

1. Department: Pharmacology, Pharmacotherapy and Clinical Pharmacology

2. Level of training: master

3. Specialty: "Medicine", scientific and pedagogical

4. Course: 1

5. Name of elective discipline: "Interaction and interchangeability of drugs"

6. Number of loans: 5

7. Purpose: to teach undergraduates in the OP "Medicine" to conduct rational pharmacotherapy of various diseases in their practical activities, taking into account the interaction of drugs and to conduct the optimal selection and replacement of a drug.

8. Tasks:

- To teach to predict and evaluate the side effects of drugs, taking into account the individual characteristics of the patient;

- To teach the optimal selection and replacement of a drug if necessary in order to improve the rationality of pharmacotherapy.

9. The content of the discipline: Interaction of drugs - a change in the pharmacological action or strength of one drug while prescribing another drug. This can lead to either an increase or a weakening of the action of the drug, the appearance of toxicity of one or both drugs. Drug Interaction Mechanisms .

The main types of interaction: pharmacokinetic (changes in drug absorption, changes in distribution, metabolic disturbances, drug interactions during metabolism, induction and inhibition of metabolic enzymes) and pharmacodynamic (addiction, superraddition, antagonism).

10. Justification of the choice of discipline: The elective discipline "Interaction and interchangeability of medicines" is the final link in the chain of study of biomedical disciplines at the Faculty of Medicine. As an integrative subject, "Interaction and Interchangeability of Medicines," it combines a number of logically related, harmoniously complementary disciplines: pharmacology, biochemistry, clinical pharmacology, evidence-based medicine, genetics, pharmacogenetics, pharmaceutical chemistry and biochemistry.

11. Learning outcomes (competency):

Knowledge (cognitive sphere)	Skills (psychomotor sphere)	Personalities and professional competencies (relationships)
<ul style="list-style-type: none">- Knows the features of the pharmacokinetics and pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient- Knows risk factors and clinical manifestations of major adverse drug reactions.- Knows methods for assessing the quality of life, the basic principles of dosage of drugs, depending on the pathological and physiological parameters of the human body.- Knows the main types of drug interactions.	<ul style="list-style-type: none">- Able to make the choice of the most effective and safe and affordable medicines, for the rational use of drugs, taking into account age-related aspects and the condition of patients, determine the optimal dosage regimen;- Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs;- Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration.- Able to use types of literature (educational, scientific,	<ul style="list-style-type: none">- Competent in determining the causes and consequences of irrational use of drugs;- Understands the strengths and weaknesses of various strategies to improve drug use;- Advises doctors on the rational use of drugs.- Conduct a consultation of doctors and patients;- Formulates the problems of rational use of medicines.- He argues the formulary list based on the protocol of treatment.

<p>- Knows methods for assessing the clinical efficacy and safety of drugs, and methods of working with doctors to increase their knowledge of personalized medicine.</p>	<p>reference) and computer databases on clinical pharmacology and evidence-based medicine.</p> <p>- Is able to control and make a forecast of the risk of side effects of drugs;</p> <p>- Able to prevent and apply correction methods when they occur;</p> <p>- Able to apply clinical protocol diagnostics and treatment of diseases.</p>	
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12. Prerequisites: pharmacology, biochemistry, clinical pharmacology, evidence-based medicine, genetics, pharmacogenetics, molecular biology.

13. Post requisites: professional development.

14. Literature:

Primary:

1. Kalieva, S. S. Clinical pharmacology and rational pharmacotherapy. Volume 1: textbook / Sh. S. Kaliev., N. A. Minakova. - Almaty: Evero, 2016.-- 460

2. Kalieva, C. S. Clinical pharmacology and rational pharmacotherapy. Volume 2: textbook / S. S. Kaliev, N. A. Simokhin. - Almaty: Evero, 2016.-- 288 p.

3. Greenhalh T. Fundamentals of evidence-based medicine: textbook: translation from English / ed. G.S. Kemelov; Audit in the Kazakh language. Sagadatova TK –M.: GEOTAR-Media, 2014

4. Kulmaganbetov, I. R. Pharmacology Clinic. Line 1: About Uralsk / I.R. Kulmaganbetov. - Almaty: Euro, 2014.-- 320 p.

5. Kulmaganbetov, I. R. Pharmacology Clinic. Part II: reading Uralsk / I.R. Kulmaganbetov. - Almaty: Euro, 2014.-- 392 p.

6. Petrov VI Medicine, based on evidence: textbook. allowance / VI Petrov, SV Недогода.-; Пер. Educational-methodical unit. on med. and farm. education of Russian universities. - M.: GEOTAR-Media, 2012

Additional:

1. Rational pharmacotherapy in oncology: hand, for practicing physicians / ed. MI Davydova, VA Gorbunova. - M.: GEOTAR- Media, 2015. -844p.

