

**The catalog of elective disciplines for 2023-2024 academic year**

**1. Department: Pharmacology, Pharmacotherapy and Clinical Pharmacology**

**2. Level of training: master**

**3. Specialty: "Pharmacy", 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 at the Pharmacy Foundation to conduct rational pharmacotherapy of various diseases in their practical activities, taking into account the interaction of drugs and to conduct 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 (VLS).

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 drugs” is the final link in the chain of study of biomedical disciplines at the Faculty of Pharmacy. As an integrative subject, “Interaction and interchangeability of drugs”, it combines a number of logically related, harmoniously complementary disciplines: pharmacology, biochemistry, pharmacotherapy, evidence-based medicine, genetics, pharmacogenetics, pharmaceutical chemistry and biochemistry.

11. Learning outcomes (competency):

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personalities and professional competencies (relationships)</b>
<ul style="list-style-type: none"> <li>- Knows the features of the pharmacokinetics and pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient</li> <li>- Knows risk factors and clinical manifestations of major adverse drug reactions.</li> <li>- 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.</li> <li>- Knows the main types of drug interactions.</li> </ul>	<ul style="list-style-type: none"> <li>- 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;</li> <li>- Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs;</li> <li>- Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration.</li> </ul>	<ul style="list-style-type: none"> <li>- Competent in determining the causes and consequences of irrational use of drugs;</li> <li>- Understands the strengths and weaknesses of various strategies to improve drug use;</li> <li>- Advises doctors on the rational use of drugs.</li> <li>- Consult doctors and patients;</li> <li>- Formulates the problems of rational use of medicines.</li> <li>- Arguments the formulary list based on the protocol of treatment;</li> <li>- Understands the essence and internal nature of pharmacogenetics and the main pharmacokinetic processes that</li> </ul>

<ul style="list-style-type: none"> <li>- Knows methods for assessing the clinical efficacy and safety of drugs, and methods of working with doctors to increase their knowledge of personalized medicine;</li> <li>- Knows about the tasks, place, methodology, achievements and problems of pharmaco-genetics and pharmaco-genomics.</li> </ul>	<ul style="list-style-type: none"> <li>- Able to use types of literature (educational, scientific, reference) and computer databases on clinical pharmacology and evidence-based medicine.</li> <li>- Is able to control and make a forecast of the risk of side effects of drugs;</li> <li>- Able to prevent and apply correction methods when they occur;</li> <li>- Able to apply clinical protocols for diagnosis and treatment of diseases;</li> <li>- 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;</li> </ul>	<p>determine the possibility of population analysis;</p>
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12. Prerequisites: pharmacology, biochemistry, pharmacotherapy, 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.-; Пек. Educational-methodical unit. on med. and farm. education of Russian universities. - M.: GEOTAR- 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.-; Пек. 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: "Pharmacy", scientific and pedagogical direction**

**4. Course: 1**

**5. Name of elective discipline: Personalized pharmacotherapy**

**6. Number of loans: 5**

**7. Purpose: to teach undergraduates in the Pharmacia EP to conduct rational pharmacotherapy of various diseases in their practical activities, taking into account the optimization and personalization of prevention and treatment, to avoid undesirable 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, pharmacotherapy, evidence-based medicine, genetics, pharmacogenetics, molecular biology and OMICS technologies.

11. Learning outcomes (competency):

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personalities and professional competencies (relationships)</b>
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<ul style="list-style-type: none"> <li>- Knows the features of the pharmacokinetics and pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient</li> <li>- Knows risk factors and clinical manifestations of major adverse drug reactions.</li> <li>- 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.</li> <li>- Knows the main types of drug interactions.</li> <li>- Knows methods for assessing the clinical efficacy and safety of drugs, and methods of working with doctors to increase their knowledge of personalized medicine;</li> <li>- Knows about the tasks, place, methodology, achievements and problems of pharmaco-genetics and pharmaco-genomics.</li> </ul>	<ul style="list-style-type: none"> <li>- 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;</li> <li>- Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs;</li> <li>- Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration.</li> <li>- Able to use types of literature (educational, scientific, reference) and computer databases on clinical pharmacology and evidence-based medicine.</li> <li>- Is able to control and make a forecast of the risk of side effects of drugs;</li> <li>- Able to prevent and apply correction methods when they occur;</li> <li>- Able to apply clinical protocols for diagnosis and treatment of diseases;</li> <li>- 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;</li> </ul>	<ul style="list-style-type: none"> <li>- Competent in determining the causes and consequences of irrational use of drugs;</li> <li>- Understands the strengths and weaknesses of various strategies to improve drug use;</li> <li>- Advises doctors on the rational use of drugs.</li> <li>- Consult doctors and patients;</li> <li>- Formulates the problems of rational use of medicines.</li> <li>- Arguments the formulary list based on the protocol of treatment;</li> <li>- Understands the essence and internal nature of pharmacogenetics and the main pharmacokinetic processes that determine the possibility of population analysis;</li> </ul>
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12. Prerequisites: pharmacology, biochemistry, pharmacotherapy, 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

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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.
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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). - M.: Publishing Group "GEOTAR-Media", 2010. - Email. opt. disk (CD-ROM).

1. **The department of Pharmacognosy**
2. **Level of training (magistracy)**
3. **Specialty: 6M110400 «Pharmacy»**
4. **Course: 1 (scientifically-pedagogical direction)**
5. **Name of elective discipline: «Standardization of medicinal plant raw materials and phytopreparations»**
6. **Amount of credits: 3**
7. **Purposes:**
  - Formation of theoretical knowledge (cognitive component)
  - Mastering practical skills in conducting microscopy of medicinal plant raw materials and conducting a complete analysis of finished medicines used in phytotherapy
  - Instilling communication skills to students on the professional presentation of the external description of LR and LRS, reasoned statement, defending their own point of view, the formation of logical thinking, the ability to participate in discussions, etc.
  - Mastering legal competence by familiarizing regulatory documentation regulating the quality, effectiveness and safety of LR and LRS (GF RK, etc.)
  - Motivated training of undergraduates for continuous improvement and development of abilities for independent and creative development of materials on medicinal plant raw materials
8. **Tasks:**

- to give a general idea to undergraduates about medicines used in standardization in phytotherapy and listed in the Register of the Republic of Kazakhstan
- mastering and familiarization with practical, communicative and legal skills of students with the basic provisions on medicinal plant raw materials and medicinal plants and prepared from them, dosage forms used in standardization in the Republic of Kazakhstan.
- formation of a holistic view of medicines from LRS used in standardization in the Republic of Kazakhstan.
- legal familiarization of undergraduates with the problems of medicinal plants used in standardization in the form of ready-made dosage forms in traditional medicine, disclosure of scientific approaches to their solution.
- familiarization with modern promising areas of application of medicinal plants and medicinal plant and factory-prepared ready-made dosage forms (tinctures, extracts, tablets, etc.) used in modern phytotherapy.
- to form the ability to independently understand medicinal plants and medicinal plant raw materials and finished medicines used in standardization in phytotherapy.

#### 9. Justification of the choice of discipline:

Ensuring the proper quality of medicinal plant raw materials largely depends on the correct organization of control, its effectiveness and efficiency, as well as on the level of requirements laid down in regulatory documents (GF, AND, VAND) and the methods of analysis used. The study of the system of quality standards of medicinal plant raw materials, their products, testing methods, etc., established in a nationwide manner and mandatory for producers and consumers is currently a very urgent problem in the Republic of Kazakhstan.

