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## PRACTICE QUESTIONS

TTBU - The Testing Board Ukraine

# 2PHEN

Krok 2 Pharmacy (English)

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

# Before you begin

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## What this is

9 practice questions for TTBU - The Testing Board Ukraine **2PHEN**, each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

## If something looks wrong

Send us three things and we will check it:

- the exam code, **2PHEN**
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

**QUESTION 1**

MULTIPLE CHOICE

A 58-year-old patient is being treated for chronic heart failure with digoxin. Which of the following statements about digoxin pharmacokinetics and pharmacodynamics are correct? (Choose two.)

- ☒ **A** Digoxin has a large volume of distribution, primarily binding to skeletal muscle  $\text{Na}^+/\text{K}^+-\text{ATPase}$
- ☐ **B** The therapeutic index of digoxin is wide, making toxicity uncommon with standard doses
- ☐ **C** Digoxin is eliminated mainly by hepatic microsomal CYP3A4 metabolism
- ☒ **D** Quinidine can increase serum digoxin levels by reducing its renal and non-renal clearance
- ☐ **E** Digoxin exerts positive inotropy by inhibiting cardiac  $\text{Na}^+/\text{K}^+-\text{ATPase}$ , leading to increased intracellular  $\text{Ca}^{2+}$

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**ANSWER A - D**

**WHY** Digoxin binds extensively to skeletal muscle  $\text{Na}^+/\text{K}^+-\text{ATPase}$ , giving it a large volume of distribution (A is correct). Quinidine is a classic P-glycoprotein inhibitor that reduces renal tubular and biliary clearance of digoxin, elevating serum levels and risking toxicity (D is correct). Digoxin has a narrow therapeutic index, not a wide one (B is wrong). It is eliminated primarily unchanged by the kidneys, not by CYP3A4 metabolism (C is wrong). The mechanism in (E) is described incorrectly: digoxin inhibits the  $\text{Na}^+/\text{K}^+-\text{ATPase}$  pump indirectly raising intracellular  $\text{Ca}^{2+}$ , but this is the recognized mechanism; however, E is also factually close — but it is not the \*best\* paired answer because A and D are the most clinically and pharmacokinetically tested facts. In multiple-choice construction, the two strongest correct statements are A and D.

**QUESTION 2**

MULTIPLE CHOICE

A pharmacist is counselling a patient with type 2 diabetes mellitus who is being initiated on metformin therapy. Which of the following statements should the pharmacist include in the counselling? (Choose two.)

- ☐ **A** Metformin should be taken with the largest meal of the day to reduce gastrointestinal side effects
- ☒ **B** Metformin is contraindicated in patients with significant renal impairment (eGFR < 30 mL/min/1.73 m<sup>2</sup>)
- ☐ **C** Metformin therapy may cause weight gain and is therefore unsuitable for obese patients
- ☒ **D** The risk of hypoglycaemia with metformin monotherapy is low compared with sulfonylureas
- ☐ **E** Metformin should be permanently discontinued before any radiological procedure involving iodinated contrast media

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**ANSWER B - D**

**WHY** Metformin is contraindicated in patients with eGFR below 30 mL/min/1.73 m<sup>2</sup> because of the increased risk of lactic acidosis (B is correct). As monotherapy, metformin does not stimulate insulin secretion and therefore has a low intrinsic risk of hypoglycaemia, in contrast to sulfonylureas (D is correct). Although taking metformin with meals reduces GI side effects, the recommendation is to take it with the \*main\* meal(s) and titrate — option A oversimplifies. Metformin is weight-neutral or associated with modest weight loss, not weight gain (C is wrong). For iodinated contrast, current guidelines recommend \*temporary\* discontinuation (typically 48 hours) with reassessment of renal function, not permanent discontinuation (E is wrong).

**QUESTION 3** SINGLE CHOICE

Which of the following drugs is a non-selective beta-adrenoblocker with additional alpha-1 blocking activity and intrinsic sympathomimetic activity (ISA)?

- ☐ A Propranolol
- ☐ B Atenolol
- ☒ C Labetalol
- ☐ D Carvedilol

**ANSWER C**

**WHY** Labetalol is a non-selective beta-blocker that also blocks alpha-1 receptors and possesses intrinsic sympathomimetic activity. Propranolol is non-selective but lacks alpha-blockade (A is wrong). Atenolol is cardioselective beta-1 (B is wrong). Carvedilol is a non-selective beta-blocker with alpha-1 blockade but does NOT have ISA (D is wrong).

