Appendix to the working program

Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation

BANK OF ASSESSMENT TOOLS FOR DISCIPLINE

Name of the academic discipline: **CLINICAL PHARMACOLOGY**

Specialty: **31.05.01 GENERAL MEDICINE**

Qualification: **GENERAL PRACTITIONER**

Department: **GENERAL AND CLINICAL PHARMACOLOGY**

Mode of study: **FULL-TIME**

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Nizhniy Novgorod
2023

1. Bank of assessment tools for the current monitoring of academic performance, mid-term assessment of students in the discipline

This Bank of Assessment Tools (BAT) for the discipline " CLINICAL PHARMACOLOGY " is an integral appendix to the working program of the discipline " CLINICAL PHARMACOLOGY". All the details of the approval submitted in the WPD for this discipline apply to this BAT.

(Banks of assessment tools allow us to evaluate the achievement of the planned results stated in the educational program.

Assessment tools are a bank of control tasks, as well as a description of forms and procedures designed to determine the quality of mastering study material by students.)

2. List of assessment tools

The following assessment tools are used to determine the quality of mastering the academic material by students in the discipline/ practice:

No.	Assessment tool	Brief description of the assessment tool	Presentation of the assessment tool in the BAT
1	Test	A system of standardized tasks that allows you to automate the procedure of measuring the level of knowledge and skills of a student	Bank of test tasks
2	Situational tasks	A method of control that allows you to assess the criticality of thinking and the degree of the material comprehension, the ability to apply theoretical knowledge in practice.	List of tasks
3	Interview	A tool of control organized as a special conversation between the teacher and the student on topics related to the discipline being studied, and designed to clarify the amount of knowledge of the student on a specific section, topic, problem, etc.	Questions on topics/sections of the discipline
4	Project	The product of the student's independent work, which is a public presentation about the results obtained by solving a certain educational, practical, research or scientific topic	Topics of reports, presentations

3. A list of competencies indicating the stages of their formation in the process of mastering the educational program and the types of evaluation tools

Code and formulation of competence*	Stage of competence formation	Controlled sections of the discipline	Assessment tools
UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-	Entry, Current, Mid-term	General issues of clinical pharmacology and pharmacotherapy	Interview, Project, Situational tasks, Test, credit

10.2)			
UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)	Entry, Current, Mid-term	Clinical pharmacology of antimicrobial drugs	Interview, Project, Situational tasks, Test, credit
UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)	Entry, Current, Mid-term	Clinical pharmacology of antiviral and antifungal drugs	Interview, Project, Situational tasks, Test, credit
UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)	Entry, Current, Mid-term	Clinical pharmacology of anti-inflammatory drugs	Interview, Project, Situational tasks, Test, credit
UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)	Entry, Current, Mid-term	Clinical pharmacology of medicinal products used in diseases of the respiratory tract	Interview, Project, Situational tasks, Test, credit
UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)	Entry, Current, Mid-term	Clinical pharmacology of medicinal productsused in diseases of the digestive tract	Interview, Project, Situational tasks, Test, credit
UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-	Entry, Current, Mid-term	Clinical pharmacology of drugs used in diseases of the cardiovascular system	Interview, Project, Situational tasks, Test, credit

10.2)			
UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)	Entry, Current, Mid-term	Clinical pharmacology of drugs affecting the hemostatic system	Interview, Project, Situational tasks, Test, credit

4. The content of the assessment tools of entry, current control

The content of the assessment tool (questions, tests, situational tasks) for conducting current control and mid-term assessment of students in this discipline is presented on the Educational Portal of the PRMU

https://sdo.pimunn.net/course/view.php?id=401

Entry /current control is carried out by the discipline teacher when conducting classes in the form of: *Interview, Report, Situational tasks, Test,*

Assessment tools for current control.

(the teacher specifies all types of tasks for conducting current control, if this is provided for in the WPD, in the form given below as an example. The current control is carried out in the context of the assessment of competencies provided for in the WPD, and not topics or sections of the discipline)

4.1. situational tasks for the assessment of competence UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)

Case 1. Find out the interactions between. Describe the result
-omeprazole and clopidogrel
-captopril and diclofenac sodium
-atenolol and verapamil
-furosemide and glibenclamide
Case 2. History
A 35-year-old man was being treated in hospital for a community-acquired pneumonia.
He was receiving intravenous antibiotics and was likely to be in hospital for more than 24 h.
The patient had no past medical history, took no regular medications and had no known drug allergies.
The patient drank approximately 1 L of vodka daily plus 2–4 cans of strong lager (approximately 50 units of alcohol per day). After 6 h in hospital, he became tremulous and sweaty and his nurse reported concerns that he is withdrawing from alcohol.
Results
Bloods: WCC 14.2, Hb 140, Plt 220, Na 138, K 4.2, Creat 70, CRP 80, Bili 14, ALT 35, ALP 52, INR 1.1
Question
Using the ‘as needed’ drug chart below, prescribe one medication to treat his symptoms of alcohol withdrawal. On the ‘regular medications’ drug chart, prescribe one medication to help prevent the patient from developing Wernicke’s encephalopathy.

