Ministry of Health of Ukraine
Kharkiv National Medical University
Department of Clinical Pharmacology and Internal Medicine

CLINICAL PHARMACOLOGY

Self-study guide
For English medium students

Specialty "General Medicine"

Student's name

_____

_____

Faculty_____group _____

Kharkov

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This self-study guide is intended for the 5thyear English medium students specializing in General Medicine/ The purpose of the guide is to improve the quality of students' training in clinical pharmacology.
Worksheet prepared in accordance with the program for clinical pharmacology according to the credit-modular system of training.

TABLE OF CONTENTS

Practical lesson№ 1

Subject and tasks of clinical pharmacology.Fundamental principles of pharmacokinetics and pharmacodynamics.Clinico-pharmacological characteristics of antihypertensive and hypertensive medical agents.

LEVEL 1. Answer briefly in writing form:

1.**Give the definition of**:

I. ***Pharmacokinetics***– _____

_____

_____

_____

1)Absorption- _____

_____

_____

2)Bioavailability – _____

_____

_____

3)Distribution - _____

_____

4) Elimination(excretion)- _____

_____

_____

2. **BasicPharmacokineticParameters (describe):**

_____

_____

_____

_____

_____

_____

_____

3.**Pharmacodynamics** - _____

_____

_____

1)Drug-drug interactions -_____

_____

_____

2)Adverse Drug Effects - _____
_____
_____

4.BasicPharmacodinamicParameters (describe):
_____
_____
_____
_____
_____
_____

4. **Evidence based medicine basic parameters** (describe):

- Placebo _____
_____
_____
_____
- Clinical randomize multicenter trial-_____
_____
_____
_____
_____
1) a prospective trial- _____
_____
_____
*2) a retrospective (case-control)-*_____
_____
_____
*3) a double-blind trial-*_____
_____
_____

5. **Pharmacogenetic**- _____
_____

6. Give the definitions to the concepts:
Antihypertensive drugs -_____
_____
_____
_____
Optimal blood pressure_____
_____
_____
_____

Target blood pressure _____

Hypotension_____

Orthostatic hypotension -_____

7.Classification of antihypertensive drugs

8. The ACE inhibitors mechanism of action:

9. The Angiotensin II receptors agonists mechanism of action:

10.Calcium antagonists of the dihydropyridine group mechanism of action:

11.Indications for the use of I1-imidazoline receptor agonists (moxonidine, rilmenidine):

12.Indications for the use of renin synthesis inhibitors:

13.Classification of diuretics

14.Indications for the beta-blockers in hypertension

15.Specify the medication that can cause hypotension in a patient

16.Specifygroupsofdrugsusedtotreathypotension. Giveexamplesoftheirnames anddoses.

Complete the teaching table (1-2)

Table 1

Indications for use of the main groups of antihypertensive medications

Indication	**ACE Inhibitors**	**Angiotensin II receptors agonists**	**Calcium antagonists**	**β-blockers**	**Diuretics**
Arterial hypertension					
Hypertensive crisis					
Ishemic heart disease, angina					
Disturbances of periferal blood circulation					
Disturbancees of cerebral circulation					
Chronic heart failure					
Acute myocardial infarction					
Pulmonary edema					
Heart rhythm disturbances, tachycardias					
Heart rhythm disturbances, bradyarrhythmias					

Indicate the effect availability: +, ++, +++

Table 2

Adverse effects of antihypertensive medications

Adverse effects	**ACE Inhibitors**	**Angiotensin II receptors agonists**	**Calcium antagonists**	**β-blockers**	**Diuretics**
Hypotension					
Ortostatic collapse					
Tachycardia					
bradycardia					
Bronchospasm					
Dry cough					
Heart failure					
Constipation					
Urinaryretention					
Swellingofthelegsandankles					
Headache					
Dizziness					
Skin hyperemia					
Hypoglycaemia					
Angioedema					

Thewithdrawalsyndrome					

Indicate the effect availability: +, ++, -

Amount of incorrect answers: _____. Mark for the 1 level: _____.

Level 2.Perform tests for self-control (for each questions, only one correct answer).

1. 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)

2. Which route of drug administration is most likely to lead to the first-pass liver metabolism?

A. Sublingual
B. Oral
C. Intravenous
D. Intramuscular

3. A 67-year-old female patient suffering from the essential hypertension suddenly at night developed headache, dyspnea that quickly progressed to asphyxia. Objectively: the patient is pale, with sweaty forehead, AP- 210/140 mm Hg, heart rate - 120/min, auscultation revealed solitary dry rales and moist rales in the lower parts. The shins are pastose. What kind of emergency aid would be the most efficient in this case?

A. Nitroglycerin and furosemide intravenously
B.Enalapril and furosemide intravenously
C. Digoxin and nitroglycerin intravenously
D. Labetalol and furosemide intravenously
E. Nitroglycerin intravenously and capoten internally

4. A 46 year old woman who has been suffering from hypertension for 5 years was diagnosed with hypertensive crisis. She complains about palpitation, sense of head pulsation; heart rate is 100/min, AP is 190/100 mm Hg (haemodynamics is of hyperkinetic type). What medication from the listed below should be the medication of choice in this case?

A. ACE inhibitor
B. β-adrenoceptor blocker
C. α-adrenoceptor blocker
D. Diuretic
E. Dihydropyridine calcium antagonist

5. For a patient with hypertension to decrease the arterial pressure Bisoprolol was administered. What is its mechanism of action?

A. Alpha adrenoceptor blockade
B. Indirect adrenomimetic action
C. Beta adrenoreceptor blockade
D. Spasmolitic
E. ACE receptors blockade

6. What drug may cause constipation in a patient undergoing combined therapy for arterial hypertension?

A. Verapamil
B. Furosemide
C. Trimetazidine
D. Panangin
E. Acetylsalicilic acid in low- dosage

7. A **48 years old patient within two days complains on strengthening of a headache in an occipital area and a blurred vision in the right eye. Objectively: BP is 220/130 mm Hg, the HR is 78 beats/min. During a direct ophthalmoscopy right eye retina hemorrhages and edema of the right optic nerve disc were revealed. Other results of physical examination are in normal values. In the blood and urine tests hematuria (2 +) and serum creatinine level - 2.1 mg/dl were detected. What optimal treatment should be prescribed for this patient?**

A. Gradual reduction of diastolic pressure to 90-100 mm Hg for 2 days
B. Decrease in diastolic pressure to 90 mm Hg for 2-3 hours;
C. Reduction of systolic pressure to 120 mm Hg. for 2-3 hours;
D. Reduction of systolic pressure to 120 mm Hg. for 6-12 hours
E. Intracranial pressure studies before reducing blood pressure

8. A female patient suffering from bronchial asthma a hypertension was diagnosed. Which of the antihypertensive drugs listed below is contraindicated?

A. Verapamil
B. Hydrochlorothiazide
C. Propranolol
D. Captopril
E. Losartan

9.Risk factors associated with an increased risk of toxicity during the use of captopril include:

A. Bilateral stenosis of the renal artery
B. Congestive heart failure
C. COPD
D. Female sex
E. Bronchial asthma

10. To calculate the volume of distribution (Vd) the following should be considered:

A. Concentration of the substance in plasma
B. Concentration of the substance in the urine
C. Therapeutic width of the drug
D. Daily dose of the drug

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

Amount of incorrect answers: _____. Mark for the level 2: _____.

Level 3.Please solve next clinical situational tasks and write your answers:

Situational task 1.Apatient 70 kgweigh, acetaminophenhas a Vd = 70 L and CL = 350 mL/min. **Calculate approximately theelimination half-lifeofthedrug**

_____

_____

_____

_____

Situational task 2.At the 34-year-old man during annual prophylactic medical examination at objective examination the high arterial pressure of 165/105 mm Hg was established. The measurement of blood pressure was repeated after 40 minutes, the result was 162/103 mm Hg. The physician asked the patient to come for a second appointment in a week,

and during the next appointment the following BP figures were determined: 170/102, 168/107, 175/108, 167/102 mm Hg.

Question: 1. To establish the diagnosis of hypertension what are the mandatory laboratory and instrumental studies you should conduct? Indicate the complete diagnosis for this patient.

_____
_____
_____
_____
_____
_____
_____
_____
_____

Question: 2. What antihypertensive drugs will be the drugs of choice in this situation? Explain why.

_____
_____
_____
_____
_____
_____
_____
_____
_____

Situational task 3.A 60-year-old patient came to the family physician for consultation about the increased blood pressure. Also, the patient complains of episodes of urinary retention. During an objective examination BP was 160/100 mm Hgand the presence of benign prostatic hyperplasia was also revealed**.**

Question 1. Which medication should be prescribed for this patient?