2. Petrov VI Clinical pharmacology and pharmacotherapy in real medical practice: master class: textbook / VI Petrov.-; Пер. GOU DPO "Russian Med. acad. postgraduate education. - M.: - M.: GEOTAR-Media, 2011.-- 880 p.: Ill.

3. Lecture complex - the subject of using the results of the lesson: lecture complex / pharmacology, pharmacotherapy, clinic wife, pharmacology of the department. - Shymkent: SKSPhA, 2016. - 65 p.

4. Rakhimov K.D. Guidelines for the safe use of medicines: a guide / K.D. Rakhimov, K.A. Zordinova; Ministry of Health of the Republic of Kazakhstan; Almaty state Institute of Advanced Doctors Research Institute of Pharmacology and Toxicology; National Acad. Sciences of the Republic of Kazakhstan.- Almaty: B. and., 2009.- 244s.

Electronic editions:

1. Petrov, V. I. Clinical pharmacology and pharmacotherapy in real medical practice, master class [Electronic resource]: textbook / V. I. Petrov. - The electron. text data (63.5 MB). - M.: Publishing Group "GEOTAR-Media", 2011. - 880 p. email opt. disk (CD-ROM).

2 .. Doctor's consultant. Clinical Pharmacology. Version 1.1 [Electronic resource]: manual. - The electron. text data (132 Mb). - M.: Publishing Group "GEOTAR-Media", 2010. - Email. opt. disk (CD-ROM).

1. Department: Pharmacology, Pharmacotherapy and Clinical Pharmacology

2. Level of training: master

3. OP: "Medicine", scientific and pedagogical direction

4. Course: 1

5. Name of elective discipline: "Clinical and economic examination in clinical practice."

6. Number of credits: 5

7. Purpose: to teach undergraduates in the OP "Medicine" to conduct an examination of the rationality of pharmacotherapy of various diseases in their practical activities, taking into account the optimization of resources and means in healthcare

8. Tasks:

- teach methodologies for the efficient rational prescription of medicines, taking into account the optimization of resources and funds in healthcare;
- teach to optimize pharmacotherapy taking into account pharmacoeconomic aspects of treatment;
- predict and evaluate the side effects of drugs, taking into account the optimization of resources and funds in healthcare.

9. The content of the discipline: Pharmacoeconomics is a scientific and practical discipline that studies in comparative terms the relationship between costs, effectiveness, efficiency and safety in alternative treatment regimens (prophylaxis) of the disease. An integrated approach to assessing the appropriateness of the use of medical technology involves an interconnected assessment of the consequences (results) and cost of medical interventions. Evaluation of the relationship between costs and results. ABC, VEN and frequency analyzes.

The choice of method of pharmacoeconomic analysis.

10. Justification of the choice of discipline: The elective discipline "Clinical and economic examination in clinical practice" is the final link in the chain of study of biomedical disciplines at the Faculty of Medicine. As an integrative subject, "Clinical and Economic Expertise in Clinical Practice" combines a number of logically related, harmoniously complementary disciplines: pharmacology, clinical pharmacology, public health and evidence-based medicine.

11. Learning outcomes (competency):

Knowledge (cognitive sphere)	Skills (psychomotor sphere)	Personalities and professional competencies (relationships)
<ul style="list-style-type: none">- Knows the features of the pharmacokinetics and pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient- Knows risk factors and clinical manifestations of major adverse drug reactions.- Knows methods for assessing the quality of life, the basic principles of dosage of drugs, depending on the pathological and physiological parameters of the human body.- Knows the main types of drug interactions.- Knows methods for assessing the clinical	<ul style="list-style-type: none">- Able to make the choice of the most effective and safe and affordable medicines for the rational use of drugs, taking into account age-related aspects and the condition of patients, determine the optimal dosage regimen;- Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs;- Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration.- Able to use types of literature (educational, scientific, reference) and computer	<ul style="list-style-type: none">- Competent in determining the causes and consequences of irrational use of drugs;- Understands the strengths and weaknesses of various strategies to improve drug use;- Advises doctors on the rational use of drugs.- Consult doctors and patients;- Formulates the problems of rational use of medicines.- He argues the formulary list based on the protocol of treatment.- Understands the essence and internal nature of pharmacogenetics and the main pharmacokinetic processes that determine the possibility of population analysis;

