

CENTRAL NERVOUS SYSTEM PHARMACOLOGY PRACTICE TEST (SAMPLE) STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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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

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- 1. Which pharmacokinetic property is associated with barbiturates?**
 - A. Induce metabolism of oral contraceptives
 - B. Are substrates of lipase
 - C. Act as competitive antagonists in the liver
 - D. Decrease GABA receptor sensitivity
- 2. What is one of the categories of skeletal muscle relaxants?**
 - A. Nicotinic antagonists
 - B. Beta blockers
 - C. ACE inhibitors
 - D. Calcium channel blockers
- 3. What is the primary mechanism of action of benzodiazepines?**
 - A. Bind to the alpha subunit of GABA(A) complex
 - B. Increase production of serotonin in the brain
 - C. Bind to gamma subunit of GABA(A) complex to increase frequency of Cl⁻ channel opening
 - D. Inhibit the reuptake of norepinephrine
- 4. What is the mechanism of action of local anesthetics?**
 - A. They block potassium channels
 - B. They prevent calcium entry
 - C. They block inactivated Na⁺ channels
 - D. They stimulate nicotinic receptors
- 5. Which of the following is NOT a symptom of opioid withdrawal?**
 - A. Yawning
 - B. Rhinorrhea
 - C. Increased muscle strength
 - D. Salivation

- 6. What is the mechanism of action of monoamine oxidase inhibitors (MAOIs)?**
- A. They enhance enzyme activity
 - B. They inhibit the enzyme monoamine oxidase
 - C. They stimulate neurotransmitter receptors
 - D. They increase dopamine synthesis
- 7. What is the main action of muscle relaxants within the central nervous system?**
- A. They stimulate motor neurons
 - B. They inhibit motor neurons
 - C. They enhance muscle tone
 - D. They block pain receptors
- 8. Which of the following is a characteristic of neostigmine?**
- A. Is a muscle relaxant
 - B. Is an opioid antagonist
 - C. Is an AChE inhibitor
 - D. Is a local anesthetic
- 9. What serious health effect is associated with methanol poisoning?**
- A. Ocular damage
 - B. Cardiac arrest
 - C. Liver failure
 - D. Acute kidney injury
- 10. What condition may occur with sudden discontinuation of major tranquilizers?**
- A. Serotonin syndrome
 - B. Neuroleptic malignant syndrome (NMS)
 - C. Withdrawal syndrome
 - D. Extrapyrarnidal symptoms

Answers

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

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Explanations

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1. Which pharmacokinetic property is associated with barbiturates?

- A. Induce metabolism of oral contraceptives**
- B. Are substrates of lipase
- C. Act as competitive antagonists in the liver
- D. Decrease GABA receptor sensitivity

Barbiturates are known to induce hepatic microsomal enzymes, which leads to an increased metabolism of various drugs, including oral contraceptives. This induction can potentially decrease the effectiveness of oral contraceptives, resulting in unintended pregnancies. The mechanism behind this involves barbiturates enhancing the activity of cytochrome P450 enzymes in the liver, which are responsible for the metabolism of many substances. Therefore, understanding this interaction is crucial in clinical settings, especially for patients taking oral contraceptive medications while being prescribed barbiturates. The other options do not accurately describe the characteristics of barbiturates. For example, barbiturates are not substrates of lipase; instead, they are primarily metabolized in the liver. Additionally, they do not act as competitive antagonists in the liver; rather, they can enhance the effects of certain neurotransmitters like GABA. Lastly, barbiturates actually increase GABA receptor sensitivity rather than decrease it, leading to their sedative and anxiolytic effects.

2. What is one of the categories of skeletal muscle relaxants?

- A. Nicotinic antagonists**
- B. Beta blockers
- C. ACE inhibitors
- D. Calcium channel blockers

Nicotinic antagonists are classified as a category of skeletal muscle relaxants due to their mechanism of action at the neuromuscular junction. They block the activity of nicotinic acetylcholine receptors on muscle cells, preventing acetylcholine from binding and activating the muscle contraction process. This results in reduced muscle tone and relaxation, making them effective in certain clinical scenarios, such as during surgical procedures for intubation or for managing conditions that require muscle relaxation. The other categories mentioned—beta blockers, ACE inhibitors, and calcium channel blockers—impact different physiological systems. Beta blockers primarily influence the cardiovascular system by blocking beta-adrenergic receptors, which helps manage hypertension and arrhythmias. ACE inhibitors are used to lower blood pressure by inhibiting the angiotensin-converting enzyme, thus affecting the renin-angiotensin system. Calcium channel blockers primarily affect muscle contraction in vascular smooth muscle and cardiac muscle through the modulation of calcium entry, but they are not categorized as skeletal muscle relaxants.

