question #167:

Reviewing dosimetry reports is not an important part of dose monitoring.

- a. True
- b. False

# Question #167: Review

- Occupational radiation exposure must be routinely monitored using:
- Personal dosimeters (e.g., thermoluminescent dosimeters, OSL badges) worn at the collar and under the lead apron.
- Area monitors in procedure rooms to assess environmental dose levels.
- Regular review and documentation of exposure records.

# Question #168:

Continuous education and training should include:

- a. radiation physics
- b. biology
- c. equipment operation
- d. All of the above

# Question #168: Review

- Continuous education is essential for maintaining a safe work environment. Training programs should cover:
- Radiation physics and biology.
- Safe equipment operation and emergency procedures.
- Regulatory requirements and institutional policies.
- Updates on new technologies and safety protocols.
- Image Gently and Image Wisely pledges

# Question #169:

Continuous education and training should include:

- a. Image Gently
- b. Image Wisely
- c. None of the above
- d. Both a and b

# Question #169: Review

- Continuous education is essential for maintaining a safe work environment. Training programs should cover:
- Radiation physics and biology.
- Safe equipment operation and emergency procedures.
- Regulatory requirements and institutional policies.
- Updates on new technologies and safety protocols.
- Image Gently and Image Wisely pledges

# Question #170:

ICRP recommended annual effective dose limit with no single year exceeding 50 mSv:

- a. 10 mSv averaged over 10 years
- b. 20 mSv averaged over 5 years
- c. 5 mSv averaged over 20 years
- d. 1 mSv averaged over 5 years

# Question #170: Review

- International and national bodies set dose limits for occupational exposure:
- ICRP recommended annual effective dose limit: 20 mSv averaged over 5 years, with no single year exceeding 50 mSv.
- Lens of the eye: 20 mSv/year averaged over 5 years.
- Skin, hands, and feet: 500 mSv/year.
- Institutions should strive to keep exposures well below these limits.

# Question #171:

ICRP recommended annual effective dose limit for the lens of the eye:

- a. 10 mSv averaged over 10 years
- b. 20 mSv averaged over 5 years
- c. 5 mSv averaged over 20 years
- d. 1 mSv averaged over 5 years

# Question #171: Review

- International and national bodies set dose limits for occupational exposure:
- ICRP recommended annual effective dose limit: 20 mSv averaged over 5 years, with no single year exceeding 50 mSv.
- Lens of the eye: 20 mSv/year averaged over 5 years.
- Skin, hands, and feet: 500 mSv/year.
- Institutions should strive to keep exposures well below these limits.

# Question #172:

ICRP recommended annual effective dose limit for the hands:

- a. 1000 mSv/year
- b. 20 mSv/year
- c. 500 mSv/year
- d. 100 mSv/year

# Question #172: Review

- International and national bodies set dose limits for occupational exposure:
- ICRP recommended annual effective dose limit: 20 mSv averaged over 5 years, with no single year exceeding 50 mSv.
- Lens of the eye: 20 mSv/year averaged over 5 years.
- Skin, hands, and feet: 500 mSv/year.
- Institutions should strive to keep exposures well below these limits.

# Question #173:

ICRP recommended annual effective dose limit for the skin:

- a. 500 mSv/year
- b. 200 mSv/year
- c. 50 mSv/year
- d. 100 mSv/year

# Question #173: Review

- International and national bodies set dose limits for occupational exposure:
- ICRP recommended annual effective dose limit: 20 mSv averaged over 5 years, with no single year exceeding 50 mSv.
- Lens of the eye: 20 mSv/year averaged over 5 years.
- Skin, hands, and feet: 500 mSv/year.
- Institutions should strive to keep exposures well below these limits.

# Question #174:

Components of a radiation safety audit include:

- a. compliance with radiation safety protocols
- b. dosimetry data
- c. lead inspection
- d. All of the above

# Question #174: Review

- Regular audits verify compliance with radiation safety protocols and identify areas for improvement. Audit components include:
  - Review of equipment performance and calibration records.
  - Assessment of personnel dosimetry data.
  - Evaluation of procedural protocols and adherence to ALARA.
  - Inspection of shielding and PPE integrity.

