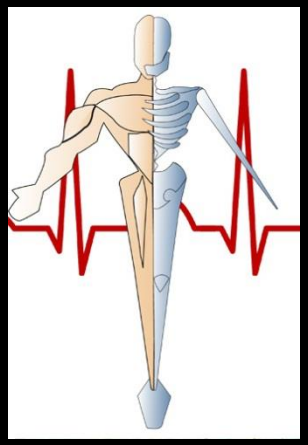
Three Phase CEUs Presents:

Topics in Radiography Volume II ©

"Mastery Test"

by

John Fleming, M.Ed.,RT(R)(MR)(CT)



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Forward:

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

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.

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Mastery Test Instructions:

Please place an "X" over the correct response on your answer sheet. Feel free to write your answer down on a blank piece of paper if you do not have access to a printer. That is just as good.

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Question #1:

According to the National Council on Radiation Protection and Measurement (NCRP), the exposure switch cord on mobile x-ray units (portable machines) must be at least _____ feet in length.

a. 2
b. 4
c. 6
d. 10

Question #1: Review

- The following is a list of guidelines that the NCRP recommends in regard to radiation protection during general radiographic examinations:

  The protective tube housing must be designed to ensure that tube leakage is kept below 100 mR/hour at a distance of 1 meter.

  The collimator light field must be accurate to within +/- 2% of the SID that is set.

  -For example, at a 40" SID the light field may be off by as much as 0.8" in either direction (40" SID x 2% = 0.8").

  -To avoid missing required anatomy, you should not place body parts of interest within 0.8" of the edge of your light field.

  It is recommended that the central ray alignment must be accurate to within +/- 1 degree of perfect vertical.

  The source to image-receptor distance (SID) indicator or dial must be accurate to within 2% of the SID that is set.

  -This is to ensure that your "tape measure" is accurate.

  The exposure switch cord on mobile units (portable machines) must be at least 2 meters or 6 feet in length.

  -This allows the radiographer to stand a safe distance from the source.

Question #2:

In reference to dose-response relationships, which of the following conditions is an example of a stochastic effect?

a. epilation or hair loss
b. primary lung cancer
c. cataract formation
d. skin erythema or reddening

Question #2: Review

- The following refers to dose-response relationships and the salient differences between stochastic and non stochastic effects:

  Stochastic effects do not require a dose threshold and are considered to be randomly occurring somatic changes such as cancer formation.

  -In essence, as the dose increases, the likelihood that the individual acquiring cancer will also increase.

  -It is important to note that as the dose increases, the severity of the cancer will not be affected, only the likelihood of acquiring the cancer.

  -Therefore, it is an all-or-none response to ionizing radiation.

  Non stochastic effects differ from stochastic effects b/c as you increase the dose, the severity of the effect changes but not the effect itself.

  -Non stochastic effects are considered to be a threshold type of response to ionizing radiation.

  -In other words, these effects are not seen until a minimum dose has been delivered.

  -After the threshold dose has been achieved, any dose above that will result in an increase in the severity of the response.

  -Examples include skin erythema, epilation, and cataract formation.

Question #3:

Which of the following organelles is responsible for protein synthesis within a cell?

a. ribosomes
b. mitochondria
c. endoplasmic reticulum (ER)
d. golgi apparatus

Question #3: Review

- Organelles are small organs that perform specific functions within the cell and the following is a description of some of the more common ones:

  The endoplasmic reticulum (ER) consists of a network of tubes or channels that are closely associated with the nucleus

  -The ER is essentially the transport system from the nucleus to the cytoplasm.

  Ribosomes are small, round structures that are the site of protein synthesis.

  -They are either attached to the ER (often referred to as rough ER) or are loose within the cytoplasm.

  The golgi apparatus consists of a series of tubules that extend from the nucleus to the cell membrane.

  Mitochondria are bean-shaped organelles within the cytoplasm.

  -They are known as the powerhouse of the cell as their function is to produce energy for cell use.

  Lysosomes are small sacs that contain the digestive enzymes of the cell.

Question #4:

DNA synthesis occurs during which of the following stages of mitosis?

a. Interphase
b. Prophase
c. Metaphase
d. Telophase

Question #4: Review

- The following is a description of the phases of somatic cell division or mitosis.

  Interphase consists of the following steps:

  -Gap 1 (resting phase)

  -DNA synthesis

  -Gap 2 (resting phase)

  During prophase, the nuclear membrane dissolves, the centrioles separate and move to opposite ends of the cell and the mitotic spindle fibers appear.

  During metaphase, the centromere of each chromosome attaches to a spindle fiber and align themselves at the equatorial plate of the cell.

  The centromere duplicates and the chromosomes begin to migrate towards opposite ends of the cell during anaphase.

  Telophase is characterized by the following events:

  -A division furrow appears as the cytoplasm and organelles are equally divided between the two daughter cells by a process called cytokinesis.

  -Each daughter cell now contains the required diploid number of 46 chromosomes.

Question #5:

According to the National Council on Radiation Protection and Measurement (NCRP), the generator reproducibility must not vary more than plus or minus ___ %.

a. 1
b. 2
c. 5
d. 10

Question #5: Review

- The following is a list of guidelines that the NCRP recommends in regard to radiation protection during general radiographic examinations:

  The x-ray generator reproducibility refers to the ability of the machine to produce the same beam intensity with repeated exposures.

  -It must not vary more than +/- 5%.

  -For example, if the first exposure produced 100 mR, then the next exposure must produce between 95 to 105 mR to be within the 5% allowable variance.

  mA station linearity refers to ensuring that adjacent mA stations are calibrated properly.

  -They must not vary ore than +/- 10%.

  -For example, if a constant kVp and time station are employed and the 200 mA station produced 100 mR then the 400 mA station should produce 200 mR.

  The most common thickness for protective apparel, such as lead aprons, gloves and thyroid shields, is 0.5 mm of lead and it will absorb 88% of the primary beam at 75 kVp.

  -Protective apparel made of 1.0 mm of lead will absorb approximately 99% of the primary beam at 75 kVp.

Question #6:

According to the National Council on Radiation Protection and Measurement (NCRP), what is the annual dose limit (DL) in rem for the general population exposed to infrequent exposures?

a. 0.5
b. 5.0
c. 15
d. 50

Question #6: Review

- According to the NCRP, there are two categories for annual whole body dose limits for the general population, and they are as follows:

  Frequent Exposures: This group includes individuals that work in the hospital other than radiographers (secretaries, file room staff etc.) and their dose limit is 0.1 rem/year.

  -This guideline is meant to ensure that the x-ray rooms are properly designed to prevent radiation leakage.

  Infrequent Exposures: This group includes the general population, and their dose limit is 0.5 rem/year.

Question #7:

The nuclear membrane disappears, and the centrioles separate and migrate to opposite ends of the cell during which of the following stages of mitosis?

a. Interphase
b. Prophase
c. Metaphase
d. Telophase

Question #7: Review

- The following is a description of the phases of somatic cell division or mitosis.

  Interphase consists of the following steps:

  -Gap 1 (resting phase)

  -DNA synthesis

  -Gap 2 (resting phase)

  During prophase, the nuclear membrane dissolves, the centrioles separate and move to opposite ends of the cell and the mitotic spindle fibers appear.

  During metaphase, the centromere of each chromosome attaches to a spindle fiber and align themselves at the equatorial plate of the cell.

  The centromere duplicates and the chromosomes begin to migrate towards opposite ends of the cell during anaphase.

  Telophase is characterized by the following events:

  -A division furrow appears as the cytoplasm and organelles are equally divided between the two daughter cells by a process called cytokinesis.

  -Each daughter cell now contains the required diploid number of 46 chromosomes.

Question #8:

According to the National Council on Radiation Protection and Measurement (NCRP), how much total filtration of the primary beam is required for an x-ray tube that can operate above 70 kVp?

a. 0.5 mm
b. 1.5 mm
c. 2.0 mm
d. 2.5 mm

Question #8: Review

- The NCRP dictates that aluminum filtration must be employed on all x-ray machines.
- Aluminum filtration of the primary beam is employed to remove low energy x-rays before they can exit the x-ray tube housing.

  They do not have any diagnostic value and would normally be absorbed by the patient's skin.
- The amount of aluminum filtration required is dictated by the maximum kVp that the tube can produce.

  Greater than 70 kVp requires 2.5 mm of aluminum filtration.

  50 to 70 kVp requires 1.5 mm of aluminum filtration.

  Less than 50 kVp requires 0.5 mm of aluminum filtration.

Question #9:

According to the National Council on Radiation Protection and Measurement (NCRP), the bucky slot cover must contain _____ mm of lead or its equivalent.

a. 0.25
b. 0.5
c. 1.0
d. 2.5

Question #9: Review

- The following is a list of guidelines that the NCRP recommends in regard to radiation protection during fluoroscopy examinations:

  A cumulative timer set with a 5-minute alarm must be part of every fluoroscopic unit.

  -The idea is to make the radiologist aware of how much fluoroscopic time has elapsed during the procedure.

  A dead-man type of fluoroscopic exposure control must be employed.

  -In other words, radiation will only be emitted when the exposure pedal is depressed

  -A "light switch" type of exposure switch that can be "flipped on" is not permitted.

  The bucky slot is the opening where the bucky moves up and down below the tabletop and it must be covered with a shielding device that is equal to 0.25 mm of lead or its equivalent.

  -The bucky slot is located directly at the reproductive organ level of the radiologist and this is a means to reduce their exposure.

  A protective lead curtain of at least 0.25 mm of lead or its equivalent must be positioned between the image intensifier and the radiologist.

Question #10:

The chromosomes align themselves along the equatorial plate of the cell during which of the following stages of mitosis?

a. Interphase
b. Prophase
c. Metaphase
d. Telophase

Question #10: Review

- The following is a description of the phases of somatic cell division or mitosis.

  Interphase consists of the following steps:

  -Gap 1 (resting phase)

  -DNA synthesis

  -Gap 2 (resting phase)

  During prophase, the nuclear membrane dissolves, the centrioles separate and move to opposite ends of the cell and the mitotic spindle fibers appear.

  During metaphase, the centromere of each chromosome attaches to a spindle fiber and align themselves at the equatorial plate of the cell.

  The centromere duplicates and the chromosomes begin to migrate towards opposite ends of the cell during anaphase.

  Telophase is characterized by the following events:

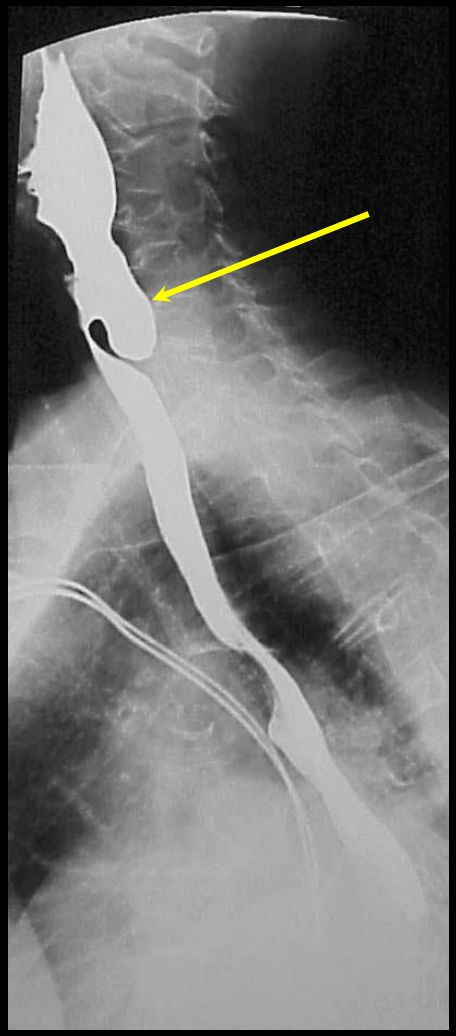
  -A division furrow appears as the cytoplasm and organelles are equally divided between the two daughter cells by a process called cytokinesis.

  -Each daughter cell now contains the required diploid number of 46 chromosomes.

Question #11:

The most likely condition depicted on this radiograph of the esophagus (arrow) would be which of the following?

a. polyp
b. traction diverticula
c. Zenker's diverticula
d. epiphrenic diverticula



Question #11: Review

- A diverticulum is an outpouching that occurs due to a weakening in the lining of, in this instance, the digestive system.

  This is not to be confused with a neoplasm which is a new growth that usually develops in towards the lumen of the digestive system.

  Diverticulum are often diagnosed with barium studies of the digestive system.
- Zenker's diverticulum arise from the posterior wall of the upper esophagus in the area of the pharynx.

  Although often asymptomatic, they can cause dysphagia (difficulty in swallowing) and halitosis (bad breath).

Question #12:

The most likely condition depicted on this UGI radiograph (arrows) would be which of the following?

a. epiphrenic diverticula
b. candida
c. hiatal hernia
d. gastric ulcer

Question #12: Review

- A hiatal hernia occurs when a portion of the stomach protrudes (herniates) into the thorax through the esophageal opening in the diaphragm.

  This is known as a sliding hiatal hernia, and it is the most common type of hiatal hernia encountered.

  A rolling or paraesophageal hiatal hernia if very rare but occurs when a portion of the stomach herniates into the thorax while the gastroesophageal junction remains stationary.
- This is one of the most common findings on an UGI series.
- It can affect up to 50% of the population as some point in their lives.

Question #13:

Which of the following disorders of the intestines involves the "telescoping" of one bowel loop inside another loop?

a. adhesion
b. intussusception
c. volvulus
d. hernia

Question #13: Review

- Intussusception occurs when a section of bowel is constricted by peristalsis causing it to prolapse or telescope into itself.
- This condition is primarily confined to infants aged 2 to 36 months and occurs more frequently in boys than girls at a ratio of 3:1.
- Intussusception is the cause of approximately 1% of all adult bowel obstructions and commonly affects the ileocecal valve.
- It is commonly corrected with a barium enema.

Question #14:

The main abnormality on this BE radiograph (arrows) would be which of the following?

a. sessile polyps
b. Crohn's disease
c. diverticulosis
d. pedunculated polyps

Question #14: Review

- Diverticulosis can occur along the entire length of the GI tract.
- In regard to the large intestine, they are commonly found in the area of the sigmoid colon.
- Diverticulum often have no signs or symptoms and are often a serendipitous discover on a barium study or colonoscopy.

Question #15:

A volvulus is a type of mechanical bowel obstruction that is defined as a loop of twisted bowel.

a. true
b. false

Question #15: Review

- A volvulus is a type of mechanical obstruction whereby a loop of intestine has twisted around itself causing either a partial or complete obstruction.
- They may resolve on their own, but some will require surgical intervention in order to prevent a loss of blood supply to the affected area and relieve the obstruction.

Question #16:

The lower esophageal sphincter (LES) has failed to relax on this radiograph (arrow) resulting in an esophageal motility disorder. Which of the following would best describe this condition?

a. candida
b. gastroesophageal reflux disease
c. esophageal varices
d. achalasia

Question #16: Review

- Achalasia is an esophageal motility disorder that occurs due to the inability of the lower esophageal sphincter (LES) to relax.

  As a result, the esophagus fills with ingested food and fluids.
- This is the exact opposite of acid reflux.
- Treatment includes a bland diet, medication to relax the LES, surgery, and an upright position to reduce regurgitation.

Question #17:

Which of the following is one of the most common findings on an UGI series?

a. achalasia
b. hiatal hernia
c. adynamic ileus
d. candida

Question #17: Review

- A hiatal hernia occurs when a portion of the stomach herniates into the thorax through the esophageal opening in the diaphragm.

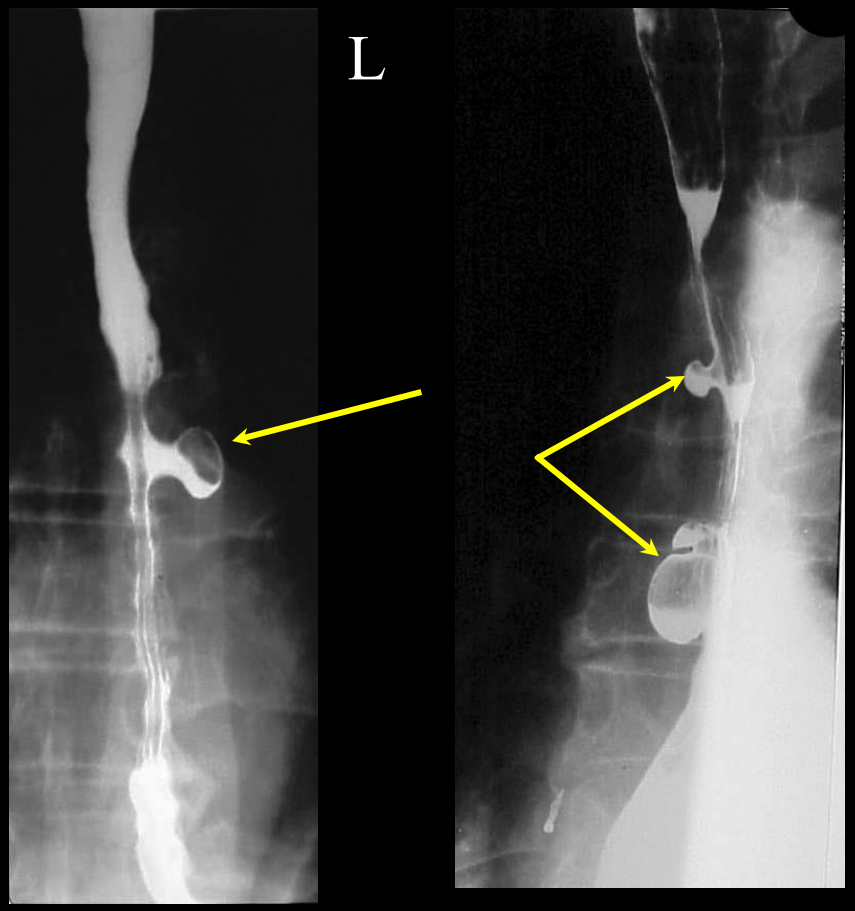
  This is known as a sliding hiatal hernia, and it is the most common type of hiatal hernia encountered.

  A rolling or paraesophageal hiatal hernia if very rare but occurs when a portion of the stomach herniates into the thorax while the gastroesophageal junction remains stationary.
- This is one of the most common findings on an UGI series.
- It can affect up to 50% of the population as some point in their lives.

Question #18:

The most likely condition depicted on this radiograph of the esophagus (arrows) would be which of the following?

a. Zenker's diverticula
b. epiphrenic diverticula
c. traction diverticula
d. polyp



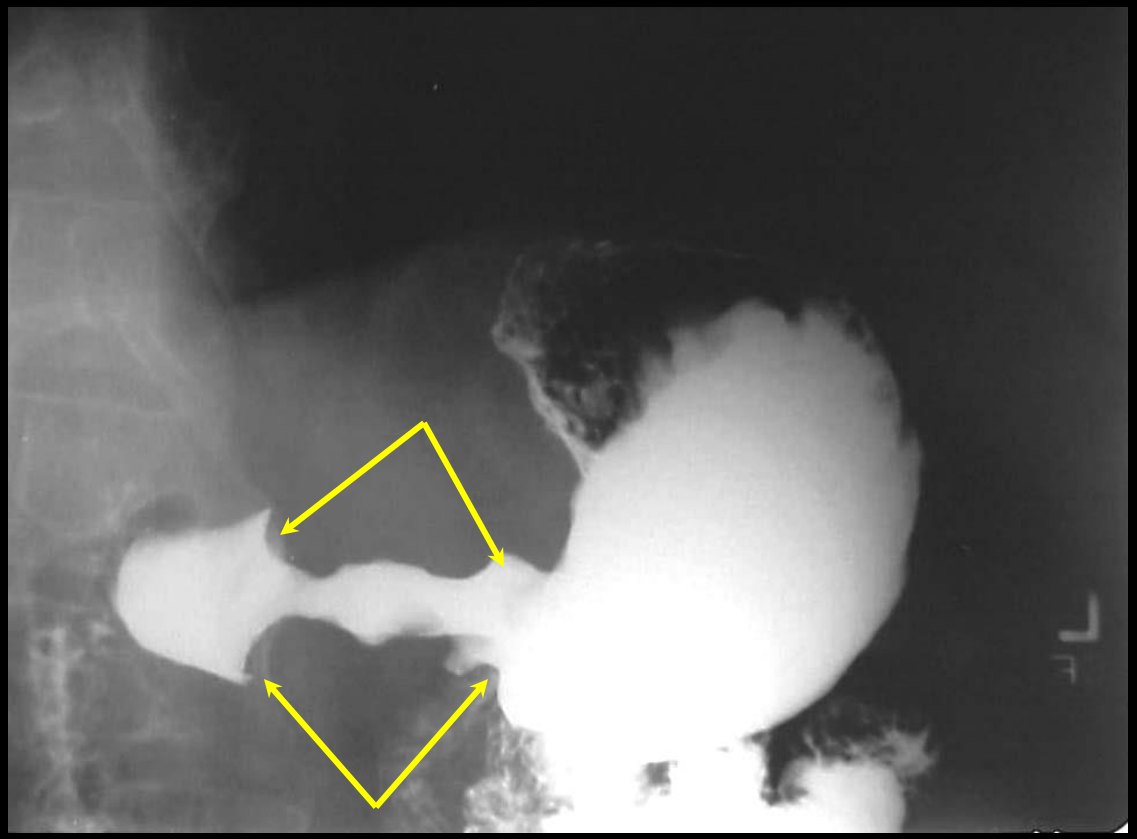
Question #18: Review

- A traction diverticulum forms in the mid esophagus area.
- Traction diverticulum may form due to scarring from pulmonary tuberculosis or an inflammatory process within the mediastinum.

Question #19:

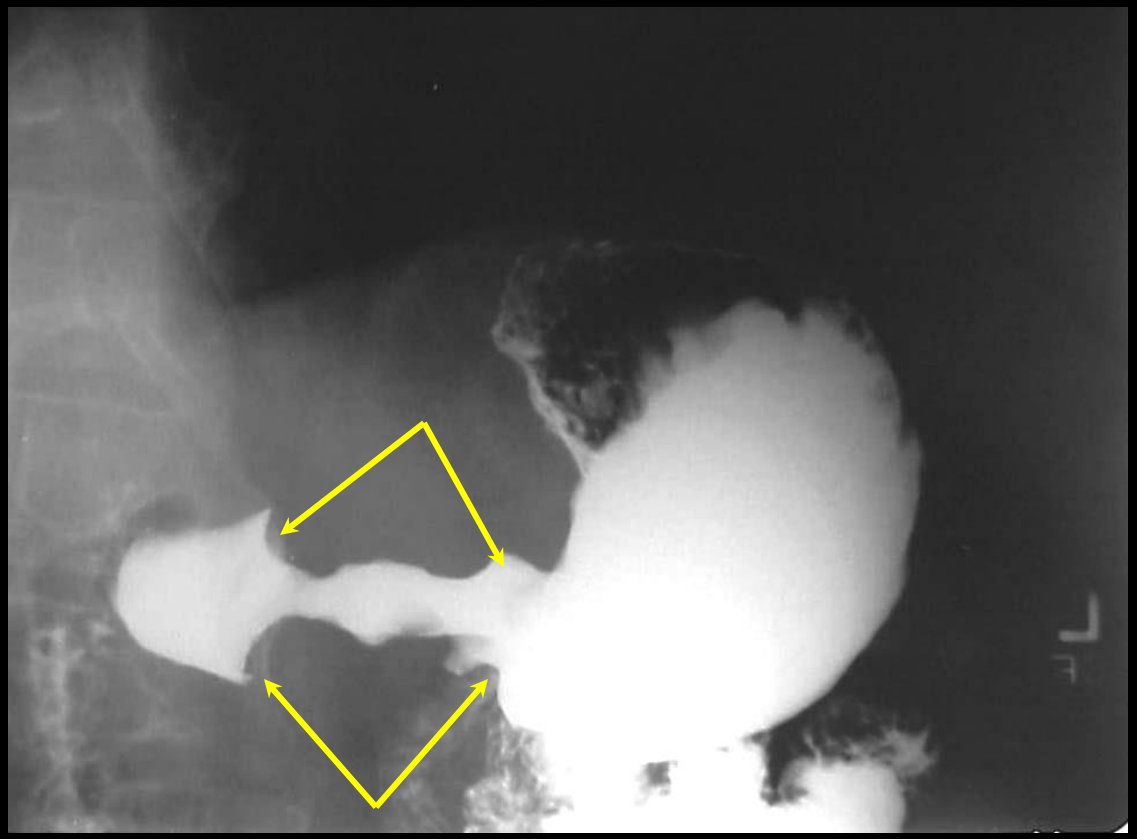
The main abnormality depicted on the radiograph below (arrows) is a gastric carcinoma?

a. true
b. false



Question #19: Review

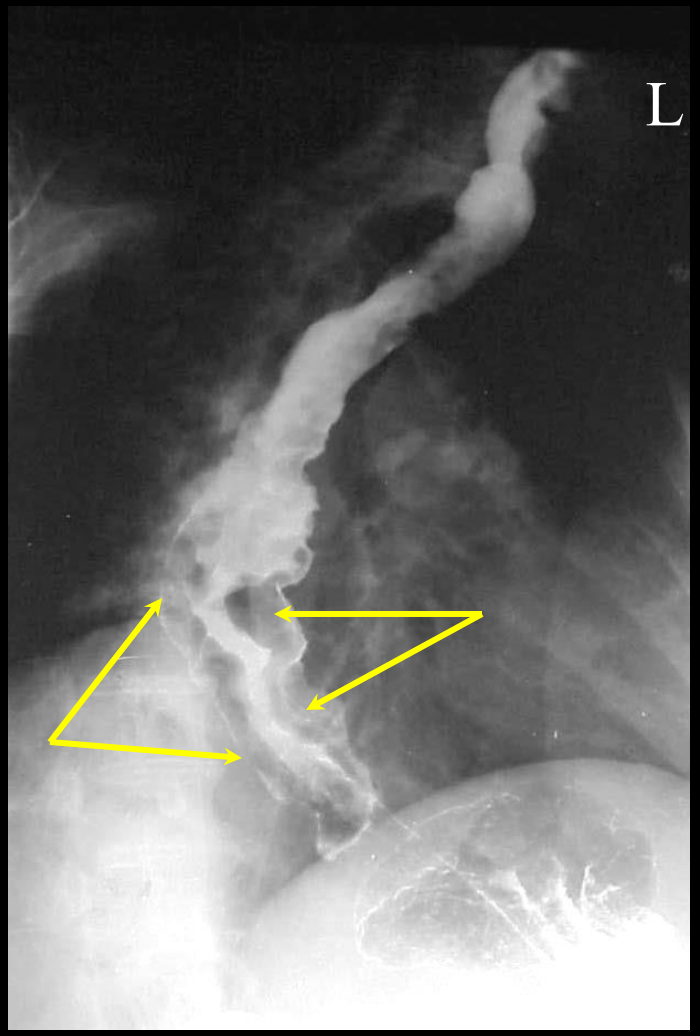
- A gastric carcinoma can be asymptomatic in the early stages and has generally metastasized to other areas of the body by the time it has been diagnosed.
- It has a poor prognosis.
- UGI studies present thick, irregular, and rigid (linitis plastica) folds.
- Treatment includes gastrectomy, chemotherapy, and radiation therapy.



Question #20:

The arrows on this radiograph of the esophagus are pointing to esophageal varices. Damage to which of the following organs is the likely etiology for this condition?

a. liver
b. kidneys
c. pancreas
d. adrenal glands



Question #20: Review

- Esophageal varices are dilated, tortuous veins of the esophagus which may rupture.
- They are commonly a result of portal hypertension and/or liver cirrhosis.

  Esophageal varies are often a complication of alcoholism.

Question #21:

The bowel pattern demonstrated on this radiograph is the result in the disruption of the normal peristaltic action of the intestines. Which of the following is the most likely etiology for this condition?

a. adhesion
b. adynamic ileus
c. constipation
d. intussusception

Question #21: Review

- An adynamic or paralytic ileus is a type of bowel obstruction that is caused by a reduction in the normal peristaltic action of the intestines.
- This loss of peristalsis will cause the lumen of both the small and large intestines to fill with air and fluid.
- Therefore, the radiographic appearance of air in both the small and large intestines is an indication of this condition.
- Some common causes of an adynamic ileus are as follows:

    Anesthesia/Some Medications

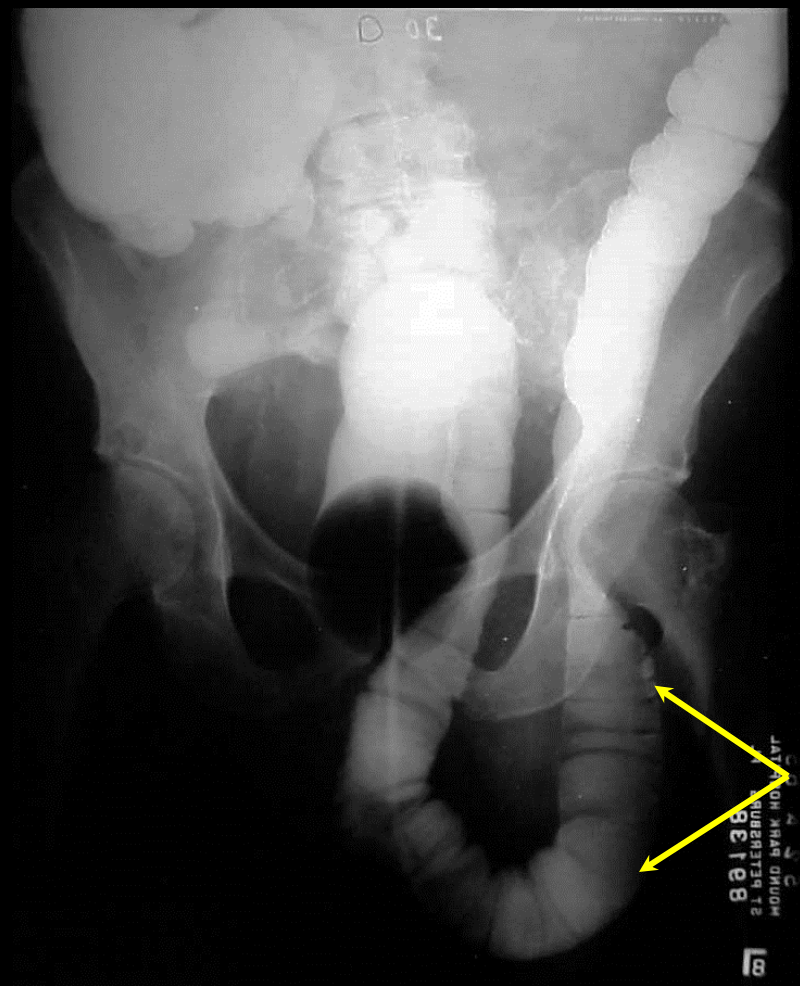
    Abdominal Surgery

    Illness

Question #22:

The most likely etiology for the condition depicted on this radiograph would be which of the following?

a. bowel adhesion
b. Crohn's disease
c. adenocarcinoma
d. inguinal hernia



Question #22: Review

- A hernia type of obstruction is caused by a weakening of the abdominal wall that allows a portion of the small and/or large intestine to protrude through it.
- A *reducible hernia* can be pushed back into the abdominal cavity while an *incarcerated hernia* cannot and could therefore lead to a bowel obstruction.
- A common hernia in men is called an inguinal hernia.

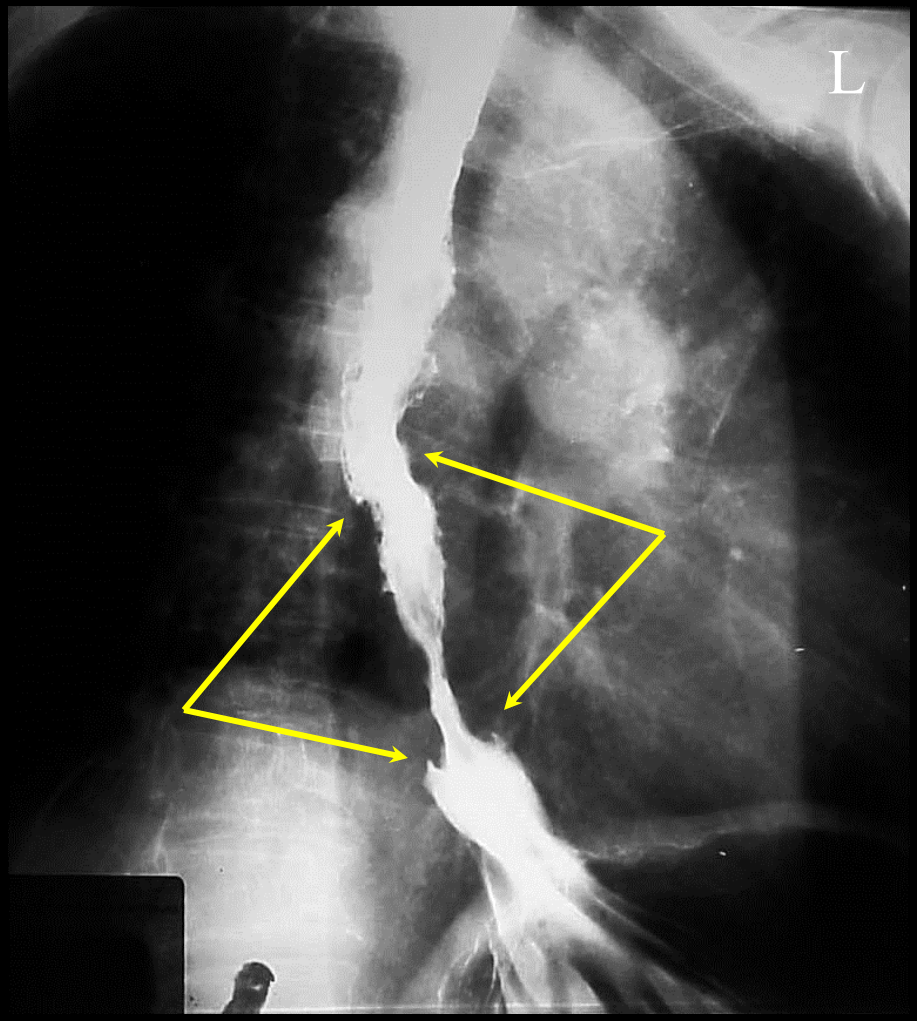
  This condition occurs when the inguinal ring is compromised thus allowing a portion of the bowel to rupture through the abdominal wall.

  In some instances, the bowel will descend into the scrotum.

