Section X – General Competency

197. What is the annual permissible effective dose equivalent for a radiation worker in the United States?
   A. 1 mSv (0.1 rem)
   B. 5 mSv (0.5 rem)
   C. 10 mSv (1 rem)
   D. 50 mSv (5 rem)

Rationale:
A. According to NCRP report 116, 1 mSv is the annual effective dose limit for general population, which indicates the amount of shielding required for x-ray facilities
B. Incorrect.
C. Incorrect.
D. According to NCRP report 116, the annual effective dose equivalent limit for radiation worker is 50 mSv.

198. In a patient with acute chest pain and suspected pulmonary embolism, the MOST appropriate initial imaging test is a:
   A. chest radiograph.
   B. CT pulmonary angiogram.
   C. lower extremity Doppler ultrasound.
   D. V/Q scan.

Rationale:
A: The chest radiograph is to exclude other causes of acute chest pain. It is also the cheapest study with a minimal relative radiation level.
B: CT pulmonary angiogram is the standard of care for detection of PE but should be performed after a chest radiograph.
C: US lower extremity with Doppler can be performed if chest x-ray is negative and index of suspicion is high but does not address the direct question about PE.
D: Te99m V/Q study is indicated if the chest x-ray is negative and CTPA is contraindicated or nondiagnostic.
199. In a patient with clinically suspected avascular necrosis of the hip, the initial imaging study should be:

A. MRI of the hip.
B. cross-table radiographs of the hips.
C. a nuclear medicine bone scan.
D. an anteroposterior (AP) radiograph of the pelvis.

**Rationale:**
A: This would not be the appropriate initial exam.
B: This would not be the appropriate first exam.
C: This would not be the appropriate initial exam.
D: MRI of the hip (answer A) is the most sensitive method for detection of AVN, but not indicated before radiographs, in part due to expense. Cross-table lateral radiograph of the hips (answer B) have poor detail due to overlapping soft tissues, which limits usefulness. Nuclear medicine bone scan (answer C) is a sensitive method for detection of AVN, but not indicated before radiographs. AP radiograph of the pelvis (answer D) is essential for initial evaluation in patients at risk for AVN who present with hip pain. It also has a low relative radiation level.

200. According to the Accreditation Council for Graduate Medical Education (ACGME), incorporating considerations of cost awareness in patient care is part of which competency?

A. Systems-based practice
B. Professionalism
C. Interpersonal and communication skills
D. Practice-based learning and improvement
E. Medical knowledge

**Rationale:**
A: According to the Accreditation Council for Graduate Medical Education (ACGME), incorporating considerations of cost awareness in patient care is part of systems-based practice.
B: Incorrect.
C: Incorrect.
D: Incorrect.
E: Incorrect.
201. Concerning the Accreditation Council of Graduate Medical Education (ACGME) toolbox for assessment of the General Competencies, which of the following terms describes how well assessment measures represent or predict a resident’s ability?

A. Reliability
B. Generalizability
C. Validity
D. Formative evaluation
E. Summative evaluation

**Rationale:**
A: Incorrect.
B: Incorrect.
C: According to the ACGME's assessment toolbox, validity describes "how well assessment measures represent or predict a resident's ability."
D: Incorrect.
E: Incorrect.

202. Concerning HIPAA, which of the following requires written authorization prior to disclosure of Protected Health Information (PHI)?

A. Treatment, payment, and healthcare operations
B. Marketing or fund-raising activities
C. Cadaveric organ, eye, or tissue donation
D. Specific research activity with IRB waiver

**Rationale:**
A: Permitted uses and disclosures of PHI include disclosure to related treatment, payment, and healthcare operations activities.
B: Patient permission or authorization is required to disclose or use PHI for certain marketing or fund-raising activities.
C: PHI may be disclosed without authorization to facilitate donation and transplantation of cadaveric organs, eyes and tissue.
D: PHI may be disclosed without authorization for certain research activities if the IRB has granted a waiver.

203. A study yields a receiver operator characteristic (ROC) curve that is a straight line from the origin (TPF=FPF=0) to the upper right corner (TPF=FPF=1). Which of the following statements BEST describes the study results?

A. The area under the ROC curve (Az) is equal to 1.
B. The ROC curve describes a perfect imaging modality.
C. The ROC curve indicates that the imaging modality performance is poor.
D. The threshold criteria were selected too high.

**Rationale:**
A: The area for this situation is 0.5
B: A perfect ROC curve would be near the upper left
C: This curve shape describes random guessing by observers
D: Threshold criteria vary to create the ROC curve.
Concerning patient care, the American College of Radiology practice guidelines and standards for imaging of pregnant or potentially pregnant adolescents and women with ionizing radiation state that:

A. the majority of routine diagnostic studies deliver more than 20 mGy to the uterus.
B. a screening policy must be developed that will guarantee 100% detection of pregnancy.
C. informed consent for imaging with ionizing radiation should be obtained from patients known to be pregnant.
D. a negative pregnancy test allows the technologist to forgo standard screening procedures for pregnancy.

