

NMTCB RADIATION SAFETY PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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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

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- 1. What does UN2910 indicate regarding radioactive materials?**
 - A. It is a label for high-level radioactive waste
 - B. It refers to limited quantities of radioactive material
 - C. It indicates radioactive materials with no restrictions for transport
 - D. It defines radioactive materials that are safe to handle
- 2. What are deterministic effects of radiation exposure?**
 - A. Increased radiation sensitivity
 - B. Radiation exposure that results in cell death
 - C. Effects that improve over time
 - D. Short-term health effects only
- 3. What technique can be employed to help reduce patient motion during imaging?**
 - A. Reduce FOV
 - B. Increase pitch
 - C. Decrease frame rate
 - D. Shorten exposure time
- 4. What is the primary function of personal protective equipment in radiation safety?**
 - A. To increase visibility
 - B. To prevent contamination
 - C. To reduce radiation exposure
 - D. To enhance mobility
- 5. Which statement is true about the disposal of materials with a half-life of 120 days or less?**
 - A. They must be incinerated
 - B. They can be disposed of in regular trash when levels reach background
 - C. They should be stored indefinitely
 - D. They require special hazardous waste disposal

- 6. Which regulation outlines the standard for protection against radiation hazards?**
- A. 10 CFR Part 19
 - B. 10 CFR Part 20
 - C. 10 CFR Part 35
 - D. 10 CFR Part 71
- 7. Which radionuclide is approved for manual brachytherapy?**
- A. Cesium-137
 - B. Palladium-103
 - C. Gold-198
 - D. Iridium-192
- 8. What type of protective gear is recommended during a nuclear medicine procedure?**
- A. Only gloves and goggles
 - B. Lead aprons, gloves, and thyroid shields
 - C. Disposable uniforms only
 - D. Standard lab coats
- 9. What documentation is necessary for transporting hazardous materials?**
- A. Hazmat training certificate
 - B. Bill of lading
 - C. Radiation safety manual
 - D. No documentation is required
- 10. Which of the following devices can be used for radiation detection?**
- A. Infrared thermometers
 - B. Geiger-Muller counters
 - C. Ultrasonic scanners
 - D. Magnetic resonance imagers

Answers

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

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Explanations

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1. What does UN2910 indicate regarding radioactive materials?

- A. It is a label for high-level radioactive waste
- B. It refers to limited quantities of radioactive material**
- C. It indicates radioactive materials with no restrictions for transport
- D. It defines radioactive materials that are safe to handle

UN2910 is a designation used in the transport of radioactive materials, specifically indicating the presence of limited quantities of radioactive material in a package. This designation allows for certain regulatory relaxations in transportation, provided that the material meets specific criteria regarding its radioactivity levels. The use of this designation is important for ensuring safety while also allowing for the efficient transport of materials that do not pose significant risk in limited amounts. In this context, "limited quantities" means that the amounts are low enough to be safely transported without the extensive regulations that apply to higher levels of radioactive materials. This helps streamline logistics for materials that can be handled with less stringent safety measures compared to more hazardous quantities.

2. What are deterministic effects of radiation exposure?

- A. Increased radiation sensitivity
- B. Radiation exposure that results in cell death**
- C. Effects that improve over time
- D. Short-term health effects only

Deterministic effects of radiation exposure refer to effects that occur as a direct result of a certain dose of radiation, where the severity of the effect increases with the dose received. These effects are predictable and generally have a threshold dose, meaning that below a certain level of exposure, the effects will not appear. Cell death is a prime example of a deterministic effect, as exposure to high doses of radiation can lead to the immediate death of cells, tissues, or even organs depending on the level and duration of exposure. This type of effect is typically observed in scenarios of acute radiation exposure, where significant damage occurs within a short period of time, leading to observable biological consequences such as skin burns, radiation sickness, and, at very high doses, death. In contrast, the other options do not accurately encompass the nature of deterministic effects. Increased radiation sensitivity and effects that improve over time do not align with the inherent characteristics of deterministic effects. Additionally, while deterministic effects can manifest as short-term health effects, they are not exclusively limited to that timeframe; they could also be considered in the context of long-term consequences if exposures are sufficiently high.

