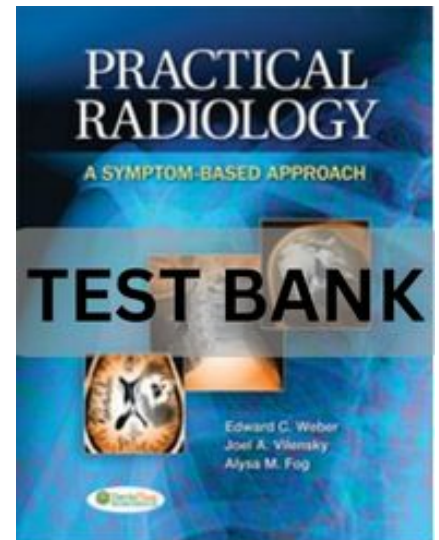


# Practical Radiology: A Symptom-Based Approach 1st Edition Test Bank

## Chapter 1. Modalities of Medical Imaging

### Multiple Choice

Identify the choice that best completes the statement or answers the question.



- \_\_\_\_\_ 1. Which of the following shows the order of radiologic densities from most dense to least dense?
- A. Metal, calcium, air, fat, water
  - B. Calcium, metal, fat, water, air
  - C. Metal, calcium, water, fat, air
  - D. Calcium, metal, fat, air, water
  - E. Metal, calcium, water, air, fat
- \_\_\_\_\_ 2. The finding of an air-fluid level on a radiologic image may reveal all of the following *except*:
- A. the presence of fluid in an air cavity such as a paranasal sinus.
  - B. the presence of gas and purulent fluid in an abscess.
  - C. the orientation of the patient when the radiograph was done.
  - D. the normal presence of fluid and air in the stomach.
  - E. the radiographic density of pathologic fluid.
- \_\_\_\_\_ 3. The three types of resolution fundamental to radiologic imaging are:
- A. spatial, temporal, and color.
  - B. spatial, sensitivity, and contrast.
  - C. spatial, temporal, and sensitivity.
  - D. spatial, contrast, and color.
  - E. spatial, contrast, and temporal.
- \_\_\_\_\_ 4. Which of the following is *not* true about radiographic projections?
- A. The heart appears larger in an AP than in a PA projection.
  - B. A portable x-ray of a supine bedridden patient would be an AP projection.
  - C. In a lateral projection, a side marker indicates the side of the patient closest to the detector.
  - D. Oblique projections always have the patient's right side closer to the detector.
  - E. Both AP and PA projections are viewed as if the patient is looking at you.
- \_\_\_\_\_ 5. Which of the following is *not* true about partial volume averaging?
- A. It is more likely to occur in thin sections than in thicker sections.
  - B. It is applicable to CT.
  - C. It is applicable to MR.
  - D. It may result in a missed diagnosis because of an apparent loss of contrast resolution.
- \_\_\_\_\_ 6. A narrow CT window refers to:
- A. a narrow opening by which ionizing radiation is emitted from the CT scanner.

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- B. a narrow opening in the CT gantry for the patient, which enhances image quality.
- C. a CT scan in which small differences in CT attenuation are clearly visible.
- D. a CT scan in which small differences in CT attenuation are less evident.

- \_\_\_\_\_ 7. In the most common T2-weighted MRI images without fat suppression:
- A. fluid has high signal (shown as bright), and fat has low signal (shown as dark).
  - B. fluid has low signal, and fat has low signal.
  - C. fluid has high signal, and fat commonly also has high signal.
  - D. fluid has low signal, and fat has high signal.
- \_\_\_\_\_ 8. Ultrasound imaging:
- A. is excellent for cortical bone.
  - B. is excellent for lung.
  - C. usually shows enhancement posterior to fluid structures.
  - D. is always based on using strict orthogonal planes.
  - E. should not be used on pregnant patients.
- \_\_\_\_\_ 9. Nuclear medicine:
- A. has better contrast resolution than MRI.
  - B. has better spatial resolution than radiography.
  - C. provides more information about physiologic activity than CT.
  - D. involves significantly more ionizing radiation risks than CT.
- \_\_\_\_\_ 10. Which of the following is *not* true about gadolinium-based contrast material?
- A. It is used with CT.
  - B. It is used with MRI.
  - C. It is associated with nephrogenic systemic fibrosis in a very small percentage of patients with advanced renal failure.
  - D. It generally differentiates vascularized tissue from relatively avascular tissue such as an area of fibrosis, and in the brain differentiates areas of intact blood-brain barrier from damaged or absent blood-brain barrier.
- \_\_\_\_\_ 11. Which of the following type of information is *not* part of a radiology report?
- A. Patient demographic data
  - B. Clinical history
  - C. Differential diagnosis
  - D. Cost data
  - E. Modalities done
- \_\_\_\_\_ 12. Clinically relevant information should be included on a radiology order for all of the following reasons *except*:
- A. to help focus the radiologist's attention on the acute clinical concern.
  - B. to improve the sensitivity and specificity of the radiologic interpretation.
  - C. for the benefit of the patient.
  - D. to increase the likelihood of the radiology report having clinical relevance.
  - E. to reduce expenses.