# Question #175:

Key elements in reporting a radiation safety event include:

- a. Immediate reporting
- b. Root cause to determine contributing factors
- c. Corrective action plan
- d. All of the above

# Question #175: Review

- A transparent incident reporting system encourages identification and analysis of radiation safety events. Key elements are:
- Immediate reporting of accidental exposures, equipment malfunctions, or protocol deviations.
- Root cause analysis to determine contributing factors.
- Implementation of corrective actions and follow-up.

# Question #176:

Open Mouth View structures include:

- a. C1
- b. C7/T1
- c. Wisdom teeth
- d. None of the above

# Question #176: Review

## Open Mouth View Structures

Visible structures include transverse process of **C1**, zygapophyseal joint C1-C2, C2 body, mandible, lateral mass of C1, odontoid, and upper incisors.

# Question #177:

Open Mouth View a chin \_\_\_\_\_ for the odontoid tip to be visualized.

- a. tilt
- b. tuck
- c. raise
- d. None of the above

# Question #177: Review

## **Open Mouth/Odontoid Positioning**

**Tucking** the chin prevents occipital bone superimposition over the odontoid tip for clear visualization.

# Question #178:

In the lateral projection of the cervical spine, the following structures can be visualized:

- a. nasopharynx
- b. oropharynx
- c. occipital bone
- d. All of the above

# Question #178: Review

## **Lateral Projection Details**

Lateral view shows **nasopharynx, oropharynx,** transverse processes, spinous processes, and **occipital bone.**

# Question #179:

These views are utilized for whiplash injuries:

- a. Fuch method
- b. flex/extension
- c. Neither of these
- d. Both a and b

# Question #179: Review

## **Special Views and Uses**

**Fuch method** and **flexion/extension** views aid visualization and functional assessment, especially for whiplash injuries.

# Question #180:

An AP Sacrum view shows:

- a. L5 spinous process
- b. sacroiliac joint
- c. L5-S1 joint
- d. All of the above

# Question #180: Review

## **AP Sacrum View Features**

This view identifies L5 spinous process, L5-S1 joint, sacroiliac joint, anterior sacral foramen, acetabulum, and obturator foramen.

# Question #181:

The AP Coccyx view requires a \_\_\_\_\_ degree caudal tube angle.

- a. 5
- b. 20
- c. 10
- d. 15

# Question #181: Review

## **AP Coccyx View Technique**

A 10-degree caudal tube angle desuperimposes symphysis pubis and coccyx for clear lateral displacement visualization.

# Question #182:

The best view to show the floating ribs is:

- a. AP Ribs
- b. Oblique Ribs
- c. Lateral Sternum
- d. All of the above

# Question #182: **Review**

## **Oblique Rib Views**

Oblique views (LPO or RAO) best show axillary and anterior left ribs and posterior right ribs, including diaphragm and **floating ribs**.

# Question #183:

The best view to visualize the sternum is:

- a. Lateral
- b. AP
- c. RAO
- d. None of the above

# Question #183: **Review**

## **RAO Sternum View**

The RAO sternum view displays the posterior rib, manubrium, sternal angle, and body for clear anatomical visualization.

# Question #184:

Radiographic projections of the skull include all except:

- a. PA
- b. Towne's
- c. Lateral
- d. AP

# Question #184: Review

Standard radiographic projections of the skull includes **PA, PA Caldwell, Towne's, Lateral**, and specialized views for the mandible, facial bones, sinuses, nasal bones, zygomatic arches, and orbits.

# Question #185:

The Lambdoidal Suture is located in the front of the skull.

- a. True
- b. False

# Question #185: Review

**Lambdoidal Suture:** Located at the **posterior** aspect of the skull, connecting the occipital bone to the parietal bones. It is visible in PA, PA Caldwell, and Towne's views, serving as a landmark for assessing cranial symmetry and integrity.

# Question #186:

The Coronal Suture runs transversely across the skull.