3. What technique can be employed to help reduce patient motion during imaging?

- A. Reduce FOV
- B. Increase pitch**
- C. Decrease frame rate
- D. Shorten exposure time

The technique of increasing pitch in imaging is important for reducing patient motion. When pitch is increased during a CT scan, the table moves faster through the gantry, which can help to minimize the overall time the patient is required to remain still. This is especially beneficial in scenarios where patients may find it difficult to stay motionless, such as children or individuals in discomfort. A shorter duration of time for image acquisition means that patient motion—such as breathing or muscle spasms—has less chance to affect the quality of the images. In contrast, while reducing the field of view (FOV) and decreasing the frame rate could theoretically manage aspects of imaging resolution or data capture, they do not address motion directly. Furthermore, shortening exposure time can enhance patient safety by reducing radiation dose, but it could also have the opposite effect if not managed carefully, potentially leading to a need for longer imaging times or lower quality images, which could increase the risk of motion artifacts. Hence, increasing pitch is the most effective approach for managing and mitigating patient motion during imaging.

4. What is the primary function of personal protective equipment in radiation safety?

- A. To increase visibility
- B. To prevent contamination
- C. To reduce radiation exposure**
- D. To enhance mobility

The primary function of personal protective equipment (PPE) in radiation safety is to reduce radiation exposure. PPE is designed to shield individuals from harmful radiation, thereby minimizing the dose received while performing tasks in environments where radiation is present. This is crucial in healthcare settings, especially in fields such as nuclear medicine and radiology, where professionals are routinely exposed to ionizing radiation. By utilizing materials such as lead aprons, thyroid shields, and goggles, PPE helps to absorb or deflect radiation, significantly lowering the risk of radiation-related health issues. In essence, the correct answer addresses the most critical aspect of radiation safety, which is protecting the staff and patients from the potential dangers associated with radiation exposure.

5. Which statement is true about the disposal of materials with a half-life of 120 days or less?

- A. They must be incinerated
- B. They can be disposed of in regular trash when levels reach background**
- C. They should be stored indefinitely
- D. They require special hazardous waste disposal

The statement regarding the disposal of materials with a half-life of 120 days or less being disposed of in regular trash when levels reach background is accurate due to the principle of radioactive decay and the established safety standards for managing radioactive waste. Materials with a half-life of 120 days will decrease in radioactivity significantly over time. According to regulatory guidelines, if these materials are allowed to decay to a point where their radioactivity levels are indistinguishable from background radiation, they are considered safe and may be disposed of in regular waste. This process ensures that any potential hazard is minimized and aligns with responsible waste management practices. In scenarios with longer half-lives or when waste cannot reach background levels, alternate disposal methods may be required, such as incineration or special hazardous waste disposal, which is necessary for materials that retain their radioactive properties for extended periods and pose ongoing risks. Storing materials indefinitely is also not a sustainable practice, as it does not address the radioactive risk and can lead to compliance issues with regulations concerning waste management.

6. Which regulation outlines the standard for protection against radiation hazards?

- A. 10 CFR Part 19
- B. 10 CFR Part 20
- C. 10 CFR Part 35**
- D. 10 CFR Part 71

The regulation that outlines the standard for protection against radiation hazards is 10 CFR Part 20. This part of the Code of Federal Regulations sets forth the standards for the protection of workers and the general public from radiation hazards in various settings. It establishes the requirements for dose limits, radiation monitoring, and safety protocols to minimize exposure to radiation. While 10 CFR Part 35 pertains specifically to the use of byproduct material in medical applications (primarily focusing on administration and safety in medical use), it does not provide a comprehensive outline for overall radiation protection standards applicable across all sectors. The other options, such as 10 CFR Part 19, primarily deal with notices, instructions, and reports to workers regarding radiation hazards, while 10 CFR Part 71 addresses the packaging and transportation of radioactive materials. Therefore, the focus of these regulations is different, with only Part 20 providing a comprehensive framework for radiation protection standards.