Question #23:

Which of the following is the most likely etiology for the condition depicted (arrows) on this radiograph of the esophagus?

a. esophagus cancer
b. candida
c. esophageal varices
d. gastroesophageal reflux disease



Question #23: Review

- Esophagus cancer represents 2% of all cancers and there is a high incidence in smokers and alcoholics.
- The prognosis for this cancer is very poor as it has a 5-year survival rate of 25%.
- It presents with a very "ratty" radiographic appearance on a barium swallow.
- Treatment includes the following:

  Chemotherapy

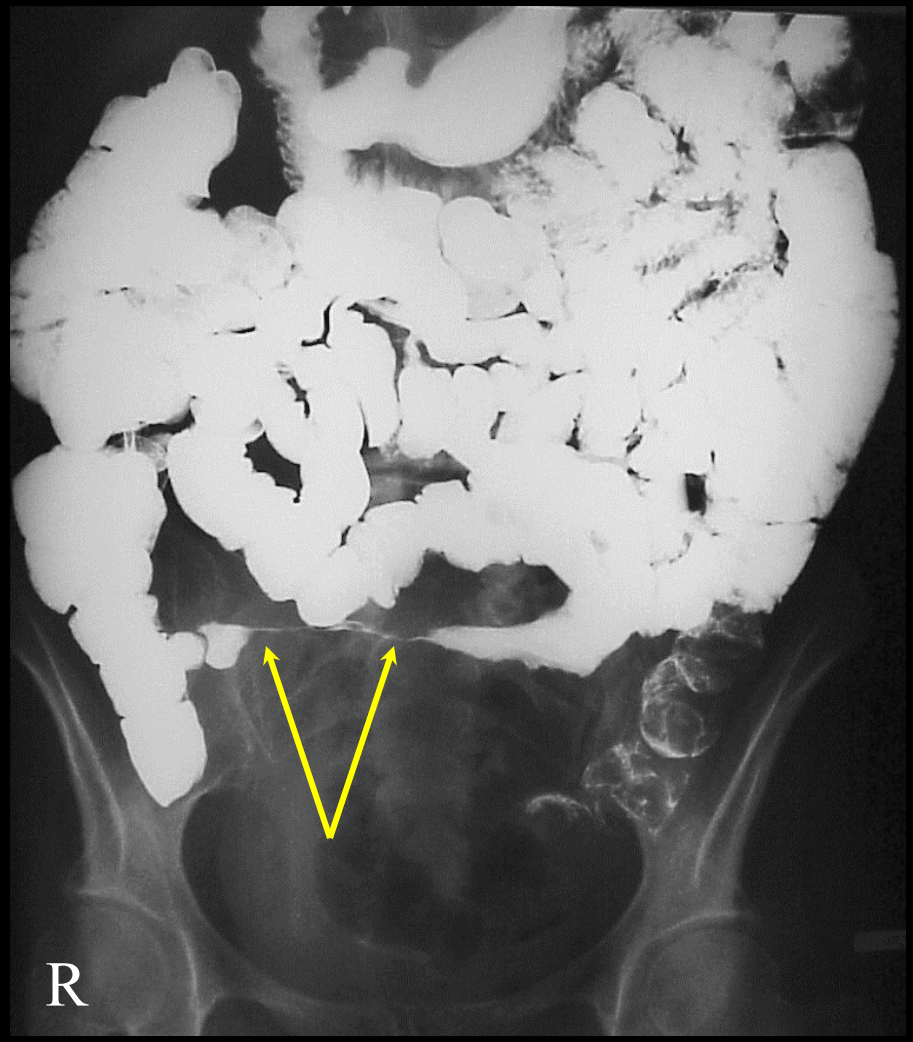
  Radiation Therapy

  Esophagogastrectomy (gastric pull-up)
  - The affected portion of the esophagus is removed, and the stomach is pulled up into the thorax.

Question #24:

The arrows on this radiograph are pointing to a condition referred to as the "string sign." This is a characteristic of which of the following diseases?

a. Wilm's tumor
b. adenocarcinoma
c. Crohn's disease
d. candida



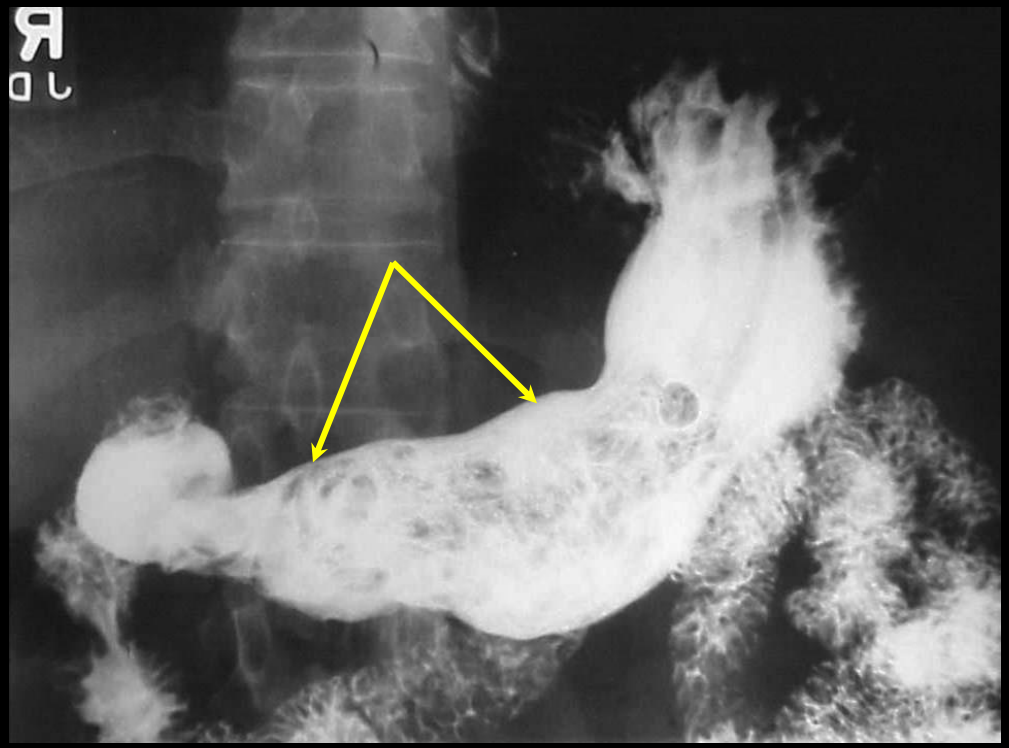
Question #24: Review

- Regional enteritis or Crohn's Disease is an example of a disease that may be the cause of a mechanical bowel obstruction.
- Crohn's disease is characterized by a chronic inflammation of the bowel and has an unknown etiology.
- It is characterized by abdominal cramping, diarrhea, constipation, weight loss or gain, and vomiting.
- Fistulas may form in response the chronic inflammation that characterizes this disease.
- There is no known cure for Crohn's disease.

Question #25:

The hard mass of entangled material found within the stomach (arrows) on the radiograph below is referred to as a bezoar.

a. true
b. false



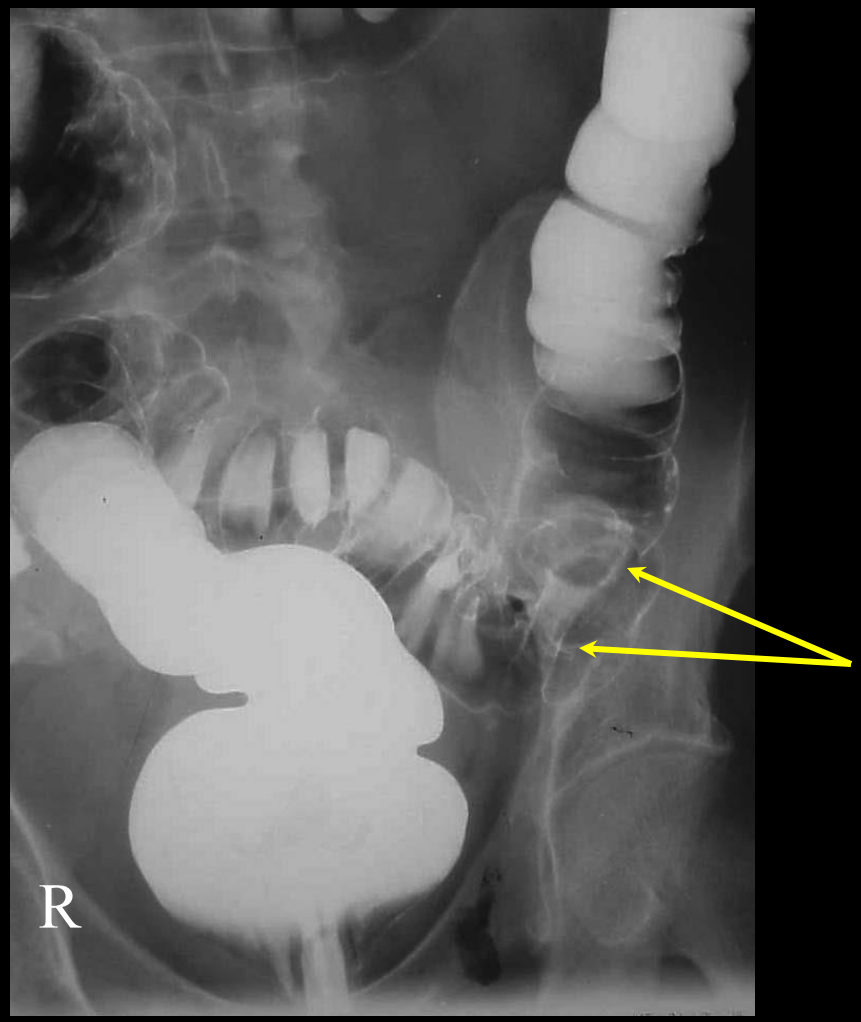
Question #25: Review

- A bezoar is a hard mass of entangled material found within the stomach or intestines that cannot be digested.
- They are often made of hair and food fibers.

Question #26:

Which of the following is the most likely etiology for the condition depicted (arrows) on this radiograph of the large intestine?

a. diverticulosis
b. peduculated polyp
c. Crohn's disease
d. diverticulitis



Question #26: Review

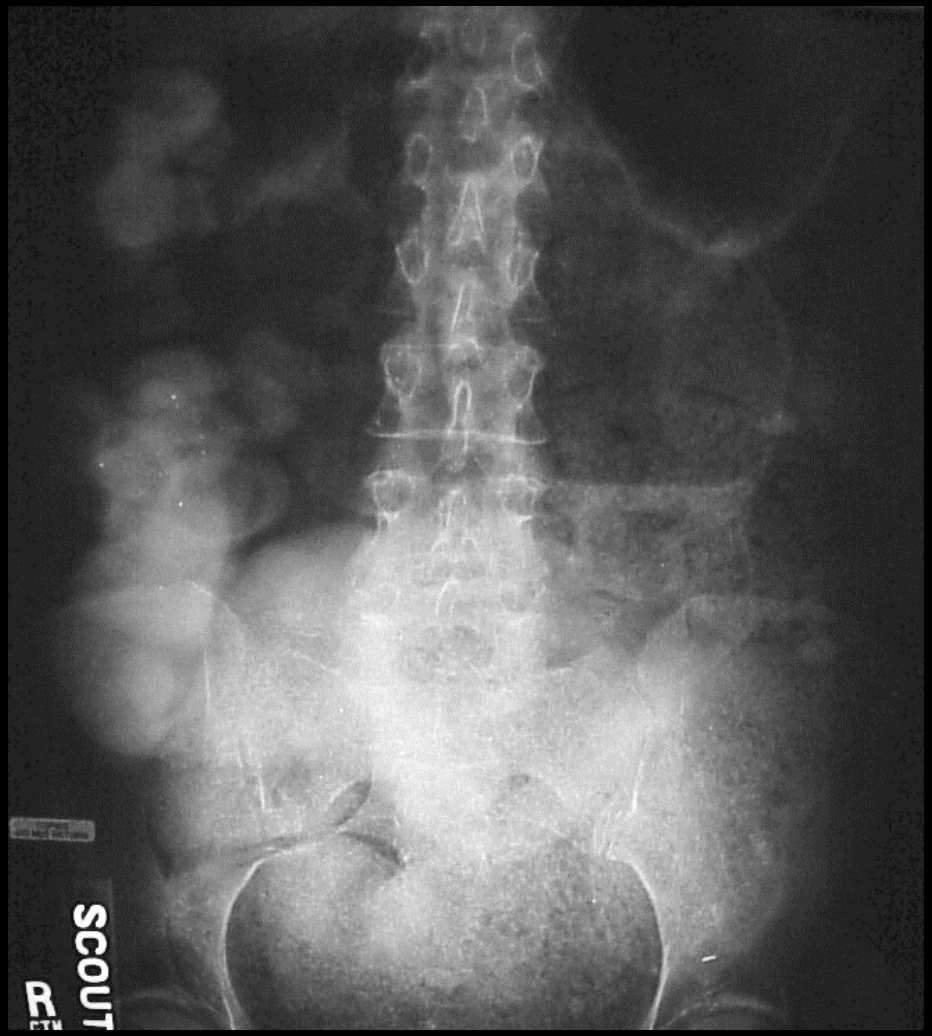
- A neoplasm that grows into the lumen of the colon is called a polyp.
- A pedunculated polyp possess a stalk while a sessile (barnacle) polyp is attached directly to the bowel wall.
- Most polyps are benign, but an adenomatous polyp may transform into a malignancy and must be removed.

  This is sometimes referred to as simply an adenoma.
- Colon polyps are generally asymptomatic, but some may cause rectal bleeding, pain, diarrhea, and/or constipation.

Question #27:

Which of the following is the most likely etiology for the grainy appearance on this radiograph of the abdomen?

a. ascites
b. constipation
c. GI bleed
d. paralytic ileus



Question #27: Review

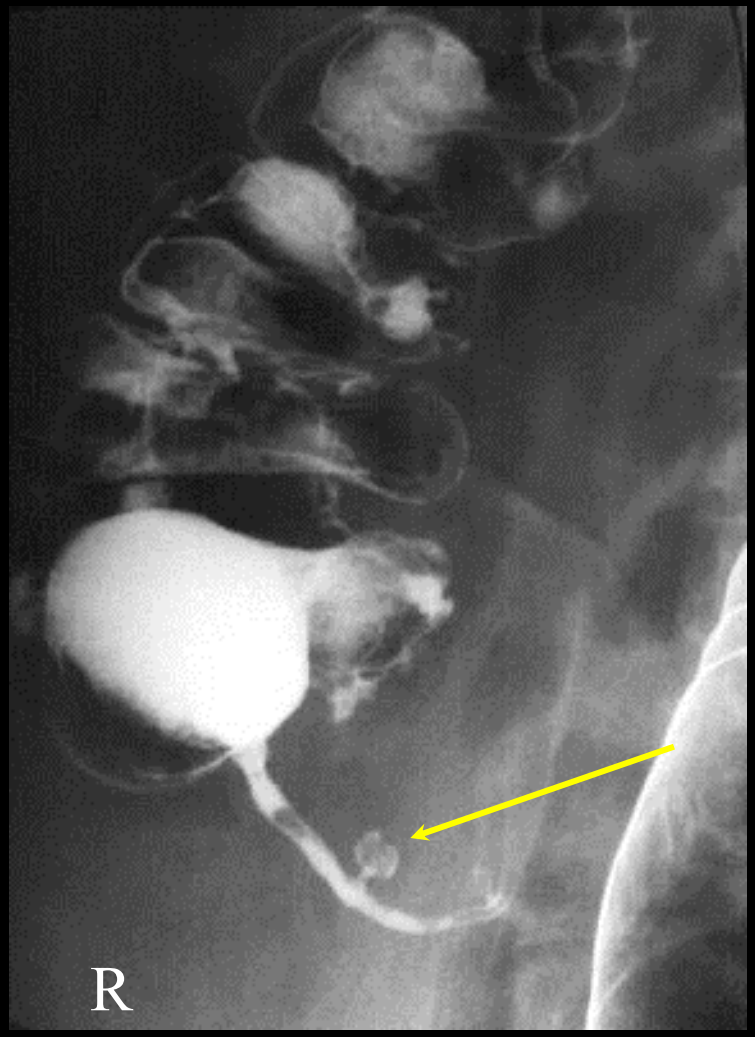
- Treatment for constipation usually consists of an increased intake of fluid and dietary fibers and the use of laxatives.

  In some instances, the impaction will require the use of enemas and/or manual removal.

Question #28:

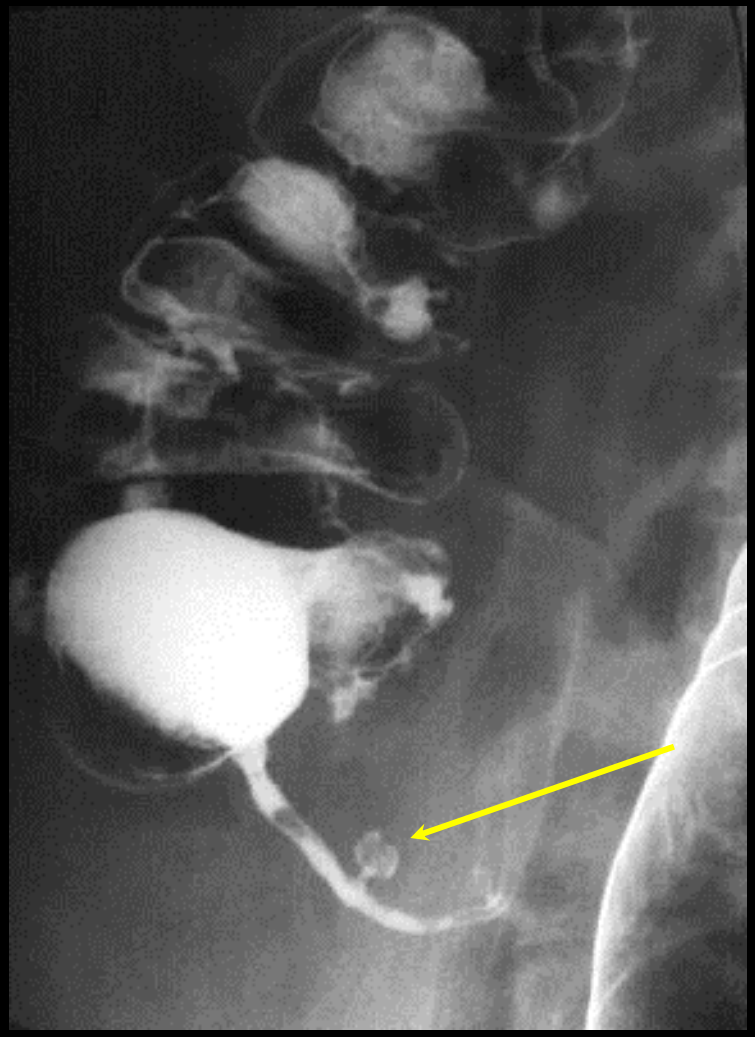
Which of the following is the most likely etiology for the structure identified by the arrow on this BE radiograph?

a. diverticula
b. adenocarcinoma
c. polyp
d. appendicolith



Question #28: Review

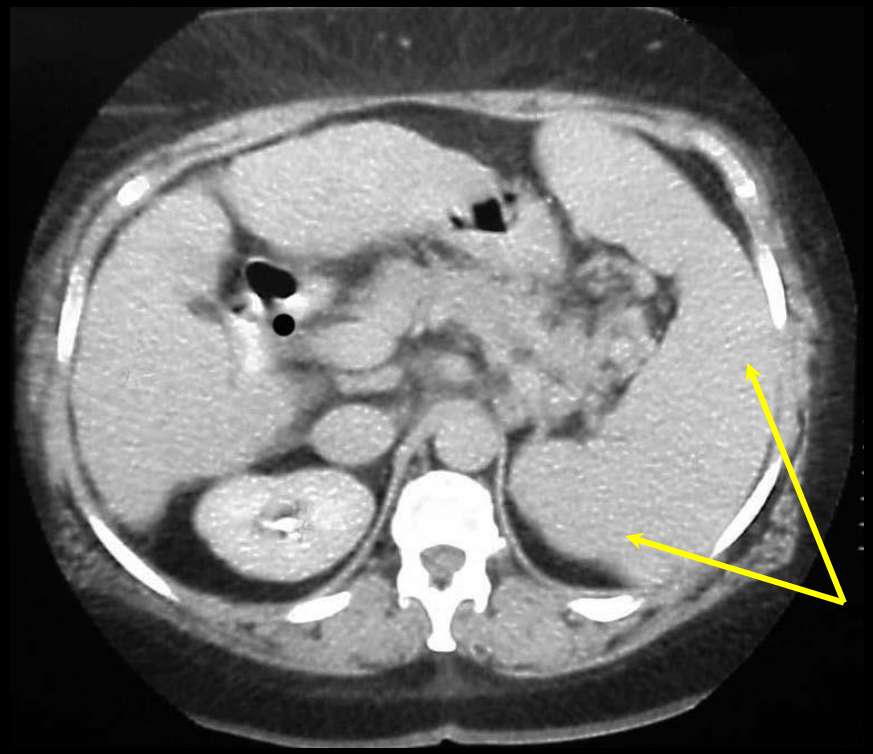
Diverticula can form anywhere along the alimentary canal. In this instance, the lining of the appendix has weakened resulting in the formation of a small diverticula.



Question #29:

Which of the following would be the most likely condition for what the arrows on this CT image of the abdomen are pointing to?

a. hepatomegaly
b. kidney hyperplasia
c. splenomegaly
d. none of the above



Question #29: Review

- Splenomegaly simply refers to an enlargement of the spleen.
- It is usually associated with any disease that involves the destruction of a large number of defective red blood cells.

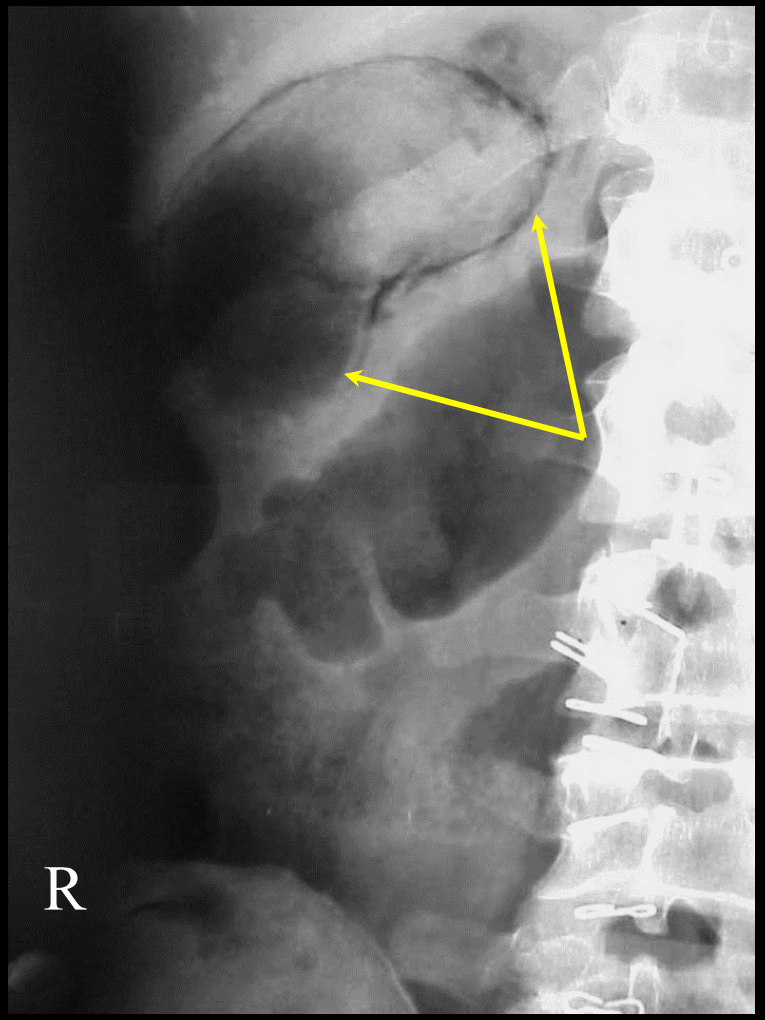
  It is also linked to leukemia, lymphoma, and portal hypertension.
- Treatment for this condition usually includes a splenectomy.

Question #30:

The main abnormality on this radiograph (arrows) is an emphysematous gallbladder. This condition is caused by a bacterial infection.

a. true

b. false



Question #30: Review

- Emphysematous cholecystitis is characterized by the presence of bacteria within the gallbladder.

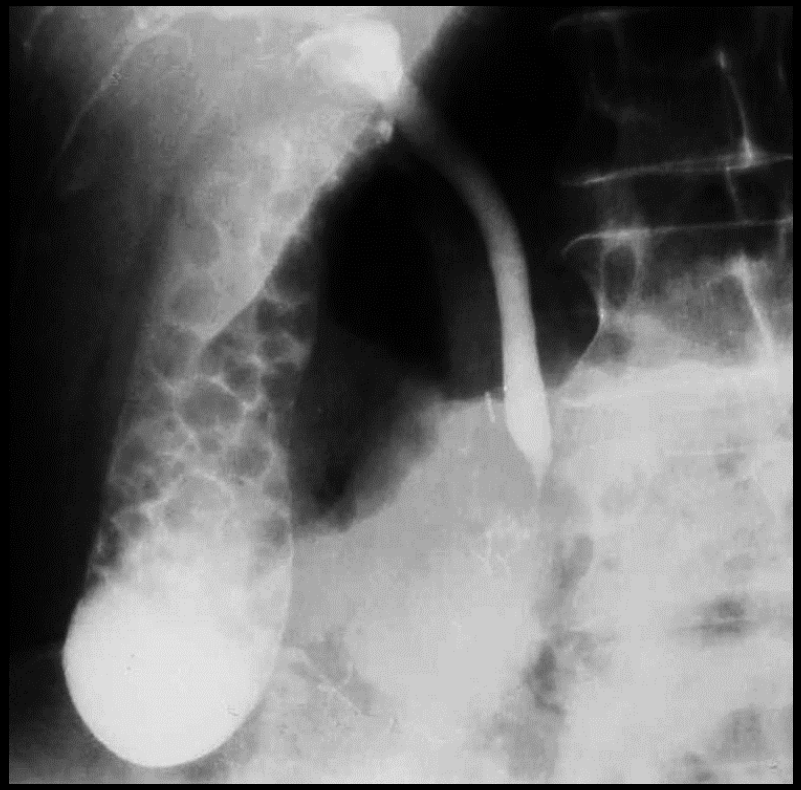
  In this particular instance, bacteria has managed to work their way from the small intestine, through the biliary tree, and finally into the gallbladder.

  Bacteria produce gas as an excrement and as a result, the gallbladder will produce a distinct air-fluid level on an upright abdomen radiograph.
- Treatment involves cholecystectomy and broad-spectrum antibiotic coverage.

Question #31:

The main abnormality depicted on the radiograph below would be consistent with radiopaque choleliths.

a. true
b. false



Question #31: Review

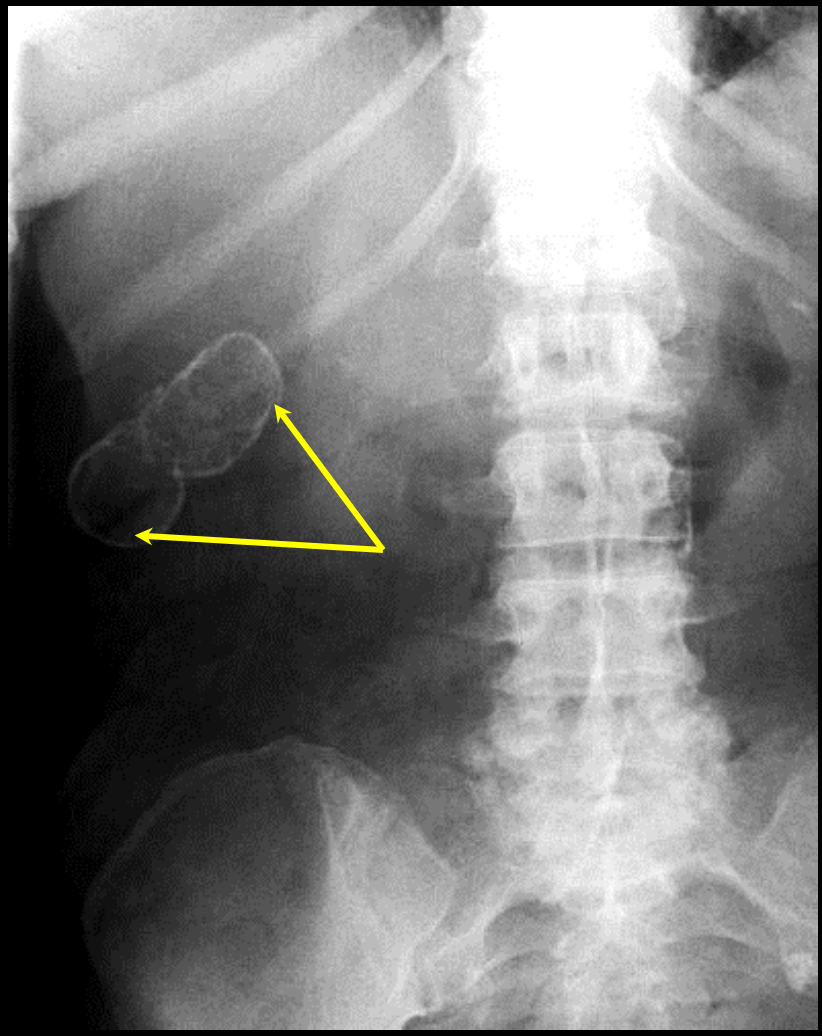
- Cholelithiasis is the condition of having gallstones.
- This only becomes a problem if the stones cause an inflammation of the gallbladder which is called cholecystitis.

  This is often secondary to cystic duct obstruction.
- Nuclear medicine and ultrasound are the imaging modalities of choice in the diagnosis of cholelithiasis although 15% of gallstones appear radiopaque on a KUB.

Question #32:

Which of the following is the most likely condition for the structure identified by the arrows on this abdominal radiograph?

a. dermoid
b. calcified renal cyst
c. porcelain gallbladder
d. calcified splenic cyst



Question #32: Review

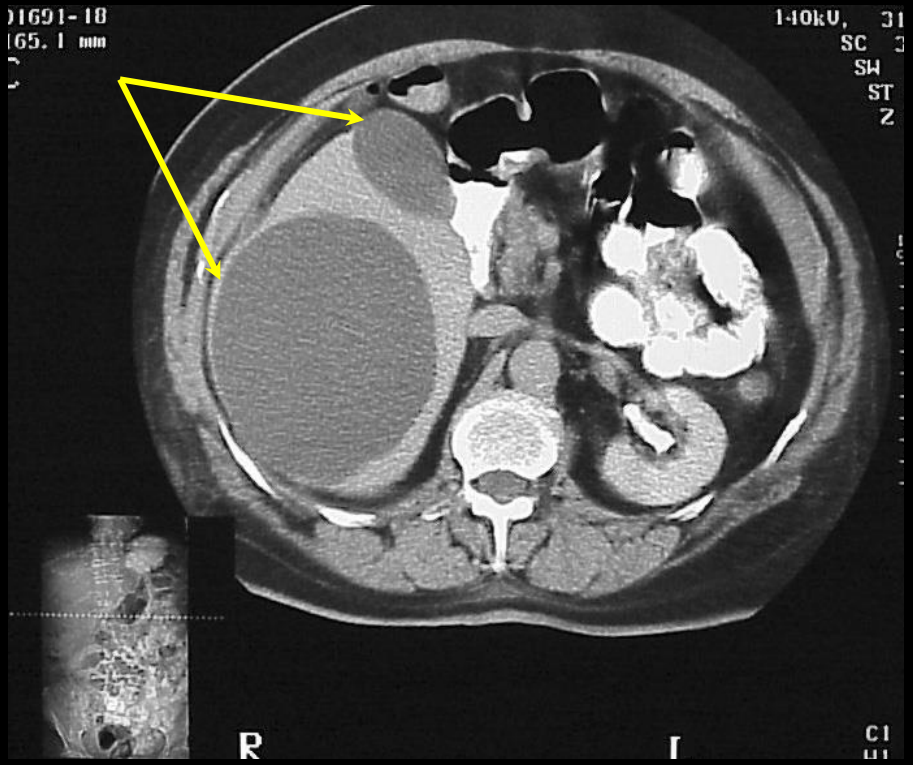
- Calcification of the gallbladder is commonly referred to as a porcelain gallbladder.

  The walls of the gallbladder can calcify and form a hard, bluish color that resembles porcelain.
- It may be associated with gallbladder cancer which is very rare or it may be brought on by excessive gallstone production.
- Treatment includes cholecystectomy.

Question #33:

Which of the following would be the most likely condition for what the arrows on this CT image of the abdomen are pointing to?

a. hepatic cysts
b. hepatic hemangioma
c. hepatocellular carcinoma
d. none of the above



Question #33: Review

- A hepatic cyst is a benign, thin-walled sac that may be either empty or full of fluid.
- They may be located within the liver or on its external surface.
- Hepatic cysts generally have no symptoms and are usually incidental findings on ultrasounds, CT scans and/or MRI scans of the abdomen.
- No treatment is usually required.

Question #34:

Which of the following terms is employed to describe an infection that was obtained from a health care environment?

a. neoplasm
b. nosocomial
c. pathogenesis
d. disease

Question #34: Review

- The study of disease and how it impacts the human body.
- The following is a partial list of sources for pathology:

  Hereditary or Congenital

  Tumors

  Iatrogenic

  - Any adverse conditions that results from medical treatment.
  - An example would be a pneumothorax that occurs as the result of a thoracentesis.

  Infections

  - A nosocomial infection is acquired from a health care environment.

Question #35:

Which of the following terms is a group of signs and symptoms that characterize an abnormal disturbance?

a. disease
b. etiology
c. pathogenesis
d. syndrome

Question #35: Review

- A syndrome is a group of signs and symptoms that characterize an abnormal disturbance.

  An example would be Marfan's Syndrome.

  - This is a genetic disorder of connective tissue
  - It is characterized by a predisposition to cardiac disorders, long limbs, long fingers, and a tall stature.
  - Abraham Lincoln had Marfan's Syndrome.

Question #36:

Which of the following terms refers to an abnormal accumulation of fluid in body cavities or intercellular spaces?

a. edema
b. cellulitis
c. abscess
d. ulcer

Question #36: Review

- Edema is an abnormal accumulation of fluid in body cavities or intercellular spaces.
- The increase in fluid can be localized within a structure or dispersed throughout the body.