_____
_____

Question 2: What is the mechanism of action of this drug?

_____
_____
_____

Situational task 4.65-year-old patient reported that he has dizziness and general weakness around last 6 months in the presence of upright position. He takes no medications and has no personal or family history of neurological diseases. An objective examination in the supine position his blood pressure is 160/100 mm Hg. and HR -. 72 beats / min. After he got the vertical position, his BP drops to 70/40 mm Hg. but pulse not changed. The results of neurological examination were normal.

Question 1. What mandatory laboratory and instrumental diagnostic methods are necessary to conduct for diagnosis in this case?

_____
_____
_____
_____

_____

Question 2. Specify medication for the treatment of this patient? Explain your choice.

_____
_____
_____
_____
_____
_____
_____
_____
_____

Amount of incorrect answers: _____. Mark for the level 3: _____.

Level 4. Write prescriptions for medicines:

Medication	**Prescriptions**
1. **Lisinopril**	Rp: D.t.d. S.
2. **Amlodipine**	Rp: D.t.d. S.
3. **Irbesartan**	Rp: D.t.d. S.
4. Hydrochlortiazide	Rp: D.t.d. S.
5. **Torasemide**	Rp: D.t.d. S.

Amount of incorrect answers: _____. Mark for the level 4: _____.

Overall mark for the class: _____

Teacher Signature:_____

Student signature: _____

Practical lesson№ 2

Topic 3.Clinico-pharmacological characteristics of antianginal and antiischemic medical agents.Clinico-pharmacological characteristics of medical agent affecting lipid metabolism

Topic 4.Clinico-pharmacological characteristics of medical agent affectingblood coagulation

Level 1.Complete the teaching table (1-3)

Table 1

The pharmacological properties of antianginal medical agents

Group	BP	Systemic vascular resistance	Venous tone	Pulmonary artery pressure	Heart rate	AV-, SA- conduction	Stroke volume	Myocardial contractility	Oxygen demand	Blood flow		Motility of the gastrointestinal tract	Bronchial tone
										Coronary	Cerebral		
1. Organic nitrates													
Nitroglycerine													
Isosorbidedinitrate													
Isosorbidemononitrate													
2. β-blockers													
Non-selective β1, β2													
Selective β1													
3. Calcium antagonists													
Phenylalkylamines													
Dihydropyridines													
Benzothiazepines													
Biphenyl piperazines													
4. Inhibition of the funny channel													
Ivabradine													

Denote the effect availability: ↓ - decrease, 0 - no effect, ↑ - increase

Table 2

Indications for application of antianginal agents

Indication	Nitrates	β-blockers		Calcium antagonists				Ivabradine
		Non-selective	Selective	Phenylalkylamines	Dihydropyridines	Benzothiazepines	Biphenyl piperazines	
Angina attacks prophylaxis								
Acute attack of angina pectoris								
Acute myocardial infarction								
Pulmonary edema								
Hypertension								
Cardiac arrhythmias: tachyarrhythmias								
Cardiac arrhythmias: bradyarrhythmias								
Cerebrovascular accident								

Indicate the effect availability: +, ++, -

Table 3

Adverse effects of antianginal agents

Side effect	Nitrates	β-blockers		Calcium antagonists			Ivabra-dine
	Nitroglycerine	Propranolol	Bisoprolol	Verapamil	Nifedipine		
Hypotension							
Orthostatic collapse							
Tachycardia							
Bradycardia							
Bronchospasm							
Heart failure							
Constipation, urinary retention							
Swelling of feet and ankles							
Headache, dizziness							
Flushing of skin							
Hypoglycemia							
Metgemoglobinemiya							
Withdrawal syndrome							
Tolerance							

Indicate the effect availability: +, ++, -

Answer briefly in writing form:

1. Classification of lipid-lowering drugs

2.The main effects of statins:

3. The main indications for statins prescription:

4.Side effects of statins:

5.Fibrates mechanism of action:

7.Contraindications to the nicotinic acid:

8.Effects of Omega-3 fattyacids

9.The main effects of ezetimibe

10.The prescription of statins in urgent situations (choice of drug, dose, purpose of administration)

11. Classification of anticoagulants:

12. Pharmacodynamics of heparin

13.Low molecular weight heparins

14.Side effects of heparin

15.Classification of antiplatelet agents

16. Mechanism of action of antiplatelet agents

17.Basic requirements for antithrombotic therapy

18.Indications for the antithromboticsprescription

19.Factors determining the effectiveness of antiplatelet therapy

20.New oral anticoagulants (NOA)

21.Classification of drugs that increase blood coagulability.

The number of wrong answers: _____. Teacher's evaluation for the level 1 _____.

level 2. Perform tests for self-control (for each questions, only one correct answer)

1. **70 year old male patient with confirmed multi-vessel coronary vascular disease and stable angina of exertion III functional class also suffers from COPD [chronic obstructive pulmonary disease]. He was prescribed nifedipine for prophylaxis of angina attacks, but soon after the start of the drug application the complains of angina attacks increased. Chooseanexplanation:**

A. Nifedipine should not be used for angina attacks prophylaxis.
B. Nifedipine- a calcium channel blocker, causes significant vasodilation, hypotension and reflex cardiac stimulation whichleads to increased anginal episodes
C. Nifedipine need to be used in combination with propranolol, since propranolol would block reflex tachycardia due to nifedipine'svasodilatory effects.

2**. Calcium and sodium channel blocker useful in treating chronic stable angina not responsive to typical antianginal drugs**:

A. Diltiazem
B. Bepridil (Vascor)
C. Nifedipine
D. Lisinopril

3**. Choose from the list, an antianginal drug that can be administrated by inhalation:**

A. Isosorbidedinitrate
B. Glyceryltrinitrate
C. Amylnitrite
D. Isosorbidemononitrate

4. Symptoms associated with organic nitrates:

A. Bradycardia
B. Hypotension
C. Headache
D. Hypertension
E. B & C

5. Contraindication to the fibrates is:

A. Urolithiasis
B. Nonspecific ulcerative colitis
C. Rheumatoid arthritis
D. Myocardial infarction
E. Cholelithiasis or indication on a cholestones in an anamnesis

6. To the side effects of nicotinic acid it should be included everything except:

A. Arrhythmias
B. Nausea, vomiting
S. Bradycardia
D. Vertigo
E. Itching and redness of the skin**.**

7. In the case of rhabdomyolysis with statin therapy it is noted:

A. Increased ESR
B. Increased AST
C. Increased ALT
D. Increased CK
E. Increased LDH

8. Which of the following does not refer to absolute contraindications to thrombolytic therapy?

A. Age over 70 years
B. First trimester of pregnancy
C. Severe diabetic retinopathy

D. Hemorrhagic diathesis
E. Peptic ulcer disease

9. What level of in diastolic blood pressure is prohibited to conduct thrombolytic therapy?

A. 90 mm Hg
B. 95 mm Hg
C. 100 mm Hg
D. 105 mm Hg
E. 110 mm Hg

10. Which of the following statements regarding enoxaparin is incorrect?

A. **S**ubcutaneous injection is rapidly absorbed
B. Do not administer in case of severe renal failure
C. Can be used when body weight is above 150 kg
D. Has a high antithrombotic activity against Xa factor
E. Has a high antiaggregant activity

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

The number of wrong answers: _____. Teacher's evaluation for the level 2 _____.

Level 3.Please solved next clinical situational tasks and write your answer:

Situational task 1.A 60-year-old man comes into the office complaining of chest pains that primarily occur in the early morning and do not appear to be associated with stress or exercise. Following coronary angiography and positive stress-test with Ergonovineyou determine that this patient has angina pectoris as a result of coronary artery spasm.

1. **How would you treat the patient to alleviate the acute attacks when they occur ?**

_____
_____
_____
_____

2. **How would you treat chronically to prevent their reoccurrence?**

_____
_____
_____
_____
_____
_____
_____
_____
_____

Situational task 2.A 72-year-old woman was taken to the emergency room with attacks of intense heart pain and the presence of a transient myocardial infarction without ST elevation (NSTEMI). In the history such compressive pain in the chest during exercise appeared approximately 1-2 times a day. She underwent coronary angiography and 2 stents were installed in places of critical narrowing of the coronary vessels.