Case 3. A 20-year-old young boy was hospitalized in a severe state with bilateral pneumonia occurred after influenza. He had hyperthermia (t 40°C) and severe cardiorespiratory failure on the admission. Eventual infec-tion: influenza virus, Haemophilus influensae.

Is it necessary to administer antiviral drugs and if yes, namely what drugs? Is it necessary to administer antibiotics and if yes, namely what drugs? What are eventual side effects of the chosen drugs?

4.2. Questions for interviews *:* UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)

Questions for interview

1. CPH and comparative characteristics of cardiac glycosides and dopaminomimetics used for the treatment of heart failure.
2. CPH and comparative characteristics of antihypertensive drugs of central action.
3. CPH and comparative characteristics of alpha-blockers.
4. CPH and comparative characteristics of beta-blockers.
5. CPH and comparative characteristics of calcium antagonists.
6. CPH and comparative characteristics of angiotensin converting enzyme inhibitors and angiotensin receptor blockers.
7. CPH and comparative characteristics of nitrates.
8. CPH and comparative characteristics of the main groups of diuretics.
9. CP of hypolipidemic drugs and their comparative characteristics.
10. CPH and comparative characteristics of a drug that improves myocardial metabolism (preduktal, mildronate, L-carnitine).
11. CPH and comparative characteristics of insulin preparations.
12. CPH and comparative characteristics of oral hypoglycemic agents.
13. CPH and comparative characteristics of drugs for the treatment of thyroid diseases.
14. CPH and comparative characteristics of coagulants and anticoagulants.
15. CPH and comparative characteristics of antiaggregants.
16. CPH and comparative characteristics of fibrinolytic and antifibrinolytic agents.
17. CPH and comparative characteristics of iron preparations.

4.3. Test questions for*:* UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)

Question	Competence code (according to the WPD)
1. RISK FACTOR FOR DRUG INTERACTIONS: 1) polypharmacy; 2) lack of sleep; 3) poor income; 4) sedentary lifestyle. 2. THE TERM "SYNERGY" IS USED IN PD TO DESCRIBE MUTUAL INFLUENCING OF THE EFFECTS OF TWO DRUGS. WHAT DOES SYNERGY MEAN?: 1) mutual strengthening of effect; 2) the effect can only be achieved by giving the drugs at the same time; 3) an effect that is at least more than the additive effect of both drugs; 4) reduction of the side effects; 5) mutual canceling out (neutralization) of effects. 3. TYPE OF INTERACTION WITH DRUGS BEFORE ABSORBTION: 1) pharmaceutical ; 2) chemical ; 3) PK; 4) PD. 4. DDI IMPLYING CHANGES IN THE RUG CONCENTRATION: 1) PK; 2) pharmaceutical ;	UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)

3) PD;
4) no correct answer.

5. ACTION OF TWO DRUGS IN ONE DIRECTION WITH GETTING A STRONGER TOTAL EFFECT THAN EACH OF THE DRUGS SEPARATELY:
1) synergy;
2) addiction;
3) antagonism;
4) no correct answer.

6. WHICH DRUG INCREASES THE BA OF DIGOXIN BY INHIBITING THE PGP EFFLUX TRANSPORTER?:
1) dabigatran;
2) hypericin;
3) rifampicin;
4) clarithromycin;
5) morphine .

7. DDI CAUSING INCREASED RENAL BLOOD FLOW:
1) hydralazine and digoxin;
2) probenecid and penicillin;
3) systemic antacids and aspirin;
4) omeprazole and diazepam.

8. INEFFICACY OF DIGOXIN AFTER COADMINISTRATION OF CARBAMAZEPINE IS THE EXAMPLE OF:
1) reduced BA through induction of PGP;
2) increased BA through inhibition of PGP;
3) both answers are correct;
4) no correct answer.

