ELECTROTHERAPY US PRACTICE TEST (SAMPLE)

STUDY GUIDE

SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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. How is the duty cycle defined in therapeutic ultrasound?

A. on time/total time (%)

B. peak intensity

C. frequency of pulses

D. duration of treatment

2. The primary energy conversion in the piezoelectric crystal is from electrical energy to

A. Sound waves

B. Magnetic energy

C. Chemical energy

D. Electrical energy

3. Which element pertains to expected outcomes in a dosimetric plan?

A. Electrode placement

B. Treatment duration

C. Modality choice

D. Expected outcomes

4. 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

5. 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

6. Which waveform reverses direction sinusoidally?

A. Direct current (DC) reverses direction sinusoidally.

B. Alternating current (AC) reverses direction sinusoidally.

C. Pulsed current delivers current in bursts with off-times.

D. Mixed waveform alternates amplitude with zero crossing.

7. Which parameter is used to heat a deep tendon?

A. 1 MHz at 1.5 W/cm2 for 10 minutes

B. 3 MHz at 1.5 W/cm2 for 4 minutes

C. 1 MHz at 0.5 W/cm2 for 12 minutes

D. 1.5 MHz at 1.0 W/cm2 for 6 minutes

8. Interferential current therapy uses two carrier frequencies that intersect. The beat frequency falls in which range to modulate pain?

A. 1-150 Hz range

B. 60-100 Hz range

C. 0-1 Hz range

D. 150-300 Hz range

9. For acute lateral epicondylitis, how would you plan an iontophoresis treatment?

A. Administer a corticosteroid iontophoresis (e.g., dexamethasone) for inflammation, followed by a brief analgesic modality; time and current per device protocol

B. Iontophoresis with distilled water only

C. Use iontophoresis with saline only

D. Apply only a heat pack before iontophoresis

10. What is the recommended approach if a patient has a pacemaker and requires treatment near the chest?

A. Avoid treating the chest region; consider alternate sites or modalities; obtain physician clearance and monitor if exposure is necessary

B. Proceed with treatment at normal chest sites

C. Increase the intensity near chest

D. Use only magnetic therapy near chest

Answers

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

Explanations

1. How is the duty cycle defined in therapeutic ultrasound?

A. on time/total time (%)

B. peak intensity

C. frequency of pulses

D. duration of treatment

In therapeutic ultrasound, the duty cycle tells you how much of each ultrasound cycle is actually delivering energy. It's calculated as on time divided by the total cycle time, and then expressed as a percentage. For example, if the transducer is emitting for 2 milliseconds and then off for 8 milliseconds, one cycle lasts 10 milliseconds, and the duty cycle is 2/10, or 20%. This measure controls heating: lower duty cycles (like 20%) limit heating and emphasize non-thermal, healing effects; higher duty cycles (toward 100% continuous) deliver more energy and increase tissue heating. The other factors—peak intensity, pulse frequency, or total treatment duration—do not define the duty cycle. Continuous emission corresponds to a 100% duty cycle.

2. The primary energy conversion in the piezoelectric crystal is from electrical energy to

A. Sound waves

B. Magnetic energy

C. Chemical energy

D. Electrical energy

Piezoelectric crystals convert electrical energy into mechanical energy. When an alternating electrical signal is applied, the crystal rapidly deforms, producing mechanical vibrations that travel as sound or ultrasonic waves. This is why the primary energy conversion is electrical energy to mechanical (acoustic) energy. Magnetic energy and chemical energy aren't generated by this effect, and electrical energy is the input, not the output.

3. Which element pertains to expected outcomes in a dosimetric plan?

A. Electrode placement

B. Treatment duration

C. Modality choice

D. Expected outcomes

The main point here is that a dosimetric plan should state what results you expect to achieve and how you'll measure success. Describing the expected outcomes sets the goals of the plan—things like achieving adequate target coverage, meeting dose constraints for healthy tissues, and anticipating tumor response or symptom relief. These anticipated results guide how the dose is prescribed, optimized, and evaluated. The other elements—where electrodes are placed, how long the treatment lasts, or which modality is used—are about how the therapy is delivered. They influence the results, but they don't define the outcomes themselves; they are means to reach those planned results.

4. 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.

5. 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.

6. Which waveform reverses direction sinusoidally?

A. Direct current (DC) reverses direction sinusoidally.

B. Alternating current (AC) reverses direction sinusoidally.

C. Pulsed current delivers current in bursts with off-times.

D. Mixed waveform alternates amplitude with zero crossing.

Reversing direction sinusoidally means the current direction changes smoothly over time in a wave that follows a sine curve. This is a hallmark of alternating current, which periodically reverses direction. In a sinusoidal AC waveform, the current rises to a positive peak, crosses zero, reaches a negative peak, and returns to zero, repeating each cycle. Direct current stays in one direction and does not undergo this kind of smooth reversal. Pulsed current comes in bursts with off-times, so the direction isn't reversing in a continuous sine fashion within a single waveform. A mixed waveform with amplitude changes and zero crossings may cross zero, but its reversal isn't inherently a pure sine reversal. Therefore, the waveform that reverses direction sinusoidally is alternating current.

