Cognitive Domain

1. Spell and define the key terms
2. Explain the theory and function of x-rays and x-ray machines
3. State the principles of radiology
4. Describe routine and contrast media, fluoroscopy, computed tomography, sonography, magnetic resonance imaging, nuclear medicine, and mammographic examinations
5. Explain the role of the medical assistant in radiologic procedures
6. Describe body planes, directional terms, quadrants, and cavities
7. Describe implications for treatment related to pathology
8. Identify critical information required for scheduling patient admissions and/or procedures

Psychomotor Domain

1. Assist with x-ray procedures (Procedure 25-1)
2. Instruct patients according to their needs to promote health maintenance and disease prevention
3. Prepare a patient for procedures and/or treatments
4. Document patient education
5. Schedule patient admissions and/or procedures
6. Perform within scope of practice
7. Apply local, state, and federal health care legislation and regulation appropriate to the medical assisting practice setting

Affective Domain

1. Apply critical thinking skills in performing patient assessment and care
2. Use language/verbal skills that enable a patient's understanding
3. Demonstrate respect for diversity in approaching patients and families
4. Explain the rationale for performance of a procedure to the patient
5. Demonstrate empathy in communicating with patients, family, and staff
6. Apply active listening skills
7. Use appropriate body language and other nonverbal skills in communicating with patients, family, and staff
8. Demonstrate awareness of the territorial boundaries of the person with whom you are communicating
9. Demonstrate sensitivity appropriate to the message being delivered
10. Demonstrate recognition of the patient's level of understanding communications
11. Recognize and protect personal boundaries in communicating with others
12. Demonstrate respect for individual diversity, incorporating awareness of one's own biases in areas including gender, race, religion, age, and economic status
PART III • The Clinical Medical Assistant

ABHES Competencies

1. Assist the physician with the regimen of diagnostic and treatment modalities as they relate to each body system
2. Comply with federal, state, and local health laws and regulations
3. Communicate on the recipient’s level of comprehension
4. Serve as a liaison between the physician and others
5. Show empathy and impartiality when dealing with patients
MULTIPLE CHOICE

Circle the letter preceding the correct answer.

1. Which term below means lying face downward?
   a. Supine
   b. Prone
   c. Decubitus
   d. Recumbent
   e. Relaxed

2. Which of the following is a form of nuclear medicine?
   a. Radiopaque
   b. Barium
   c. Iodine
   d. Radionuclides
   e. Radiolucent

3. Noises heard during an x-ray exposure may come from:
   a. the x-ray tube.
   b. x-rays.
   c. the positioning aid.
   d. high voltage.
   e. the sheet of film.

4. Which of the following is an example of radiopaque tissue?
   a. Lungs
   b. Bone
   c. Muscle
   d. Fat
   e. Veins

5. A minimum of two x-rays should be taken at:
   a. 180° of each other.
   b. 30° of each other.
   c. 70° of each other.
   d. 90° of each other.
   e. 50° of each other.

6. A type of radiography that creates cross-sectional images of the body is:
   a. fluoroscopy.
   b. echogram.
   c. computerized tomography.
   d. ultrasound.
   e. mammography.

7. Which of the following form of radiography does not use x-rays?
   a. MRI
   b. Nuclear medicine
   c. Fluoroscopy
   d. Teleradiology
   e. Tomography

8. Which procedure creates an image that depends on the chemical makeup of the body?
   a. Tomography
   b. Fluoroscopy
   c. MRI
   d. Mammography
   e. Nuclear medicine

9. Sonograms create images using:
   a. radioactive material.
   b. contrast media.
   c. magnetic resonance.
   d. chemotherapy.
   e. sound waves.
10. X-rays can be harmful to infants and young children because:
   a. their immune systems are not fully developed.
   b. their cells divide at a rapid pace.
   c. they have less muscle mass than adults.
   d. they have a smaller body mass.
   e. they have less body fat than adults.

11. Which of the following procedures may be done in a confined space?
   a. MRI
   b. Nuclear medicine
   c. Fluoroscopy
   d. Teleradiology
   e. Tomography

12. A physician who specializes in interpreting the images on the processed film is a(n):
   a. pulmonologist.
   b. internist.
   c. immunologist.
   d. ophthalmologist.
   e. radiologist.

13. Scenario for questions 13 and 14: A patient has come in for an x-ray. The physician wants you to get a clear image of the patient’s liver.