Concomitant drug therapy of the patient includes atorvastatin 20 mg daily, clopidogrel 75 mg daily, aspirin 100 mg daily, carvedilol 6.25 mg twice daily. After objective examination nitroglycerin in an inhaled form for episodic admission in angina attacks was also prescribed. Two weeks after discharge from the hospital, she came for a follow-up examination. When examined complains about episodes of intense headache, heartburn, general weakness

Question: 1.*For which of the prescribed drugs are these side effects inherent?*

_____

_____

_____

Question2. Can be in addition to this therapy prescribed verapamil and why?

_____

_____

_____

Situational task 3.Patient M., 45 years old on the background of good well-being, during the shoefelt an acute pain behind the sternum, cold sticky sweat, shortness of breath, cough, a sense of fear of death. In the anamnesis - a varicose disease. Objectively: the condition is severe, the body weight is significantly elevated (body mass - 120 kg, Body Mass Index (BMI) -Ketle index - 34 kg / m2), orthopnea, jugular vein distension. Skin is clean, cold, moist, purple-cyanotic. During lungs auscultation: breathing is weak, multiple moist ralesin the lower lobes. RR-30 per minute. Heart sounds are significantly muted, the S II over the pulmonary artery. The pulse= heart rate = 130 per minute, thegalop rhythm. BP - 75/40 mm Hg. The tongue is dry, coated with white coating. The liver does not protrude under the edge of the costal arch. There are multiple varicose nodules on the shins. On the ECG -sinus rhythm with heart rate - 130 / min, deep S wave in I lead, deep Q wave in the III lead.

Question:

1. What is your preliminary diagnosis?

_____

_____

_____

2. What can you see on the chest X-ray?

_____

_____

_____

3. Assign anticoagulant therapy.

_____

_____

_____

Situational task 4.

A healthy 75-year-old woman, who has a moderately active lifestyle, underwent a prophylactic examination, in which the total serum cholesterol content was found to be 5.1 mmol/L and HDL-70 mg/dl cholesterol. On the ECG no pathological changes were detected.

Question: What recommendations for the patient are the most correct?

_____

_____

_____

_____

_____

_____

Situational task 5.In a patient with angina pectoris and type 2 diabetes mellitus the level of TG is isolate increased.

Question: Which hypolipidemic therapy will be the most rational in this case and why?

_____

_____

_____

_____

The number of wrong answers: _____. Teacher's evaluation for the level 3 _____.

4 level. Write prescriptions for medicines:

Medication	Prescriptions
1. Nitroglycerin (for sublingual use or aerosol)	Rp: D.t.d. S.
2. Verapamile	Rp: D.t.d. S.
3. Varfarin	Rp: D.t.d. S.
4. Bisoprolol	Rp: D.t.d. S.
5. Ivabradine	Rp: D.t.d. S.

The number of wrong answers: _____. Teacher's evaluation for the level 4 _____.

Overall teacher's evaluation for the class: _____

Signature of teacher: _____

Signature of student: _____

Practical lesson№ 3
« Clinical-pharmacological characteristics of antibacterial medical agents »

LEVEL 1. Answer briefly in writing form:

1.**Give the definition of**:

Antibacterial medications -_____

_____

_____

_____

_____

_____

***Minimuminhibitoryconcentration*(*MIC*) -** _____

_____

_____

The value of minimum inhibitory concentration for assigning antibacterial medications_____

_____

_____

_____

Eradication_____

_____

_____

_____

Postantibioticeffect_____

_____

_____

_____

_____

Basic requirements for the dosage regimen of antibacterial drugs _____

_____

_____

_____

_____

Drugs with a dose-dependent effect_____

_____

_____

_____

_____

Drugs with time-dependent effect_____

_____

_____

_____

_____

_____

Please fill the next training table (1-3)

Table 1

Classification of antibacterial agents into bactericidal and bacteriostatic

Bactericidal	Bacteriostatic
1.	1.
2.	2.
3.	3.
4.	4.
	5.

Table 2

Classification of antibacterial agents according to mechanism of action

Mechanism of action	Antibacterial agent
Inhibition of cell wall synthesis	1. 2. 3. 4.
Inhibition of DNA gyrase	
Inhibition of RNA polymerase	
Inhibition of protein synthesis	1. 2. 3. 4.
Inhibition of folic acid metabolism	1. 2.

Table 3

Classes of Antibiotics and their Properties (summary of the types or classes of antibiotics and their properties including their spectrum and mode of action).

Chemical class	Examples	Spectrum (effective against)	Mode of action
Example of filling			
Beta-lactams (penicillins and cephalosporins)	Penicillin G, Cephalothin	Gram-positive bacteria	Inhibits steps in cell wall (peptidoglycan) synthesis and murein assembly
Semisynthetic beta-lactams			
Clavulanic Acid			
Monobactams			

Carboxypenems			
Aminoglycosides	Streptomycin		
	Gentamicin		
Glycopeptides	Vancomycin		
Lincomycins			
Macrolides			
Polypeptides	Polymyxin		
	Bacitracin		
Polyenes	Amphotericin		
	Nystatin		
Rifamycins	Rifampicin		
Tetracyclines	Tetracycline		
Semisynthetic tetracycline	Doxycycline		

Chloramphenicol	Chloramphenicol		
Quinolones	Nalidixic acid		
Fluoroquinolones	Ciprofloxacin		
Cephalosporins			
Growth factor analogs	Sulfanilamide, Gantrisin, Trimethoprim		
	Isoniazid (INH)		
	para-aminosalicylic acid (PAS)		

The number of wrong answers: _____. Teacher's evaluation for the level 1 _____.

2 level.Perform tests for self-control (for each questions, only one correct answer)

1. Young man 18 N., 18 years old, treated in the gastroenterology department with a firstly diagnosed duodenal ulcer. His test for Helicobacter pylori - positive.Gastric pH - 1.0. What is the optimum eradication therapy in this case?

A. Cvamatel+ amoksicylin + biseptol
B. Clarithromycin+omeprazole+amoxicillin
C. De-Nol + Trichopolum
D. Omeprazole + oxacillin
E. De-Nol + cimetidine

2. 10 years old girl is being treated in the cardiology department with a diagnosis of "Rheumatic disease, the active phase of Rheumatic heart disease." What etiotropicmedication should be given in the first place?

A. Ceftriaxone
B. Ascorbic acid
C. Videhol
D. Strepsils
E. Groprinazin

3. A 4 years old child is for the treatment of acute tonsillitis was administrated an antibacterial drug. After 2 weeks after treatment there was the yellow color of the teeth, which can not be removed with toothpaste. Which antibiotic might have caused this complication?

A. Azithromycin
B. Metronidazole
C. Tetracycline
D. Ceftriaxone
E. Amikacin

4. The chemotherapy drug with bactericidal effect on streptococci, staphylococci, Bacillus and Clostridium. What spectrum of action belongs to this medicine?

A. Antibacterial narrow spectrum
B. Droad spectrum antifungal
C. Antiviral
D. Antibacterial broad-spectrum
E. Antituberculous

5. Patient N., 32 years old, takes a massive antibiotic therapy and complains of abdominal pain, loose stools (4-6 times a day), general weakness. OBJECTIVE: satisfactory condition, blood pressure 120/70 mm Hg., heart rate 84 beats per minute. Abdominal palpation is soft, painful in the lower abdomen. The liver and spleen were not palpable. What type of drugs should be used in order to normalize intestinal microflora?

A. Linnex
B. Creon
C. Essentiale
D. Motilium.
E. Imodium

6. The patient 27 years of age who abuses alcohol, was diagnosed right-sided lobar pneumonia. On chest XR was foun infiltrative changes in the lower lobe in segments C6 and C10. Earlier bronchopulmonary diseases were not observed.Which antibiotic is most advisable to be administered in this case?

A. Gentamicin
B. Biseptolum
C. Tetracycline
D. Amoxycilin
E. Ceporinum(Cefaloridinum)

7. At 46 years old male detected bilateral pneumonia with multiple cavities. Penicillin treatment was ineffective. It was sown Staphylococcus aureus, from the broncho-pulmonary lavage, which is resistant to methicillin. Which is the optimum antibacterial agent in this situation?

A. Carbenicillin
B. Ampicillin
C. Claforan (cefotaxime)
D. Tetracycline
E. Biseptolum

8.A 6-year-old child with pneumonia was prescribed an antibiotic. After the treatment the child became deaf. Which antibiotic group might have caused this complication?

A. Aminoglycosides
B. Cephalosporins
C. Macrolides
D. Natural penicillin
E. Semisynthetic penicillin

9. Patient E 27- years with acute tonsillitis in background of antibiotic treatment with aminopenicillinsdeveloped allergic reactions. What is the optimum alternative antibiotics to treat the patient in the future to reduce the chance of developing an allergic reaction?