  An example of a localized edema would be ascites which is essentially edema of the peritoneal cavity.

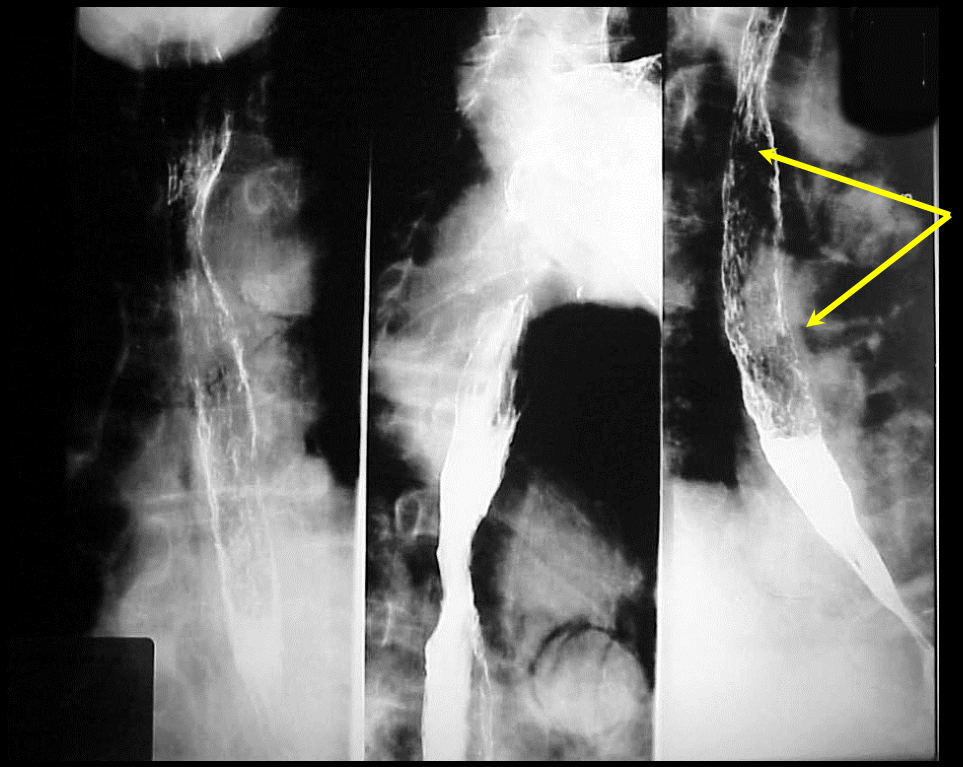
  Generalized edema can be caused by congestive heart failure

  - This is characterized by peripheral edema, pulmonary edema, pleural effusions, and ascites.

Question #37:

The pathology depicted on this radiograph (arrows) is caused by a fungal infection that has affected the esophagus. This is referred to as:

a. volvulus.
b. gastroesophageal reflux.
c. achalasia.
d. candida.



Question #37: Review

- Candida occurs as the result of a fungus that has affected the esophagus.

  This is sometimes referred to as thrush.

  It is an opportunistic infection that is often found in HIV positive and cancer patients due to the state of their suppressed immune system.

Question #38:

Which of the following would not be an etiology (cause) of an an adynamic or paralytic ileus?

a. anesthesia
b. adhesions
c. abdominal surgery
d. illness

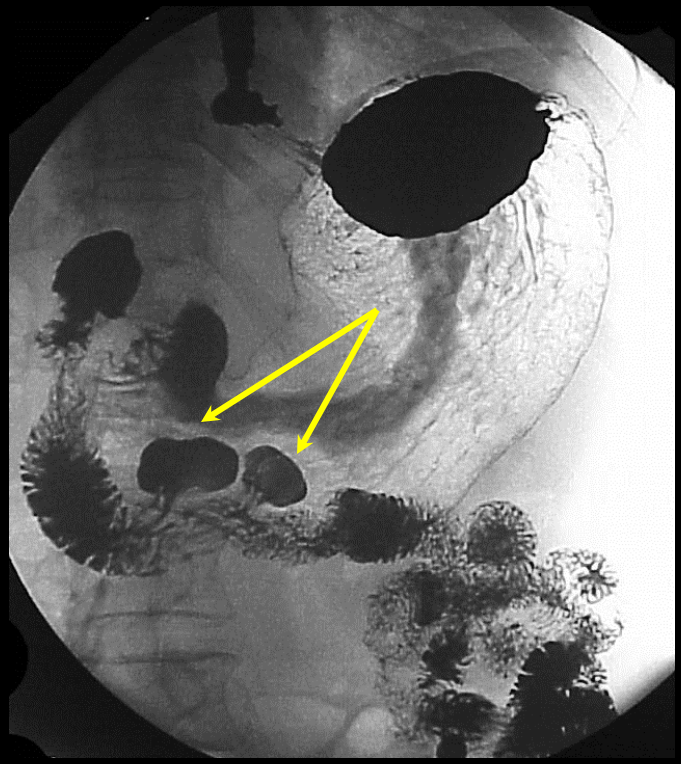
Question #38: Review

- An adynamic or paralytic ileus type of bowel obstruction is caused by a reduction in the normal peristaltic action of the intestines.
- This loss of peristalsis will cause the lumen of both the small and large intestines to fill with air and fluid.
- Therefore, the radiographic appearance of air in both the small and large intestines is an indication of this condition.
- Some common causes of an adynamic ileus are as follows:
    - Anesthesia/Some Medications
    - Abdominal Surgery
    - Illness

Question #39:

The most likely cause of the multiple outpouching deformities found on this radiograph (arrows) would be:

a. pedunculated polyp.
b. sessile polyp.
c. adenocarcinoma.
d. diverticulosis.



Question #39: Review

- Diverticulosis can occur along the entire length of the GI tract.
- In regard to the large intestine, they are commonly found in the area of the sigmoid colon.
- Diverticulum often have no signs or symptoms and are often a serendipitous discover on a barium study or colonoscopy.

Question #40:

The most common benign tumor of the liver that is characterized by dilated blood vessels that form pools of blood would be:

a. hemangioma.
b. hepatocellular carcinoma.
c. liver metastasis.
d. hepatic cysts.

Question #40: Review

- A hepatic hemangioma is the most common benign tumor of the liver.
- It consists of dilated blood vessels that create pools or lakes of blood within the liver.
- They commonly manifest between the ages of 30 to 50 and are more prevalent in women than in men.
- A needle biopsy is not indicated with this condition and may even be considered a contraindication due to the increased potential for excessive bleeding.
- MRI is the modality of choice in differentiating between a hepatocellular carcinoma and a hepatic hemangioma.
- There is no treatment for this condition although surgery may be indicated in severe cases.

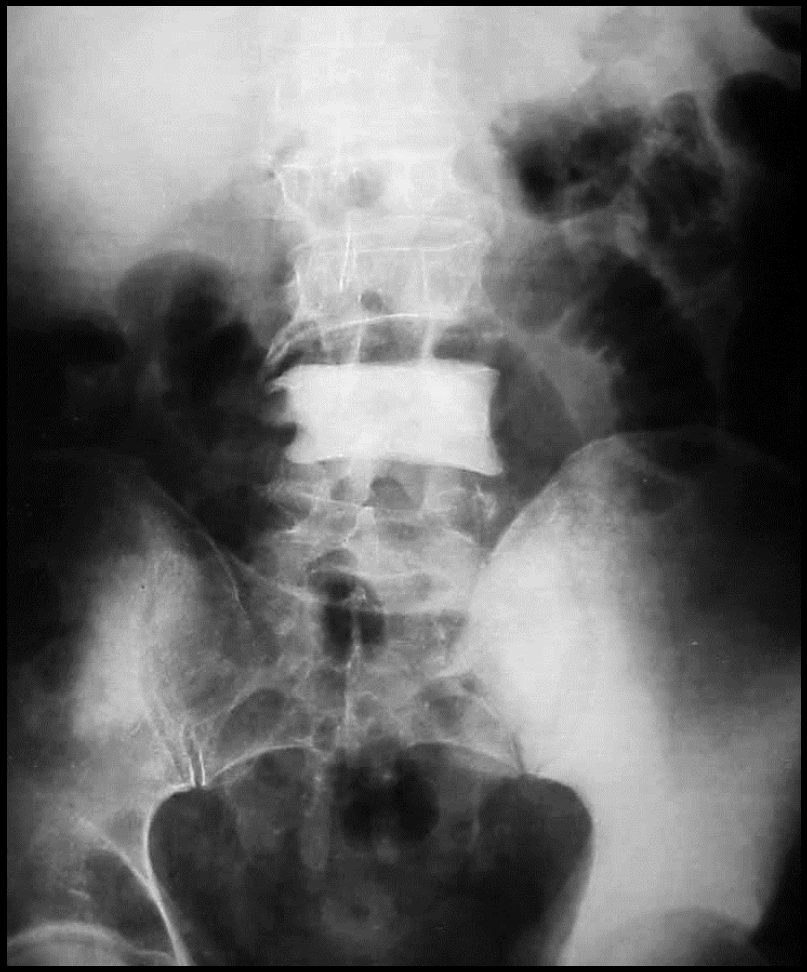
Question #41:

The vertebral body on this radiograph is an example of how a cancer that originates in one organ or structure can spread to a distant site. Which of the following terms refers to the ability of some cancers to spread in this manner?

a. benign
b. metastatic
c. ischemia
d. cachexia

Question #41: Review

Non-Hodgkin's Lymphoma will begin with the lymph nodes and spleen and can then metastasize to the liver, kidneys, spine, brain, lungs, and bone. In this example, it has spread to the spine and has formed an osteoblastic condition that is commonly referred to as an ivory vertebra.



Question #42:

An abnormal increase in the size of the cells that make up an organ or structure is referred to as:

a. hypertrophy.
b. atrophy.
c. aplasia.
d. an abscess.

Question #42: Review

- Hypertrophy is the opposite of atrophy in that there is an abnormal increase in cell size.
- This condition is also sometimes referred to as hyperplasia or hypergenesis.
- The following is a list of some of the common causes of hypertrophy:

  An Increase in Physical Activity

  Hormonal Changes

  Chronic Inflammation

Question #43:

Which of the following would not be considered a type of hemorrhage?

a. hematoma.
b. ecchymosis.
c. ischemia.
d. petechia.

Question #43: Review

- Hemorrhage or bleeding is simply the loss of blood from the circulatory system.
- The following is a list of a few examples of a hemorrhage:

  Hematoma
  - This occurs as the result of a break in a blood vessel that causes a pooling of blood below the surface of the skin, organ, or structure.

  Ecchymosis
  - This is a type of hematoma that is commonly referred to as a bruise or contusion.
  - Capillaries below the skin are damaged usually as the result of some type of trauma.

  Purpura
  - These are red or purple spots on the body that are caused by a hemorrhage.
  - They are often the result of some type of platelet or coagulation disorder.

  Petechia
  - This is a type of purpura that consists of very small red or purple spot on the body.

Question #44:

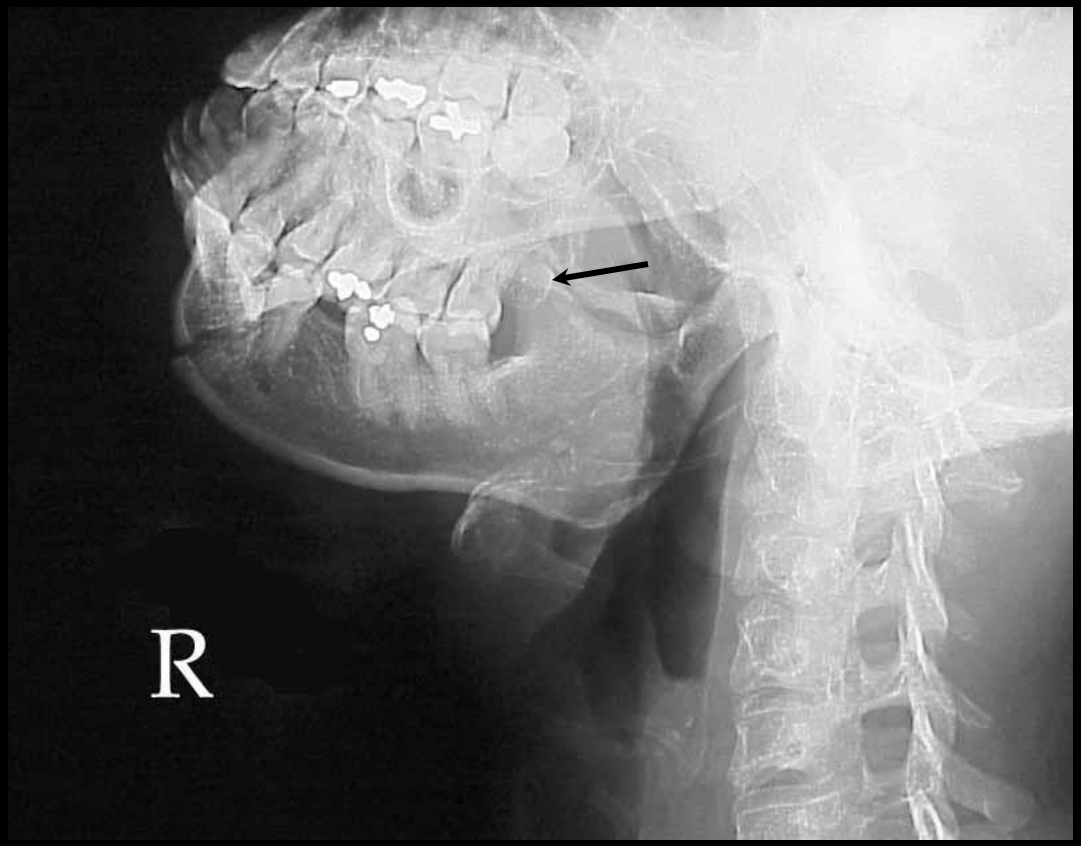
The arrow on this axiolateral oblique of the mandible is pointing to the:

a. condyle.

b. coronoid process.

c. coracoid process.

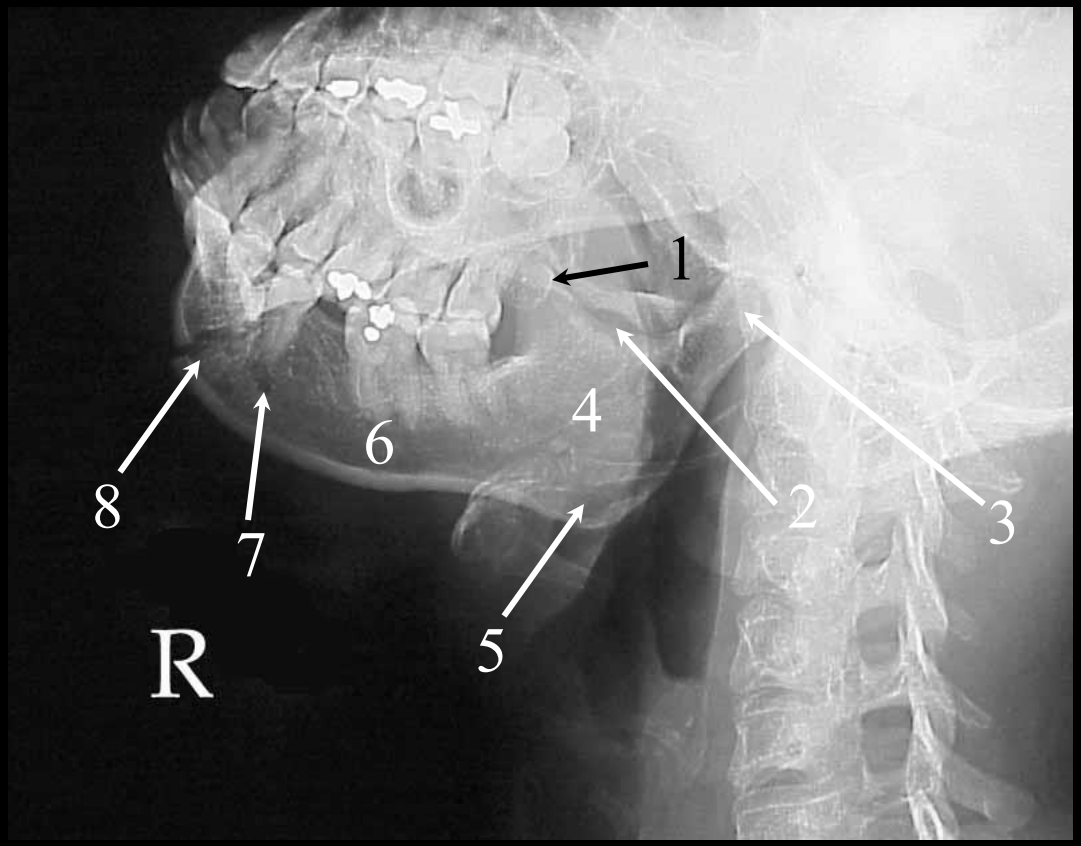
d. ramus.



Question #44: 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



RPO Axiolateral Oblique Mandible

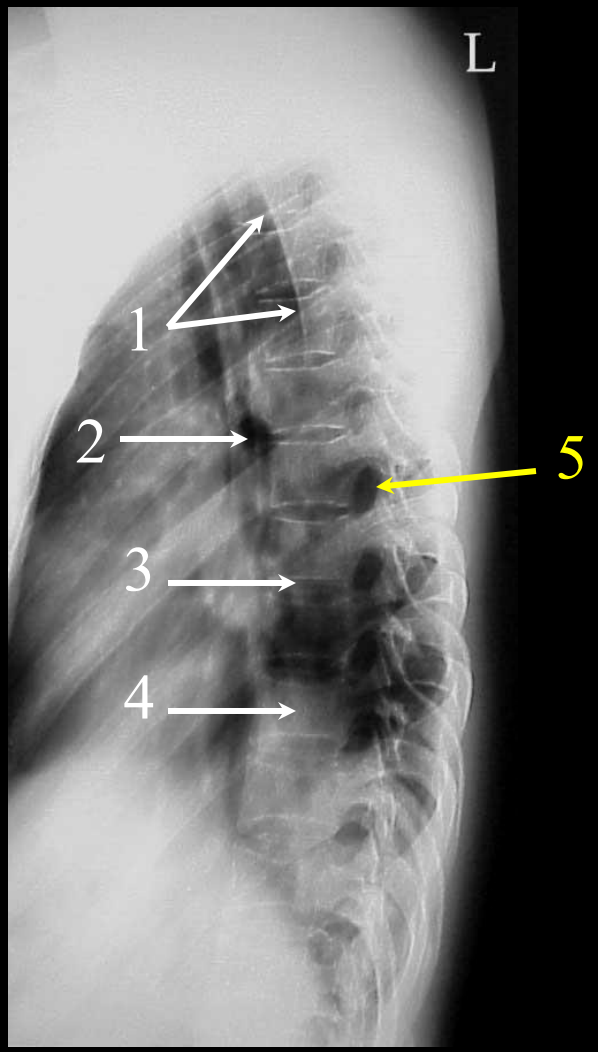
Question #45:

The arrow on this lateral thoracic spine radiograph is pointing to the:

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

Question #45: Review

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



Lateral Thoracic Spine

Question #46:

The arrow on this lateral c-spine radiograph is pointing to the _____ of C1.

a. posterior arch

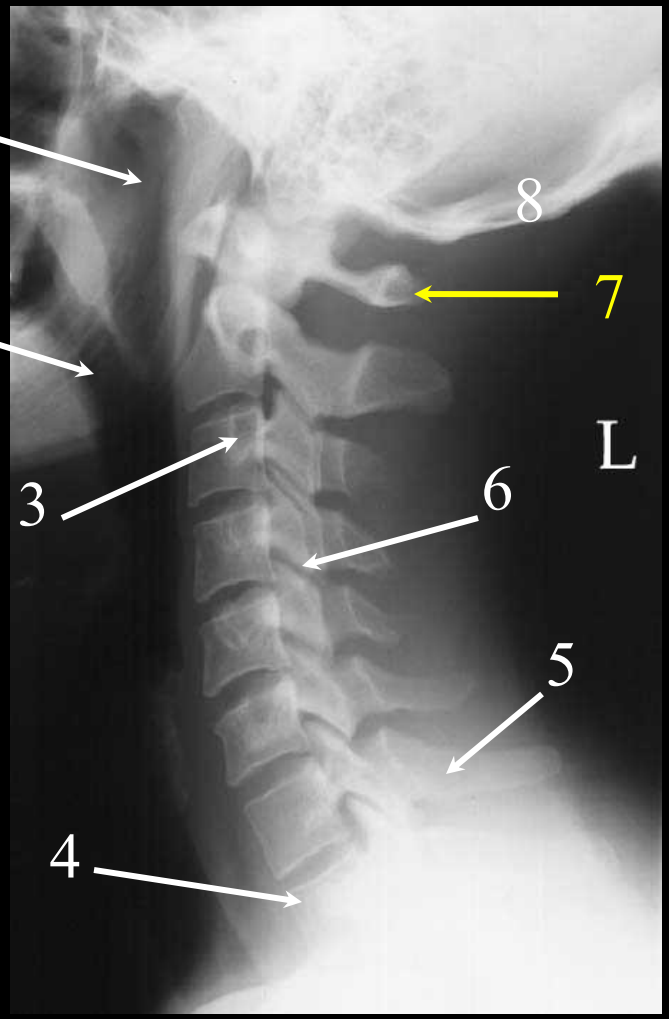
b. anterior arch

c. spinous process

d. lamina

Question #46: 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



Lateral Cervical Spine

Question #47:

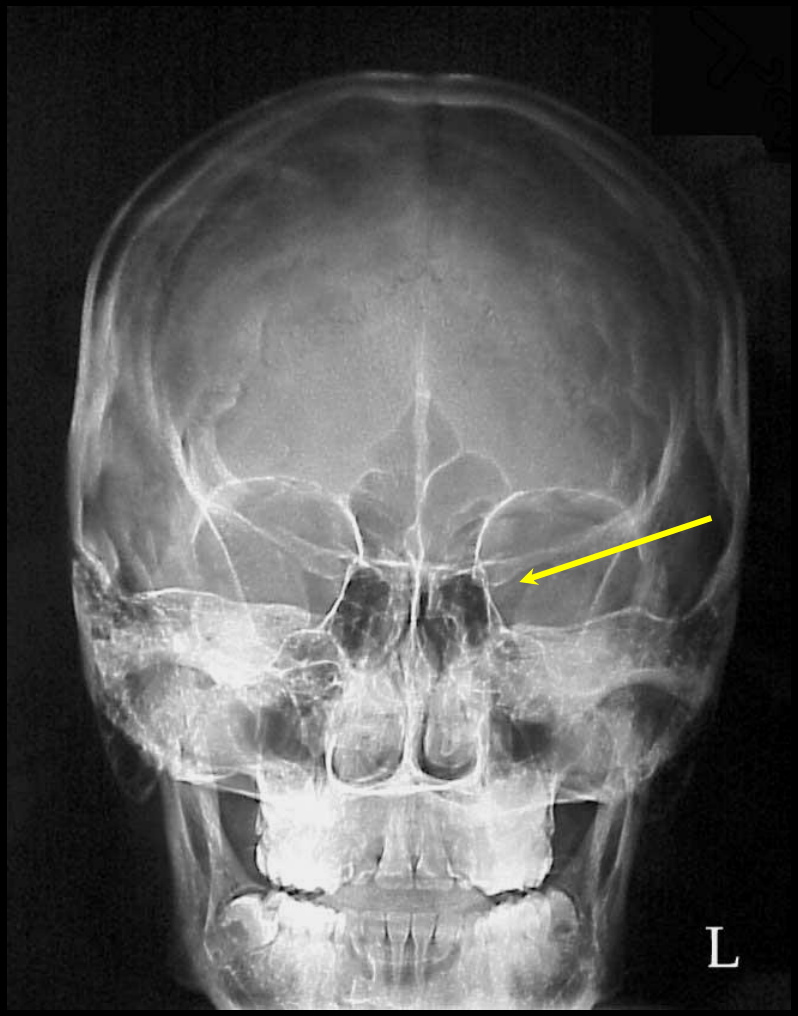
The arrow on this PA Caldwell radiograph of the skull is pointing to the:

a. optic canal.

b. superior orbital fissure.

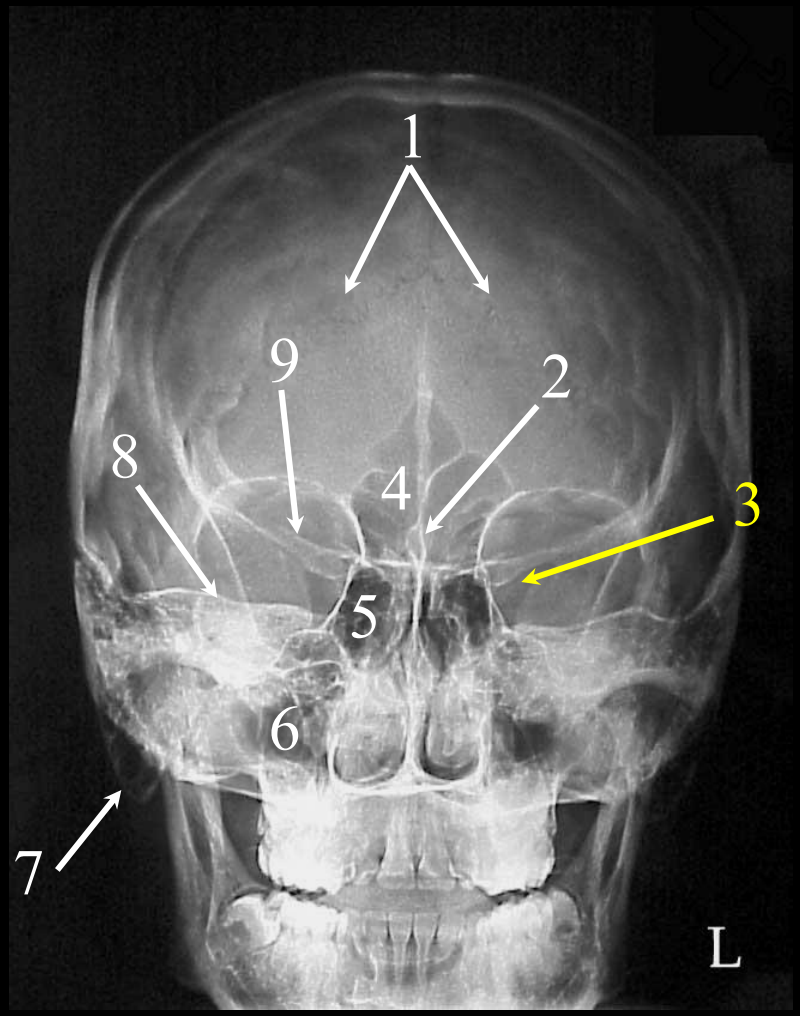
c. petrous ridge.

d. crista galli.



Question #47: 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



PA Caldwell Facial Bones & Sinuses

Question #48:

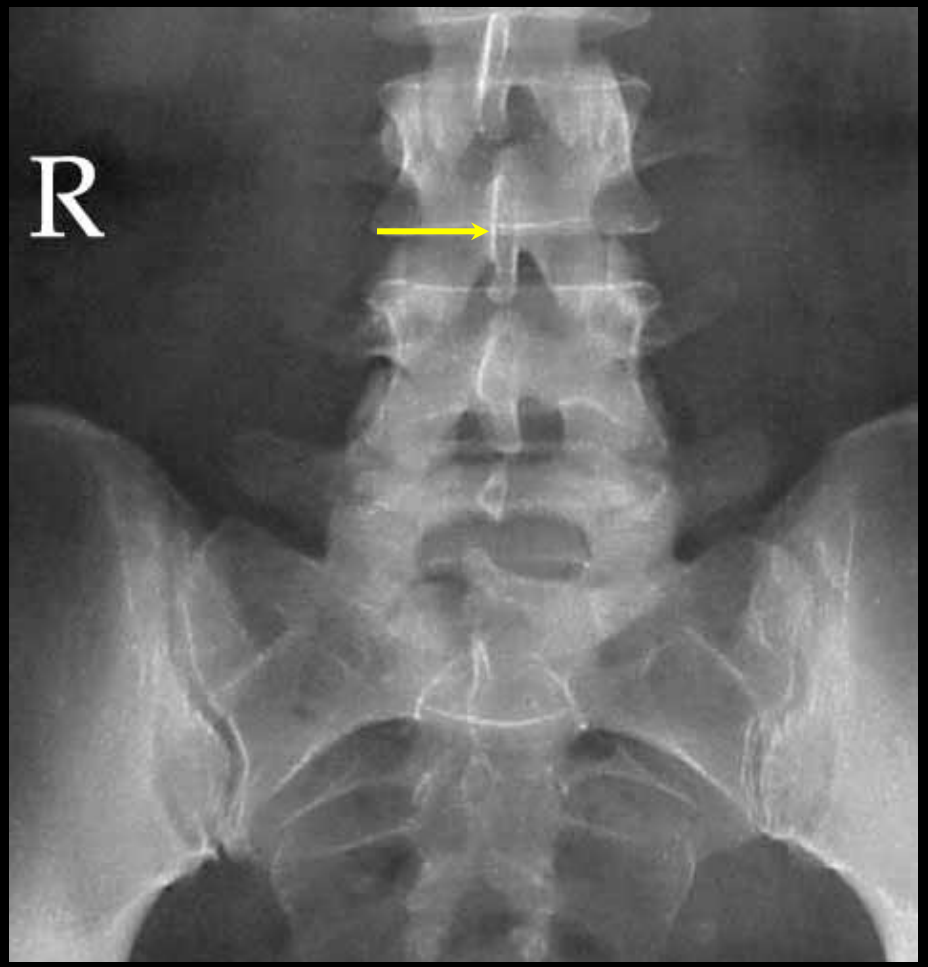
The arrow on this magnified AP lumbar spine is pointing to the:

a. transverse process.

b. spinous process.

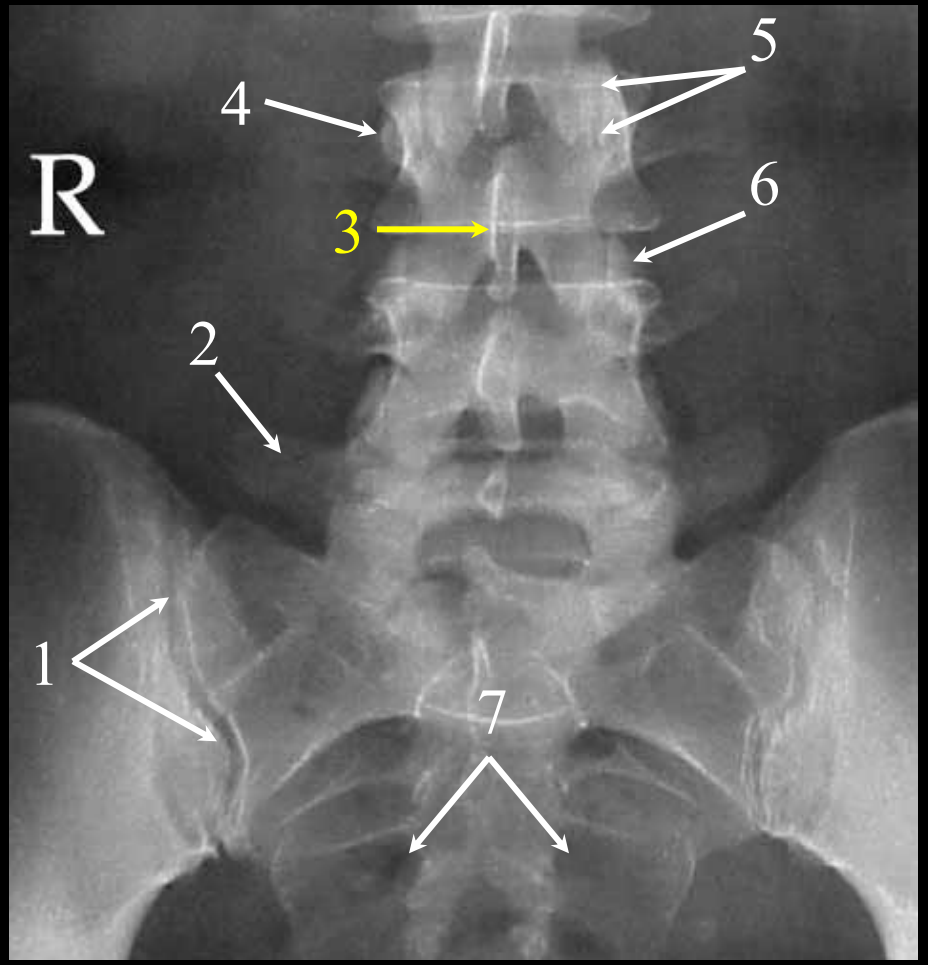
c. pedicle.

d. zygapophyseal joint.



Question #48: 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 Articulating Process of L4
7. Anterior Sacral Foramen



AP Lumbar Spine

Question #49:

The arrow on this magnified oblique cervical spine is pointing to the:

a. pedicle.

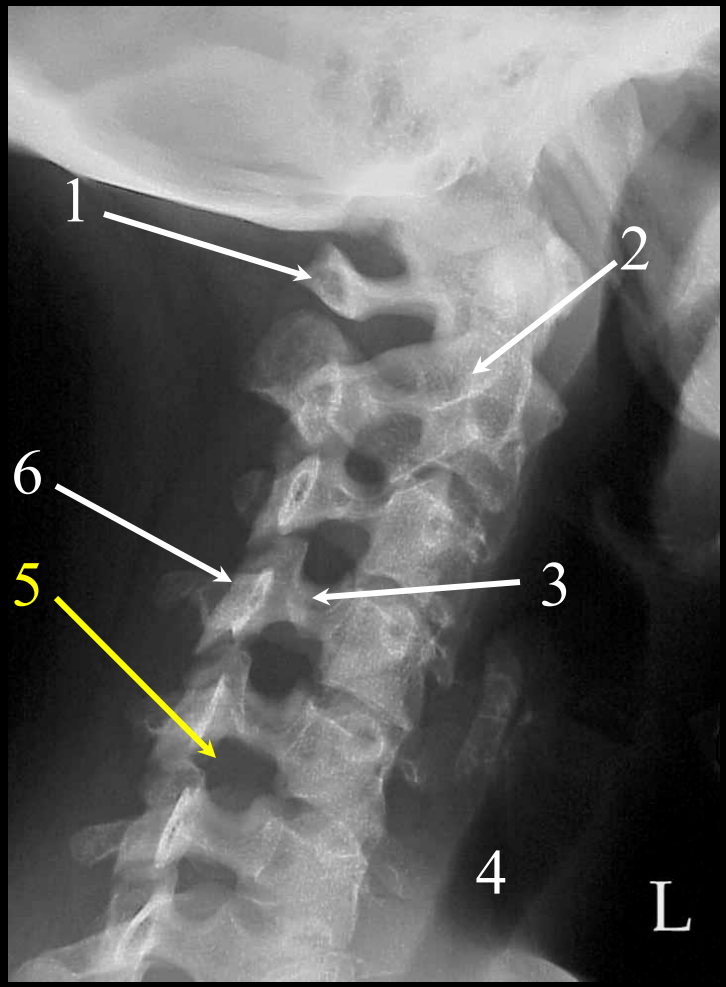
b. intervertebral foramen.

