CAMRT Radiography Practice Exam (Sample)

Study Guide

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Questions

1. To evaluate bony structures in a CT image, what would increase the dark appearance of the image?

A. Decrease the window width

B. Decrease the window level

C. Increase the window level

D. Increase the window width

2. Protective or reverse isolation is indicated for which of the following conditions?

A. Transplant recipient

B. Burns

C. Leukemia

D. All of the above

3. Lyme disease is a condition caused by bacteria carried by deer ticks. This is an example of transmission of an infection by?

A. Droplet contact

B. Airborne

C. A vector

D. A vehicle

4. What are the folds in the stomach called?

A. Rugae

B. Cilia

C. Microvilli

D. Plicae

5. What sphincter regulates the passage of food into the duodenum?

A. Cardiac sphincter

B. Pyloric sphincter

C. Iliocecal sphincter

D. Anal sphincter

6. Which radiation weighting factor applies to neutrons with energy between 10 - 100 keV?

A. 1

B. 10

C. 2

D. 20

7. Which anatomical landmarks are assessed for an optimal scapular Y view?

A. Coracoid, Acromion, and Inferior angle

B. Coracoid, Acromion angle, and Medial scapular angle

C. Medial scapular angle, Lateral border, and Inferior angle

D. Acromion, Spine of scapula, and Inferior angle

8. What does Entrance Skin Exposure (ESE) primarily measure in diagnostic imaging?

A. The total amount of exposure to X-ray technicians

B. The amount of radiation received by a patient during imaging

C. The radiation dosage applied to imaging equipment

D. The amount of background radiation in a facility

9. To best demonstrate a left axillary 6th rib fracture, how should the patient be positioned?

A. Upright posteroanterior (PA)

B. Upright and 45 degree left posterior oblique (LPO)

C. Prone

D. Supine and 45 degree left posterior oblique (LPO)

10. Which vein is most commonly used for an IVP injection?

A. Femoral vein

B. Internal jugular vein

C. Radial vein

D. Antecubital vein

Answers

1. C
2. D
3. C
4. A
5. B
6. B
7. B
8. B
9. B
10. D

Explanations

1. To evaluate bony structures in a CT image, what would increase the dark appearance of the image?

A. Decrease the window width

B. Decrease the window level

C. Increase the window level

D. Increase the window width

To understand how the adjustment of window levels in a CT image affects the appearance of bony structures, it's important to consider what window level and width mean in the context of CT imaging. The window level controls the center of the range of tissue densities displayed in the image, while the window width determines the range of densities that are included. When you increase the window level, you are shifting the center of the grayscale representation to higher density values. Bony structures, which have a high density and therefore appear lighter on CT images, will become less prominent when the window level is elevated. This shift allows less dense tissues, such as surrounding softer tissues or fat, to be evaluated more clearly, resulting in a relatively darker appearance of bony structures. As the relative contrast between the bony areas and adjacent soft tissues diminishes due to this adjustment, the bones appear darker in the visual output. In contrast, decreasing the window level or width would allow for broader range visualization of lower densities, making bones appear lighter. Hence, increasing the window level effectively enhances the visualization of softer tissue at the potential expense of bony detail, which is perceived as a darker appearance on the image.

2. Protective or reverse isolation is indicated for which of the following conditions?

A. Transplant recipient

B. Burns

C. Leukemia

D. All of the above

Protective or reverse isolation is a critical practice aimed at protecting patients with weakened immune systems from infections. This type of isolation is particularly important for individuals who are highly susceptible to infections due to their medical conditions or treatment. Transplant recipients, for instance, are usually on immunosuppressive therapy to prevent organ rejection. This makes them more vulnerable to infections, hence the need for protective isolation to reduce their exposure to pathogens. Burn patients also require reverse isolation because the integrity of their skin barrier is compromised. The skin plays a significant role in protecting the body from infections, and when this barrier is damaged, patients are at an increased risk for infection. Patients with leukemia, particularly those undergoing treatments that affect bone marrow function, often experience neutropenia (a low level of neutrophils). This condition can leave them defenseless against infections, necessitating reverse isolation measures to further minimize their risk of exposure. Given that all these conditions—transplant recipients, burn patients, and individuals with leukemia—share the commonality of being seriously immunocompromised and thus at higher risk for infection, protective isolation is appropriate for each of them. This understanding justifies why all listed conditions indicate the need for protective or reverse isolation.

