

ARRT Nuclear Medicine Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 - 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

- 1. Which of the following is identified as a daily QC test for a CT scanner?**
 - A. Exposure time calibration**
 - B. CT number accuracy**
 - C. Geometric distortion assessment**
 - D. Contrast resolution**
- 2. Which procedure is performed before the administration of Y-90 therapy?**
 - A. Whole body imaging with In-111 ibritumonab tiuxetan**
 - B. Chest X-ray**
 - C. CT scan of the abdomen**
 - D. Complete blood count (CBC)**
- 3. What is the main purpose of a uniformity test in nuclear medicine?**
 - A. Check for camera wear and tear**
 - B. Ensure the camera accurately portrays distances/shapes**
 - C. Ensure uniform distribution of counts and check for cold/hot spots**
 - D. Calibrate the sensitivity of the gamma camera**
- 4. Which tracer can be used to assess the patency of ventriculoperitoneal shunts?**
 - A. F-18-FDG**
 - B. Thallium-201**
 - C. Tc99m-Pertechnetate**
 - D. I-123**
- 5. In dual-radionuclide myocardial perfusion imaging, which tracer is typically used during stress?**
 - A. Tl201 Thallous Chloride**
 - B. 99mTc-Sestamibi**
 - C. 99mTc-pertechnetate**
 - D. F-18 fluorodeoxyglucose**

- 6. Where is the x-ray generator located in a CT scanner?**
- A. Outside the gantry**
 - B. Inside the gantry**
 - C. On the patient bed**
 - D. Above the imaging table**
- 7. During a normal cisternogram, radioactivity is visualized in which areas?**
- A. Central canal, basal cisterns, cerebral convexities, and subarachnoid space**
 - B. Only in the subarachnoid space**
 - C. In the cerebral cortex only**
 - D. Only the spinal canal and ventricles**
- 8. What condition is ^{89}Sr -chloride primarily used to treat?**
- A. Rheumatoid arthritis**
 - B. Malignant effusions**
 - C. Bone pain**
 - D. Polycythemia vera**
- 9. What is a typical use for F-18 besides imaging the brain?**
- A. Bone scanning**
 - B. Thyroid studies**
 - C. Cardiac perfusion imaging**
 - D. Detection of infections**
- 10. Which preparation step is unnecessary for Sr-^{89} Chloride therapy?**
- A. Blood work**
 - B. Patient isolation**
 - C. Discontinuation of pain medications**
 - D. Physical examination**

Answers

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1. B
2. A
3. C
4. C
5. B
6. B
7. A
8. C
9. D
10. C

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Explanations

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1. Which of the following is identified as a daily QC test for a CT scanner?

- A. Exposure time calibration**
- B. CT number accuracy**
- C. Geometric distortion assessment**
- D. Contrast resolution**

The identification of CT number accuracy as a daily quality control (QC) test for a CT scanner is significant because it directly impacts the reliability and consistency of the imaging results produced by the scanner. CT number accuracy, often referred to as Hounsfield unit (HU) accuracy, ensures that the scanner produces the correct values for different tissue types. This is crucial for proper diagnosis, as these values help radiologists differentiate between various structures and conditions in the body. Daily verification of CT number accuracy involves scanning a standardized phantom and ensuring that the measured values correspond to the expected Hounsfield units. If the numbers fall outside acceptable ranges, it indicates that the scanner may need servicing or calibration, preventing potential misdiagnoses due to inaccurate imaging data. While the other options mentioned play important roles in the overall quality assurance of a CT scanner, they do not typically require daily assessment. For instance, exposure time calibration is often performed less frequently and focuses more on the temporal aspect of imaging rather than the direct output values of the scan. Geometric distortion assessment and contrast resolution evaluations are critical for ensuring image quality but are usually conducted on a weekly or monthly basis rather than daily. Thus, daily monitoring of CT number accuracy ensures ongoing reliability and effectiveness in clinical imaging settings.

2. Which procedure is performed before the administration of Y-90 therapy?

- A. Whole body imaging with In-111 ibritumomab tiuxetan**
- B. Chest X-ray**
- C. CT scan of the abdomen**
- D. Complete blood count (CBC)**

The procedure that is performed before the administration of Y-90 therapy is whole body imaging with In-111 ibritumomab tiuxetan. This imaging is crucial as it provides important information about the distribution of lymphatic tissue and the extent of any malignancy, which aids in planning the treatment effectively. By visualizing the lymphatic system, healthcare providers can determine the precise areas that require therapy and assess the potential involvement of the disease, ultimately guiding the delivery of targeted radiation therapy with Y-90. In the context of Y-90 therapy, specifically for treating conditions like non-Hodgkin lymphoma, understanding the tumor burden prior to the treatment ensures that the procedure is both safe and effective. The imaging technique utilizes a radiolabeled monoclonal antibody that binds to the CD20 antigen prevalent on B-cell lymphomas, allowing for accurate mapping of lymphoid tissues. While the other listed procedures may provide valuable information or baseline data, they do not have the same direct role in the pre-treatment assessment for Y-90 therapy. For instance, a chest X-ray could evaluate thoracic structures but would not inform specifically about lymphoma distribution, whereas a CT scan of the abdomen might visualize potential metastases but lacks the specificity provided by the radiol