- a. True
- b. False

# Question #186: Review

**Coronal Suture:** Runs **transversely** across the skull, separating the frontal bone from the parietal bones. It is best visualized in the lateral projection.

# Question #187:

The frontal sinuses are visible in these two views:

- a. Water's and Fuch
- b. Fuch and Caldwell
- c. Water's and Caldwell
- d. Fuch only

# Question #187: Review

**Frontal Bone and Sinuses:** The frontal bone forms the forehead and the superior part of the orbital cavity. The frontal sinuses, located within the bone, are visible in **Water's and Caldwell views**. The orbital plates of the frontal bone are also highlighted in lateral projections.

# Question #188:

The sides and roof of the skull are formed by these bones:

- a. parietal
- b. occipital
- c. temporal
- d. frontal

# Question #188: **Review**

**Parietal Bones:** These form the sides and roof of the cranium and are often referenced in lateral and PA views.

# Question #189:

The palpable bump at the base of the skull is called:

- a. petrous ridge
- b. occipital fossa
- c. temporal plateau
- d. occipital protuberance

# Question #189: Review

**Occipital Bone:** The posterior base of the skull, containing the external **occipital protuberance** (a palpable bump) and the foramen magnum, which is the large opening for the spinal cord. The foramen magnum is especially prominent in the Towne's view.

# Question #190:

The infraorbital foramen is a small opening below the:

- a. orbit
- b. nasal bone
- c. mandible
- d. zygomatic arch

# Question #190: Review

**Maxilla (Maxillary Sinus):** The maxilla forms the upper jaw and contains the maxillary sinuses, which are large air-filled spaces visible in Water's, Caldwell, and SMV views. The infraorbital foramen, a small opening below the orbit, is also a key landmark.

# Question #191:

The primary views for the mandible include:

- a. PA
- b. Towne's
- c. axoilateral oblique
- d. All of the above

# Question #191: Review

**Mandible:** The lower jaw consists of the body, ramus, angle, condyle, and coronoid process. Each part is best demonstrated in specific projections: **PA and Towne's views and the axiolateral oblique views.**

# Question #192:

There are \_\_\_\_\_ sinuses in the skull.

- a. 1
- b. 2
- c. 3
- d. 4

# Question #192: Review

- **Frontal Sinus:** Located above the orbits, visible in Water's and Caldwell views.
- **Ethmoid Sinus:** Situated between the nose and the orbits, seen in Caldwell and lateral views.
- **Sphenoid Sinus:** Deep within the skull, best seen in open mouth Water's and SMV views.
- **Maxillary Sinus:** The largest, located in the maxilla, visible in Water's, Caldwell, and SMV views

# Question #193:

What orbital landmark is best visualized in the Rhese view?

- a. supraorbital margin
- b. optical canal
- c. lateral wall
- d. All of the above

# Question #193: Review

- **Supraorbital Margin:** The superior rim of the orbit, seen in Rhese views.
- **Optic Canal:** The passage for the optic nerve, visualized in Rhese for pathology.
- **Lateral Wall:** Formed by the zygoma and frontal bone, assessed in Rhese for trauma.

# Question #194:

An important view for shoulder trauma is the “Y” view.

- a. True
- b. False

# Question #194: **Review**

**Scapula Projections:** Covers AP and lateral (“Y” view) scapula projections. Identifies anatomical features—AC joint, scapular notch, spine, medial/lateral borders, glenoid fossa, intertubercular groove, inferior angle, and coracoid process. The “Y” view is emphasized for its utility in trauma and shoulder dislocation assessment.

# Question #195:

Pathology is the study of disease and its impact on the body. Sources of pathology include:

- a. hereditary conditions
- b. tumors
- c. iatrogenic causes
- d. All of the above

# Question #195: Review

Pathology is the study of disease and its impact on the body. Sources of pathology include:

- Hereditary or congenital conditions
- Tumors
- Iatrogenic causes (adverse conditions resulting from medical treatment, e.g., pneumothorax after thoracentesis)
- Infections (including nosocomial infections acquired in healthcare settings)

# Question #196:

A symptom is observable by a healthcare worker.