13. What is another possible way to view the patient’s liver without injections?
   a. Mammography
   b. Sonography
   c. Fluoroscopy
   d. Teleradiology
   e. Tomography

14. Which position would allow the best images of the liver?
   a. Supine
   b. Decubitus
   c. Posterior
   d. Left anterior oblique
   e. Right anterior oblique

15. Who owns the x-ray film after it has been developed?
   a. The patient
   b. The physician who ordered the x-rays
   c. The physician who will use the x-rays
   d. The lab that developed the film
   e. The site where the film was taken and developed.

16. You should wear a dosimeter to:
   a. lower the level of radiation.
   b. protect against radiation effects.
   c. monitor personal radiation exposure.
   d. enhance radiography images.
   e. collect data on different procedures.

17. Why do some tests require patients to be NPO before an administration of barium PO?
   a. Gastric juices may interfere with the readings.
   b. A full stomach may distort or alter an image.
   c. Patients are not allowed to relieve themselves.
   d. Undigested food might counteract contrast media.
   e. Instruments might become soiled during the procedure.

18. Images that partially block x-rays are called:
   a. radiographs.
   b. radiolucent.
   c. radiopaque.
   d. radionuclides.
   e. radiograms.

19. Why is radiology used as a form of cancer treatment?
   a. X-rays show the exact location of cancer.
   b. Radioactive cells produce more white blood cells.
   c. Radiation can destroy or weaken cancer cells.
   d. Radiation makes cancerous tumors benign.
   e. Chemotherapy is not as effective as radiation.
20. When explaining procedures to patients:
   a. let the physician go into detail.
   b. answer all the questions they ask.
   c. do not worry them with potential risk.
   d. soothe their fears without telling them anything.
   e. allow only the nurse to explain the procedure.

**COG MATCHING**

Match each key term with its definition.

**Key Terms**

<table>
<thead>
<tr>
<th>Key Terms</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. _____ cassette</td>
<td>a. invisible electromagnetic radiation waves used in diagnosis and treatment of various disorders</td>
</tr>
<tr>
<td>22. _____ contrast medium</td>
<td>b. a lightproof holder in which film is exposed</td>
</tr>
<tr>
<td>23. _____ film</td>
<td>c. imaging technique that uses a strong magnetic field</td>
</tr>
<tr>
<td>24. _____ fluoroscopy</td>
<td>d. a radioactive material with a short life that is used in small amounts in nuclear medicine studies</td>
</tr>
<tr>
<td>25. _____ magnetic resonance imaging</td>
<td>e. physician who interprets images to provide diagnostic information</td>
</tr>
<tr>
<td>26. _____ nuclear medicine</td>
<td>f. imaging technique that uses sound waves to diagnose or monitor various body structures</td>
</tr>
<tr>
<td>27. _____ radiograph</td>
<td>g. not permeable to passage of x-rays</td>
</tr>
<tr>
<td>28. _____ radiography</td>
<td>h. processed film that contains a visible image</td>
</tr>
<tr>
<td>29. _____ radiologist</td>
<td>i. a substance ingested or injected into the body to facilitate imaging of internal structures</td>
</tr>
<tr>
<td>30. _____ radiology</td>
<td>j. the use of computed imaging and information systems to transmit diagnostic images to distant locations</td>
</tr>
<tr>
<td>31. _____ radiolucent</td>
<td>k. a procedure in which the x-ray tube and film move in relation to each other during exposure, blurring out all structures except those in the focal plane</td>
</tr>
<tr>
<td>32. _____ radionuclide</td>
<td>l. a raw material on which x-rays are projected through the body; prior to processing, this does not contain a visible image</td>
</tr>
<tr>
<td>33. _____ radiopaque</td>
<td>m. permitting the passage of x-rays</td>
</tr>
<tr>
<td>34. _____ teleradiology</td>
<td>n. a special x-ray technique for examining a body part by immediate projection onto a fluorescent screen</td>
</tr>
<tr>
<td>35. _____ tomography</td>
<td>o. the branch of medicine involving diagnostic and therapeutic applications of x-rays</td>
</tr>
<tr>
<td>36. _____ ultrasound</td>
<td>p. a branch of medicine that uses radioactive isotopes to diagnose and treat disease</td>
</tr>
<tr>
<td>37. _____ x-rays</td>
<td>q. the art and science of producing diagnostic images with x-rays</td>
</tr>
</tbody>
</table>
MATCHING

Match the different types of radiography techniques with their individual characteristics.

