MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS
EDUCATIONAL INSTITUTION
"GOMEL STATE MEDICAL UNIVERSITY"
DEPARTMENT OF GENERAL AND CLINICAL PHARMACOLOGY

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LIST OF QUESTIONS FOR THE EXAMINATION IN THE DISCIPLINE "PHARMACOLOGY" FOR STUDENTS OF THE GENERAL MEDICINE FACULTY AND FIS (English language of instruction)

Section 1. General Prescription and General Pharmacology

1. Definition and objectives of pharmacology as a science and academic discipline. Sections and fields of modern pharmacology. Basic terms and concepts of pharmacology: pharmacological activity, action, efficacy.
2. Concept of a medicinal substance, medicinal product, dosage form, and pharmaceutical preparation.
3. Nomenclature of drugs: chemical, international nonproprietary, and trade names. Concept of original drugs and generics.
4. Pharmacopoeia and its purpose. International (pharmacopoeial) and brand (trade) names of drugs.
5. Physician's prescription: its structure, rules for writing. Specifics of writing prescriptions for narcotic, poisonous, and potent drugs.
6. Solid dosage forms: general characteristics, advantages, disadvantages, and prescription rules.
7. Liquid dosage forms: solutions for external and internal use, characteristics, dosing features, and prescription rules.
8. Characteristics of injectable dosage forms. Requirements for injectable dosage forms. Rules for prescribing injection forms of factory and pharmacy preparation.
9. Soft dosage forms, their characteristics, requirements, and prescription formatting specifics.
10. Concept of chronopharmacology. Influence of biological rhythms on drug action. Concept of pharmacogenetics.
11. Main methods of drug therapy (allopathy and homeopathy), their essence and prevalence of use.
12. Sources of drug production. Ways of discovering new drugs. Stages of introducing drugs into medical practice.
13. Clinical drug trials: concept, objectives, ethical aspects. Phases of clinical trials, their characteristics, objectives, and scope (number of participants). Significance for drug introduction into medical practice.

14. Characteristics of tonic, stimulating, sedative, depressant, and paralyzing action of drugs.
15. General pharmacology: definition of the section and its content. Pharmacokinetics of drugs, main stages of pharmacokinetics.
16. Routes of drug administration into the body: enteral and parenteral, their comparative characteristics, advantages, and disadvantages.
17. Main mechanisms of drug absorption, comparative characteristics. Factors affecting absorption.
18. Bioavailability, definition. Factors affecting bioavailability. Ionization constant (pKa) and its significance for drug absorption.
19. Concept of presystemic elimination of drugs (first-pass effect through the liver). Routes of administration that avoid this process.
20. Distribution of drugs in the body: binding to plasma proteins, tissue deposition. Biological barriers. Concept of apparent volume of distribution.
21. Biotransformation of drugs in the body. Phases of metabolic transformations. Role of the microsomal cytochrome P450 system, its induction and inhibition.
22. Routes of drug elimination from the body. Renal and hepatic clearance. Half-life and elimination constant, their significance for determining the dosing interval.
23. Dependence of drug dosage and action on individual body characteristics (age, sex, body weight, pregnancy, physiological or pathological condition, circadian rhythms). Specifics of drug prescription for the elderly and children.
24. Dose, definition. Types of doses. Units of drug dosing. Therapeutic range of drug action, therapeutic index.
25. Characteristics of the final effects of drugs. Types of drug action.
26. Pharmacodynamics of drugs: concept of receptors. Concept of agonism (full, partial, inverse) and antagonism (competitive, non-competitive).
27. Types of drug action: local and resorptive, direct and indirect, main and side, selective and non-selective, reversible and irreversible, their characteristics. Concept of the placebo effect.
28. Drug interactions (pharmaceutical, pharmacokinetic, pharmacodynamic). Types of synergism and antagonism. Concept of polypharmacotherapy: risks and principles of rational combination.
29. Adverse drug reactions, types, and prevention strategies. Drug allergy, pseudo-allergy, idiosyncrasy: definition, clinical picture, diagnosis, prevention, and treatment. Embryotoxic, teratogenic, fetotoxic, and carcinogenic effects.
30. Concept of drug accumulation: material and functional accumulation. Examples of drugs prone to accumulation and their dosing rules.
31. Types of pharmacotherapy: etiotropic, pathogenetic, symptomatic, replacement, preventive. Examples for each type of therapy.
32. Phenomena upon withdrawal and long-term use of drugs: withdrawal syndrome, rebound phenomenon, abstinence. Tolerance (tachyphylaxis). Drug dependence (psychological, physical).