7. Which radionuclide is approved for manual brachytherapy?

- A. Cesium-137
- B. Palladium-103**
- C. Gold-198
- D. Iridium-192

The approval of Palladium-103 for manual brachytherapy is rooted in its desirable physical and biological properties that make it suitable for treating certain types of cancer, particularly prostate cancer. Palladium-103 is a low-energy radionuclide that emits beta and gamma radiation, allowing for effective radiation treatment while limiting damage to adjacent healthy tissues. Its short half-life of approximately 17 days provides a rapid decay profile, which is beneficial for timely treatment responses. In brachytherapy, the implantable sources are positioned close to or within tumors, enabling high doses of localized radiation with minimal exposure to surrounding organs. The handling and placement of Palladium-103 sources are manageable with manual techniques, ensuring precision targeting of the cancerous tissue. Thus, it is an approved and widely utilized radionuclide in clinical applications for manual brachytherapy. Other radionuclides mentioned, like Cesium-137, Gold-198, and Iridium-192, each have their own applications in brachytherapy but are often used in specific scenarios or with different techniques that may or may not be suited for manual implantation in the same way as Palladium-103.

8. What type of protective gear is recommended during a nuclear medicine procedure?

- A. Only gloves and goggles
- B. Lead aprons, gloves, and thyroid shields**
- C. Disposable uniforms only
- D. Standard lab coats

During a nuclear medicine procedure, the use of protective gear is crucial for minimizing exposure to radiation. The recommended protective gear includes lead aprons, gloves, and thyroid shields. Lead aprons are designed to provide a barrier against scatter radiation, protecting vital organs and reducing the dose of radiation that healthcare workers may absorb during procedures involving radioactive materials. Gloves are essential in safeguarding against both direct contact with radioactive materials and contamination from spills or drips. Thyroid shields are particularly important, as the thyroid gland is sensitive to radiation; these shields help protect this gland from potential exposure. While other options may mention gloves or uniforms, they do not provide the comprehensive protection afforded by lead materials and specialized gear necessary in a nuclear medicine setting. Therefore, utilizing a combination of lead aprons, gloves, and thyroid shields is the most effective approach to ensure the safety of healthcare professionals working with radioactive substances.

9. What documentation is necessary for transporting hazardous materials?

- A. Hazmat training certificate
- B. Bill of lading**
- C. Radiation safety manual
- D. No documentation is required

When transporting hazardous materials, having a bill of lading is essential as it serves as a document of title and a receipt for the goods being transported. It outlines the details of the shipment, including the type of hazardous materials, quantity, and the sender and receiver's information. This documentation is crucial not only for compliance with transportation regulations but also for providing information in case of an emergency, ensuring the safety of everyone involved during transit. The bill of lading functions as a legal contract between the shipper and the carrier, detailing the responsibilities and liabilities of both parties. It also helps keep track of the hazardous materials during transport, thereby facilitating efficient handling and emergency response if necessary. While a hazmat training certificate is important for ensuring that personnel handling hazardous materials are properly trained, it is not required for the physical transportation process itself. A radiation safety manual is related to safety protocols for handling radioactive materials but does not serve as a transport document. Similarly, the idea that no documentation is required contradicts regulations governing the transportation of hazardous materials, which clearly stipulate that adequate documentation must be provided to ensure safety and legal compliance.

10. Which of the following devices can be used for radiation detection?

- A. Infrared thermometers
- B. Geiger-Muller counters**
- C. Ultrasonic scanners
- D. Magnetic resonance imagers

The Geiger-Muller counter is specifically designed for detecting and measuring ionizing radiation. It operates by counting the ion pairs created when radiation passes through a gas-filled tube, which allows it to detect alpha, beta, and gamma radiation. This characteristic makes it a valuable instrument in radiation safety, allowing users to monitor radiation levels and ensure safe environments in medical, industrial, and research settings. Infrared thermometers, while useful for measuring temperature, do not detect radiation. They work by sensing infrared energy emitted from objects. Ultrasonic scanners use sound waves to create images of internal structures, such as organs, but are not related to radiation detection. Magnetic resonance imagers also do not detect radiation; instead, they use strong magnetic fields and radio waves to generate images of the body's internal structures. Thus, the Geiger-Muller counter is the only device listed that is capable of specifically detecting radiation, making it the correct answer.

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:

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

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