3. Lyme disease is a condition caused by bacteria carried by deer ticks. This is an example of transmission of an infection by?

A. Droplet contact

B. Airborne

C. A vector

D. A vehicle

Lyme disease is an infectious disease that is transmitted through the bite of infected deer ticks, which act as vectors. Vectors are organisms that carry and transmit pathogens to other living organisms. In this case, the deer tick carries the bacteria Borrelia burgdorferi, responsible for Lyme disease, and transfers it to humans through its bite. In contrast, droplet contact refers to the transmission of infectious agents via respiratory droplets typically expelled by coughing, sneezing, or talking. Airborne transmission involves pathogens being carried through the air in small particles that can remain suspended for long periods, affecting individuals at a distance from the source. Vehicle transmission refers to the indirect spread of infection through inanimate objects or substances, such as food, water, or medical devices. Thus, the mechanism of transmission of Lyme disease through a deer tick clearly exemplifies transmission by a vector, which is the correct classification in this scenario.

4. What are the folds in the stomach called?

A. Rugae

B. Cilia

C. Microvilli

D. Plicae

The folds in the stomach are known as rugae. These folds are essential for facilitating the expansion of the stomach as it fills with food. Rugae provide a larger surface area for the stomach to accommodate a significant volume of ingested substances, enabling effective mixing and digestion. As the stomach fills, these folds flatten out, allowing for greater capacity without over-distension. The other terms listed refer to different structures in the body. Cilia are hair-like projections on cell surfaces involved in movement or sensation. Microvilli are microscopic cellular membrane protrusions that increase surface area for absorption, primarily found in the intestines. Plicae are permanent folds in the intestinal lining meant to increase the surface area for absorption, but they are not found in the stomach. Understanding these distinctions helps clarify the unique role that rugae play in gastric function.

5. What sphincter regulates the passage of food into the duodenum?

A. Cardiac sphincter

B. Pyloric sphincter

C. Iliocecal sphincter

D. Anal sphincter

The pyloric sphincter plays a crucial role in regulating the passage of food from the stomach into the duodenum, which is the first part of the small intestine. This sphincter is located at the lower end of the stomach and acts as a gatekeeper, controlling the release of chyme (the semi-liquid mixture of food) into the duodenum. By ensuring that the contents of the stomach are adequately processed and mixed with digestive enzymes and acids, the pyloric sphincter helps facilitate the beginning of nutrient absorption while also preventing backflow into the stomach. In contrast, the other options serve completely different functions in the digestive system. The cardiac sphincter, also known as the lower esophageal sphincter, is responsible for preventing the backflow of stomach contents into the esophagus. The iliocecal sphincter regulates the passage of material from the small intestine into the large intestine, while the anal sphincter controls the expulsion of feces from the rectum. Understanding the specific roles of these different sphincters is essential for grasping the overall process of digestion and the directed movement of food through the gastrointestinal tract.

6. Which radiation weighting factor applies to neutrons with energy between 10 - 100 keV?

A. 1

B. 10

C. 2

D. 20

The radiation weighting factor, often referred to in the context of radiation protection, indicates the relative biological effectiveness of different types of radiation. Neutrons are classified according to their energy levels because their potential to cause biological damage varies significantly with energy. For neutrons with energies between 10 and 100 keV, the established radiation weighting factor is 10. This factor has been determined based on numerous studies evaluating the biological impact of neutrons compared to other types of ionizing radiation. In contrast, lower energy neutrons (below 10 keV) might have different weighting factors, and neutrons with higher energies typically have different values as well. Thus, the value of 10 specifically applies to neutrons in the 10 - 100 keV range, reflecting their increased potential for causing biological effects relative to other forms of radiation. This factor is critical for calculating dose equivalents in radiation protection, ensuring that dosimetry adequately reflects the health risks associated with exposure to different types of radiation.