#### 10. Results of training (competence):

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personal and professional competences (relations)</b>
<p>-general concept of work safety in chemical testing laboratories, standardization, standards, laws used in standardization, medicinal plants, medicinal plant raw materials, the concept of biologically active substances, familiarity with the State Budget of the Republic of Kazakhstan, the Register of the Republic of Kazakhstan;</p> <p>-the general importance of medicinal plants and medicinal plant raw materials as a source of biologically active compounds used in standardization in modern phytotherapy;</p> <p>- to get acquainted with the general nomenclature of medicinal plants, medicinal plant raw materials and phytopreparations in finished form used in standardization and quality control in testing laboratories of the Republic of Kazakhstan;</p>	<p>- be able to correctly give a general description of medicinal preparations from medicinal plants and medicinal plant raw materials according to a common external feature, the main features characteristic of the LRS family, the main chemical composition and use in phytotherapy;</p> <p>- search and selection of material for the disclosure of the topic standardization of medicinal plants used in herbal medicine;</p> <p>-be able to use the necessary scientific, educational and professional literature for a future specialist, suitable for working with medicinal plants used in phytotherapy;</p> <p>- Be able to use regulatory documents (the Law on</p>	<p>- To carry out work with safety procedures of work in a chemical laboratory with medicinal plant raw materials and medicinal plants used in phytotherapy;</p> <p>- to carry out standardization and quality control of medicinal plant raw materials;</p> <p>- State registration and re-registration of some ready-made medicines: "Hawthorn tincture", "Motherwort Tincture", "Lily of the Valley Tincture" used in herbal medicine. General study of medicinal plant raw materials used in settings. Study of the general article on the GF of the Republic of Kazakhstan;</p> <p>- State registration and re-registration of some</p>

<p>-to study, familiarize and master the necessary quality indicators used in the standardization of various ready-made dosage forms (tinctures, tablets, extracts, ointments, etc.) containing medicinal plant raw materials</p> <p>-recognize medicinal plants and medicinal plant raw materials used in standardization;</p> <p>- to carry out quality control according to the required indicators and analysis of medicinal products from medicinal plants and medicinal plant raw materials used in standardization;</p>	<p>Medicines, the State Budget of the Republic of Kazakhstan, the Register of the Republic of Kazakhstan, standardization orders, standardization regulations, codes, etc.) on standardization of finished dosage forms used in herbal medicine;</p> <p>- Be able to state registration and re-registration of medicinal raw materials, plant and animal origin</p> <p>The concept of registration, re-registration and certification of pharmaceutical products from raw materials of animal and vegetable origin in the Republic of Kazakhstan.</p>	<p>medicines: "Salvin – solution for external use", "Chlorophyllipt -alcohol 1% solution", "Infusion, tincture of birch buds", "Infusion of melissa herb" are derivatives of essential oils used in phytotherapy. Study of quality indicators for finished dosage forms.</p>
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**11. Prerequisites:** bachelor degree

**12.Post-details:** doctorate

### **13.Literature**

The main:

- 1.Лекарственное сырье растительного и животного происхождения. Фармакогнозия / Под ред. Г.П. Яковлева. – СПб.: СпецЛит, 2006. – 845 с.: ил.
2. Муравьева Д.А., Самылина И.А., Яковлев Г.П. Фармакогнозия. Учебник. – 4-е изд., перераб. и доп. – М.: ОАО Издательство «Медицина», 2007. – 656 с.: ил.
3. Руководство к практическим занятиям по фармакогнозии: Учебное пособие / Под ред. И.А. Самылиной, А.А. Сорокиной. – М.: ООО «Мед. информационное агентство», 2007. – 672 с.
4. Самылина И.А., Аносова О.Г. Фармакогнозия: учебное пособие: Атлас в 2 т. – М., 2007. – Т.1. – 192 с.; Т.2. – 384 с.
5. Самылина И.А., Ермакова В.А., Бобкова Н.В., Потанина О.Г. Фармакогнозия: учебное пособие: Атлас. – Т.3. – М., 2009. – 488 с.

#### **Additional:**

1. Головкин Б.Н., Руденская Р.Н., Трофимова И.А., Шретер А.И. Биологически активные вещества растительного происхождения. – М.: Наука, 2001. – 240 с.
- 2.Государственная фармакопея Республики Казахстан. Т.1. – Алматы: Издательский дом «Жибек жолы», 2008. – 592 с.
3. Машковский М.Д. Лекарственные средства. – 15-е изд., перераб., испр. и доп. – М.: РИА «Новая волна»: Издатель Умеренков, 2008. – 1206 с.: ил.

1. **The department of Pharmacognosy**

2. **Level of training (magistracy)**

3. **Specialty: 6M110400 «Pharmacy»**

4. **Course: 1 (scientifically-pedagogical direction)**

5. **Name of elective discipline: «Features of the phytochemical analysis of medicinal raw materials of plant and animal origin»**

**6. Amount of credits: 2****7. Purposes:**

Acquaintance of undergraduates with topical issues of a pharmakognoziya, the organization of preparations of medicinal plant raw materials, the chemical composition and classification of herbs, bases of rational environmental management, methods of procuring process of medicinal plant raw materials and its standardization and also with the main directions of scientific research in the field of studying of herbs.

**8.Tasks:** - ability to define humidity, ash-content, characteristic numerical indicators of medicinal plant raw materials (in fats — acid number, iodine number, etc.);

- studying high-quality and quantitative definition of active ingredients of medicinal raw materials of plant and animal origin;

- carrying out phytochemical analysis of medicinal raw materials of plant and animal origin;

- to create the skills necessary for implementation of professional activity of the undergraduate;

- to give a general idea to undergraduates about the medicines applied at standardization in phytotherapy and entered in the Register of the Republic of Kazakhstan

- development and acquaintance by practical, communicative and legal skills of students with basic provisions about medicinal plant raw materials and herbs and ready of them, the dosage forms applied at standardization in the Republic of Kazakhstan.

- formation of complete idea of medicines from MPRM applied at standardization in the Republic of Kazakhstan.

- legal acquaintance of students with problems of the herbs applied at standardization in the form of ready dosage forms at traditional medicine, disclosure of scientific approaches in their decision.

**9. Justification of the choice of discipline:**

"Features of the phytochemical analysis of medicinal raw materials of plant and animal origin" – one of pharmaceutical sciences studying herbs, medicinal plant raw materials and some products of primary processing of plant and animal origin. It is considered features of the phytochemical analysis of medicinal raw materials of plant and animal origin a special subject for studying of a pharmakognoziya as the main subject. Pharmakognoziya (from Greek pharmakon – medicine, poison and gnosis - knowledge) – the science which is comprehensively studying herbs, medicinal raw materials plant is more rare than animal origin.