Rationale:
A: The American College of Radiology practice guidelines and standards for imaging of pregnant or potentially pregnant adolescents and women with ionizing radiation states: “The vast majority of routine diagnostic studies deliver less than 20 mGy to the uterus, and single-phase acquisition computed tomography (CT) of the abdomen including pelvis usually delivers less than 35.”
B: The American College of Radiology practice guidelines and standards for imaging of pregnant or potentially pregnant adolescents and women with ionizing radiation states: “The purpose of screening patients for the possibility of pregnancy is to reasonably minimize the number of unexpected exposures of pregnant patients who have entered a potentially vulnerable stage of gestation. In developing a screening policy it must be realized that no screening policy will guarantee 100% detection.”
C: The American College of Radiology practice guidelines and standards for imaging of pregnant or potentially pregnant adolescents and women with ionizing radiation states: “For an imaging examination using ionizing radiation, obtaining consent from a patient known to be pregnant is an essential component of providing comprehensive medical care. This process requires: 1) a realistic overview of the limited risk to the patient and her developing child from the examination, and 2) the beneficial role of this imaging procedure in maternal or fetal health evaluation. Whether particular institutions use written consent forms or verbal consent, this interaction must be documented in the patient’s medical record and in compliance with state law. The written consent form must be retained in the medical record. The verbal consent should be documented within the radiology information system.”
D: The American College of Radiology practice guidelines and standards for imaging of pregnant or potentially pregnant adolescents and women with ionizing radiation states: If the results of a pregnancy test are available, the information should be used with discretion. A negative pregnancy test should not be used by technologists as a reason to forgo standard screening procedures for pregnancy. If a patient does not pass standard verbal or written screening queries about menstrual history or potential for pregnancy, the radiologist should be notified and the date and results of the negative pregnancy test should be included in the notification.”
205. In a young or middle-aged patient (< 65 years of age) with a suspected rib fracture, the MOST appropriate initial imaging test is:

A. ultrasound of the chest.
B. CT of the chest with or without contrast.
C. radiographs of the ribs (rib views).
D. radiograph of the chest (PA view).

**Rationale:**
A: Not the most appropriate initial examination.
B: Not the most appropriate initial examination.
C: Not the most appropriate initial examination.
D: In a young or middle aged patient (<65 years of age) with suspected rib fracture, the most appropriate initial imaging test is a radiograph of the chest (PA view) (answer D). This is performed to exclude pneumothorax and possibly identify a rib fracture. There is no indication to perform an ultrasound of the chest (answer A), CT of the chest with or without contrast (answer B) or radiograph of the ribs (rib views) (answer C). Radiograph of the ribs (rib views) alone may miss a pneumothorax. The addition of radiographs of the ribs (rib views) after a radiograph of the chest does not generally change management.

206. The legal basis for an action filed against any person who submits a claim to the federal government (Medicare) that he or she knows, or should know, is incorrect is called the:

A. Deficit Reduction Act.
B. Whistleblower Reward Act.
C. False Claims Act.
D. Stark II law.

**Rationale:**
A: The Deficit Reduction Act does not address false claims.
B: This act provides a safe haven for those identifying false claims against Medicare (CMS), but does not address the penalties for those who file false claims.
C: The False Claims Act does address the filing of false claims.
D: The Stark II law does not address the filing of false claims.
207. Concerning ethics, the American College of Radiology Code of Ethics states that:

A. **members should at all times be aware of their limitations and be willing to seek consultations in clinical situations where appropriate.**

B. a physician who has not personally interpreted the images obtained in a radiological examination should not under any circumstance sign a report or take attribution of an interpretation of that examination rendered by another physician.

C. members should appropriately disclose their limitations to referring physicians, but not to patients.

D. members should report perceived illegal or unethical conduct of other members only to the Ethics Committee of the American College of Radiology.

**Rationale:**

A: The American College of Radiology Code of Ethics states, “Members should at all times be aware of their limitations and be willing to seek consultations in clinical situations where appropriate.”

B: The American College of Radiology Code of Ethics does not state that physicians not personally interpreting images should not sign a report of another physician under any circumstances. It states, “A physician who has not personally interpreted the images obtained in a radiological examination should not sign a report or take attribution of an interpretation of that examination rendered by another physician in a manner that causes the reader of a report to believe that the signing radiologist was the interpreter.”

C: The American College of Radiology Code of Ethics states, “Members should at all times be aware of their limitations and be willing to seek consultations in clinical situations where appropriate. These limitations should be appropriately disclosed to patients and referring physicians.”