<p>efficacy and safety of drugs, and methods of working with doctors to increase their knowledge of personalized medicine.</p> <ul style="list-style-type: none"> - Knows about the tasks, place, methodology, achievements and problems of pharmacogenetics and pharmacogenomics, the basics of using the results of pharmacogenetics studies in the formation of the principles of personalized medicine and standardization in healthcare - in the field of rational pharmacotherapy; 	<p>databases on clinical pharmacology and evidence-based medicine.</p> <ul style="list-style-type: none"> - Is able to control and make a forecast of the risk of side effects of drugs; - Able to prevent and apply correction methods when they occur; - Able to apply clinical protocols for diagnosis and treatment of diseases. - Able to independently acquire new knowledge in this discipline, analyze it, apply the knowledge gained in practice and in the study of other disciplines, as well as to solve urgent practical problems in the field of pharmaceuticals; describe the various techniques and methods of pharmacogenetics; - Able to discuss the benefits and limitations of pharmacogenetics and pharmacogenomics; - Able to identify the key problems of the widespread introduction of the principles of pharmacogenetics in health systems; - Able to critically evaluate publications on the results of research in the field of pharmacogenetics. 	
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12. Prerequisites: pharmacology, biochemistry, clinical pharmacology, evidence-based medicine, genetics, pharmacogenetics, molecular biology.

13. Post requisites: professional development.

14. Literature:

Primary:

1. Kalieva, S. S. Clinical pharmacology and rational pharmacotherapy. Volume 1: textbook / Sh. S. Kaliev., N. A. Minakova. - Almaty: Evero, 2016. -- 460
2. Kalieva, C. S. Clinical pharmacology and rational pharmacotherapy. Volume 2: textbook / S. S. Kaliev, N. A. Simokhin. - Almaty: Evero, 2016. -- 288 p.
3. Greenhalh T. Fundamentals of evidence-based medicine: textbook: translation from English / ed. G.S. Kemelov; Audit in the Kazakh language. Sagatova TK –M. : GEOTAR-Media, 2014
4. Kulmaganbetov, I. R. Pharmacology Clinic. Line 1: About Uralsk / I.R. Kulmaganbetov. - Almaty: Euro, 2014. -- 320 p.
5. Kulmaganbetov, I. R. Pharmacology Clinic. Part II: reading Uralsk / I.R. Kulmaganbetov. - Almaty: Euro, 2014. -- 392 p.

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Additional:

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2. Petrov VI Clinical pharmacology and pharmacotherapy in real medical practice: master class: textbook / VI Petrov.-; Рек. GOU DPO "Russian Med. acad. postgraduate education. - М .: - М.: GEOTAR-Media, 2011 .-- 880 p.: Ill.

3. Lecture complex - the subject of using the results of the lesson: lecture complex / pharmacology, pharmacotherapy, clinic wife, pharmacology of the department. - Shymkent: SKSPhA, 2016. - 65 p.

4. Rakhimov K.D. Guidelines for the safe use of medicines: a guide / K.D. Rakhimov, K.A. Zordinova; Ministry of Health of the Republic of Kazakhstan; Almaty state Institute of Advanced Doctors Research Institute of Pharmacology and Toxicology; National Acad. Sciences of the Republic of Kazakhstan .- Almaty: B. and., 2009.- 244s.

Electronic editions:

1. Petrov, V. I. Clinical pharmacology and pharmacotherapy in real medical practice, master class [Electronic resource]: textbook / V. I. Petrov. - The electron. text data (63.5 MB). - М.: Publishing Group "GEOTAR-Media", 2011. - 880 p. email opt. disk (CD-ROM).

2 .. Doctor's consultant. Clinical Pharmacology. Version 1.1 [Electronic resource]: manual. - The electron. text data (132 Mb). - М.: Publishing Group "GEOTAR-Media", 2010. - Email. opt. disk (CD-ROM).

1. Department: Pharmacology, Pharmacotherapy and Clinical Pharmacology

2. Level of training: master

3. OP: "Medicine", scientific and pedagogical direction

4. Course: 1

5. Name of elective discipline: "Methodology of rational use of medicines"

6. Number of loans: 5

7. Purpose: to teach undergraduates in the OP "Medicine" the methodology of rational pharmacotherapy of various diseases in their practical activities, taking into account the optimization and personalization of prevention and treatment, to avoid unwanted side effects through the identification of individual characteristics of the body.

8. Tasks:

- teach methodologies for rational prescribing of drugs taking into account the individual characteristics of the patient;
- teach the methodology to predict and evaluate the side effects of drugs, taking into account the individual characteristics of the patient;
- teach to evaluate the possible interactions of drugs taking into account the individual characteristics of the patient;

9. The content of the discipline: Methodology for the rational use of drugs. Methods for assessing the use of drugs, in accordance with clinical need, in doses that meet individual needs, for an adequate period of time and at the lowest cost for the patient and medical treatment.