**10. Results of training (competence):**

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personal and professional competences (relations)</b>
<p>- "Features of the phytochemical analysis of medicinal raw materials of plant and animal origin" as science and as subject matter and main stages of development.</p> <p>- a general meaning of herbs and medicinal plant raw materials, as source of biologically active connections applied at standardization in modern phytotherapy;</p> <p>- to study the general nomenclature of herbs, medicinal plant raw materials and the phytomedicines in a ready form used at standardization and quality control in testing</p>	<p>- ability to define humidity, ash-content, characteristic numerical indicators of medicinal plant raw materials (in fats — acid number, iodine number, etc.);</p> <p>- Knows zhiropodobny substances. Wax: beeswax, spermatst also lanolin;</p> <p>- studying high-quality and quantitative definition of active ingredients of medicinal raw materials of plant and animal origin;</p> <p>- is able systematizes knowledge of a subject and problems of standardization</p>	<p>- carrying out phytochemical analysis of medicinal raw materials of plant and animal origin;</p> <p>- to define humidity, ash-content, characteristic numerical indicators of medicinal plant raw materials (in fats — acid number, iodine number, etc.);</p> <p>- to carry out analyses on zhiropodobny substances. Wax: beeswax, spermatst also lanolin;</p> <p>- to carry out high-quality and quantitative definition of active ingredients of</p>



<p>laboratories of the Republic of Kazakhstan;</p> <ul style="list-style-type: none"> <li>- to study, examine and master necessary indicators of quality, various ready dosage forms applied at standardization (tinctures, tablets, extracts, ointments, etc.), containing medicinal plant raw materials;</li> <li>- Acquaintance with safety measures of work in chemical laboratory with medicinal plant raw materials and herbs, applied in phytotherapy;</li> <li>- Defines distinctive features of standardization and quality control of the crushed MPRM in comparison with other areas of standardization and quality control;</li> <li>- Explains the parameters used in standardization and quality control of the crushed MPRM;</li> <li>- Explains essence of quality control of the crushed MPRM, its purpose and tasks as sciences;</li> <li>- to distinguish herbs and medicinal plant raw materials, applied at standardization in phytotherapy.</li> </ul>	<p>and quality control of the crushed medicinal plant raw materials of the packed-up products;</p> <ul style="list-style-type: none"> <li>- Owns metodolgiy standardization and quality control of the crushed MPRM;</li> <li>- Is able defines distinctive features of standardization and quality control of the crushed MPRM in comparison with other areas of standardization and quality control;</li> <li>- Explains the parameters used in standardization and quality control of the crushed MPRM;</li> <li>- Explains essence of quality control of the crushed MPRM, its purpose and tasks as sciences;</li> <li>- Is able to compare evaluation stages of standardization and quality control of MPRM;</li> <li>- Is able to characterize quality control investigation phases;</li> <li>- knows ways of use and application in medicine of medicinal plant raw materials</li> </ul>	<p>medicinal raw materials of plant and animal origin;</p> <ul style="list-style-type: none"> <li>- Ability to apply standard and technical documentation, knowledge in the field of standard and legal bases of protection of intellectual property and a transfer of technologies, knowledge in the field of ISO</li> <li>Free possession of professional knowledge in the field of standardization and quality control;</li> <li>- To Vladeet to provide stability of indicators~ productions and qualities of the products which are turned out~;</li> <li>- To carry out the touch assessment of finished goods;</li> <li>- To carry out the analysis and to generalize the received results for use in production and technological activity;</li> <li>- to predict emergence of possible problems, crisis or unusual situations, to find possibilities of their monitoring, permission or prevention;</li> <li>- To carry out environmental control</li> </ul>
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**11. Prerequisites: bachelor degree**

**12. Post-details: doctorate**

**13. Literature**

**The main:**

1. Лекарственное сырье растительного и животного происхождения. Фармакогнозия / Под ред. Г.П. Яковлева. – СПб.: СпецЛит, 2006. – 845 с.: ил.
2. Муравьева Д.А., Самылина И.А., Яковлев Г.П. Фармакогнозия. Учебник. – 4-е изд., перераб. и доп. – М.: ОАО Издательство «Медицина», 2007. – 656 с.: ил.
3. Руководство к практическим занятиям по фармакогнозии: Учебное пособие / Под ред. И.А. Самылиной, А.А. Сорокиной. – М.: ООО «Мед. информационное агентство», 2007. – 672 с.
4. Самылина И.А., Аносова О.Г. Фармакогнозия: учебное пособие: Атлас в 2 т. – М., 2007. – Т.1. – 192 с.; Т.2. – 384 с.
5. Самылина И.А., Ермакова В.А., Бобкова Н.В., Потанина О.Г. Фармакогнозия: учебное пособие: Атлас. – Т.3. – М., 2009. – 488 с.

**Additional:**

1. Головкин Б.Н., Руденская Р.Н., Трофимова И.А., Шретер А.И. Биологически активные вещества растительного происхождения. – М.: Наука, 2001. – 240 с.

2. Государственная фармакопея Республики Казахстан. Т.1. – Алматы: Издательский дом «Жибек жолы», 2008. – 592 с.
3. Машковский М.Д. Лекарственные средства. – 15-е изд., перераб., испр. и доп. – М.: РИА “Новая волна”: Издатель Умеренков, 2008. – 1206 с.: ил.

1. **The department of Pharmacognosy**
2. **Level of training (magistracy)**
3. **Specialty: 6M110400 «Pharmacy»**
4. **Course: 1 (scientifically-pedagogical direction)**
5. **Name of elective discipline: «Herbs in traditional medicine»**
6. **Amount of credits: 3**
7. **Purposes:**

Acquaintance of undergraduates with herbs which are applied in traditional medicine, the organization of preparations of medicinal plant raw materials, the chemical composition and classification of herbs, bases of rational environmental management, methods of procuring process of medicinal plant raw materials and its standardization and also with the main directions of scientific research in the field of studying of herbs.

8. **Tasks:** - orientation in properties and the chemical composition of herbs according to constantly growing demand in quality phytoproducts and medicinal plant raw materials;  
 - orientation in properties and the chemical composition of the products of animal and mineral origin which are widely used in a modern arsenal the pharmacological of medicines;  
 - carrying out phytochemical and merchandising analysis of raw materials of natural origin.

9. **Justification of the choice of discipline:**

Herbs in traditional medicine – takes special place in the system of training of specialists with pharmaceutical education after the higher education as traditional medicine and national remedies always drew attention of doctors and researchers. Some of such means after test them in clinics found application in modern medicine and received from herbs take the important place.

Herbs in traditional medicine it is considered a special subject for studying of a pharmacognosy as the main subject.

Considering the increased requirements of practical pharmacy and medicine to use of medicinal raw materials in traditional medicine, the subject "Herbs in Traditional Medicine" considers a circle of the questions connected with preparation of medicinal plant raw materials, rational and careful attitude to resources of herbs, sources of raw materials of mineral and animal origin, processing of plant raw materials and their application in medicine.

10. **Results of training (competence):**

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personal and professional competences (relations)</b>
- Shows knowledge of the basic concepts of herbs in traditional medicine, a subject and its value for practical activities of the expert of pharmacy - Knows difference between botanical, pharmakognostichesky and merchandising characteristic of plants. - Considering the increased requirements of practical pharmacy and medicine to use of medicinal raw	- Shows knowledge of the legislation of RK in the field of health care, the international standards, their structure and other specifications and technical documentation regulating quality, rules of preparation, acceptance, the requirement to terms and storage conditions of medicinal plant raw materials,	- Shows knowledge of the legislation of RK in the field of health care, the international standards, their structure and other specifications and technical documentation regulating quality, rules of preparation, acceptance, the