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 Articulating Process of C4



Cervical Spine: LPO Magnified

Question #50:

What is the common name of this position or method?

a. Caldwell

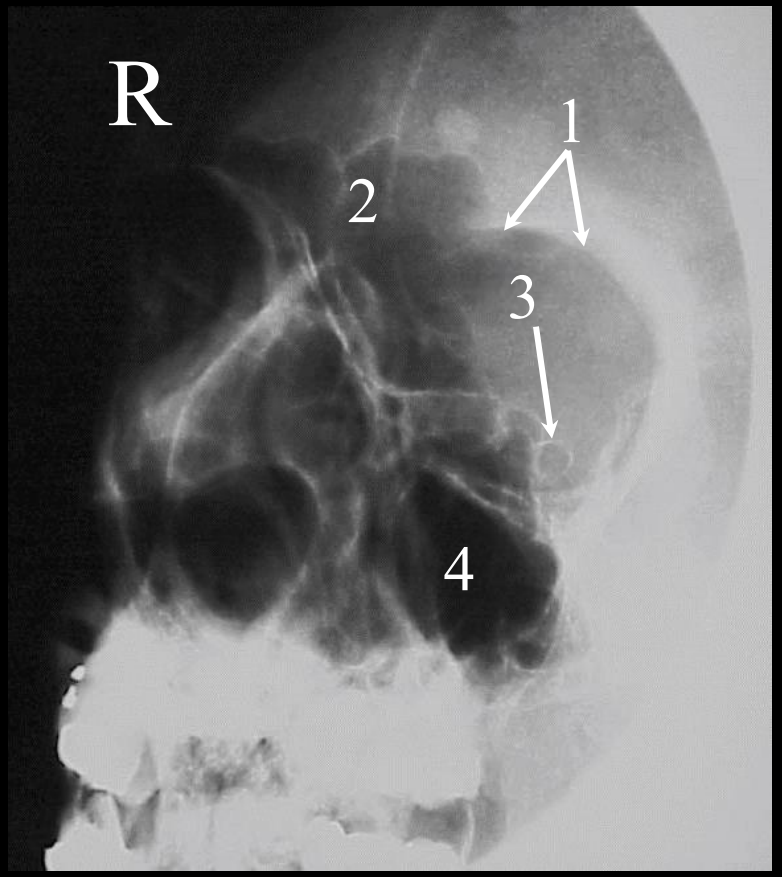
b. Towne

c. Rhese

d. Water’s

Question #50: Review

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

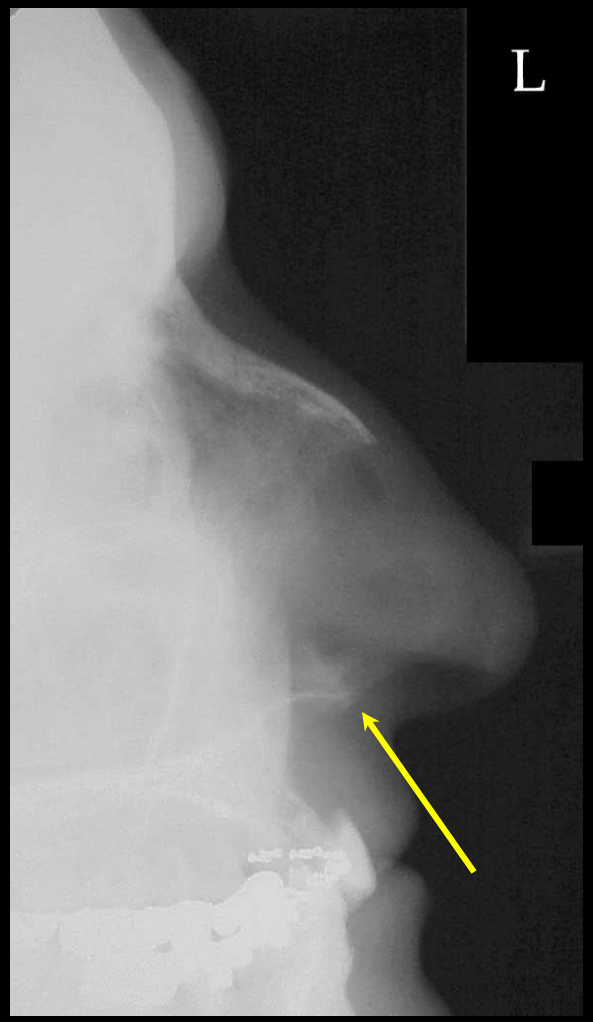


Rhese Orbits

Question #51:

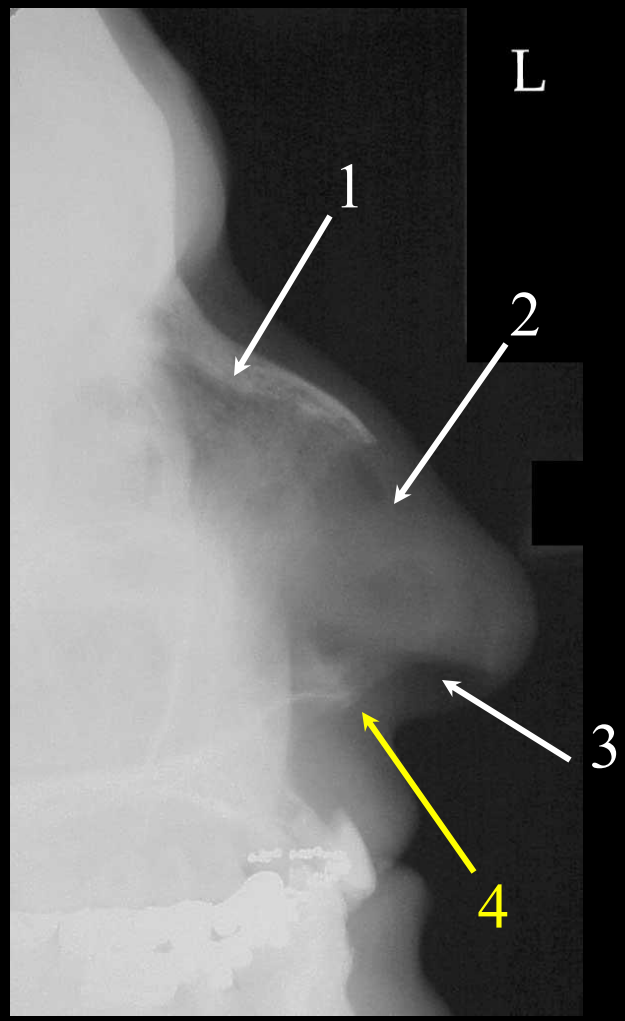
The arrow on this lateral of the nasal bones is pointing to the:

a. nasal bones.
b. nasal cartilage.
c. anterior nasal spine.
d. naris.



Question #51: Review

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



Lateral Nasal Bones

Question #52:

The arrow on this magnified oblique L-spine is pointing to the:

a. inferior articulating process.

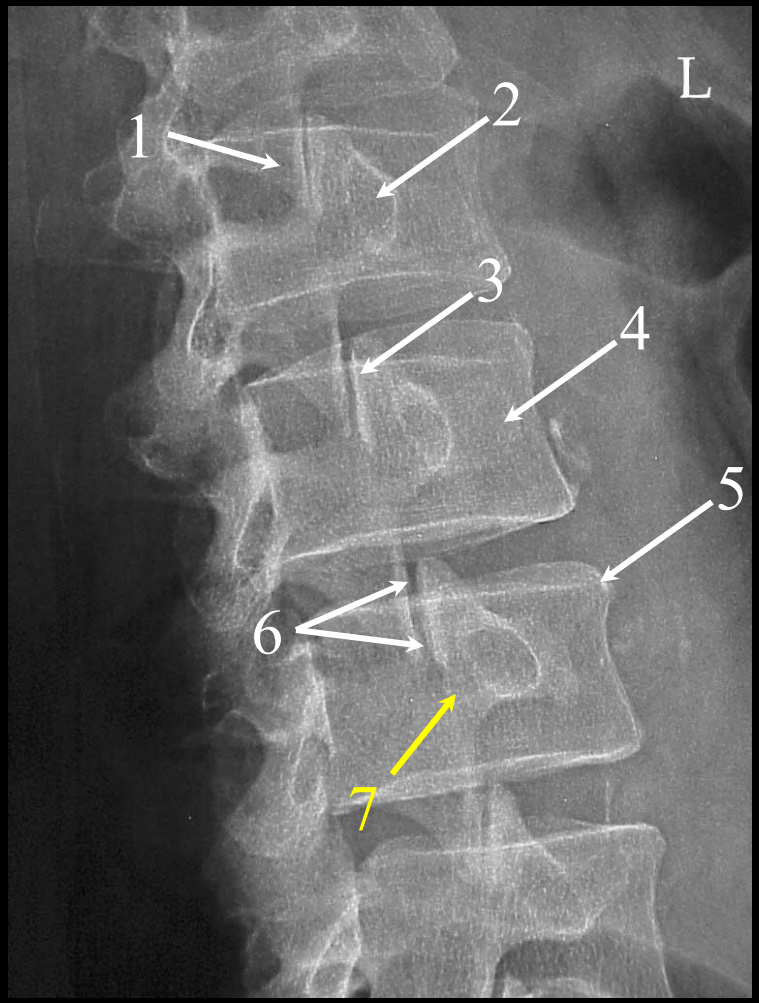
b. transverse process.

c. pars interarticularis.

d. superior articulating process.

Question #52: 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



LPO Lumbar Spine: Magnified

Question #53:

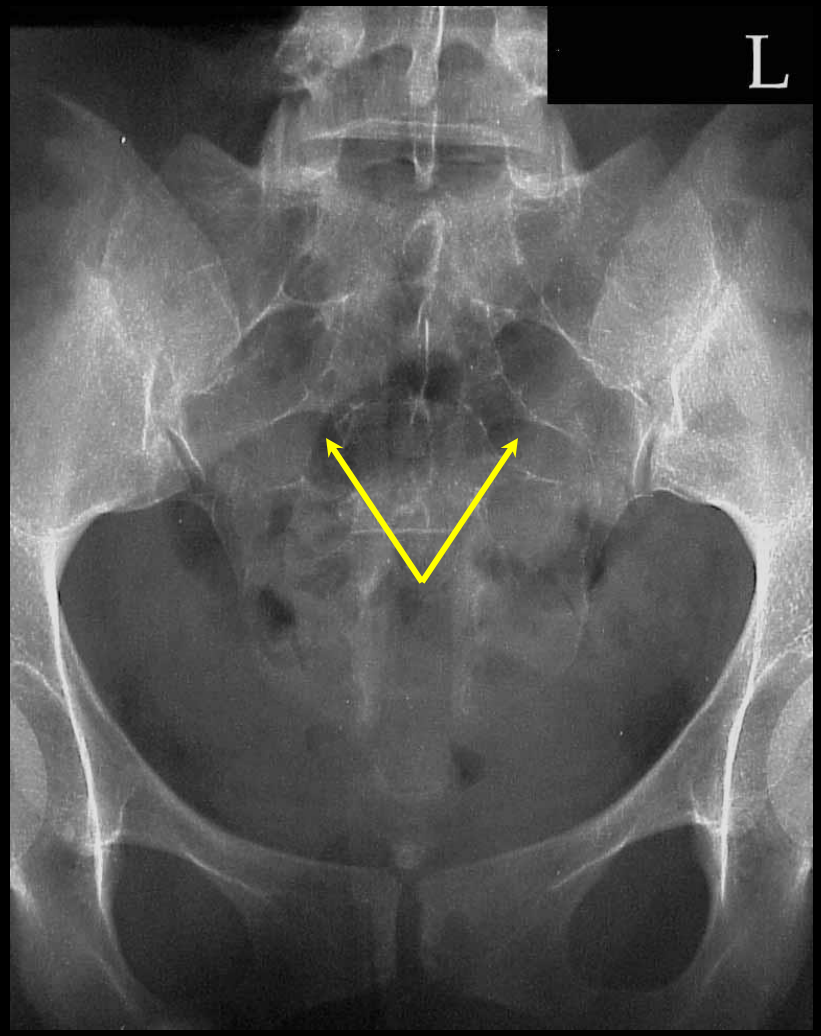
The arrows on this AP sacrum radiograph are pointing to the:

a. spinous process.

b. pedicle.

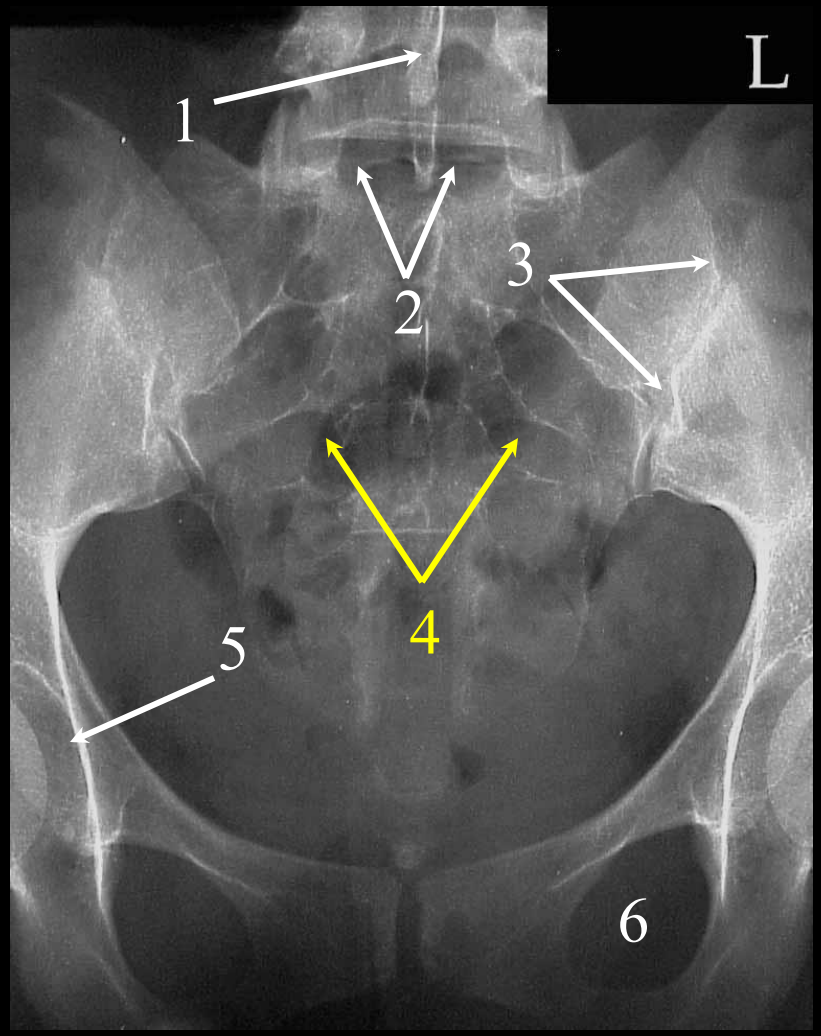
c. sacral promontory.

d. anterior sacral foramen.



Question #53: Review

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



AP Sacrum

Question #54:

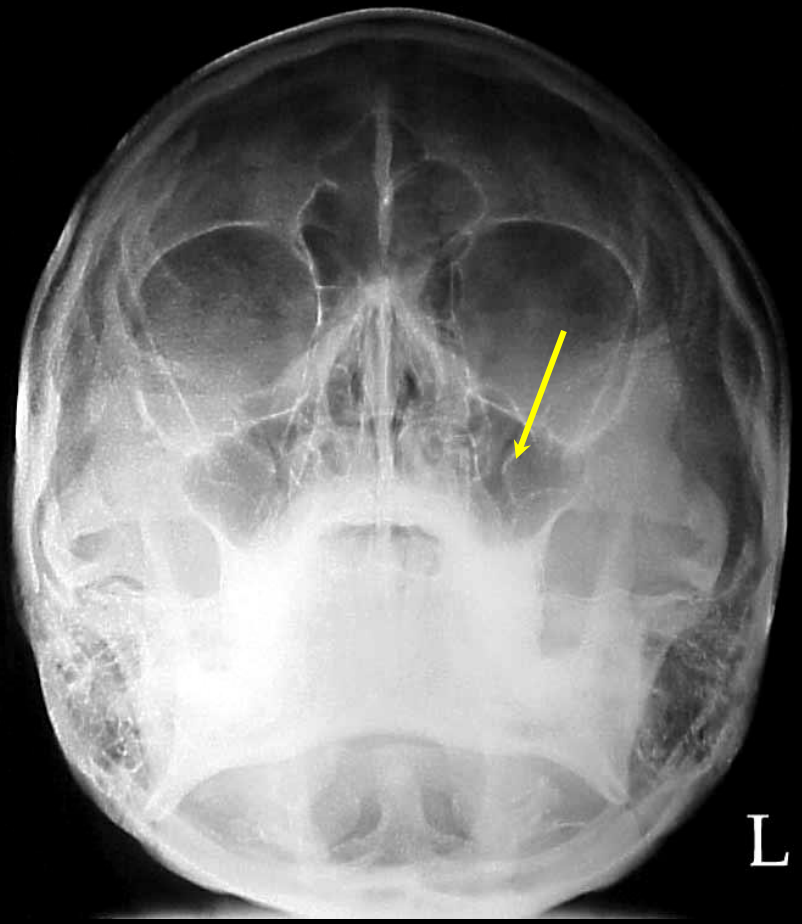
The arrow on this Water's Method is pointing to the:

a. ethmoid sinus.

b. infraorbital margin.

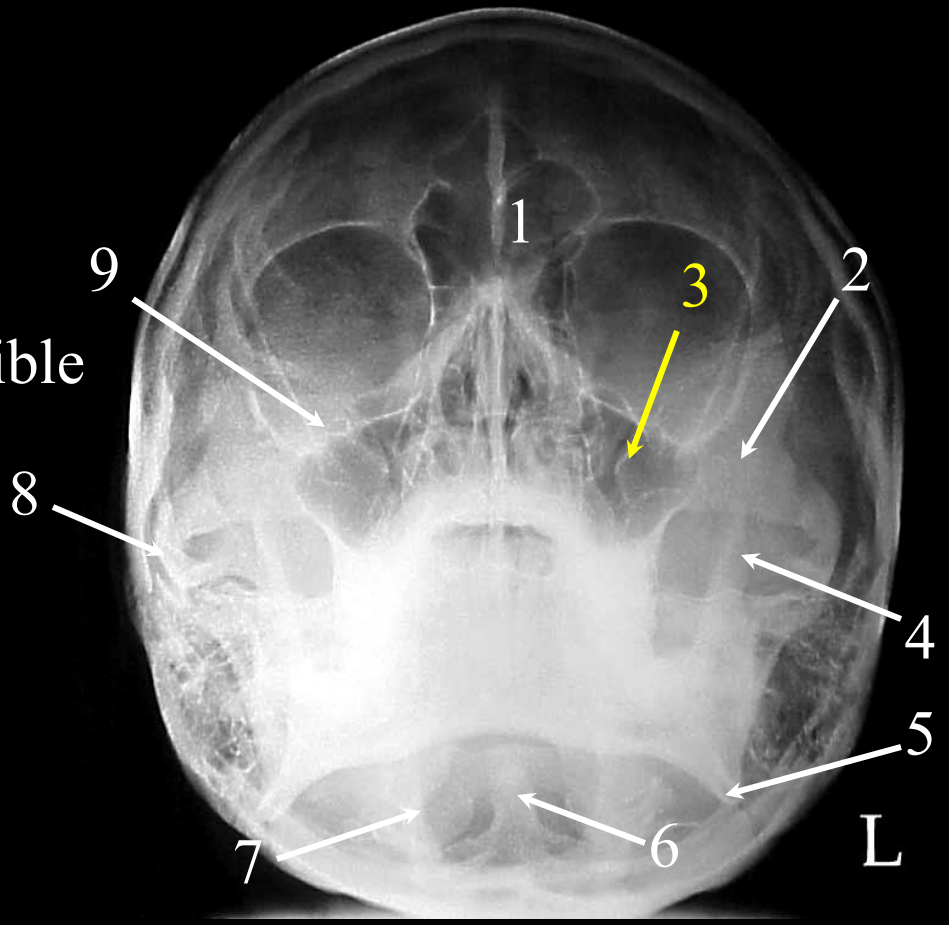
c. inferior nasal conchae.

d. maxillary sinus.



Question #54: 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



Water's Facial Bones & Sinuses

Question #55:

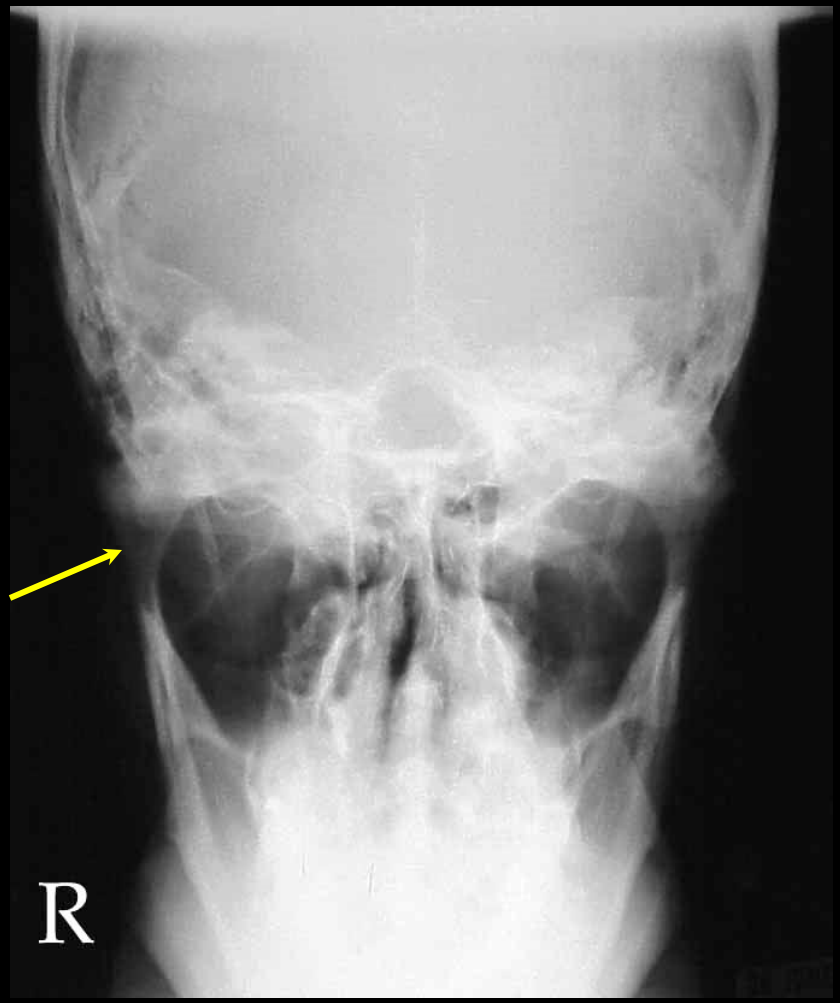
The arrow on this Towne's Method of the mandible is pointing to the:

a. mentum.

b. condyle.

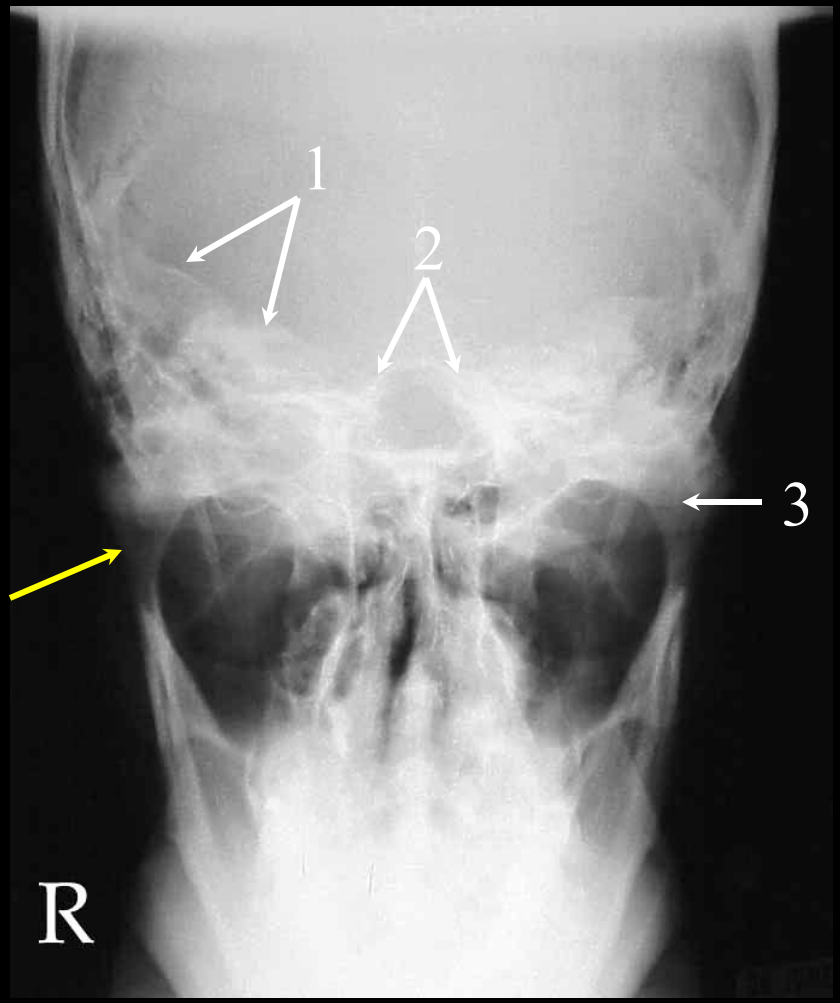
c. coronoid process.

d. ramus.



Question #55: Review

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



Towne's Mandible

Question #56:

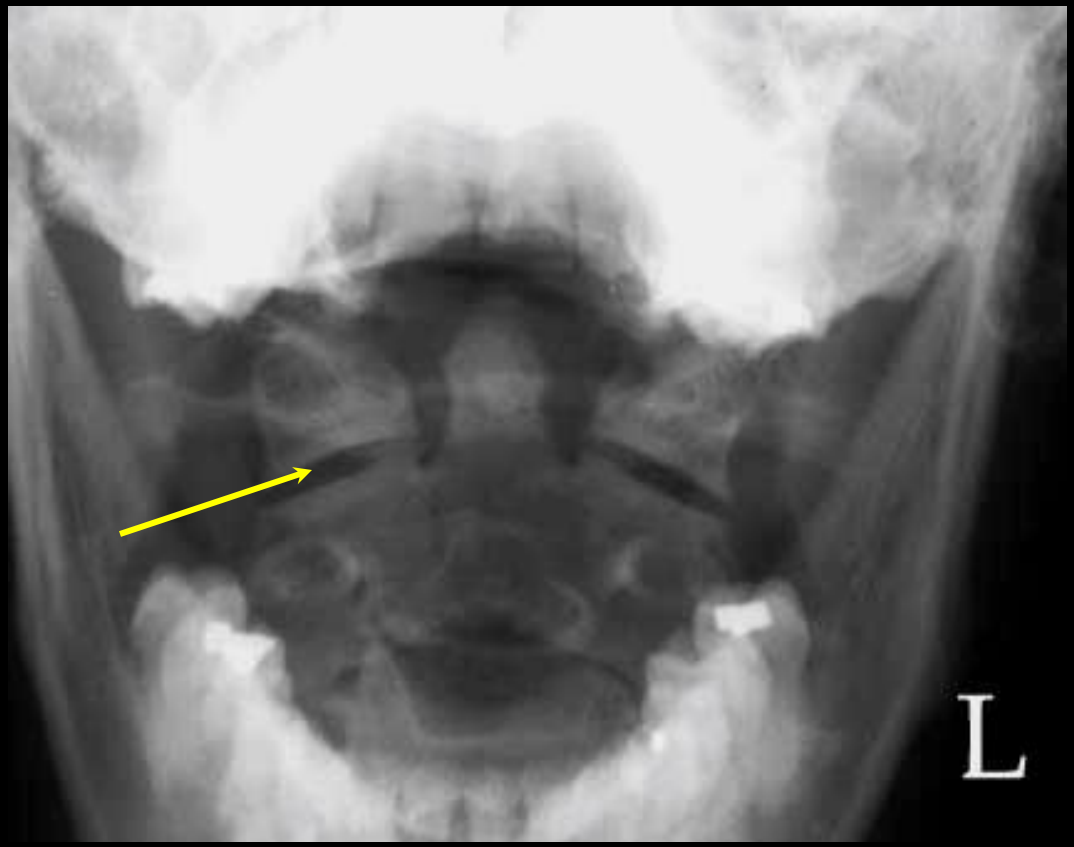
The arrow on this open mouth method of the odontoid is pointing to the:

a. zygapophyseal joint.

b. transverse process.

c. anterior arch.

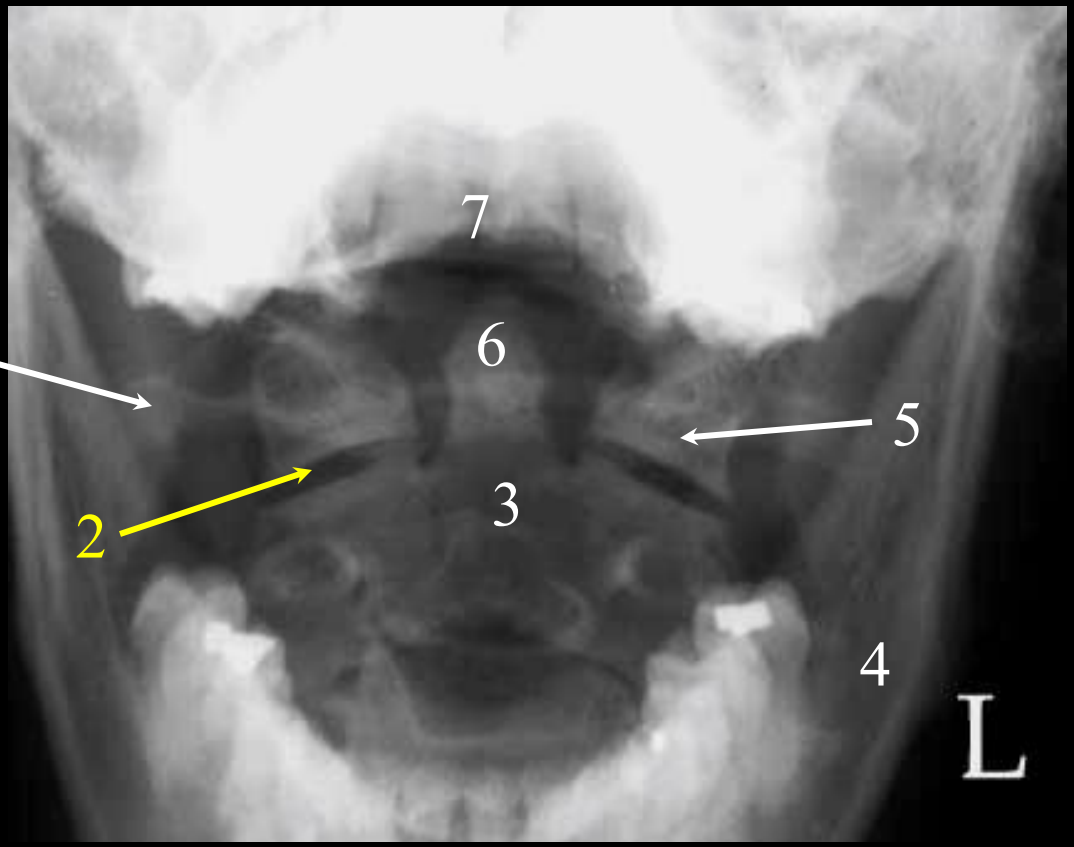
d. lamina.



Question #56: 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



AP "Open Mouth" Cervical Spine

Question #57:

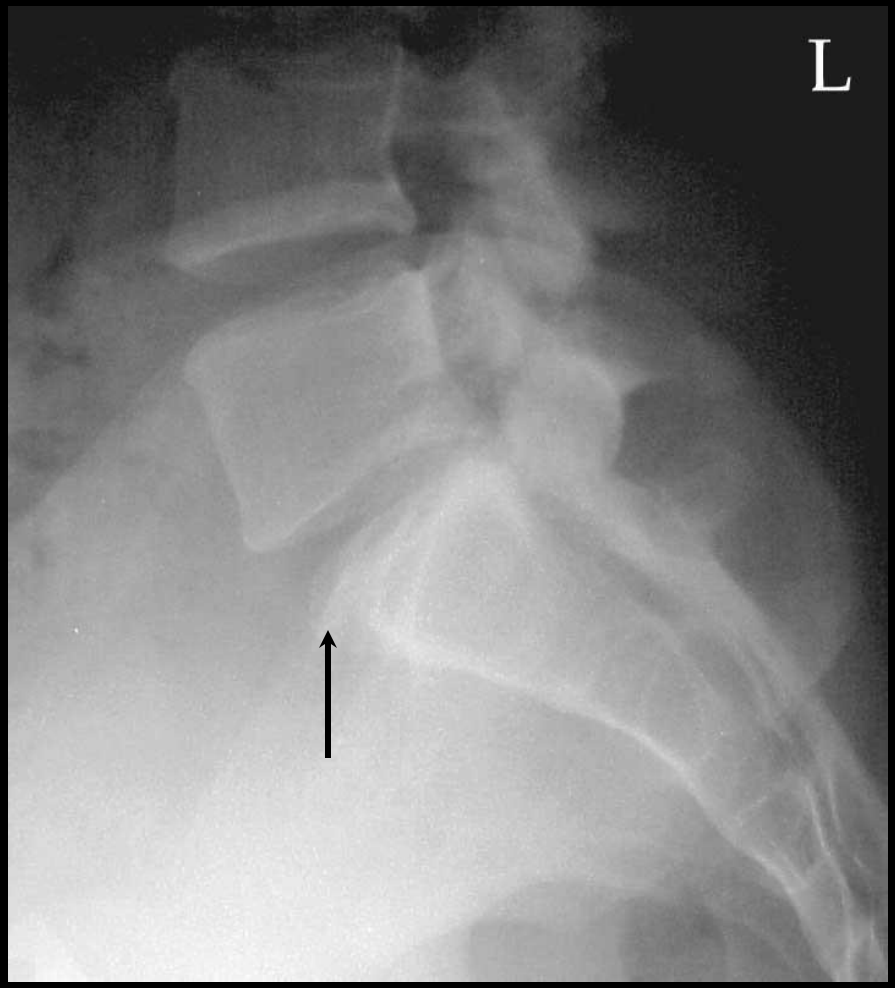
The arrow is pointing to the:

a. ASIS.

b. L5/S1 joint space.