10. Justification of the choice of discipline: The elective discipline "Methodology for the rational use of medicines" is the final link in the chain of study of biomedical disciplines at the Faculty of Medicine. As an integrative subject, the Methodology for the Rational Use of Medicines combines a number of logically related, harmoniously complementary disciplines: pharmacology, biochemistry, clinical pharmacology, evidence-based medicine, genetics, pharmacogenetics, molecular biology and OMICS technologies.

11. Learning outcomes (competency):

Knowledge (cognitive sphere)	Skills (psychomotor sphere)	Personalities and professional competencies (relationships)
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- Knows the features of the pharmacokinetics and pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient
- Knows risk factors and clinical manifestations of major adverse drug reactions.
- Knows methods for assessing the quality of life, the basic principles of dosage of drugs, depending on the pathological and physiological parameters of the human body.
- Knows the main types of drug interactions.
- Knows methods for assessing the clinical efficacy and safety of drugs, and methods of working with doctors to increase their knowledge of personalized medicine.
- Knows about the tasks, place, methodology, achievements and problems of pharmacogenetics and pharmacogenomics, the basics of using the results of pharmacogenetics studies in the formation of the principles of personalized medicine and standardization in healthcare
- in the field of rational pharmacotherapy;

- Able to make the choice of the most effective and safe and affordable medicines for the rational use of drugs, taking into account age-related aspects and the condition of patients, determine the optimal dosage regimen;
- Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs;
- Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration.
- Able to use types of literature (educational, scientific, reference) and computer databases on clinical pharmacology and evidence-based medicine.
- Is able to control and make a forecast of the risk of side effects of drugs;
- Able to prevent and apply correction methods when they occur;
- Able to apply clinical protocols for diagnosis and treatment of diseases.
- Able to independently acquire new knowledge in this discipline, analyze it, apply the knowledge gained in practice and in the study of other disciplines, as well as to solve urgent practical problems in the field of pharmaceuticals; describe the various techniques and methods of pharmacogenetics;
- Able to discuss the benefits and limitations of pharmacogenetics and pharmacogenomics;
- Able to identify the key problems of the widespread introduction of the principles

- Competent in determining the causes and consequences of irrational use of drugs;
- Understands the strengths and weaknesses of various strategies to improve drug use;
- Advises doctors on the rational use of drugs.
- Consult doctors and patients;
- Formulates the problems of rational use of medicines.
- He argues the formulary list based on the protocol of treatment.
- Understands the essence and internal nature of pharmacogenetics and the main pharmacokinetic processes that determine the possibility of population analysis;

	of pharmacogenetics in health systems; - Able to critically evaluate publications on the results of research in the field of pharmacogenetics.	
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12. Prerequisites: pharmacology, biochemistry, clinical pharmacology, evidence-based medicine, genetics, pharmacogenetics, molecular biology.

13. Post requisites: professional development.

14. Literature:

Primary:

1. Kalieva, S. S. Clinical pharmacology and rational pharmacotherapy. Volume 1: textbook / Sh. S. Kaliev., N. A. Minakova. - Almaty: Evero, 2016 .-- 460

2. Kalieva, C. S. Clinical pharmacology and rational pharmacotherapy. Volume 2: textbook / S. S. Kaliev, N. A. Simokhin. - Almaty: Evero, 2016 .-- 288 p.

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3. Lecture complex - the subject of using the results of the lesson: lecture complex / pharmacology, pharmacotherapy, clinic wife, pharmacology of the department. - Shymkent: SKSPhA, 2016. - 65 p.

4. Rakhimov K.D. Guidelines for the safe use of medicines: a guide / K.D. Rakhimov, K.A. Zordinova; Ministry of Health of the Republic of Kazakhstan; Almaty state Institute of Advanced Doctors Research Institute of Pharmacology and Toxicology; National Acad. Sciences of the Republic of Kazakhstan .- Almaty: B. and., 2009.- 244s.

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2 .. Doctor's consultant. Clinical Pharmacology. Version 1.1 [Electronic resource]: manual. - The electron. text data (132 Mb). - М.: Publishing Group "GEOTAR-Media", 2010. - Email. opt. disk (CD-ROM).

1. Department: pharmacology, pharmacotherapy and clinical pharmacology

2. Level of training: master

3. OP: "Medicine", scientific and pedagogical direction

4. Course: 1

5. Name of elective discipline: Personalized pharmacotherapy

6. Number of credits: 5

7. Purpose: to teach undergraduates in the OP “Medicine” to conduct rational pharmacotherapy of various diseases in their practical activities, taking into account the optimization and personalization of prevention and treatment, to avoid unwanted side effects by identifying the individual characteristics of the body.