<p>materials in traditional medicine, the subject "Herbs in Traditional Medicine" considers a circle of the questions connected with preparation of medicinal plant raw materials, rational and careful attitude to resources of herbs, sources of raw materials of mineral and animal origin, processing of plant raw materials and their application in medicine.</p> <ul style="list-style-type: none"> <li>- Shows knowledge of herbs in traditional medicine takes special place in the system of training of specialists with pharmaceutical education after the higher education as traditional medicine and national remedies always drew attention of doctors and researchers.</li> <li>- Some of such means after test them in clinics found application in modern medicine and received from herbs take the important place.</li> <li>- Knows the BAS main groups of natural origin and their physical and chemical properties, the main ways of biosynthesis, methods of allocation, cleaning, the qualitative and quantitative analysis of the MPRM active ingredients</li> </ul>	<p>a basis of a legal system of Kazakhstan, etc.</p> <ul style="list-style-type: none"> <li>- Carries out search and information processing about medicinal plant raw materials for consultation of doctors, druggists, the population concerning their preparation, application and storage;</li> <li>- Imparts to students own knowledge and abilities of work with information (educational, help, scientific) in the field of herbs in traditional medicine;</li> <li>- knows, herbs and their application in traditional medicine;</li> <li>- knows plants applied in the people at diseases of a liver and gall bladder;</li> <li>- knows plants applied in the people at diseases of urinogenital bodies;</li> <li>- Knows plants applied in the people at diseases of airways (lungs, a throat);</li> <li>- knows the poisonous plants applied in the people as medicinal means</li> </ul>	<p>requirement to terms and storage conditions of medicinal plant raw materials, a basis of a legal system of Kazakhstan, etc.</p> <ul style="list-style-type: none"> <li>- Carries out search and information processing about medicinal plant raw materials for consultation of doctors, druggists, the population concerning their preparation, application and storage;</li> <li>- Imparts to students own knowledge and abilities of work with information (educational, help, scientific) in the field of herbs in traditional medicine;</li> <li>- to carry out comparative analysis herbs and their application in traditional medicine;</li> <li>- to carry out the comparative analysis of plants applied in the people at diseases of a liver and gall bladder;</li> <li>- to carry out comparative analysis on plants applied in the people at diseases of urinogenital bodies;</li> <li>- to carry out comparative analysis on plants applied in the people at diseases of airways (lungs, a throat);</li> <li>- to carry out comparative analysis on the poisonous plants applied in the people as medicinal means</li> </ul>
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**11. Prerequisites: bachelor degree**

**12. Post-details: doctorate**

**13. Literature**

**The main:**

1. Лекарственное сырье растительного и животного происхождения. Фармакогнозия / Под ред. Г.П. Яковлева. – СПб.: СпецЛит, 2006. – 845 с.: ил.
2. Муравьева Д.А., Самылина И.А., Яковлев Г.П. Фармакогнозия. Учебник. – 4-е изд., перераб. и доп. – М.: ОАО Издательство «Медицина», 2007. – 656 с.: ил.
3. Руководство к практическим занятиям по фармакогнозии: Учебное пособие / Под ред. И.А. Самылиной, А.А. Сорокиной. – М.: ООО «Мед. информационное агентство», 2007. – 672 с.
4. Самылина И.А., Аносова О.Г. Фармакогнозия: учебное пособие: Атлас в 2 т. – М., 2007. – Т.1. – 192 с.; Т.2. – 384 с.
5. Самылина И.А., Ермакова В.А., Бобкова Н.В., Потанина О.Г. Фармакогнозия: учебное пособие: Атлас. – Т.3. – М., 2009. – 488 с.

**Additional:**

1. Головкин Б.Н., Руденская Р.Н., Трофимова И.А., Шретер А.И. Биологически активные вещества растительного происхождения. – М.: Наука, 2001. – 240 с.
2. Государственная фармакопея Республики Казахстан. Т.1. – Алматы: Издательский дом «Жибек жолы», 2008. – 592 с.
3. Машковский М.Д. Лекарственные средства. – 15-е изд., перераб., испр. и доп. – М.: РИА “Новая волна”: Издатель Умеренков, 2008. – 1206 с.: ил.

**1. Department: Pharmacology, Pharmacotherapy and Clinical Pharmacology****2. Level of training: master****3. OP: "Pharmacy", scientific and pedagogical direction****4. Course: 1****5. Name of elective discipline: “Good Clinical Practice (GCP)”****6. Number of loans: 5****7. Purpose: to teach graduates of higher medical institutions in the Pharmacy EP the methodology for conducting clinical trials in accordance with international standards****8. Tasks:**

- teach clinical research methodologies in accordance with international standards;
- introduce ethical guidelines for research on volunteers;
- predict and evaluate the side effects of drugs in an experiment on volunteers.

9. Content of the discipline: GCP Standard (Good Clinical Practice - Good Clinical Practice) is an international standard for ethical standards and quality of scientific research that describes the rules for the development, conduct, documentation and reporting of studies that imply the participation of a person as a subject (clinical research) . The discipline shows the compliance of the study with this standard: the rights of participants in the study; rules to ensure their safety; desire to do no harm; reliability requirements for research.

10. Justification of the choice of discipline: The elective discipline "Good Clinical Practice (GCP)" is the final link in the chain of study of biomedical disciplines at the Faculty of Pharmacy. As an integrative subject, “Good Clinical Practice (GCP)” combines a number of logically related, harmoniously complementary disciplines: pharmacology, pharmacotherapy and evidence-based medicine.

11. Learning outcomes (competency):

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personalities and professional competencies (relationships)</b>
- methodologies for conducting clinical trials in accordance with international standards; - knows the features of the pharmacokinetics and	- participate in clinical trials in accordance with international standards; • introduce ethical guidelines for research on volunteers;	- Competent in predicting and evaluating side effects of drugs in an experiment on volunteers. - Competent in determining the causes and consequences of irrational use of drugs;

<p>pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient.</p> <ul style="list-style-type: none"> <li>- knows the risk factors and clinical manifestations of the main adverse reactions of drugs.</li> <li>- Knows methods for assessing the quality of life, basic principles of dosage of drugs depending on the pathological and physiological parameters of the body person.</li> <li>- methods for assessing the clinical efficacy and safety of drugs.</li> </ul>	<ul style="list-style-type: none"> <li>• predict and evaluate the side effects of drugs in an experiment on volunteers.</li> <li>- Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs;</li> <li>- Able to provide informational and advisory assistance to doctors in choosing dosage form of the drug, dose, frequency and duration of administration of the drug.</li> <li>- Able to use types of literature (educational, scientific, reference) and computer databases on clinical pharmacology and evidence-based medicine.</li> <li>- Is able to control and make a forecast of the risk of side effects of drugs;</li> <li>- Able to prevent and apply correction methods when they occur;</li> <li>- Able to apply clinical protocols for the diagnosis and treatment of diseases.</li> </ul>	<ul style="list-style-type: none"> <li>- understands the strengths and weaknesses of various strategies to improve drug use;</li> <li>- When doctors consult about the rational use of drugs.</li> <li>- Formulates the problems of rational use of medicines.</li> <li>- argues the formulary list based on treatment protocol.</li> </ul>
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12. Prerequisites: pharmacology, pharmacotherapy, pharmacokinetics, evidence-based medicine.

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.

6. Petrov VI Medicine, based on evidence: textbook. allowance / VI Petrov, SV Недогода.-; Пек. Educational-methodical unit. on med. and farm. education of Russian universities. - M.: GEOTAR- 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.-; Пек. 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:** organization and management of pharmaceutical business

**2. Level of education:** master's degree scientific and pedagogical

**3. Educational programme** M140-Pharmacy

**4. Course:** 1

**5. Name of the elective discipline: Good distribution practice**

**6. Number of credits:**4 credits

**7. Purpose:** Formation and consolidation of undergraduates' sustainable skills, knowledge in the field of drug treatment in conjunction with good distribution practice to comply with the norms, rules and basic principles of pharmaceutical activity.