Section 2. Drugs Affecting the Peripheral Nervous System

33. Astringents, coating agents, adsorbents, and irritants: mechanisms of action and indications for medical use.
34. Local anesthetics, classification, mechanism of action, use in different types of anesthesia, toxic effects.
35. M-cholinomimetics and reversible anticholinesterase agents: mechanisms of action, main pharmacological effects, indications for use, and adverse effects.
36. M-cholinoblockers: classification, pharmacological effects (effect on the eye, heart, smooth muscles, gland secretion), indications for use, adverse effects.
37. Drugs affecting N-cholinergic receptor activity, classification. N-cholinergic agonists (N-cholinomimetic agents). Ganglioblockers: characteristics, use.
38. Alpha-adrenomimetics, classification of drugs, mechanisms of action, main pharmacological effects, indications, and contraindications for use.
39. Alpha-adrenoblockers: classification of drugs, mechanisms of action, main pharmacological effects, indications, and contraindications for use.
40. Beta-adrenomimetics: classification (selective and non-selective), mechanism of action, main pharmacological effects, indications for use, adverse effects.
41. Alpha,beta-adrenomimetics. Definition. Mechanism of action. Effect on the heart, vascular tone, smooth muscles, metabolism. Use. Adverse effects. Contraindications.
42. Beta-adrenoblockers, classification (selectivity, intrinsic sympathomimetic activity), pharmacological effects, use, adverse effects, and withdrawal syndrome.

Section 3. Drugs Affecting the Central Nervous System

43. Agents for inhalation and non-inhalation anesthesia: mechanisms of action, stages of anesthesia, adverse effects.
44. Ethyl alcohol: local and resorptive action. Principles of treatment of acute poisoning and chronic alcoholism.
45. Hypnogenic (hypnotic) agents, classification, principles of action and prescription rules, effect on sleep structure, undesirable effects.
46. Narcotic analgesics, definition, classification, mechanism of action, comparative characteristics, indications for use.
47. Non-narcotic analgesics and mixed-action analgesics: mechanisms of analgesic action, differences from opioids.
48. Anticonvulsants, definition, classification. Pharmacological characteristics of antiepileptic drugs. Principles of epilepsy therapy. Management of status epilepticus.
49. Antiparkinsonian drugs. Definition. Classification. Influence on impulse transmission in neurons of the extrapyramidal system. Use. Adverse effects.

50. Antipsychotic agents (neuroleptics), definition, classification, mechanism of action, main effects, and use in various fields of medicine. Adverse effects of neuroleptics and the mechanism of their development.
51. Anxiolytics (tranquilizers), definition, classification, pharmacodynamics, use, adverse effects. Differences between anxiolytics and neuroleptics.
52. Antidepressants, definition, classification by mechanism of action, main effects, use. Adverse effects of antidepressants.
53. Nootropic agents. Classification. Mechanism of action. Pharmacological effects. Indications for use. Adverse effects.
54. Sedatives, pharmacodynamics, use. Bromism: clinical picture, treatment measures.