8. Tasks:

- teach methodologies for rational prescribing of drugs taking into account the individual characteristics of the patient;
- teach to predict and evaluate side effects of drugs, taking into account the individual characteristics of the patient;
- teach to evaluate the possible interactions of drugs taking into account the individual characteristics of the patient;

9. The content of the discipline: Issues of rational pharmacotherapy, personalized approaches to pharmacotherapy, which involves the use of clinical and pharmacological technologies (determination of biomarkers, pharmacogenetic and pharmacotranscriptome tests), identifying individual characteristics of patients for effective and safe pharmacotherapy, which require monitoring of drug efficacy and safety, the principle of rationality of pharmacotherapy, the choice of the most appropriate drugs (combination of drugs), medicine hydrochloric forms, doses and routes of administration and duration of pharmacotherapy forecast, reduce the risk of adverse drug reactions.

10. Justification of the choice of discipline: The elective discipline "Personalized Pharmacotherapy" is the final link in the chain of study of biomedical disciplines at the Faculty of Medicine. As an integrative subject, “Personalized Pharmacotherapy” combines a number of logically related, harmoniously complementary disciplines: pharmacology, biochemistry, clinical pharmacology, evidence-based medicine, genetics, pharmacogenetics, molecular biology and OMICS technologies.

11. Learning outcomes (competency):

Knowledge (cognitive sphere)	Skills (psychomotor sphere)	Personalities and professional competencies (relationships)
<ul style="list-style-type: none"> - Knows the features of the pharmacokinetics and pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient - Knows risk factors and clinical manifestations of major adverse drug reactions. - Knows methods for assessing the quality of life, the basic principles of dosage of drugs, depending on the pathological and physiological parameters of the human body. - Knows the main types of drug interactions. - Knows methods for assessing the clinical efficacy and safety of drugs, and methods of working with doctors to increase their 	<ul style="list-style-type: none"> - Able to make the choice of the most effective and safe and affordable medicines for the rational use of drugs, taking into account age-related aspects and the condition of patients, determine the optimal dosage regimen; - Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs; - Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration. - Able to use types of literature (educational, scientific, reference) and computer databases on clinical pharmacology and evidence-based medicine. 	<ul style="list-style-type: none"> - Competent in determining the causes and consequences of irrational use of drugs; - Understands the strengths and weaknesses of various strategies to improve drug use; - Advises doctors on the rational use of drugs. - Consult doctors and patients; - Formulates the problems of rational use of medicines. - He argues the formulary list based on the protocol of treatment. - Understands the essence and internal nature of pharmacogenetics and the main pharmacokinetic processes that determine the possibility of population analysis;

<p>knowledge of personalized medicine.</p> <ul style="list-style-type: none"> - Knows about the tasks, place, methodology, achievements and problems of pharmacogenetics and pharmacogenomics, the basics of using the results of pharmacogenetics studies in the formation of the principles of personalized medicine and standardization in healthcare - in the field of rational pharmacotherapy; 	<ul style="list-style-type: none"> - Is able to control and make a forecast of the risk of side effects of drugs; - Able to prevent and apply correction methods when they occur; - Able to apply clinical protocols for diagnosis and treatment of diseases. - Able to independently acquire new knowledge in this discipline, analyze it, apply the knowledge gained in practice and in the study of other disciplines, as well as to solve urgent practical problems in the field of pharmaceuticals; describe the various techniques and methods of pharmacogenetics; - Able to discuss the benefits and limitations of pharmacogenetics and pharmacogenomics; - Able to identify the key problems of the widespread introduction of the principles of pharmacogenetics in health systems; - Able to critically evaluate publications on the results of research in the field of pharmacogenetics. 	
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12. Prerequisites: pharmacology, biochemistry, clinical pharmacology, evidence-based medicine, genetics, pharmacogenetics, molecular biology.

13. Post requisites: professional development.

14. Literature:

Primary:

1. Kalieva, S. S. Clinical pharmacology and rational pharmacotherapy. Volume 1: textbook / Sh. S. Kaliev., N. A. Minakova. - Almaty: Evero, 2016.-- 460

2. Kalieva, C. S. Clinical pharmacology and rational pharmacotherapy. Volume 2: textbook / S. S. Kaliev, N. A. Simokhin. - Almaty: Evero, 2016.-- 288 p.