A. Cephalosporins
B. Imipenem
C. Protected aminopenicillin
D. Semi-synthetic penicillins
E. Macrolides

10. A 30 y.o. patient who suffers from acute left side pneumonia was prescribed ceftriaxone intravenously. The patient is prone to allergic reactions to painkillers. What kind of solution for dilution of antibiotic should use nurse to conduct tests for susceptibility to ceftriaxone?

A. 0,9% sodium chloride solution
B. 10% sodium chloride solution
C. The water for injection
D. 0,25% novocaine solution
E. 1% solution of novocaine

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

The number of wrong answers: _____. Teacher's evaluation for the level 2 _____.

3 level. <u>Please solved next clinical situational tasks and write your answer:</u>

Situational task 1. While on holiday in Spain, a 62-year-old man develops a cough, fever and breathlessness at rest. He is told that his chest x-ray confirms that he has right side segmental pneumonia. He is started on a seven-day course of oral antibiotics by a local physician and stays in his hotel for the remainder of his ten-day holiday. When he returns home, he is reviewed by his own GP who notices that he looks pale and sallow and is still breathless on exertion, but his chest examination no longer reveals any signs of pneumonia. A full blood count reveals a haemoglobin level of 6.7 g/dL (previously normal), normal white blood count and platelets, and a reticulocyte count of 4.1%.

Question: **What other tests should you do and what antibiotics would be most likely to cause this clinical scenario?**

_____
_____
_____
_____
_____
_____

Situational task 2. A 16-year-old student was admitted to an intensive care unit following a severe head injury in a road traffic accident. Four days after admission, he was still in need of mechanical ventilation and had developed a fever and raised leucocyte count. One of the nurses had noticed that the patient had purulent and slightly bloodstained tracheal secretions and had sent them to the diagnostic laboratory. The Gram stain report said: 'Gram-positive cocci: further identification and sensitivities to follow'. Intravenous flucloxacillin was commenced, and fucidic acid added 2 days later when further results reached the intensive care unit. The patient had a further serious infection with Pseudomonas aeruginosa2 weeks later but survived and eventually left hospital after almost a year.

Question:1. **What was the first infection?**

_____
_____
_____

Question:2. **Why was flucloxacillin chosen?**

_____

_____

_____

Question:3**. How reliable is tracheal suction as a specimen collection technique?**

_____

_____

_____

_____

Situational task 3.A48-year-old man with fever and a productive cough was admitted after he became increasingly short of breath. He had a temperature of 38.5°C, a pulse of 120 beats/min and a respiratory rate of 22 breaths/min. Chest examination revealed reduced expansion on the right, dullness to percussion, quiet breath sounds and dullness to percussion in the right midzone and green-coloured sputum. Chest Xray showed a clearly demarcated opacity occupying the right middle lobe. Blood gases on arterial blood collected while the patient was breathing room air confirmed a hypoxia and respiratory acidosis.

Question:1**. Does this patient have a lobar pneumonia?**

_____

_____

Question:2. **Will bacteriological investigations assist the immediate management of this infection?**

_____

_____

Question:3**. Should ceftriaxone be used as a first choice of antibiotic in resistant *Streptococcus pneumoniae*infection?**

_____

_____

_____

Situational task 4.A 19-year-old, sexually active woman presents to the emergency room complaining of a 2-day history of urinary frequency, burning, and urgency. She denies vaginal discharge or itching, fever, chills, nausea, vomiting, back pain, abdominal pain, and hematuria. She has no history of UTI or a sexually transmitted disease. She recently began using a diaphragm for birth control, and reports that her last menstrual period occurred 3 weeks ago. She has only one sexual partner, who denies penile discharge or burning on urination. On physical examination, she is noted to be afebrile with a normal blood pressure and pulse. There is no costovertebral angle tenderness. Her abdomen is soft and there is mild suprapubic tenderness in response to palpation. A urinalysis reveals 1+ protein, 2+ leukocytes, and 1+ blood. The urine pH is 5.6. Gram's staining of an unspun urine specimen reveals abundant polymorphonuclear leukocytes and moderate gram-negative rods. A clean-catch urine specimen is sent to the microbiology laboratory for culture.

Question:1**. What other therapeutic options would have been appropriate in this patient?**

_____

_____

_____

_____

_____

Question:2**. What other diagnostic or laboratory tests should have been performed?**

_____

_____

_____
_____
_____

***Question:*3. What side effects of therapy should this woman know about?**

_____
_____
_____
_____

***Question:*4. What would be an appropriate analgesic for a patient with UTI who is experiencing severe urethral discomfort?**

_____
_____

The number of wrong answers: ____. Teacher's evaluation for the level 3 _____.

4 level. Write out the prescription for these drugs in different forms:

Medication	**Prescriptions**
1. Gatifloxacine	Rp: D.t.d. S.
2. Co-amoxiclav (amoxicillin/clavulanic acid)	Rp: D.t.d. S.
3. Ceftriaxone	Rp: D.t.d. S.
4. Azithromycin	Rp: D.t.d. S.
5.Ketoconazole	Rp: D.t.d. S.

The number of wrong answers: ____. Teacher's evaluation for the level 4 _____.

Overall teacher's evaluation for the class: _____

Signature of teacher: _____

Signature of student: _____

Practical lesson№ 4.

Clinico-pharmacological characteristics of medicines that affect the bronchial patency. Anti-inflammatory medical agents (steroidal and nonsteroidal) .

1 LEVEL. Answer briefly in writing form:

1. **Give the definition of**:

Nonsteroid anti-inflammatory drugs –

_____

_____

Beta 2 selective drugs -

_____

_____

_____

Corticosteroids - _____

_____

_____

Leukotriene pathway inhibitors_____

_____

2. Classification of COX-2 inhibitors:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

3.**Mechanismofbronchodilatorsaction:**

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

4. **Mechanismof aerosol corticosteroidsaction:**

1. _____
2. _____
3. _____

4. _____

4. Indications to the use of Beta2 - agonists:

1. _____
2. _____
3. _____
4. _____
5. _____

5. Indications for the use of antimuscarinic drugs :

1. _____
2. _____
3. _____
4. _____
5. _____

6.Contraindications to the use of methylxanthines :

1. _____
2. _____
3. _____
4. _____
5. _____

7.COX -1, COX-2 inhibitors classification:

_____
_____
_____
_____
_____
_____
_____
_____

8. Indications for COX-1, COX-2 inhibitors treatment:

1. _____
2. _____
3. _____
4. _____
5. _____

9. Adverse effects of glucocorticoids

1)gastrointestinal effects:

_____
_____
_____

2) renal effects:_____
_____
3)_____
4) central symptoms:_____
_____
5) allergic reactions:_____
_____

10.Contraindications for glucocorticoid treatment:

_____
_____
_____
_____
_____
_____

11. Mechanisms of glucocorticoid action :

a) Impact on the immune system:

_____
_____

b) Effect on water and electrolyte metabolism :

_____
_____

c) Effects on metabolism :

_____
_____

d) Impact on CVS Impact on the system of the hypothalamus -pituitary- adrenal Effects on blood:

_____
_____

12. Indications for NSAIDS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

13. Contraindication for NSAIDS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Amount of incorrect aswers: _____. Mark for the 1 level: _____.

2 level.Perform tests for self-control (for each questions, only one correct answer)

1. Tick the drug belonging to non-selective beta2-adrenomimics:

A. Salbutamol
B. Isoprenaline
C. Salmeterol
D. Terbutaline
E. All of above

2. Select the side-effect characteristic for non-selective beta2-adrenomimics:

A. Depression of the breathing centre
B. Tachycardia
C. Peripheral vasoconstriction
D. Dry mouth
E. All of above

3. Pick out the bronchodilator drug related to xanthine:

A. Atropine
B. Orciprenaline
C. Adrenaline
D. Theophylline
E. All of above

4. Which of the following is the drug of choice for bronchial asthma attacks prevention?

A. Salbutamol
B. Cromolyn sodium
C. Drotaverine
D. Ambroxol
E.Diphenhydramine hydrochloride

5. What complications can occur when assigning ASA patient with deficiency of glucose-6 - phosphodiesterase ?

A. Anaphylaxis
B. Lyell syndrome
C. Trombocytopenic purple
D. Intravascular hemolysis
E. Asthma

6. Pick out the bronchodilator drug belonging to sympathomimics:

A. Isoprenaline
B. Ephedrine
C. Atropine
D. Salbutamol
E. All of above

7. The mechanism of methylxanthines action is:

A. Inhibition of the enzyme phosphodiesterase

B. Beta2 -adrenoreceptor stimulation
C. Inhibition of the production of inflammatory cytokines
D. Inhibition of M-cholinoreceptors
E. All of above

8. Which of the following M-cholinoblocking agents is used especially as an anti-asthmatic?
A. Atropine
B. Ipratropium
C. Platiphylline
D. Metacin
E. All of above

9. Indicate the side effect of Theophylline:
A. Bradycardia
B. Increased myocardial demands for oxygen
C. Depression of respiratory centre
D. Elevation of the arterial blood pressure
E. All of above

10. Which of the following agents is a nonselective beta receptor agonist?
A. Norepinephrine
B. Terbutaline
C. Isoproterenol
D. Dobutamine
E. All of above

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

Amount of incorrect aswers: _____. Mark for the 2 level: _____.