Section 4. Drugs Regulating the Functions of Executive Organs and Systems

55. Drugs used in bronchial asthma: bronchodilators and anti-inflammatory agents.
56. Antitussive agents, classification, mechanism of action, rules of use, possible complications.
57. Expectorant and mucolytic agents, classification, mechanisms of action, effect on sputum structure, indications for use, and rules of administration.
58. Agents reducing the activity of the acid-peptic factor. Classification and pharmacological characteristics.
59. Antacid drugs and agents for *Helicobacter pylori* eradication. Classification, mechanisms of action, use, adverse effects.
60. Choleretic agents. Definition. Classification. Mechanisms of action. Use.
61. Agents affecting gastrointestinal motility: stimulants and antispasmodics. Antiemetic agents.
62. Laxatives. Definition. Classification. Site of action and onset of laxative effect. Comparative characteristics, indications, main adverse effects. Contraindications.
63. Antidiarrheal agents. Definition. Classification. Comparative characteristics of drugs in this group. Prescription rules and indications. Main adverse effects. Contraindications.
64. Hepatoprotectors: classification, mechanisms of action, indications for use.
65. Agents affecting the exocrine function of the pancreas: classification, mechanisms of action, indications for use.
66. Cardiotonic (inotropic) agents, definition, classification. Characteristics and use of non-glycoside cardiotonic agents.
67. Cardiac glycosides. Classification. Mechanism of action. Pharmacological effects. Indications. Digitalis intoxication: causes, symptoms, treatment principles.
68. Antiarrhythmic agents, definition, classification. Agents for the treatment of tachyarrhythmias, classification, mechanisms of action, use considering efficacy in arrhythmias of various origins.
69. Diuretics. Definition, classification. Mechanism of action, indications for use depending on the group. Main adverse reactions and contraindications.

70. Antihypertensive agents. Beta-adrenoblockers: classification by selectivity and intrinsic sympathomimetic activity. Pharmacological effects, indications, contraindications, adverse effects.
71. Calcium channel blockers. Classification by chemical structure. Mechanism of action, differences in effects on the heart and blood vessels. Pharmacological effects. Indications, adverse effects, contraindications.
72. Reserve antihypertensive agents (central alpha-2 agonists, vasodilators, alpha-adrenoblockers): classification, mechanisms of action, use in hypertensive crises, and adverse effects.
73. Antianginal drugs. Classification. Organic nitrates and nitrate-like agents, classification, pharmacodynamics, rules of use. Concept of tolerance to nitrates.
74. Lipid-lowering agents, classification, mechanism of action, specifics of use, adverse effects.
75. Drugs affecting the renin-angiotensin-aldosterone system (RAAS). Classification. Mechanism of action, pharmacological effects, indications for use, contraindications, and characteristic adverse effects of each group.
76. Antiplatelet agents. Classification. Mechanism of action. Pharmacological effects. Pharmacokinetic features of this group. Indications. Main adverse effects. Contraindications.
77. Direct and indirect anticoagulants. Classification. Mechanisms of action. Indications for use. Laboratory methods for safety monitoring. Antidotes.
78. Fibrinolytic agents. Classification. Mechanism of action. Pharmacological effects. Indications. Main adverse effects. Contraindications.
79. Classification of drugs affecting hemostasis. Hemostatic agents. Definition. Classification. Mechanism of action. Indications. Main adverse effects.
80. Pharmacotherapy of myocardial infarction. Main drug groups. Mechanisms of action, effects, and adverse reactions.
81. Pulmonary edema. Principles of pharmacotherapy. Classification of drugs used in pulmonary edema. Mechanisms of action, pharmacological effects.
82. Pharmacotherapy of coronary heart disease. Classification of antianginal drugs. Mechanisms of action and pharmacological effects (influence on myocardial oxygen demand, coronary blood flow). Adverse reactions.
83. Agents affecting uterine tone and contractile activity. Classification. Use. Adverse effects.

Section 5. Agents Regulating Tissue Metabolism

84. Hypothalamic and pituitary hormone preparations (octreotide, somatropin, desmopressin, oxytocin): clinical use.
85. Thyroid hormone preparations (levothyroxine sodium) and antithyroid agents (thiamazole): mechanisms of action, adverse effects.