3. Greenhalh T. Fundamentals of evidence-based medicine: textbook: translation from English / ed. G.S. Kemelov; Audit in the Kazakh language. Sagadatova TK –M.: GEOTAR-Media, 2014

4. Kulmaganbetov, I. R. Pharmacology Clinic. Line 1: About Uralsk / I.R. Kulmaganbetov. - Almaty: Euro, 2014.-- 320 p.

5. Kulmaganbetov, I. R. Pharmacology Clinic. Part II: reading Uralsk / I.R. Kulmaganbetov. - Almaty: Euro, 2014.-- 392 p.

6. Petrov VI Medicine, based on evidence: textbook. allowance / VI Petrov, SV Недогода.-; Рек. Educational-methodical unit. on med. and farm. education of Russian universities. - М.: ГЭОТАР-Медиа, 2012

Additional:

1. Rational pharmacotherapy in oncology: hand, for practicing physicians / ed. MI Davydova, VA Gorbunova. - M.: GEOTAR-Media, 2015. -844p.
2. Petrov VI Clinical pharmacology and pharmacotherapy in real medical practice: master class: textbook / VI Petrov.-; Pek. GOU DPO "Russian Med. acad. postgraduate education. - M.: - M.: GEOTAR-Media, 2011. -- 880 p.: Ill.
3. Lecture complex - the subject of using the results of the lesson: lecture complex / pharmacology, pharmacotherapy, clinic wife, pharmacology of the department. - Shymkent: SKSPhA, 2016. - 65 p.
4. Rakhimov K.D. Guidelines for the safe use of medicines: a guide / K.D. Rakhimov, K.A. Zordinova; Ministry of Health of the Republic of Kazakhstan; Almaty state Institute of Advanced Doctors Research Institute of Pharmacology and Toxicology; National Acad. Sciences of the Republic of Kazakhstan. - Almaty: B. and., 2009.- 244s.

Electronic editions:

1. Petrov, V. I. Clinical pharmacology and pharmacotherapy in real medical practice, master class [Electronic resource]: textbook / V. I. Petrov. - The electron. text data (63.5 MB). - M.: Publishing Group "GEOTAR-Media", 2011. - 880 p. email opt. disk (CD-ROM).
2. Doctor's consultant. Clinical Pharmacology. Version 1.1 [Electronic resource]: manual. - The electron. text data (132 Mb). - M.: Publishing Group "GEOTAR-Media", 2010. - Email. opt. disk (CD-ROM).

1. Department: Pharmacology, Pharmacotherapy and Clinical Pharmacology

2. Level of training: master

3. OP: "Medicine", scientific and pedagogical direction

4. Course: 2

5. The name of the elective discipline: "Therapeutic drug monitoring"

6. Number of loans: 5

7. Purpose: to teach undergraduates in the OP "Medicine" the methodology of maintaining the optimal concentration of the drug at the site of action, especially for drugs that have a narrow therapeutic corridor to optimize pharmacotherapy.

8. Tasks:

- teach the methodology of therapeutic drug monitoring;
- teach to control the concentration of drugs in blood plasma in order to select an individual dosage regimen of the drug;
- Teach you how to evaluate potential drug interactions.

9. The content of the discipline: Therapeutic drug monitoring; determination of the concentration of a drug substance and its metabolites in body fluids in order to monitor the ongoing drug therapy.

Clarification of the reasons for the lack of effectiveness of pharmacotherapy, prevention or confirmation of toxic effects. Clarification of the causes of nonlinear kinetics of the drug (lack of a direct relationship between the dose of the drug and its concentration in the blood). The use of drugs in groups of patients with potential pharmacological variability (senile / childhood, pregnancy). Schemes of therapeutic drug monitoring.

10. Justification of the choice of discipline: The elective discipline "Therapeutic drug monitoring" is the final link in the chain of study of biomedical disciplines at the Faculty of Medicine. As an integrative subject, "Therapeutic Drug Monitoring" combines a number of logically related, harmoniously complementary disciplines: pharmacology, pharmacotherapy, clinical pharmacology, analytical chemistry, bio-chemistry, pharmacogenetics.

11. Learning outcomes (competency):

Knowledge (cognitive sphere)	Skills (psychomotor sphere)	Personalities and professional competencies (relationships)
- Knows the features of the pharmacokinetics and pharmacodynamics of drugs	- Able to make the choice of the most effective and safe and affordable medicines for the	- Competent in determining the causes and consequences of irrational use of drugs;

and methods for assessing the quality of life of a particular patient

- Knows risk factors and clinical manifestations of major adverse drug reactions.
- Knows methods for assessing the quality of life, the basic principles of dosage of drugs, depending on the pathological and physiological parameters of the human body.
- Knows the main types of drug interactions.
- Knows methods for assessing the clinical efficacy and safety of drugs, and methods of working with doctors to increase their knowledge of personalized medicine.
- Knows about the tasks, place, methodology, achievements and problems of pharmacogenetics and pharmacogenomics, the basics of using the results of pharmacogenetics studies in the formation of the principles of personalized medicine and standardization in healthcare - in the field of rational pharmacotherapy;

rational use of drugs, taking into account age-related aspects and the condition of patients, determine the optimal dosage regimen;

- Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs;
- Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration.
- Able to use types of literature (educational, scientific, reference) and computer databases on clinical pharmacology and evidence-based medicine.
- Is able to control and make a forecast of the risk of side effects of drugs;
- Able to prevent and apply correction methods when they occur;
- Able to apply clinical protocols for diagnosis and treatment of diseases.
- Able to independently acquire new knowledge in this discipline, analyze it, apply the knowledge gained in practice and in the study of other disciplines, as well as to solve urgent practical problems in the field of pharmaceuticals; describe the various techniques and methods of pharmacogenetics;
- Able to discuss the benefits and limitations of pharmacogenetics and pharmacogenomics;
- Able to identify the key problems of the widespread introduction of the principles of pharmacogenetics in health systems;
- Able to critically evaluate publications on the results of

- Understands the strengths and weaknesses of various strategies to improve drug use;

- Advises doctors on the rational use of drugs.
- Consult doctors and patients;
- Formulates the problems of rational use of medicines.
- He argues the formulary list based on the protocol of treatment.
- Understands the essence and internal nature of pharmacogenetics and the main pharmacokinetic processes that determine the possibility of population analysis;

12. Prerequisites: pharmacology, biochemistry, clinical pharmacology, evidence-based medicine, genetics, pharmacogenetics, molecular biology.

13. Post requisites: professional development.

14. Literature:

Primary:

1. Kalieva, S. S. Clinical pharmacology and rational pharmacotherapy. Volume 1: textbook / Sh. S. Kaliev., N. A. Minakova. - Almaty: Evero, 2016 .-- 460

2. Kalieva, C. S. Clinical pharmacology and rational pharmacotherapy. Volume 2: textbook / S. S. Kaliev, N. A. Simokhin. - Almaty: Evero, 2016 .-- 288 p.

3. Greenhalh T. Fundamentals of evidence-based medicine: textbook: translation from English / ed. G.S. Kemelov; Audit in the Kazakh language. Sagadatova TK –M .: GEOTAR-Media, 2014

4. Kulmaganbetov, I. R. Pharmacology Clinic. Line 1: About Uralsk / I.R. Kulmaganbetov. - Almaty: Euro, 2014 .-- 320 p.

5. Kulmaganbetov, I. R. Pharmacology Clinic. Part II: reading Uralsk / I.R. Kulmaganbetov. - Almaty: Euro, 2014 .-- 392 p.

6. Petrov VI Medicine, based on evidence: textbook. allowance / VI Petrov, SV Недогода.-; Рек. Educational-methodical unit. on med. and farm. education of Russian universities. - М .: ГЭОТАР-Медиа, 2012

Additional:

1. Rational pharmacotherapy in oncology: hand, for practicing physicians / ed. MI Davydova, VA Gorbunova. - М .: GEOTAR- Media, 2015. -844p.

2. Petrov VI Clinical pharmacology and pharmacotherapy in real medical practice: master class: textbook / VI Petrov.-; Рек. GOU DPO "Russian Med. acad. postgraduate education. - М .: - М.: GEOTAR-Media, 2011 .-- 880 p.: Ill.

3. Lecture complex - the subject of using the results of the lesson: lecture complex / pharmacology, pharmacotherapy, clinic wife, pharmacology of the department. - Shymkent: SKSPhA, 2016. - 65 p.

4. Rakhimov K.D. Guidelines for the safe use of medicines: a guide / K.D. Rakhimov, K.A. Zordinova; Ministry of Health of the Republic of Kazakhstan; Almaty state Institute of Advanced Doctors Research Institute of Pharmacology and Toxicology; National Acad. Sciences of the Republic of Kazakhstan .- Almaty: B. and., 2009.- 244s.

Electronic editions:

1. Petrov, V. I. Clinical pharmacology and pharmacotherapy in real medical practice, master class [Electronic resource]: textbook / V. I. Petrov. - The electron. text data (63.5 MB). - М.: Publishing Group "GEOTAR-Media", 2011. - 880 p. email opt. disk (CD-ROM).

2 .. Doctor's consultant. Clinical Pharmacology. Version 1.1 [Electronic resource]: manual. - The electron. text data (132 Mb). - М.: Publishing Group "GEOTAR-Media", 2010. - Email. opt. disk (CD-ROM).

