

Ministry of Health of Ukraine
DANYLO HALYTSKYI LVIV NATIONAL MEDICAL
UNIVERSITY

Endocrinology Department

Methodical guidelines for practical classes on discipline of
CLINICAL PHARMACOLOGY
For 4th year students of dentistry
(Magister level)

Lviv 2019

Methodological guidelines are compiled in accordance with the educational and qualification characteristics and educational professional programs of training specialists, experimental curriculum, developed on the principles of credit transfer system and approved At a meeting of the cyclic methodical Commission on therapeutic disciplines of Danylo Halytskyi Lviv National Medical University (Protocol No. 5 from 04.04.2019).

Authors:

A.M.Urbanovich, MD, Ph.D., Dr. Sc (Med), professor;

O.P.Kikhtyak, MD, Ph.D., Dr. Sc (Med), professor;

O.V.Safonova, PhD, associate professor;

Kh.A.Moskva, PhD, associate professor;

H.I.Suslyk, PhD, associate professor;

Editor-in-chief:

Deputy Rector of Studies, Prof. M. Gshegotskiy.

Reviewers:

Head of Department of Internal Medicine №2 at Danylo Halitsky Lviv National Medical University, MD, Ph.D., Dr. Sc (Med), professor O.M. Radchenko

Head of Department of family medicine at Danylo Halitsky Lviv National Medical University, MD, Ph.D., Dr. Sc (Med), professor O.N. Nadashkevych.

Plan and structure of the lesson:

#	Main stages of the lesson, their functions and content	Methods of study and assessment	Methodological materials	Timing
I The preparatory stage				
1	Organizing the class.			1-3 min.
2	Defining educational goals. Assessment of the initial knowledge level (relevant to the topic):	1.Initial theoretical rapid survey	Tables, flow-charts	10%
3	The subject and tasks of clinical pharmacology. The main principles of pharmacokinetics and pharmacodynamics. Clinical pharmacological characteristics of medications, which influence lipid metabolism. Clinical pharmacology of antiarrhythmic, antianginal, antiischemic and inotropic drugs. Clinical pharmacological characteristics of antihypertensive drugs. Clinical pharmacological characteristics of drugs influencing bronchial patency. Antiinflammatory drugs. Clinical pharmacological characteristics of hormone drugs. Clinical pharmacological characteristics of antibacterial drugs. Clinical pharmacological characteristics of drugs influencing digestive canal functions. Clinical pharmacological characteristics of drugs influencing hepatobiliary system and pancreas.	2.Level 1 testing	Oral questions, Level 1 testing	
II The main stage				
	1.To learn the modern classification of medications relevant to the topic 2. To learn the clinical pharmacological characteristics of the relevant drugs 3. To study the modern usage principles of the outlined medications. 4. To know how according to the clinical and laboratory data and additional methods of examination to assess the patient's condition and to assign the adequate therapy, as well as to evaluate the therapy efficiency criteria relevant to the topic. 6. To learn the rules of writing prescriptions for medications for the treatment of the illnesses relevant to the topic.	Practical training for solving typical and non typical professional tasks.	1. Medical histories 2. Tables, slides, instructions and prospectuses for medications	60%

III	The final stage			
	1. Assessment and correction of the professional skills and knowledge level 2. Summing up the class 3. Home task: the topic of the next lesson	Individual control of the practical skills and their results	Phonendoscopes, tonometers, medical histories	30% 2-3min. 1-3min.

**LIST OF CLASS STUDIES OF
“Clinical Pharmacology”
4th year of study, stomatology**

#	Theme	Hours
1	Main principles of clinical pharmacology: pharmacokinetics, pharmacodynamics. Drug-drug interactions, adverse reactions and complications.	2
2	Clinical pharmacology of antianginal drugs and the treatment of congestive heart failure	2
3	Clinical pharmacology of anticoagulants and coagulants	2
4	Clinical pharmacology of vasodilators, hypotensive and antihistaminic drugs.	2
5	Clinical pharmacology of drugs that affect respiratory system. Antihistaminic drugs.	2
6+7	Clinical pharmacology of antibacterial agents.	4
8	Clinical pharmacology of local anesthetics and antiseptics	2
9	Clinical pharmacology of anti-inflammatory drugs (steroids and nonsteroidal)	2
10	Clinical pharmacology of drugs that affect bone metabolism and mineralization of enamel	2
Total		20

LIST FOR OUTSIDE READING

	Theme	Hours
1	Preparing to class studies	8
2	Clinical pharmacology of antiarrhythmic drugs. Clinical pharmacology of hypolipidemic drugs.	1
3	Clinical pharmacology of agents that affect intestinal motility and secretion.	1
Total		10

Theme #1. Main principles of clinical pharmacology: pharmacokinetics, pharmacodynamics. Drug-drug interactions, adverse reactions and complications.

Subject: clinical pharmacology

Year of study: 5

Faculty: medical

Number of hours: 4

1.Topicality. Clinical pharmacology is the science of drugs and their clinical use. It is based on the science of pharmacology and focuses on the application of pharmacological principles and methods in the real world. Clinical pharmacology fills the gap between laboratory science and medical practice. Its main objective is to enhance the safety of use, maximise the drug efficiency and minimise the side effects or toxic effects.

The main branches of clinical pharmacology are:

Pharmacokinetics – studies what happens to the drug in the body, namely: absorption, distribution, metabolism, excretion.

Pharmacodynamics – studies what effect drugs have on the body and how it happens. This includes not just the cellular and molecular aspects, but also the relevant clinical laboratory or instrumental parameters.

Correct prescribing – includes using the right medication, at the right dose, with the right way and frequency of administration and stopping the drug use at the right time.

Adverse drug effects – studies the drugs effects, which are not connected with the therapeutic effect, which can be unwanted or harmful.

Toxicology of drugs – is the study of symptoms, mechanisms, detection and treatment of poisoning with the help of medications.

Drug interactions – the increase or decrease of drug action, or emergence of a new nontypical effect of a medication, caused by the simultaneous administration of another drug.

Drug implementation – in case of clinical pharmacology it means mainly clinical trial of drugs with the aim of studying their safety and efficiency, having enough information about the quality of the new drug and proved preclinical safety.

2. Educational aim. To acquaint the students with the content, subject matter and the main parts of clinical pharmacology.

3. Pedagogical aim. To teach the rational use of the drugs. To focus the student’s attention at the dosage, intake and prescription rules. To highlight the importance of the Ukrainian scientist’s contribution into the development and introduction of the new medications.

4. Interdisciplinary integration:

Subjects	Knowledge	Skills
1.Preceding : normal anatomy	cardiovascular system structure	
normal physiology	cardiovascular system physiology	

pathological physiology	etiology and pathogenesis of cardiovascular system diseases	
pathological anatomy	morphological changes during cardiovascular system diseases	
pharmacology	classification, pharmacodynamics and pharmacokinetics of lipid lowering drugs	to write the relevant prescriptions
2. Following: internal diseases	main clinical manifestations of ischemic heart disease: stenocardia, myocardial infarction, arterial hypertension, collapse and other emergency states	to perform clinical examinations of the patients, to prescribe the relevant additional examinations.
Interdisciplinary integration: clinical pharmacology of drugs used for cardiovascular failure treatment	effect peculiarities of statines, fibrates, niacins, bile acid sequestrants, omega-3 polyunsaturated fatty acids	to write the relevant prescriptions

5. Theme content:

Definition of clinical pharmacology as a subject.

The main parts of clinical pharmacology.

Pharmacodynamics: definition, content, main principles, practical value.

Pharmacokinetics: definition, content, main principles, practical value.

Ways of administration of the medications into the body.

Distribution, biotransformation, accumulation and excretion of medications.

Mechanism of action of medications.

The notion of side effects and toxic effects of medications.

Drugs interaction, polypragmasia.

The notion of clinical research and its stages. The levels of evidence in medicine. The importance in the daily practice of doctors.

