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Кафедра клінічної фармакології та клінічної фармації

WORKBOOK
For student's self-guided work

Навчальна дисципліна «Клінічна фармакологія»
Напрямок 1201 «Медицина»
Спеціальність 7.12010001 “Лікувальна справа”, 7.12010002 “Педіатрія”,
7.12010003 “Медико-профілактична справа”

Student _____ year
_____ f-ty
Name _____
_____ Date «___» _____ 20__ y.
Teacher: _____

Kyiv - 20__ .

Introduction.

Over 50% of all drugs are prescribed and released irrationally, while about 50% of patients use them incorrectly.

The goal of teaching "Clinical Pharmacology" is to train professionals who possess a sufficient amount of theoretical knowledge and practical skills for the most efficient drug therapy for the **individual patient**. Discipline will **learn the methodology of selecting** the most effective and safe drugs and their combinations, taking into account the individual characteristics of the patient, the course and form of the disease, the presence of comorbidity, based on evidence-based medicine.

All acquired skills of individualization of drug therapy provide the ability to test in preparation of "Protocol of assessment of the effectiveness and safety of medications" (Annex 2).

Lecturer at the beginning of cycle provides students with the workbook. Checks the status of the tasks of the bid (printed or submitted in electronic form, sent by e-mail, etc.) made by another written test and control, as well as the ability to solve the typical problem situations.

Evaluation of results of the tasks in the workbook are included in the assessment of the current control.

General knowledge (knowledge and skills to use in solving practical problems) of the Workbook material ensures positive assessment of a student at the end of the discipline.

Topic 1. Object and purpose of clinical pharmacology. The main provisions of pharmacokinetics and pharmacodynamics.

Objective: To learn the methodology of individualization of drug therapy

The student should know:

- Define basic concepts of clinical pharmacology;
- Clinical pharmacokinetic parameters;
- Basic mechanisms of absorption, distribution, biotransformation and excretion of drugs;
- Classification of adverse reactions;
- The main problem of interaction between drugs;
- Specifics of the clinical pharmacology of drugs in people of all ages, pregnant and lactating women

The student should be able to:

- Identify drugs with a narrow range of action;
- Assess the risk of interaction of drugs;
- To determine the expected and unexpected adverse reactions in the appointment of drugs.

Main definitions are:

Clinical pharmacokinetics – it is ...

Clinical pharmacodynamics – it is ...

Evidence-based medicine - it is...

Pharmacogenetics - it is...

Questions submitted to the Module:

1. The definition of clinical pharmacology. Objective of clinical pharmacology, its relationship with other disciplines.
2. Clinical pharmacodynamics - determination. Lines of action of physiologically active substances drugs.
3. Clinical pharmacokinetics - determination. The clinical significance of the main parameters of pharmacokinetics (bioavailability, volume of distribution, communication with the protein half-life).
4. Mechanisms of absorption of drugs. The clinical significance.
5. Distribution of drugs in the body. Conditional volume of distribution. The clinical significance
6. Biotransformation of drugs - definition phase. The clinical significance of the induction and inhibition of biotransformation (examples).

7. Ways of elimination of drugs from the body. Options. The clinical significance.
8. Interaction of drugs - determination. The aim of combination therapy. Types of interaction, the result of interaction. Provide clinical examples.
9. Side effect of drugs - determination. Classification of adverse reactions. Methods to prevent complications of therapy.
10. Clinical pharmacogenetics, main concept. Provide clinical examples.
11. The main provision of evidence-based medicine. The organization of clinical trials of drugs.
12. Age features of usage of drugs (give clinical examples of the age limit use of drugs).