- a. True
- b. False

# Question #196: Review

- **Sign:** Observable by healthcare workers (e.g., swelling, rash)
- **Symptom:** Subjective experience reported by the patient (e.g., headache)

# Question #197:

A group of signs and symptoms characterizing an abnormal disturbance is known as syndrome.

- a. True
- b. False

# Question #197: Review

A **syndrome** is a group of signs and symptoms characterizing an abnormal disturbance. For example, Marfan's Syndrome is a genetic disorder of connective tissue, marked by cardiac issues, long limbs, and tall stature.

# Question #198:

Diseases with no identifiable cause:

- a. Ischemic
- b. Idiopathic
- c. Genetic
- d. None of the above

# Question #198: **Review**

**Idiopathic:** Diseases with no identifiable cause  
(e.g., hypertension, spontaneous pneumothorax)

# Question #199:

Inflammation is the body's response to injury, aiming to isolate and remove harmful agents. Key processes include:

- a. Hyperemia
- b. Phagocytosis
- c. Cardinal signs
- d. All of the above

# Question #199: Review

Inflammation is the body's response to injury, aiming to isolate and remove harmful agents. Key processes include:

- **Hyperemia:** Dilation of capillaries to allow fluids and leukocytes to infiltrate the affected area
- **Phagocytosis:** Leukocytes remove cellular debris
- **Cardinal signs:** Heat, redness, pain, and decreased function

# Question #200:

Types of Inflammatory Reactions include all except:

- a. bleeding
- b. bruising
- c. abscess
- d. flaky skin

# Question #200: Review

## Types of Inflammatory Reactions

- **Abscess:** Walled-off ball of pus; antibiotics cannot penetrate, so aspiration and drainage are required
- **Ulcers:** Healing wounds on skin or mucous membranes
- **Cellulitis:** Acute bacterial infection of the skin, often seen where skin is damaged. Bacterial reproduction produces methane, which can be visualized on radiographs as air within tissue.

# Question #201:

Ascites is example of generalized edema.

- a. True
- b. False

# Question #201: Review

Edema is the abnormal accumulation of fluid in body cavities or intercellular spaces. It can be:

- **Localized:** e.g., **ascites** (edema of the peritoneal cavity)
- **Generalized:** e.g., congestive heart failure, leading to peripheral edema, pulmonary edema, pleural effusions, and ascites

# Question #202:

Loss of blood supply leads to tissue necrosis, known as ischemia.

- a. True
- b. False

# Question #202: **Review**

## **Infarct**

Loss of blood supply leads to tissue necrosis, known as infarct.

# Question #203:

Hemorrhage is the loss of blood from the circulatory system. Types include:

- a. Hematoma
- b. Ecchymosis
- c. Petechia
- d. All of the above

# Question #203: Review

Hemorrhage is the loss of blood from the circulatory system. Types include:

- **Hematoma:** Pooling of blood below the skin or within organs due to vessel rupture
- **Ecchymosis:** Bruise or contusion from damaged capillaries
- **Purpura:** Red or purple spots from hemorrhage, often due to platelet or coagulation disorders
- **Petechia:** Small red or purple spots, a type of purpura

# Question #204:

Atrophy is the decrease in cell size within an organ or structure.

- a. True
- b. False

# Question #204: Review

Atrophy is the decrease in cell size within an organ or structure.

Causes include:

- Lack of physical activity
- Poor nourishment
- Nerve damage
- Poor circulation

# Question #205:

Hypertrophy is the inability of an organ or structure to form properly, resulting in partial or complete loss of the organ.

- a. True
- b. False

# Question #205: **Review**

Aplasia is the inability of an organ or structure to form properly, resulting in partial or complete loss of the organ.