6. Class plan and structure (see introduction).

7. Methodological materials for the class.

7.1 Materials for the preparatory stage of class – assessment questions:

- Define the terms:
- Clinical pharmacology
- Pharmacokinetics

- Pharmacodynamics
- Side effects of drugs
- Toxic effects of drugs
- Drugs interaction
- Therapeutic effect.
- What is pharmacokinetics? What and why does it study?
- What is pharmacodynamics? What and why does it study?
- Why is clinical research conducted? What is its aim and how to assess its results?
- Modern classification of lipid lowering drugs.
- Name the possible side effects of statines.
- What changes in lipid profile may occur as a result of using statines?
- What are the modern approaches to statines dosage?
- Name the main side effects and contraindications for use of nicotine acid.

7.2. Methodological materials for the main stage of the class:

To analyze basing on the real clinical examples the indications and contraindications for use of drugs influencing lipid metabolism, their compatibility and possible side effects as well as the possibilities of use in various clinical situations.

7.3. Materials for assessment at the final stage of the class – situational tasks:

1. Find correct definition to presystemic metabolism (first pass metabolism).
 - A. drug inactivation in the systemic circulation
 - B. drug inactivation in kidneys
 - C. drug inactivation in the liver after systemic circulation
 - D. enzymatic cleavage in the gastrointestinal lumen, gut wall, by bacterial enzymes, and in the liver
 - E. enzymatic cleavage in the gastrointestinal lumen
2. Advantages of parenteral rout of administration does not include one of the following:
 - A. rapid onset of action
 - B. low risk of overdosing
 - C. precise dosing
 - D. absence of influence on gastrointestinal tract
 - E. 100% bioavailability
3. Bioavailability means:
 - A. high dose in blood
 - B. good penetration of active drug form into the target organs from systemic circulation
 - C. amount of inactive form of drug after liver metabolism
 - D. the certain proportion of administered drug that gains systemic circulation in unchanged form or as an active metabolite
 - E. sufficient penetration of active form of drug into the target organs from portal circulation
4. Apparent volume of distribution determines:
 - A. ratio between drug dose and plasma drug concentration
 - B. ratio between drug absorption and bioavailability
 - C. drug distribution between systemic circulation and muscles
 - D. amount of drug that reach the systemic circulation

E. relationship between bioavailability and excretion

5. In the case of renal failure drug adjustment is carry out taking into account the following:

- A. biochemical laboratory
- B. measurement of diuresis
- C. clearance of creatinine
- D. drug elimination
- E. renal excretion of drug

6. In the case of hepatic insufficiency drug adjustment is carry out taking into account the following:

- A. enterohepatic cycle
- B. total clearance
- C. apparent volume of distribution
- D. evaluation of clinical, paraclinical and laboratory data
- E. extrarenal clearance

8. The list of drugs to be studied for the final modular test

Name in English	Name in Latin	Drug forms
Atorvastatin	Atorvastatinum	tab. 10 mg
Nicotinic acid	Acidum Nicotinicum	flac. 1%; tab. 50 mg
Rosuvastatin	Rozuvastatinum	tab. 10, 20 mg
Simvastatin	Simvastatinum	tab. 10, 20 mg
Fenofibrate	Fenofibratum	cap. 0,1 g

9. Recommended literature (see at the end of methodological instructions).

Theme #2. Clinical pharmacology of antianginal drugs and the treatment of congestive heart failure

Subject: clinical pharmacology

Year of study: 5

Faculty: medical

Number of hours: 4

1. Topicality. Treatment and prevention of cardiovascular diseases (CVD) is one of the main tasks of the medical practice. Often help is needed for the patients with ischemic heart disease (IHD) and arrhythmia. Acute myocardial infarction is a serious IHD complication, which can lead to death or disability. The heart rhythm disorders cause deterioration of geodynamics and development of heart failure. Apart from knowing the etiological and pathogenic peculiarities of the illness, as well as the accompanying conditions, their seriousness and other points, it is also necessary to possess the deep understanding of medications action for their proper use. The proper medical practice requires comprehensive awareness of indications and contraindications of drugs, which is based on the knowledge of their pharmacodynamics and pharmacokinetics. In the everyday work a doctor should not only know how to diagnose various types of IHD and arrhythmia, but also to provide adequate and qualified medical treatment.

2. Educational aim. To acquaint the students with the clinical pharmacological characteristics of antianginal and antiarrhythmic drugs and the basics of their rational use.

3. Pedagogical aim. To draw the doctor's-to-be attention to the necessity of deep study of the main cardiovascular diseases taking into consideration the importance of antianginal and antiarrhythmic drugs in their treatment.

4. Interdisciplinary integration:

Subject	Knowledge	Skills
1. Preceding: normal anatomy	Cardiovascular system structure	
normal physiology	cardiovascular system physiology	
pathological physiology	etiology and pathogenesis of cardiovascular system diseases	
pathological anatomy	morphological changes during cardiovascular system diseases, especially during arrhythmias	
pharmacology	drugs for cardiovascular diseases treatment, namely drugs for ischemic heart disease and arrhythmia	to write prescriptions for the relevant drugs

<p>2. Following: internal diseases</p> <p>general surgery</p>	<p>treatment. Classification of antianginal and antiarrhythmic drugs</p> <p>main clinical manifestations of heart disorders</p> <p>main clinical manifestations of heart disorders</p>	<p>to perform clinical examinations of the patients, to prescribe the relevant additional examinations.</p> <p>to perform clinical examinations of the patients, to prescribe the relevant additional examinations.</p>
<p>3. Interdisciplinary integration: clinical pharmacology of antianginal and antiarrhythmic drugs for treatment of cardiovascular pathology.</p>		
<p>Organic nitrates, β- adreno blockers, calcium antagonists. Membrane stabilizing potassium channels blockers.</p>	<p>peculiarities of action of antianginal and antiarrhythmic drugs for treatment of cardiovascular pathology, their compatibility and side effects.</p>	<p>to write prescriptions for the relevant drugs</p>

5. Theme content:

Modern classification of antianginal and antiarrhythmic drugs.

Clinical symptoms and diagnostic criteria of stenocardia and myocardial infarction.

Types of arrhythmia and conduction disorders, their differential diagnostic features.

Clinical pharmacological characteristics of antianginal drugs

Clinical pharmacological characteristics of membrane stabilizing drugs

Clinical pharmacological characteristics of drugs used for the treatment of stable and unstable forms of stenocardia.

Modern pharmacotherapy of acute myocardial infarction.

Clinical pharmacological characteristics of antiarrhythmic drugs with the membrane stabilizing and local anesthesia effect.

Clinical pharmacological characteristics of antiarrhythmic effect of class III drugs.

Antiarrhythmic effect mechanism of β -adreno blockers and slow potassium channels blockers.

Treatment of arrhythmias with potassium ions containing drugs.

The main contraindications for use of antianginal and antiarrhythmic drugs.

6. Class plan and structure (see introduction).

7. Methodological materials for the class.

7.1 Materials for the preparatory stage of class – assessment questions:

- Modern classification of antianginal and antiarrhythmic drugs.
- Name the mechanism of action of antianginal and membrane stabilizing drugs.
- Which antiarrhythmic properties do β -adreno blockers possess?
- What is the action mechanism and pharmacokinetics of antiarrhythmic drugs of class III?
- Name the main pharmacodynamic effects of slow potassium channels blockers antiarrhythmic action.
- Name the main clinical pharmacological approaches to the treatment of unstable stenocardia.
- Name the main clinical pharmacological approaches to the first aid and principles of myocardial infarction treatment.
- Name the main clinical pharmacological approaches to arrhythmia treatment.
- Which are the side effects of antiarrhythmic drugs use?
- Indications and contraindications for use of antiarrhythmic drugs.

7.2. Methodological materials for the main stage of the class:

To analyze basing on the real clinical examples the indications and contraindications for use of antiarrhythmic drugs, their compatibility and possible side effects.