9. CENTRAL INHIBITION BY LOPERAMIDE AFTER ADMINISTRATION OF VERAPAMIL IS THE EXAMPLE OF :
1) increased BA through inhibition of PGP
2) reduced BA through induction of PGP
3) both answers are correct
4) no correct answer

10. CAUSES OF UNWANTED DRUG EFFECTS AND INTERACTIONS:
1) all answers are correct
2) failing to take account of renal function
3) wrong dosage
4) wrong route of administration
5) errors in taking the drug
6) transmission errors

1. WHAT COMPONENTS OF TOBACCO SMOKE POTENTIALLY CAN AFFECT PK OF A DRUG:
1) PAHs
2) flavors
3) there is no right answer
4) there are no such components

2. INTOXICATION WITH ACETALDEHYDE TAKES PLACE WHEN A DRUG WAS TAKEN ALONG WITH :
1) nicotine
2) alcoholic beverages
3) orange juice

4) no answer

3. PROLONGED USE OF ALCOHOLIC DRINKS CAUSES :
1) cytochrome P450 inhibition
2) does not affect the metabolism of drugs
3) cytochrome P450 induction
4) there is no right answer

4. TOBACCO SMOKE INTERACTS WITH MEDICATIONS BY INFLUENCING THE:
1) drugs absorption
2) drugs distribution
3) drugs metabolism or elimination
4) all of above

5. PD INTERACTIONS CAN OCCUR WITH INTERMITTENT ALCOHOL CONSUMPTION AND EVEN AFTER A SINGLE DOSE. THIS SATEMET IS:
1) true
2) false
3) unknown
4) all answers are correct

6. FOOD CONSIDERATIONS WHEN TAKING ANTIDEPRESSANTS :
1) patients need to increase vitamin K intake
2) patients need to avoid tyramine and serotonin containing food, that may cause so-called «cheese syndrome»
3) patients need to increase intake of fat-soluble vitamins
4) the diet does not change

FOOD CONSIDERATIONS WHEN TAKING ORAL ANTICOAGULANTS :
1) the diet does not change
2) it is recommended to increase the intake of green vegetables (containing vitamin K)
3) it is recommended to limit the consumption of green vegetables (containing vitamin K)
4) there is no right answer

8. FOOD CONSIDERATIONS WHEN TAKING IRON PREPARATIONS :
1) the diet does not change
2) there is no right answer
3) ascorbic acid contained in foods impairs the absorption of iron preparations
4) food containing phytin (nuts, wheat) and tannins (tea, coffee) and dairy products limit the absorption of iron preparations to form poorly soluble compounds with them

1. WHICH ONE OF THE FOLLOWING ANTIBIOTICS IS A POTENT INDUCER OF HEPATIC DRUG-METABOLIZING ENZYMES?:
1) Ciprofloxacin
2) Cyclosporine
3) Erythromycin
4) Rifampin+
5) Tetracycline

2. AN AMINOGLYCOSIDE ANTIBIOTIC SHOULD NOT BE USED

CONCURRENTLY WITH THE FOLLOWING DRUG:
1) Ampicillin
2) Vancomycin+
3) Ciprofloxacin
4) Rifampin

3. A PATIENT ON ORAL ANTICOAGULANT THERAPY IS COMMENCED ON SULFAMETHOXAZOLE- TRIMETHOPRIM, DOUBLE-STRENGTH TWICE DAILY. ONE MAY EXPECT TO SEE THE INTERNATIONAL NORMALIZED RATIO:
1) Increase+
2) Decrease
3) Remain unchanged

4. OVER 90% OF THIS DRUG IS EXCRETED IN THE URINE IN INTACT FORM. BECAUSE ITS URINARY SOLUBILITY IS LOW, PATIENTS SHOULD BE WELL HYDRATED TO PREVENT NEPHROTOXICITY:
1) Acyclovir+
2) Amantadine
3) Indinavir
4) Zanamivir
5) Zidovudine

5. CISAPRIDE SHOULD NOT BE USED IN COMBINATION WITH EITHER FLUCONAZOLE OR INDINAVIR BECAUSE OF INCREASED POTENTIAL FOR:
1) Atrial fibrillation
2) Atrial flutter
3) Ventricular fibrillation
4) Torsades de pointes+
5) Angina pectoris

6. A PATIENT NEEDS ANTIBIOTIC TREATMENT FOR NATIVE VALVE, CULTURE-POSITIVE INFECTIVE ENTEROCOCCAL ENDOCARDITIS. HIS MEDICAL HISTORY INCLUDES A SEVERE ANAPHYLACTIC REACTION TO PENICILLIN G DURING THE PAST YEAR. THE BEST APPROACH WOULD BE TREATMENT WITH:
1) Amoxicillin/clavulanate
2) Aztreonam
3) Cefazolin + genatamicin
4) Meropenem
5) Vancomycin+

