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# Medical Technology

## Sonography

### Sonography Certification Exam



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## Question: 1

Which statement best defines the ALARA principle?

- A. The principle states that the lowest reasonable energy should be used to produce the clearest image.
- B. The principle states that the highest reasonable energy should be used to produce the clearest image.
- C. The principle states the level of energy is not included in when deciding what technique to use to get a clear image.
- D. The principle states that the lowest reasonable energy' should be used with minimal exposure for obtaining the clearest image.

**Answer: D**

Explanation:

The as low as reasonably achievable (ALARA) principle stresses the use of the lowest reasonable energy' when obtaining the clearest image and minimal exposure to the patient. The principle also stresses that the FDA regulates the ultrasound instruments used because of the bio effects of ultrasound and the effects on patient safety. Choices a, b, and c are not correct.

## Question: 2

What is the lowest intensity value of ultrasound imaging?

- A. SATA
- B. SPPA
- C. SATP
- D. SPTP

**Answer: A**

Explanation:

SATA is the spatial average-temporal average of a sound beam and is the lowest level of intensity. SPPA refers to spatial peak-pulse average and is measured during the time of the pulse. SATP refers to spatial average-temporal peak and is the average intensity of a beam at the highest point. SPTP is spatial peak-temporal peak and is the peak intensity of the beam in both space and time, being the highest intensity measurement for a sound beam.

## Question: 3

What aspects of patient care and safety should be of concern to the ultrasound technologist?

- A. Identify the patient by name and offer privacy
- B. Address the patient by name, explain the procedure, and offer privacy
- C. Address the patient by name, explain the procedure clearly, offer privacy, select proper equipment and follow the ALARA principles
- D. Explain the procedure, offer privacy, and minimize conversation

**Answer: C**

Explanation:

It is important to identify the patient by name, explain the procedure clearly, protect privacy, select the proper equipment, and follow the ALAR-A principles for safety. The other choices are only partially correct.

#### **Question: 4**

What physical abnormalities or illnesses may distort the results of an ultrasound of the gallbladder and may alter the interpretation of the images?

- A. The patient's history of chemotherapy, AIDS, a recent meal, or hepatitis
- B. Gallbladder stones
- C. An empty stomach
- D. Ascites

**Answer: A**

Explanation:

A history of chemotherapy, ascites, hepatitis, AIDS, or a recent meal may alter the interpretation of the gallbladder ultrasound. The other choices are only partially correct or incorrect.

#### **Question: 5**

The ultrasound for an abscess can be difficult to image due to which of these pitfalls?

- A. A full stomach
- B. A full bladder
- C. An empty stomach
- D. Confusing the bowel with a possible abscess

**Answer: D**

Explanation:

It is a common pitfall to confuse the bowel with a possible abscess. A full stomach or a

completely empty stomach or a full bladder can assist in telling the difference between the bowel and an abscess, and often the patient is asked to drink water to fill the stomach after scanning with an empty stomach. The bladder is often also filled to help to determine the bowel from an abscess or other organs.

## Question: 6

Which statement explains the pitfalls of using ultrasound as a diagnostic tool for scanning the abdomen?

- A. There are no pitfalls. It is the best available test for abdominal pathology.
- B. The right kidney axis is unpredictable and often can shadow or imitate pathology when scanning the abdomen.
- C. Air, fluid, and tissue density will not affect the absorption and scatter in abdominal scans.
- D. The liver is too fatty to be noted on ultrasound.

## Answer: B

Explanation:

The right kidney axis is different in each person and can lead to misinterpretation of imaging of the abdomen. There are other tests that will be done to diagnose abdominal pathology along with the ultrasound, because the ultrasound alone can be inconclusive. Air, fluid, and tissue will affect the absorption and scatter of sound beams in the abdomen, making images false or unclear. The liver is not too fatty to be noted on an ultrasound exam.

## Question: 7

Pertinent information that must be obtained prior to performing a fine needle aspiration of the thyroid includes all of the following except:

- A. reviewing prior imaging and reports.
- B. a signed and dated script for an FNA of the thyroid.
- C. a signed consent form.
- D. a prepared sterile tray.

## Answer: D

Explanation:

Though a prepared sterile tray is necessary for a fine needle aspiration of the thyroid, it is not pertinent information. Reviewing prior images and reports, a script from the referring physician, and a signed consent form are all pertinent information that must be obtained prior to an invasive procedure such as an ultrasound-guided FNA of the thyroid.

## Question: 8

The testicles are suspended within the scrotum by the:

- A. vas deferens.
- B. epididymis.
- C. seminiferous tubules.
- D. spermatic cord.

**Answer: A**

**Explanation:**

The spermatic cord suspends the testicles in the scrotum. The vas deferens transports sperm to the urethra. The epididymis stores and excretes sperm. The seminiferous tubules produce sperm.

### **Question: 9**

The least invasive type of thyroid biopsy that may be performed on a solitary thyroid nodule is a(n):

- A. fine needle aspiration.
- B. complete thyroidectomy.
- C. core biopsy.
- D. excisional biopsy.

**Answer: A**

**Explanation:**

A fine needle aspiration (FNA) of the thyroid gland is a minimally-invasive procedure that involves the use of a very thin needle, usually an 18 to 25-gauge needle. The needle is guided directly into the nodule under ultrasound and is moved around within the nodule to shear off as many cells as possible. An FNA is the least invasive of the procedures listed, but warrants the poorest results. An excisional biopsy or a complete thyroidectomy are more invasive but allow the pathologist to examine the tissue makeup, which increases the chance of a definite diagnosis. A core biopsy also provides the pathologist with a larger sample of tissue. An FNA provides the pathologist with cells examined under cytology, whereas the other choices provide the pathologist with tissue samples examined under histology and increase the chance of diagnosis.

### **Question: 10**

A 16-year-old male presents to the emergency department with left-sided scrotal pain, nausea, and vomiting for the past several hours. He denies any recent trauma to his genitals. During sonographic evaluation, an enlarged left testicle with decreased echogenicity was documented. After further evaluation with color and spectral Doppler, intratesticular vasculature was noted to be absent. The patient most likely presents with:

- A. orchitis.
- B. torsion.
- C. an abscess.

D. a hematocoele.

**Answer: B**

**Explanation:**

Torsion occurs when the spermatic cord becomes twisted, cutting off blood supply to the testicle. It occurs more commonly in adolescents than in adults and more often in the left testicle. The patient may present with scrotal pain, nausea, and vomiting. Sonographically, the testicle may appear enlarged with decreased echogenicity, a hydrocele may be present, and interrogation of the intratesticular vasculature may be absent with color and power Doppler evaluation. Torsion is considered a medical emergency and must be treated immediately to prevent complete infarction of the testicle. Orchitis is inflammation of the testes and presents as scrotal pain. Sonographically, orchitis may have a variable appearance ranging from hypoechoic with hyperemic vasculature under color and spectral Doppler evaluation to atrophic testes. Abscess may occur due to untreated orchitis. The patient may present with scrotal pain and swelling. An avascular, sonolucent, or complex mass may be seen on the sonogram. A hematocoele most often occurs after trauma and causes blood to accumulate within the scrotum. It often mimics torsion and varies in sonographic appearances from sonolucent to complex with septations.

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