7.3. Materials for assessment at the final stage of the class – situational tasks:

1. To the inotrope medication belong all except:

- A. Cardiac glycosides
- B. Beta 1-adrenoreceptors stimulators
- C. Inhibitors of phosphodiesterase
- D. β -adrenoblockators
- E. Mast cell stabilizers

2. Cardiac glycosides have the following effect:

- A. Positive inotropic effect, negative dromotropic and chronotropic effects
- B. Negative inotropic effect, positive dromotropic and chronotropic effects
- C. Positive inotropic, dromotropic and chronotropic effects
- D. Negative inotropic, dromotropic and chronotropic effects
- E. Positive inotropic and dromotropic and negative chronotropic effects

3. β -adrenoblockators fall into the following groups except

- A. Blockators of β 1- and β 2-adrenoreceptors

- B. Selective blockators of β_1 - adrenoreceptors
- C. Combined blockators of β - and α -adrenoreceptors
- D. Blockators of α_1 - and α_2 -adrenoreceptors
- E. Not connected with blocking of adrenoreceptors

4. Nifedipine belongs to the group of derivatives from:

- A. Dihydropyridin
- B. Fenilalkilamin
- C. Benzodiazepine
- D. Benzoic acid
- E. Phenylalanine

5. Which of the following medicines blocks calcium channels in the blood vessels of the brain most?

- A. Amlodipine
- B. Verapamil
- C. Diltiazem
- D. Cinnarizine
- E. Nitrendipine

6. The danger of combining Diltiazem or Verapamil with β -adrenoblockators lies in the following:

- A. Excessive development of positive inotropic, chronotropic and dromotropic effects
- B. Excessive development of negative inotropic, chronotropic and dromotropic effects
- C. Excessive development of positive chronotropic effect
- D. Excessive development of positive chronotropic and dromotropic effects
- E. Excessive development of negative chronotropic effect

8. The list of drugs to be studied for the final modular test

Name in English	Name in Latin	Drug forms
Isosorbide mononitrate	Isosorbidum mononitratum	cap., tab. 40; 60 mg
Isosorbide dinitrate	Isosorbidum dinitratum	tab. 20, 40 mg
Nitroglycerin	Nitroglycerinum	tab.5 mg; flac.1% -5 ml; ointment 1%
Molsidomine	Molsidominum	tab. 2 mg
Amlodipine	Amlodipinum	tab. 5; 10 mg
Verapamil	Verapamilum	tab. 40; 80 mg
Diltiazem	Diltiazem	tab. 30; 60 mg
Nifedipine	Nifedipinum	cap. 10; 20 mg
Ethacyzin	Aethacizinum	tab. 25; 50 mg
Amiodarone	Amiodaronum	tab. 200 mg
Lidocain	Lidocainum	amp. 0.5; 1; 2; 5; 10 %
Propafenone hydrochloride	Propafenonum hydrochloridum	tab. 150 mg

Sotalol	Sotalol	tab. 80; 160 mg
Procainamide	Procainamidum	tab.0,25 g, 10 % - 5 ml
Digoxin	Digoxinum	tab. 0.125; 0,25 mg, amp. 0,025% - 1 ml
Dobutamine	Dobutaminum	flac. 5 %- 55 ml; flac. 0,1; 0,25
Dopamine	Dopaminum hydrochloridum	amp. 50; 200 mg №5
Strophanthin	Strophanthinum	amp. 0.025 % - 1 ml
Atenolol	Atenololum	tabl. 0,1; 0,05 g
Bisoprolol	Bisoprololum	tabl. 2.5; 5; 10 g
Doxazosin	Doxazosinum	tabl. 2; 4 mg
Carvedilol	Carvedilolum	tabl. 12,5; 25; 50 mg
Metoprolol	Metoprololum	tabl. 50 mg
Nebivolol	Nebivololum	tabl. 5 mg

9. Recommended literature (see at the end of methodological instructions).

Theme #4. Clinical pharmacology of vasodilators, hypotensive and antihistaminic drugs.

Subject: clinical pharmacology

Year of study: 5

Faculty: medical

Number of hours: 4

1. Topicality. Substances causing vasoconstriction are called vasoconstrictors, vasopressors, or simply pressors. Generalized vasoconstriction usually results in an increase in systemic blood pressure, but it may also occur in specific tissues causing a localized reduction in blood flow. The extent of vasoconstriction may be slight or severe depending on the substance or circumstance. Many vasoconstrictors also cause pupil dilation. Medications that cause vasoconstriction include antihistamines, decongestants and stimulants used to treat attention deficit-hyperactivity disorder.

Vasodilation refers to the widening of blood vessels resulting from relaxation of smooth muscle cells within the vessel walls, particularly in the large veins, large arteries, and smaller arterioles. The process is essentially the opposite of vasoconstriction, which is the narrowing of blood vessels.

When blood vessels dilate, the flow of blood is increased due to a decrease in vascular resistance. Therefore, dilation of arterial blood vessels (mainly the arterioles) causes a decrease in blood pressure. The response may be intrinsic (due to local processes in the surrounding tissue) or extrinsic (due to hormones or the nervous system). Additionally, the response may be localized to a specific organ (depending on the metabolic needs of a particular tissue, as during strenuous exercise), or it may be systemic (seen throughout the entire systemic circulation).

Drugs that cause vasodilation are termed vasodilators.

Vasodilators are used to treat high blood pressure (hypertension). By widening the arteries, these drugs allow blood to flow through more easily, reducing blood pressure. Controlling high blood pressure is important because the condition puts a burden on the heart and the arteries, which can lead to permanent damage over time. If untreated, high blood pressure increases the risk of heart attack, heart failure, stroke, or kidney failure. Vasodilators usually are prescribed with other types of blood pressure drugs and rarely are used alone.

2. Educational aim. To acquaint the students with the clinical pharmacological characteristics and principles of choice of drugs influencing vascular tone.

3. Pedagogical aim. To teach the students to be ready for the adequate medical action in case of chronic process exacerbation or emergency in outpatient and inpatient care units. To draw the doctor's-to-be attention to the possibility of patients developing the symptoms of cardiovascular failure, hypertonic crisis, coma etc., and to teach them the rational use of drugs influencing vascular tone. To focus their attention on the dosage, rule of use and writing the correct prescriptions. To highlight the importance of the Ukrainian scientist's contribution into the development and introduction of the new medications.

4. Interdisciplinary integration:

Subjects	Knowledge	Skills
1.Preceding : normal anatomy	cardiovascular system structure	

normal physiology	cardiovascular system physiology	
pathological physiology	etiology and pathogenesis of cardiovascular system diseases	
pathological anatomy	morphological changes during cardiovascular system diseases	
pharmacology	classification, pharmacodynamics and pharmacokinetics of vasodilators and vasoconstrictors	to write the relevant prescriptions
2. Following: internal diseases	main clinical manifestations of ischemic heart disease: stenocardia, myocardial infarction, arterial hypertension, collapse and other emergency states	to perform clinical examinations of the patients, to prescribe the relevant additional examinations.
Interdisciplinary integration: clinical pharmacology of drugs used for cardiovascular failure treatment	effect peculiarities of cardiac glycosides and hypotensive drugs.	writing the relevant prescriptions

5. Theme content:

- Arterial hypertension classification.
- Modern classification of drugs lowering vascular tone.
- Clinical pharmacological characteristics of centrally-acting drugs: central α_2 -adrenoreceptors agonists.
- Clinical pharmacological characteristics of centrally-acting drugs: imidazoline-I1-receptor agonists.
- Clinical pharmacological characteristics of ganglionic blocker.
- Clinical pharmacological characteristics of sympatholytics.
- Clinical pharmacological characteristics of α -adreno blockers.
- Clinical pharmacological characteristics of β -adreno blockers.
- Clinical pharmacological characteristics of cardiononselective β -adrenoreceptor blockers without own sympathomymetic activity.

- Clinical pharmacological characteristics of cardiononselective β -adrenoreceptor blockers with own sympathomimetic activity.
- Clinical pharmacological characteristics of cardiononselective β_1 -adreno blockers without intrinsic sympathomimetic activity.
- Clinical pharmacological characteristics of cardiononselective β_1 -adreno blockers with intrinsic sympathomimetic activity.
- Clinical pharmacological characteristics of α - and β -adrenoreceptors blockers (α_1 -, β_1 and β_2 -adrenolytics) of mixed action.
- Clinical pharmacological characteristics of calcium antagonists (blockers of slow calcium channels).
- Clinical pharmacological characteristics of angiotensin converting enzyme inhibitors (ACEi).
- Clinical pharmacological characteristics of angiotensin II receptor blockers of the first type.
- Clinical pharmacological characteristics of arterial vasodilators.
- Clinical pharmacological characteristics of drugs with mostly myotropic action.
- The principles of choice of medications used for treatment of arterial hypertension.

