NMTCB Computed Tomography (CT) Board Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

Table of Contents

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. What is the definition of dysphagia?

A. Difficulties in breathing

B. Difficulties in swallowing

C. Difficulties in speaking

D. Difficulties in digestion

2. What is the typical adult pulse rate range?

A. 50-75 bpm

B. 60-100 bpm

C. 70-110 bpm

D. 80-120 bpm

3. During which phase do parenchymal lesions become apparent in kidney contrast enhancement?

A. Corticomedullary phase

B. Nephrographic phase

C. Excretory phase

D. Delayed phase

4. What range of mOsm/kg of water is characteristic of high-osmolar contrast?

A. 100-500

B. 500-1000

C. 1000-2400

D. 2400-3000

5. How much greater in HU is a normal liver compared to the spleen?

A. 10

B. 5

C. 15

D. 20

6. Which of the following effects can saline flush have following iodinated contrast administration?

A. Increased allergies to contrast

B. Increased incidence of CIN

C. Reduction of streaking artifacts

D. Enhanced visualization of anatomy

7. Which condition is NOT considered a risk factor for contrast-induced nephrotoxicity (CIN)?

A. Diabetes

B. Myeloma

C. Cardiac disease

D. Healthy kidney function

8. A Stanford type B dissecting aneurysm primarily affects which part of the aorta?

A. Ascending aorta

B. Thoracic aorta

C. Descending aorta

D. Abdominal aorta

9. What is the prodromal stage of infection?

A. The active spread of infection

B. The recovery phase after infection

C. The initial phase with mild symptoms

D. The stage after full symptom resolution

10. How does the dose profile compare to the slice sensitivity profile in CT scans?

A. Narrower

B. Wider

C. Equal

D. Inversely proportional

Answers

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

Explanations

1. What is the definition of dysphagia?

A. Difficulties in breathing

B. Difficulties in swallowing

C. Difficulties in speaking

D. Difficulties in digestion

Dysphagia specifically refers to difficulties in swallowing, which can be caused by various underlying medical conditions affecting the esophagus, throat, or muscles associated with swallowing. This condition can manifest as pain during swallowing, the sensation that food is stuck in the throat or chest, or even the inability to swallow at all. Understanding this definition is crucial, especially in the medical and imaging fields, as it aids in identifying patients who may need specific interventions or diagnostic evaluations related to their swallowing function. Identifying dysphagia is essential for ensuring proper nutrition and preventing complications such as aspiration pneumonia or malnutrition.

2. What is the typical adult pulse rate range?

A. 50-75 bpm

B. 60-100 bpm

C. 70-110 bpm

D. 80-120 bpm

The typical adult pulse rate range is generally accepted to be 60 to 100 beats per minute (bpm). This range is considered normal for most adults at rest. Factors such as age, fitness level, and health can influence an individual's resting heart rate, making it essential to understand that while some may have rates slightly outside this range and still be considered normal, the standard medical guideline places the average within these limits. It is important for professionals in the medical field to be aware of this standard range, as deviations could indicate underlying health issues that may require further investigation.

3. During which phase do parenchymal lesions become apparent in kidney contrast enhancement?

A. Corticomedullary phase

B. Nephrographic phase

C. Excretory phase

D. Delayed phase

The nephrographic phase is when parenchymal lesions in the kidney become apparent due to optimal contrast enhancement of the renal cortex and medulla. During this phase, there is peak enhancement of kidney tissue because the contrast material has been absorbed by the renal parenchyma, allowing for better visualization of abnormalities such as tumors, cysts, or areas of ischemia. In the corticomedullary phase, the contrast is primarily present in the renal arteries and the outer cortex, and while some early lesions may be identified, they are usually not fully appreciated until the nephrographic phase, which occurs shortly after. The excretory phase occurs later when the contrast begins to clear from the renal parenchyma and enters the collecting system. In this phase, kidney lesions may still be visible, but the clarity of the lesion appearance decreases as the contrast diminishes in the renal tissue. The delayed phase occurs even later when the contrast opacification of the kidney has largely dissipated, making it less effective for assessing parenchymal lesions. Thus, the nephrographic phase is specifically the optimal time for identifying these lesions due to its peak contrast enhancement in the renal parenchyma.

4. What range of mOsm/kg of water is characteristic of high-osmolar contrast?

A. 100-500

B. 500-1000

C. 1000-2400

D. 2400-3000

High-osmolar contrast agents are characterized by a higher concentration of osmotically active particles per kilogram of water, which can lead to increased osmolarity. The range for high-osmolar contrast is typically 1000-2400 mOsm/kg of water. This high osmolarity can result in higher viscosity and can impact the body's fluid balance, potentially leading to adverse effects when used in certain patient populations. In contrast, other types of contrast agents, such as low-osmolar contrasts, generally fall into a lower osmolarity range, which tends to be less irritating and associated with fewer side effects. Understanding the specific osmolarity of contrast agents is crucial for healthcare professionals as it influences patient safety, the risk of adverse reactions, and the choice of contrast media in imaging studies.