3 level. <u>Please solved next clinical situational tasks and write your answer:</u>

Situational task 1.A 53-year-old woman who has been treated for rheumatoid arthritis for a long time complains about arterial pressure rise, gastric pain, heartburn.

Question:**What preparation has she taken?**

_____

_____

Question:**What other side effects this drug can occur?**

_____

_____

_____

_____

Situational task 2.3- days newborn, admitted to neonatal center with a diagnosis of pulmonary hypertension, premature closure of the arterial duct**.**

Question: **What COX inhibitor-drug was used during pregnancy could cause this complications?**

_____

_____

***Situational task* 3.** A patient hasan angina pectoris, he didnt inform his doctor that he had attacks of COPD. Doctor administered him a medication, which taking resulted in less frequent attacks of angina, but attacks of cough became more frequent.

angina ***Question:*** **Medication from which group was prescribed to the patients?**

_____

_____

Question:**What adverse effects of this group you know?**

_____

_____

_____

_____

_____

Situational task **4.**A pregnant woman (III trimester) who became ill with influenza for 3 days, in order to reduce the temperature took aspirin 0.5 twice a day.

Question: **Which drugs from Nsaids group could we use in pregnant woman?**

_____

Situational task **5.**A 75 year old patient had in the dentists room a sudden dyspnea, weakness. The doctor gave him nitroglycerin, without any effect, then inhaled salbutamol.

Question:**What is the mechanism of action of this drug?**

_____

_____

_____

Question: **How many times per day could you prescribe this drug. Side effects.**

_____

_____

Amount of incorrect aswers: _____. Mark for the 3 level: _____.

4 level. Write out the prescription for these drugs in different forms:

Medication	**Prescriptions**
1. Salbutamol	Rp.: D.t.d. S.
2. Tiotropium bromide	Rp.: D.t.d. S.
3.Ibuprofen	Rp.: D.t.d. S.
4**.** Paracetamol	Rp.: D.t.d. S.

5.Budesonide	Rp.: D.t.d. S.

The number of wrong answers: ____. Teacher's evaluation for the level 4 _____.

Overall teacher's evaluation for the class: _____

Signature of teacher: _____

Signature of student: _____

Practical lesson №5.
«Clinical pharmacological characteristics of the medical agents, which are used for the treatment of gastrointestinal tract and hepatobiliary system diseases»

Level 1. Complete the teaching table (1-6)

Table 1

The pharmacological properties of the medical agents, which are used in gastrointestinal tract disorders

Group	Inhibition of acid secretion in stomach	Neutralization of acid in stomach	Anti- H.pylori properties	Binds selectively to ulcers	Stimulation of mucus and bicarbonate secretion	Enhancement of mucosal blood flow	Stimulation of GIT motility	Prevention of vomiting	Relax the smooth muscles of GIT	Pain syndrome relief	Relief of constipation	Antidiarrheal action
PPIs												
H2 receptor antagonists												
Mucosal protective agents												
Sucralfate												
Prostaglandin analogs												
Colloidal bismuth compounds												
Antacids												
Sodium bicarbonate												
Calcium carbonate												
Al +Mg **hydroxide**												
Spasmolytics												
Prokinetics												
Laxatives												
Antidiarrheal drugs												

Denote the effect availability: +, ++, +++, -

Table 2

The pharmacological properties of the medical agents that influence the function of liver and pancreas

Group	Inhibition of viral replication	Inhibition of cell proliferation	Immunomodulation	Hepatocyte membrane	Stimulation of liver regeneration	Antioxidant action	Antitoxic action	Antifibrotic action	Bile-expelling action	Antidepressant action	Neuroprotective	Dissolution of cholesterol gallstones	Breakdown of proteins, fats, and	Promotion of nutrient absorption in GIT
α-interferons														
Peginterferon														
Nucleoside analogues														
Ribavirin														
Lamivudin														
Hepatoprotectors														
Silymarin														
Essential phospholipids														
S-adenosylmethinonin														
UDCA														
Pancreatic enzymes														

Denote the effect availability: +, ++, +++, -

Table 3

Indications for application of the medical agents, which are used in gastrointestinal tract disorders

Indication	PPIs	H2 receptor antagonists	Mucosal protective agents			Antacids	Prokinetics	Spasmolytics	Laxatives	Antidiarrheal agents
			Sucralfate	Prostaglandin analogs	Colloidal bismuth compounds					
GERD										
Peptic ulcer disease										
H.pylori-associatedulcers										
NSAID-associated ulcers										
Prevention of rebleeding from peptic ulcers										
Nonulcerdyspepsia										
Prevention of stress-related mucosal bleeding										
Gastrinoma and other hypersecretory conditions										
Impaired gastric emptying										
Hyperperistalsis of GIT										
Acute diarrhea (mild to moderate)										
Chronic diarrhea (eg, in case of IBD or IBS)										
Pain associated with spasms of smooth muscles										
Constipation										

Indicate the effect availability: +, ++, +++, -

Table 4

Indications for application of the medical agents that influence the function of liver and pancreas

Indication	α-interferons	Peginterferon	Nucleoside analogues		Hepatoprotectors			UDCA	Pancreatic enzymes
			Lamivudin	Ribavirin	Silymarin	Essential phospholipids	S-adenosylmethinonin		
Hepatitis B									
Hepatitis C									
Hairy cell leukemia									
Multiple myeloma									
Kaposi's sarcoma									
Melanoma									
Chronic myeloid leukemia									
HIV infection									
Toxic liver injury									
Non-alcoholic fatty liver disease									
Liver cirrhosis									
Cholangitis									
Encephalopathy associated with liver failure									
Depression									
Non-calculousc hroniccholecystitis									
Gallstone disease (cholesterol stones)									
Primary biliary cirrhosis									
Gastritis with bile reflux									
Insufficient exocrine function of the pancreas									

Indicate the effect availability: +, ++, +++, -

Table 5

Adverse effects of the medical agents, which are used in gastrointestinal tract disorders

Side effect	PPIs	H2-	Antacids	Mucosal	Prokineti	Spasmol

		receptor antagonists				protective agents			cs		ytics	
		Cimetidine	Other H2-receptor antagonists	Sodium bicarbonate	Calcium carbonate	Al +Mg hydroxide	Sucralfate	Prostaglandin analogs	Colloidal bismuth compounds	Metoclopramide	Domperidone	Neurotropic	Myotropic
Diarrhea													
Constipation													
Risk of enteric infections													
Headache													
Abdominal pain													
Bradycardia and hypotension													
Tachycardia													
Metabolic alkalosis													
Black stool													
Extrapyramidal effects													
Mental status changes													
Gynecomastia in men/ Galactorrhea in women													
Dry mouth													
Blurred vision													
Belching													

Indicate the effect availability: +, -

Table 6

Adverse effects of the medical agents that influence the function of liver and pancreas

Side effect	α -	P	Nucleoside	Hepatoprotectors	U D	P a

			analogues						
			Lamivudin	Ribavirin	Silymarin	Essential phospholipids	S-adenosylmethinonin		
Systemic "flu-like" symptoms									
Bone marrow suppression									
Neuropathy									
Autoimmune disorders									
Nausea, vomiting, diarrhea									
Injection site reactions, partial alopecia									
Pancreatitis									
Lactic acidosis									
Emotional lability									
Hemolysis									
Teratogenic effect									
Skin rash									
Abdominal pain									

Indicate the effect availability: +, -

The number of wrong answers: _____. Teacher's evaluation for the level 1 _____.