7. THIS DRUG HAS ACTIVITY AGAINST MANY STRAINS OF PSEUDOMOMAS AERUGINOSA. HOWEVER, WHEN IT IS USED ALONE, RESISTANCE HAS EMERGED DURING THE COURSE OF TREATMENT. THE DRUG SHOULD NOT BE USED IN PENICILLIN-ALLERGIC PATIENTS. ITS ACTIVITY AGAINST GRAM- NEGATIVE RODS IS ENHANCED IF IT IS GIVEN IN COMBINATION WITH TAZOBACTAM:
1)Amoxicillin
2) Aztreonam
3) Imipenem

4) Piperacillin+
5) Vancomycin

8. THE ANTIBIOTIC THAT MAY ACCENTUATE THE NEUROMUSCULAR BLOCKADE PRODUCED BY CURARE:
1) Pencillin G
2) Erythromycin
3) Streptomycin+
4) Chloramphenicol

9. A 19-YEAR-OLD WOMAN WITH RECURRENT SINUSITIS HAS BEEN TREATED WITH DIFFERENT ANTIBIOTICS ON SEVERAL OCCASIONS. DURING THE COURSE OF ONE SUCH TREATMENT SHE DEVELOPED A SEVERE DIARRHEA AND WAS HOSPITALIZED. SIGMOIDOSCOPY REVEALED COLITIS, AND PSEUDOMEMBRANES, WERE CONFIRMED HISTOLOGICALLY. WHICH OF THE FOLLOWING DRUGS, ADMINISTERED ORALLY, IS MOST LIKELY TO BE EFFECTIVE IN THE TREATMENT OF COLITIS DUE TO C. DIFFICILE?:
1) Ampicillin
2) Cefazolin
3) Clindamycin
4) Metonidazole+
5) Tetracycline
10. PATIENTS TREATED WITH THE FOLLOWING DRUGS SHOULD BE CAUTIONED NOT TO CONSUME ALCOHOLIC BEVERAGES:
1) Mebendazole
2) Metronidazole+
3) Methimazole
4) Metamizole

11. SULFONAMIDES CAN POTENTIALLY DISPLACE SU FROM PLASMA PROTEIN BINDING SITES, RESULTING IN:
1) Hypoglycemia +
2) Severe bone marrow depression
3) Both
4) None

12. SULFONAMIDES CAN POTENTIALLY DISPLACE METHOTREXATE FROM PLASMA PROTEIN BINDING SITES, RESULTING IN:
1) Hypoglycemia
2) Severe bone marrow depression+
3) Both
4) None

13. DECREASED TETRACYCLINE CONCENTRATION CAUSED BY:
1) Zinc
2) Iron
3) Barbiturates
4) All answers are correct+

14. THE DRUG INTERACTION PROFILE OF THIS ANTIBIOTIC CLASS IS TYPICALLY ASSOCIATED WITH THE INHIBITION OF MAO, WHICH RESULTS IN AN INCREASE IN SEROTONIN CONCENTRATIONS AND

THE DEVELOPMENT OF THE SEROTONIN SYNDROME:
1) Linezolid+
2) Metronidazole
3) Tetracycline
4) Nalidixic acid

1. SSRIS AND NSAIDS INCREASE BLEEDING RISK BY INHIBITING PLATELET ADHESION AND FUNCTION:
1) true+
2) false

2. NSAIDS REDUCE THE DIURETIC ACTION OF FUROSEMIDE BY:
1) Preventing PG mediated intrarenal haemodynamic actions+
2) Blocking the action in ascending limb of loop of Henle
3) Enhancing salt and water reabsorption in distal tubule
4) Increasing aldosterone secretion

3. INDOMETHACIN AND FLURBIPROFEN (BUT NOT NAPROXEN OR ASPIRIN):
1) interact with β-blockers (propranolol, oxprenolol, atenolol), attenuating their antihypertensive effects.
2) do notinteract with β-blockers (propranolol, oxprenolol, atenolol), attenuating their antihypertensive effects.
3) interact with β-blockers (propranolol, oxprenolol, atenolol), icreasing their antihypertensive effects.