D: The American College of Radiology Code of Ethics states, “The medical profession should safeguard the public and itself against physicians deficient in moral character or professional competence by reporting, to the appropriate body, without hesitation, perceived illegal or unethical conduct of members of the medical profession.” Perceived illegal or unethical conduct of any member of the medical profession must be reported to the appropriate governing body.

208. In a postmenopausal patient with vaginal bleeding, the MOST appropriate initial imaging test is:

A. MRI of the pelvis with contrast.

B. CT of the pelvis with contrast.

C. ultrasound hysterosonogram.

D. **ultrasound pelvis transabdominal and/or pelvis transvaginal.**

**Rationale:**

A: Not the most appropriate initial imaging examination.

B: Not the most appropriate initial imaging examination.

C: Not the most appropriate initial imaging examination.

D: In a postmenopausal patient with vaginal bleeding, the initial imaging study should be ultrasound pelvis transabdominal and/or pelvis transvaginal (answer D). MRI of the pelvis with contrast (answer A), CT of the pelvis with contrast (answer B), and ultrasound hysterosonogram (answer C) are not first-line investigations.
209. According to the Accreditation Council for Graduate Medical Education (ACGME), use of information technology to improve learning is part of which competency?

A. Systems-based practice  
B. Professionalism  
C. Interpersonal and communication skills  
D. Practice-based learning and improvement  
E. Medical knowledge

Rationale:
A: Incorrect.  
B: Incorrect.  
C: Incorrect.  
D: According to the Accreditation Council for Graduate Medical Education (ACGME), use of information technology to improve learning is part of practice-based learning and improvement.  
E: Incorrect.

210. Concerning patient care, the American College of Radiology practice guideline for performance of screening and diagnostic mammography states that:

A. a diagnostic mammogram should be performed under the direct supervision of a physician qualified in mammography under MQSA.  
B. asymptomatic women who are 40 years of age or older should have annual screening mammograms until 80 years of age.  
C. screening mammography can be performed on a symptomatic woman if she has seen her physician within the last 6 months.  
D. asymptomatic women with breast implants are not candidates for screening mammography and must undergo diagnostic mammography.

Rationale:
A: The American College of Radiology practice guideline for performance of screening and diagnostic mammography states: “Diagnostic mammography is a radiographic examination performed to evaluate patients who have signs and/or symptoms of breast disease, imaging findings of concern or prior imaging findings requiring specific follow-up. Diagnostic mammography requires direct supervision...A diagnostic mammogram should be performed under the direct supervision of a physician qualified in mammography under MQSA.”  
B: The American College of Radiology practice guideline for performance of screening and diagnostic mammography state: “Asymptomatic women 40 years of age or older should have an annual screening mammogram. It is unclear at what age, if any, women cease to benefit from screening mammography. Because this age is likely to vary depending on the individual’s overall health, the decision as to when to stop routine mammography screening should be made on an individual basis by each woman and her physician.”  
C: The American College of Radiology practice guideline for performance of screening and diagnostic mammography state: “Symptomatic women, and women with a previously detected abnormality for whom short interval follow-up or further evaluation has been recommended, are not candidates for screening mammography.”  
D: The American College of Radiology practice guideline for performance of screening and diagnostic mammography state: “Asymptomatic women with breast implants may undergo screening mammography. At the discretion of the facility, asymptomatic women with breast implants may receive a diagnostic mammogram.”
211. The American Medical Association (AMA) developed and maintains CPT Coding. CPT coding is defined as:

   A. **Current Procedural and Terminology codes.**
   B. Critical Policy and Treatment codes.
   C. CT Processing and Trauma codes.
   D. Clinical Patient and Technology codes.

**Rationale:**
A: Correct.
B: Incorrect.
C: Incorrect.
D: Incorrect.

212. Concerning the Accreditation Council of Graduate Medical Education (ACGME) toolbox for assessment of the General Competencies, simulations for the assessment of clinical performance should:

   A. include a narrow array of options in simulating reality.
   B. be restricted to anatomical models or mannequins.
   C. avoid role-playing and other exercises that require imagination.
   D. **permit examinees to make life-threatening errors without harming a real patient.**

**Rationale:**
A: Simulations should include a wide array of options.
B: Simulations need not necessarily involve anatomical models of mannequins.
C: Simulations often involve role-playing.
D: According to the ACGME, a key attribute of simulations is that they allow examinees to make life-threatening errors without harming a real patient.

213. Regarding an institution’s pharmaceutical charge generated from intravenous contrast material used from a single-use vial, which of the following represents the MOST appropriate practice?

   A. An average single amount predetermined by the exam protocol
   B. A multiple of a charge determined by Medicare
   C. Only for the quantity of pharmaceutical utilized
   D. **The entire amount within the pharmaceutical container**

**Rationale:**
A: Incorrect.
B: Incorrect.
C: Incorrect.
D: An institution can charge for waste pharmaceuticals if the material is not useable subsequently and the waste is documented.