**8. Discipline content:** Distribution is an activity related to the purchase, storage, supply or export of drugs, with the exception of retail sales, carried out jointly with manufacturers or holders of a registration certificate, importers, other distributors or jointly with business entities involved in the retail sale of drugs. The subject of study is the basics of good distribution practice, the organization of a rational process for promoting goods from manufacturers to consumers.

**9. Tasks:**

- build system knowledge of good distribution practices;
- provide systemic knowledge on the main provisions of international and national documents on pharmaceutical activities;
- teach graduate students to apply logistic approaches in the field of drug circulation

**10. Rationale for the choice of discipline:**

In modern conditions, it is not enough to develop a new effective drug, to establish its optimal price, it is still necessary to choose effective channels for the distribution of drugs from the place of manufacture to the places of their use at a specific time in order to meet the needs of the population and medical institutions in the provision of medicines. Distribution — activities related to the purchase, storage, supply or export of drugs, except for retail sales. This activity is carried out in conjunction with the manufacturers or owners of the registration certificate, importers, other distributors or together with business entities engaged in the retail sale of drugs.

**11.Learning outcomes**

Knowledge (the cognitive sphere)	Skills (psychomotor sphere)	Personal and professional competences (relations)
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<p>demonstrates developing knowledge and understanding of regulatory and legal documents, logistics approaches in the field of drug circulation, principles of good distribution practice, requirements for pharmaceutical personnel, self-inspection procedures for carrying out activities in the field of drug circulation.</p>	<p>analyzes distribution channels of goods, factors of consumption of medicines and MD, information about suppliers, customers, applying methods for estimating logistics costs and ways to optimize them in the distribution system of goods; organizes the acceptance of goods from the supplier, storage of medicines and medical devices on the basis of compliance with all operational procedures and their documentation. taking measures to prevent falsification of medicines, medical devices; develops a unified approach to organizing the process of wholesale sales of medicines and medical devices, determining the turnover in pharmaceutical organizations, building models for managing stocks, material flows, justifying the use of the product life cycle in the promotion of medicines and medical devices, methods for determining, analyzing and assessing risks for quality.</p>	<p>possesses the skills of public speaking with the presentation of their own judgments, analysis and synthesis of information, building partnerships, trusting relationships with colleagues and healthcare workers, demonstrating multiculturalism and openness in work; engages in professional growth by demonstrating introspection skills, teaching experience at the higher education level, searching information in databases, organizing information and using it to solve specific professional problems based on research methods, developing ideas and developing critical thinking and writing skills scientific works.</p>
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**12. Prerequisites:** Organizational Framework for Good Practices in Pharmacy (GXP)

**13. Postrequisites:** Management in pharmaceutical logistics

**14. Literature**

**Main:**

1. Management and economics of pharmacy [Text]: textbook / ed. I. A. Narkevich. - M.: GEOTAR - Media, 2017. - 928 p.
2. Arystanov, Zh. M. Management and economics of pharmacy textbook - Almaty: Evero, 2015.
3. Management and economics of pharmacy: textbook / ed. V. L. Bagirova. - M., 2008

**Additional:**

1. Collection of Legislative and regulatory legal acts regulating pharmaceutical activities in the Republic of Kazakhstan: collection / comp. B.K. Makhatov [et al.]. - Shymkent: Zhasulan, 2017. - 380 p.
2. Collection of legislative and normative legal acts regulating pharmaceutical activity in the Republic of Kazakhstan: collection / compilation. B.K. Makhatov [etc.]. - Shymkent: Zhasulan, 2017. - 327 pages.

3. Arystanov, Zh. M. Organization of pharmaceutical activities: textbook. - Almaty: Evero, 2015. - 608 p.

**Electronic resources:**

1. Electronic library "Student consultant". Access link: <http://www.studmedlib.ru>, LOGIN ibragim123, PASSWORD Libukma123

2. Website of the Library and Information Center of the Academy [lib.ukma.kz](http://lib.ukma.kz)

3. SKMA Media Library <https://media.skma.edu.kz/>

4. Digital library "Aknurpress" [www.aknurpress.kz](http://www.aknurpress.kz) register and enter the promo code SDH-28

5. SKMA Repository <http://lib.ukma.kz/repository/>

6. Electronic library of republican higher educational institutions <http://rmebrk.kz/>

7. Database of legal acts "Zan" <https://zan.kz/ru>

8. "Paragraph Medicine" information system <https://online.zakon.kz/Medicine/>

9. Code of the Republic of Kazakhstan dated July 7, 2020 No. 360-VI "On the health of the people and the healthcare system" (with amendments and additions). Ch. 2, art. 10; ch. 5, paragraph 3; ch. 27.28;

[https://online.zakon.kz/document/?doc\\_id=34464437](https://online.zakon.kz/document/?doc_id=34464437)

10. Order acting Minister of Health of the Republic of Kazakhstan dated February 4, 2021 No. ҚРДЦМ-15. "On Approval of Good Pharmaceutical Practices"

<https://adilet.zan.kz/rus/docs/V2100022167#z13>

11. Order of the Minister of Health of the Republic of Kazakhstan dated February 16, 2021 No. KR DSM-19 "On approval of the rules for the storage and transportation of medicines and medical devices"

<https://adilet.zan.kz/rus/docs/V2100022230#z7>

12. Order of the Minister of Health of the Republic of Kazakhstan dated September 17, 2020 No. ҚРДЦМ-104/2020

On approval of the Rules for the wholesale and retail sale of medicines and medical devices.

<https://adilet.zan.kz/rus/docs/V2000021229#z129>

**1. Department** of organization and management of pharmaceutical business

**2. Level of education:** master's degree scientific and pedagogical

**3. Educational programme:** M142 pharmacy

**4. Course:** 1

**5. The name of the elective discipline: Human resources and financial management**

**6. Number of credits:** 4 credits

**7. Purpose:** Formation of undergraduates knowledge in the field of financial management for decision-making to ensure the most efficient movement of financial resources between the pharmaceutical company and its sources of financing, mastering the skills and practical skills of effective personnel management of pharmaceutical organizations.

**8. Content discipline:** Management acts as a system of program-targeted management, planning, forecasting of scientific developments, organization of production, implementation of products and services based on innovations in order to increase economic efficiency, meet the needs of the market and society as a whole, and increase profits. Special attention is paid to the characteristics and use of the potential of financial management as the main tool for the development of a pharmaceutical enterprise

**9. Tasks:**

- to form knowledge about the principles, methods and functions of personnel management, mechanisms for building a personnel management system in a pharmaceutical organization;
- the formation of skills for the analysis and optimization of personnel management practices in pharmaceutical organizations;
- build knowledge on the theoretical foundations of financial management;
- give an idea of the financial environment of entrepreneurship, financial planning at enterprises and information support of financial management;



- build knowledge about risk assessment methods and methodological foundations of financial decision making.

#### **10. Rationale for the choice of discipline:**

The market is characterized by a constant desire to improve production efficiency, requires constant adjustments to the goals and planned programs of the company, depending on the state of the market. This requires a special management system that takes into account the priorities and specifics of Kazakhstan. It is impossible to achieve success in the market without effective and purposeful management of all processes, including in the financial field. Today, management acts as a system of program and target management, current and future planning, forecasting of scientific developments, organization of production, sales of products and services on the basis of constant innovations in order to improve the efficiency of management, meet the needs of the market and society as a whole, increase profits.