4. SOME ANTIDEPRESSANTS MAY BE ASSOCIATED WITH AN INCREASED RISK FOR BLEEDING, WHICH MAY BE ADDITIVELY ENHANCED BY COADMINISTRATION OF NSAIDS:
1) true+
2) false

5. THE ANTIHYPERTENSIVE EFFECTS OF CAPTOPRIL CAN BE ANTAGONIZED (REDUCED) BY:
1) Angiotensin II receptor blockers
2) Loop diureties
3) NSAIDS+
4) SUs
5) Thiazides
6. ACCIDENTAL POISONINGS ARE COMMON WITH BOTH ASPIRIN AND IBUPROFEN, TWO OTC DRUGS AVAILABLE IN TASTY CHEWABLE TABLETS. IN CASES OF OVERDOSE, ASPIRIN IS MORE LIKELY THAN IBUPROFEN TO CAUSE:
1) Autonomic Instability
2) Hepatic necrosis
3) Metabolic acidosis+
4) Thrombocytopenia
5) Ventricular arrhythmias
Choose one correct answer

1.PATIENTS TAKING SU DRUGS SHOULD AVOID PRODUCTS CONTAINING:
1) Acetaminophen
2) Ethanol

3) Vitamin A
4) Penicillins+
5) Milk products

2. WHICH OF THE FOLLOWING MAY INCREASE THE INSULIN NEED OF DIABETICS?:
1) Isoniazid
2) Penicillin
3) Aspirin
4) Prednisone+

3. THE HYPOGLYCAEMIC ACTION OF SULFONYLUREAS IS LIKELY TO BE ATTENUATED BY THE CONCURRENT USE OF:
1) Hydrochlorothiazide+
2) Propranolol
3) Chloramphenicol
4) Aspirin

4. A DIABETIC ON ORAL HYPOGLYCAEMIC DRUG CHLORPROPAMIDE, SUFFERED FROM ENTERIC FEVER AND WAS PRESCRIBED CHLORAMPHENICOL. HE DEVELOPED SEVERE HYPOGLYCAEMIA. THIS IS BECAUSE:
1) Chloramphenicol itself has mild hypoglycaemic effect
2)Chloramphenicol increases the absorption of chlorpropamide
3) Chloramphenicol causes release of insulin
4) Chloramphenicol inhibits the metabolism of chlorpropamide+

5. A-GLUCOSIDASE INHIBITORS:
1) May decrease digoxin absorption
2) May increase effect of warfarin
3) both +
4) no answer

6. EXENATIDE:
1) May slow absorption of medications when rapid adsorption needed (acetaminophen, pain killers)+
2) May increase effect of warfarin
3) both variants
4) no answer

7. ALCOHOL WITH FIRST-GENERATION SUS MAY CAUSE FLUSHING REACTION:
1) true +
2) false

8. CIMETIDINE MAY COMPETE WITH METFORMIN FOR RENAL ELIMINATION, WHICH MAY INCREASE LEVELS OF METFORMIN:
1) true +
2) false

Answer keys

Question number	Correct answer	Question number	Correct answer
1.	1	6.	5
2.	2	7.	1
3.	1	8.	1
4.	1	9.	1
5.	1	10.	1
Question number	Correct answer	Question number	Correct answer
1.	1	16.	2
2.	2	17.	3
3.	3	18.	4
4.	4		
5.	1		

Question number	Correct answer	Question number	Correct answer	Question number	Correct answer
19.	4	24.	5	29.	1
20.	2	25.	4	30.	2
21.	1	26.	3	31.	4
22.	1	27.	4	32.	1
23.	4	28.	2		

Question number	Correct answer	Question number	Correct answer
33.	1	36.	1
34.	1	37.	3
35.	1	38.	3
Question number	Correct answer	Question number	Correct answer
39.	1	43.	3
40.	4	44.	1
41.	1	45.	1
42.	4	46.	1

4.4. Project topics list for the assessment of competence UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)
"Clinical pharmacology of cardiotonic agents",
"Clinical pharmacology of diuretics used in the treatment of hypertension".
Monitoring the effectiveness and safety of pharmacotherapy
Clinical pharmacology of penicillins used in the treatment of respiratory diseases".
Clinical pharmacology of drugs used in the treatment of dermatomycosis".
"Clinical pharmacology of glucocorticosteroid preparations used in the treatment of emergency conditions".
"Clinical pharmacology of drugs used in the treatment of COPD"
"Clinical pharmacology of diuretics used in the treatment of patients with arterial hypertension".
"Clinical pharmacology of fibrin-and antifibrinolytic agents".

5. The content of the assessment tools of mid-term assessment

Mid-term assessment is carried out in the form of a credit.