Techniques

38. ___________ Fluoroscopy
39. ___________ Tomography
40. ___________ Mammography
41. ___________ Ultrasound
42. ___________ Magnetic resonance imaging
43. ___________ Radiation therapy

Characteristics

a. the image depends on the chemical makeup of the body, commonly used in prenatal testing
b. can create three-dimensional images, so that organs can be viewed from all angles
c. the area of the body exposed must be defined exactly so that each treatment is identical
d. used as an aid to other types of treatment, such as reducing fractures and implanting devices such as pacemakers
e. a vital adjunct to biopsy
f. designed to concentrate on specific areas of the body

SHORT ANSWER

44. List the four processes by which radiographic film is produced.

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

45. List five radiation safety procedures for patients.

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________
46. Fill in the full names for the abbreviations below.
   a. PET ______________________________________________________________________________________
   b. SPECT ______________________________________________________________________________________
   c. ALARA ______________________________________________________________________________________

47. Name two contrast mediums.
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________

48. What are the three ways contrast media may be introduced into the body?
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________

49. Name four types of interventional radiological procedures.
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________

50. List five side effects of radiation therapy.
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________
    __________________________________________________________________________________________
51. What is the difference between radiolucent and radiopaque tissues? How do these tissues appear differently on a radiograph? Give an example of each.

52. Why do x-ray examinations require a minimum of two exposures?

53. Why is it imperative to have an esophagogastroduodenoscopy done before other barium studies?

54. Compare and contrast fluoroscopy with tomography. How do these procedures use movement?

55. You have a patient who will have a radiographic exam using contrast media next week. You find out this patient has an allergy to shellfish. What should you do?
TRUE OR FALSE?

Indicate whether the statements are true or false by placing the letter T (true) or F (false) on the line preceding the statement.

56. _____ A patient may hear noises during an x-ray procedure.

57. _____ A mammogram is a minimally invasive procedure.

58. _____ You need to be proficient in the operation of your facility's equipment.

59. _____ The best way to explain procedures to a patient is with lots of detail.

CASE STUDIES FOR CRITICAL THINKING

1. Mrs. Kay has had several radiographic and contrast media studies over the past 5 years. She is now moving to another state and wants to know how to get copies of the films and reports to her new physician. What will you tell her about transferring these records?

2. You have a patient with a fear of enclosed spaces who is not able to have an open MRI at your outpatient radiographic center. How would you console this patient and explain x-ray procedures?
3. You have a patient coming in for radiation therapy who has been experiencing side effects such as weight loss, loss of appetite, and hair loss. She has concerns about the radiation therapy that she has been receiving and feels that it may be too much for her body. What would you say to her to help her better understand the situation?

4. You have a patient who has had radiographs taken with a referring physician. This patient has already spoken to his referral physician about the finding in his x-rays and would now like to consult with his primary care physician. However, the referring physician has not yet sent a summary of findings. Your patient is very anxious. What should you say?
### PROCEDURE 25-1 Assist with X-Ray Procedures

**Name:** __________________________  **Date:** _______  **Time:** _______  **Grade:** _______

**EQUIPMENT/SUPPLIES:** Patient gown and drape

**STANDARDS:** Given the needed equipment and a place to work the student will perform this skill with _______% accuracy in a total of _______ minutes. *(Your instructor will tell you what the percentage and time limits will be before you begin.)*

**KEY:**  
4 = Satisfactory  0 = Unsatisfactory  NA = This step is not counted

<table>
<thead>
<tr>
<th>PROCEDURE STEPS</th>
<th>SELF</th>
<th>PARTNER</th>
<th>INSTRUCTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wash your hands.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Greet the patient by name, introduce yourself, and escort him or her to the room where the x-ray equipment is maintained.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. Ask female patients about the possibility of pregnancy. If the patient is unsure or indicates pregnancy in any trimester, consult with the physician before proceeding with the x-ray procedure.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. <strong>AFF</strong> Explain how to respond to a patient who speaks English as a second language.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. After explaining what clothing should be removed, if any, give the patient a gown and privacy.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. Notify the x-ray technician or physician that the patient is ready for the x-ray procedure. Stay behind the lead-lined wall during the x-ray procedure to avoid exposure to x-rays during the procedure.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. After the x-ray, ask the patient to remain in the room until the film has been developed and checked for accuracy and readability.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8. Once you have determined that the exposed film is adequate for the physician to view for diagnosis, have the patient get dressed and escort him or her to the front desk.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
CALCULATION
Total Possible Points: _______
Total Points Earned: _______ Multiplied by 100 = _______. Divided by Total Possible Points = ______% 

PASS    FAIL    COMMENTS:
☐       ☐       
Student’s signature ___________________________ Date ______
Partner’s signature ___________________________ Date ______
Instructor’s signature _______________________ Date ______