3. What is the primary mechanism of action of benzodiazepines?

- A. Bind to the alpha subunit of GABA(A) complex
- B. Increase production of serotonin in the brain
- C. Bind to gamma subunit of GABA(A) complex to increase frequency of Cl⁻ channel opening**
- D. Inhibit the reuptake of norepinephrine

Benzodiazepines primarily act by binding to the gamma subunit of the GABA(A) receptor complex. This binding enhances the effect of GABA, the principal inhibitory neurotransmitter in the brain. When benzodiazepines attach to the gamma subunit, they facilitate the opening of the associated chloride channels more frequently upon GABA binding. This leads to an increased influx of chloride ions into the neuron, resulting in hyperpolarization and decreased neuronal excitability. This mechanism is central to the anxiolytic, sedative, muscle relaxant, anticonvulsant, and amnesic effects of benzodiazepines, making them effective in treating various conditions such as anxiety disorders, insomnia, and seizure disorders.

4. What is the mechanism of action of local anesthetics?

- A. They block potassium channels
- B. They prevent calcium entry
- C. They block inactivated Na⁺ channels**
- D. They stimulate nicotinic receptors

Local anesthetics primarily function by blocking the sodium (Na⁺) channels that are necessary for generating and propagating action potentials in neurons. By inhibiting these channels, local anesthetics effectively prevent the depolarization of the nerve membrane, which is essential for transmitting pain signals to the central nervous system. This action results in a localized loss of sensation in the area where the anesthetic is applied. Blocking inactivated sodium channels is particularly important because when a neuron is stimulated, sodium channels open and allow Na⁺ ions to flow into the cell, leading to depolarization. Local anesthetics stabilize the inactivated state of these channels, making it more difficult for them to reopen, thus interrupting the cycle of depolarization and repolarization that is necessary for the transmission of signals related to pain. The other mechanisms listed are not the primary action of local anesthetics. They do not act by blocking potassium channels or preventing calcium entry, and they certainly do not stimulate nicotinic receptors. Instead, their effect is quite specific to the inhibition of sodium channels, making them effective for preventing nerve signal transmission, particularly for sensory and pain pathways.

5. Which of the following is NOT a symptom of opioid withdrawal?

- A. Yawning
- B. Rhinorrhea
- C. Increased muscle strength**
- D. Salivation

Opioid withdrawal symptoms arise when a person who is dependent on opioids reduces their use or stops taking them altogether. Common symptoms include yawning, rhinorrhea (runny nose), and increased salivation. These symptoms reflect the body's adaptation to the presence of opioids and its response when they are no longer available. Increased muscle strength is not a symptom associated with opioid withdrawal. During withdrawal, individuals typically experience muscle aches, cramps, and overall discomfort, rather than an increase in muscle strength. The physical and psychological distress during withdrawal often leads to decreased physical functioning rather than any enhancement. Recognizing the symptoms associated with opioid withdrawal is crucial for understanding the physiological effects of opioid dependence and the challenges faced during the detoxification process.

6. What is the mechanism of action of monoamine oxidase inhibitors (MAOIs)?

- A. They enhance enzyme activity
- B. They inhibit the enzyme monoamine oxidase**
- C. They stimulate neurotransmitter receptors
- D. They increase dopamine synthesis

Monoamine oxidase inhibitors (MAOIs) work by inhibiting the enzyme monoamine oxidase, which is responsible for the breakdown of monoamine neurotransmitters, including serotonin, norepinephrine, and dopamine. By blocking this enzyme, MAOIs lead to increased levels of these neurotransmitters in the synaptic cleft, thereby enhancing neurotransmission and alleviating symptoms of depression and anxiety. The significance of this mechanism is that it allows the brain to maintain higher concentrations of mood-regulating chemicals, which is particularly beneficial in treating certain mood disorders. Effective treatment often requires a careful balance and understanding of how these neurotransmitters interact, particularly because elevated levels can also lead to side effects or contribute to other health issues if not managed properly. The other options suggest alternative mechanisms that are not accurate representations of how MAOIs function. Enhancing enzyme activity or stimulating neurotransmitter receptors would not provide the intended therapeutic effect seen with MAOIs. Additionally, while increasing dopamine synthesis could theoretically improve symptoms, MAOIs do not directly influence the production of neurotransmitters; rather, they affect their breakdown. Thus, option B correctly describes the unique and important role of MAOIs in pharmacology.