The content of the assessment tool (questions, tests, situational tasks, list of drugs for prescriptions) for conducting current control and mid-term assessment of students in this discipline is presented on the Educational Portal of the PRMU https://sdo.pimunn.net/course/view.php?id=3221

5.1 The list of control tasks and other materials necessary for the assessment of knowledge, skills and work experience

5.1.1. Test questions for the discipline exam

Question	Competence code (according to the WPD)
1. Pharmacokinetics is: a) The study of biological and therapeutic effects of drugs **b) The study of absorption, distribution, metabolism and excretion of drugs** c) The study of mechanisms of drug action d) The study of methods of new drug development 2. What does “pharmacokinetics” include? a) Complications of drug therapy **b) Drug biotransformation in the organism** c) Influence of drugs on metabolism processes d) Influence of drugs on genes 3. What does “pharmacokinetics” include? a) Pharmacological effects of drugs b) Unwanted effects of drugs c) Chemical structure of a medicinal agent **d) Distribution of drugs in the organism** 4. What does “pharmacokinetics” include? a) Localization of drug action b) Mechanisms of drug action **c) Excretion of substances** d) Interaction of substances 5. The main mechanism of most drugs absorption in GI tract is: a) Active transport (carrier-mediated diffusion) b) Filtration (aqueous diffusion) c) Endocytosis and exocytosis **d) Passive diffusion (lipid diffusion)** 6. What kind of substances can’t permeate membranes by passive diffusion? a) Lipid-soluble b) Non-ionized substances c) Hydrophobic substances **d) Hydrophilic substances** 7. A hydrophilic medicinal agent has the following property: **a) Low ability to penetrate through the cell membrane lipids** b) Penetrate through membranes by means of endocytosis c) Easy permeation through the blood-brain barrier d)High reabsorption in renal tubules 8. What is implied by «active transport»?	UC-1 (IUC-1.2, IUC-1.3), GPC-7 (I GPC -7.1; I GPC -7.2; I GPC -7.3), PC-8 (IPC-8.1; IPC-8.2), PC-10 (IPC-10.1, IPC-10.2)

a) Transport of drugs trough a membrane by means of diffusion
b) Transport without energy consumption
c) Engulf of drug by a cell membrane with a new vesicle formation
d) Transport against concentration gradient

9.What does the term "bioavailability" mean?
a) Plasma protein binding degree of substance
b) Permeability through the brain-blood barrier
c) Fraction of an uncharged drug reaching the systemic circulation following any route administration
d) Amount of a substance in urine relative to the initial doze

10. The reasons determing bioavailability are:
a) Rheological parameters of blood
b) Amount of a substance obtained orally and quantity of intakes
c) Extent of absorption and hepatic first-pass effect
d) Glomerular filtration rate

11. Pick out the appropriate alimentary route of administration when passage of drugs through liver is minimized:
a) Oral
b) Transdermal
c) Rectal
d) Intraduodenal

12. Which route of drug administration is most likely to lead to the first-pass effect?
a) Sublingual
b) Oral
c) Intravenous
d) Intramuscular

13. What is characteristic of the oral route?
a) Fast onset of effect
b) Absorption depends on GI tract secretion and motor function
c) A drug reaches the blood passing the liver
d) The sterilization of medicinal forms is obligatory

14. Tick the feature of the sublingual route:
a) Pretty fast absorption
b) A drug is exposed to gastric secretion
c) A drug is exposed more prominent liver metabolism
d) Adrug can be administrated in a variety of doses

15. Pick out the parenteral route of medicinal agent administration:
a) Rectal
b) Oral
c) Sublingual
d) Inhalation

16. Parenteral administration:
a) Cannot be used with unconsciousness patients
b) Generally results in a less accurate dosage than oral administration
c) Usually produces a more rapid response than oral administration

d) Is too slow for emergency use

17. What is characteristic of the intramuscular route of drug administration?
a) Only water solutions can be injected
b) Oily solutions can be injected
c) Opportunity of hypertonic solution injections
d) The action develops slower, than at oral administration

18. Intravenous injections are more suitable for oily solutions:
a) True
b) False

19. Correct statements listing characteristics of a particular route of drug administration include all of the following EXCEPT:
a) Intravenous administration provides a rapid response
b) Intramuscular administration requires a sterile technique
c) Inhalation provides slow access to the general circulation
d) Subcutaneous administration may cause local irritation

20. Most of drugs are distributed homogeneously.
a) True
b) False

21. Biological barriers include all except:
a) Renal tubules
b) Cell membranes
c) Capillary walls
d) Placenta

22. What is the reason of complicated penetration of some drugs through brain-blood barrier?
a) High lipid solubility of a drug
b) Meningitis
c) Absence of pores in the brain capillary endothelium
d) High endocytosis degree in a brain capillary