#### **11. Learning outcomes**

Knowledge (the cognitive sphere)	Skills (psychomotor sphere)	Personal and professional competences (relations)
demonstrates developing knowledge and understanding of pharmaceutical business management methods, business management development trends in the national economy, and financial management mechanisms.	develops the overall and financial strategy of the organization, using the tools of strategic and financial management; owns the methods of making strategic, tactical and operational decisions in the personnel management of pharmaceutical organizations; analyzes the main directions and methods of personnel management, the influence of various factors on the business environment, the interaction of financial policy, the financial system and financial management, developing personnel management technologies.	possesses the skills of public speaking with the presentation of their own judgments, analysis and synthesis of information, building partnerships, trusting relationships with colleagues and healthcare workers, demonstrating multiculturalism and openness in work; engages in professional development by demonstrating introspective skills, teaching experience at the higher education level, searching information in databases, organizing information and using it to solve specific professional problems, using research methods, developing ideas, developing critical thinking and writing skills scientific works.

**12. Prerequisites:** management and economics of pharmacy.

**13. Postrequisites:** management and marketing at pharmaceutical enterprises

#### **14. Literature**

##### **Main:**

1. Arystanov, Zh. M. Management and marketing in pharmacy: textbook / Zh. M. Arystanov, A. T. Tokseitova. - Almaty: Evero, 2016. - 532 p.
2. Blinova, O. V. Pharmaceutical management: textbook / O. V. Blinova; Ministry of Health of the Republic of Kazakhstan; SKPhA. - Shymkent: Zhasulan, 2013. - 165 p.
3. Shopabayeva, A. R. Accounting and reporting system in pharmacy organizations of the Republic of Kazakhstan [Matin]: textbook. / A. R. Shopabaeva, A. S. Nemchenko, S. V. Khimenko. - Almaty: IP Publishing House "Aknur", 2014. - 72 p.

##### **Additional:**

1. Shertaeva K.D. Pharmaceutical economics: textbook; Ministry of Health and Social Development of the Republic of Kazakhstan. SKMPHA. - Shymkent: [p. i.], 2016. - 211p. S.

2. Arystanov, Zh. M. Basics of management in the field of pharmacy: workshop / Zh. M. Arystanov. - The book was approved by the Central Methodological Council of SKSMA. - Almaty: Evero, 2012. - 156 pages.
3. Collection of legislative and normative legal acts regulating pharmaceutical activity in the Republic of Kazakhstan: collection / compilation. B. K. Makhatov [etc.]. - Shymkent: Zhasulan, 2017. - 327 pages.

**Electronic resources:**

1. Electronic library "Student consultant". Access link: <http://www.studmedlib.ru>, LOGIN ibragim123, PASSWORD Libukma123
2. Website of the Library and Information Center of the Academy [lib.ukma.kz](http://lib.ukma.kz)
3. SKMA Media Library <https://media.skma.edu.kz/>
4. Digital library "Aknurpress" [www.agnurpress.kz](http://www.agnurpress.kz) register and enter the promo code SDH-28
5. SKMA Repository <http://lib.ukma.kz/repository/>
6. Electronic library of republican higher educational institutions <http://rmebrk.kz/>
7. Database of normative legal acts "Law" <https://zan.kz/ru>
8. "Paragraph Medicine" information system <https://online.zakon.kz/Medicine/>
9. Code of the Republic of Kazakhstan dated July 7, 2020 No. 360-VI "On the health of the people and the healthcare system" (with amendments and additions). Ch. 2, art. 10; ch. 5, paragraph 3; ch. 27.28;  
[https://online.zakon.kz/document/?doc\\_id=34464437](https://online.zakon.kz/document/?doc_id=34464437)
10. Order of the Minister of Health of the Republic of Kazakhstan No. ҚРДЦМ-305/2020 dated December 21, 2020 "On approval of the nomenclature of specialties and specializations in the field of healthcare, the nomenclature and qualification characteristics of positions of health workers".  
<https://adilet.zan.kz/rus/docs/V2000021856>
11. Order of the Minister of Health of the Republic of Kazakhstan dated September 17, 2020 No. ҚРДЦМ-104/2020  
On Approval of the Rules for Wholesale and Retail Sales of Medicinal funds and medical products.  
<https://adilet.zan.kz/rus/docs/V2000021229#z129>
12. About making changes to the order. Minister of Health of the Republic of Kazakhstan dated April 19, 2019 No. KR DSM-42 "On approval of the Rules for regulating prices for medicines"  
[https://online.zakon.kz/document/?doc\\_id=34490056](https://online.zakon.kz/document/?doc_id=34490056)
13. Order of the Minister of Health of the Republic of Kazakhstan dated December 11, 2020 No. ҚР DSM-249/2020. On the approval of the rules for assessing the knowledge and skills of students, assessing the professional preparedness of graduates of educational programs in the field of health and health professionals <https://adilet.zan.kz/rus/docs/V2000021763>

**1.Department** of organization and management of pharmaceutical business

**2. Level of education:** master's degree scientific and pedagogical

**3.Educational programme:** M142 pharmacy

**4. Course:** 1

**5. Name of elective discipline:** Applied Pharmacoeconomics

**6. Number of credits:**3 credits

**7. Purpose:**the Formation of undergraduates knowledge to determine the economic efficiency of specific treatment schemes, disease prevention to solve problems to ensure the rational use of medicines.

**8.Content of the discipline:** The objects of study of the discipline are the safety and effectiveness of medical interventions, as well as the economic costs of their implementation. The subject of the discipline is economic evaluation in the healthcare system and pharmacy for the analysis of alternative methods of treatment. The main objective of the discipline is to search for new approaches to optimization and rationalization of drug therapy and to conduct a scientifically based assessment of the effectiveness and cost characteristics of treatment.

**9. Tasks:**

- form an understanding of the methods for analyzing the effectiveness and quality of the use of drugs in the treatment of specific diseases;
- teach to scientifically substantiate the choice of drugs;
- develop skills in developing interrelated assessments of quality indicators and economic characteristics.

**10. Rationale for the choice of discipline:**

The constantly increasing range of medicines on the pharmaceutical market and the limited funds allocated by the state for health care have necessitated the rational distribution of medicines. In this regard, along with information on the therapeutic efficacy and safety of drugs, the main treatment regimens for common diseases require knowledge and, in economic evaluation, drug therapy, which provides the discipline "Pharmacoeconomics".

**11. Learning outcomes**

Knowledge (comitiva sphere)	Skills (psychomotor sphere)	Personal and professional competences (relations)
demonstrates developing knowledge and understanding of the distinctive features of pharmacoeconomics, the problems of increasing costs for the provision of medical and pharmaceutical care; a systematic approach to the analysis and critical perception of medical information and innovations; stages of evaluation of the therapeutic efficacy of a medicinal product	analyzes the sources of information, the main factors affecting the cost of treatment, the cost structure in pharmacoeconomics, conducting a retrospective analysis of the results of clinical trials; makes a choice of methods of clinical and economic research, applying the methods of pharmacoeconomic and pharmacoepidemiological analyzes in scientific research, using the methodology of studying the actual consumption of medicines based on the established daily dose; develops approaches to the use of biostatistics and modeling methods in conducting pharmacoeconomic studies, the main parameters for evaluating drugs and treatment methods.	possesses the skills of public speaking with the presentation of their own judgments, analysis and synthesis of information, building partnerships, trusting relationships with colleagues and healthcare workers, demonstrating multiculturalism and openness in work; engages in professional growth by demonstrating self-reflection skills, teaching experience at the tertiary level, searching for information, using systematic review, meta-analysis, Cochrane systematic reviews to solve specific professional problems, developing ideas and developing critical thinking and skills in scientific writing .