7. What is the main action of muscle relaxants within the central nervous system?

- A. They stimulate motor neurons
- B. They inhibit motor neurons**
- C. They enhance muscle tone
- D. They block pain receptors

The primary action of muscle relaxants within the central nervous system is to inhibit motor neurons. By doing so, these medications reduce the excessive tone and spasms associated with certain neurological and muscular conditions. Muscle relaxants work by acting on specific pathways in the brain and spinal cord to dampen the excitatory signals that would normally lead to muscle contraction. The inhibition of motor neurons allows for a decrease in overall muscle excitability, leading to a relaxing effect on the muscles. This is particularly beneficial in managing conditions that involve muscle spasticity or rigidity, such as multiple sclerosis, cerebral palsy, and certain acute injuries. By decreasing the neuromuscular transmission, muscle relaxants effectively alleviate rigidity and spasticity, allowing for improved mobility and reduced discomfort. In contrast, the other options do not accurately capture the primary action of muscle relaxants within the central nervous system. Stimulating motor neurons would contradict the intended relaxing effect, enhancing muscle tone goes against the primary goal of producing relaxation, and blocking pain receptors pertains more to analgesic drugs rather than muscle relaxants.

8. Which of the following is a characteristic of neostigmine?

- A. Is a muscle relaxant
- B. Is an opioid antagonist
- C. Is an AChE inhibitor**
- D. Is a local anesthetic

Neostigmine is characterized as an acetylcholinesterase (AChE) inhibitor. This means that it works by inhibiting the enzyme acetylcholinesterase, which breaks down the neurotransmitter acetylcholine in the synaptic cleft. By preventing the breakdown of acetylcholine, neostigmine increases the availability of this neurotransmitter at neuromuscular junctions and other synapses, enhancing cholinergic transmission. This action is particularly beneficial in medical conditions such as myasthenia gravis, where there is a deficiency in acetylcholine receptors. By increasing the levels of acetylcholine, neostigmine helps improve muscle strength and facilitates motor function. The distinction of neostigmine as an AChE inhibitor sets it apart from drugs that serve different purposes, such as muscle relaxants, opioid antagonists, or local anesthetics, which do not share this specific mechanism of action.

9. What serious health effect is associated with methanol poisoning?

- A. Ocular damage**
- B. Cardiac arrest
- C. Liver failure
- D. Acute kidney injury

Methanol poisoning is primarily associated with ocular damage, particularly because methanol is metabolized to formaldehyde and formic acid, both of which are highly toxic to the optic nerve and can lead to visual disturbances, including blindness. The mechanism involves the inhibition of mitochondrial function and the resultant damage to retinal and optic nerve tissues. The effect of methanol on vision is significant and can occur even with relatively low levels of methanol exposure. Symptoms of ocular damage can include blurred vision, changes in color perception, and in severe cases, complete loss of vision. Thus, recognizing the potential for ocular toxicity is crucial in cases of suspected methanol ingestion, making this a key health effect associated with methanol poisoning. While other health effects associated with methanol poisoning, such as metabolic acidosis and effects on various organs, are important considerations, the prominent and often irreversible damage to eyesight makes ocular damage a particularly serious consequence of methanol exposure.

10. What condition may occur with sudden discontinuation of major tranquilizers?

- A. Serotonin syndrome
- B. Neuroleptic malignant syndrome (NMS)**
- C. Withdrawal syndrome
- D. Extrapyrarnidal symptoms

Neuroleptic malignant syndrome (NMS) is a severe reaction that can occur with the withdrawal of major tranquilizers, primarily antipsychotic medications. This life-threatening condition is characterized by symptoms such as hyperthermia, muscle rigidity, autonomic dysregulation, and altered mental status. When major tranquilizers are suddenly discontinued, the abrupt change in medication levels can lead to a rebound effect, causing the body to react in an exaggerated manner, which embodies the characteristics of NMS. In the context of antipsychotic treatment, NMS can manifest when withdrawal happens too rapidly or when there is an interplay of medications that destabilizes the dopaminergic system. This syndrome illustrates the importance of careful management and gradual tapering of antipsychotic medications to prevent serious complications like NMS. The other conditions, while relevant in the context of CNS pharmacology, do not specifically relate to the sudden discontinuation of major tranquilizers in the same manner.

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:

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

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