Electrotherapy US 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. The ERA is determined by the

A. The outer boundary of the transducer

B. The depth of tissue penetration

C. The maximum power setting on the unit

D. Diameter of the crystal in the transducer

2. For neck pain with mobility deficits, which ultrasound approach is supported in chronic cases?

A. Pulsed US

B. High-power continuous US

C. Ultrasound is not recommended

D. Pulsed or high-power US

3. Which ultrasound parameter set is recommended for adhesive capsulitis?

A. 10 minutes at 3 MHz and 1.5 W/cm2

B. 5 minutes at 1 MHz and 0.5 W/cm2

C. 20 minutes at 5 MHz and 0.8 W/cm2

D. 15 minutes at 1 MHz and 2.0 W/cm2

4. Which parameter primarily determines depth of penetration in ultrasound?

A. ERA

B. Frequency

C. Time

D. Power

5. What does frequency determine?

A. Depth of penetration

B. Beam width

C. Acoustic impedance

D. Tissue perfusion

6. If the Spatial Peak Intensity equals the Spatial Average Intensity, what is the Beam Nonuniformity Ratio (BNR)?

A. 2

B. 0

C. 1

D. Undefined

7. Which is a non-thermal indication for ultrasound?

A. Facilitate tissue healing

B. Open wounds

C. Fractures

D. Acute nerve injury

8. For heating a superficial tendon, which parameter set is correct?

A. 1 MHz, 1.0 W/cm2, 10 min

B. 3 MHz, 0.2-0.4 W/cm2, 2 min

C. 5 MHz, 0.5 W/cm2, 6 min

D. 3 MHz, 0.8-1 W/cm2, 4-5 min

9. Tissues absorb US delivered at 3 MHz at a rate 3x faster than 1 MHz US

A. slower

B. the same

C. faster

D. unpredictable

10. Which combination best describes typical LIPUS parameters?

A. intensity <0.1 W/cm2; 20% duty cycle; 20 min daily

B. intensity >0.5 W/cm2; 50% duty cycle; 60 min daily

C. intensity <0.1 W/cm2; 50% duty cycle; 10 min daily

D. intensity >1 W/cm2; 20% duty cycle; 20 min daily

Answers

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

Explanations

1. The ERA is determined by the

A. The outer boundary of the transducer

B. The depth of tissue penetration

C. The maximum power setting on the unit

D. Diameter of the crystal in the transducer

ERA is the portion of the transducer surface that actually emits ultrasound energy. It is set by the crystal's size—the diameter of the crystal determines the effective radiating area. This radiating surface is used to calculate intensity (I = power divided by ERA), so a larger crystal increases ERA and changes the delivered intensity for the same power. The outer boundary of the transducer isn't the radiating area, the depth of tissue penetration is determined by frequency and tissue properties rather than ERA, and the maximum power setting affects total energy, not the actual radiating surface.

2. For neck pain with mobility deficits, which ultrasound approach is supported in chronic cases?

A. Pulsed US

B. High-power continuous US

C. Ultrasound is not recommended

D. Pulsed or high-power US

In chronic neck pain with mobility deficits, ultrasound therapy can be beneficial using either pulsed or high-power continuous modes because each mode targets a different tissue response that can support recovery and function. Pulsed ultrasound provides non-thermal effects—like microstreaming and cavitation—that help promote tissue healing and reduce inflammatory irritability without significant heating. This can be advantageous when the goal is to facilitate repair and decrease tenderness in a chronic condition. High-power continuous ultrasound, by contrast, delivers thermal effects that raise tissue temperature, which can increase collagen extensibility, reduce muscle spindle activity, and improve range of motion. When stiffness and limited mobility are driving the symptoms, the heating effect can be particularly helpful. Since chronic neck pain with mobility deficits can benefit from either healing-oriented (pulsed) or mobility-enhancing (continuous) ultrasound, both approaches have clinical support. Therefore, the best answer is that either pulsed or high-power continuous ultrasound can be appropriate. Always apply with appropriate dose, duration, and patient monitoring to ensure safety.

3. Which ultrasound parameter set is recommended for adhesive capsulitis?

A. 10 minutes at 3 MHz and 1.5 W/cm2

B. 5 minutes at 1 MHz and 0.5 W/cm2

C. 20 minutes at 5 MHz and 0.8 W/cm2

D. 15 minutes at 1 MHz and 2.0 W/cm2

The best ultrasound set for adhesive capsulitis targets heating of the superficial tissues around the shoulder capsule to improve tissue extensibility and reduce stiffness. A higher frequency like 3 MHz heats more superficially, which suits the shoulder area where the capsule and nearby tissues are relatively close to the surface. Ten minutes at an intensity of 1.5 W/cm2 provides enough energy to raise tissue temperature to a therapeutic level without excessive heating. Other options would either risk insufficient heating (lower frequency at a shallower depth or lower intensity), heat too superficially or for too long (very high frequency with excessive duration), or use a combination that isn't optimal for warming the shoulder capsule. This set strikes a practical balance to promote mobility and pain relief in adhesive capsulitis.