**12. Prerequisites:** management and economics of pharmacy, pharmacology, pharmacotherapy.

**13. Postrequisites:** management in pharmaceutical logistics

**14. Literature**

Main:

1. Management and economics of pharmacy [Text]: textbook / ed. I. A. Narkevich. - M.: GEOTAR - Media, 2017. - 928 p.
2. Shopabayeva, A. R. Pharmacoeconomics: textbook / A. R. Shopabayeva, N. A. Chebotarenko, S. V. Khimenko; Ministry of Health and Social Development of the Republic of Kazakhstan. - Karaganda: AKHYIP, 2016. - 146 p.
3. Shertaeva, K. D. Basics of pharmacoeconomics: textbook / K. D. Shertaeva, Zh. K. Shimirova, O. V. Blinova; Ministry of Social Development and Health Care of the Republic of Kazakhstan. SKSPhA. - Shymkent: SKSPhA, 2015. - 136 pages

4. Shertaeva, K. D. Basis of pharmacoeconomics: textbook / K. D. Shertaeva, O. V. Blinova, J. K. Shimirova; Ministry of Health and Social Development of the Republic of Kazakhstan. SKSPhA. - Shymkent: SKSPhA, 2015. - 143 p

**Additional:**

1. Pharmacoeconomics: educational tool / A. R. Shopabaeva [s/b.]. - Almaty: AKNUR, 2016. - 194 pages. S
2. Introduction to pharmacoeconomics [Text]: textbook / I. R. Kulmagambetov [and others]. - Astana: LLP "Berkut-Print", 2011. - 100 p.

**Electronic resources**

1. Shertaeva, K. D. Fundamentals of pharmacoeconomics [Electronic resource]: textbook / K. D. Shertaeva, Zh. K. Shimirova, O. V. Blinova; Ministry of Social Development and Health Care of the Republic of Kazakhstan. - Electron. from the text. - Shymkent: SKSPhA, 2015. - 1.36 Mb + el. Opt. disc (CD ROM).
2. Shertaeva, K. D. Fundamentals of pharmacoeconomics [Electronic resource]: textbook / K. D. Shertaeva, O. V. Blinova, Zh. K. Shimirova; Ministry of Health and Social Development of the Republic of Kazakhstan. - Electron. text data. - Shymkent: SKMPhA, 2015. - 1.98 Mb + email. opt. disc (CD ROM).
3. EMCD is posted on the educational portal ukma.kz
4. Electronic library "Student consultant". Access link: <http://www.studmedlib.ru>, LOGIN ibragim123, PASSWORD Libukma123
5. Website of the Library and Information Center of the Academy [lib.ukma.kz](http://lib.ukma.kz)
6. SKMA Media Library <https://media.skma.edu.kz/>
7. Digital library "Aknurpress" [www.agnurpress.kz](http://www.agnurpress.kz) register and enter the promo code SDH-28
8. SKMA Repository <http://lib.ukma.kz/repository/>
9. Electronic library of republican higher educational institutions <http://rmebrk.kz/>
10. Database of normative legal acts "Law" <https://zan.kz/ru>
11. "ParagraphMedicine" informationsystem <https://online.zakon.kz/Medicine/>
12. Code of the Republic of Kazakhstan dated July 7, 2020 No. 360-VI "On the health of the people and the healthcare system" (with amendments and additions). Ch. 2, art. 10; ch. 5, paragraph 3; ch. 27.28; [https://online.zakon.kz/document/?doc\\_id=34464437](https://online.zakon.kz/document/?doc_id=34464437)
13. Order acting Minister of Health of the Republic of Kazakhstan dated February 4, 2021 No. ҚРДЦМ-15. "On Approval of Good Pharmaceutical Practices" <https://adilet.zan.kz/rus/docs/V2100022167#z13>
14. Order of the Minister of Health of the Republic of Kazakhstan dated December 8, 2017 No. 931 as amended by the order dated April 21, 2020 No. ҚРДЦМ-40/2020 On approval of the Kazakhstan national medicinal formulary

1. **The department of Pharmacognosy**

2. **Level of training (magistracy)**

3. **Specialty: 6M110400 «Pharmacy»**

4. **Course: 2 (scientifically-pedagogical direction)**

5. **Name of elective discipline: «Standardization and quality control of the crushed medicinal plant raw materials and the packed-up products»**

6. **Amount of credits: 3**

1. **Purposes:** Acquaintance of undergraduates with herbs which are applied in traditional medicine, the organization of preparations of medicinal plant raw materials, the chemical composition and classification of herbs, bases of rational environmental management, methods of procuring process of medicinal plant raw materials and its standardization and also with the main directions of scientific research in the field of studying of herbs.

2. **Tasks:** - orientation in properties and the chemical composition of herbs according to constantly growing demand in quality phytoproducts and medicinal plant raw materials;

- orientation in properties and the chemical composition of the products of animal and mineral origin which are widely used in a modern arsenal the therapeutic of medicines;
- carrying out phytochemical and merchandising analysis of raw materials of natural origin.

**9. Justification of the choice of discipline:**

Standardization and quality control of the crushed medicinal plant raw materials and the finished packed-up goods – takes special place in the system of training of specialists with pharmaceutical education. Some of such means after test them in clinics found application in modern medicine and received from herbs take the important place.

Considering the increased requirements of practical pharmacy and medicine to use of medicinal raw materials in traditional medicine, the subject "Herbs in Traditional Medicine" considers a circle of the questions connected with preparation of medicinal plant raw materials, rational and careful attitude to resources of herbs, sources of raw materials of mineral and animal origin, processing of plant raw materials and their application in medicine.

**10. Results of training (competence):**

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personal and professional competences (relations)</b>
<ul style="list-style-type: none"> <li>- Shows knowledge of the basic concepts of herbs in traditional medicine, a subject and its value for practical activities of the expert of pharmacy</li> <li>- Knows difference between botanical, pharmacognostic and merchandising characteristic of plants.</li> <li>- Considering the increased requirements of practical pharmacy and medicine to use of medicinal raw materials in traditional medicine, the subject "Herbs in Traditional Medicine" considers a circle of the questions connected with preparation of medicinal plant raw materials, rational and careful attitude to resources of herbs, sources of raw materials of mineral and animal origin, processing of plant raw materials and their application in medicine.</li> <li>- Shows knowledge of herbs in traditional medicine takes special place in the system of training of specialists with pharmaceutical education after the higher education as traditional medicine and national remedies always drew</li> </ul>	<ul style="list-style-type: none"> <li>- Shows knowledge of the legislation of RK in the field of health care, the international standards, their structure and other specifications and technical documentation regulating quality, rules of preparation, acceptance, the requirement to terms and storage conditions of medicinal plant raw materials, a basis of a legal system of Kazakhstan, etc.</li> <li>- Carries out search and information processing about medicinal plant raw materials for consultation of doctors, druggists, the population concerning their preparation, application and storage;</li> <li>- Imparts to students own knowledge and abilities of work with information (educational, help, scientific) in the field of standardization of herbs</li> </ul>	<ul style="list-style-type: none"> <li>- Shows knowledge of the legislation of RK in the field of health care, the international standards, their structure and other specifications and technical documentation regulating quality, rules of preparation, acceptance, the requirement to terms and storage conditions of medicinal plant raw materials, a basis of a legal system of Kazakhstan, etc.</li> <li>- Carries out search and information processing about medicinal plant raw materials for consultation of doctors, druggists, the population concerning their preparation, application and storage;</li> <li>- Imparts to students own knowledge and abilities of work with information (educational, help, scientific) in the field of standardization of medicinal plant raw materials and the packed-up products</li> </ul>