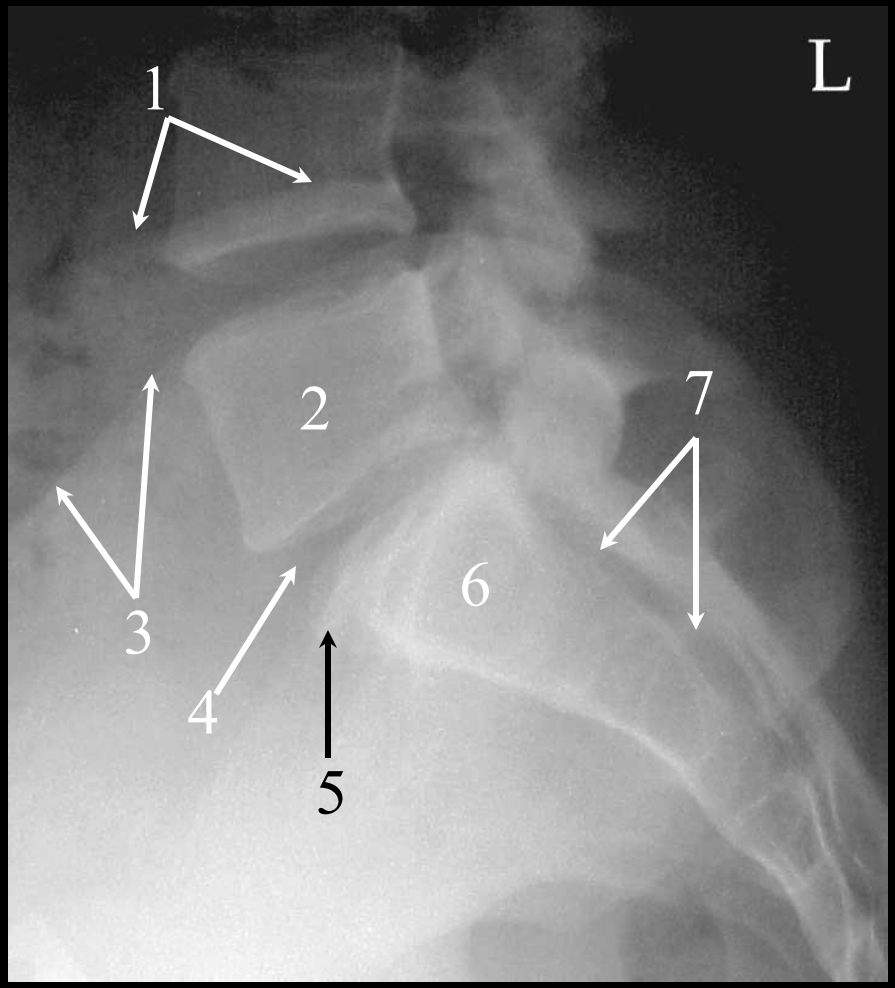
c. sacral promontory.

d. none of the above



Question #57: 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. 1st Sacral Segment
7. Sacral Canal



Lateral L5/S1 Spot Lumbar Spine

Question #58:

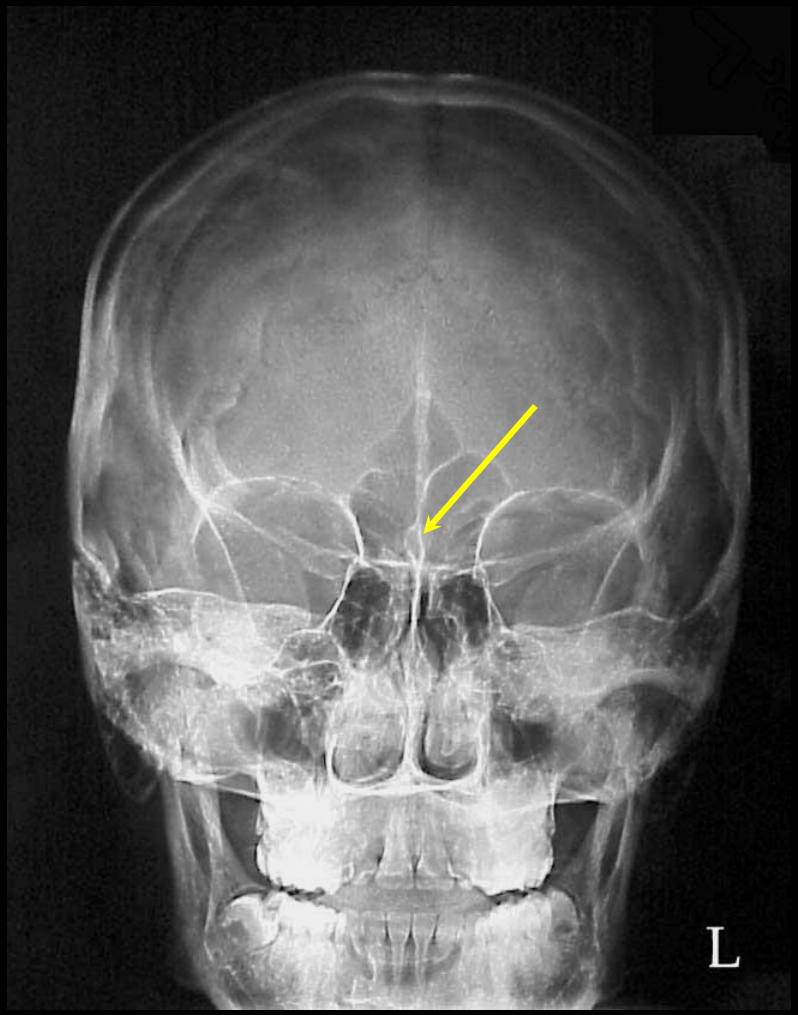
The arrow on this Caldwell Method is pointing to the:

a. optic canal.

b. crista galli.

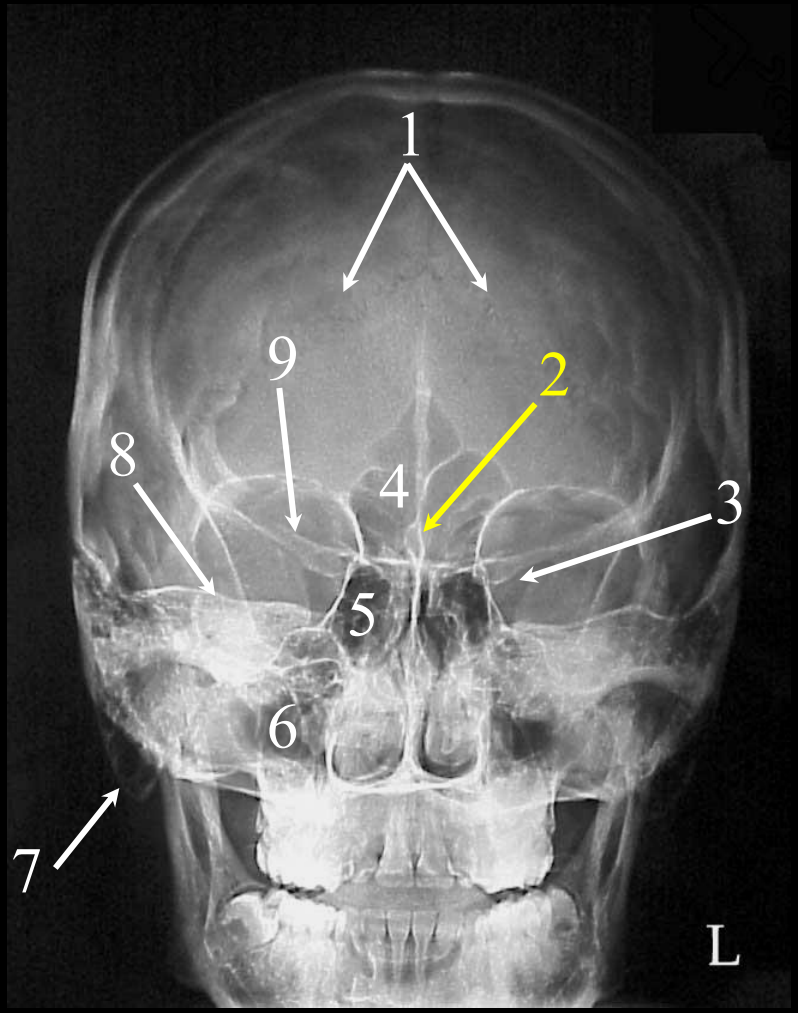
c. greater wing of the sphenoid.

d. anterior nasal spine.



Question #58: 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



PA Caldwell Facial Bones & Sinuses

Question #59:

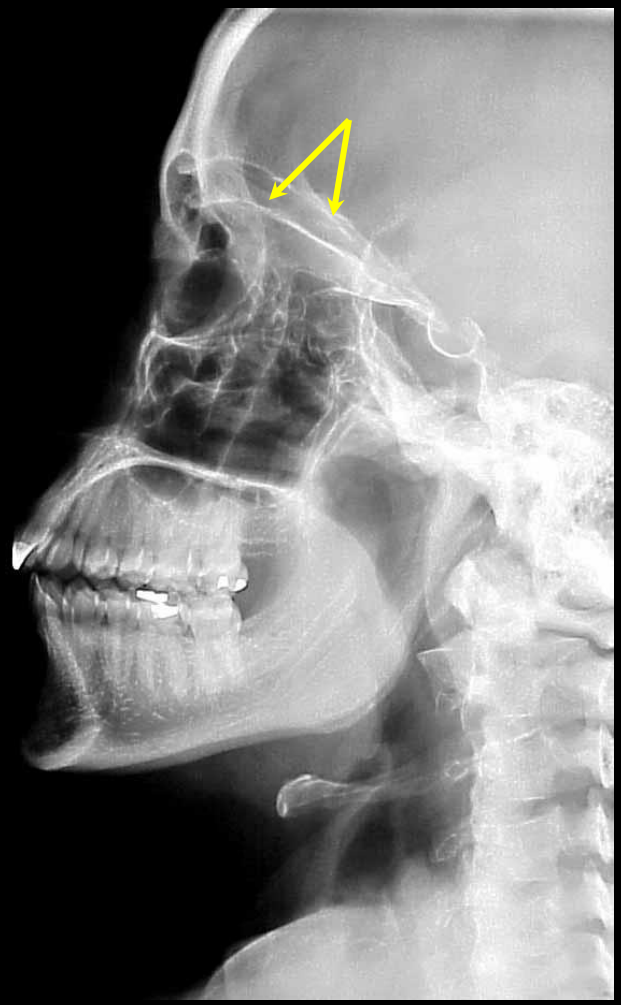
The arrows on this lateral of the facial bones are pointing to the:

a. ethmoid sinus.

b. greater wing of the sphenoid.

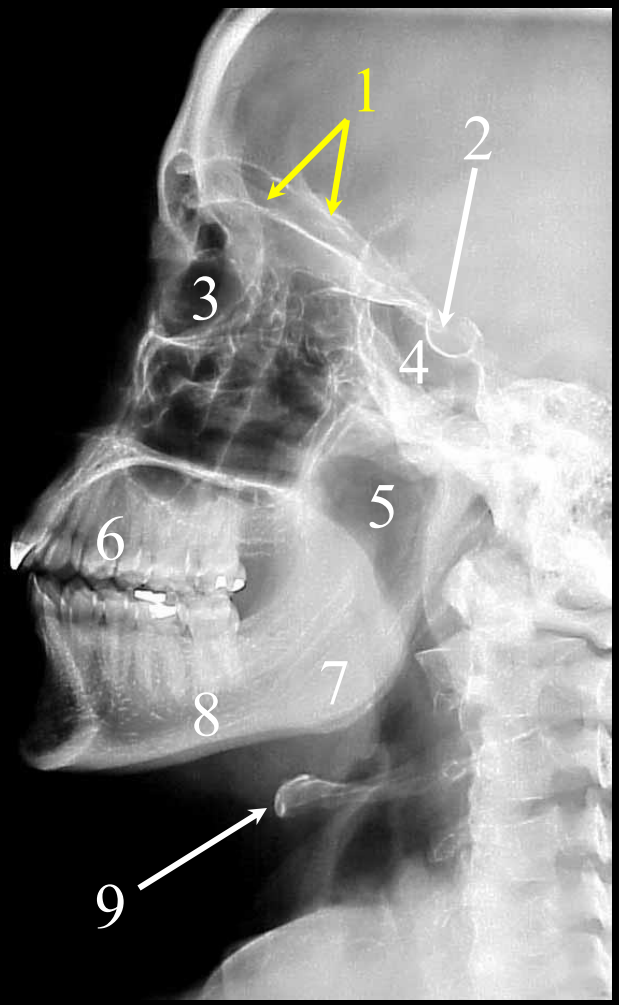
c. inferior nasal conchae.

d. orbital plates of the frontal bone.



Question #59: 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



Lateral Facial Bones & Sinuses

Question #60:

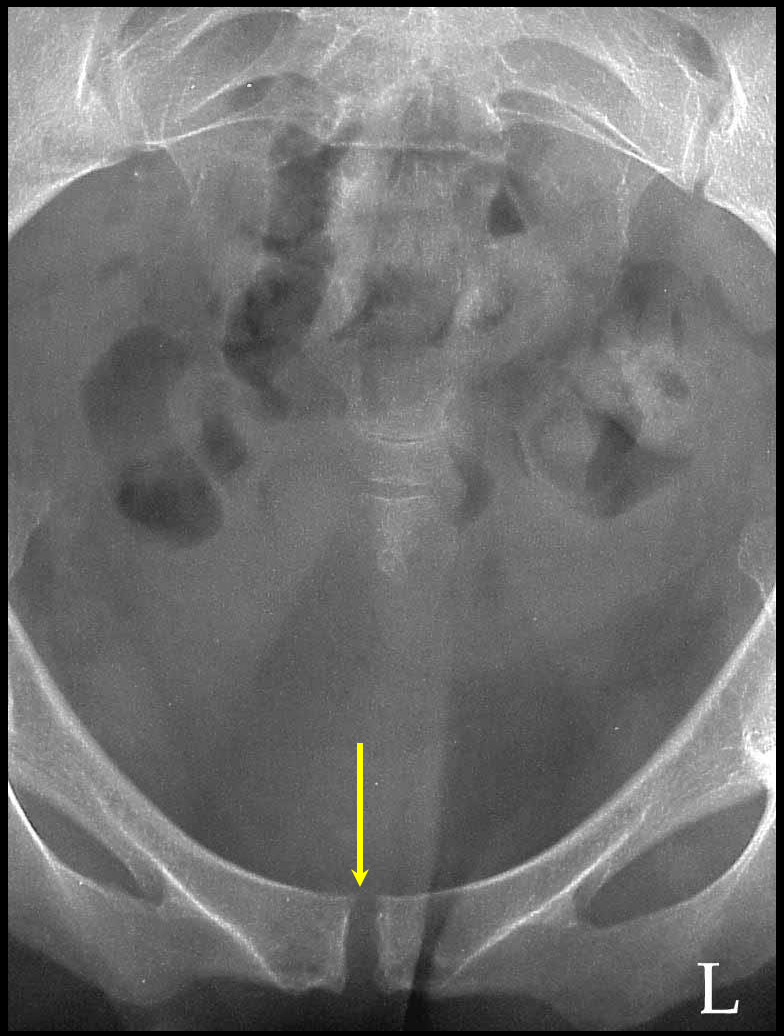
The arrow on this radiograph is pointing to the:

a. superior ramus of the pubis.

b. inferior ramus of the pubis.

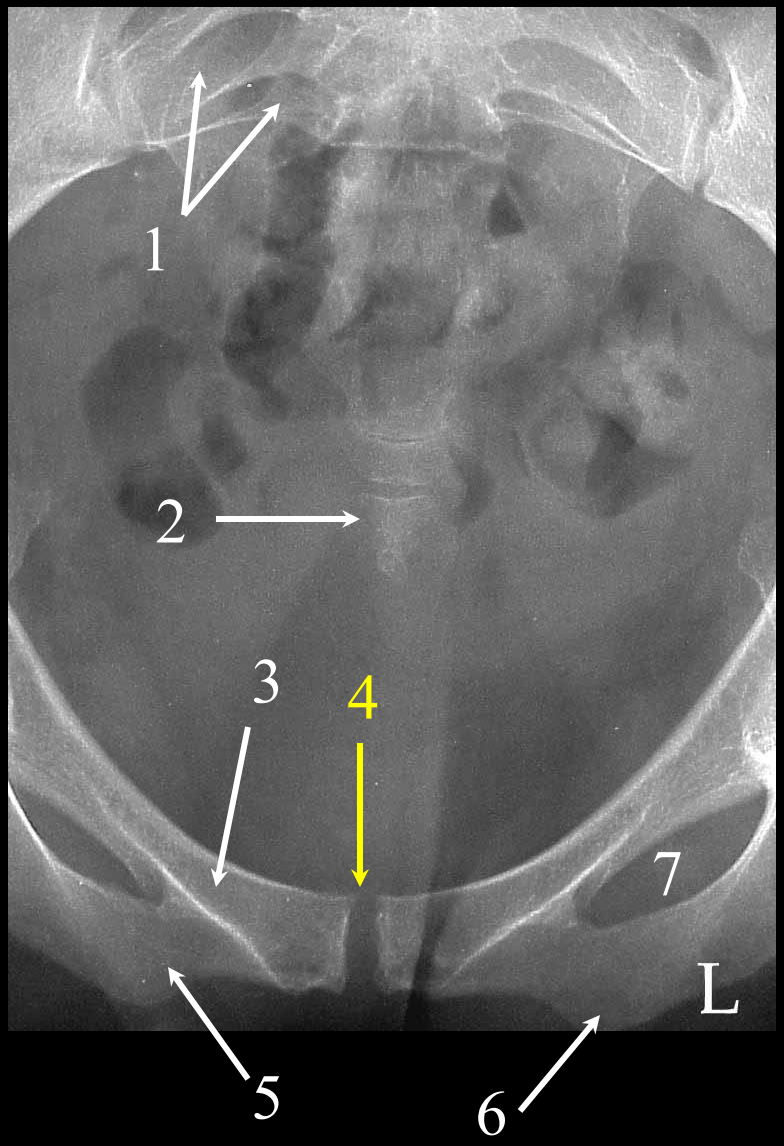
c. ischial tuberosity.

d. symphysis pubis.



Question #60: Review

1. Anterior Sacral Foramen
2. Coccyx
3. Superior Ramus of the Pubic Bone
4. Symphysis Pubis
5. Inferior Ramus of the Pubic Bone
6. Ischial Tuberosity
7. Obturator Foramen



AP Coccyx

Question #61:

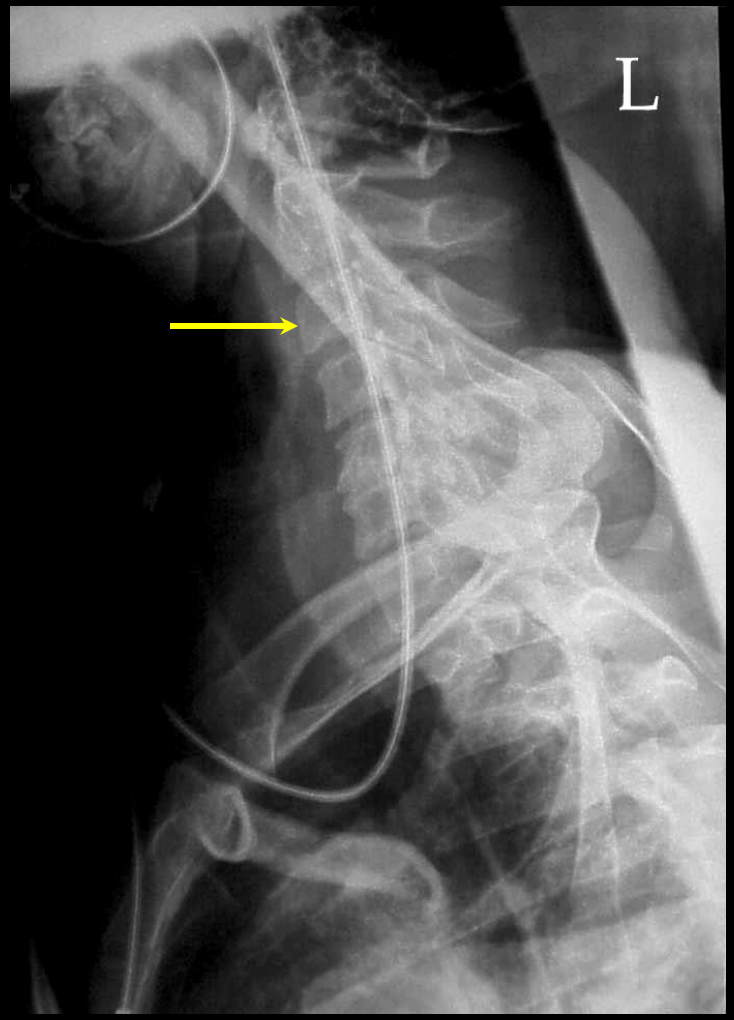
The arrow on this radiograph is pointing to the body of ____.

a. C2

b. C3

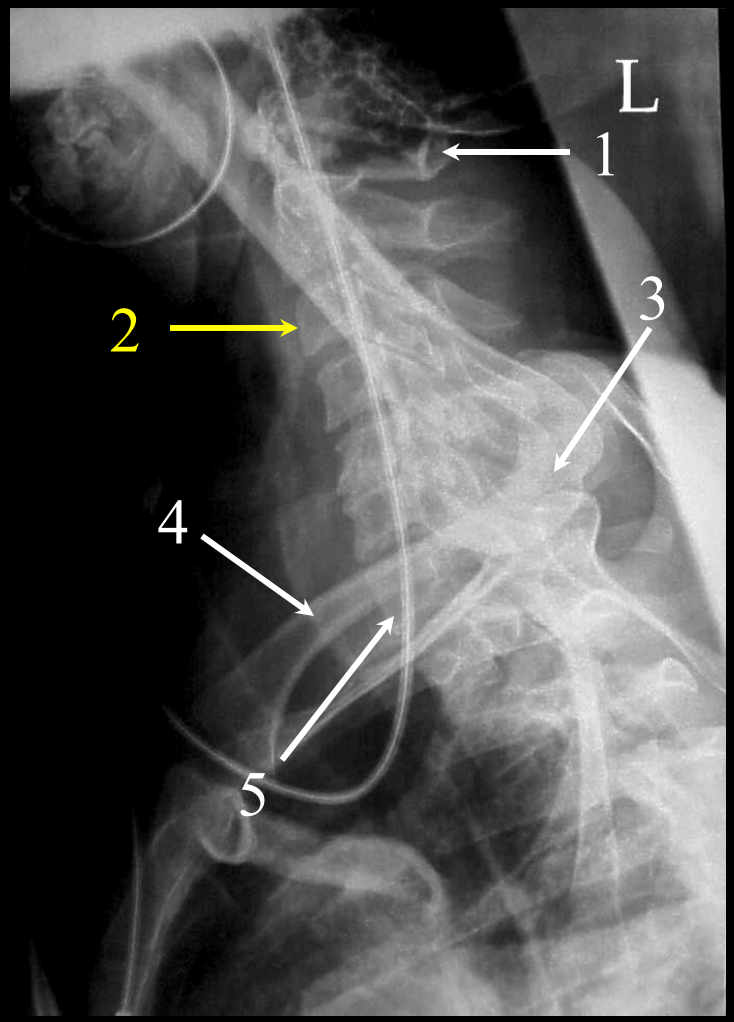
c. C4

d. C5



Question #61: Review

1. Posterior Arch of C1
2. Body of C3
3. Head of the Right Humerus
4. Right Clavicle
5. Body of C7



Cervicothoracic Thoracic Spine

Question #62:

The arrow on this Towne's Method of the skull is pointing to the _____.

a. anterior clinoid process

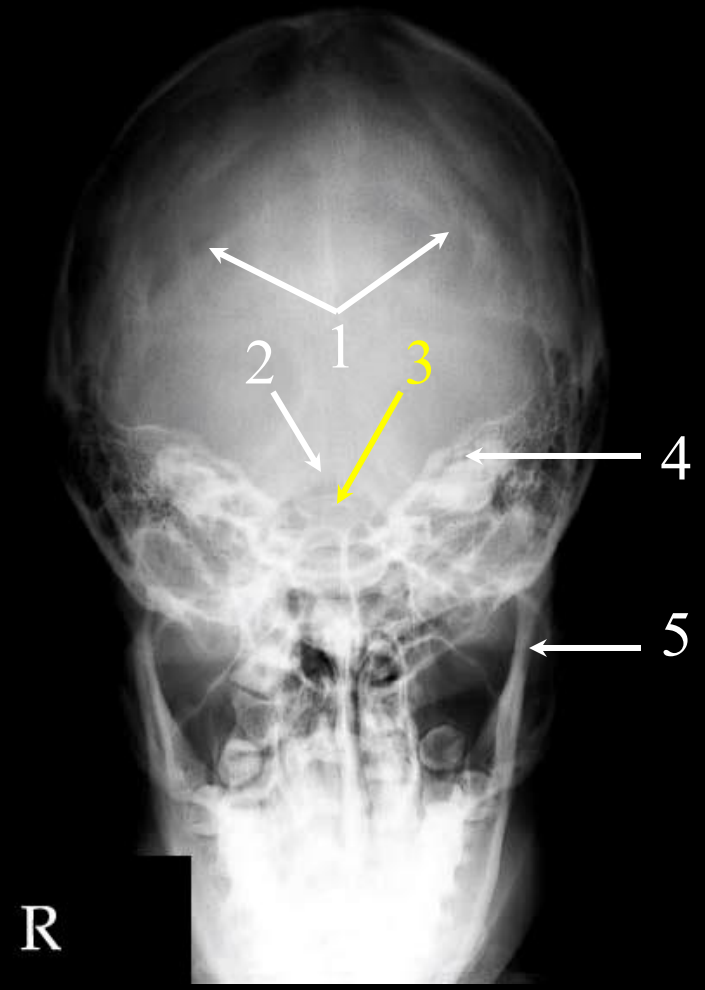
b. sella turcica

c. foramen magnum

d. dorsum sella

Question #62: Review

1. Lambdoidal Suture
2. Foramen Magnum
3. Dorsum Sella
4. Petrous Ridge
5. Condyle of the Mandible



Towne's Method of the Skull

Question #63:

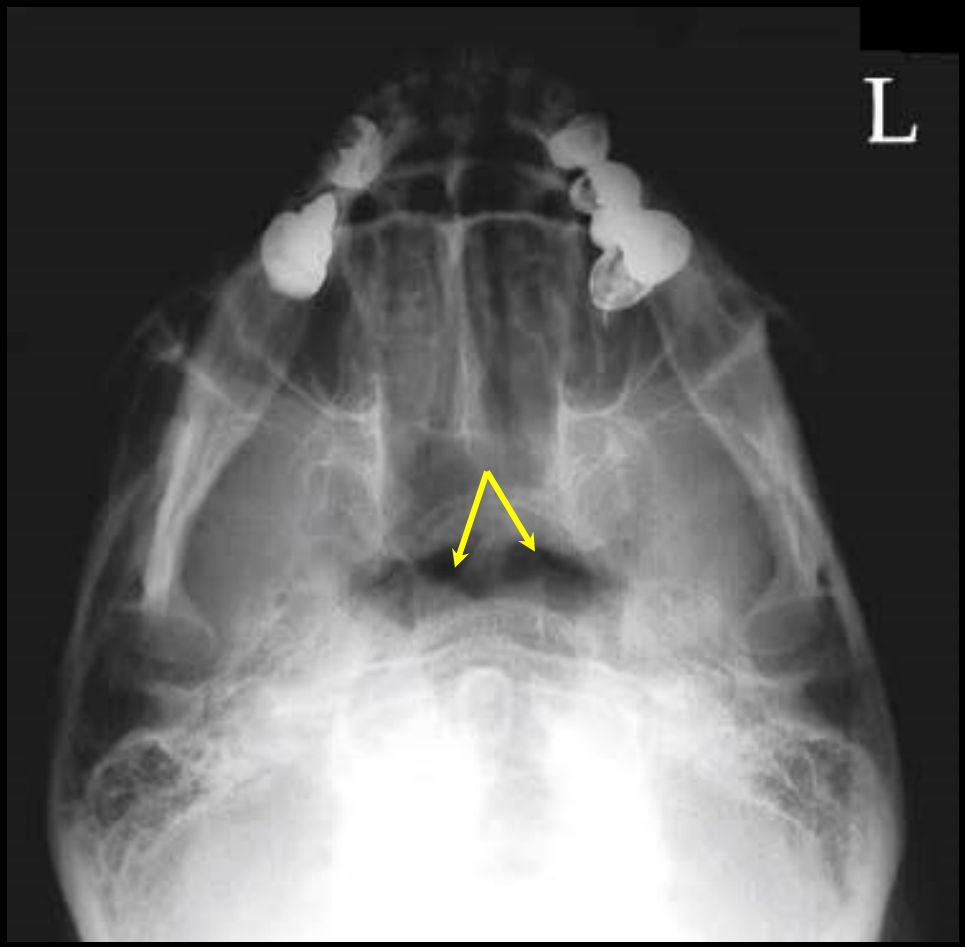
The arrows on this SMV projection are pointing to the:

a. maxillary sinus.

b. ethmoid sinuses.

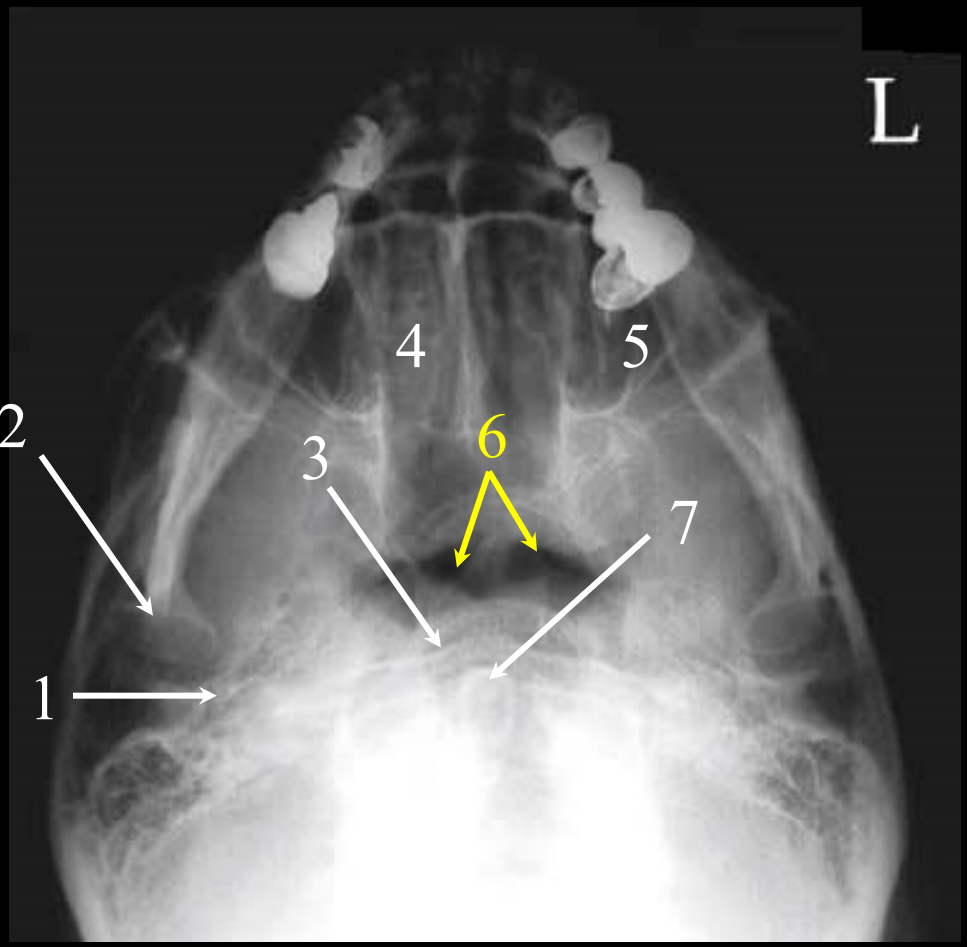
c. sphenoid sinus.

d. mastoid air cells.