86. Hormonal antidiabetic agents: short-acting, ultra-short-acting, and long-acting insulins. Mechanism of influence on carbohydrate metabolism. Dosing principles, indications, and complications of insulin therapy.
87. Female sex hormone preparations and their antagonists. Oral contraceptives.
88. Drugs affecting calcium metabolism and bone tissue metabolism.
89. Androgenic agents and their antagonists: pharmacodynamics, use. Anabolic steroids: influence on metabolic processes, use, adverse effects.
90. Water-soluble vitamin preparations. Influence on metabolic processes, nervous and cardiovascular systems, gastrointestinal tract, hematopoiesis, tissue regeneration. Use. Adverse effects.
91. Fat-soluble vitamin preparations. Influence on metabolic processes, tissues, organs, and systems. Use. Adverse effects.
92. Synthetic antidiabetic drugs. Classification. Mechanisms of action. Comparative characteristics. Use. Adverse effects.
93. Glucocorticosteroids. Classification, mechanisms of anti-inflammatory and immunosuppressive action, main indications, adverse effects, and withdrawal rules.
94. Female and male sex hormone preparations. Hormonal contraceptives: classification, principles of action.
95. Nonsteroidal anti-inflammatory drugs. Classification. Mechanism of effects. Influence on cyclooxygenase activity and prostaglandin synthesis. Use. Adverse effects.
96. Anti-gout drugs. Mechanism of action. Indications and contraindications for use. Drugs used in acute gout attacks. Mechanism of action. Adverse effects.
97. Classification of antiallergic drugs. Drugs inhibiting the release of allergy mediators. Drugs for the treatment of anaphylactic shock.
98. Drugs used in anemias. Classification. Drugs for the treatment of iron-deficiency anemias. Specifics of use. Adverse effects. Symptoms of overdose. Drugs for the treatment of megaloblastic anemias. Specifics of use. Anemia of chronic disease. Principles of therapy.

Section 6. Chemotherapeutic and Antidote Agents

99. Basic principles of rational chemotherapy. The problem of antibiotic resistance and ways to overcome it.
100. Penicillins. Classification. Mechanism and spectrum of antimicrobial action. Use. Adverse effects.
101. Macrolides and azalides. Mechanism, nature, and spectrum of antimicrobial action. Use. Adverse effects.
102. Cephalosporins. Classification. Mechanism and spectrum of antimicrobial action. Comparative characteristics of drugs of different generations. Use. Adverse effects.
103. Carbapenems and monobactams. Mechanism and spectrum of action. Use. Adverse effects.

104. Tetracyclines. Mechanism, nature, and spectrum of antimicrobial action. Use. Adverse effects.
105. Aminoglycosides. Mechanism, nature, and spectrum of antimicrobial action. Use. Adverse effects.
106. Lincosamides and amphenicols: mechanisms of action, spectrum of antibacterial activity, indications, and specific adverse effects.
107. Sulfonamides. Mechanism, nature, and spectrum of antimicrobial action. Comparative characteristics. Combined preparations. Use. Adverse effects and their prevention.
108. Fluoroquinolones. Classification, mechanism and spectrum of antimicrobial action. Main indications and adverse effects.
109. Oxazolidinones and polymyxins. Mechanism, nature, and spectrum of antimicrobial action. Use. Adverse effects.
110. Nitroimidazoles. Classification, mechanism and spectrum of antimicrobial action. Main indications and adverse effects.
111. 8-Hydroxyquinoline derivatives and nitrofurans. Mechanism and spectrum of antimicrobial action. Main indications and adverse effects.
112. Glycopeptides. Classification. Mechanism and spectrum of action. Indications. Main adverse effects. Contraindications.
113. Antituberculosis drugs. Mechanism and nature of antimicrobial action. Comparative characteristics. Specifics of use. Adverse effects. Principles of tuberculosis pharmacotherapy.
114. Antiviral drugs: classification, mechanisms of action. Characteristics of groups: spectrum of activity, specifics of use.
115. Anthelmintic drugs, classification. Mechanisms of action on parasites. Specifics of use, adverse effects.
116. Antiretroviral drugs for the treatment of HIV infection and drugs for the treatment of chronic viral hepatitis B and C.
117. Antifungal agents, definition, classification, mechanism of action, spectrum of activity, indications, and adverse effects.
118. Clinical and pharmacological characteristics of drugs used for amebiasis, trichomoniasis, and giardiasis. Influence of pathogen localization on drug choice. Mechanism of action and main adverse reactions.
119. Drugs used for toxoplasmosis, leishmaniasis, pneumocystosis. Specifics of disease course, pathogen localization, and principles of pharmacotherapy.
120. Antimalarial drugs. Classification according to the effect on different forms of the malarial plasmodium. Principles of drug selection for treatment and chemoprophylaxis. Main adverse reactions.
121. Antiseptic and disinfectant agents: classification by chemical groups. Mechanisms of antimicrobial action and use.
122. Antineoplastic drugs. Classification. Mechanisms of action. Spectrum of antitumor activity. Complications arising from use, their prevention and treatment. Immunosuppressive properties of cytostatics. Concept of targeted antineoplastic agents.