6. Class plan and structure (see introduction).

7. Methodological materials for the class.

7.1 Materials for the preparatory stage of class – assessment questions:

- Name the main pharmacokinetic and pharmacodynamic effects of action of central α_2 -adrenoreceptors and central imidazoline-I1-receptor agonists.
- Which side effects may occur during the use of α_2 -adrenoreceptors agonists?
- Which side effects may occur during the use of imidazoline-I1-receptor agonists?
- Name the possible side effects and contraindications for use of ganglionic blockers.
- Name the possible side effects of sympatholytics (guanitidine and reserpine).
- Which extravascular effects are typical of α -adreno blockers (influence on metabolism, rheology, urodynamics and sexual function of men)?
- Modern classification of β -adreno blockers according to the selectivity of action.
- Name the main side effects and contraindications for use of β -adreno blockers.
- What groups of β -adreno blockers are defined?
- Name the indications for use of arterial vasodilators - minoxidine and hydralazine.
- Side effects and contraindications for use of angiotensin converting enzyme inhibitors (ACE-i).
- Indications for use of angiotensin II receptor antagonists.
- Name the main groups and dosage of drugs used in case of hypertonic crisis.

7.2. Methodological materials for the main stage of the class:

To analyze basing on the real clinical examples the indications and contraindications for use of drugs influencing vascular tone, their compatibility and possible side effects, as well as peculiarities of use in case of emergency.

7.3. Materials for assessment at the final stage of the class – situational tasks:

1. Usage of angiotensin II type 1 receptor blockers is contraindicated in one of the following condition.

- A. acute myocardial infarction
- B. renovascular hypertension
- C. essential hypertension
- D. chronic heart failure (treatment aim)
- E. chronic heart failure (aim of prophylaxis)

2. β -Adrenoblockers may be combined with:

- A. clonidine
- B. reserpine
- C. pilocarpine
- D. losartan
- E. verapamil

3. One sign of the given below does not typical to β -adrenoblockers.

- A. bradycardia
- B. bronchial spasm
- C. impotence
- D. claudication
- E. decrease in intra-uterine tone in pregnant women

4. Point indication to use β -adrenoblockers.

- A. hypertension
- B. effort angina pectoris
- C. acute heart failure
- D. hypothyroidism
- E. premature delivery

5. Name pharmacological effect which is typical for calcium channel blockers

- A. decline of automaticity in pacemaker cells
- B. increase platelet aggregation
- C. increase smooth muscle tone in brain vessels
- D. increase myocardial contractility
- E. promote oxyhemoglobin dissociation

6. One of the following side effects occurs fore often than others regarding use of calcium channel blockers.

- A. cardiac failure
- B. parkinsonism
- C. headache
- D. constipation
- E. bigeminy or trigeminy

8. The list of drugs to be studied for the final modular test

Name in English	Name in Latin	Drug forms
Hydrochlorothiazide	Hydrochlorothiazidum	tab. 25 mg; 100 mg
Indapamide	Indapamidum	tab.1,5; 2,5 mg
Spironolactone	Spironolactonum	tab.25; 50; 100 mg

Torasemide	Torasemidum	amp.10 мг, tab. 10 mg
Furosemide	Furosemidum	tab. 40 mg, amp. 20 mg
Ivabradine	Ivabradinum	tab. 5; 7,5 mg
Enalapril	Enalaprilum	tab. 5; 10; 20; 40 mg
Captopril	Captoprilum	tab. 12,5; 25; 50; 100 mg
Lisinopril	Lisinoprilum	tab. 10; 40 mg
Perindopril	Perindoprilum	tab. 4; 8 mg
Ramipril	Ramiprilum	tab. 12,5; 25; 5; 10 mg
Fosinopril	Fosinoprilum	tab. 10; 40 mg
Valsartan	Valsartanum	tab. 80 mg, 160 mg
Irbesartan	Irbesartanum	tab. 75; 150 mg
Candesartan	Candesartanum	tab. 4.8; 16 mg
Losartan	Losartanum	tab. 10; 40 mg
Telmisartan	Telmisartanum	tab. 80 mg
Methyldopa	Alpha methyldopa	tab. 250 mg
Clonidine	Clonidinum	tab. 0.075; 0,15 mg; amp. 0,01% -1 ml

9. Recommended literature (see at the end of methodological instructions).

Theme #5. Clinical pharmacological characteristics of drugs influencing bronchial patency. Antihistaminic drugs.

Subject: clinical pharmacology

Year of study: 5

Faculty: medical

Number of hours: 4

1. Topicality. In their everyday practice doctors often see patients suffering from acute and chronic broncho-obstructive diseases. The number of such patients is growing every year. The main danger in this case lies in the probability of developing asthma status. The study of pharmacotherapeutic action of drugs, which improve respiratory drainage patency, enables doctors to provide qualified medical help.

A histamine antagonist (commonly called an antihistamine) is a pharmaceutical drug that inhibits the action of histamine by blocking it from attaching to histamine receptors; or it may inhibit the enzymatic activity of histidine decarboxylase, catalyzing the transformation of histidine into histamine (atypical antihistaminics).

Antihistamines are commonly used for the relief of allergies caused by intolerance of proteins.

In common use, the term antihistamine refers only to H1 antagonists, also known as H1 antihistamines. It has been discovered that these H1-antihistamines are actually inverse agonists at the histamine H1-receptor, rather than antagonists per se. Clinically, H1 antagonists are used to treat allergic reactions. Sedation is a common side-effect, and some H1 antagonists, such as diphenhydramine and doxylamine, are also used to treat insomnia. However, second-generation antihistamines do not cross the blood–brain barrier, and as such do not cause drowsiness.

2. Educational aim. To acquaint the students with the clinical pharmacological characteristics and principles of choice of drugs influencing bronchial patency, as well as of antihistamines.

3. Pedagogical aim. To draw the doctor's-to-be attention to the possibility of patients developing the symptoms of acute respiratory failure, which is accompanied by acute bronchial obstruction, to teach the rational use of bronchodilators and antiinflammatory drugs taking into consideration the dosage, possible side effects and prescription rules. To define the role of Ukrainian scientists in this sphere.

4. Interdisciplinary integration:

Subjects	Knowledge	Вміти Skills
1.Preceding : normal anatomy	bronchopulmonary system structure	
normal physiology	bronchopulmonary system physiology	
pathological physiology	etiology and pathogenesis of bronchopulmonary system diseases	

<p>pathological anatomy</p>	<p>the notions of inflammation, allergy, etiology and pathogenesis of inflammation and allergy processes</p> <p>morphological changes during bronchopulmonary system diseases</p>	
<p>pharmacology</p>	<p>classification and pharmacodynamics of bronchodilators and antiinflammatory drugs</p>	<p>to write the relevant prescriptions</p>
<p>2. Following: internal diseases</p>	<p>main clinical manifestations and use of broncholytics and antiinflammatory drugs in case of acute and chronic pulmonary diseases</p>	<p>to perform clinical examinations of the patients, to prescribe the relevant additional examinations.</p>
<p>general surgery</p>	<p>main clinical manifestations of asthma status, acute respiratory failure in case of surgical pathology and peculiarities of prescribing broncholytics and antiinflammatory drugs</p>	<p>to perform clinical examinations of the patients, to prescribe the relevant additional examinations.</p>
<p>3. Interdisciplinary integration:</p>		

clinical pharmacology of α - and β -adrenostimulators, β -adrenostimulators, M-cholinomimetics, methylxanthines, expectorants, mucolytics and antiinflammatory drugs	peculiarities of action of α - and β -adrenostimulators, β -adrenostimulators, M-cholinomimetics, methylxanthines, expectorants, mucolytics and antiinflammatory drugs	to write the relevant prescriptions
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5. Theme content:

- Modern classification of bronchodilators.
- Clinical pharmacological characteristics of α - and β -adrenostimulators.
- Clinical pharmacological characteristics of β -adrenostimulators.
- Clinical pharmacological characteristics of M-cholinomimetics.
- Clinical pharmacological characteristics of methylxanthines.
- Clinical pharmacological characteristics of expectorants.
- Clinical pharmacological characteristics of mucolytics.
- Principle of bronchodilators choice.
- Peculiarities of bronchodilators use.
- Methods of efficiency and safety evaluation of using drugs, which cause elevation of blood pressure.
- Modern classification of antihistamines.
- Examples of H1-receptor antagonists.
- Side effects of H1-receptor antagonists.
- Clinical pharmacological characteristics of H1-receptor antagonists.