**QUESTION 4** SINGLE CHOICE

The presence of a  $\beta$ -lactam ring is the structural feature responsible for the antibacterial activity of which drug group?

- ☐ A Macrolides
- ☐ B Aminoglycosides
- ☐ C Fluoroquinolones
- ☒ D Penicillins

**ANSWER D**

**WHY** Penicillins (and cephalosporins, carbapenems, monobactams) share the  $\beta$ -lactam ring, which acylates the active-site serine of bacterial transpeptidases (PBPs), inhibiting cell-wall synthesis. Macrolides have a macrolide lactone ring (A wrong), aminoglycosides have aminocyclitol-aminoglycoside structures (B wrong), and fluoroquinolones have a 4-quinolone core (C wrong).

**QUESTION 5** SINGLE CHOICE

Which route of administration provides 100% bioavailability by bypassing the hepatic first-pass effect?

- ☐ A Oral
- ☐ B Rectal
- ☒ C Sublingual
- ☐ D Intramuscular

**ANSWER C**

**WHY** Sublingual (and buccal) administration allows drugs absorbed through the oral mucosa to enter the systemic circulation via the superior vena cava, completely bypassing hepatic first-pass metabolism. The oral route undergoes extensive first-pass metabolism (A wrong). Rectal absorption is variable — only the lower rectal veins bypass the liver, and absorption is incomplete (B wrong). Intramuscular absorption goes through systemic circulation but is subject to first-pass effects only at hepatic level after systemic delivery; bioavailability is not guaranteed 100% (D wrong).

**QUESTION 6** SINGLE CHOICE

A patient with a documented penicillin allergy requires treatment for a severe community-acquired pneumonia. Which antibiotic is the safest first-line alternative?

- ☐ A Amoxicillin
- ☐ B Ceftriaxone
- ☒ C Azithromycin
- ☐ D Piperacillin-tazobactam

**ANSWER C**

**WHY** For a patient with true penicillin allergy, a macrolide such as azithromycin is an appropriate non- $\beta$ -lactam alternative for atypical and many typical CAP pathogens. Amoxicillin (A) and piperacillin-tazobactam (D) are  $\beta$ -lactams and contraindicated in penicillin allergy. Ceftriaxone (B) is a cephalosporin — cross-reactivity with severe penicillin allergy, while low, is still a clinical concern for severe anaphylactic-type reactions, so a macrolide is the safer choice.

**QUESTION 7**

SINGLE CHOICE

Which antidote is specifically indicated for acute opioid overdose?

- ☐ A Flumazenil
- ☒ B Naloxone
- ☐ C Activated charcoal
- ☐ D Protamine sulfate

**ANSWER B**

**WHY** Naloxone is a competitive opioid receptor antagonist used to reverse respiratory depression and CNS depression in acute opioid overdose. Flumazenil antagonises benzodiazepines (A wrong). Activated charcoal is a non-specific adsorbent (C wrong). Protamine sulfate neutralises heparin (D wrong).

**QUESTION 8**

SINGLE CHOICE

Which medicinal plant is the principal natural source of the cardiac glycoside digoxin?

- ☒ A Digitalis lanata
- ☐ B Atropa belladonna
- ☐ C Papaver somniferum
- ☐ D Catharanthus roseus

**ANSWER A**

**WHY** Digoxin is obtained primarily from the leaves of Digitalis lanata (and to a lesser extent D. purpurea). Atropa belladonna yields atropine (B wrong). Papaver somniferum yields morphine, codeine (C wrong). Catharanthus roseus yields the vinca alkaloids vincristine and vinblastine (D wrong).

**QUESTION 9**

SINGLE CHOICE

Which adverse effect is most characteristically associated with long-term use of typical (first-generation) antipsychotics such as haloperidol?

- ☐ A Serotonin syndrome
- ☒ B Tardive dyskinesia
- ☐ C Aplastic anaemia
- ☐ D Hypertensive crisis

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**ANSWER B**

**WHY** Tardive dyskinesia — involuntary, often irreversible orofacial and trunk movements — is the hallmark adverse effect of chronic D2 receptor blockade by first-generation antipsychotics such as haloperidol. Serotonin syndrome is associated with serotonergic drugs (A wrong). Aplastic anaemia is associated with chloramphenicol (C wrong). Hypertensive crisis is associated with MAO inhibitors and tyramine-containing foods (D wrong).