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### Chapter 1. Modalities of Medical Imaging Answer Section

#### MULTIPLE CHOICE

1. ANS: C

Radiographic density relates to atomic number and thickness of tissue, and densities are shown in order of metal, calcium, water, fat, and air in Table 1.1 of the text.

PTS: 1

2. ANS: E

According to the text, an air-fluid level is the horizontal edge between air and fluid in any medical image; it does not reveal the radiographic density of pathologic fluid.

PTS: 1

3. ANS: E

As discussed under the heading "Types of Resolution" in chapter 1, the three resolutions fundamental to radiologic imaging are spatial, contrast, and temporal.

PTS: 1

4. ANS: D

The statement "Oblique projections always have the patient's right side closer to the detector" is not true. As the text states, "It doesn't matter if the oblique view was done as a right posterior oblique or a left anterior oblique, as long as an 'R' marker indicates to the viewer which side of the image is the Right side of the patient or an 'L' marker indicates the Left side of the patient."

PTS: 1

5. ANS: A

Thicker reconstructed sections, not thin sections, may lead to an artifact called partial volume averaging. If a thickly reconstructed slice includes tissues of different CT densities, the apparent Hounsfield density measurement will be an average of all of these tissues, and not an accurate measurement of any one of the individual anatomic structures included (partial volume averaging).

PTS: 1

6. ANS: C

Narrow window CT images are perceived as high contrast, or very black and white, images. These images make conspicuous very slight differences in CT density among tissues.

PTS: 1

7. ANS: C

In T2-weighted images, fluids (or tissue with high water content) have a high signal and appear bright (T2 hyperintensity). There are both T1 and T2 sequences that use a variety of techniques to suppress the MR signal from lipid. The main reason for a fat suppressed T2 sequence is so that a high signal from a lipid-containing tissue (seen with the most common T2 sequences) does not obscure a high signal from adjacent fluid.

PTS: 1

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8. ANS: C

Because sound travels unimpeded through fluid, the echoes that are deep to a fluid collection (the “far side” in relation to the transducer) are brighter than in adjacent tissue. This is referred to as acoustic enhancement. Radiography and CT are excellent for cortical bone, whereas ultrasound may only be able to show a displaced cortical fracture in a relatively superficial bone. CT is also excellent for the lungs, whereas ultrasound has very limited and specific uses for pleural and lung disease. Ultrasound is not based on using strict orthogonal planes. Ultrasound images tend to be more difficult to interpret than CT, MRI, or radiography because the display of anatomic structures completely depends on the particular orientation and angulation of the transducer at any given moment during this generally “free hand” imaging modality.

PTS: 1

9. ANS: C

Nuclear medicine is fundamentally different from other types of radiologic imaging because it emphasizes physiology rather than morphology. The images produced by nuclear medicine procedures have poor spatial resolution but can provide functional information about body tissues and organs that cannot be obtained any other way.

PTS: 1

10. ANS: A

Gadolinium-based contrast agents are used in MRI, not CT. Some very ill patients with renal failure who had large doses or multiple doses of gadolinium-based contrast material within a short time frame develop a systemic illness called nephrogenic systemic fibrosis. The degree of contrast enhancement usually varies with the vascularity of tissues. As a general principle, hypervascular tissue displays more intense enhancement than other tissues in both CT and MRI. The neovascularity of many tumors results in their detection with contrast enhanced imaging. One can also differentiate viable tissue from necrotic debris by whether or not a tissue enhances.

PTS: 1

11. ANS: D

An ideal radiology report should contain four basic sections: demographics, clinical information, descriptive information, and a diagnostic conclusion followed by further lengthy discussion about what is on the report. There is no mention of cost being part of the report.

PTS: 1

12. ANS: E

Of the many reasons discussed in the text for providing relevant clinical information on a radiology requisition or order, reduction of expenses was not one of the reasons given. Providing appropriate clinical information to the radiologist can make the difference between establishing a correct diagnosis and having an important piece of information lost because of poor communication between medical practitioners.

PTS: 1

### **Chapter 2. Shoulder, Pelvis, and Limbs**

#### **Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

1.