2 level. Tests and assignments for self-assessment, basic level of knowledge: one choice questions (choose one correct answer/statement for each question):

1**. Female44 years old patient is worried about periodic pain in the epigastric region, which appears 1.5 hours after eating and at night. Objectively: heart rate is 70/min., BP 125/75 mm Hg., tenderness in the epigastric region. During Esophagogastroduodenoscopya duodenal ulcer up to 0.6 cm in diameter was found. The test for H. Pylori is positive. Which of the listed above antisecretory drugs will be an obligatory component of the patient's treatment regimen?**

A. Omeprazole
B. Famotidine
C. Pyrenzepine
D. Atropine
E. Maalox (aluminium oxide hydrated +magnesium hydroxide)

2. **Adverse effects of ribavirin:**

A. Liversteatosis
B. Pancreatitis
C. Hemolytic anemia

D. Bleeding
E. Peptic ulcer of the stomach and duodenum

3. A 7 years old child complains of the paroxysmal pain in the abdomen that occurs after a mental stress, the use of cold drinks, ice cream. After clinical and instrumental examination a diagnosis of was made: dyskinesia of the gallbladder, the hypertonic type. Which group should be prescribed primarily for the treatment?

A. Spasmolytics and choleretics
B. Choleretics and cholekinetics
C. Sedatives and cholekinetics
D. Antioxidants
E. Antibiotics

4. Which antacid may cause the following side effects: gastric distention, belching, metabolic alkalosis and liquid retention?

A. Sodium bicarbonate
B. Magnesium hydroxide
C. Aluminium hydroxide
D. Aluminum-magnesium antacids
E. Antacids with alginic acid

5. Steatorrhea, caused by insufficiency of exocrine pancreatic function can be successfully treated with

A. Misoprostol
B. UDCA
C. Lipase
D. Secretin

6. Which drugs are the most effective ones for the prevention of NSAID-induced ulcers?

A. Antacids
B. H2-receptor antagonists
C. Prostaglandin analogs
D. Proton pump inhibitors
E. M-cholinolytics

7. The drug, which forms the viscous paste selectively adhering to ulcers in the stomach:

A. Maalox
B. Sucralfate
C. Famotidine
D. Gastrozepin

8. Indications for the interferon-alpha are all the following, except:

A. Hepatitis B and C
B. Kaposi's Sarcoma
C. Primary biliary cirrhosis
D. Chronic myeloid leukemia
E. Hairy cell leukemia

9. The safest laxative for long term use is:

A. Magnesium citrate
B. Lactulose
C. Polyethylene glycol
D. Phenolphthalein

10. The main groups of antidiarrheal drugs are the following, except one:

A. Opioid agonists
B. Serotonin 5-HT4- agonists
C. Colloidal bismuth compounds
D. Caolin and pectin
E. Bile salt binding resins

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

The number of wrong answers: _____. Teacher's evaluation for the 2 level _____.

3 level. Perform tests for self-control (for each questions, only one correct answer)

***Situational task* 1.**Apatientsufferingfromgastroesophagealrefluxhastakena certaindrugthat"reduces acidity"fromtimetotimeover the past 5years.Thisdrugwasrecommendedbya pharmaceutist.Thefollowingsideeffectsareobserved:osteoporosis,muscleasthenia, indisposition.

***Question:* What drug has suchside effects?**

_____

_____

_____

***Situational task* 2.**The 65 years old patient with long term anamnesis of diabetes mellitus type 2 was diagnosed with gastroparesis. The appropriate treatment was prescribed to eliminate the signs of gastroparesis. After several days of treatment he developed such symptoms as restlessness, drowsiness, insomnia, anxiety, and agitation. Lab data of glucose metabolism demonstrate no acute deviations.

***Question:* What drug could be the potential reason for such side effects?**

_____

_____

_____

_____

***Situational task* 3.**A 14-year-old boy periodically complains of pain in the epigastrium on an empty stomach, nausea and heartburn during 3 years. Gastroduodenoscopy: signs of gastroduodenitis and ulcer defect of the mucous membrane of the duodenum.

***Question:* What is the most effective medication to treat this child?**

_____

_____

***Situational task* 4**.A45 years-old men, *a* liquidator of a breakdown at a nuclear power plant, who was irradiated complained about vomiting that occurs all of a sudden.

***Question:* What medication should be prescribed?**

_____

_____

What is the mechanism of action of this drug?

_____

_____

_____

_____

Situational task5.A 50-year-old man reports a 10-year history of chronic active hepatitis caused by hepatitis C virus. He was brought to the emergency room because of cachexia and disturbed mental status. Physical examination reveals palmar erythema, clubbing, jaundice, massive ascites. Patient has asterixis. Laboratory data reveals severe hypoalbuminemia and hyperbilirubinemia.

Question: **What preparation should be used for the treatment?**

_____

_____

Question: **What is the mechanism of action of this drug?**

_____

_____

_____

_____

The number of wrong answers: _____. Teacher's evaluation for the level 3 _____.

4 level. Prescribe the recepies:

Medication	**Prescriptions**
1. Omeprazole (tablets)	Rp: D.t.d. S
2. Ursodeoxycholicacid (capsules)	Rp: D.t.d. S
3. Bismuth subcitrate (tablets)	Rp: D.t.d. S
4. Ademetionine for parenteral administration	Rp: D.t.d. S
5. Metoclopramide for parenteral administration	Rp: D.t.d. S
6.Ribavirin (capsules)	Rp: D.t.d. S
7.Drotaverin (for parenteral use)	Rp: D.t.d. S

Amount of incorrect answers: _____. Mark for the 4 level: _____.

Overall mark for the class: _____

Teacher Signature:_____

Student signature: _____

APPROXIMATE LIST OF QUESTIONS TO FINAL CONTROL

1. Classification of lipid-lowering drugs.
2. Mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications for statins.

3. Mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications for fibrates administration.
4. Omega 3 - fatty acids. The mechanism of action. Features of the application.
5. Classification of dyslipidemia. Differentiated approach to the use of lipid-lowering medications.
6. Group of medicines related to the anti-ischemic and antianginal drugs.
7. Mechanism of action, pharmacological effects, indications and contraindications to organic nitrates administration.
8. Mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications to beta - blockers.
9. Mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications to calcium channel blockers.
10. Classification of calcium channel blockers. Peculiarities of administration. Dosage.
11. Classification of beta-blockers. Peculiarities of administration. Dosage.
12. Antiplatelet drugs. Classification. Mechanisms of action. Methods of administration.
13. Thrombolytic agents. Indications and contraindications for thrombolysis. Schemes of administration.
14. Anticoagulants. Classification. Mechanisms of action. Side effects.
15. Classification of antihypertensive drugs.
16. Differentiated approach to antihypertensive therapy with concomitant diseases (diabetes, asthma, pregnancy, old age, pheochromocytoma, etc.).
17. The mechanism of antihypertensive action, pharmacological effects, side effects when prescribing calcium antagonists dosage.
18. The mechanism of antihypertensive action, pharmacological effects, side effects when prescribing beta -blockers. Dosage.
19. The mechanism of antihypertensive actions, pharmacological effects, indications and contraindications, side effects when prescribing angiotensin-converting enzyme inhibitor. Dosage.
20. The mechanism of antihypertensive action, pharmacological effects, indications and contraindications, side effects when prescribing angiotensin II receptor antagonists. Dosage.
21. Principles of combined use of antihypertensive drugs.
22. Classificationofantiarrhythmicmedicines.
23. Differentiated approach to the administration of antiarrhythmic medications.
24. Classification of cardiac glycosides. Dosage.
25. Cardiac effects of cardiac glycosides (digoxin).
26. Indicationsforcardiacglycosides.
27. Clinical and ECG signs of cardiac glycosides intoxication.
28. *Non-glycoside inotropic agents*. Indications for use.
29. Classificationofdiuretics.
30. Mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications for loop diuretics.
31. Mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications for the purpose of thiazide and to thiazides similar agents. Dosage.
32. The mechanism of action and pharmacological effects of potassium sparing diuretics. Indications and contraindications for use. Dosage.
33. A differentiated approach to the choice of diuretic agents, depending on the presence of comorbidities (effects on lipid and carbohydrate metabolism).
34. Classification of medical agents affecting the bronchial patency.
35. Mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications for β2 agonists administration, short-acting β2 agonists. Dosage.
36. Mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications for β2 agonists. Long-acting β2 agonists. Dosage.