7. Which anatomical landmarks are assessed for an optimal scapular Y view?

A. Coracoid, Acromion, and Inferior angle

B. Coracoid, Acromion angle, and Medial scapular angle

C. Medial scapular angle, Lateral border, and Inferior angle

D. Acromion, Spine of scapula, and Inferior angle

The optimal scapular Y view is a radiographic projection used to visualize the shoulder, specifically to assess the scapula and its relationship with the humeral head. The correct choice identifies anatomical landmarks that are crucial for this imaging technique, focusing on the precise positioning of the scapula during the procedure. In this case, the coracoid process, acromion angle, and medial scapular angle are significant landmarks because they help radiologic technologists and radiologists correctly align the patient and the imaging equipment for optimal results. The coracoid process serves as a prominent anatomical reference point that helps in determining the orientation of the scapula. The acromion provides stability and delineates the upper boundary of the scapula, while the medial scapular angle assists in realigning the scapula alongside the thoracic cage for a clear depiction of the joint space and to properly assess any underlying injuries or pathologies. A comprehensive understanding of these landmarks is essential for ensuring proper visualization of the scapula and assessing any related anatomical injuries. This knowledge helps in optimizing imaging techniques and improving diagnostic accuracy, which is fundamental in the radiography practice.

8. What does Entrance Skin Exposure (ESE) primarily measure in diagnostic imaging?

A. The total amount of exposure to X-ray technicians

B. The amount of radiation received by a patient during imaging

C. The radiation dosage applied to imaging equipment

D. The amount of background radiation in a facility

Entrance Skin Exposure (ESE) primarily measures the amount of radiation received by a patient during imaging. This metric is crucial in the field of diagnostic radiology as it provides a quantifiable indication of the radiation dose that the skin, specifically the area that is exposed during an imaging procedure, receives from the X-ray source. Understanding ESE is vital for ensuring patient safety and minimizing radiation exposure while still obtaining high-quality diagnostic images. It helps radiology professionals assess and optimize imaging protocols to balance adequate image quality with the least amount of radiation harm to the patient. The measurement of ESE is particularly important in procedures where high radiation doses are common, as it aids in monitoring patient exposure over time and ensures adherence to safety standards. In this context, while other options mention aspects of radiation exposure, they do not specifically relate to the patient's received dose during imaging procedures. For instance, ESE does not measure the total exposure to technicians, the radiation dosage applied to imaging equipment, or the background radiation in a facility, which are all separate considerations in radiological practices but do not pertain directly to patient exposure as does ESE.

9. To best demonstrate a left axillary 6th rib fracture, how should the patient be positioned?

A. Upright posteroanterior (PA)

B. Upright and 45 degree left posterior oblique (LPO)

C. Prone

D. Supine and 45 degree left posterior oblique (LPO)

To effectively visualize a left axillary 6th rib fracture, positioning the patient upright and at a 45-degree left posterior oblique (LPO) is optimal. This positioning allows for the ribs on the left side, particularly the 6th rib, to be projected more prominently over the imaging receptor. When the patient is positioned in an LPO, the left side of the rib cage is angled away from the receptor, while the right side of the body is positioned towards it. This angle increases the contrast between the rib shadow and surrounding tissues, making fractures more discernible. Additionally, being upright helps to eliminate rib compression that may occur in a supine position, thereby providing a clearer image for fracture assessment. In terms of imaging technique, this positioning facilitates a better view of the axillary region, where the fracture would typically be located, as it allows for the ribs to be imaged without overlapping structures obscuring the view. Other positions, such as prone or supine, may hinder visibility of the rib fracture due to overlapping structures or may not provide the necessary angles for optimal rib visualization. Therefore, the use of an upright and 45-degree left posterior oblique position maximizes the potential for accurately diagnosing a left axillary rib fracture

10. Which vein is most commonly used for an IVP injection?

A. Femoral vein

B. Internal jugular vein

C. Radial vein

D. Antecubital vein

The antecubital vein is the most commonly used site for intravenous pyelogram (IVP) injections due to its anatomical location and accessibility. This vein, located in the crease of the elbow, is typically larger and more superficial than other veins, making it easier to puncture for the purpose of inserting an intravenous catheter. Additionally, the antecubital vein offers a straight path for the contrast material, which is crucial for imaging clarity during the IVP procedure. The ease of obtaining venous access in this region is a significant factor, especially in emergency or routine imaging settings. Its prominence and stability make it a preferred choice for radiologic procedures requiring intravenous contrast administration.