1. Department: Pharmacology, Pharmacotherapy and Clinical Pharmacology

2. Level of training: master

3. OP: "Medicine", scientific and pedagogical direction

4. Course: 2

5. Name of elective discipline: “Chemotherapy and toxic effects of chemotherapeutic drugs”

6. Number of loans: 5

7. Purpose:

• to teach undergraduates in the OP “Medicine” to conduct rational chemotherapy of various diseases in their practical activities, taking into account clinical efficacy and toxicity, depending on specific clinical situations and polymorbidity;

- teach methodologies for the rational use of chemotherapeutic drugs for the treatment of various diseases.

8. Tasks:

- teach methodologies for the rational use of chemotherapeutic drugs;
- teach to predict and evaluate the toxic effects of drugs;
- teach to evaluate the possible interactions of drugs taking into account pharmaceutical, pharmacokinetic and pharmacodynamic aspects.

9. The content of the discipline: The basic principles of chemotherapy. The choice of chemotherapeutic agents, dosage form, dose and frequency of administration of the drug. Duration of treatment, monitoring of treatment, the possibility of undesirable effects of chemotherapeutic agents on the human body, including the fetus in pregnant women, as well as in newborns and when breastfeeding.

The rational combination of chemotherapeutic agents. Use in children, taking into account their anatomical and physiological characteristics. Toxic effects. Measures to eliminate or reduce the adverse reactions of chemotherapeutic agents. Preventive chemotherapy. Combination chemotherapy.

10. Justification of the choice of discipline: The elective discipline "Chemotherapy and toxic effects of chemotherapeutic drugs" is the final link in the chain of study of biomedical disciplines at the Faculty of Pharmacy. As an integrative subject "Chemotherapy and toxic effects of chemotherapeutic drugs" combines a number of logically connected, harmoniously complementary disciplines: pharmacology, pharmacotherapy, clinical pharmacology, biochemistry, pharmacogenetics and clinical toxicology.

11. Learning outcomes (competency):

Knowledge (cognitive sphere)	Skills (psychomotor sphere)	Personalities and professional competencies (relationships)
<ul style="list-style-type: none"> - Knows the features of the pharmacokinetics and pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient - Knows risk factors and clinical manifestations of major adverse drug reactions. - Knows methods for assessing the quality of life, the basic principles of dosage of drugs, depending on the pathological and physiological parameters of the human body. - Knows the main types of drug interactions. - Knows methods for assessing the clinical efficacy and safety of drugs, and methods of working with doctors to increase their knowledge of personalized medicine. - Knows about the tasks, place, methodology, achievements and problems of pharmacogenetics and pharmacogenomics, the 	<ul style="list-style-type: none"> - Able to make the choice of the most effective and safe and affordable medicines for the rational use of drugs, taking into account age-related aspects and the condition of patients, determine the optimal dosage regimen; - Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs; - Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration. - Able to use types of literature (educational, scientific, reference) and computer databases on clinical pharmacology and evidence-based medicine. - Is able to control and make a forecast of the risk of side effects of drugs; - Able to prevent and apply correction methods when they occur; 	<ul style="list-style-type: none"> - Competent in determining the causes and consequences of irrational use of drugs; - Understands the strengths and weaknesses of various strategies to improve drug use; - Advises doctors on the rational use of drugs. - Consult doctors and patients; - Formulates the problems of rational use of medicines. - He argues the formulary list based on the protocol of treatment. - Understands the essence and internal nature of pharmacogenetics and the main pharmacokinetic processes that determine the possibility of population analysis;

<p>basics of using the results of pharmacogenetics studies in the formation of the principles of personalized medicine and standardization in healthcare - in the field of rational pharmacotherapy;</p>	<ul style="list-style-type: none"> - Able to apply clinical protocols for diagnosis and treatment of diseases. - Able to independently acquire new knowledge in this discipline, analyze it, apply the knowledge gained in practice and in the study of other disciplines, as well as to solve urgent practical problems in the field of pharmaceuticals; describe the various techniques and methods of pharmacogenetics; - Able to discuss the benefits and limitations of pharmacogenetics and pharmacogenomics; - Able to identify the key problems of the widespread introduction of the principles of pharmacogenetics in health systems; - Able to critically evaluate publications on the results of research in the field of pharmacogenetics. 	
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12. Prerequisites: pharmacology, biochemistry, clinical pharmacology, evidence-based medicine, genetics, pharmacogenetics, molecular biology.

13. Post requisites: professional development.

14. Literature:

Primary:

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- 2 .. Doctor's consultant. Clinical Pharmacology. Version 1.1 [Electronic resource]: manual. - The electron. text data (132 Mb). - M.: Publishing Group "GEOTAR-Media", 2010. - Email. opt. disk (CD-ROM).