23. The volume of distribution (Vd) relates:
a) Single to a daily dose of an administrated drug
b) An administrated dose to a body weight
c) An uncharged drug reaching the systemic circulation
d) The amount of a drug in the body to the concentration of a drug in plasma

24. For the calculation of the volume of distribution (Vd) one must take into account:
a) Concentration of a substance in plasma
b) Concentration of substance in urine
c) Therapeutical width of drug action
d) A daily dose of drug

25. A small amount of the volume of distribution is common for lipophylic substances easy penetrating through barriers and
widely distributing in plasma, interstitial and cell fluids:
a) True

b) False

26. The term "biotransformation" includes the following:
a) Accumulation of substances in a fat tissue
b) Binding of substances with plasma proteins
c) Accumulation of substances in a tissue
d) Process of physicochemical and biochemical alteration of a drug in the body

27. Biotransformation of the drugs is to render them:
a) Less ionized
b) More pharmacologically active
c) More lipid soluble
d) Less lipid soluble

28. Tick the drug type for which microsomal oxidation is the most prominent:
a) Lipid soluble
b) Water soluble
c) Low molecular weight
d) High molecular weight

29. Pick out the right statement:
a) Microsomal oxidation always results in inactivation of a compound
b) Microsomal oxidation results in a decrease of compound toxicity
c) Microsomal oxidation results in an increase of ionization and water solubility of a drug
d) Microsomal oxidation results in an increase of lipid solubility of a drug thus its excretion from the organism is facilitated

30. Stimulation of liver microsomal enzymes can:
a) Require the dose increase of some drugs
b) Require the dose decrease of some drugs
c) Prolong the duration of the action of a drug
d) Intensify the unwanted reaction of a drug

31. Metabolic transformation (phase 1) is:
a) Acetylation and methylation of substances
b) Transformation of substances due to oxidation, reduction or hydrolysis
c) Glucuronide formation
d) Binding to plasma proteins

32. Biotransformation of a medicinal substance results in:
a) Faster urinary excretion
b) Slower urinary excretion
c) Easier distribution in organism
d) Higher binding to membranes

33.Conjugation is:
a) Process of drug reduction by special enzymes
b) Process of drug oxidation by special oxidases
c) Coupling of a drug with an endogenous substrate
d) Solubilization in lipids

34. Which of the following processes proceeds in the second phase of

biotransformation?
a) Acetylation
b) Reduction
c) Oxidation
d) Hydrolysis

35. Conjugation of a drug includes the following EXCEPT:
a) Glucoronidation
b) Sulfate formation
c) Hydrolysis
d) Methylation

36.Metabolic transformation and conjugation usually results in an increase of a substance biological activity:
a) True
b) False

37. In case of liver disorders accompanied by a decline in microsomal enzyme activity the duration of action of some drugs
is:
a) Decreased
b) Enlarged
c) Remained unchanged
d) Changed insignificantly

38. Half life (t ½) is the time required to:
a) Change the amount of a drug in plasma by half during elimination
b) Metabolize a half of an introduced drug into the active metabolite
c) Absorb a half of an introduced drug
d) Bind a half of an introduced drug to plasma proteins

39. Half life (t ½) doesn't depend on:
a) Biotransformation
b) Time of drug absorption
c) Concentration of a drug in plasma
d) Rate of drug elimination

40. Elimination is expressed as follows:
a) Rate of renal tubular reabsorption
b) Clearance speed of some volume of blood from substance
c) Time required to decrease the amount of drug in plasma by one-half
d) Clearance of an organism from a xenobiotic

41. Elimination rate constant (Kelim) is defined by the following parameter:
a) Rate of absorption
b) Maximal concentration of a substance in plasma
c) Highest single dose
d) Half life (t ½)

42. The most rapid eliminated drugs are those with high glomerular filtration rate and actively secreted but aren't passively
reabsorbed:
a) True

b) False 43. Systemic clearance (CLs) is related with: a) Only the concentration of substances in plasma b) Only the elimination rate constant **c) Volume of distribution, half life and elimination rate constant** d) Bioavailability and half life	

5.1.2. Credit theoretical questions: UC-1 (IUC-1.4), GPC-2 (IGPC-2.1, IGPC-2.2, IGPC-2.3), PC-3 (IPC-3.1, IPC-3.2, IPC-3.3)