7. Which parameter is used to heat a deep tendon?

A. 1 MHz at 1.5 W/cm2 for 10 minutes

B. 3 MHz at 1.5 W/cm2 for 4 minutes

C. 1 MHz at 0.5 W/cm2 for 12 minutes

D. 1.5 MHz at 1.0 W/cm2 for 6 minutes

For heating a deep tendon, you want energy to reach deeper tissues, which is best achieved with a lower ultrasound frequency, since lower frequencies penetrate deeper than higher ones. At the same time, you need a sufficient intensity and a long enough treatment duration to raise the tissue temperature in deeper structures. The combination of 1 MHz with 1.5 W/cm2 for about 10 minutes provides sufficient energy and depth of penetration to heat a deep tendon effectively, using a continuous heating approach that targets depth without overdoing surface tissues. The other options either use a higher frequency, which concentrates energy more superficially and won't heat the deep tendon as effectively, or they combine lower intensity or shorter duration with a less optimal depth-to-energy ratio, making them less reliable for achieving the desired deep heating.

8. Interferential current therapy uses two carrier frequencies that intersect. The beat frequency falls in which range to modulate pain?

A. 1-150 Hz range

B. 60-100 Hz range

C. 0-1 Hz range

D. 150-300 Hz range

Interferential current therapy creates a low-frequency beat by the interference of two carrier signals that are close in frequency. The beat frequency is simply the difference between those two carriers, and this low-frequency modulation is what interacts with nerve fibers to relieve pain. To achieve analgesia without causing strong muscle contractions, this beat frequency is kept in a low range, typically about 1 to 150 Hz. Clinically, many practitioners use around 80–100 Hz for acute pain. Frequencies much lower (0–1 Hz) or much higher (150–300 Hz) don't provide the same effective pain modulation through the nerve fibers.

9. For acute lateral epicondylitis, how would you plan an iontophoresis treatment?

A. Administer a corticosteroid iontophoresis (e.g., dexamethasone) for inflammation, followed by a brief analgesic modality; time and current per device protocol

B. Iontophoresis with distilled water only

C. Use iontophoresis with saline only

D. Apply only a heat pack before iontophoresis

In acute lateral epicondylitis, the goal of iontophoresis is to deliver anti-inflammatory medication directly to the inflamed tendon area using electrical current, so you get targeted relief with minimal systemic effects. Using a corticosteroid like dexamethasone phosphate leverages its anti-inflammatory action right at the site of irritation. Because dexamethasone carries a negative charge, you place it under the electrode that matches that charge to drive the medication into the tissue effectively, and you follow the device's recommended time and current settings to ensure safe, sufficient dosing. After delivering the drug, a brief analgesic modality helps control pain and supports comfort as the anti-inflammatory effect begins. Following the device protocol for duration and intensity ensures you don't over- or under-treat. Options that use distilled water or saline alone wouldn't deliver an anti-inflammatory agent, so they don't address the inflammatory process directly. Applying heat beforehand isn't ideal in the acute phase, as it can increase inflammation and edema; the typical approach is to use anti-inflammatory drug delivery with iontophoresis and then apply a modality aimed at relief and tissue recovery within safe, protocol-guided parameters.

10. What is the recommended approach if a patient has a pacemaker and requires treatment near the chest?

A. Avoid treating the chest region; consider alternate sites or modalities; obtain physician clearance and monitor if exposure is necessary

B. Proceed with treatment at normal chest sites

C. Increase the intensity near chest

D. Use only magnetic therapy near chest

When a patient has a pacemaker, any electrical or magnetic energy you apply near the chest can interfere with the device. The safest approach is to avoid the chest region altogether and treat other areas or use modalities that do not transmit energy through the chest. If exposure near the chest is ever considered, you must get clearance from the patient's physician and carefully monitor the patient and the device before, during, and after the treatment. This is best because the pacemaker relies on electrical signals to keep the heart rhythm, and external energy can cause inappropriate sensing or pacing inhibition, potentially leading to symptoms or rhythm changes. By using alternative treatment sites or non-contradicted modalities and ensuring medical oversight, you minimize the risk of device interference. Choosing to proceed at the chest as usual, increasing the intensity near the chest, or relying on magnetic therapy near the chest all carry unnecessary risk of EMI affecting the pacemaker, so they're not appropriate.

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!