37. Methylxanthines, mechanism of action, pharmacological effects, side effects. Dosage.
38. Glucocorticoids. Advantages of inhaled forms. Different dosing regimens.
39. Systemic adverse events occurring with prolonged use of glucocorticoids.
40. Withdrawal effects of glucocorticosteroids.
41. Antitussive agents. Mechanisms of action. Dosing regimens.
42. Drugs interaction.
43. Types of side effects.
44. Classification of NSAIDs.
45. Mechanisms of action, pharmacological properties of NSAIDs.
46. Indications and contraindications. Side effects of NSAIDs.
47. Regime of NSAIDs dosing.
48. The most frequent mistakes in antimicrobial drugs prescribing.
49. Allergic reactions to administration of antibacterial agents . Clinical implications .
50. Classification. The spectrum of activity. Mechanism of action .Features of the penicillins application.Dosage.
51. Classification. The spectrum of activity. Mechanism of action . Features the cephalosporins use. Dosage .
52. Classification. The spectrum of activity. Mechanism of action . The carbapenems application features. Dosage.
53. Classification. The spectrum of activity. Mechanism of action .Features of aminoglycosides use.Dosage .
54. Classification. The spectrum of activity.Mechanism of action. Features the fluoroquinolones use. Dosage.
55. Classification. The spectrum of activity.Mechanism of action. The macrolides application features. Dosage.
56. Medications that stimulate motility of the gastrointestinal tract. Classification.
57. Mechanism of action, pharmacokinetics and pharmacodynamics , indications and contraindications for the dopamine receptors selective blockers. Dosage.
58. Clinical and pharmacological characteristics of drugs which inhibit the digestive tract motility - loperamide .Dosage .
59. Medical agents with spasmolytic activity, mechanisms of action , pharmacological properties, indications , contraindications, dosage.
60. Medical agents with anti-secretory activity.
61. Classification, mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications for the purpose of proton pump inhibitors. Dosage.
62. Classification, mechanism of action, pharmacokinetics and pharmacodynamics, indications and contraindications for the use of H2-histamine receptor blockers. Dosage.
63. Antacids mechanism of action. Pharmacological properties.Dosage.
64. Cytoprotectors . Pharmacological features. Dosage .
65. Hepatoprotectors .Classification. Mechanism of action, pharmacokinetics and pharmacodynamics , indications and contraindications for use. Dosage .
66. Pancreatic enzymes. Pharmacological features. Indications for use. Side effects .Dosage .
67. Complications of drug therapy.

Notes

Notes

LIST OF ALL MEDICATIONS WHICH STUDENTS OF MEDICAL AND DENTISTRY FACULTIES MUST KNOW

ANTIBACTERIAL AGENTS

1. Benzylpenicillin -sodium
2. Oxacillin – sodium
3. Ampicillin – sodium
4. Carbenicillin
5. Clarithromycin
6. Gentamycin sulfate
7. Tetracycline hydrochloride
8. Doxycycline hydrochloride
9. Erythromycin
10. Azithromycin
11. Amoxicillin
12. Clavulanicacid
13. Rovamicin
14. Diflucan / Fluconazole
15. Levofloxacin
16. Gatifloxacin
17. Moxifloxacin

ANTIVIRAL AGENTS

1. Interferon-alpha
2. Interferon-alpha (pegylated)
3. Ribavirin
4. Lamivudine
5. Rimantadine

ANTIPARASITIC AGENTS

1. Quinine sulfate
2. Primaquine
3. Albendazole
4. Vermox (Mebendazole)
5. Pyrantel

NONSTEROID ANTI-INFLAMMATORY AGENTS

- Acetylsalicylicacid
- Indometacin
- Diclofenac sodium
- Ibuprofen
- Nimesulid
- Meloxicam
- Celecoxib

GLUCOCORTICOIDS

- CortisoneAcetate
- Prednisolone
- Triamcinolone
- Dexamethasone
- Budesonide
- Methylprednisolone

IMMUNOMODULATORS AND ANTIRHEUMATIC DRUGS

1. Plaquenil (Hydroxychloroquine)
2. Levamisole
3. Azathioprine (Imuran)
4. Chlorbutin
5. D-penicillamine

CARDIAC GLYCOSIDE

1. Digoxin
2. Digitoxin
2. Strophanthin
3. Corglycone

PERIPHERAL VASODILATOR

1. Nitroglycerine
2. Molsidomine
3. Nitroprusside Sodium
4. Isosorbide Dinitrate
5. Isosorbide -5-Mononitrate

ANGIOTENSIN-CONVERTINGENZYME (ACE) INHIBITORS AND ANGIOTENSIN II RECEPTOR ANTAGONISTS

2. Captopril
3. Enalaprilmaleate
4. Lisinopril
5. Perindopril
6. Ramipril
7. Quinapril
8. Losartan
9. Irbesaftan
10. Olmesartan
11. Telmisartan
12. Valsartan

CALCIUM CHANNEL-BLOCKING AGENT

2. Verapamil
3. Diltiazem
4. Nifedipine
5. Amlodipine
6. Nimodipine
7. Lercanidipine

HYPOLIPIDEMIC AGENTS

3. Simvastatin
4. Atorvastatin
5. Rosuvastatin
6. Lovastatin
7. Fenofibrate

MEDICINES WHICH TAKE ACTION ON ADRENERGIC SYSTEM

1. Phentolamine
2. Pyroxan
3. Moxonidine
4. Methyldopa
5. Dopamine
6. Dobutamine
7. Prazozine
8. Doxazosin
9. Propranolol
10. Metoprolol
11. Bisoprolol
12. Nibivolol
13. Carvedilol

DIURETICS

1. Hydrochlorothiazide
2. Indapamide

3. Clopamide
4. Furosemide
5. Torasemide
6. Ethacrynic acid
7. Eplerenon (inspra)
8. Diacarb
9. Spironolactone
10. Mannitol

ANTIARRHYTHMIC DRUG

1. Amiodarone
2. Dronedarone
3. Propafenone
4. Novocainamide

MEDICAL AGENTS FOR THE TREATMENT OF AIRWAY CONDUCTANCE ABNORMALITIES

4. Orciprenalin (alupent)
5. Fenoterol
6. Izadrinehydrochloride
7. Tiotropium bromide
8. Efedrinhydrochlorid
9. ComoglycateSodium
10. NedocromilSodium
11. Ketotifen

MEDICAL AGENTS FOR THE TREATMENT OF DIGESTIVE SYSTEM DISEASES

4. Almagele
5. Bismuthsubcitrats
6. Famotidine
7. Allachole
8. Flamine
9. Cholosasum
10. Chophytole
11. Ursodeoxycholic acid
12. Festale
13. Pancreatine
14. Digestal
15. Plantaglucide
16. Ademethionin
17. Sodiumpicosulfate
18. Loperamide
19. Omeprazole
20. Lansoprazole
21. Rabeprazole
22. Pantoprazole
23. Esomeprazole
24. Legalon
25. Silibor
26. Bifidum-bacterin
27. Linex
28. Mebeverine
29. Metoclopramide
30. Domperidone
31. Prifinium bromide
32. Ondasetron

TISSUE METABOLISM ACTIVATORS

3 Solcoseryl
4 Aktovegin
5 Pentoxifylline
6 Thiotriazoline

ANTICOAGULANT, ANTITHROMBOTIC, AND THROMBOLYTIC AGENTS

3 Ethamsylate
4 Vikasol
5 Aminocapronic acid
6 Ticlopidine
7 Streptokinase
8 Alteplase
9 Heparin
10 Nadroparin
11 Enoxaparin
12 Fraxiparine
13 Fondaparin

MEDICINES WHICH USED FOR THE TREATMENT FOR HEMOBLASTOSIS AND ANOTHER MALIGNANT TUMORS

1. Methotrexate
2. Cyclophosphane
3. Mercaptopurine
4. Fluorouracil
5. Phosphazine
6. Procarbazine hydrochloride
7. Myelosan
8. Rubomycine hydrochloride

MEDICATIONS FOR THE TREATMENT FOR PROFESSIONAL POISONING

1. Alloxim
2. Dipiroxim
3. Iisonitrozine
4. Cuprenyl
5. Sodium thiosulfate
6. Pentacin

READING LISTFOR LEARNING:

1. Goodman&Gilman’sThePharmacologicalBasisofTherapeutics / Laurence L. Brunton, Keith L. Parker, Donald K. Blumenthal, Iain L.O. Buxton / 11th edition/2007
2. Basic&ClinicalPharmacology / Bertram G. Katzung / 10th edition / 2006.
3. Katzung&Trevor'sPharmacology: Examination&BoardReview / Trevor A.J., Katzung B.G., &Masters S.B. / 7th edition / 2005
4. .USMLE RoadMap: Pharmacology / Katzung B.G., Trevor A.J. / 2nd edition / 2006
5. База даних тестового контролю МОЗ України – Київ, 2011
6. Drug Facts and Comparisons. 2001 ed. St. Louis: Facts and Comparisons/ .- 2000.
7. Middleton, Elliott, Jr., et al., eds. Allergy: Principles and Practice / 5th ed. -St. Louis: Mosby.-Year Book.- 1998. 2v