References:

- 1) Ritter J.M. et al. A Textbook of Clinical Pharmacology and Therapeutics. Fifth Edition. in 2008 by Hodder Arnold, an imprint of Hodden Education, part of Hachette Livre UK 465 p. (p.6-85).
- 2) Katzung B.G., Masters S.B., Trevor A.J. Basic and Clinical Pharmacology. 2012. 12 Edition. The McGraw-Hill Companies. (p.5-68).
- 3) Raymon L.P. et al. USMILE. Step 1. Lecture notes. Pharmacology. Caplan Medical 2009. 334 p. (p.3-38).

Self control tasks:

1. Pharmacokinetics stages

- a. Drug admission
- b. _____
- c. _____
- d. _____
- e. _____

2. Absorbtion mechanism

- a. passive diffusion
- b. _____
- c. _____
- d. _____
- e. _____

3. Biotransformation stages

- a. _____
- b. _____

4. Drug elimination mechanism in the kidneys

- a. passive glomerual filtration
- b. _____
- c. _____

5. Pharmacokinetics parameters:

Parameter		Clinical relevance
($T_{1/2}$)	Half-life period	
Vd		
Cl		
Css		

Tmax		
F		
AUC		

1. Cytochrome P450 isoforms, their substrates, inhibitors and inductors

Cyp450	Substrate	Inductors	Inhibitors	Genetic polymorphism
1A2	Teophyllin Coffein Clozapine	Smoking Broccoli Grilled food	Fluorquinolons Macrolides Amiodaron Fluvoxamine	No
2C9				
2C19				
2D6				
2E1				
3A4				

Topic 2. Clinical and pharmacological characteristics of antihypertensive drugs.

Objective: To master the question of safe and effective individualized pharmacotherapy of hypertension

The student should know:

- General semiotics of hypertension;
- Etiopathogenesis and diagnostic criteria of hypertension;
- Data of evidence-based medicine of antihypertensive therapy;
- The parameters of pharmacokinetics and pharmacodynamics of major antihypertensive drugs.

The student should be able to:

- Choose necessary drugs, adequate dose and form for the appointment for patients with hypertension;
- Identify the main methods of clinical trial for patients to assess the efficacy and safety of antihypertensive drugs and analyze their results;
- Use basic pharmacokinetic parameters of the rational purpose of antihypertensive drugs;
- Foresee the consequences of interactions and adverse effects of antihypertensive drugs.

Main definitions are:

Arterial (symptomatic) hypertension - is

Questions submitted to the Module:

1. Classification of antihypertensive drugs (drugs of the first and second line).
2. Classification, mechanism of action, specifics of pharmacokinetics of ACE inhibitors.
3. Complications of treatment, contraindications for appointment and dangerous combinations of ACE.
4. The mechanism of antihypertensive effect of β -blockers. Risk situations in their prescription.
5. Classification of β -blockers. The main pharmacological effects that they cause. Contraindications, complications of therapy.
6. Classification of calcium antagonists. The main pharmacological effects that they cause. The impact on the basic parameters of hemodynamics. Complications of therapy.
7. Classification of diuretic drugs. Pharmacodynamics, complications of therapy of spironolactone, hydrochlorothiazide, furosemide. Features for use of diuretics in hypertension and / or edema syndrome.

References:

- 1) Raymon L.P. et al. USMILE. Step 1. Lecture notes. Pharmacology. Caplan Medical 2009. 334 p. (p.93-98).
- 2) A Guide to Clinical Decision-Making: The PSAP Algorithms Online Handbook Fourth Edition American College of Clinical Pharmacy. 2008 (1-2).

Self control tasks:

1. First line of antihypertensive drugs (provide example)

- 1) Beta-blockers (bisoprolol)
- 2) Calcium channel blockers (_____)
- 3) _____
- 4) _____
- 5) _____

2. The most common side effects:

BB

ACE

CCB

Thiazide diuretics _____

3. Patient who has bronchiatic asthma was diagnosed with hypertension. Which antihypertensive drug is contraindicated? Верапаміл

- A. Hipotyazyd
- B. Propranolol
- C. Captopril
- D. Losartan

4. What caused the appearance of dry cough in a patient that for long-term treatment of hypertension took lisinopril?

- A. Inhibition of angiotensin receptor
- B. Increase in blood levels of aldesteron
- C. Depletion of noradrenaline
- D. Increase of concentrations of bradykinin

5. The patient, age 42, complains of intense headaches, thirst, frequent urination, seizures, severe weakness and pain in the muscles of both legs. OBJECTIVE: BP = 200/120 mmHg, expanded boundaries of the heart, deafness of tones of heart. Potassium serum - 2.9 mmol / L. What would be the most effective way to control blood pressure?

