MDC PHARMACOKINETICS (PK) II PRACTICE EXAM (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. Which antibiotic is supplied by Cathay Drug?

A. Cloxacillin (Oxaclen)

B. Amoxicillin (Pediamox)

C. Cefaclor (Ceclor)

D. Benzylpenicillin

2. In the well-stirred model, holding Clint and fu constant, what happens to CLh as hepatic blood flow Qh increases?

A. CLh increases

B. CLh decreases

C. CLh remains unchanged

D. CLh becomes zero

3. Which antibiotic is a beta-lactam antibiotic combined with clavulanic acid?

A. Amoxicillin

B. Amoxicillin + Clavulanic acid

C. Co-Amoxiclav

D. Rifampicin

4. What is the effect of increasing the unbound fraction (fu) on clearance and free drug exposure?

A. Increases both clearance and free exposure

B. Increases clearance but decreases free exposure

C. Increases clearance only

D. No effect on clearance or free exposure

5. Cefixime is supplied by UAP under which brand name?

A. Tergecef

B. Zefral

C. Azyth

D. Klaricid

6. What is the effect of enzyme inhibition on drug clearance and exposure?

A. Inhibition decreases Clint, decreasing Cl, increasing AUC, risk of toxicity.

B. Inhibition increases Clint, increasing Cl, decreasing AUC.

C. Inhibition has no effect on exposure.

D. Inhibition increases hepatic clearance.

7. If fu decreases, what happens to clearance?

A. Clearance decreases

B. Clearance increases

C. No change

D. Clearance becomes unpredictable

8. Which supplier supplies Amoxicillin (Pediamox)?

A. Gsk

B. Westmont

C. Pediatrica

D. Aspen

9. Which scenario would most likely increase the risk of higher unbound drug concentrations due to a drug–drug interaction?

A. A drug with low protein binding displaces another highly bound drug

B. A highly bound drug is displaced by another drug

C. A drug with no protein binding binds to plasma proteins

D. Clearance remains constant regardless of fu

10. Which expression correctly derives bioavailability (F) from AUC measurements for PO and IV dosing?

A. F = (AUC_po × Dose_iv) / (AUC_iv × Dose_po)

B. F = (AUC_iv × Dose_po) / (AUC_po × Dose_iv)

C. F = AUC_po / AUC_iv

D. F = Dose_po / Dose_iv

Answers

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

Explanations

1. Which antibiotic is supplied by Cathay Drug?

A. Cloxacillin (Oxaclen)

B. Amoxicillin (Pediamox)

C. Cefaclor (Ceclor)

D. Benzylpenicillin

The question tests familiarity with which antibiotic a supplier stocks. Cathay Drug is known in many practice references for supplying benzylpenicillin (penicillin G) preparations for injection. Among the options, this is the classic injectable penicillin that matches Cathay Drug's product line. The other drugs belong to different families or forms—cloxacillin is a penicillinase-resistant penicillin, amoxicillin is an oral amino-penicillin, and cefaclor is a cephalosporin—so they don't align with Cathay Drug's typical listing.

2. In the well-stirred model, holding Clint and fu constant, what happens to CLh as hepatic blood flow Qh increases?

A. CLh increases

B. CLh decreases

C. CLh remains unchanged

D. CLh becomes zero

In the well-stirred liver model, hepatic clearance depends on both blood flow to the liver and the liver's intrinsic ability to clear the drug. The relationship is given by CLh = Qh × (fu × Clint) / (Qh + fu × Clint). If Clint and fu are held constant, CLh changes with Qh in a saturating way. When Qh is small, CLh grows roughly in proportion to Qh. As Qh increases and becomes large compared to fu × Clint, CLh approaches fu × Clint and levels off. So increasing hepatic blood flow raises CLh, up to a maximum set by the intrinsic clearance.

3. Which antibiotic is a beta-lactam antibiotic combined with clavulanic acid?

A. Amoxicillin

B. Amoxicillin + Clavulanic acid

C. Co-Amoxiclav

D. Rifampicin

Clavulanic acid acts as a beta-lactamase inhibitor, meaning it blocks the enzymes some bacteria produce that would destroy a beta-lactam antibiotic. When you pair a beta-lactam antibiotic like amoxicillin with clavulanic acid, the combination is protected from those enzymes, so the drug can work against a broader range of organisms that would otherwise inactivate it. That's why the product you're looking for is amoxicillin combined with clavulanic acid, often sold as Co-amoxiclav. This pairing enhances effectiveness against beta-lactamase–producing bacteria. Amoxicillin by itself is just a beta-lactam antibiotic without the inhibitor, and rifampicin is a different class altogether.

4. What is the effect of increasing the unbound fraction (fu) on clearance and free drug exposure?

A. Increases both clearance and free exposure

B. Increases clearance but decreases free exposure

C. Increases clearance only

D. No effect on clearance or free exposure

Unbound fraction tells us how much drug is available for clearance and for pharmacologic action. In the liver, as the fraction unbound increases, more drug is accessible to metabolic enzymes, so clearance rises. The relationship is often described by the well-stirred model, where increasing fu pushes clearance upward toward the liver's blood-flow limit. At the same time, the portion that is unbound in plasma also increases, so the free drug concentration (and thus free exposure) goes up. Although total exposure may change as clearance changes, the unbound exposure itself increases with fu. That's why increasing the unbound fraction raises both clearance and free exposure.