3. What is the main purpose of a uniformity test in nuclear medicine?

- A. Check for camera wear and tear**
- B. Ensure the camera accurately portrays distances/shapes**
- C. Ensure uniform distribution of counts and check for cold/hot spots**
- D. Calibrate the sensitivity of the gamma camera**

The primary purpose of a uniformity test in nuclear medicine is to ensure a uniform distribution of counts across the imaging detector and to identify any cold or hot spots that may indicate issues with the camera's performance. This test is essential for verifying that the gamma camera is functioning properly and that it can accurately capture images without any artifacts caused by non-uniformities in its response. Uncorrected non-uniformity in imaging can lead to misinterpretation of images, potentially affecting diagnoses and patient safety. By assessing both uniformity and the presence of artifacts within the imaging data, technologists can ensure that the camera is performing optimally, which is crucial for producing high-quality diagnostic images. The other options relate to significant aspects of camera maintenance and functionality, but they do not specifically identify the uniformity test's primary goal of evaluating the evenness of response and identifying areas of anomalies in detection.

4. Which tracer can be used to assess the patency of ventriculoperitoneal shunts?

- A. F-18-FDG**
- B. Thallium-201**
- C. Tc99m-Pertechnetate**
- D. I-123**

The tracer that is commonly utilized to assess the patency of ventriculoperitoneal shunts is technetium-99m pertechnetate. This choice is particularly effective because Tc-99m-pertechnetate has favorable physical properties, including a suitable half-life and energy emissions that make it well-suited for imaging purposes. When injected, this tracer can effectively highlight the flow of cerebrospinal fluid (CSF) through the shunt, allowing for evaluation of whether the device is functioning properly or if there are any blockages. In the context of this application, the other tracers mentioned are primarily used for different diagnostic purposes. For instance, F-18-FDG is typically employed in oncology for PET imaging to assess metabolism in tissues, while thallium-201 is mainly used for myocardial perfusion imaging. I-123 is predominantly utilized for thyroid imaging and certain neuroendocrine assessments. The specific utility of Tc-99m-pertechnetate in visualizing CSF flow makes it the preferred choice in the assessment of the patency of ventriculoperitoneal shunts.

5. In dual-radionuclide myocardial perfusion imaging, which tracer is typically used during stress?

A. Tl201 Thallous Chloride

B. 99mTc-Sestamibi

C. 99mTc-pertechnetate

D. F-18 fluorodeoxyglucose

In dual-radionuclide myocardial perfusion imaging, the tracer commonly utilized during stress is 99mTc-Sestamibi. This radiopharmaceutical is particularly effective for assessing myocardial blood flow and viability. Its use during stress testing allows for the simultaneous evaluation of myocardial perfusion under conditions that simulate physical workload or pharmacologic stress. 99mTc-Sestamibi is advantageous due to its favorable characteristics, including optimal photon energy for imaging, quick clearance from non-myocardial tissues, and a good myocardial uptake, which helps in visualizing both ischemic and viable myocardial areas. These properties make it a reliable choice for distinguishing between viable tissue and areas of reduced perfusion, which is critical in diagnosing coronary artery disease. In contrast, Tl201 Thallous Chloride, while sometimes used, is typically reserved for certain scenarios and is less common in modern protocols due to its longer half-life and higher radiation dose. 99mTc-pertechnetate is mainly utilized for thyroid imaging and does not provide the information necessary for myocardial perfusion assessment. F-18 fluorodeoxyglucose is primarily used in metabolic imaging and does not offer the same direct assessment of perfusion as 99mTc-Sestamibi does. Thus,

6. Where is the x-ray generator located in a CT scanner?

A. Outside the gantry

B. Inside the gantry

C. On the patient bed

D. Above the imaging table

In a CT scanner, the x-ray generator is located inside the gantry. This positioning is crucial for several reasons. The gantry is the part of the CT scanner that houses both the x-ray tube and the detectors in a circular arrangement, allowing for the rotation around the patient. By placing the x-ray generator inside the gantry, the design facilitates the efficient generation and direct delivery of x-rays toward the detectors as they capture the images. This arrangement helps in minimizing the distance that the emitted x-rays need to travel and allows for precise calibration and alignment of the x-ray beam with the detectors. Furthermore, housing the generator within the gantry contributes to the overall compactness and design efficiency of CT systems, enabling the necessary rotation and movement while maintaining the integrity and safety of the equipment. In contrast, placing the generator outside the gantry would complicate the setup and could lead to increased radiation exposure to staff and potential misalignment of the x-ray beam relative to the detectors. The other two options about the generator's location being on the patient bed or above the imaging table would not allow for the desired functionality and safety standards required for effective CT imaging.