6. Class plan and structure (see introduction).

7. Methodological materials for the class.

7.1 Materials for the preparatory stage of class – assessment questions:

- Where are α - and β -receptors localized and which pharmacodynamic effects occur during their stimulation?
- Name the mechanism of α - and β -receptors stimulators action.
- Indications for use of β -adrenomimetics of short and long lasting action.
- Name the main pharmacodynamic effects of teofilin.
- Name the mechanism of action, side effects and contraindications for use of mucolytics.
- Mechanism of action and pharmacodynamics of M-cholinoblocker – troventol.
- Name the main schemes of asthma status pharmacotherapy.
- Side effects of H1-receptor antagonists.
- Peculiarities of prescribing, dosage, side effects of H1-receptor antagonists.
- Clinical pharmacological characteristics of H1-receptor antagonists.

- Contraindications for use of H1-receptor antagonists.

7.2. Methodological materials for the main stage of the class:

To analyze basing on the real clinical examples the indications and contraindications for use of various drugs with bronchodilatory action, and the peculiarities of anti-inflammatory drugs use; their compatibility and possible side effects, as well as peculiarities of use in medical practice.

7.3. Materials for assessment at the final stage of the class – situational tasks:

1. Choose the inhalation glucocorticoids

- A. Beclometasoni dipropionas
- B. Prednisolone
- C. Betamethasone
- D. Dexamethasone
- E. Fluocinolone acetonide

2. Contraindications for prescribing inhalation glucocorticoids are all except:

- A. Lung tuberculosis
- B. Fungal infections
- C. Bacterial infections
- D. Viral infections
- E. Chronic hepatitis

3. Which medication normalizes cell formation of bronchial secretion and surfactant synthesis?

- A. Glycyrrhiza root
- B. Ammonii chloridum
- C. Ambroxol
- D. Acetylcysteine
- E. Ipecacuanha medicines

4. Choose anticough medicine, which is not a narcotic?

- A. Codeinum
- B. Dimemorfan acetylcysteine
- C. Butamirate
- D. Dekstrometomorfan
- E. Ethylmorphine

5. Which of the following medications is not expectorant?

- A. Glaucine
- B. Potassium iodine
- C. Althaea officinalis (Marshmallow) root
- D. Ipecacuanha (vomiting root)
- E. Acetylcysteine

6. For stopping infrequent attacks of bronchospasm of any genesis usually are prescribed:

- A. α - and β -adrenostimulators
- B. Nonselective β -adrenostimulators
- C. Selective adrenostimulators of short term action

D. Selective adrenostimulators of long term action

E. M-cholinobacters

8. The list of drugs to be studied for the final modular test

Name in English	Name in Latin	Drug forms
Epinephrine	Epinephrinum	amp. 0,18 % 1 ml №10
Ambroxol	Ambroxolum	tab. 30 mg; amp. 0,75%
Acetylcysteine	Acetylcysteinum	tab. 100 mg; cap.200; 400 mg
Euphyllin	Euphyllinum	tab. 150 mg; amp. 2,4%
Tiotropium bromide	Tiotropium bromidum	aerosol 18 µg
Nedocromil sodium	Nedocromilum natricum	aerosol 1 dose - 2 mg
Salbutamol	Salbutamolum	aerosol 200 dose; tab. 2;4 mg
Salmeterol	Salmeterolum	aerosol 25 µg -120/doses
Fenoterol	Fenoterolum	aerosol 0,1 mg
Beclometasone dipropionate	Beclometasonum dipropionatum	aerosol 50, 100, 250 µg /dose flac. 200 doses
Montelukast	Montelukastum	tab. 10 mg
Hydrocortisone	Hydrocortisonum	amp.100; 500 mg; ointment 0,1;1;5 %; cream 0,1%
Mebhydrolin	Mebhydrolinum	tab. 0,05; 0,1
Chloropyramine	Chloropyraminum	tab. 0,025; amp.2% 1 ml
Clemastin	Clemastinum	tab. 0,001
Astemizole	Astemizolum	tab. 0,01
Loratadine	Loratadinum	tab. 0,01

9. Recommended literature (see at the end of methodological instructions).

Theme #6+7. Clinical pharmacology for antibacterial agents.

Subject: clinical pharmacology

Year of study: 5

Faculty:

medical

Number of hours: 4

1. Topicality. The number of various antimicrobial drugs has risen recently, which enhances the treatment opportunities of different diseases of bacterial origin. However the choice of an effective and safe antibacterial drug remains a difficult task, which is caused first of all by the increase of bacterial flora resistance, and impossibility of defining, in some cases, the causative agent of the disease and its sensitivity to antibacterial drugs; another cause is the increase in number of patients with chronic pathologies and various immunodeficiencies. The growing number of medical manipulations for diagnosis and treatment also facilitates the occurrence and development of infections caused by the nontypical microflora and/or its

nontypical location. The insufficient information about the indications, action mechanism and side effects of drugs of this group limits its prescription possibilities, while, on the other hand, we can see its uncontrolled careless use. Thus there is a need of deep comprehensive study of clinical pharmacology of antibacterial drugs.

2. Educational aim: To acquaint the students with the modern antibacterial therapy and its use in main infectious diseases. To define the principles of rational dosage, optimal administration mode, duration of use and principles of changing drugs in the course of treatment with antimicrobial drugs.

3. Educational aim: To use in medical practice the principles of ethics and deontology; to help the students form clinical thinking; to learn the achievements of Ukrainian scientists in antimicrobial therapy.

4. Interdisciplinary integration:

Subjects	Knowledge	Skills
1. Preceding :		
normal anatomy	anatomy of internal organs	
normal physiology	physiology of internal organs	
pathological physiology	etiology and pathogenesis of bacterial diseases	
pathological anatomy	morphological changes during bacterial diseases	
microbiology	characteristics of bacteria	
pharmacology	pharmacology of antimicrobial drugs	to write the relevant prescriptions
2. Following:		
internal diseases	indications, contraindications and dosage of antimicrobial drugs in the internal diseases clinic	to perform clinical examinations of the patients, to prescribe the relevant additional examinations.
surgery	indications, contraindications and dosage of antimicrobial drugs in surgical pathology	to perform clinical examinations of the patients, to prescribe the relevant additional

<p>3. Interdisciplinary integration: clinical pharmacology of antiinflammatory and antihistamine drugs</p>	<p>peculiarities of use of antiinflammatory and antihistamine drugs</p>	<p>examinations. to prescribe a rational combination with the drugs of other groups to write the relevant prescriptions</p>
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5. Theme content:

- The main principles of the modern antibacterial therapy.
- Modern classification of antibiotics.
- The role of antibiotics during infectious and pyoinflammatory diseases.
- The choice of antiinflammatory drugs according to the sensitivity of microorganisms, process localization and seriousness of the disease.
- Side effects of antibacterial drugs.
- Contraindications for use of antibacterial therapy.
- Clinical pharmacological characteristics of antibiotics.
- The choice of antibacterial drugs depending on pharmacokinetics.
- Interaction of antimicrobial drugs.
- Dosage mode of antimicrobial drugs.
- Antibacterial therapy efficiency evaluation criteria.
- Age peculiarities of antibacterial therapy.
- Antibiotic resistance and ways of fighting it.

6. Class plan and structure (see introduction).

7. Methodological materials for the class.

7.1 Materials for the preparatory stage of class – assessment questions:

- What does the notion of antimicrobial drugs include?
- Classification of antibacterial drugs (according to groups and mechanism of action).
- Classification of antibacterial drugs.
- Principles of antibiotics choice taking into consideration the nature of agent, character and location of pathological process.
- The meaning of allergological anamnesis.
- Defining sensitivity to an antibiotic. The meaning of antibiotics gram.
- Name the examples of antibiotics side effects and ways of their prevention.

