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. Which of the following is NOT a LIPUS parameter?

A. intensity <0.1 W/cm2

B. 20% duty cycle

C. 20 minutes daily

D. frequency 2 MHz

3. Which of the following is NOT a typical use of moderate heating?

A. Chronic inflammation

B. Pain relief

C. Myofascial trigger point

D. Acute infection

4. Cavitation in ultrasound therapy results in which of the following?

A. Expansion and compression of gas or vapor filled cavities (gas bubbles)

B. Decrease in membrane permeability

C. No effect on membranes

D. Decreases healing

5. If the ultrasound intensity is set to 1.0 W/cm2 and the BNR is 5:1, what is the peak intensity (SPI)?

A. 5.0 W/cm2

B. 1.0 W/cm2

C. 2.0 W/cm2

D. 0.2 W/cm2

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

A. ERA

B. Frequency

C. Time

D. Power

7. What is the effect of mild heating on tissue metabolism?

A. Accelerates metabolic tissue rate

B. Slows metabolic rate

C. No change in tissue metabolism

D. Decreases blood flow

8. What are the optimal dose parameters for heating a deep muscle?

A. 1 MHz, 1.5 W/cm2, 14 min

B. 3 MHz, 1.0 W/cm2, 8 min

C. 1 MHz, 0.5 W/cm2, 5 min

D. 2 MHz, 2.0 W/cm2, 10 min

9. MIST therapy is delivered by which method?

A. Direct contact high frequency US through a gel pad

B. Non-contact low frequency US (30-40 kHz) delivered through a saline mist to stimulate cells in and under the wound bed

C. Laser-assisted thermal therapy through saline spray

D. Standard acoustic US with direct skin contact

10. In hip osteoarthritis, ultrasound therapy is recommended with which dose and region coverage?

A. 1 MHz at 1 W/cm2 for 5 minutes each to anterior, lateral, and posterior hip

B. 3 MHz at 0.5 W/cm2 for 10 minutes to the hip joint

C. 1 MHz at 2 W/cm2 for 3 minutes to medial hip

D. 3 MHz at 1 W/cm2 for 10 minutes to entire hip region

Answers

1. D
2. D
3. D
4. A
5. A
6. B
7. A
8. A
9. B
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. Which of the following is NOT a LIPUS parameter?

A. intensity <0.1 W/cm2

B. 20% duty cycle

C. 20 minutes daily

D. frequency 2 MHz

Low-intensity pulsed ultrasound settings are defined by how much energy is delivered, how that energy is pulsed, how long each session lasts, and the frequency used to generate the waves. For LIPUS, the energy is low to avoid heating, it's delivered in short bursts (a low duty cycle), sessions are typically around 20 minutes each day, and the frequency is chosen to suit the typical depth of the target tissue. The intensity being less than 0.1 W/cm2 fits the low-energy approach used in LIPUS. A 20% duty cycle means the ultrasound is on only a portion of the time, which maintains low average energy and reduces heating while still delivering the therapeutic effect. A 20-minute daily duration aligns with common treatment guidelines to provide sufficient cumulative energy over time for bone healing. Frequency, however, is not aligned with standard LIPUS practice when set to 2 MHz. LIPUS devices commonly use about 1.5 MHz (with some variation around that value), chosen to penetrate to the bone tissue adequately without excessive attenuation. Using 2 MHz is not a typical or recommended LIPUS parameter, so that option is not a standard setting for this therapy.

3. Which of the following is NOT a typical use of moderate heating?

A. Chronic inflammation

B. Pain relief

C. Myofascial trigger point

D. Acute infection

Moderate heating is used to raise tissue temperature to improve muscle elasticity, increase blood flow, and reduce muscle guarding, which helps with pain relief and range of motion. This makes it a common choice for chronic inflammation and for easing tight muscles or myofascial trigger points, where warming the area facilitates relaxation and a more effective response to therapy. It is not typical to use heat when an acute infection is present, because increasing temperature and circulation can amplify inflammation and may worsen the infection; in acute infections, cooling or other modalities are preferred until the infection subsides.

4. Cavitation in ultrasound therapy results in which of the following?

A. Expansion and compression of gas or vapor filled cavities (gas bubbles)

B. Decrease in membrane permeability

C. No effect on membranes

D. Decreases healing

Cavitation in ultrasound therapy refers to the behavior of gas or vapor-filled bubbles in tissue when exposed to the alternating pressure of the sound waves. As the waves cycle, bubbles respond by expanding during the low-pressure phase and contracting during the high-pressure phase. In some cases, these bubbles can even collapse violently. This expansion and compression of gas-filled cavities is the defining feature of cavitation and drives the mechanical effects seen in tissues, such as microstreaming and localized stresses. These bubble dynamics can increase membrane permeability and influence interactions at the cellular level, which is why cavitation is leveraged to enhance therapeutic effects like drug delivery or tissue modification. It does not imply a universal decrease in permeability, no effect on membranes, or a blanket decrease in healing; instead, the mechanical activity of the bubbles is what mediates these tissue interactions.