- A. Doxazosin
- B. Propranolol
- C. Adelfan
- D. Nifedipine
- E. Veroshpiron

Topic 3. Clinical and pharmacological characteristics of antianginal, anti-ischemic drugs and hypolipidemic drugs.

Objective: To master the issue of effective and safe use of antianginal, anti-ischemic and hypolipidemic means.

The student should know:

- General semiotics coronary heart disease and myocardial infarction;
- Data of evidence-based medicine of antianginal, anti-ischemic drugs and hypolipidemic
- The parameters of pharmacokinetics and pharmacodynamics of main antianginal, anti-ischemic and hypolipidemic drugs.

The student should be able to:

- Choose necessary drugs, adequate dose and form for appointment of patients with angina pectoris;
- Identify the main methods of clinical trial in patients to evaluate the efficacy and safety of antianginal, anti-ischemic and hypolipidemic drugs and analyze their results;
- Use basic pharmacokinetic parameters for the purpose of rational prescription of antianginal, anti-ischemic and hypolipidemic drugs;
- Foresee the consequences of interactions and adverse effects of application of antianginal, anti-ischemic and hypolipidemic means.

Main definitions are:

Stable angina - is

Unstable angina - is ...

Questions submitted to the Module:

1. Name the groups of antianginal drugs. Features of pharmacokinetics of nitrates.
2. The mechanism of antianginal effect of nitroglycerin. Situations of risk, contraindications and complications of therapy with nitrates.
3. The principles of selecting β -blockers as antianginal drugs. The mechanism of antianginal effect of β -blockers. The use of β -blockers in children and during pregnancy.
4. Classification of lipid-lowering drugs. Pharmacodynamics, complications of therapy of inhibitors of HMG-CoA reductase inhibitors, fibrates and bile acid sequestrants.
5. Classification of antiarrhythmic drugs. Specifics of choice of drugs depending on the type of arrhythmia.

6. Clinical and pharmacological characteristics of cardiac glycosides, mechanism of action, the main pharmacological effects, complications of therapy. Antidote for overdose.

7. Clinico-pharmacological characteristics of nonglycoside cardiotonic drugs: classification, main pharmacodynamic effects, indications for use, complications of therapy.

References:

1. Raymon L.P. et al. USMILE. Step 1. Lecture notes. Pharmacology. Caplan Medical 2009. 334 p. (p.103-106, 113-116).

Topic 4. Clinical pharmacology of drugs that affect the blood's ability to clot (thrombolytics, anticoagulants, antiplatelet drugs, coagulants)

Objective:

Master the skills of individualization of drug therapy for bleeding disorders

The student should know:

1. Phases and factors of clotting.
2. Clinical and pharmacological properties of drugs that affect platelet aggregation, blood coagulation and fibrinolysis.
3. Indications for drugs.

The student should be able to:

1. Assess the benefit / risk in the use of drugs that affect platelet aggregation, blood coagulation and fibrinolysis.
2. Foresee the adverse effects and interactions while administering the drugs that affect blood clotting.
3. Provide care for the patient with an overdose of drugs, that affect blood clotting.
4. Prescribe the medicines that affect platelet aggregation, blood coagulation and fibrinolysis and conduct their pharmacological analysis.