# Question #206:

Cancer of blood and blood-forming tissues; acute (immature cells) and chronic (mature cells) forms is:

- a. sarcoma
- b. leukemia
- c. carcinoma
- d. lymphoma

# Question #206: **Review**

**Leukemia:** Cancer of blood and blood-forming tissues; acute (immature cells) and chronic (mature cells) forms

# Question #207:

Cancer of soft or connective tissue (bone, cartilage, muscle, fat); rare but highly malignant is:

- a. sarcoma
- b. leukemia
- c. carcinoma
- d. lymphoma

# Question #207: **Review**

**Sarcoma:** Cancer of soft or connective tissue (bone, cartilage, muscle, fat); rare but highly malignant

# Question #208:

Cancer originating in lymphatic tissues, affecting lymphocyte production is:

- a. sarcoma
- b. leukemia
- c. carcinoma
- d. lymphoma

# Question #208: **Review**

**Lymphoma:** Cancer originating in lymphatic tissues, affecting lymphocyte production

# Question #209:

Osgood-Schlatter Disease is common in young athletes, especially boys between the ages of:

- a. 10-16
- b. 5-8
- c. 7-9
- d. None of the above

# Question #209: Review

## **Osgood-Schlatter Disease**

Common in young athletes, especially boys aged 10–16, this condition involves inflammation of the tibial tuberosity following exercise. It is a frequent cause of knee pain and is managed primarily with rest.

# Question #210:

“Bamboo spine” is associated with:

- a. rheumatoid arthritis
- b. gout
- c. ankylosing spondylitis
- d. osteoarthritis

# Question #210: Review

## **Ankylosing Spondylitis**

A chronic, degenerative arthritis beginning in the sacroiliac joints and spreading to the spine, ankylosing spondylitis is characterized by osteoporosis and fusion of joints, producing a “bamboo spine” appearance. Historical treatments included high-dose x-rays, which provided relief but increased leukemia risk.

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# Congratulations, you have just completed the Mastery Test!!

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Now, please take a picture of your completed answer sheet and text it to [Shane Smith at \(727\) 515-9532](#) or email is to [ceuarmy@yahoo.com](mailto:ceuarmy@yahoo.com). If you score a 75% or higher, your certificate of completion will be emailed back to you within one week of receiving your answer sheet and payment.

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# About the Author:

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Shane began his career in the health field by becoming a certified personal trainer by AFAA (Aerobics and Fitness Association of America) in 1993. Soon after he began taking prerequisite classes at the Community College of Rhode Island for the Physical Therapist Assistant program.

In 1996, Shane was accepted at Newbury College in Brookline, MA to enroll into the Physical Therapist Assistant program. While attending classes at Newbury, he was employed by the college as a tutor for kinesiology. Shane graduated Cum Laude from Newbury College in 1998 with an A.A.S. degree. He was also elected into the Who's Who Amongst Students in American Universities and Colleges for 1997-1998. Shane immediately took his licensing test in Rhode Island and successfully received his license as a Physical Therapist Assistant.

Shane moved to Florida 1999 and began working as a Physical Therapist Assistant in the acute, skilled nursing and outpatient settings. He has done extensive co-treating with Occupational Therapists and Occupational Therapist Assistants on a wide variety of patients with varying health conditions.

In 2001, Shane enrolled into the Radiography program at St. Petersburg College. There he gained a whole new appreciation for anatomy and health/patient care. He graduated top of his class in 2003 with an A.A.S. degree in radiography and earned the Mallinckrodt Award. Shane took the national registry by the ARRT and obtained a General Radiographer's license. He has been working in the field ever since, Shane has also successfully completed two MRI courses offered by St. Petersburg College.

In 2003, his radiographer instructor, John Fleming, inspired him to create a company that offered high quality continuing education units at an affordable price. SCS Continuing Education was born. SCS Continuing Education currently has two continuing education programs approved by the Florida Physical Therapy Association (FPTA), the Mississippi State Board of Physical Therapy (MSBPT) and the Arkansas State Board for Physical Therapy (ARPTB) for Physical Therapists and Physical Therapist Assistants and two continuing education programs approved by the Florida Department of Health (FDOH) Bureau of Radiation Control for Category A credits for radiographers.

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