5. Cefixime is supplied by UAP under which brand name?

A. Tergecef

B. Zefral

C. Azyth

D. Klaricid

Brand naming of antibiotics varies by manufacturer, so you need to know which brand a company markets for a given generic. For cefixime, UAP lists it under the brand Tergecef. This is the brand you'd encounter from that company's cefixime product. The other options are different antibiotics or brands not associated with UAP's cefixime, so they don't match the product described. In exams like this, matching the generic drug to the specific brand used by a company helps you identify the exact product quickly.

6. What is the effect of enzyme inhibition on drug clearance and exposure?

A. Inhibition decreases Clint, decreasing Cl, increasing AUC, risk of toxicity.

B. Inhibition increases Clint, increasing Cl, decreasing AUC.

C. Inhibition has no effect on exposure.

D. Inhibition increases hepatic clearance.

Enzyme inhibition reduces the liver's metabolic capacity, so intrinsic clearance (Clint) falls. Total hepatic clearance is determined by Clint and hepatic blood flow (Q) through the well-stirred relationship CL = (Q × Clint) / (Q + Clint). When Clint decreases, the overall clearance tends to drop, especially if Clint isn't already far above Q. With lower clearance, the drug remains in the body longer, so exposure rises for a given dose (AUC = Dose/CL). That increased exposure can raise the risk of toxicity, and the elimination half-life lengthens as well (t1/2 ≈ 0.693 × Vd / CL). While the magnitude of the effect can vary with the drug's extraction ratio, the general rule is that enzyme inhibition lowers clearance and increases exposure.

7. If fu decreases, what happens to clearance?

A. Clearance decreases

B. Clearance increases

C. No change

D. Clearance becomes unpredictable

The key idea is that only the unbound fraction of a drug (fu) is available for elimination. In the liver, the rate of clearance depends on how much drug is unbound to proteins, because only unbound drug can be metabolized by enzymes and pass through the hepatic processes. For drugs that are not limited by blood flow (low to moderate extraction), hepatic clearance is approximately proportional to fu (CL ≈ fu × CLint in the well-stirred model). So when fu decreases, less drug is free to be cleared, and clearance falls accordingly. That's why decreasing fu leads to a decrease in clearance in these scenarios. It's worth noting that for drugs with very high extraction, clearance is largely determined by hepatic blood flow and is less affected by fu, but the common teaching in this context is that lowering fu reduces clearance.

8. Which supplier supplies Amoxicillin (Pediamox)?

A. Gsk

B. Westmont

C. Pediatrica

D. Aspen

Pediamox is the pediatric formulation of amoxicillin associated with a specific manufacturer, Pediatrica. In pharmacology, brand names like Pediamox are tied to particular suppliers, and this pediatric product is known to be marketed by Pediatrica. The other company names listed produce amoxicillin or other brands, but Pediamox, in this context, is linked to Pediatrica. If you're ever unsure, always check the product label or formulary, which will list the exact manufacturer.

9. Which scenario would most likely increase the risk of higher unbound drug concentrations due to a drug–drug interaction?

A. A drug with low protein binding displaces another highly bound drug

B. A highly bound drug is displaced by another drug

C. A drug with no protein binding binds to plasma proteins

D. Clearance remains constant regardless of fu

The key concept is that plasma protein binding controls the unbound (free) drug concentration, which is the portion that distributes to effect and is cleared. If another drug competes for the same binding site and displaces a drug that was highly bound, the displaced drug's unbound fraction increases. This can raise the active free drug level quickly, potentially boosting effect or toxicity. Why the scenario where a highly bound drug is displaced by another drug is the best fit: when a drug with high affinity for the binding site is pushed off by a second drug, a noticeable amount of the previously bound drug is released into the unbound pool. Because the displaced drug was highly bound, even a small shift in binding occupancy translates into a relatively large jump in free concentration, which has clear clinical implications. In contrast, a low protein binding drug displacing another highly bound drug would require that the displacer effectively compete for binding, but since it itself spends little time bound, the magnitude of any increase in unbound concentration of the displaced drug is typically smaller. A drug with no protein binding cannot cause displacement to affect fu in the way protein-bound drugs do, and one stating that clearance stays constant regardless of fu ignores the well-established relationship where fu influences clearance for many drugs.

10. Which expression correctly derives bioavailability (F) from AUC measurements for PO and IV dosing?

A. F = (AUC_po × Dose_iv) / (AUC_iv × Dose_po)

B. F = (AUC_iv × Dose_po) / (AUC_po × Dose_iv)

C. F = AUC_po / AUC_iv

D. F = Dose_po / Dose_iv

Bioavailability is the fraction of the oral dose that reaches systemic circulation. Using the PK relationship AUC = F × Dose / Clearance, compare oral and IV routes: AUC_po = F × Dose_po / CL and AUC_iv = Dose_iv / CL (since F for IV is 1). Taking the ratio AUC_po / AUC_iv cancels the clearance and gives AUC_po / AUC_iv = F × Dose_po / Dose_iv. Solving for F leads to F = (AUC_po × Dose_iv) / (AUC_iv × Dose_po). This is the expression that correctly incorporates both the AUC measurements and the differences in administered doses. If the doses were the same, it would simplify to F = AUC_po / AUC_iv.

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://mdcpk2.examzify.com

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