

# SELF-ASSESSMENT QUIZ: THREE-PHASE BONE SCANNING

The Continuing Education Committee presents this quiz for self-evaluation in three-phase bone scanning. Although it is not possible to cover all aspects of three-phase bone scanning, these questions do cover several pertinent areas. A special thanks to all item writers with regard to this quiz. Answers can be found on page 174. References are listed at the end of the quiz to assist you in your review of this topic. Please select the best answer for the questions below.

1. The best dynamic acquisition parameters for a three-phase bone scan following the bolus i.v. administration of  $^{99m}\text{Tc}$ -MDP are:
  - a. 10-serial images of 1 min each.
  - b. 20-serial images of 3 sec each.
  - c. 30-serial images of 1 sec each.
  - d. 30-serial images of 60 sec each. Ref 1
  
2. Three-phase bone imaging is beneficial for which of the following:
  - a. Distinguishing chronic from acute osteomyelitis.
  - b. Differentiating recent from remote trauma.
  - c. Assessing differences in regional blood flow.
  - d. Diagnosing osteoporosis. Ref 1
  
3. The pattern of osteomyelitis in a three-phase bone scan would demonstrate:
  - a. Focal increased blood flow to the involved bone and diffuse intense activity of the tracer in the bone on delayed images.
  - b. Diffuse increased blood flow to the involved bone and focal intense activity of the tracer in the bone on delayed images.
  - c. Diffuse increased blood flow to the involved bone and diffuse intense activity of the tracer in the bone on delayed images.
  - d. Focal increased blood flow to the involved bone and focal intense activity of the tracer in the bone on delayed images. Ref 1
  
4. The delayed static image is focally abnormal in acute osteomyelitis but not in \_\_\_\_\_.
  - a. Osteoarthropathy.
  - b. Cellulitis.
  - c. Recent fracture.
  - d. Chronic osteomyelitis. Ref 2
  
5. Gallium-67 scanning in the evaluation of acutely infected hip prosthesis has been shown to be far superior to three-phase bone scanning.
  - a. True.
  - b. False. Ref 3
  
6. When performing a three-phase bone scan of the wrist it is important to:
  - a. Position the right wrist in the center of the field of view.
  - b. Use a pinhole collimator.
  - c. Position both wrists in the field of view.
  - d. Inject in the effected extremity. Ref 6

7. Some disease states may be differentiated by obtaining early "blood-pool" images. Which will show reduced tracer uptake in repeated scans?
  - a. Cellulitis.
  - b. Acute osteomyelitis.
  - c. Chronic osteomyelitis.
  - d. Osteoarthritis. Ref 4
  
8. Photon deficient lesions on the radionuclide angiogram phase are often signs of early \_\_\_\_\_.
  - a. Chronic osteomyelitis.
  - b. Acute osteomyelitis.
  - c. Malignancy.
  - d. Cellulitis. Ref 5

The following conditions make the diagnosis of acute osteomyelitis difficult:

9. Skin ulcers. True or False.
10. Soft tissue abscesses. True or False.
11. Aseptic necrosis. True or False.

This disease state will be abnormal on all three phases of the bone study:

12. Acute osteomyelitis. True or False.
13. Reflex sympathetic dystrophy. True or False.
14. Degenerative disease. True or False.
15. Infection of the bone. True or False.
16. Acute bone infarct. True or False.

## References

1. Maurer AH, Chen DCP, Camargo EE, et al. Utility of three-phase skeletal scintigraphy in suspected osteomyelitis: Concise communication. *J Nucl Med* 1981;22:941-49.
2. Paru HM, Wheat LJ, Siddigui AR, et al. Scintigraphic evaluation of diabetic osteomyelitis: Concise communication. *J Nucl Med* 1982;23:569-73.
3. Kroop SA, Stone RG, Seldin DW, et al. Comparison of three-phase bone scintigraphy and Ga-67 imaging in evaluation of painful total hip prostheses (abstract). *J Nucl Med* 1983;24:P84.
4. Wallner RJ, Dadparvar S, Croll MN, et al. Demonstration of an infected popliteal (Baker's) Cyst with three-phase skeletal scintigraphy. *Clin Nucl Med* 1985;10:153-55.
5. O'Mara RE, Weber DA. *Clinical Radionuclide Imaging*. Freeman LM, ed. New York: Grune and Stratton, 1980:1141-1239.
6. Alazaraki N, Dries D, Datz F, et al. Value of 24-hour image (four-phase bone scan) in assessing osteomyelitis in patients with peripheral vascular disease. *J Nucl Med* 1985;26:711-17.