THERAPY RADIOPHARMACEUTICALS PRACTICE TEST (SAMPLE)

STUDY GUIDE

SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

https://therapyradiopharmaceuticals.examzify.com

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. In PRRT planning, Ga-68 DOTATATE imaging guides decisions by indicating which of the following?

A. Measurement of glucose metabolism

B. Echocardiographic data

C. Presence and extent of somatostatin receptor expression, uptake intensity, lesion distribution; helps select patients likely to respond.

D. Size-only measurement of lesions

2. Which brand names are associated with Y-90 microspheres?

A. Sir-Spheres and Thera-Spheres

B. Sir-Spheres

C. Thera-Spheres

D. Zevalin

3. I-131 mode of decay?

A. Alpha decay

B. Beta positive

C. Beta negative and gamma

D. Electron capture

4. Which of the following is NOT part of Sr-89 chloride normal biodistribution?

A. Bone surface

B. Bone marrow

C. Lower GI

D. Liver

5. For Ra-223 dichloride, which organ receives the highest radiation dose?

A. Bone surface

B. Liver

C. Kidney

D. Bone marrow

6. Lu-177 emissions include which type?

A. Alpha particles

B. Beta positive

C. Beta negative and gamma

D. Gamma rays only

7. Which isotope is a pure beta emitter with no significant gamma emission and is used in liver-directed therapies such as radioembolization?

A. Lutetium-177.

B. Yttrium-90.

C. Strontium-89.

D. Samarium-153.

8. Under what condition would the bladder receive the highest dose in I-131 therapy?

A. When thyroid absent

B. During dehydration

C. When thyroid present

D. During exercise

9. What is the half-life of Y-90 microspheres?

A. 24 hours

B. 64 hours

C. 8 days

D. 100 hours

10. How do dose strategies differ between I-131 hyperthyroidism treatment and I-131 thyroid remnant ablation after thyroidectomy?

A. Hyperthyroidism uses higher doses than remnant ablation.

B. Hyperthyroidism uses gamma-only dosing; remnant ablation uses alpha therapy.

C. Both use the same dosing.

D. Hyperthyroidism uses moderate doses (~5-30 mCi) to ablate hyperactive tissue; remnant ablation uses higher activities (30-100 mCi) to eliminate residual tissue.

Answers

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

Explanations

1. In PRRT planning, Ga-68 DOTATATE imaging guides decisions by indicating which of the following?

A. Measurement of glucose metabolism

B. Echocardiographic data

C. Presence and extent of somatostatin receptor expression, uptake intensity, lesion distribution; helps select patients likely to respond.

D. Size-only measurement of lesions

Ga-68 DOTATATE PET imaging reveals where somatostatin receptors are expressed, how strongly they are expressed (uptake intensity), and how the disease is distributed. This directly guides PRRT planning because the radiopharmaceuticals used in PRRT target those same receptors. If tumors show receptor expression and significant uptake, PRRT is more likely to accumulate in tumors and deliver effective radiation, making the patient a good candidate and helping plan the extent of treatment. Imaging also shows the overall lesion distribution, which informs which sites may require attention and helps in dose planning. In contrast, glucose metabolism imaging reflects metabolic activity and does not indicate receptor presence, so it doesn't directly inform PRRT suitability. Evaluating lesions by size alone ignores the essential receptor biology that PRRT relies on, so it's not sufficient for guiding therapy.

2. Which brand names are associated with Y-90 microspheres?

A. Sir-Spheres and Thera-Spheres

B. Sir-Spheres

C. Thera-Spheres

D. Zevalin

The concept here is that Y-90 microspheres used for targeted liver therapy come under two well-known brand names: SIR-Spheres and TheraSphere. SIR-Spheres are resin-based microspheres, while TheraSphere are glass-based microspheres. Both are delivered via the hepatic artery to lodge in tumor vessels and deliver localized beta radiation, but they come from different manufacturers and have different physical forms. Zevalin, by contrast, is a Y-90 radiolabeled antibody used for lymphoma, not a microsphere, so it isn't a brand name for Y-90 microspheres.

3. I-131 mode of decay?

A. Alpha decay

B. Beta positive

C. Beta negative and gamma

D. Electron capture

I-131 decays by beta minus emission to xenon-131, and the daughter nucleus emits gamma radiation as it de-excites. In this process, a neutron in I-131 converts to a proton, increasing the atomic number by 1 (Iodine, Z = 53, becomes Xenon, Z = 54) while the mass number stays at 131. The resulting xenon-131 is typically left in an excited state and releases a gamma photon to drop to a lower energy state, which is why gamma emission accompanies the beta particle. This combination—beta minus decay followed by gamma emission—is characteristic of I-131 and is what the answer reflects. Other decay modes, such as alpha decay, beta plus emission, or electron capture, do not describe this isotope's typical decay path.

4. Which of the following is NOT part of Sr-89 chloride normal biodistribution?

A. Bone surface

B. Bone marrow

C. Lower GI

D. Liver

Sr-89 chloride behaves like calcium and concentrates in bone mineral, especially on surfaces where new bone is formed. Its normal biodistribution is largely skeletal, with uptake at bone surfaces tied to osteoblastic activity and only minimal soft-tissue involvement. It does not normally accumulate in the liver, so hepatic uptake would indicate an abnormal distribution. Therefore, the liver is not part of Sr-89 chloride's normal biodistribution.