1. CPH: position among medical sciences, relationship and interaction with general pharmacology and pharmacotherapy, goals and objectives.
2. Interrelation of pharmacotherapy (PHT), pharmacology and clinical pharmacology (CPH).
3. The concept of the main sections of clinical pharmacology (pharmacokinetics, pharmacodynamics). Significance for rational pharmacotherapy.
4. The concept of the main sections of clinical pharmacology (methodology for monitoring the effectiveness and safety of drug use). Significance for rational pharmacotherapy.
5. The significance of the relationship between pharmacodynamic and pharmacokinetic processes for individualization of pharmacotherapy.
6. Effects of repeated drug administration in the body.
7. Drug absorption: factors that determine the rate and completeness of absorption (properties of drugs, place of absorption, state of the body).
8. Advantages and disadvantages of drug intake in the body with enteral methods of administration.
9. Advantages and disadvantages of receiving drugs in the body with parenteral methods of administration.
10. Circulation of drugs in the blood. Importance of protein binding and competition for protein binding. Their influence on the realization of the pharmacological effect.
11. Distribution of drugs in body tissues. Volume of distribution, practical meaning of the concept. Features in newborns and the elderly.
12. Drug biotransformation: phases, factors that determine the speed of the process. The concept of fermentopathies.
13. Elimination of drugs from the body (renal, hepatic and total clearances).
14. Pharmaceutical and pharmacodynamic interaction of drugs.
15. Drug interaction at the stages of pharmacokinetics.
16. Effects of co-administration of drugs (typical examples).
17. Types of drug action.
18. Dose-dependent side effects of drugs.
19. Side effects of drugs, independent of the dose.
20. Pharmacogenetics and pharmacogenomics. Goals and objectives. Prospects for individualization (personalization) of pharmacotherapy.
21. Pharmacogenetic reactions in drug biotransformation.
22. Pharmacogenetic reactions affecting drug transport.
23. Pharmacogenetic reactions affecting the pharmacodynamics of drugs.
24. Medicine and pregnancy. Embryotoxic and teratogenic effects of drugs.
25. Features of pharmacodynamics and pharmacokinetics of drugs in the fetus.
26. Features of pharmacodynamics and pharmacokinetics of drugs in newborns and breast-feeding.
27. Features of drug pharmacokinetics during pregnancy.
28. Features of pharmacodynamics, pharmacokinetics and dosage of drugs in the elderly.
29. Pharmacotherapy: goals and types. Principles of drug effectiveness and safety assessment.
30 Treatment process, structure and tasks.

31. Methods of examination of patients, general understanding of symptoms and syndromes, principles of diagnosis.
32. Main symptoms and syndromes of hypertension. Basic principles of drug selection.
33. Main symptoms and syndromes of coronary heart disease, basic principles of drug selection.

6. Criteria for evaluating learning outcomes

For the credit (example)

Learning outcomes	**Evaluation criteria**	
	Not passed	**Passed**
Completeness of knowledge	The level of knowledge is below the minimum requirements. There were bad mistakes.	The level of knowledge in the volume corresponding to the training program. Minor mistakes may be made
Availability of skills	Basic skills are not demonstrated when solving standard tasks. There were bad mistakes.	Basic skills are demonstrated. Typical tasks have been solved, all tasks have been completed. Minor mistakes may be made.
Availability of skills (possession of experience)	Basic skills are not demonstrated when solving standard tasks. There were bad mistakes.	Basic skills in solving standard tasks are demonstrated. Minor mistakes may be made.
Motivation (personal attitude)	Educational activity and motivation are poorly expressed, there is no willingness to solve the tasks qualitatively	Educational activity and motivation are manifested, readiness to perform assigned tasks is demonstrated.
Characteristics of competence formation*	The competence is not fully formed. The available knowledge and skills are not enough to solve practical (professional) tasks. Repeated training is required	The competence developed meets the requirements. The available knowledge, skills and motivation are generally sufficient to solve practical (professional) tasks.
The level of competence formation*	Low	Medium/High

For testing:

Mark "5" (Excellent) - points (100-90%)
Mark"4" (Good) - points (89-80%)
Mark "3" (Satisfactory) - points (79-70%)

Less than 70% – Unsatisfactory – Mark "2"

Developer(s):
Lovtsova L. V., Doctor of Medical Sciences, academic title-Associate Professor, Head of the Department of General and Clinical Pharmacology.
Sorokina Yu. A., Candidate of Biological Sciences, academic title-Associate Professor, Associate Professor of the Department of General and Clinical Pharmacology.

Date "_____" _____ 202__