Main definitions are:

Fibrinolysis -

Coagulation -

Hemostasis –

Questions submitted to the Module:

1. Classification of antihemorrhagic medicines. Pharmacodynamics, complications of therapy of aminocaproic acid, etamzilate, aprotinin.
2. Classification of antithrombotic agents. Pharmacodynamics of vitamin K antagonist and clopidogrel. Complications of therapy.

3. Clinical pharmacokinetics and pharmacodynamics of heparin. Contraindications, especially for the use of heparin. Antidote for the overdose.

References:

1) Raymon L.P. et al. USMILE. Step 1. Lecture notes. Pharmacology. Caplan Medical 2009. 334 p. (p.257-270).

Self control tasks:

1. Provide prescriptions for:

- acetylsalicylic acid tablets
- ticlopidine tablets
- heparin vials
- warfarin tablets
- protamine sulfate ampoules

2. Fill in the table

Drugs	Indications	Side effects
Acetylsalicylic acid		
Ticlopidine		
Heparin		
Warfarin		
Protamine sulfate		
Thrombin		
Etamsylate		
Menadione		
Streptokinase		
Aminocaproic acid		

3. Among these drugs select those that have the ability to inhibit platelet aggregation:

- A. Heparin
- B. Alteplase
- C. Dipyridamole

- D. Clopidogrel
- E. Ticlopidine
- F. Aminocaproic acid
- G. Aspirin

4. Among these drugs select those with local hemostatic effect:

- A. Calcium chloride
- B. Menadione
- C. Aminocaproic acid
- D. Aspirin
- E. Thrombin
- F. Hemostatic sponge
- G. Etamsylate

5. Specify the mechanism of antiphibrinolytic action of aminocaproic acid:

- A. It acts directly on fibrin stabilizing it
- B. Blocks activators of profibrinolysin
- C. Inhibits conversion of profibrinolysin in fibrinolysin
- D. Inhibits action of fibrinolysin
- E. Reduces the activity of trypsin and kallikrein

Topic 5.

Clinical and pharmacological characteristics of drugs that affect bronchial patency.
Clinical pharmacology of anti-inflammatory drugs.

Objective:

To master the aspects of effective and safe use of drugs affecting the bronchial permeability and anti-inflammatory drugs.

The student should know:

- General semiotics of acute and chronic bronchitis, asthma, chronic obstructive pulmonary disease, systemic connective tissue diseases;
- Etiopathogenesis and diagnostic criteria for these diseases;
- Principles of pharmacotherapy of above conditions;
- Clinical pharmacology of drugs used in this disease (classification, pharmacodynamics, pharmacokinetics features, side effects, especially interaction);
- Peculiarities of clinical pharmacology of these drugs in people of all ages, pregnant women and nurturing.

The student should be able to:

- Choose necessary drugs, adequate dosage, form and dose regimen in patients with broncho-obstructive pathology;
- Identify the main methods of clinical trial for patients to assess the efficacy and safety of administering of drugs affecting the airway and analyze their results;
- Use basic pharmacokinetic parameters for the rational prescribing of drugs affecting the airway;
- Anticipate the consequences of drug interactions;
- Choose the necessary nonsteroidal anti-inflammatory drugs, their pharmaceutical form and dose regimen;
- Identify the main methods of clinical examination of patients to assess the efficacy and safety of NSAID prescription;
- conduct a survey to gather patients medical history and anticipate possible complications of pharmacotherapy when using drugs that affect the airway and NSAID.

Main definitions are:

Ways of admission of bronchodilators -

Ricochet Syndrome -.

Locking Syndrome -.