7.2. Methodological materials for the main stage of the class:

To analyze basing on the real clinical examples the indications and contraindications for use of various drugs in case of endocrine system, pancreas, thyroid, pituitary, adrenals diseases; their compatibility and possible side effects.

7.3. Materials for assessment at the final stage of the class – situational tasks:

1. Choose the mechanism of bacteriostatic antibiotics action:
 - A. disturb the function of the microorganisms cytoplasmic membrane
 - B. inhibit microbe wall synthesis
 - C. inhibit protein synthesis on the microorganisms ribosome level
 - D. inhibit DNA microorganisms synthesis
 - E. inhibit DNA-gyrase microorganisms synthesis

2. Bactericide antibiotic of wide-range action should be prescribed:
 - A. as a starting medicine in case of acute purulent process
 - B. in case of severe inflammatory disease of unknown etiology
 - C. for the treatment of infections, caused by Chlamydia
 - D. at the finishing stage of infectious disease treatment
 - E. for viral disease treatment

3. Chose the data, which is not used for the empiric antibiotic choice
 - A. data of smear microscopic examination, colored according to Gram
 - B. clinical picture of disease
 - C. epidemic situation
 - D. organism's sensitivity to the antibiotic
 - E. patient's pharmacological anamnesis data

4. Chose the antibiotic, whose effectiveness is higher in acid environment (pH 5,0-6,5):
 - A. Fosfomycin
 - B. Erythromycin
 - C. Gentamicin
 - D. Lincomycin
 - E. Natural Penicillin

5. The medicine for the treatment of the candidiasis of gastrointestinal tract, caused by *Candida albicans*, is:
 - A. Clotrimazole
 - B. Fluconazole
 - C. Nystatin
 - D. Natamycin (Pimafucin)
 - E. Amphotericin B

6. The medicine for the treatment of the diseases, caused by Chlamydia, is
 - A. Ampicillin
 - B. Amikacin
 - C. Azithromycin
 - D. Amoxicillin/clavulanate acid (Amoksilav)
 - E. Cefuroxim

8. The list of drugs to be studied for the final modular test

Name in English	Name in Latin	Drug forms
Azithromycin	Azithromycinum	tab. 125; 500 mg; cap. 250 mg

Amikacin	Amikacinum	amp. 50; 125; 250; 500 mg – 1 ml
Amoxicillin	Amoxicillinum	tab. 250; 500 mg
Acyclovir	Acyclovirum	tab. 200, 400, 800 mg
Benzylpenicillin	Benzylpenicillinum	flac. 25000; 50000; 1 mln. IU
Vancomycin	Vancomycinum	flac. 500; 1000 mg
Gentamicin	Gentamicinum	amp. 10; 20; 40 mg - 1 ml; ointment 0,1%; aerosol 0,1 %
Doxycycline	Doxycyclinum	cap., tab. 50; 100; 200 mg
Imipenem	Imipenemum	flac. 500 mg
Interferon alfa	Interferonum alfa	sol. 10, 18, 25, 30, 60 mln. IU
Clarithromycin	Clarithromycinum	tab. 250 mg; flac. 500 mg
Clindamycin	Clindamycinum	cap. 75; 150; 300 mg; amp. 2;4 ml
Levofloxacin	Levofloxacinum	tab. 250; 500 mg; flac. 5 mg/ml - 100 ml
Rifampicin	Rifampicinum	cap.150; 300 mg; amp. 125 mg – 1,5 ml; 250 mg –3 ml; 500 mg – 10 ml
Ribavirin	Ribavirinum	cap. 100, 200 mg
Streptomycin	Streptomycinum	flac. 500; 1000 mg
Sulfadimethoxine	Sulfadimethoxinum	tab. 200; 500 mg
Sulfasalazine	Sulfasalasinum	tab. 500 mg
Tetracycline	Tetracyclinum	cap. 250; 500 mg
Tobramycin	Tobramycinum	amp.10; 20; 40 mg –1 ml; ointment 0,3%
Fluconazole	Fluconazolium	cap. 50, 100, 150 mg
Cefalexin	Cephalexinum	tab. 50; 250; 1000 mg; cap. 250; 500 mg
Cefepime	Cefepimum	flac. 500 mg; 1; 2 g
Cefotaxime	Cefotaximum	flac. 250; 500 mg; 1; 2 g
Ceftriaxone	Ceftriaxonum	flac. 250; 500 mg; 1; 2 g
Cefuroxime	Cefuroximum	flac. 250; 750; 1500 mg; tab. 125; 250; 500 mg
Ceftazidime	Ceftazidimum	flac. 0,5, 1,2 g
Ciprofloxacin	Ciprofloxacinum	tab. 250; 500; 750 mg; amp. 10; 20 mg – 1 ml

9. Recommended literature (see at the end of methodological instructions).

Theme #8. Clinical pharmacology of local anaesthetics and antiseptics.

Subject: clinical pharmacology

Year of study: 5

Faculty: medical

Number of hours: 4

1. Topicality. A local anesthetic is a drug that causes reversible local anesthesia, generally for the aim of having a local analgesic effect, that is, inducing absence of pain sensation, although other local senses are often affected as well. Also, when it is used on specific nerve pathways (nerve block), paralysis (loss of musclepower) can be achieved as well.

Clinical local anesthetics belong to one of two classes: aminoamide and aminoester local anesthetics. Synthetic local anesthetics are structurally related to cocaine. They differ from cocaine mainly in that they have no abuse potential and do not act on the sympathoadrenergic system, i.e. they do not produce hypertension or local vasoconstriction, with the exception of Ropivacaine and Mepivacaine that do produce weak vasoconstriction.

Local anesthetics vary in their pharmacological properties and they are used in various techniques of local anesthesia such as:

- Topical anesthesia (surface)
- Infiltration
- Plexus block
- Epidural (extradural) block
- Spinal anesthesia (subarachnoid block)

The local anesthetic lidocaine (lignocaine) is also used as a Class Ib antiarrhythmic drug.

Typical operations performed under conduction anesthesia in dentistry include surface anesthesia, infiltration anesthesia or intraligamentary anesthesia during restorative operations or extractions, regional nerve blocks during extractions and surgeries.

Antiseptics are antimicrobial substances that are applied to living tissue/skin to reduce the possibility of infection, sepsis, or putrefaction. Antiseptics are generally distinguished from antibiotics by the latter's ability to be transported through the lymphatic system to destroy bacteria within the body, and from disinfectants, which destroy microorganisms found on non-living objects.

Some antiseptics are true germicides, capable of destroying microbes (bacteriocidal), while others are bacteriostatic and only prevent or inhibit their growth.

Antibacterials are antiseptics that have the proven ability to act against bacteria. Microbicides which destroy virus particles are called viricides or antivirals.

2. Educational aim: To know the clinical pharmacology of drugs used to treat infections in dental practice. To learn the modern principles of pharmacotherapy of the main infectious diseases. To know how to analyze, basing on a clinical example, the indications and contraindications for use of drugs and their side effects and compatibility; to learn the methods of drugs choice and if needed to be able to interchange them.

3. Pedagogical aim: To draw the doctor's-to-be attention to the peculiarities of diagnosing and pharmacotherapy of infectious diseases. To highlight the importance of the Ukrainian

scientist's contribution into the development and introduction of the new medications into infectious diseases.

4. Interdisciplinary integration:

Subjects	Knowledge	Skills
1. Preceding: normal anatomy topographic anatomy	structure and topography of dental cavity	
normal physiology pathological anatomy	normal physiology of dental cavity morphological changes during dental diseases	
pathological physiology	etiology and pathogenesis of dental diseases	to model the development of some pathology on the cell level, organ level and body level
pharmacology	classification, pharmacodynamics and pharmacokinetics of relevant drugs	to write the relevant prescriptions
2. Following: oral surgery hospital surgery	preoperative preparation of a patient and postoperative period during dental diseases	to perform clinical examinations of the patients, to prescribe the relevant additional examinations and therapy plan.
3. Interdisciplinary integration: clinical pharmacology of antimicrobial drugs interaction of drugs	clinical pharmacological peculiarities of relevant drugs; potential variants and consequences of drugs interaction in dental diseases	to write the relevant prescriptions

5. Theme content:

- Classification of local anesthetics (esters, amides, combinations).
- Mechanism of action of local anesthetics.
- Clinical pharmacological peculiarities and rational use of local anesthetics.
- Features of topical anesthesia (surface) and infiltration variant.
- Difference between antiseptic and anaesthetic.
- Classification of antiseptics

- Clinical pharmacology of antiseptics.
- Clinical pharmacology of Alcohols, Chlorhexidine Gluconate, Hydrogen peroxide, Iodine, Phenol (carbolic acid) compounds, Polyhexanide (polyhexamethylene biguanide, PHMB), Sodium chloride, Sodium hypochlorite, Sodium bicarbonate.