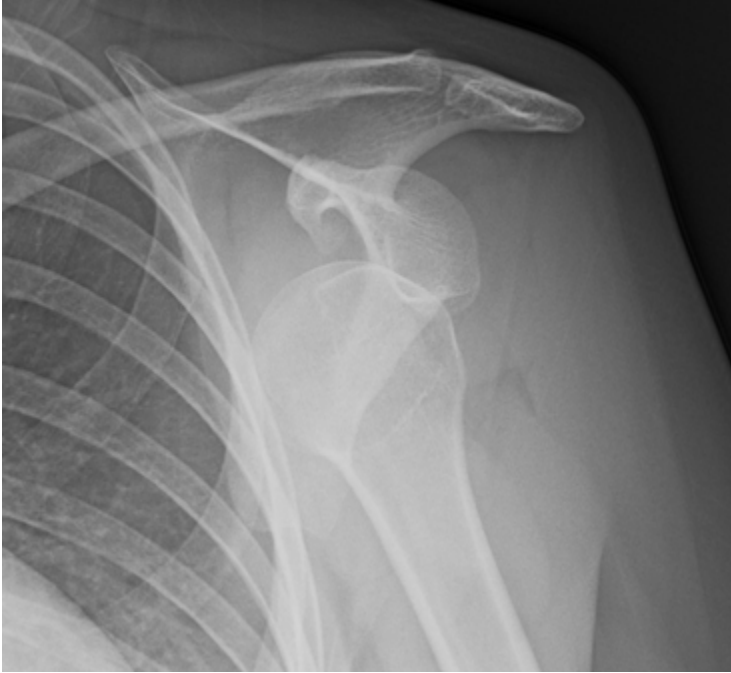


This image depicts a patient with:

- A. a Salter-Harris fracture.
- B. a normal proximal humerus.
- C. an anatomic neck fracture of the humerus.
- D. a surgical neck fracture of the humerus.

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2.



The patient depicted in the image has:

- A. an anterior shoulder dislocation.
- B. a normal shoulder in complete adduction.
- C. a separated shoulder.
- D. a fracture of the proximal humeral shaft.

3.



The patient in this image has:

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- A. a dislocated shoulder.
- B. an AC joint separation.
- C. a Bankart lesion.
- D. a winged scapula.

4.



The patient in this image has:

- A. glenohumeral joint osteoarthritis.
- B. dislocated shoulder.
- C. separated shoulder.
- D. Bankart lesion.

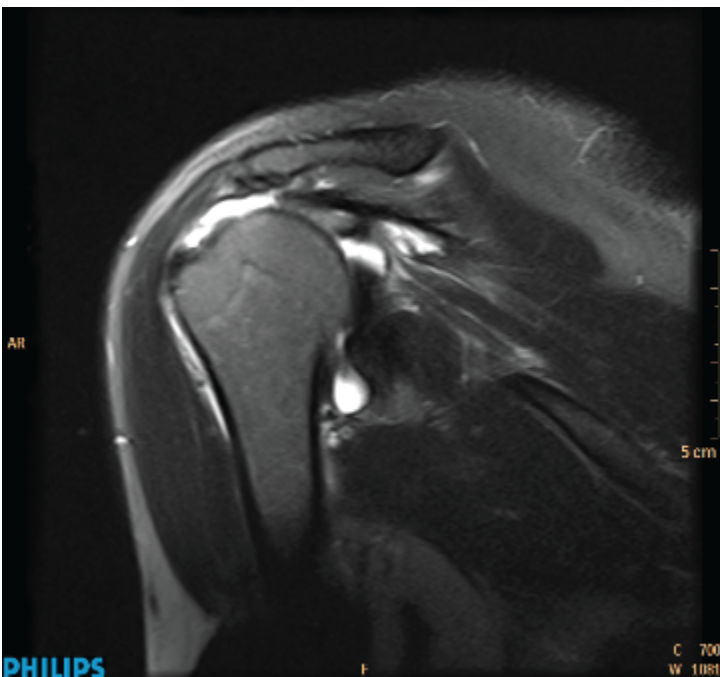
5.



This image from a PA chest radiograph shows the incidental finding of:

- A. chronic AC joint separation.
- B. old nonunited Bankart fracture.
- C. a chronic full-thickness supraspinatus tear.
- D. blastic metastatic bone lesions.

6.



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What is the diagnosis based on the coronal T2 MRI?

- A. AC joint separation
- B. Full-thickness rotator cuff tear
- C. Radiographically occult humeral head fracture
- D. Glenoid labral tear

7.



Lateral elbow radiograph after trauma; other radiographs show no fracture. Your diagnosis is:

- A. occult intra-articular fracture.
- B. dislocated elbow.
- C. normal elbow.
- D. torn distal biceps tendon tear.

8.



The patient in this image has:

- A. a boxer's fracture.
- B. degenerative joint disease of the first carpometacarpal joint.
- C. a fractured scaphoid.
- D. a spiral second metacarpal fracture.

9.



- The image shows a patient with:
- A. acute onset of hand pain.
  - B. a positive rheumatoid arthritis (RA) titer.
  - C. carpal tunnel syndrome.
  - D. history of multiple prior hand injuries.