5. For Ra-223 dichloride, which organ receives the highest radiation dose?

A. Bone surface

B. Liver

C. Kidney

D. Bone marrow

Ra-223 dichloride acts like calcium and localizes to bone, especially at sites of active bone formation (osteoblastic remodeling surfaces). Its emissions are alpha particles, which deposit a lot of energy over a very short distance. Because the radiopharmaceutical concentrates at the bone mineral at remodeling surfaces, the energy is deposited most intensely right at the bone surface where those cells are located. Other organs like the liver or kidney don't accumulate Ra-223 to the same extent, and alpha particles don't travel far enough to deliver comparable doses to deeper tissues. Some dose to nearby bone marrow can occur due to proximity, but the highest local dose remains at the bone surface where Ra-223 sits.

6. Lu-177 emissions include which type?

A. Alpha particles

B. Beta positive

C. Beta negative and gamma

D. Gamma rays only

Lu-177 decays by beta minus emission to an excited state of hafnium-177, and that excited nucleus relaxes by emitting gamma rays. So the emissions you'd expect from Lu-177 are a beta minus particle (the therapeutic part) plus gamma photons (used for imaging and verification). Alpha emission isn't part of Lu-177's decay, and positron (beta positive) emission doesn't occur here. Gamma rays alone aren't the only emission because the beta decay happens first and drives the cascade to the gamma emission.

7. Which isotope is a pure beta emitter with no significant gamma emission and is used in liver-directed therapies such as radioembolization?

A. Lutetium-177.

B. Yttrium-90.

C. Strontium-89.

D. Samarium-153.

In liver-directed therapies, the key is delivering radiation locally with beta particles while minimizing exposure from gamma rays to surrounding tissues. Yttrium-90 fits this role because it decays by beta minus to stable zirconium-90 and emits no clinically significant gamma radiation. The beta particles have enough energy to kill tumor cells but a limited range in tissue, which is ideal when delivered as microspheres via the hepatic artery for radioembolization. This combination targets the tumor while reducing dose to the rest of the body and minimizes shielding and imaging challenges associated with gamma emissions. Other options either produce gamma radiation or are used for different indications. For example, isotopes that emit gamma rays enable imaging but also increase whole-body exposure, and those used for non-liver indications (like bone palliation) are not suitable for liver-directed therapy.

8. Under what condition would the bladder receive the highest dose in I-131 therapy?

A. When thyroid absent

B. During dehydration

C. When thyroid present

D. During exercise

The bladder dose from I-131 therapy mainly comes from the radioactivity that's excreted in urine. If the thyroid tissue is absent, there's nothing to take up iodine, so most of the administered I-131 stays in the bloodstream and is cleared by the kidneys into the urine. This increases the amount of radioactive material passing through the bladder, delivering the highest dose to the bladder. When the thyroid is present, it sequesters a portion of the iodine, reducing how much is excreted in urine and thereby lowering bladder dose. Hydration or dehydration can influence urine volume and concentration, but the absence of thyroid uptake is the primary factor that maximizes bladder exposure.

9. What is the half-life of Y-90 microspheres?

A. 24 hours

B. 64 hours

C. 8 days

D. 100 hours

Half-life is the time it takes for radioactivity to fall to half of its initial value. Yttrium-90 microspheres have a half-life of about 64 hours, so the activity decreases by half roughly every 2.7 days. This value guides how the dose rate changes over time and informs planning for therapy and follow-up. The other timeframes (24 hours, 8 days, 100 hours) do not match the established half-life of Y-90, making 64 hours the correct value.

10. How do dose strategies differ between I-131 hyperthyroidism treatment and I-131 thyroid remnant ablation after thyroidectomy?

A. Hyperthyroidism uses higher doses than remnant ablation.

B. Hyperthyroidism uses gamma-only dosing; remnant ablation uses alpha therapy.

C. Both use the same dosing.

D. Hyperthyroidism uses moderate doses (~5-30 mCi) to ablate hyperactive tissue; remnant ablation uses higher activities (30-100 mCi) to eliminate residual tissue.

The main idea is that the dose is tailored to the therapeutic goal. For treating hyperthyroidism with I-131, the aim is to suppress the diffuse overactive thyroid by destroying enough tissue to reduce function, but not necessarily to remove all thyroid tissue. This means a moderate dose is used, typically in the range of about 5 to 30 mCi, to achieve control of hyperactivity while limiting unnecessary radiation exposure. After thyroidectomy for thyroid cancer, the objective shifts to eliminating residual thyroid tissue in the neck to enable reliable surveillance (like thyroglobulin monitoring) and reduce recurrence risk. To accomplish near-complete ablation of remnant tissue, higher activities are used, commonly in the range of 30 to 100 mCi. I-131 therapy works primarily through beta radiation to destroy tissue, while gamma radiation is emitted mainly for imaging and dosimetry; alpha therapy is not part of standard I-131 thyroid disease treatments, so the idea of gamma-only dosing or alpha therapy doesn't fit. So the correct concept is that hyperthyroidism uses moderate doses to suppress hyperactive tissue, whereas remnant ablation uses higher doses to eradicate residual tissue after surgery.

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://therapyradiopharmaceuticals.examzify.com

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