123. Antidotes and principles of emergency care in acute drug poisoning. Classification of antidotes.

LIST OF DRUGS FOR THE EXAMINATION IN PHARMACOLOGY FOR 3RD-YEAR STUDENTS OF THE GENERAL MEDICINE FACULTY AND FIS

International Nonproprietary Names (INN)

1. Azithromycin capsules
2. Azathioprine tablets
3. Amikacin ampoules
4. Amiodarone tablets
5. Amlodipine tablets
6. Amitriptyline tablets
7. Ambroxol tablets
8. Amoxicillin tablets
9. Atorvastatin tablets
10. Atropine sulfate ampoules
11. Acetylsalicylic acid tablets
12. Acetylcysteine tablets
13. Acyclovir tablets
14. Bisoprolol tablets
15. Beclomethasone aerosol
16. Vancomycin vials
17. Warfarin tablets
18. Bismuth subcitrate tablets
19. Haloperidol tablets
20. Gentamicin ampoules
21. Glibenclamide tablets
22. Dexamethasone ampoules
23. Diazepam tablets
24. Digoxin tablets
25. Diclofenac sodium ampoules
26. Doxycycline capsules
27. Domperidone tablets
28. Drotaverine tablets
29. Zopiclone tablets
30. Isoniazid tablets
31. Indapamide tablets
32. Ipratropium bromide metered-dose aerosol
33. Captopril tablets

34. Clindamycin capsules
35. Clopidogrel tablets
36. Lactulose syrup
37. Levothyroxine sodium tablets
38. Levofloxacin tablets
39. Lidocaine ampoules
40. Losartan tablets
41. Metformin tablets
42. Metoclopramide tablets
43. Methotrexate tablets
44. Metronidazole tablets
45. Mebendazole tablets
46. Meropenem vials
47. Molsidomine tablets
48. Morphine hydrochloride ampoules
49. Nimesulide tablets
50. Nitroglycerin sublingual tablets
51. Allopurinol tablets
52. Omeprazole capsules
53. Oseltamivir capsules
54. Paracetamol tablets
55. Pilocarpine eye drops
56. Piracetam tablets
57. Prednisolone tablets
58. Rivaroxaban tablets
59. Salbutamol metered-dose aerosol for inhalation
60. Spironolactone tablets
61. Tamsulosin tablets
62. Tramadol ampoules
63. Ursodeoxycholic acid capsules
64. Famotidine tablets
65. Fluconazole capsules
66. Furosemide ampoules
67. Cefepime vials
68. Ceftriaxone vials
69. Ciprofloxacin tablets
70. Enalapril tablets

Combined Drugs

71. Amoxicillin in combination with clavulanic acid tablets
72. Co-trimoxazole (Sulfamethoxazole in combination with trimethoprim tablets)