5. How much greater in HU is a normal liver compared to the spleen?

A. 10

B. 5

C. 15

D. 20

In computed tomography (CT), Hounsfield Units (HU) are used to quantify radiodensity, allowing for the differentiation of various tissues based on their composition and density. In this context, the normal liver typically has a higher attenuation coefficient than the spleen due to its different cellular structure and composition. Normal liver tissue generally has an HU value that ranges from approximately 50 to 70, while the spleen ranges from approximately 40 to 60 HU. This indicates that the liver is denser than the spleen, contributing to a noticeable difference in their HU values. Taking an average value, it is commonly accepted that the liver is around 10 HU greater than the spleen. The correct choice here reflects this established difference. Understanding this relationship is crucial for radiologic interpretation, particularly in assessing hepatic conditions where the density of liver tissue may be altered compared to adjacent structures like the spleen.

6. Which of the following effects can saline flush have following iodinated contrast administration?

A. Increased allergies to contrast

B. Increased incidence of CIN

C. Reduction of streaking artifacts

D. Enhanced visualization of anatomy

The saline flush following iodinated contrast administration is particularly beneficial in reducing streaking artifacts. Streaking artifacts often arise when concentrated iodinated contrast creates high-contrast differences within the images, leading to visual discrepancies that can obscure diagnostic information. By performing a saline flush, the post-contrast phase is optimized, as it helps to dilute the iodinated contrast that might remain in the vessels or surrounding tissues. This dilution can improve the uniformity of the imaging data and aid in reducing the streaks seen on the reconstructed images, ultimately resulting in clearer and more interpretable CT scans. Additionally, saline flush can help in pushing residual contrast outside of the imaging field, thereby enhancing the quality of the images. The improved imaging quality allows for better visualization of the anatomical structures being examined, which can significantly assist clinicians in accurate diagnoses and treatment planning.

7. Which condition is NOT considered a risk factor for contrast-induced nephrotoxicity (CIN)?

A. Diabetes

B. Myeloma

C. Cardiac disease

D. Healthy kidney function

Contrast-induced nephrotoxicity (CIN) is a condition that can arise when a contrast agent is administered, leading to potential deterioration of kidney function. Understanding the risk factors associated with CIN is crucial for preventing this complication. Individuals with diabetes, myeloma, or cardiac disease are all at an elevated risk for developing CIN due to existing renal vulnerabilities. Diabetes can lead to diabetic nephropathy, a common complication that affects kidney function, making those with the disease more susceptible to CIN. Myeloma, particularly multiple myeloma, involves abnormal proteins that can cause renal impairment and enhance the effects of contrast agents. Patients with cardiac disease often have underlying conditions affecting renal perfusion and function, thereby increasing their risk as well. In contrast, individuals with healthy kidney function typically do not present the same risk factors that predispose them to contrast-induced nephrotoxicity. Healthy kidneys are better equipped to handle the excretion of contrast agents. Thus, having intact renal function serves as a protective factor against CIN, as the kidneys can effectively manage the potentially harmful effects of the contrast media.

8. A Stanford type B dissecting aneurysm primarily affects which part of the aorta?

A. Ascending aorta

B. Thoracic aorta

C. Descending aorta

D. Abdominal aorta

A Stanford type B dissecting aneurysm specifically affects the descending aorta. This type of dissection originates after the left subclavian artery and continues down the length of the aorta. The dissection typically occurs in the thoracic region but is primarily characterized by involvement of the descending aorta, which distinguishes it from type A dissections that involve the ascending aorta as well. Understanding the anatomy and implications of a type B dissection is crucial, as it informs the management and treatment options. Unlike type A, which is often considered a surgical emergency, type B dissections may be managed conservatively with medication unless complications arise, highlighting the importance of accurate identification of the affected aortic segment.

9. What is the prodromal stage of infection?

A. The active spread of infection

B. The recovery phase after infection

C. The initial phase with mild symptoms

D. The stage after full symptom resolution

The prodromal stage of infection refers to the initial phase where symptoms first begin to appear but are typically mild and nonspecific. During this stage, an individual may feel unwell and experience general symptoms such as fatigue, malaise, or low-grade fever, but the specific disease may not yet be identifiable. This phase is crucial as it marks the transition from health to illness, and understanding it can help in the early detection and management of infections. Identifying the prodromal stage can be particularly important in clinical settings, as it may prompt further investigation or preventive measures to control the spread of the infection.

10. How does the dose profile compare to the slice sensitivity profile in CT scans?

A. Narrower

B. Wider

C. Equal

D. Inversely proportional

The dose profile in CT scans is typically wider than the slice sensitivity profile. The dose profile represents the distribution of radiation dose delivered to the patient during a scan, which extends over a broader area to ensure adequate imaging of the anatomy being examined. This broader profile accounts for the inherent characteristics of the X-ray beam and the geometry of the CT acquisition process, which distributes dose over multiple slices to prevent underexposure of the structures of interest. In contrast, the slice sensitivity profile indicates the sensitivity of the detector to radiation and describes how well a particular slice of anatomy can be imaged. This profile is generally narrower because it reflects the specific anatomical area being targeted for imaging and how effectively the detector can capture that data without including adjacent structures. Thus, the relationship between the dose profile and slice sensitivity profile is that the dose profile is wider to ensure a thorough coverage of tissue, while the slice sensitivity profile focuses on the resolution and clarity of the particular slice being imaged. This distinction is crucial for understanding how CT scans balance radiation dose with image quality.

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://nmtcbctboard.examzify.com

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