4. Which parameter primarily determines depth of penetration in ultrasound?

A. ERA

B. Frequency

C. Time

D. Power

Penetration depth with ultrasound is governed by the frequency. Lower frequencies travel farther because they're less rapidly attenuated by tissue, so energy reaches deeper structures. Higher frequencies are absorbed more quickly and don't penetrate as deeply, though they offer better surface resolution. That's why deeper targets are treated with about 1 MHz, while superficial targets use around 3 MHz. The other parameters—ERA, time, and power—affect the area covered, duration of exposure, and heating intensity, but they don't set how deep the ultrasound goes.

5. What does frequency determine?

A. Depth of penetration

B. Beam width

C. Acoustic impedance

D. Tissue perfusion

The main idea is that frequency sets how deeply ultrasound can travel before it gets attenuated. Higher frequencies attenuate more quickly in tissue, so they don't reach as far, giving better resolution up close but shallower penetration. Lower frequencies travel farther because they attenuate more slowly, though with lower resolution. So frequency largely determines how deep the ultrasound can image. Beam width depends mainly on the transducer's aperture and focusing, not frequency alone. Acoustic impedance is a property of the tissue (density times sound speed) and doesn't change with frequency. Tissue perfusion is about blood flow and physiology, not the frequency of the ultrasound.

6. If the Spatial Peak Intensity equals the Spatial Average Intensity, what is the Beam Nonuniformity Ratio (BNR)?

A. 2

B. 0

C. 1

D. Undefined

BNR is the ratio of the brightest point in the beam to the average intensity across the beam cross-section, defined as SPI divided by SAI. When the Spatial Peak Intensity equals the Spatial Average Intensity, the ratio becomes 1, meaning the beam is perfectly uniform in intensity across its cross-section. For example, if every point across the beam has the same intensity, say 2 W/cm^2, then SPI is 2 and SAI is 2, giving BNR = 1. In real ultrasound beams, some nonuniformity usually exists, so SPI is greater than SAI and BNR is greater than 1.

7. Which is a non-thermal indication for ultrasound?

A. Facilitate tissue healing

B. Open wounds

C. Fractures

D. Acute nerve injury

Non-thermal ultrasound works by mechanical energy delivered in pulsed mode to stimulate biological processes involved in repair without raising tissue temperature. The energy causes micro-streaming and stable cavitation at the cellular level, which enhances cell membrane permeability and triggers healing pathways. This is why the best indication is to facilitate tissue healing—promoting repair in soft tissues, wounds, and postoperative healing without relying on warming the tissue. Other conditions listed are not the primary non-thermal indications in general practice. Fracture healing and acute nerve injuries have more specific or limited indications, and open wounds, while related to healing, are not the general non-thermal concept itself.

8. For heating a superficial tendon, which parameter set is correct?

A. 1 MHz, 1.0 W/cm2, 10 min

B. 3 MHz, 0.2-0.4 W/cm2, 2 min

C. 5 MHz, 0.5 W/cm2, 6 min

D. 3 MHz, 0.8-1 W/cm2, 4-5 min

For heating a superficial tendon, you want energy that is absorbed primarily in the near-surface tissues, with enough intensity to raise the temperature to a therapeutic level and for a duration long enough to achieve that effect without overheating deeper structures. A frequency of 3 MHz targets the superficial layers well, since higher frequencies deposit more energy near the surface than lower frequencies. An intensity around 0.8–1.0 W/cm2 provides a sufficient thermal dose to produce meaningful warming in short sessions, and a treatment time of about 4–5 minutes is typically enough to reach the desired temperature rise in superficial tissues. The other options either use a frequency that would heat deeper tissues or an intensity/duration that isn't sufficient to achieve the thermal effect on a superficial tendon. Therefore, the combination of 3 MHz, 0.8–1 W/cm2, for 4–5 minutes is the best fit for heating a superficial tendon.

9. Tissues absorb US delivered at 3 MHz at a rate 3x faster than 1 MHz US

A. slower

B. the same

C. faster

D. unpredictable

When frequency rises, tissue attenuates and absorbs energy more rapidly. In soft tissue, the attenuation coefficient increases with frequency, so a 3 MHz wave loses energy per unit depth faster than a 1 MHz wave. This means the rate at which tissue absorbs energy—and thus heats up—is higher at 3 MHz, approximately three times greater if other factors are equal. The side effect is shallower penetration, but the heating occurs more quickly near the surface. So the correct idea is that the tissue absorbs the energy faster at 3 MHz.

10. Which combination best describes typical LIPUS parameters?

A. intensity <0.1 W/cm2; 20% duty cycle; 20 min daily

B. intensity >0.5 W/cm2; 50% duty cycle; 60 min daily

C. intensity <0.1 W/cm2; 50% duty cycle; 10 min daily

D. intensity >1 W/cm2; 20% duty cycle; 20 min daily

Low-intensity pulsed ultrasound delivers energy in very small bursts to stimulate tissue without causing heating. The typical LIPUS protocol uses a low intensity, a low duty cycle, and a short daily duration to achieve non-thermal mechanical effects that support healing. An intensity under 0.1 W/cm2 keeps energy in a safe, non-thermal range. A duty cycle around 20% means the ultrasound is on only part of the time, preserving the non-thermal nature while still providing stimulation. About 20 minutes per day offers enough exposure to trigger cellular responses without excessive energy delivery. The other options push intensity higher or extend treatment time or duty cycle, which deviates from standard LIPUS practice and increases heating risk or duration beyond typical protocols.

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://electrotherapyus.examzify.com

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