CARD-NOTIFICATION FOR THE ADVERSE REACTION (AR) and/orlackofefficacy (LE) ofthemedical agent (MA) during its medical use	**MEDICAL DOCUMENTATION FormNo. 137 / o**

I. GENERAL INFORMATION

1.Patient's initials	**2. Number of history case/ source documentation**	**3. Date of birth**			**4. Sex**	**5. Consequenceof AR/LO**
		day	**month**	**year**		□recovery □recoverywithsequelae □recovers □death not from AR □withoutchanges □death probably from AR □unknown □death from AR

6. Onset of AR/LO(date, time) /____/____/_____/, /____/____/	**7.End of AR**(date,time) /____/____/_____/, /____/____/	**9. Category of AR/LO**
8. DescriptionoftheAR / SpecificationoftheLO of the MA (includinglaboratoryandinstrumentalresearchdata, whichrelatetoAR)		□patient's death /___/___/_____/ □threat to life □hospitalisation □prolongationofhospitalization □long-term disability, disability □birthdefects □another important medical event □noneoftheabove

II. INFORMATION ABOUT SUSPICIOUS medicalagent (SMA), MANUFACTURER of SMA (forvaccinesadditionallyseethereversesideofthemap)

10. SMA*(tradename, drugform)*	**11. Manufacturer, country**				**12. Serialnumber**
13. Indications(indicate code of ICD-10, if possible)	**14. Single dose**	**15.Multiplicityofintake**	**16. Way of administration**	**17. Beginning of SMA therapy**	**18.End of SMA therapy**
				/___/___/_____/	/___/___/_____/

III. INFORMATION ON RELATED MEDICINES (exceptused forcorrectiontheresultsofAR*)*

19. ConcomitantMA (*tradename, druge form, manufacturer***)**	**20. Indications** (indicate code of ICD-10, if possible)	**21. Single dose**	**22.Multiplicityofintake**	**23. Way of administration**	**24. Beginning of therapy**	**25. End of therapy**

26. Other important information (diagnosis, allergy, pregnancy with the indication of the term, etc.)

V. RESOURCES OFCORRECTION

□**Withdraw of SMA** Was the withdrawal of the SMA accompanied by the disappearance of the AR?□ **yes**□no
□**ReassignmentoftheSMA** **Wasthere a renewaloftheAR afterthereappointmentoftheSMA?**□yes□no
□**ChangeinthedosageregimeoftheSMA (decrease/ increase, indicatehowmuch):** *HastherenewaloftheAR/LO beenmarkedafterthechangeintheSMAdoseregime?*□yes□no
□**Correction of AR/LO wasn't made**
□**Medicamental therapy AR/LO (**indicate MA, dose regimen, duration of the indication*):*

V. CAUSAL-INVESTIGATIONARY RELATIONS BETWEEN CLINICAL MANIFESTATIONS OF AR AND SMA

□**certain**	□**probable**	□**possible**	□**uncertain**	□**notdefined**	□**notclassified**

VI. INFORMATION ABOUT THE COMMUNICATOR

<table>
<tr><td>27. FULL NAME OF CONTACT PERSON,tel/fax, email</td><td>28.Notification was given by</td><td colspan="3">29. Nameandlocationoftheinstitutionorapplicant</td></tr>
<tr><td></td><td>□ physician
□pharmacist
□pharmaceutist
□nurse
□paramedic
□obstetrician
□theapplicant</td><td colspan="3"></td></tr>
<tr><td rowspan="2">30. Sourse of notification
(p. 30-32 only for communicator)

□physician□patient
□investigation□literature
□other</td><td>31. Notificationnumberassignedbytheapplicant</td><td>32. Dateofreceivingbytheapplicant</td><td>33. Type of notification</td><td>34. Date of completion</td></tr>
<tr><td></td><td></td><td>□primary
□current
□final</td><td></td></tr>
<tr><td colspan="5">The notification is filled in and provided at the GI "State Expert Center of the Ministry of Health of Ukraine", Department of Post-Registration Supervision, Ave. Ushinskogo, 40, Kiev, 03151; tel / fax: +38 044 4984358;
e-mail: vigilance@dec.gov.ua/; The electronic form of notification is available at http://www.dec.gov.ua/</td></tr>
</table>

IIa. ADDITIONAL INFORMATION IN THE EVENT OF SUCCESSIVE ADVERSE REACTION TO VACCINES OR TUBERCULOSIS ALLERGENS

<table>
<tr><td colspan="3">Categoryofimmunizationortuberculindiagnostics</td><td colspan="3">Categoryofadverseeventafterimmunizationortuberculindiagnostics</td></tr>
<tr><td colspan="3">□large-scalecampany
□inoculationbyage
□atschool
□medicalofficefortravelers
□carryingouttuberculindiagnostics
□other</td><td colspan="3">□responseto a vaccine
□programme mistake
□coincidenceintime
□reactionduetoinjection / fearofinjection
□unknown</td></tr>
<tr><td colspan="2">Dose number (for vaccine)</td><td colspan="2">Placeofthevaccineintroduction/ tuberculosisallergen</td><td>Way ofvaccineintroduction/ tuberculosisallergen</td></tr>
<tr><td>□the first
□ the second
□the third</td><td>□ the fourth
□the fifth
□>the fifth</td><td rowspan="2">□left shoulder
□right shoulder
□shoulder (withoutspecifying.)
□left hip
□right hip</td><td rowspan="2">□hip (withoutspecifying)
□leftforearm
□righforearm
□forearm (withoutspecifying)</td><td rowspan="2">□oraly
□intramascular
□intracutaneously
□subcutaneously
□other _____</td></tr>
<tr><td colspan="2">Bestbefore /___/___/_____/</td></tr>
</table>

Kharkiv National Medical University
Department of Clinical Pharmacology and Internal Medicine
Research protocol of drugs efficiency and safety
(according to supervision)
Study and research work

Student_____
(Full name, year, group, department)
Supervisor_____

POTOCOL

of investigation of medical agent pharmacodinamic_____
Patient (Full name, age, body mass)_____
Clinical diagnosis: main disease_____
_____
_____
_____
Concominant disease_____
_____
_____
Date of investigation from c _____to_____

1. Patient'stherapy (presentinprescriptionsof 5 themostimportantdrugsincludingthedrugwhichwaschosenfordetailanalysis)
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

2. Justificationofthe drug choice(international,trade names,chemical structure,particularities of drug introduction,pharmacokinetics, pharmacodinamics)
_____
_____
_____
_____
_____

3. Expectedtherapeuticeffect_____
_____
_____
_____

4. Possible adverse effects_____
_____
_____
_____

5. Listthesignsthatwillbeusedtomonitorthetherapeuticefficacyof drugs:

Before treatment	**After treatment**
Objective	
A)_____	_____
B)_____	_____
C)_____	_____
D)_____	_____
E)_____	_____
Physical	
A)_____	_____
B)_____	_____
C)_____	_____
D)_____	_____
E)_____	_____
Laboratory and instrumental	
A)_____	_____
B)_____	_____
C)_____	_____
D)_____	_____
E)_____	_____

6. Listthesymptomsthatwillcontrolthesideeffectsofdrugs

Adverse effects	**Presents of reaction in patient (yes, no)**
Subjective	
A)_____	_____
Б)_____	_____
B)_____	_____
Г)_____	_____
Д)_____	_____
Physical	
A)_____	_____
B)_____	_____
C)_____	_____
D)_____	_____
E)_____	_____
Laboratory and instrumental	
A)_____	_____
B)_____	_____
C)_____	_____
D)_____	_____
E)_____	_____

7. Evaluationofcombinationtherapy (consider co-administrationof a drugthatwasevaluatedwithotherdrugsfromSection 1: pharmacokinetic, pharmacodynamic, pharmaceuticalcompatibility)

_____
_____
_____
_____
_____

8. Conclusionsandrecommendations (efficiencyoftherapy, prognosisoffurtheruse, thepossibilityofreplacingotherdrugs) _____

_____
_____
_____
_____

Investigation was made by_____ Protocol wasChecked by_____

Manual

Clinical pharmacology

Self-study guide for 5 year English medium students
speciality “General Medicine”)

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