Performance Monitoring bronchodilation therapy –

Questions submitted to the Module:

1. Clinical and pharmacological characteristics of bronchodilators (classification, pharmacodynamics of β_2 -agonists, complications of therapy, indications for use of salbutamol and salmeterol).
2. The administration features of M-cholinoblockers for the syndrome of bronchial obstruction. Pharmacodynamics and complications of therapy when using ipratropium bromide.
3. Indications for the inhaled corticosteroids for the syndrome of bronchial obstruction. Pharmacodynamics, pharmacokinetics, therapy complications for the administration of beclomethasone and fluticasone.
4. Pharmacodynamics and pharmacokinetics of methylxanthines. The main pharmacological effects. Indications. Complications of therapy.
5. Clinical pharmacological characteristics of mucolytics: classification, pharmacodynamics, complications of therapy, especially the use of acetylcysteine and ambroxol.
6. Classification of antitussive drugs. Pharmacodynamics, indications, contraindications, complications of therapy of narcotic drugs.
7. Classification of nonsteroidal anti-inflammatory drugs. Pharmacodynamics. Complications of therapy.
8. The mechanism of anti-inflammatory effect of nonsteroidal anti-inflammatory drugs.
9. The mechanism of analgesic and antipyretic effects of nonsteroidal anti-inflammatory drugs.
10. Pharmacodynamics and pharmacokinetics of corticosteroids.
11. The mechanism of anti-inflammatory and anti-allergic effects of glucocorticoids.
12. Complications of therapy that cause steroids. Methods of detection and prevention rules.
13. Classification of antihistamines drugs. The principal differences between the drugs of the I, II, III generations. Complications of therapy.

References:

1. Ritter J.M. et al. A Textbook of Clinical Pharmacology and Therapeutics. Fifth Edition. in 2008 by Hodder Arnold, an imprint of Hodden Education, part of Hachette Livre UK 465 p.
2. Katzung B.G., Masters S.B., Trevor A.J. Basic and Clinical Pharmacology. 2012. 12 Edition. The McGraw-Hill Companies.

Self-control tasks:

1. Ambroxol intake is possible:
 - A. Just before bedtime
 - B. 15 minutes before sleep

- C. 30 minutes before bedtime
- D. 1 hour before sleep
- E. 2 hours before bedtime

2. Concomitant administration of salbutamol and propranolol causes:

- A. Increased neurotoxicity
- B. Increased hepatotoxicity
- C. Increased nephrotoxicity
- D. Reduces the pharmacological effect
- E. Increase bronhodilyatatsiyi

3. Bronchodilation when using salmeterol continues:

- A. For 2 hours
- B. For 4 hours
- C. Up to 10 hours
- D. Up to 8 hours
- E. Up to 12 hours

4. The mechanism of action of montelukast is:

- A. Stimulation of alpha-receptors
- B. Stimulation of beta-receptors
- C. Blockade of alpha and beta - blockers
- D. Blockade of cholinergic receptors
- E. Leukotriene receptor blockade

5. When prescribing prednisone for a patient with type 2 diabetes we increase the risk of:

- A. Hypoglycaemia
- B. Hyperglycemia
- C. Hypokalemia
- D. Hypercalcemia
- E. Hyponatremia

6. Complete the NSAID classification table depending on their anti-inflammatory effect:

<i>NSAID with significant anti-inflammatory effect</i>	<i>NSAID with moderate anti-inflammatory effect</i>
Indometacine	Mefenamic acid

Topic 6. Clinical and pharmacological characteristics of antimicrobial drugs and antibiotics.

Objective:

To master the principles of clinical-pharmaceutical approach to the selection of antimicrobials, monitoring their efficacy and safety.

The student should know:

- General semiotics of infectious and inflammatory diseases and their complications;
- Etiopathogenesis and diagnostic criteria for these diseases;
- Basic principles of rational antibiotic therapy;
- Clinical pharmacology of antimicrobial drugs and antibiotics, mechanism of action, principles of choice, complications of therapy, age-related features of administration, interaction with other drugs.

The student should be able to:

- select the most active and least toxic drugs based on knowledge peculiarities of pharmacokinetics, pharmacodynamics, and interactions with other drugs;
- select an optimal form, dose and route of administration taking into account the severity and localization of infection;
- set the duration of antimicrobial therapy and to monitor the efficacy and safety;
- carry out prevention of adverse reactions;
- replace one drug with another if necessary.