7. During a normal cisternogram, radioactivity is visualized in which areas?

A. Central canal, basal cisterns, cerebral convexities, and subarachnoid space

B. Only in the subarachnoid space

C. In the cerebral cortex only

D. Only the spinal canal and ventricles

In a typical cisternogram, the non-invasive imaging procedure assesses the flow of cerebrospinal fluid (CSF) within the central nervous system. The primary goal is to visualize areas where radioactivity concentrates, indicating the distribution of CSF. The correct answer outlines that radioactivity is visualized in several areas: the central canal, basal cisterns, cerebral convexities, and the subarachnoid space. These regions are significant as they collectively represent the critical pathways and spaces where the CSF circulates around the brain and spinal cord. The central canal serves as an important conduit within the spinal cord, while the basal cisterns and cerebral convexities refer to areas in and around the brain where CSF can pool and circulate effectively. The subarachnoid space is where the CSF bathes the brain and spinal cord, providing a protective cushion and allowing for nutrient exchange. The other options present limited or incorrect regions of radioactivity visualization. For example, stating that radioactivity is only visualized in the subarachnoid space overlooks the complexities of CSF flow throughout the entire central nervous system, while the focus on the cerebral cortex or the spinal canal and ventricles alone does not provide a complete picture of the cisternogram.

8. What condition is ⁸⁹Sr-chloride primarily used to treat?

A. Rheumatoid arthritis

B. Malignant effusions

C. Bone pain

D. Polycythemia vera

Strontium-89 chloride is primarily utilized in the treatment of bone pain, particularly that which is caused by metastatic bone cancer. This radioisotope emits beta particles, which target bone tissue and help alleviate pain associated with skeletal metastases. When injected into a patient's bloodstream, Strontium-89 is preferentially taken up by areas of increased bone turnover, such as those affected by malignant processes, allowing for localized radiotherapy that effectively reduces pain levels in individuals suffering from cancer that has spread to the bone. In contrast, the other options do not align with the primary use of Strontium-89 chloride. Rheumatoid arthritis involves systemic inflammation and is typically treated with non-radiative methods such as medications, not radiotherapy. Malignant effusions refer to fluid accumulation related to cancer and are generally treated with drainage or chemotherapy rather than with a bone-targeting radioactive agent. Polycythemia vera, a condition characterized by an overproduction of red blood cells, does not involve bone pain as a primary symptom, and its treatment focuses on managing blood counts rather than addressing bone-related issues. Thus, Strontium-89's specific action on bone tissue makes it particularly suited for the treatment of bone pain, solidifying its indication in oncology practices.

9. What is a typical use for F-18 besides imaging the brain?

- A. Bone scanning**
- B. Thyroid studies**
- C. Cardiac perfusion imaging**
- D. Detection of infections**

Fluorine-18 (F-18) is widely known for its use in positron emission tomography (PET) imaging, particularly in oncology and neuroimaging. One of its typical uses beyond brain imaging is the detection of infections. This is primarily achieved through the use of F-18 labeled compounds, such as F-18 fluorodeoxyglucose (FDG), which is taken up by metabolically active cells, including inflammatory cells in the area of infection. In the case of infections, the heightened metabolic activity of leukocytes (white blood cells) allows for the visualization of areas impacted by infection or inflammation on a PET scan. This makes F-18 particularly useful in diagnosing and monitoring conditions such as abscesses, osteomyelitis, or other infectious processes. In contrast, the other options listed typically do not utilize F-18 in the same manner. Bone scanning usually employs different radiopharmaceuticals like technetium-99m (Tc-99m) compounds, thyroid studies often involve iodine isotopes such as I-123 or I-131, and cardiac perfusion imaging commonly uses agents like Tc-99m or rubidium-82.

10. Which preparation step is unnecessary for Sr-89 Chloride therapy?

- A. Blood work**
- B. Patient isolation**
- C. Discontinuation of pain medications**
- D. Physical examination**

In the context of Sr-89 Chloride therapy, discontinuation of pain medications is unnecessary because this treatment is intended for patients who are experiencing pain due to metastatic bone disease. Sr-89 functions by targeting and localizing in areas of bone where there is increased osteoblastic activity, effectively providing palliative relief from pain without needing to stop existing pain management therapies. Other steps, such as blood work, patient isolation, and physical examination, are critical to ensure the patient's safety and overall health prior to the procedure. Blood work is important to monitor kidney function and overall blood counts, patient isolation may be necessary to avoid unnecessary radiation exposure to others after administration of the radionuclide, and a physical examination helps ensure that the patient is fit for the procedure and to assess their current health status. Therefore, while the other preparations aim to optimize the treatment process and safety, discontinuing pain medications does not contribute to the efficacy or safety of Sr-89 therapy.

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

<https://arrtnuclearmedicine.examzify.com>

We wish you the very best on your exam journey. You've got this!