5. If the ultrasound intensity is set to 1.0 W/cm2 and the BNR is 5:1, what is the peak intensity (SPI)?

A. 5.0 W/cm2

B. 1.0 W/cm2

C. 2.0 W/cm2

D. 0.2 W/cm2

The beam nonuniformity ratio (BNR) tells you how much the peak intensity (SPI) can exceed the average intensity (SAI) across the beam. By definition, BNR = SPI / SAI. If the machine is set to 1.0 W/cm^2 and the BNR is 5:1, then the peak intensity is 5 times the average: SPI = 5 × 1.0 = 5.0 W/cm^2. So the highest instantaneous intensity in the beam is 5.0 W/cm^2.

6. 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.

7. What is the effect of mild heating on tissue metabolism?

A. Accelerates metabolic tissue rate

B. Slows metabolic rate

C. No change in tissue metabolism

D. Decreases blood flow

Mild heating raises tissue temperature, which speeds up biochemical reactions inside cells. Enzymes work more efficiently as temperature increases, so metabolic processes occur faster. This increased enzymatic activity means higher oxygen use and energy demand in the tissue, effectively accelerating the metabolic rate. That's why the best choice describes metabolism as accelerated. The idea that metabolism slows, doesn't change, or that blood flow decreases doesn't fit the typical metabolic response to mild heating—although heating can increase blood flow, the core effect on metabolism is the faster rate.

8. What are the optimal dose parameters for heating a deep muscle?

A. 1 MHz, 1.5 W/cm2, 14 min

B. 3 MHz, 1.0 W/cm2, 8 min

C. 1 MHz, 0.5 W/cm2, 5 min

D. 2 MHz, 2.0 W/cm2, 10 min

The main idea is that depth of heating with therapeutic ultrasound is governed by frequency: lower frequencies penetrate deeper, so to heat a deep muscle you want a setting that uses a lower frequency rather than a higher one. Among the options, the 1 MHz setting is the only one that reaches deep tissue effectively. Pairing that with a moderate intensity of 1.5 W/cm2 provides enough energy to raise the temperature of deeper muscles, and a treatment duration of about 14 minutes delivers sufficient total energy without overstressing tissues. The other choices mix frequency and intensity in ways that reduce deep heating. A higher frequency (3 MHz or 2 MHz) heats superficially and doesn't reach deep muscle as well. A lower intensity at 1 MHz may not produce the desired heating in deep tissue within a practical time frame, and a high intensity at 2 MHz, while energetic, concentrates heat more superficially and isn't as efficient for deep targets.

9. MIST therapy is delivered by which method?

A. Direct contact high frequency US through a gel pad

B. Non-contact low frequency US (30-40 kHz) delivered through a saline mist to stimulate cells in and under the wound bed

C. Laser-assisted thermal therapy through saline spray

D. Standard acoustic US with direct skin contact

MIST therapy delivers ultrasound energy in a non-contact way, using a fine saline mist as the coupling medium to carry low-frequency energy to the wound bed. The energy is typically around 30–40 kHz and is applied without touching the wound, so it mechanically stimulates cells in and underneath the wound bed without the heating or direct contact associated with conventional ultrasound. This non-contact, low-frequency approach helps promote cellular activity, granulation, and healing while minimizing disruption of the wound surface. That's why this option is the best fit: it describes non-contact delivery through a saline mist at a low frequency, rather than direct-contact high-frequency ultrasound, laser-based therapy, or standard contact ultrasound.

10. In hip osteoarthritis, ultrasound therapy is recommended with which dose and region coverage?

A. 1 MHz at 1 W/cm2 for 5 minutes each to anterior, lateral, and posterior hip

B. 3 MHz at 0.5 W/cm2 for 10 minutes to the hip joint

C. 1 MHz at 2 W/cm2 for 3 minutes to medial hip

D. 3 MHz at 1 W/cm2 for 10 minutes to entire hip region

For hip osteoarthritis, you want ultrasound that heats deeper tissues and covers the whole hip region. Using 1 MHz allows energy to reach the hip joint and surrounding capsule, which are relatively deep structures. A moderate intensity of about 1 W/cm2 provides enough heating to promote tissue extensibility and pain modulation without risking excessive heating on a large joint. Treating multiple regions—the anterior, lateral, and posterior aspects—ensures the entire hip area is covered, rather than focusing on a single spot, which helps address the joint and surrounding soft tissues comprehensively. A duration of around 5 minutes per region is typical for achieving therapeutic heating without overdoing it. The other options are less effective because 3 MHz delivers energy too shallow for the deep hip joint, 0.5 W/cm2 may be insufficient for meaningful heating in OA, targeting only the medial hip misses other important areas, and treating the entire hip with a shallow frequency still wouldn't consistently reach the joint depth or energy distribution needed.

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!