6. Class plan and structure (see introduction).

7. Methodological materials for the class.

7.1 Materials for the preparatory stage of class – assessment questions:

- Define the following terms: sterilization, disinfection, decontamination, disinfectant, antiseptic, and sanitizer.
- State why chemical agents are usually unreliable for sterilization.
- Describe two modes of action of disinfectants, antiseptics, and sanitizers, i.e., how they harm the microorganisms.
- Name two chemical agents that are reliable for sterilization.

7.2. Methodological materials for the main stage of the class:

To analyze basing on the real clinical examples the indications and contraindications for use of various drugs in case of dental diseases; their compatibility and possible side effects.

7.3. Materials for assessment at the final stage of the class – situational tasks:

1. Most common local anesthetic choice for local infiltration

- ropivacaine (Naropin)
- bupivacaine (Marcaine)
- lidocaine (Xylocaine)
- propranolol
- metformin

2. Placement sites for regional anesthesia:

- Bier block
- subarachnoid
- peripheral nerve block
- topical use
- all of the above

3. Zone of differential motor blockade: average two segments below the sensory level

- epidural
- spinal
- extradural
- plexus block
- surface

4. Electrophysiological effect(s) of local anesthetics:

- increased phase 0 slope
- increased action potential conduction velocity
- decrease P-R interval
- increased P-R interval
- none of the above

5. In mixed peripheral nerves (motor/sensory) – sequence of anesthesia

- A. motor first
- B. sensory first
- C. depended on anatomical locations within the nerve fiber
- D. simultaneously
- E. in turn

6. Local anesthetic not recommended for their block or for local infiltration:

- A. ropivacaine (Naropin)
- B. bupivacaine (Marcaine)
- C. tetracaine (pontocaine)
- D. lidocaine (Xylocaine)
- E. procaine (Novocaine)

8. The list of drugs to be studied for the final modular test

Name in English	Name in Latin	Drug forms
Benzocaine	Benzocainum	tab. 0,3, ointment 5%
Procaine	Procainum	amp.0,5%, 1;2;5;10;20 ml, 1%, 2% 1;2;5;10 ml
Tetracaine	Tetracainum	amp. 0,25%, 3%
Articaine	Articainum	amp. 1;2% 1 ml
Bupivacaine	Bupivacainum	amp. 0,25;0,5;0,75 % 5 ml
Lidocaine	Lidocainum	amp.1% 10 ml; 2% 2;10 ml; 10% 2 ml
Trimecaine	Trimecainum	amp. 10 ml. 0,25%; 1%, 1,5%, 2%
Formaldehyde	Formaldegidum	flac. 50, 100 ml
Salicylic acid	Acidum salicylicum	Ointment 2;3 %, flac. 1;2 %
Potassium permanganate	Kalii permanganas	flac. 0,1;0,5 %
Hydrogen peroxide	Hydrogenii peroxydi	flac. 3% 25 ml; 1,5 % 10 ml
Chlorhexodine	Chlorhexodinum	flac. 20% 0,5;3;5 L
Iodinolum	Iodinolum	flac. 0,1% 100 ml
Ethanol	Spititus aethylicus	flac. 40;70,90 %
Biclotymol	Biclotymol	flac. 30 ml

9. Recommended literature (see at the end of methodological instructions).

Theme #9. Clinical pharmacology for anti-inflammatory drugs (steroids and nonsteroidal).

Subject: clinical pharmacology

Year of study: 5

Faculty: medical

Number of hours: 4

1. Topicality. Inflammation is one of the pathological conditions, which is typical of most diseases. Anti-inflammatory drugs are widely used with different somatic pathologies, which are characterized by inflammatory process, including bronchopulmonary disease.

Anti-inflammatory refers to the property of a substance or treatment that reduces inflammation. Anti-inflammatory drugs make up about half of analgesics, remedying pain by reducing inflammation as opposed to opioids, which affect the central nervous system.

Many steroids, to be specific glucocorticoids, reduce inflammation or swelling by binding to glucocorticoid receptors. These drugs are often referred to as corticosteroids.

Non-steroidal anti-inflammatory drugs (NSAIDs), alleviate pain by counteracting the cyclooxygenase (COX) enzyme. On its own, COX enzyme synthesizes prostaglandins, creating inflammation. In whole, the NSAIDs prevent the prostaglandins from ever being synthesized, reducing or eliminating the pain.

Some common examples of NSAIDs are: aspirin, ibuprofen, and naproxen. The newer specific COX-inhibitors - although, it is presumed, sharing a similar mode of action - are not classified together with the traditional NSAIDs.

On the other hand, there are analgesics that are commonly associated with anti-inflammatory drugs but that have no anti-inflammatory effects. An example is paracetamol, called acetaminophen in the U.S. and sold under the brand name of Tylenol. As opposed to NSAIDs, which reduce pain and inflammation by inhibiting COX enzymes, paracetamol has recently been shown to block the reuptake of endocannabinoids, which only reduces pain, likely explaining why it has minimal effect on inflammation.

Long-term use of NSAIDs can cause gastric erosions, which can become stomach ulcers and in extreme cases can cause severe haemorrhage, resulting in death. The risk of death as a result of use of NSAIDs is 1 in 12,000 for adults aged 16–45. The risk increases almost twentyfold for those over 75. Other dangers of NSAIDs are exacerbating asthma and causing kidney damage. Apart from aspirin, prescription and over-the-counter NSAIDs also increase the risk of myocardial infarction and stroke.

2. Educational aim. To acquaint the students with the clinical pharmacological characteristics and principles of choice of steroidal and nonsteroidal anti-inflammatory drugs; basic long-acting immune modifying drugs.

3. Pedagogical aim. To draw the doctor's-to-be attention on good prescribing of anti-inflammatory drugs; to teach the rational use of anti-inflammatory drugs taking into consideration the dosage, possible side effects and prescription rules. To define the role of Ukrainian scientists in this sphere.

4. Interdisciplinary integration:

Subjects	Knowledge	Skills
1.Preceding :		

<ul style="list-style-type: none"> • normal anatomy • normal physiology • pathological physiology 	<ul style="list-style-type: none"> • etiology and pathogenesis of main diseases with inflammation process • the notions of inflammation, allergy, etiology and pathogenesis of inflammation and allergy processes 	
<ul style="list-style-type: none"> • pathological anatomy • pharmacology 	<ul style="list-style-type: none"> • morphological changes • classification and pharmacodynamics of antiinflammatory drugs 	<ul style="list-style-type: none"> • to write the relevant prescriptions
<p>2. Following:</p> <ul style="list-style-type: none"> • internal diseases 	<ul style="list-style-type: none"> • use of antiinflammatory drugs 	<ul style="list-style-type: none"> • to perform clinical examinations of the patients, to prescribe the relevant additional examinations.
<p>3. Interdisciplinary integration:</p> <ul style="list-style-type: none"> • clinical pharmacology of antiinflammatory drugs 	<ul style="list-style-type: none"> • peculiarities of antiinflammatory drugs 	<ul style="list-style-type: none"> • to write the relevant prescriptions

5. Theme content:

- Modern classification of antiinflammatory drugs.
- Classification of nonsteroidal antiinflammatory drugs according to their chemical structure.
- Clinical pharmacological characteristics of nonsteroidal antiinflammatory drugs.
- Side effects of nonsteroidal antiinflammatory drugs.
- Clinical pharmacological characteristics of steroidal antiinflammatory drugs.