Question #63: Review

1. Petrous Ridge
2. Head of the Condyle of the Mandible
3. Anterior Arch of C1
4. Ethmoid Sinus
5. Maxillary Sinus
6. Sphenoid Sinus
7. Dens or Odontoid



SMV Projection

Question #64:

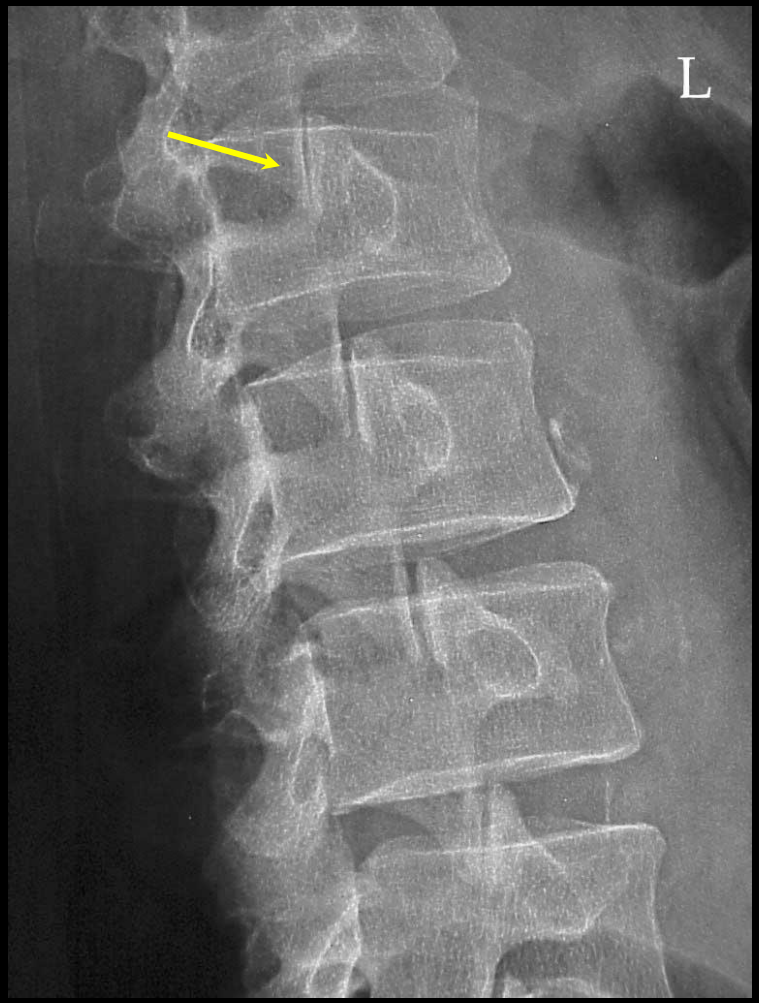
The arrow on this magnified LPO position of the lumbar spine is pointing to the _____.

a. inferior articulating process

b. transverse process

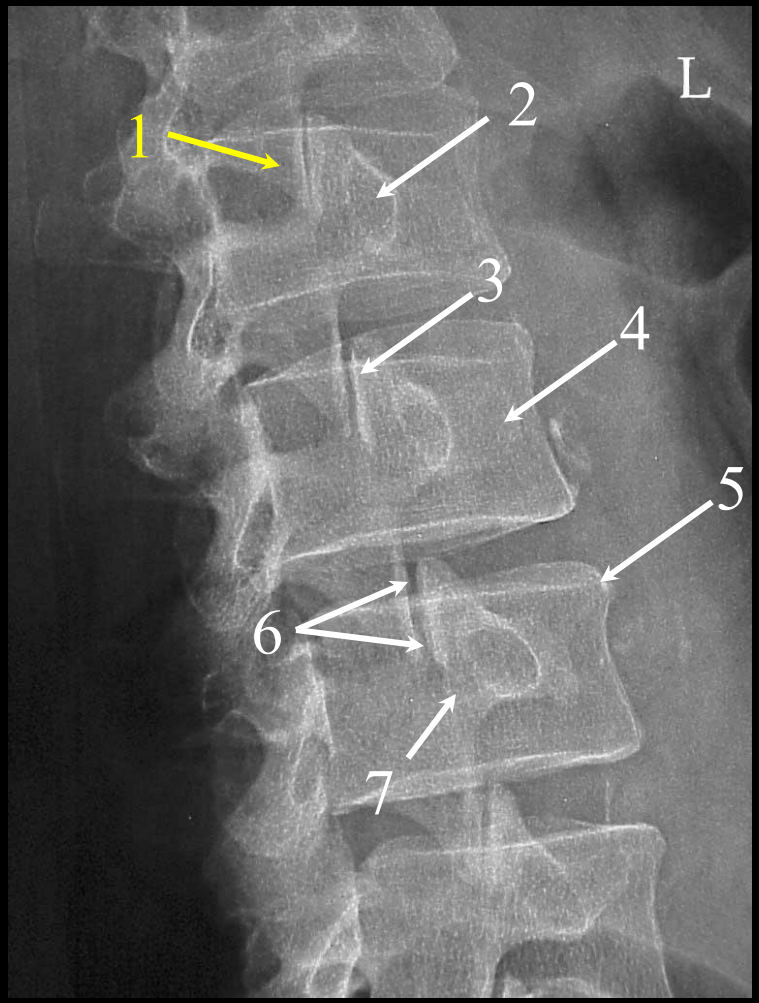
c. pars interarticularis

d. superior articulating process



Question #64: 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



LPO Lumbar Spine: Magnified

Question #65:

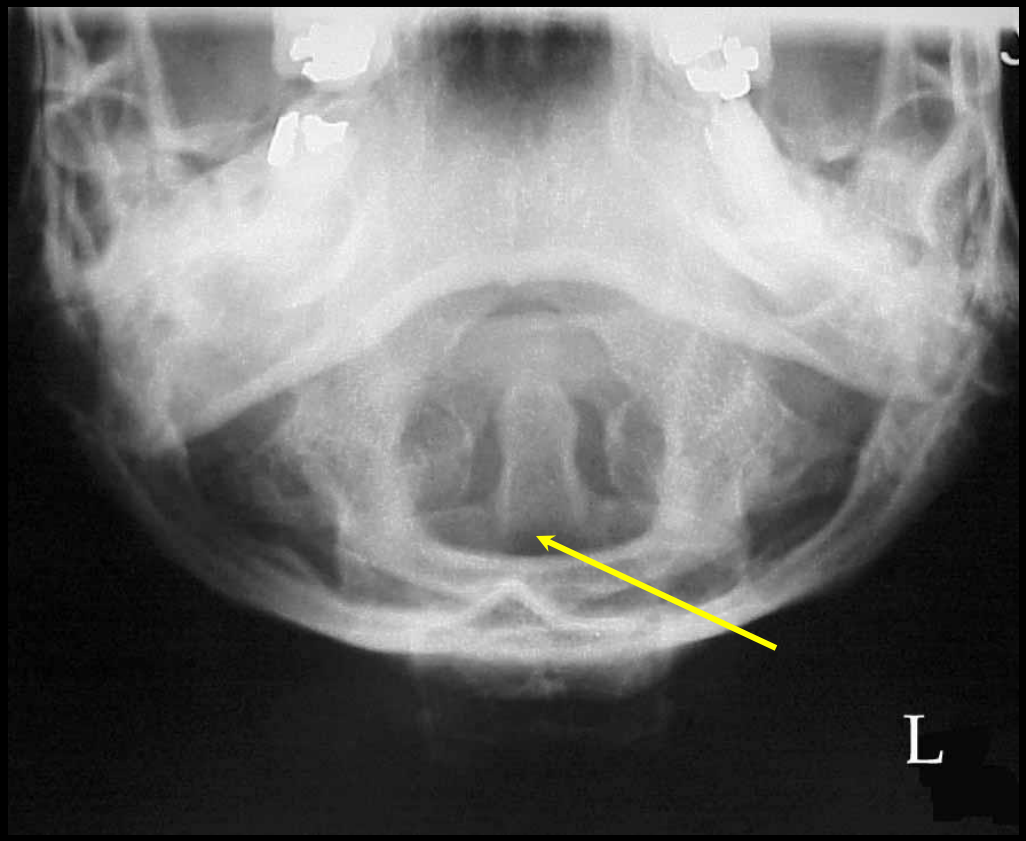
The arrow on this radiograph of the cervical spine is pointing to the:

a. transverse process.

b. pedicle.

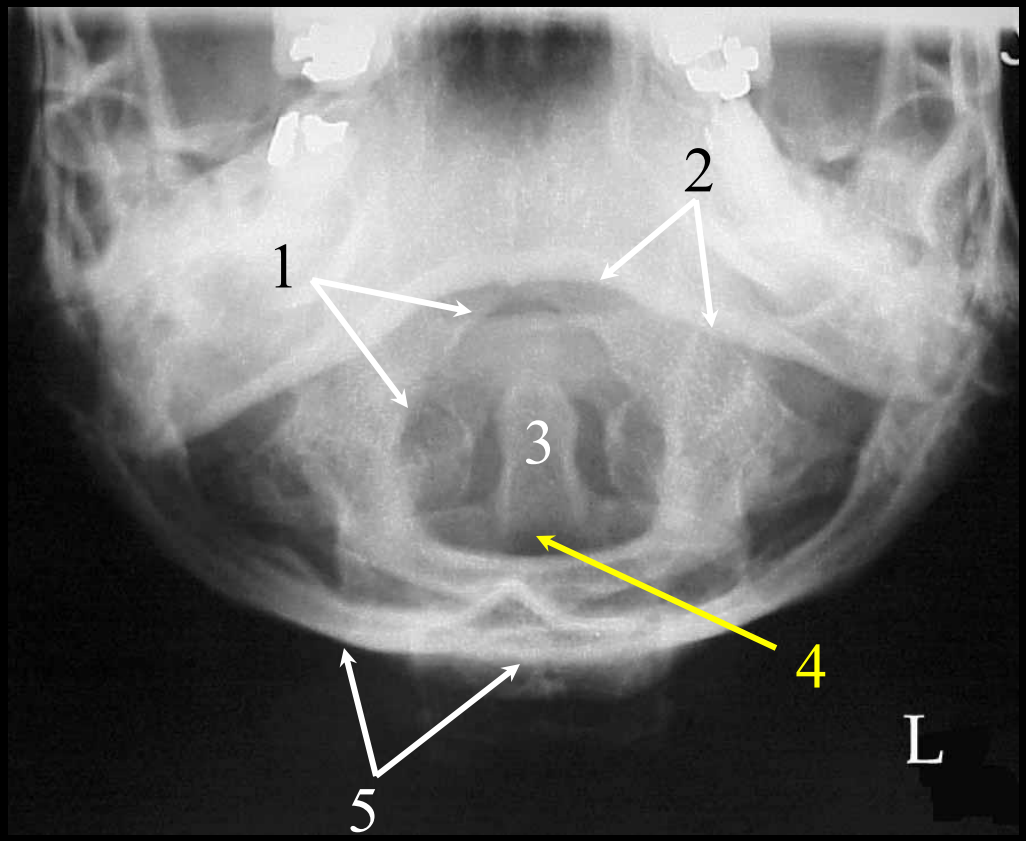
c. odontoid.

d. body of C2.



Question #65: Review

1. Foramen Magnum
2. Mandible
3. Odontoid or Dens
4. Body of C2
5. Occipital Bone



Fuch (Judd) Method Cervical Spine

Question #66:

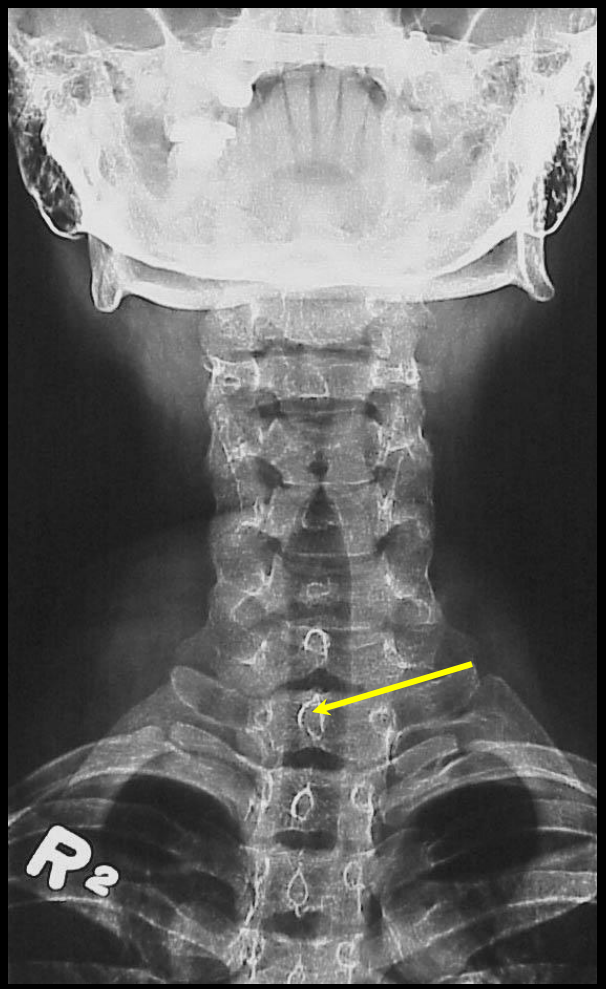
The arrow on this AP of the cervical spine is pointing to the _____ of T1.

a. spinous process

b. body

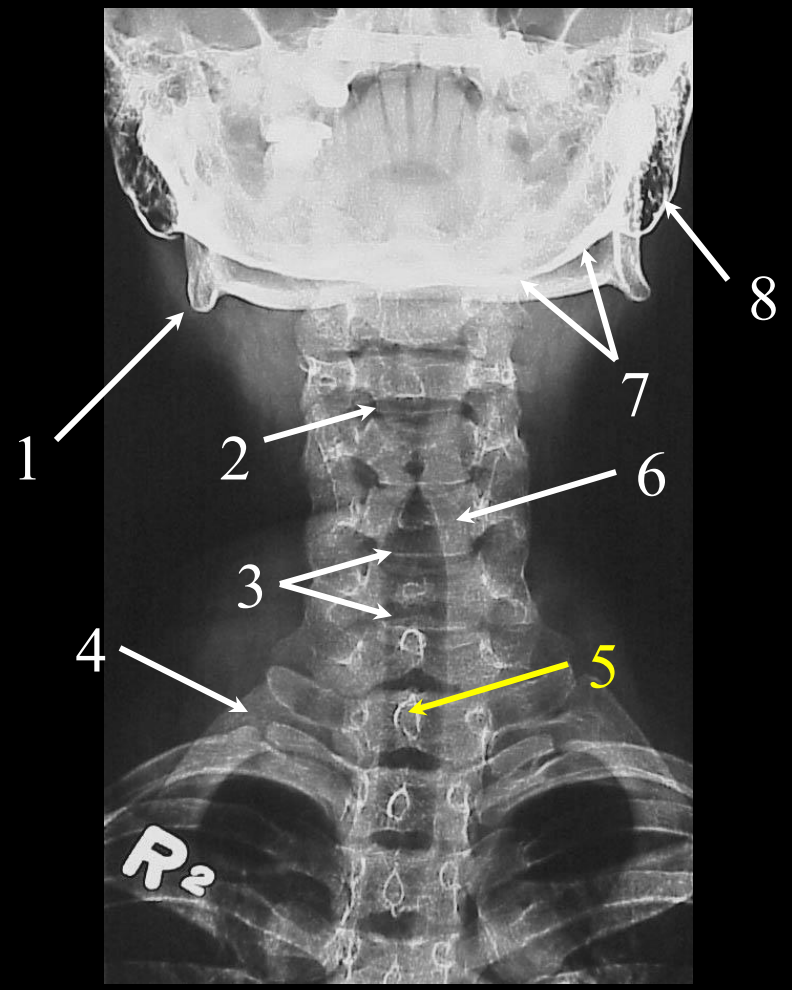
c. pedicle

d. transverse process



Question #66: Review

1. Angle of the Mandible
2. Intervertebral Disc of C3-T4
3. Air in the Trachea
4. 1st Rib
5. Spinous Process of T1
6. Body of C5
7. Occipital Bone
8. Mastoid Tip



AP Cervical Spine

Question #67:

The arrow on this SMV of the facial bones is pointing to the:

a. zygomatic bone.

b. temporal bone.

c. zygomatic arch.

d. coronoid process of the mandible.

Question #67: Review

1. Zygoma or Malar Bone
2. Zygomatic Arch
3. Zygomatic Process of the Temporal Bone

SMV Zygomatic Arches

Question #68:

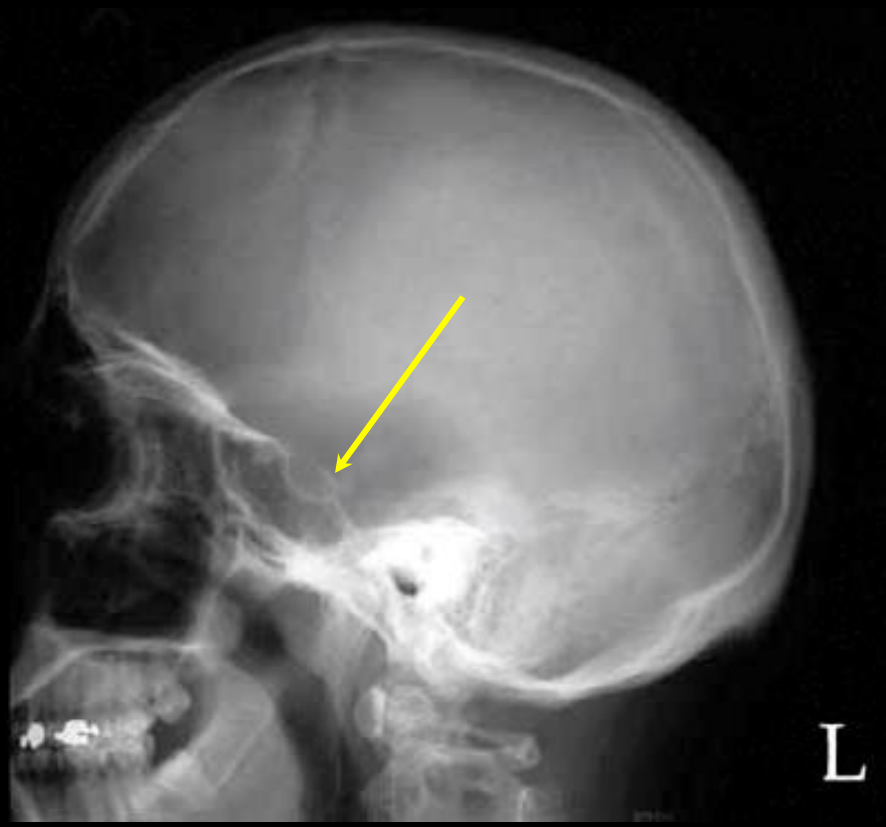
The arrow on this lateral position of the skull is pointing to the:

a. dorsum sellae.

b. anterior clinoid process.

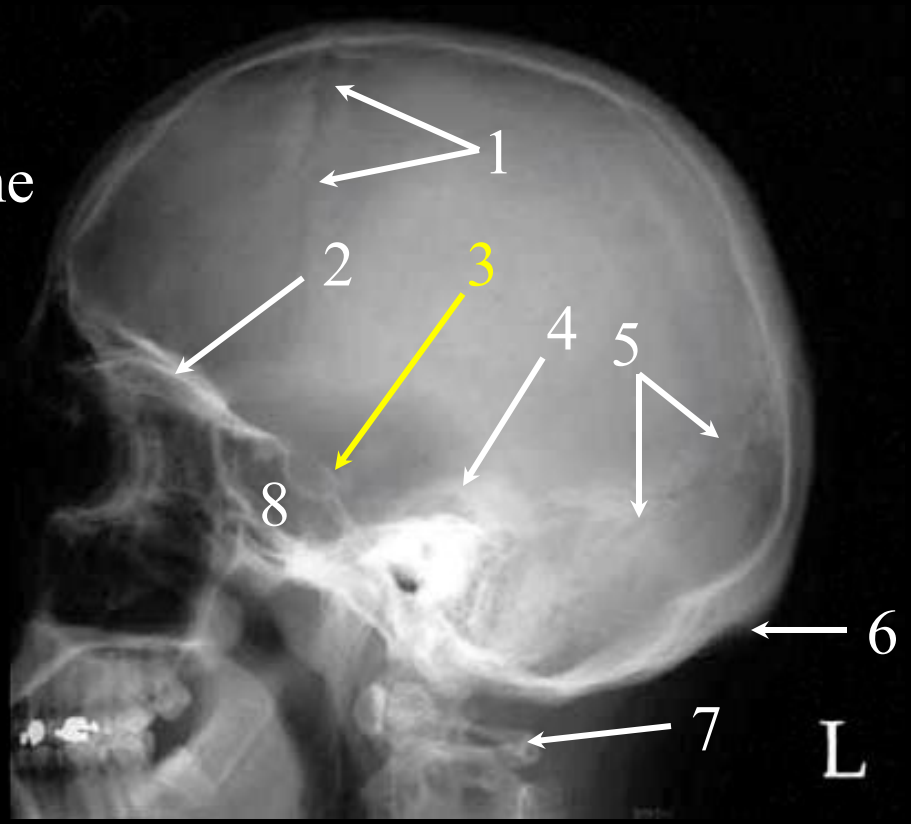
c. posterior clinoid process.

d. pituitary gland.



Question #68: Review

1. Coronal Suture
2. Orbital Plates of the Frontal Bone
3. Posterior Clinoid Process
4. Auricle or Pinna (Ear)
5. Lambdoidal Suture
6. External Occipital Protuberance
7. Posterior Arch of C1
8. Sphenoid Sinus



Lateral Skull

Question #69:

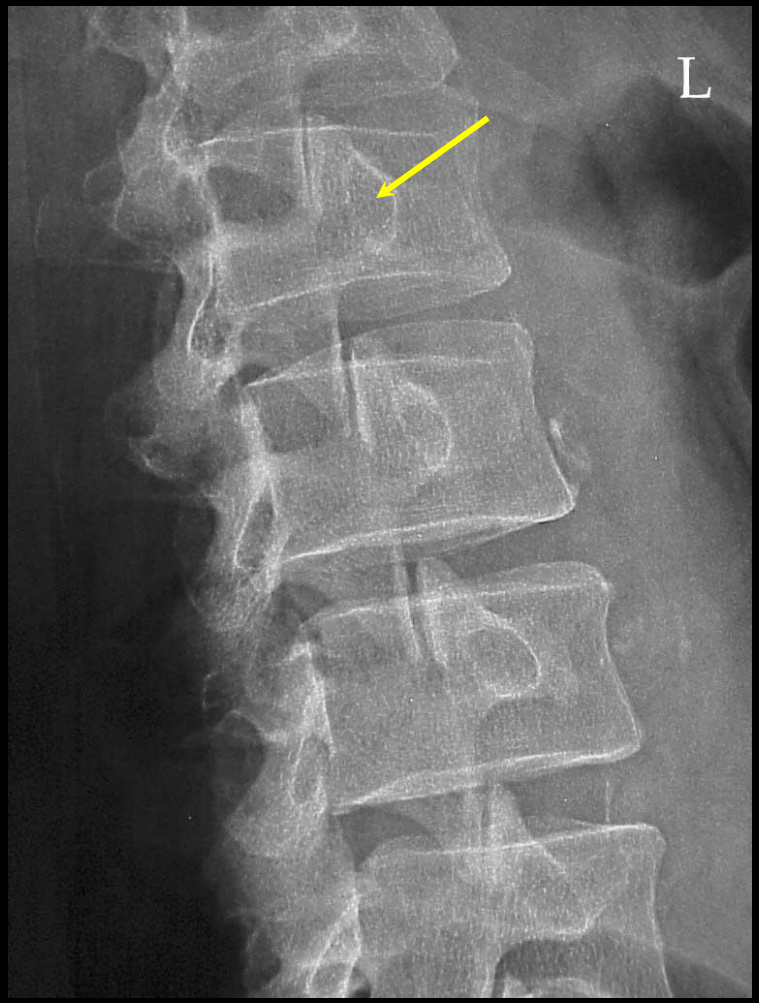
The arrow on this magnified LPO position of the lumbar spine is pointing to the _____.

a. pars interarticularis

b. pedicle

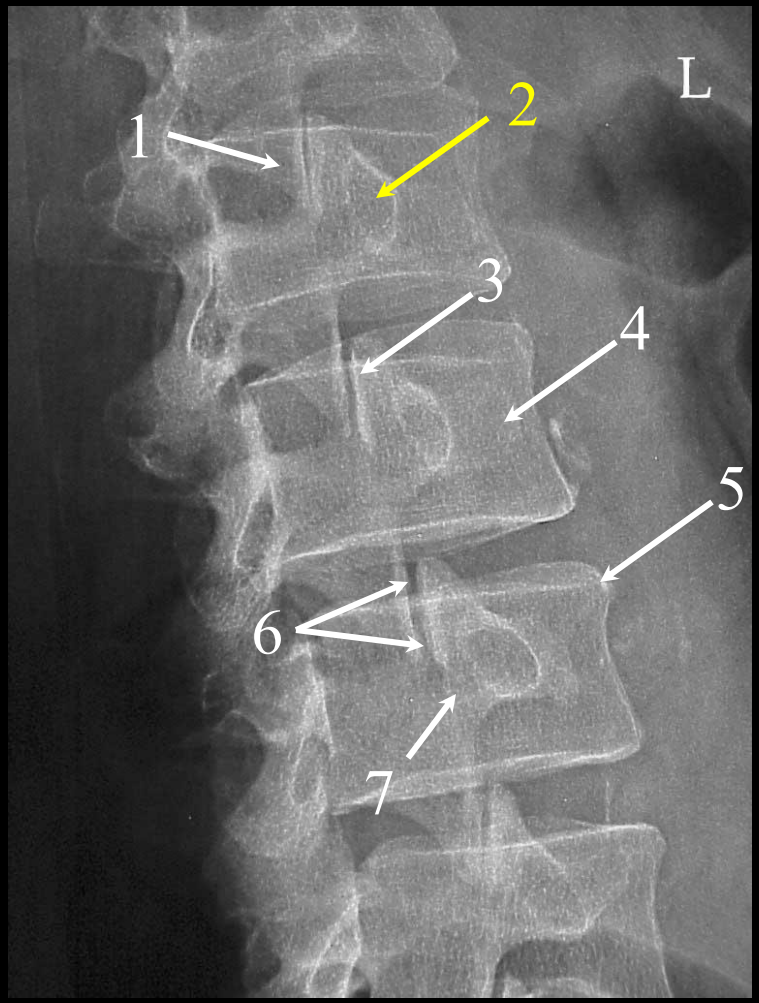
c. transverse process

d. inferior articulating process



Question #69: 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



LPO Lumbar Spine: Magnified

Question #70:

The arrows on this SMV projection of the sinuses are pointing to the:

a. petrous ridge.

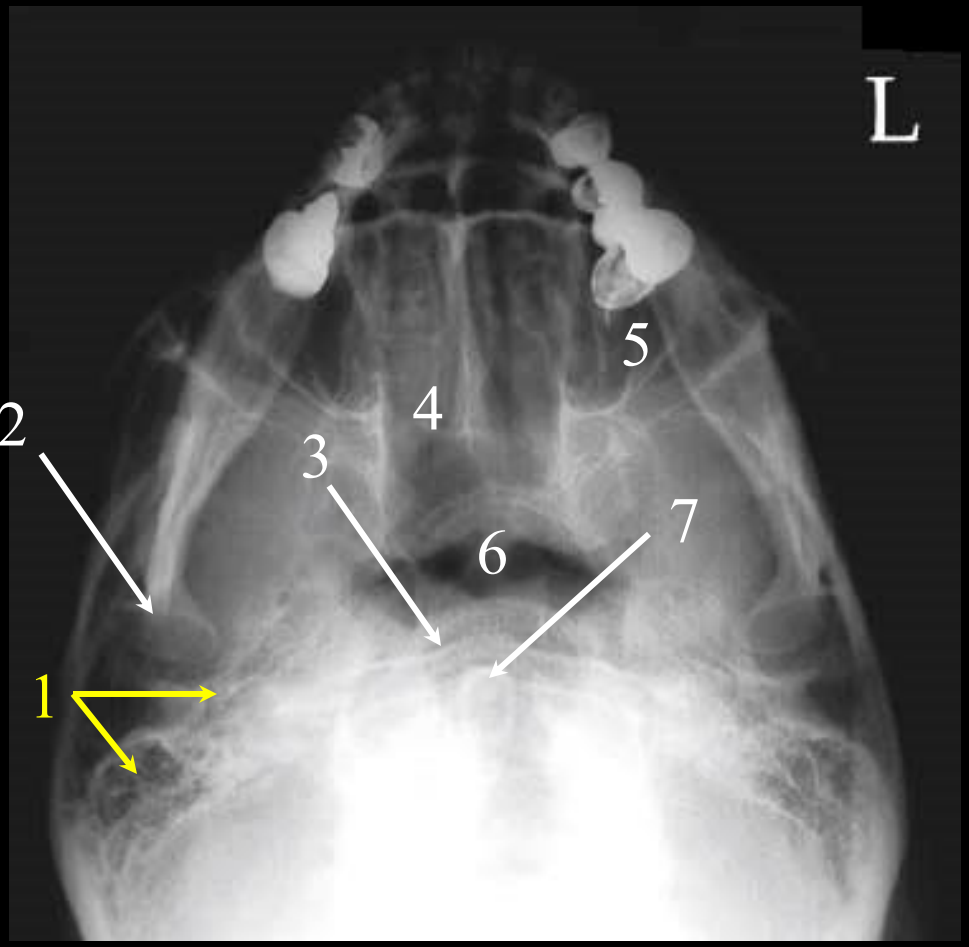
b. mastoid air cells.

c. greater wing of the sphenoid.

d. squamosal suture.

Question #70: Review

1. Petrous Ridge
2. Head of the Condyle of the Mandible
3. Anterior Arch of C1
4. Ethmoid Sinus
5. Maxillary Sinus
6. Sphenoid Sinus
7. Dens or Odontoid



SMV Projection

Question #71:

The arrows on this Towne's Method of the skull are pointing to the _____.

a. coronal suture

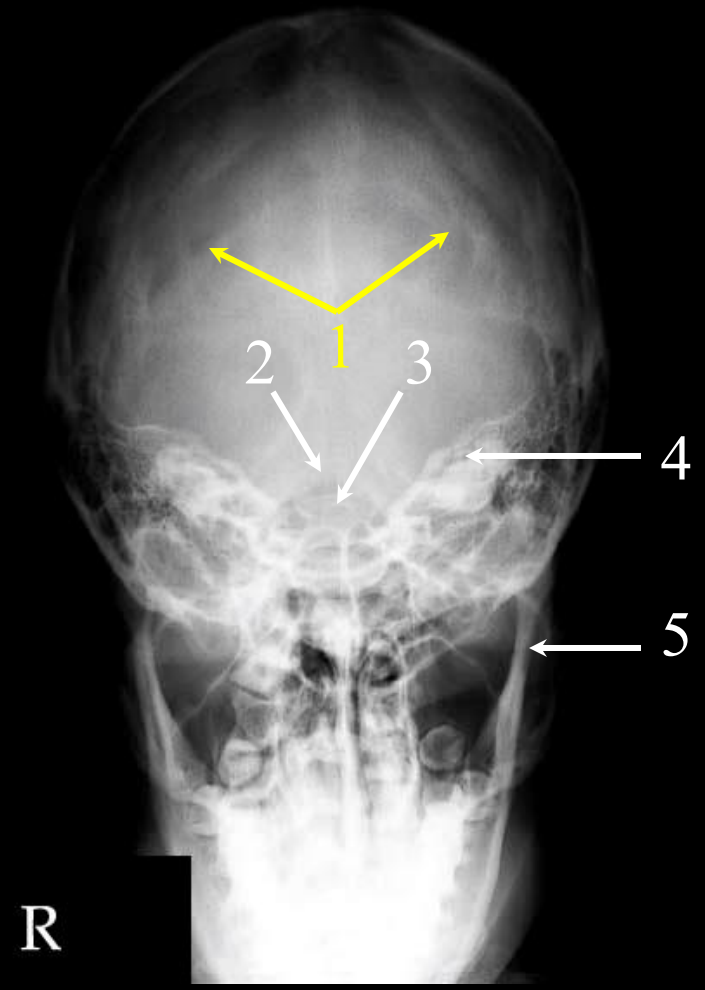
b. frontal bone

c. lambdoidal suture

d. frontal protuberance

Question #71: Review

1. Lambdoidal Suture
2. Foramen Magnum
3. Dorsum Sella
4. Petrous Ridge
5. Condyle of the Mandible



Towne's Method of the Skull

Question #72:

The arrow on this radiograph is pointing to the _____ of C1.

a. superior articulating process

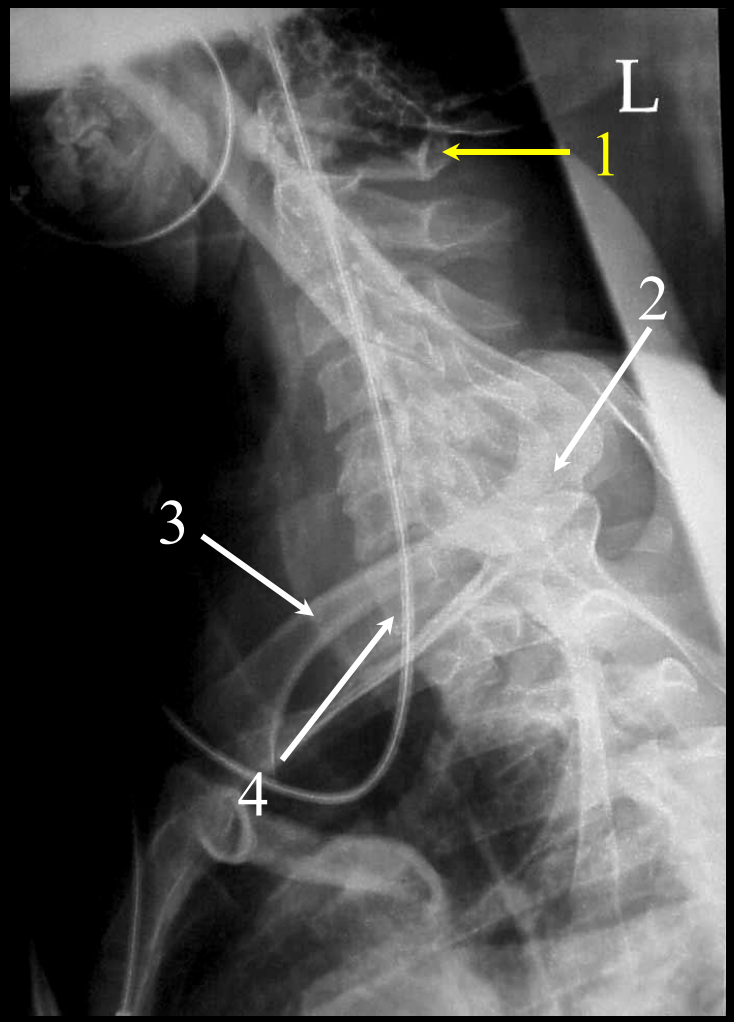
b. transverse foramina

c. spinous process

d. posterior arch

Question #72: Review

1. Posterior Arch of C1
2. Head of the Right Humerus
3. Right Clavicle
4. Body of C7



Cervicothoracic Thoracic Spine

Question #73:

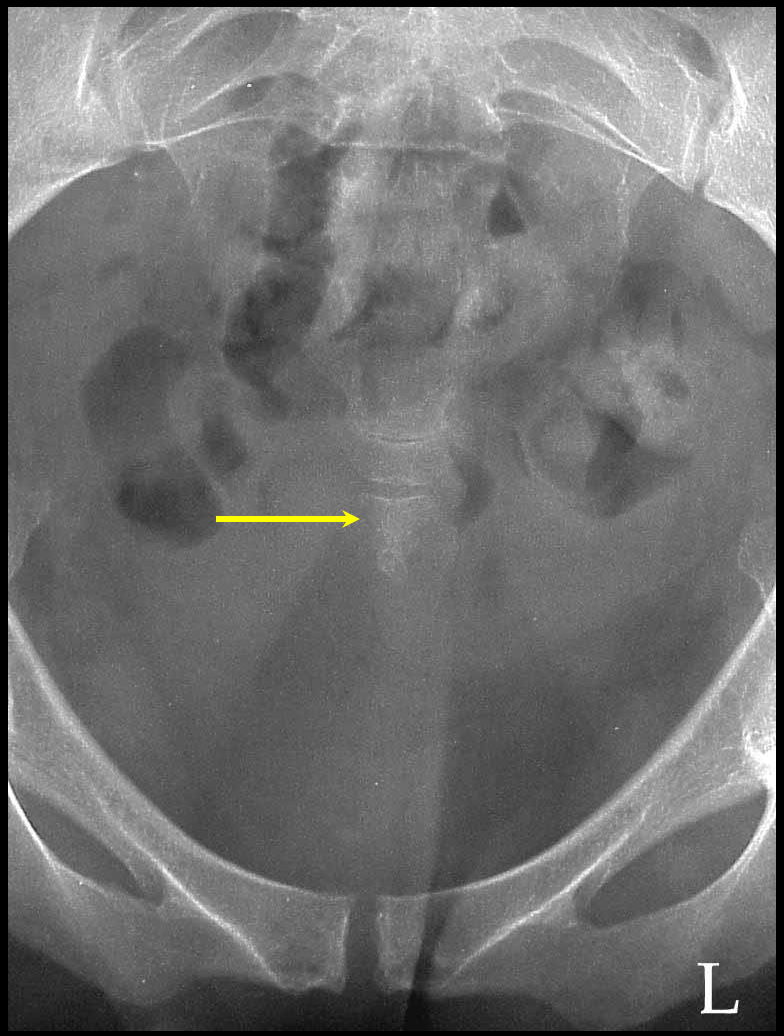
The arrow is pointing to:

a. the coccyx.

b. the sacrum.