Main definitions are:

Rational antibiotic therapy - is ...

Antibiotics - are ...

Bactericidal action - is ...

Bacteriostatic effect - it ...

The sensitivity of the pathogen - it ...

Resistance of pathogen - it ...

Questions submitted to the Module:

1. The basic rules of rational antibiotic therapy.
2. Name the complications of antibiotic therapy. Methods of detection and prevention rules.
3. Age features the use of antibacterial agents. Features of their use during pregnancy and breastfeeding.

4. Clinical and pharmacological characteristics of penicillins (classification, pharmacodynamics, pharmacokinetics).
5. Complications of therapy caused by penicillin. Ways to prevent complications.
6. Clinical pharmacology of cephalosporins: classification, pharmacodynamics, pharmacokinetic features, complications of therapy.
7. Clinical pharmacology of aminoglycosides: classification, pharmacodynamics, complications of therapy. The mechanism of ototoxic and nephrotoxic effects.
8. Clinical Pharmacology of macrolides: classification, pharmacodynamics, pharmacokinetics, complications of therapy.
9. Clinical pharmacology of sulfonamides: classification, pharmacodynamics, pharmacokinetics, complications of therapy and rules for their prevention.
10. Fluoroquinolones. Clinical pharmacology: pharmacodynamics, pharmacokinetics, complications of therapy.

References:

1. Ritter J.M. et al. A Textbook of Clinical Pharmacology and Therapeutics. Fifth Edition. in 2008 by Hodder Arnold, an imprint of Hodden Education, part of Hachette Livre UK 465 p.
2. Katzung B.G., Masters S.B., Trevor A.J. Basic and Clinical Pharmacology. 2012. 12 Edition. The McGraw-Hill Companies.
3. Raymon L.P. et al. USMILE. Step 1. Lecture notes. Pharmacology. Caplan Medical 2009. 334 p.

Self control tasks:

1. Complete the Table of main properties of groups of antimicrobial drugs and antibiotics.

Antitibacterial and antibiotic drug group	Drugs names (1-2)	Mechanism of action	Antibacterial spectre	Side effects
Sulfonilamide				
Nitrofurans				
Fluoroquinolones				
Penicillins				
Cephalosporins				
Carbapenems				
Glycopeptides				

Aminoglycosides				
Macrolides				
Tetracyclines				

2. Resident doctor has prescribed a patient with enterocolitis combined therapy with fluorquinolones (ciprofloxacin) and a stomach coating drug (sucralfate). Head of the department considers this to be a mistake. This is true, because this combination:

- A. Increases fluoroquinolone toxicity
- B. Significantly decreases absorption of fluoroquinolones
- C. Fluoroquinolones increase their allergic manifestations
- D. Increased risk of kidney failure
- E. Sucralfate's ability to cause constipation is growing

3. To prevent crystalluria while administering sulfonamides you should prescribe:

- A. Alkaline mineral waters
- B. Acidic mineral water
- C. Diuretics
- D. Traces
- E. Aspirin

4. The most frequent complications of therapy of penicillins are:

- A. Acute glomerulonephritis
- B. Allergic reactions
- C. Cardiac arrhythmias
- D. Erosive gastritis
- E. Hypertension

5. Which of the following antibiotics may cause nephro- and ototoxic effect?

- A. Penicillin
- B. Laevomycetin
- C. Gentamicin
- D. Ampicillin
- E. Spiromitsyn

Topic 7. Clinical and pharmacological characteristics of medications (drugs) that affect the function of the digestive canal.

Objective:

To develop individualized skills of treatment of patients with diseases of the digestive system.

The student should know:

- General semiotics of secretory-motor disorders of the gastrointestinal tract (GIT), diseases of the hepatobiliary system, and pancreas;
- Etiology, pathogenesis, classification and diagnostic criteria for these diseases;
- Principles of pharmacotherapy of diseases of the gastrointestinal tract;
- Clinical pharmacology of drugs used in this pathology, classification, characteristics of pharmacokinetics, pharmacodynamics, side effects, specifics of interactions with other drugs, age features of usage.