6. Class plan and structure (see introduction).

7. Methodological materials for the class.

7.1 Materials for the preparatory stage of class – assessment questions:

- Classification of antiinflammatory drugs.
- Clinical pharmacology of steroids.
- Clinical pharmacology of non-steroids.
- Side effects of steroids.
- Side effects of nonsteroidal drugs.
- Peculiarities of prescribing, dosage, side effects of steroidal anti-inflammatory drugs.

- Clinical pharmacological characteristics of basic long-acting immune modifying anti-inflammatory drugs.
- Contraindications for use of anti-inflammatory drugs.

7.2. Methodological materials for the main stage of the class:

To analyze basing on the real clinical examples the indications and contraindications for use of various drugs with anti-inflammatory activity; their compatibility and possible side effects, as well as peculiarities of use in medical practice.

7.3. Materials for assessment at the final stage of the class – situational tasks:

1. During pulse therapy is used:

- A. Prednisolonum
- B. Triamcinolone
- C. Dexamethasone
- D. Betamethasonum
- E. Methylprednisolonum

2. The mechanism of glucocorticoid action in case of bronchial asthma lies in:

- A. Antibodies production depressing
- B. Blocking of biologically active substances activity
- C. Powerful broncholytic effect
- D. The decrease of bronchial mucous swelling
- E. The improvement of mucociliaric transport

3. Which glucocorticoid has the least depressing effect on glandula suprarenalis?

- A. Hydrocortisone
- B. Betamethasonum
- C. Triamcinolone acetate
- D. Beclometasone
- E. Dexamethasone

4. Which glucocorticoid has the least ulcerogenic action?

- A. Methylprednisolonum
- B. Betamethasonum
- C. Triamcinolone
- D. Fluticasone
- E. Dexamethasone

5. The early side effect of glucocorticoid shows during the development of:

- A. Chronic pancreatitis
- B. Steroid stomach ulcer
- C. Osteoporosis
- D. Cushing syndrome
- E. Glaucoma

6. Which clinical effect is not characteristic of glucocorticoids:

- A. Antiinflammatory
- B. Antiallergic
- C. Antishock

- D. Analgetizing
- E. Immunodepressing

A. The list of drugs to be studied for the final modular test

Hydrocortisone	Hydrocortisonum	amp.100; 500 mg; ointment 0,1;1;5 %; cream 0,1%
Dexamethasone	Dexamethasonum	tab.500 mg; amp. 4 mg – 1 ml
Diclofenac sodium	Natrium diclofenacum	tab. 25, 50 mg
Meloxicam	Meloxicamum	tab. 7,5; 15 mg; supp. 7,5; 15 mg
Methylprednisolone	Methylprednisolonum	tab. 4,8 mg; amp. 0,4 %
Nimesulide	Nimesulidum	tab. 100 mg; flac. 1%
Prednisolone	Prednisolonum	tab. 5 mg; amp. 25; 30 mg – 1ml
Rofecoxib	Rofecoxibum	tab. 25; 50 mg
Celecoxib	Celecoxibum	cap. 100; 200 mg
Paracetamol	Paracetamol	tab. 325, 500 mg, cap.500 mg

9. Recommended literature (see at the end of methodological instructions).

CLINICAL PHARMACOLOGY
for the fourth year students of the faculty of dentistry

LIST OF QUESTIONS FOR THE FINAL MODULAR TEST

- The main principles of clinical pharmacology: pharmacokinetics and pharmacodynamics.
- Drug-drug interactions, adverse reactions and complications.
- Modern classification of antianginal and antiischemic drugs.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, contraindications of nitrates, side effects, doses.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, contraindications of beta adrenergic blockers, side effects, doses.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of Ca channel blockers, side effects, doses.
- Classification of Ca channel blockers. Prescription drug information.
- Classification of beta adrenergic blockers. Prescription drug information.
- Antiplatelet drugs. Classification. Mechanism of action, side effects, doses.
- Thrombolytic agents. Indications, contraindications. Algorithm for use.
- Anticoagulant medicines. Classification. Mechanism of action, side effects, doses.
- Classification of antihypertensive drugs.
- Usage of antihypertensive drugs in different clinical settings (diabetes mellitus, bronchial asthma, pregnancy, old age, pheochromocytoma etc.)
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, contraindications of ACE-inhibitors, side effects, doses.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, contraindications of AT II type 1 receptor blockers, side effects, doses.
- Combined treatment of hypertension.
- Classification of antiarrhythmic drugs, prescribing peculiarities.
- Classification of cardiac glycosides, doses. Cardiac effects of glycosides, indications, side effects.
- Inotropic agents, indications, contraindications.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of diuretics, side effects, doses (loop, thiazides, thiazide-like, potassium sparing diuretics).
- Classification of diuretics.
- Usage of diuretics in different clinical settings (influence on lipid and carbohydrate metabolism).
- Classification of drugs influencing bronchial patency.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of β_2 agonists (short and long acting), side effects, doses.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of methylxanthines, side effects, doses.
- Inhaled corticosteroids, advantages, side effects, regimen, doses, guidelines for tapering or withdrawal of corticosteroids.
- Mechanism of action, regimen and doses of antitussives, drug-drug interaction, side effects.
- Classification of nonsteroidal antiinflammatory drugs.

- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of nonsteroidal antiinflammatory drugs, side effects, regimen, doses.
- The most common errors in antibiotic therapy.
- Allergic reactions following antibiotic therapy, clinical picture.
- Penicillins: classification, spectrum of activity, mechanism of action, treatment features, doses.
- Cephalosporins: classification, spectrum of activity, mechanism of action, treatment features, doses.
- Carbapenems: classification, spectrum of activity, mechanism of action, treatment features, doses.
- Aminoglycosides: classification, spectrum of activity, mechanism of action, treatment features, doses.
- Fluoroquinolones: classification, spectrum of activity, mechanism of action, treatment features, doses.
- Macrolides: classification, spectrum of activity, mechanism of action, treatment features, doses.
- Classification of drugs correcting secretory and motor function of digestive organs.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of selective dopamine receptor antagonists, side effects, doses.
- Classification of drugs influencing gastrointestinal motorics (Loperamide, doses)
- Spasmolytics: classification, spectrum of activity, mechanism of action, treatment features, doses.
- Drugs changing secretory function of stomach, modern possibilities of such therapy.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of proton-pump inhibitors, side effects, doses.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of histamine H₂ receptor antagonists, side effects, doses.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of antacids, side effects, doses.
- Clinical pharmacological peculiarities and rational use of gastroprotectors.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of hepatoprotectors, side effects, doses.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of pancreatic enzymes, side effects, doses.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, and contraindications of anti-allergy medication, side effects, doses.
- Classification of insulins, indications, contraindications, side effects, doses.
- Oral hypoglycemic drugs. Classification, mechanism of action, indications for use.
- Classification of drugs used for hormonal replacement therapy: estrogens, androgens. Antiestrogens, antiandrogens. Drugs for treatment of male and female menopause.
- Clinical pharmacological peculiarities and rational use of hormonal contraceptives.
- Thyroid hormones drugs. Indications, contraindications, side effects, complications, modern possibilities of this type of therapy.
- Antithyroid drugs, peculiarities of use, side effects, complications.
- Modern classification of lipid lowering drugs.
- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, contraindications of statins, side effects, doses.

- Mechanism of action, pharmacodynamics, pharmacokinetics, indications, contraindications of fibrates, side effects, doses.
- Omega-3 polyunsaturated fatty acids. Mechanism of action, prescribing peculiarities.
- Classification of dyslipidemia. Differential approach to treat dyslipidemia.

List of methodological literature and textbooks

1. A Textbook of Clinical Pharmacology and Therapeutics / M. Ritter J., D. Lewis L., G.K. Mant T., Ferro A. : Amazon.co.uk., 2008. – 465 p.
2. Grahame-Smith D., Aronson J. Oxford Textbook of Clinical Pharmacology and Drug Therapy, Oxford: University Press, 2002. – 641 p.
3. Dinesh Badyal. Practical Manual of Pharmacology: Japee, 2008. – 300 p.
4. Tripathi K.D. Pharmacological classification of drugs: with doses and preparations, 3rd Edition: Japee, 2008. – 190 p.
5. Kikhtyak O.P., Zimenkovsky A.B. Conceptual pharmacotherapy in lecture notes. – Львів: Щедрик, 2006. – 152 с.