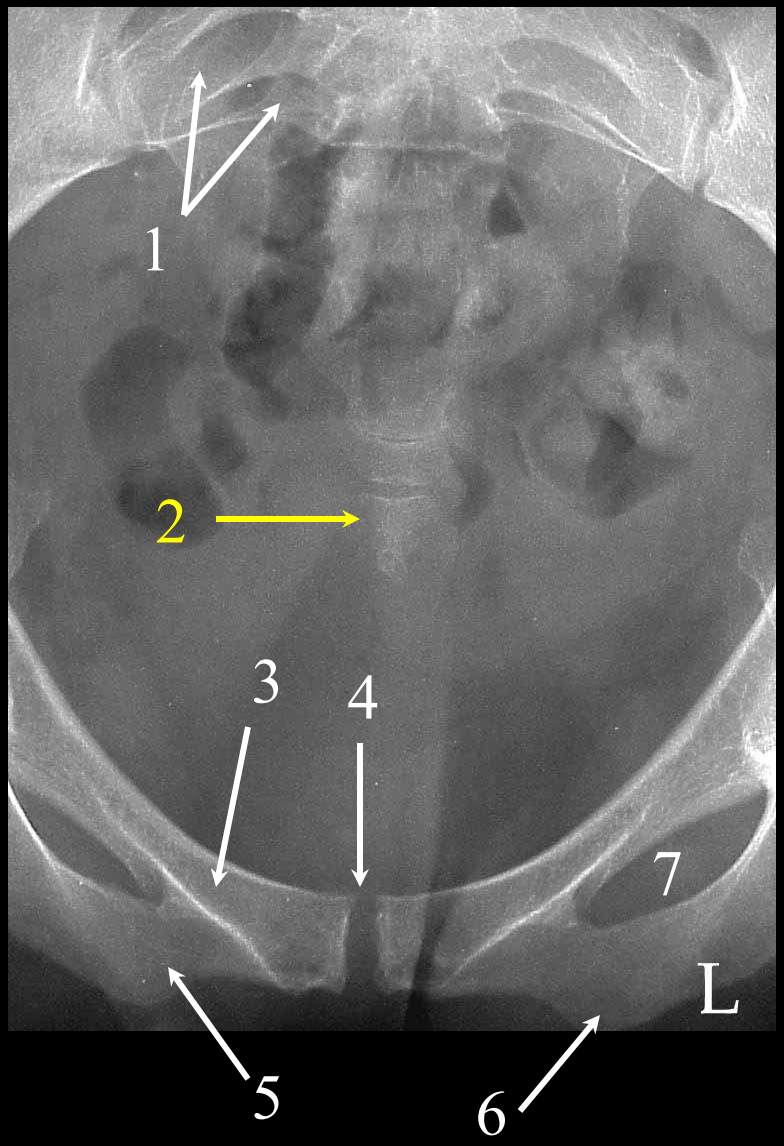
c. a phlebolith.

d. none of the above



Question #73: Review

1. Anterior Sacral Foramen
2. Coccyx
3. Superior Ramus of the Pubic Bone
4. Symphysis Pubis
5. Inferior Ramus of the Pubic Bone
6. Ischial Tuberosity
7. Obturator Foramen



AP Coccyx

Question #74:

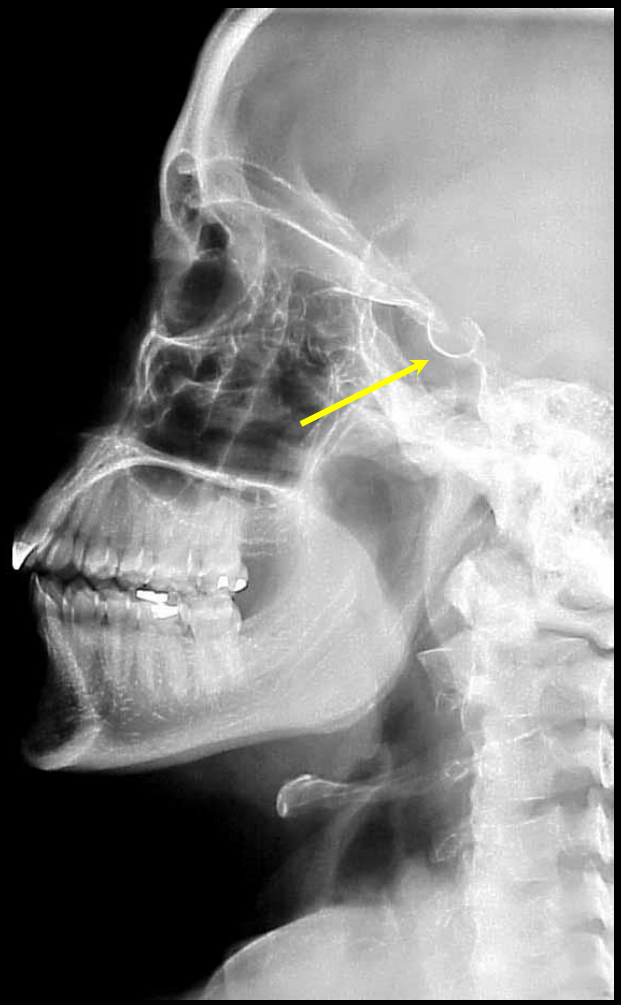
The arrow on this lateral of the facial bones is pointing to the _____ sinus.

a. sphenoid

b. frontal

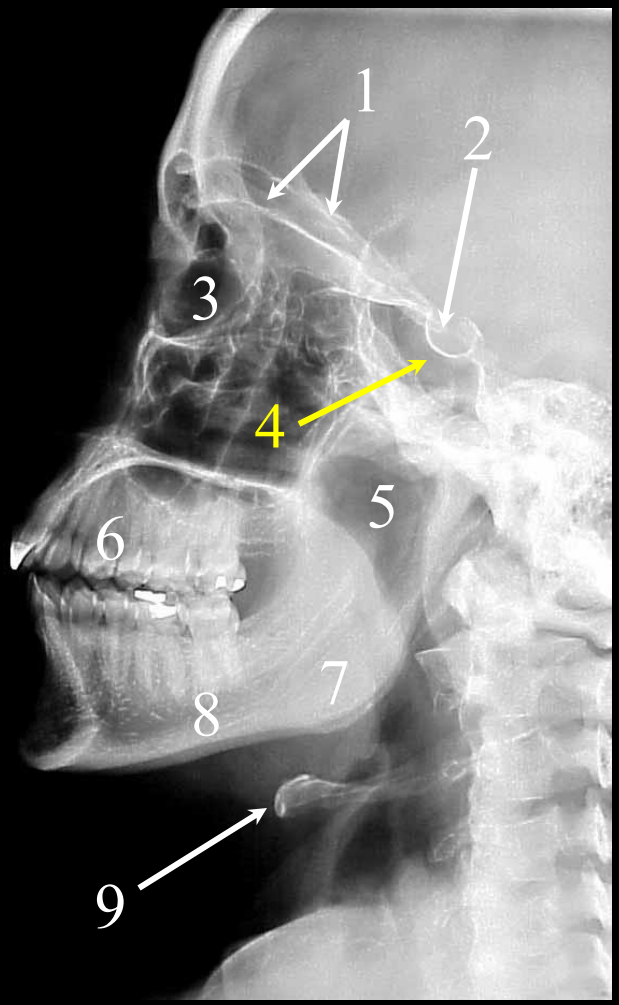
c. ethmoid

d. maxillary



Question #74: 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



Lateral Facial Bones & Sinuses

Question #75:

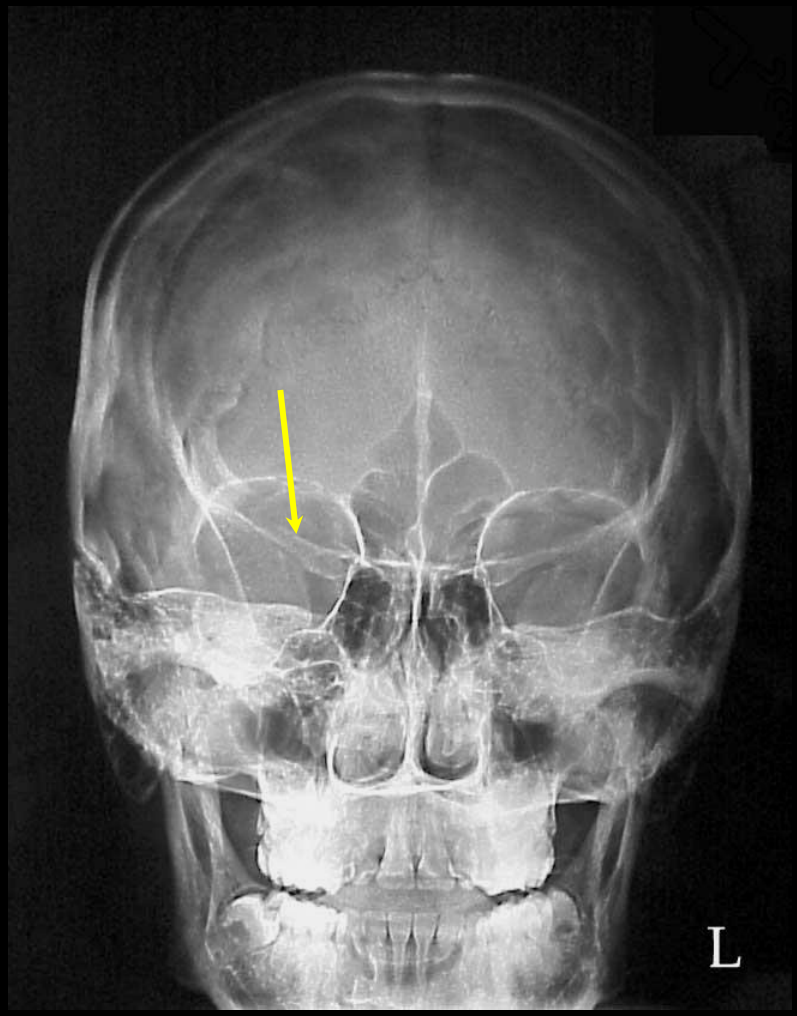
The arrow on this Caldwell Method is pointing to the:

a. lesser wing of the sphenoid.

b. superior orbital fissure.

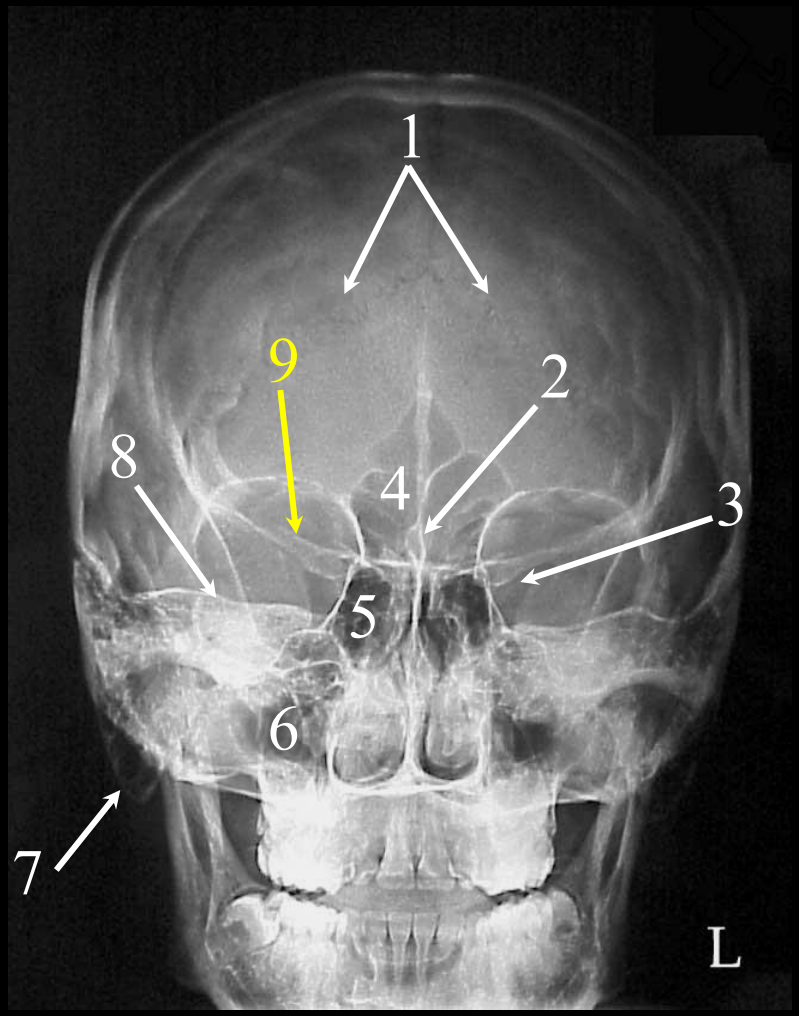
c. ethmoid sinus.

d. crista galli.



Question #75: 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



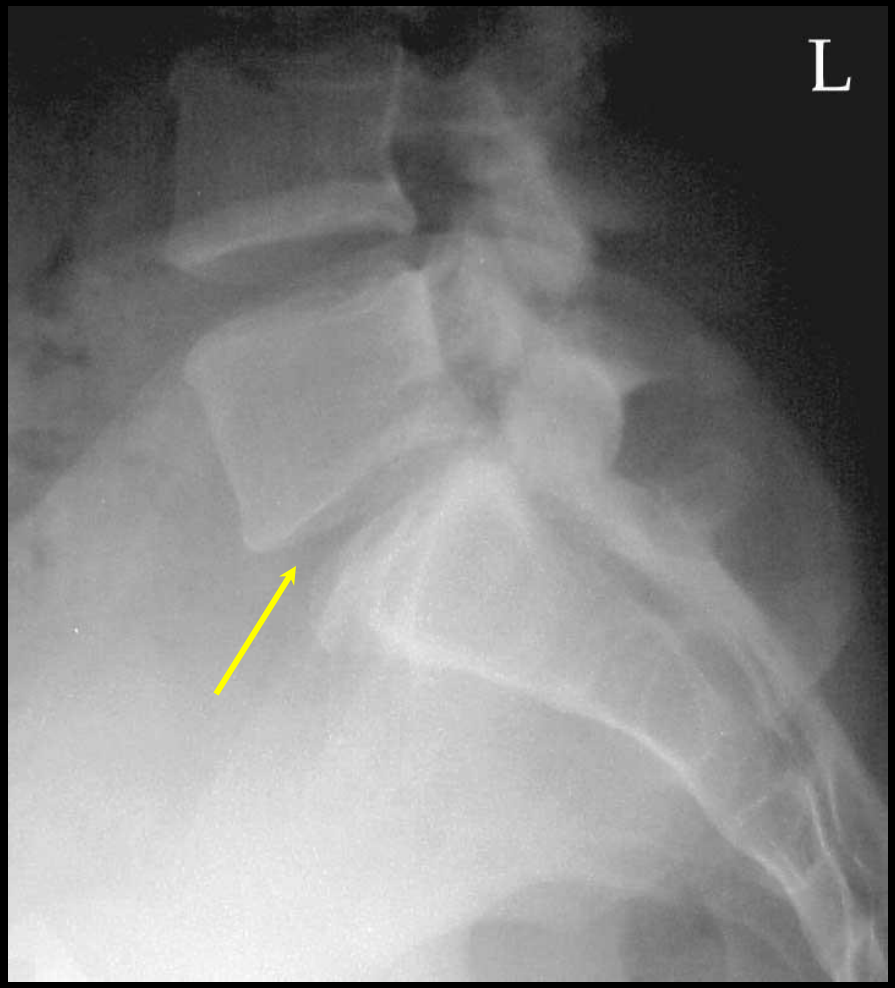
PA Caldwell Facial Bones & Sinuses

Question #76:

The arrow on this image of the lumbar spine is pointing to the L5-S1 joint space.

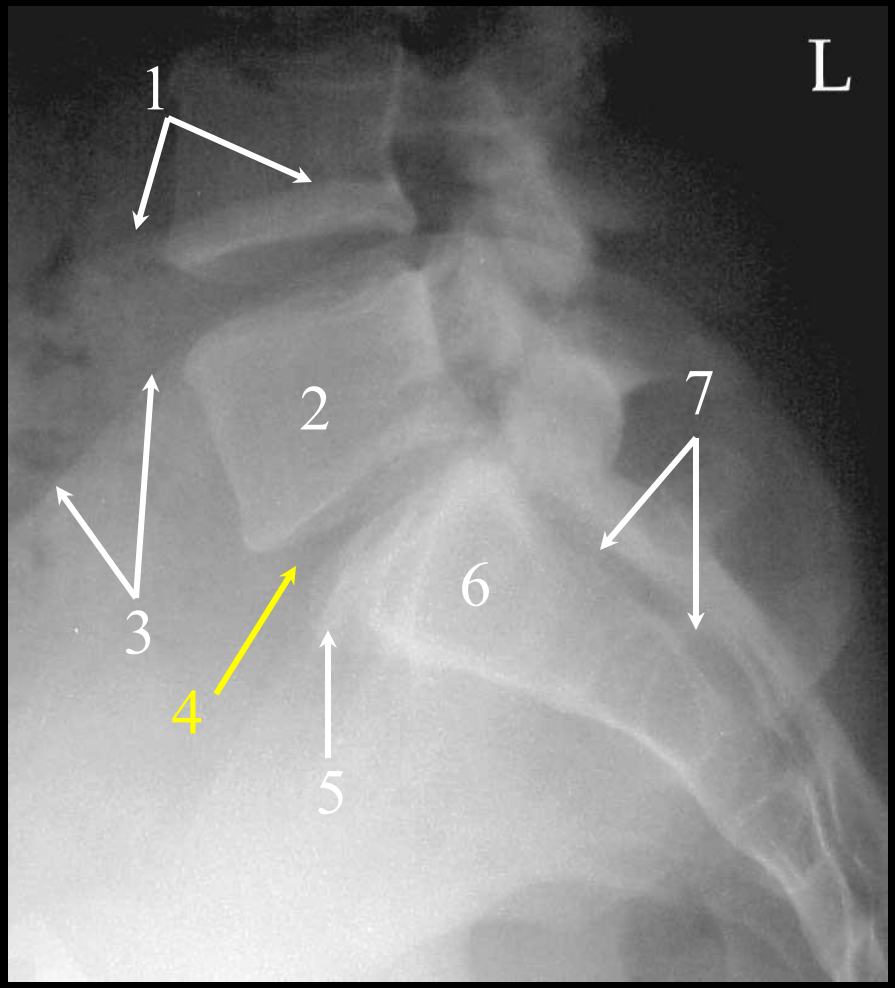
a. true

b. false



Question #76: 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. 1st Sacral Segment
7. Sacral Canal



Lateral L5/S1 Spot Lumbar Spine

Question #77:

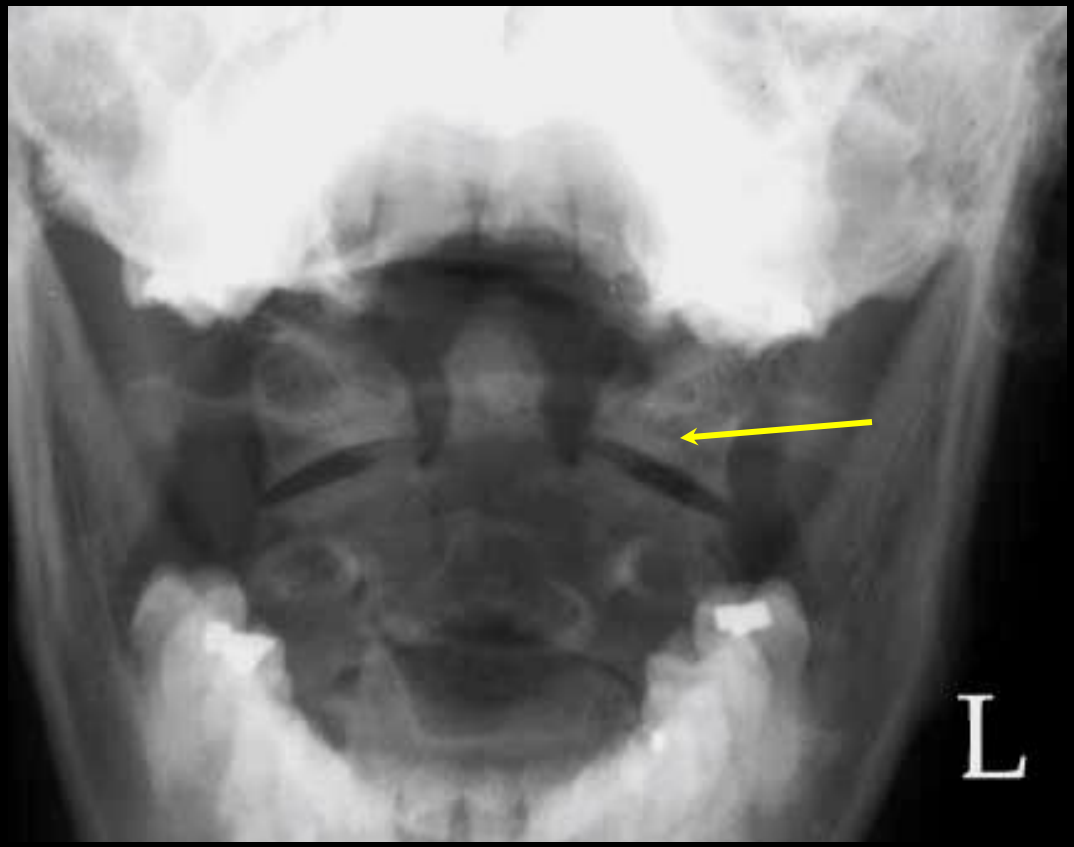
The arrow on this open mouth projection of the odontoid is pointing to the:

a. transverse process.

b. anterior arch.

c. lateral mass.

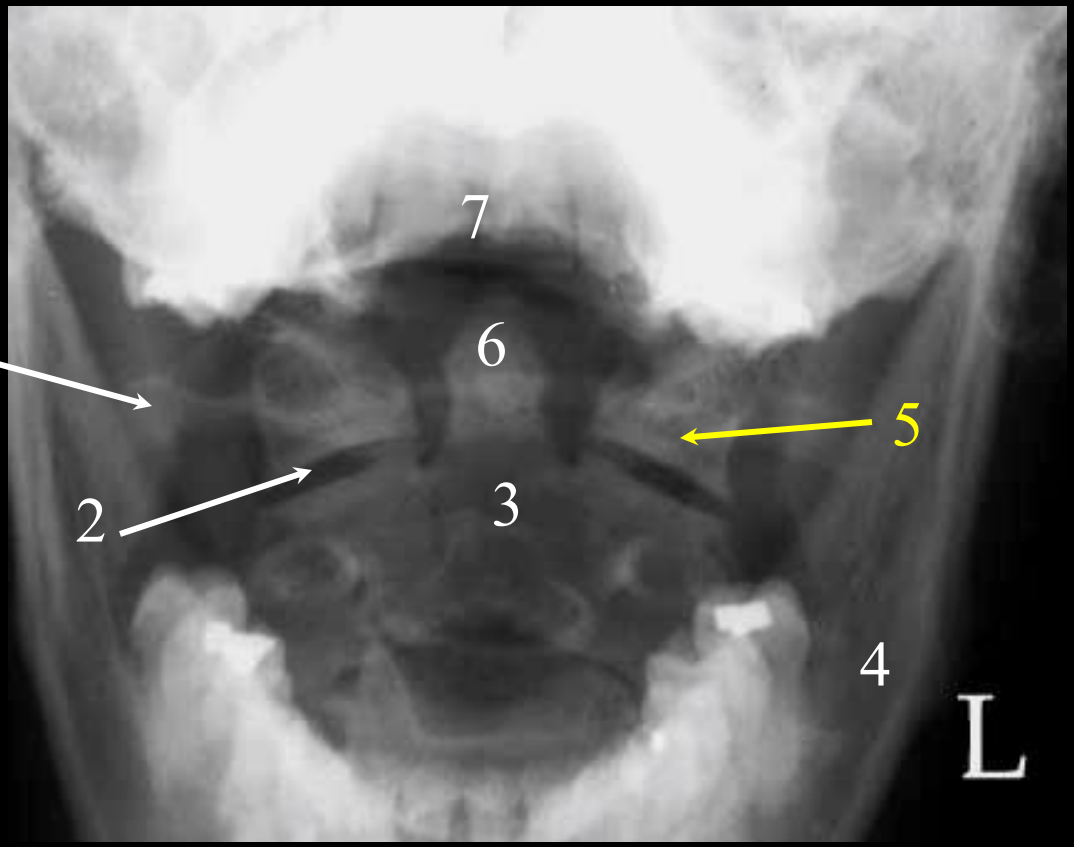
d. zygapophyseal joint.



Question #77: 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



AP "Open Mouth" Cervical Spine

Question #78:

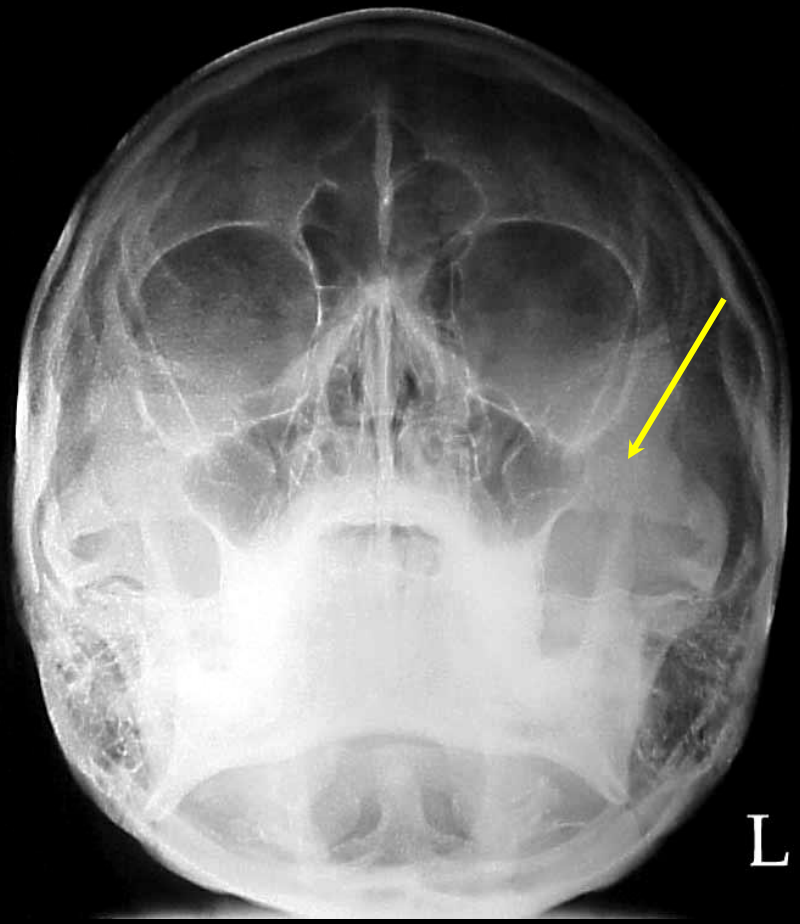
The arrow on this Water's Method is pointing to the _____ bone.

a. zygomatic

b. temporal

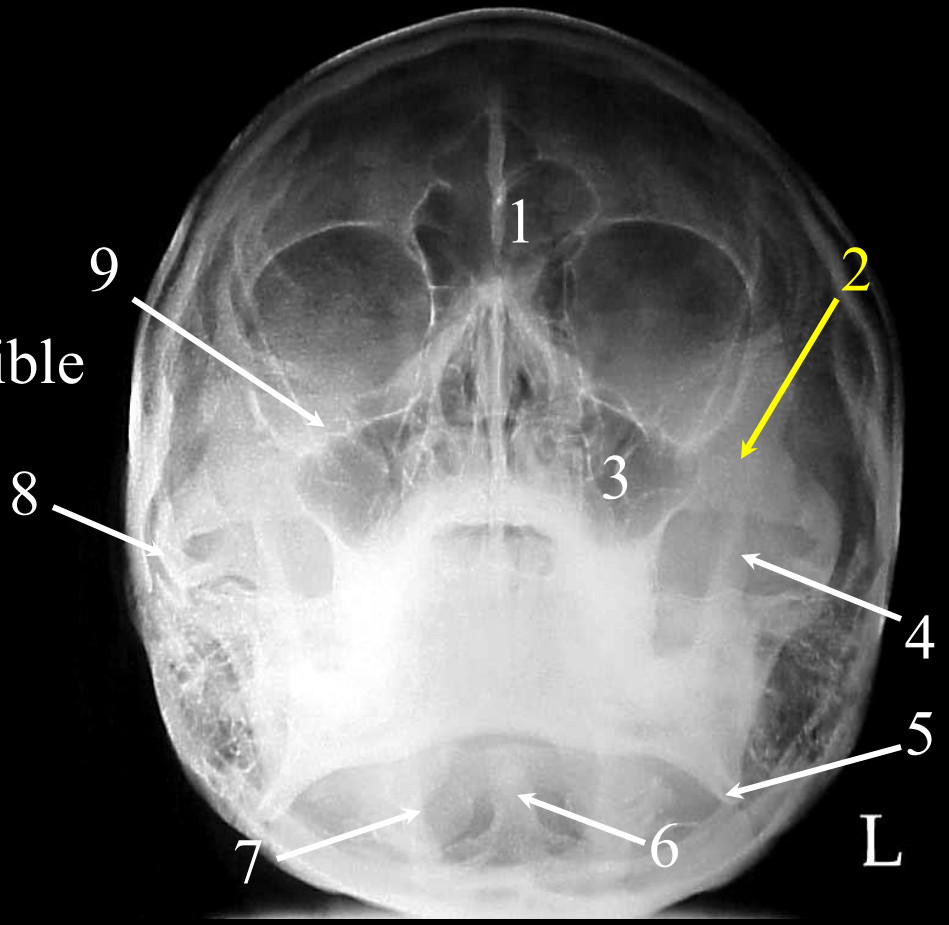
c. maxillary

d. ethmoid



Question #78: 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

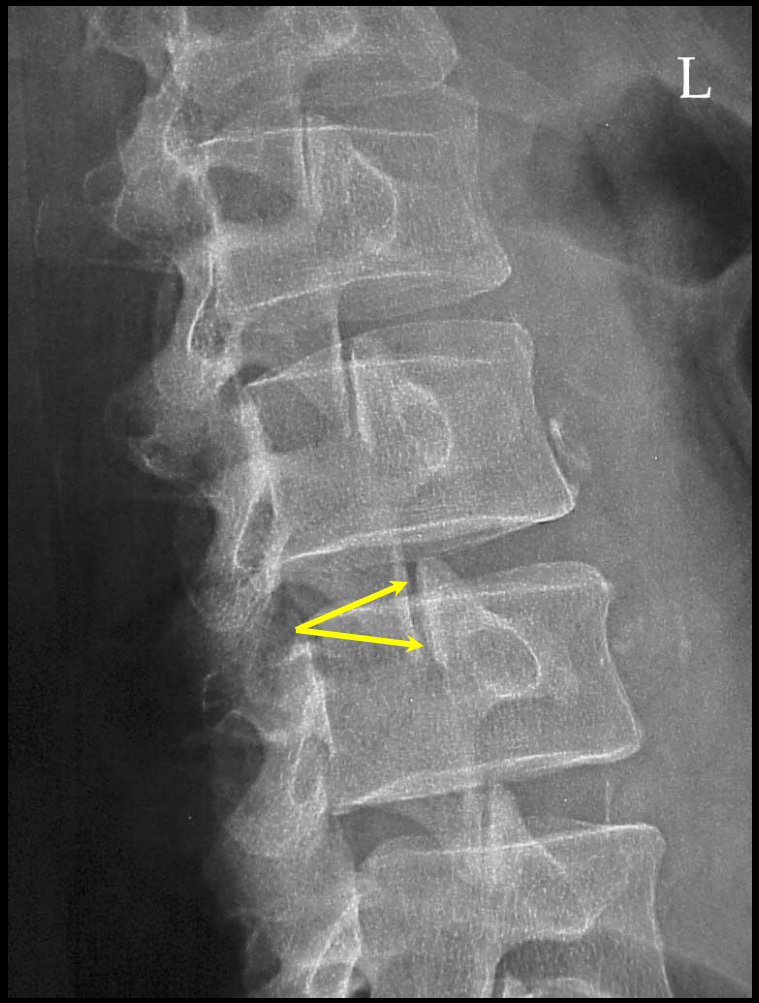


Water's Facial Bones & Sinuses

Question #79:

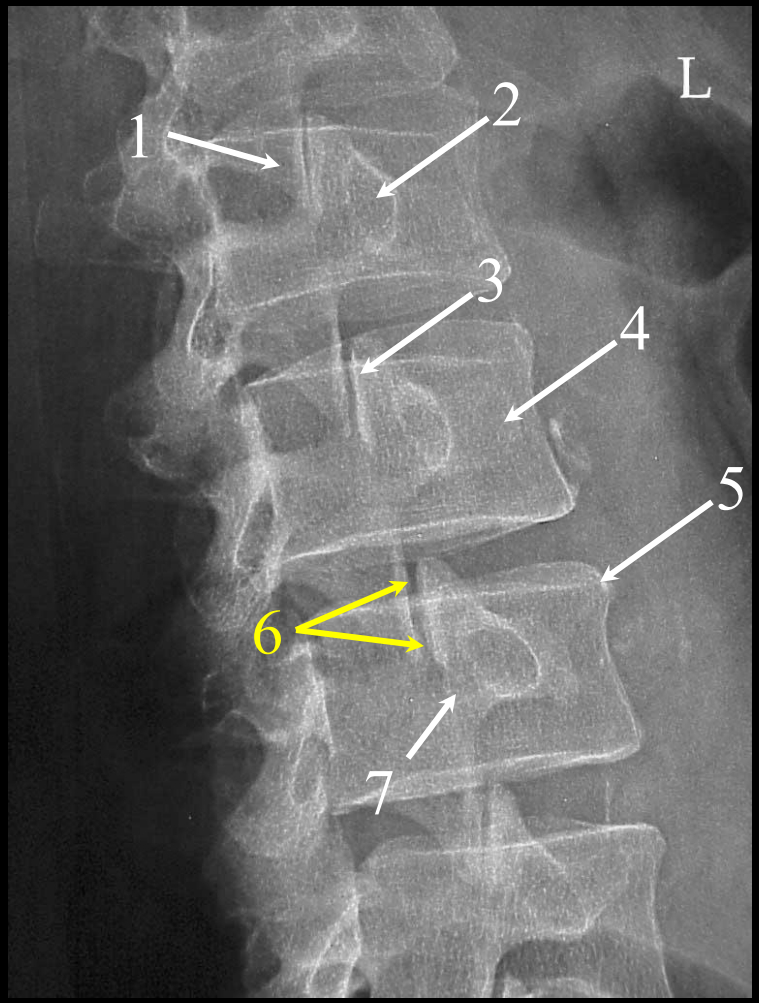
The arrows on this magnified oblique L-spine are pointing to the:

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



Question #79: 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



LPO Lumbar Spine: Magnified

Question #80:

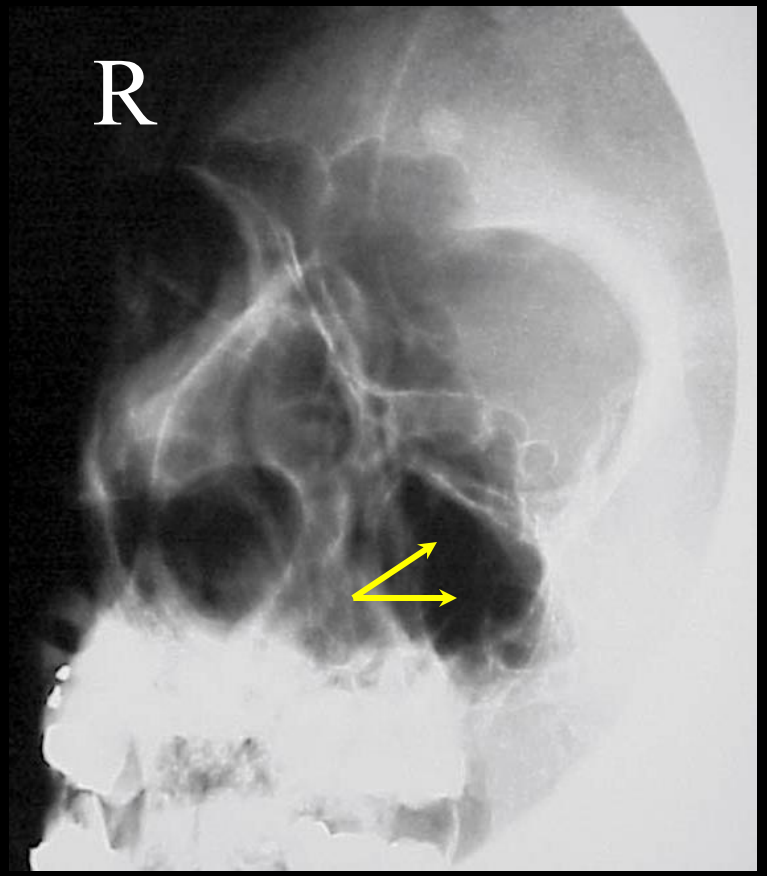
The arrows on this radiograph are pointing to the _____ sinus.

a. maxillary

b. ethmoid

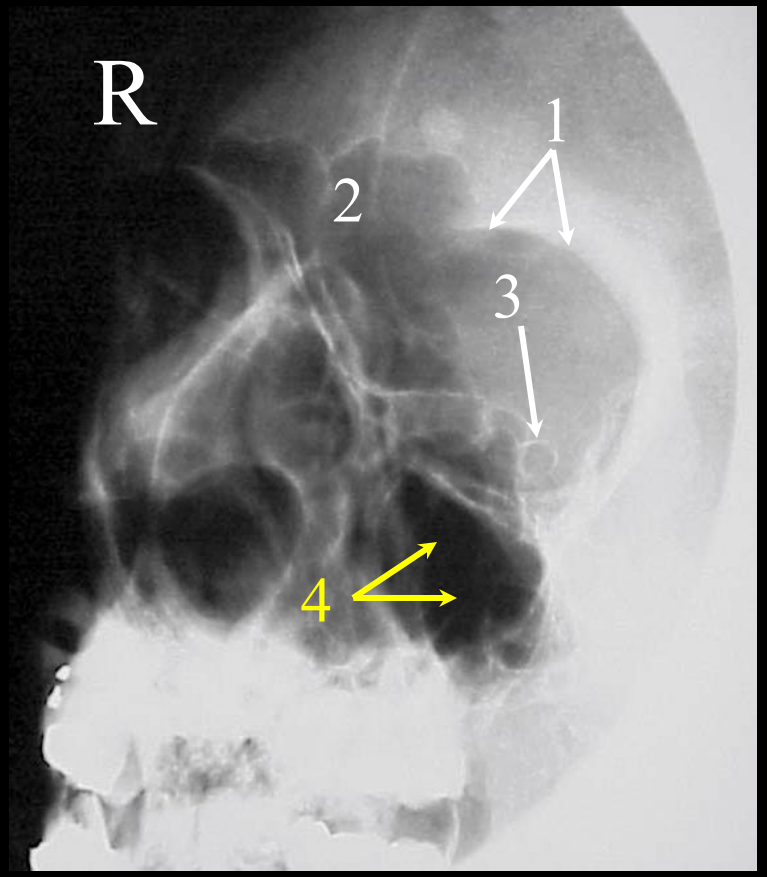
c. sphenoid

d. frontal sinus



Question #80: Review

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



Rhese Method

Question #81:

The arrow on this magnified oblique C-spine is pointing to the:

a. lamina.

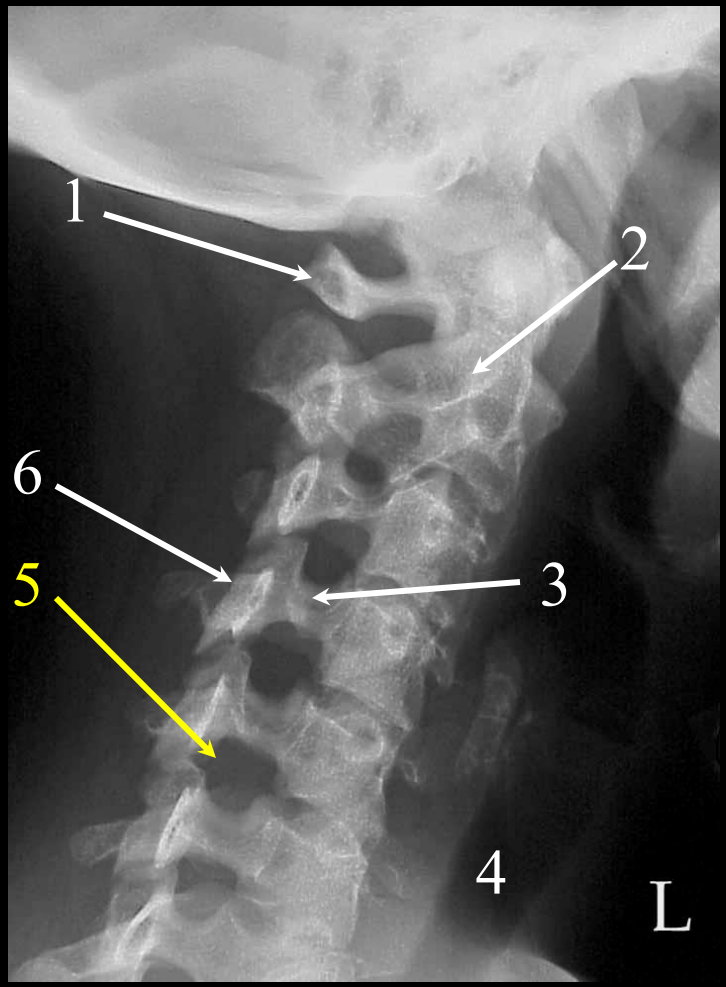
b. spinous process.

c. superior articulating process.

d. intervertebral foramen.

Question #81: 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



LPO Cervical Spine: Magnified

Question #82:

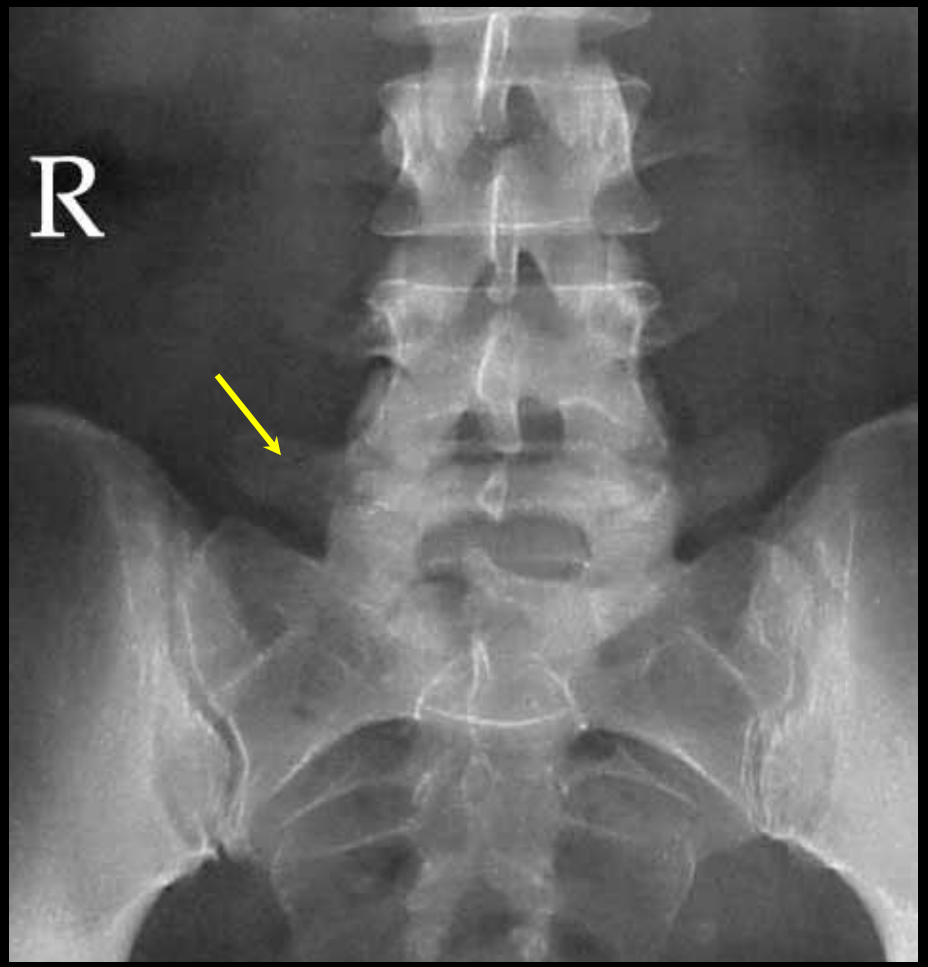
The arrow on this magnified AP L-spine is pointing to the:

a. superior articulating process.

b. spinous process.

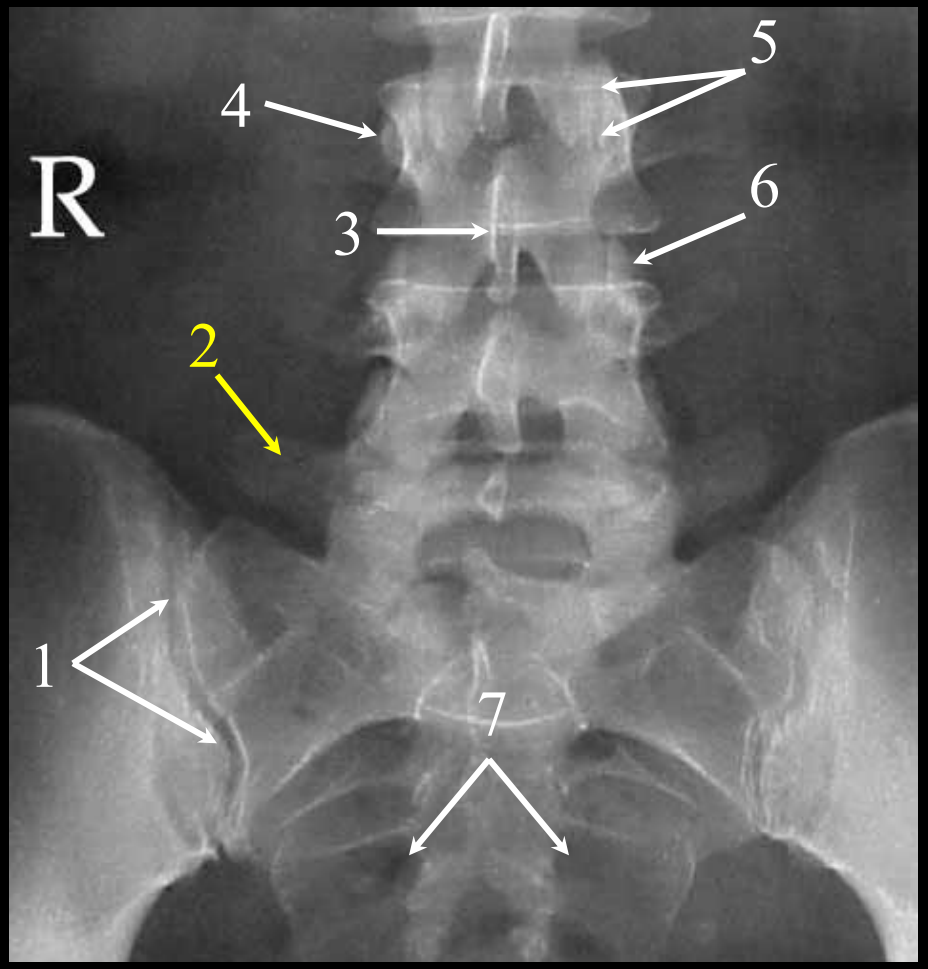
c. zygapophyseal joint.

d. None of the Above



Question #82: 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 Articulating Process of L4
7. Anterior Sacral Foramen



AP Lumbar Spine: Magnified

Question #83:

The arrow on this lateral C-spine is pointing to the:

a. spinous process.

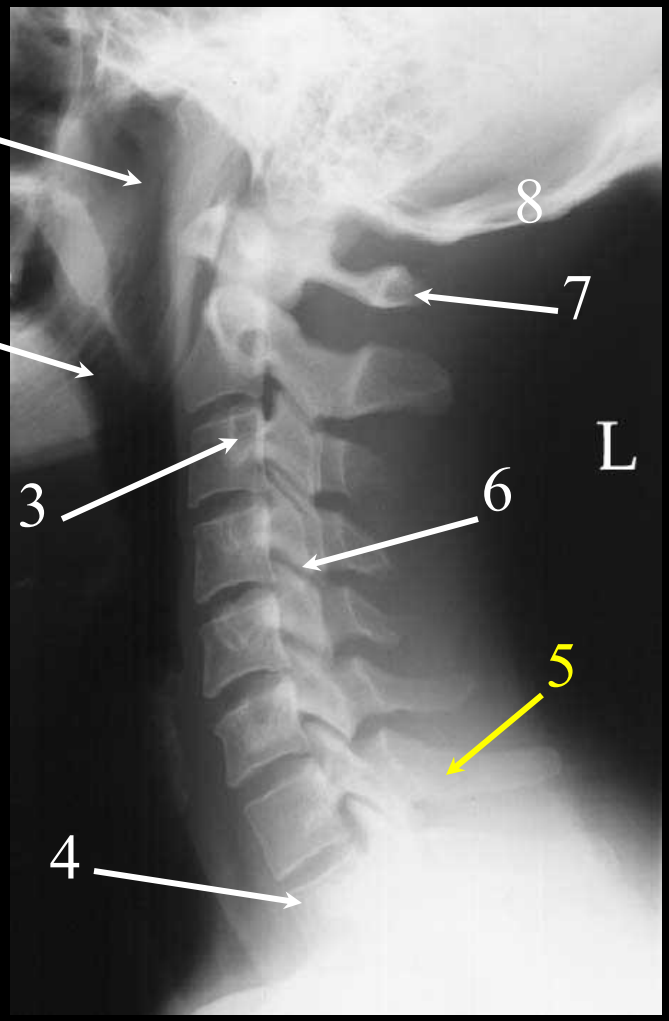
b. vertebra prominens.

c. both “a” and “b”

d. neither “a” nor “b”

Question #83: 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



Lateral Cervical Spine

Question #84:

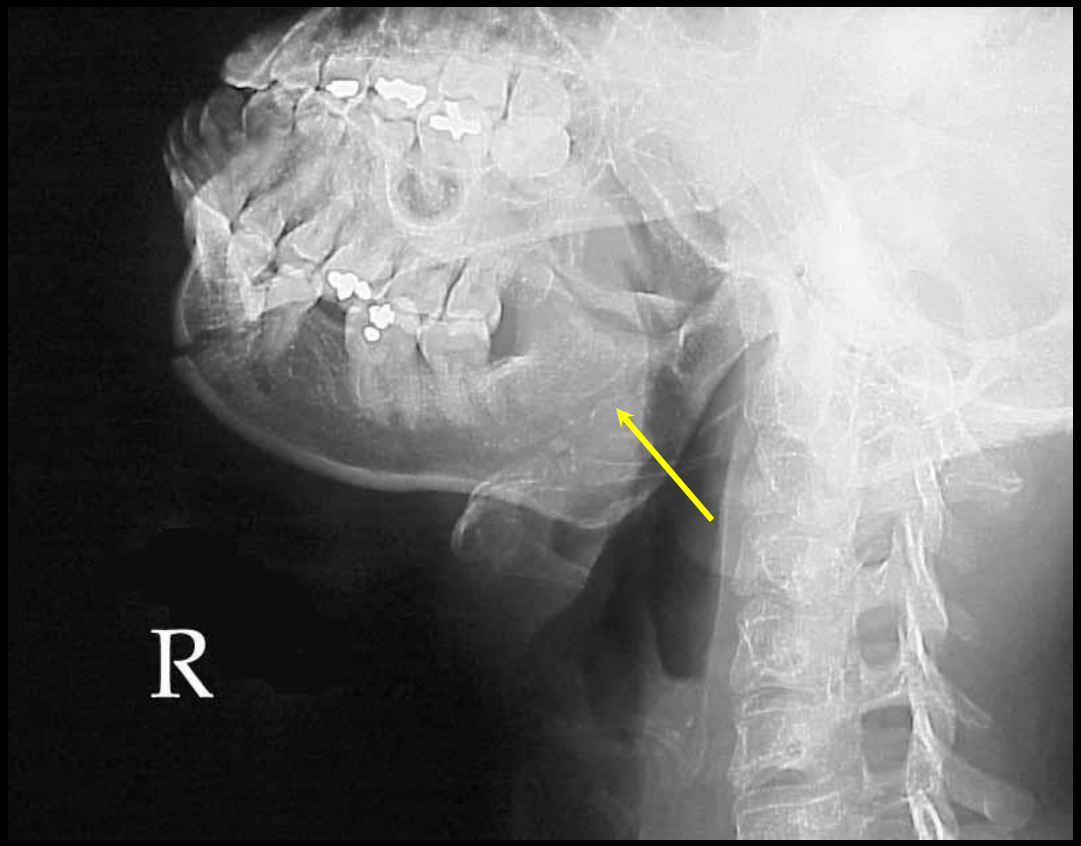
The arrow on this axiolateral oblique of the mandible is pointing to the:

a. ramus.

b. mentum.

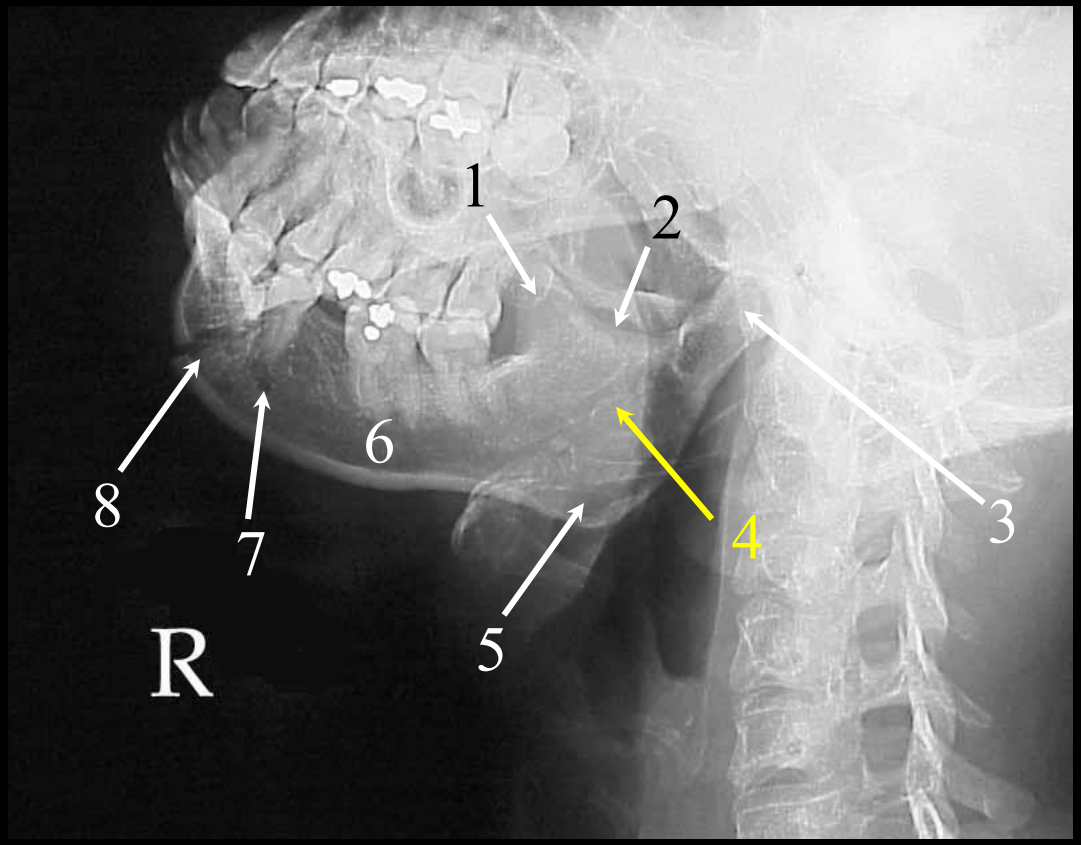
c. angle of the mandible.

d. none of the above



Question #84: Review

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



RPO Axiolateral Oblique Mandible

Question #85:

This Open Mouth Odontoid is properly positioned.

a. true

b. false

Question #85: 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.

Poorly Positioned Open Mouth Odontoid

Question #86:

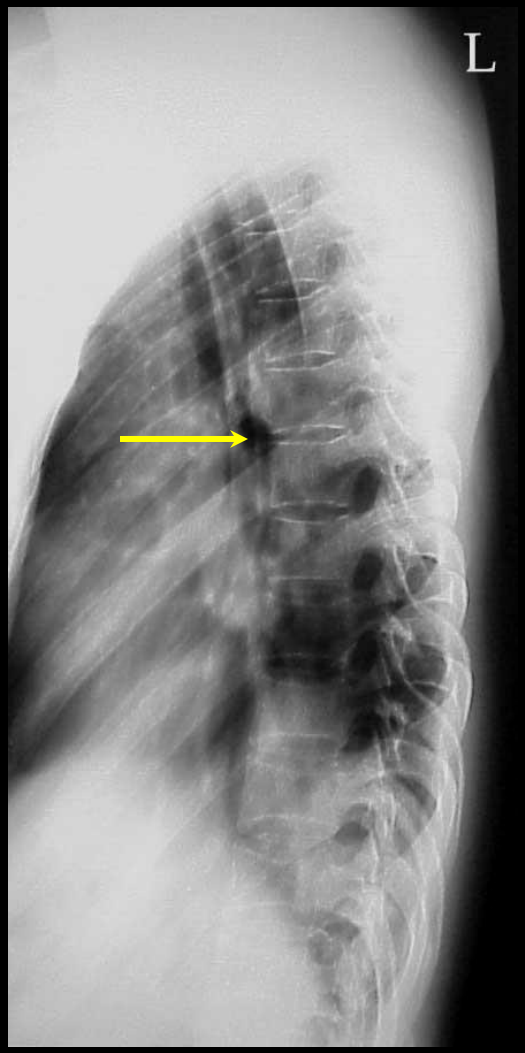
The arrow on this lateral position of the thoracic spine is pointing to the:

a. scapula.

b. intervertebral foramen.

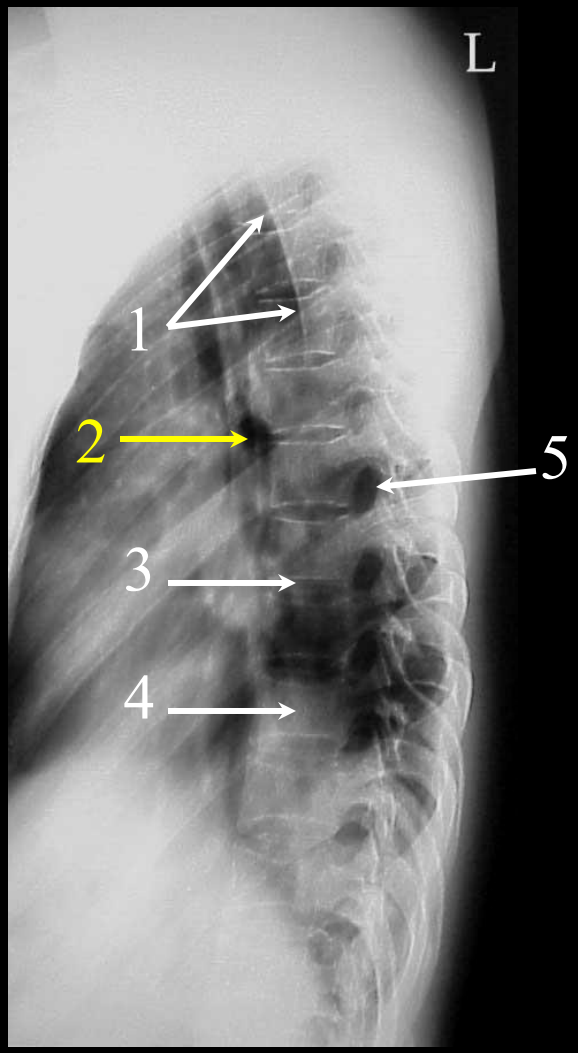
c. pneumothorax.

d. primary bronchus.



Question #86: Review

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



Lateral Thoracic Spine

Question #87:

Which of the following statements is false regarding *inorganic compounds*?

a. Salts, acids and bases are considered inorganic compounds.
b. All inorganic compounds contain carbon.
c. Approximately 80% of the body's mass consists of water.
d. Water is the most abundant inorganic compound found in the human body.

Question #87: Review

- The following describes inorganic compounds which are one of the two major categories of molecules found in the human body:

  Inorganic compounds do not contain carbon, and they are essential in order to maintain homeostasis within the body.

  -Homeostasis refers to the body's ability to maintain a relatively constant state of well-being.

  Water (H_20) is the most abundant inorganic compound and molecule, for that matter, found in the body.

  Approximately 80% of the body's mass consists of water.

  Other inorganic compounds found within cells and in the body include salts (electrolytes), acids and bases.

Question #88:

According to the National Council on Radiation Protection and Measurement (NCRP), what is the annual dose limit (DL) in rem for an occupationally exposed individuals that is pregnant?

a. 0.5
b. 1.0
c. 5.0
d. 50

Question #88: Review

- The following is a list of dose limits set by the NCRP for occupationally exposed individuals:

  Entire Body: 5 rem /year

  Lens of the Eye: 15 rem/year

  All other individual organs (liver, hands, skin etc.) of the body:

  50 rem/year

- The maximum occupational lifetime dose is determined by multiplying your age in years by 1 rem.

  For example, a 30-year-old radiographer is allowed to have a total lifetime dose of no more than 30 rem (30 years old x 1 rem).

- Pregnant radiographers must keep their dose limits below the following levels:

  0.05 rem/ month

  0.5 rem/year

Question #89:

Which of the following conventional units is used to describe the dose that a radiographer would receive on a dosimetry report?

a. roentgen
b. Curie
c. rem
d. rad

Question #89: Review

- The following is a list of conventional units that are used to describe ionizing radiation and particles.

  The roentgen (R) is used to describe a quantity of radiation intensity in air.

  -The roentgen is used to measure a quantity of ionizations that occur in a volume of dry air after exposure to either x-rays or gamma rays.

  -X-ray tube output is measured in mR (1R = 1000 mR)

  The rad is the unit of absorbed dose.

  -It is defined as 100 ergs of energy being absorbed by 1 gram of absorbing material.

  -The rad is the unit used most often to describe radiation exposure to the patient.

  The unit used to describe a quantity of radioactive material is the Curie.

  The unit for dose equivalence is the rem and it is the unit employed on dosimetry reports.

Question #90:

Which of the following concepts is used to estimate the impact of low-level exposure to ionizing radiation on the entire population?

a. ALARA
b. GSD
c. risk vs. benefit concept
d. 10-day rule

Question #90: Review

- The following is a list of concepts that are meant to help reduce the exposure of the general population to diagnostic levels of ionizing radiation:

  The genetically significant dose (GSD) is a figure that is used to estimate the impact of low-level exposure to ionizing radiation on the entire population.

  -The GSD is estimated at 20 to 30 mrem per person per year.

  The notion of keeping exposures as low as reasonably achievable (ALARA) is endorsed by the NCRP as a strategy to reduce the total GSD.

  -Radiographers achieve the concept of ALARA by using technical factors, positioning methods, and shield techniques based on sound educational methodologies.

  The Risk vs. Benefit Analysis is another import concept regarding the GSD.

  -For every procedure that is ordered, it must be determined that the benefits of helping to restore the patient back to good health outweigh the risks of exposing a patient to the potentially harmful effects of ionizing radiation.

  The 10-Day Rule states that nonemergency radiographic procedures on women in the child-bearing years (ages 11 to 50) should be performed within the first 10 days following the onset of menstruation.

  -It is unlikely that she would be pregnant during this time period.

Question #91:

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. disease
b. pathology
c. pathogenesis
d. etiology

Question #91: Review

- 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 #92:

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

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

Question #92: Review

- Abscess

  This type of inflammatory reaction causes the injurious agent to become a walled-off ball of pus.

- 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.

Question #93:

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 #93: Review

- 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 #94:

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

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

Question #94: Review

- Aplasia 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 #95:

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

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

Question #95: Review

- A neoplasm 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.

  A malignant neoplasm (cancer), on the other hand, does possess the ability to spread to distant sites in the body.

Question #96:

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

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

Question #96: Review

- Four major cancer categories are as follows:
  1. Carcinoma/Adenocarcinoma
     - This type of cancer will arise from epithelial cells or tissues such as the breast, colon, or pancreas.
  2. Sarcoma
     - Relatively rare but highly malignant.
     - This is cancer of soft tissue or connective tissue such as bone, cartilage, muscle, and fat.
  3. Leukemia
     - This is cancer of the blood and blood forming tissues.
  4. Lymphoma
     - This type of cancer originates in lymphatic tissues and affects the production of lymphocytes (white blood cells).

Question #97:

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

a. virus.
b. parasite.
c. bacteria.
d. cellulitis.

Question #97: 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.

Inflammatory Reaction: Cellulitis

Question #98:

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

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

Question #98: Review

- 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 skin rash, edema, or cyanosis.

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

Question #99:

The understanding that there may be no real underlying cause for a disease is referred to as:

a. idiopathic.
b. etiology.
c. syndrome.
d. pathology.

Question #99: Review

- Syndrome

  This is a group of signs and symptoms that characterize an abnormal disturbance.

- Etiology

  This is the study of the cause and origin of a disease.

- Idiopathic

  This refers to the fact that there may be no real cause for the disease.

  Examples would be hypertension and a spontaneous pneumothorax.

Question #100:

Atrophy refers to a decrease in size of cells within an organ or structure. Which of the following would not be an underlying cause of atrophy?

a. nerve damage
b. increase in physical activity
c. poor nourishment
d. poor circulation

Question #100: Review

- Atrophy is the decrease in size of the cells within an organ or structure.
- The following is a list of some of the common causes of atrophy:
  - Lack of Physical Activity
  - Poor Nourishment
  - Nerve Damage
  - Poor Circulation

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John completed a Master of Education Degree from the University of South Florida in December of 1998, and he has passed the American Registry of Radiologic Technology's Computed Tomography and Magnetic Resonance Imaging certification examinations.

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