The student should be able to:

- Select the required medicines, adequate form and dose way of administration for the patients with acid dependent conditions, with diseases of gastrointestinal motility disorders, disorders of the hepatobiliary system, and pancreas;
- Identify the main methods of clinical trial to assess the efficacy and safety of hepatoprotectors, enzymes, drugs that reduce acidity, analyze their results;
- Use the basic parameters of the pharmacokinetics for the rational prescription of specified groups of drugs;
- Interpret and take into account the features of clinical practice, pharmacokinetics, pharmacodynamics, side effects and interactions of hepatoprotectors, enzymes, drugs that decrease intragastric acidity, mucoprotectors, drugs that stimulate gastrointestinal motility;
- Anticipate the consequences of interaction of hepatoprotectors, enzymes, drugs that reduce intragastric acidity, mucoprotectors, drugs that stimulate gastrointestinal motility, with drugs of other pharmacological groups and have skills for prevention and correction of adverse effects of drugs;
- Conduct a survey to gather patients' medical history and predict the potential complications of drug therapy in clinical use of hepatoprotectors and enzyme drugs, drugs that reduce intragastric acidity, mucoprotectors, drugs that stimulate gastrointestinal motility.

Main definitions are:

Antiulcer drugs - are ...

Hepatoprotectors - are ...

Enzymes - are

Drugs that stimulate gastrointestinal motility - are ...

Laxatives - are ...

- Antidiarrheal drugs - are ...
- Drugs containing bile acids - are ...
- Probiotics and prebiotics - are

Questions submitted to the Module:

1. Pharmacodynamics of antacid drugs. The influence of the main factors for aggression and protection of the mucous membrane of the stomach. Complications of therapy.
2. Classification of drugs that inhibit the secretion of hydrochloric acid. Clinical pharmacology of proton pump blockers, pharmacodynamics, pharmacokinetics, complications of therapy (omeprazole, esomeprazole).
3. Clinical pharmacology of H₂ histamine blockers: classification, pharmacodynamics, complications of therapy.
4. Clinical pharmacology of hepatoprotectors: classification, pharmacodynamics, pharmacokinetics of essential phospholipids, complications of therapy.
5. Clinical and pharmacological characteristics of enzymes, pharmacodynamics of protease, lipase, amylase, complications of therapy, indications for use.
6. Clinical and pharmacological characteristics of cholagogues and choleretics: classification, pharmacodynamics, complications of therapy.

References:

1. Raymon L.P. et al. USMLE. Step 1. Lecture notes. Pharmacology. Caplan Medical 2009. 334 p. (p/221-224).

Self control tasks:

1. Classification of antiulcer drugs:	
Group	Drug
1) H ₂ -histamine blockers	Ranitidine, famotidine,
2) M ₁ - cholinoblockers	Pirenzepine
3) PPI	Omeprazol,,.....
4.	_____
5.	_____
6.	_____

7.	
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2. Mechanism of action of drugs	
Group	Mechanism of action
1. PPI	
2.	
3.	
4.	
5.	

3. Classification of cholagogue drugs				
Choleretics	Cholekinetics	Fitodrugs	Containing bile	Aminoacids
1. Odeston	1.	1.	1.	1.
		2.		
		3.		
	2.	4.	2.	
		5.		
		6.		

4. Clinical pharmacodynamics of drugs that stimulate gastrointestinal motility (kinetics)				
Pharmacological correction	Mechanism of action	Indications	Contraindications	Side effects
1. Intestinal spasmodic	1.	1.	1.	1.
2. Intestinal stimulation	2.	2.	2.	2.
3. Vermicular movement decrease	3.	3.	3.	3.
	4.	4.		4.