<p>attention of doctors and researchers.</p> <p>- Some of such means after test them in clinics found application in modern medicine and received from herbs take the important place.</p> <p>- Knows the BAS main groups of natural origin and their physical and chemical properties, the main ways of biosynthesis, methods of allocation, cleaning, the qualitative and quantitative analysis of active ingredients of medicinal plant raw materials</p>		
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**11. Prerequisites: bachelor degree**

**12. Post-details: doctorate**

**13. Literature**

**The main:**

1. Лекарственное сырье растительного и животного происхождения. Фармакогнозия / Под ред. Г.П. Яковлева. – СПб.: СпецЛит, 2006. – 845 с.: ил.
2. Муравьева Д.А., Самылина И.А., Яковлев Г.П. Фармакогнозия. Учебник. – 4-е изд., перераб. и доп. – М.: ОАО Издательство «Медицина», 2007. – 656 с.: ил.
3. Руководство к практическим занятиям по фармакогнозии: Учебное пособие / Под ред. И.А. Самылиной, А.А. Сорокиной. – М.: ООО «Мед. информационное агентство», 2007. – 672 с.
4. Самылина И.А., Аносова О.Г. Фармакогнозия: учебное пособие: Атлас в 2 т. – М., 2007. – Т.1. – 192 с.; Т.2. – 384 с.
5. Самылина И.А., Ермакова В.А., Бобкова Н.В., Потанина О.Г. Фармакогнозия: учебное пособие: Атлас. – Т.3. – М., 2009. – 488 с.

**Additional:**

1. Головкин Б.Н., Руденская Р.Н., Трофимова И.А., Шретер А.И. Биологически активные вещества растительного происхождения. – М.: Наука, 2001. – 240 с.
2. Государственная фармакопея Республики Казахстан. Т.1. – Алматы: Издательский дом «Жибек жолы», 2008. – 592 с.
3. Машковский М.Д. Лекарственные средства. – 15-е изд., перераб., испр. и доп. – М.: РИА «Новая волна»: Издатель Умеренков, 2008. – 1206 с.: ил.

**1. Department: Pharmacology, Pharmacotherapy and Clinical Pharmacology**

**2. Level of training: master**

**3. OP: "Pharmacy", scientific and pedagogical direction**

**4. Course: 2**

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

**6. Number of loans: 5**

**7. Purpose: to teach undergraduates at the Pharmacy Foundation to conduct an examination of the rationality of pharmacotherapy of various diseases in their practical activities, taking into account the optimization of resources and funds 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 pharmaceutical faculty. As an integrative subject, “Clinical and Economic Expertise in Clinical Practice” combines a number of logically related, harmoniously complementary disciplines: pharmacology, pharmacotherapy, public health and evidence-based medicine.

11. Learning outcomes (competency):

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personalities and professional competencies (relationships)</b>
<ul style="list-style-type: none"> <li>- Knows the features of the pharmacokinetics and pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient</li> <li>- Knows risk factors and clinical manifestations of major adverse drug reactions.</li> <li>- 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.</li> <li>- Knows the main types of drug interactions.</li> <li>- Knows methods for assessing the clinical efficacy and safety of drugs, and methods of working with doctors to increase their knowledge of personalized medicine;</li> <li>- Knows about the tasks, place, methodology, achievements and problems of pharmaco-genetics and pharmaco-genomics.</li> </ul>	<ul style="list-style-type: none"> <li>- 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;</li> <li>- Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs;</li> <li>- Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration.</li> <li>- Able to use types of literature (educational, scientific, reference) and computer databases on clinical pharmacology and evidence-based medicine.</li> <li>- Is able to control and make a forecast of the risk of side effects of drugs;</li> <li>- Able to prevent and apply correction methods when they occur;</li> <li>- Able to apply clinical protocols for diagnosis and treatment of diseases;</li> <li>- Able to independently acquire new knowledge in this</li> </ul>	<ul style="list-style-type: none"> <li>- Competent in determining the causes and consequences of irrational use of drugs;</li> <li>- Understands the strengths and weaknesses of various strategies to improve drug use;</li> <li>- Advises doctors on the rational use of drugs.</li> <li>- Consult doctors and patients;</li> <li>- Formulates the problems of rational use of medicines.</li> <li>- Arguments the formulary list based on the protocol of treatment;</li> <li>- Understands the essence and internal nature of pharmacogenetics and the main pharmacokinetic processes that determine the possibility of population analysis;</li> </ul>

	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;	
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12. Prerequisites: pharmacology, clinical pharmacology, public health and evidence-based medicine.

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. - M. : 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.-; Рек. 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** of organization and management of pharmaceutical business

**2. Level of education:** master's degree scientific and pedagogical

**3. Educational programme:** M142 -pharmacy

**4. Course:** 2



**5. The name of the elective discipline: Management in pharmaceutical logistics**

**6. Number of credits:** 4 credits

**7. Purpose:** formation of undergraduates ' system knowledge and understanding of the conceptual foundations of logistics and the acquisition of skills in modern methods of management of material and other flows in modern conditions.

**8.The content of the discipline:** One of the new directions in the management strategy is the use of effective logistics systems at various levels of pharmaceutical organizations. The subject of management in pharmaceutical logistics are all processes associated with changing the parameters of placement, timing, movement, form of flows in the logistics chain (pharmaceutical company - distributor - pharmacy).

**9. Tasks:**

-acquisition of deep theoretical knowledge on the concept, strategy and tactics of logistics by undergraduates;

-master's degree students mastering methodological tools for development and implementation of logistics tasks;

- mastering the skills of logical thinking and development of proposals for improvement of logistics systems and mechanisms of their functioning;

-acquisition of skills to assess the economic efficiency and consequences of the implementation of logistics solutions;

-to teach undergraduates to apply logistics approaches in the field of circulation of medicines.

**10.Rationale for the choice of discipline:**

In the field of circulation of medicines, it is possible to identify the way of movement of pharmaceutical products, ranging from the production of raw materials, substances or cultivation of medicinal plants to the purchase of a drug by the end user. Logistics is a part of economic science and the field of activity, the subject of which is to organize a rational process of promotion of goods and services from producers to consumers, the functioning of the sphere of circulation of products, goods and services, inventory management, creating an infrastructure for commodity circulation. From the position of the organization's management, logistics can be considered as a strategic management of material flows in the process of procurement, supply, transportation, sale and storage of raw materials and finished goods. Pharmaceutical logistics is one of the most complex, from procurement logistics to distribution logistics.

**11.Learning outcomes**

Knowledge (the cognitive sphere)	Skills (psychomotor sphere)	Personal and professional competences (relations)
demonstrates developing knowledge and understanding of the population drug supply management system in the Republic of Kazakhstan, methods for analyzing the assortment and distribution of pharmaceutical products, and logistical approaches to managing material flows.	develops methodological tools for the implementation of logistics tasks, organizing all types of logistics activities in the field of drug circulation; owns the methods of making strategic, tactical and operational decisions in the management of material flows of pharmaceutical organizations; analyzes the integrative qualities of logistics systems, logistics costs, information flow model, information elements that	owns the skills of public speaking with the presentation of their own judgments, analysis and synthesis of information, building partnerships, trusting relationships with colleagues and healthcare workers. demonstrating multiculturalism and openness in work; engages in professional growth by demonstrating introspective skills, teaching experience at the higher education level, systematizing information

	create the basis for information control, prices and transportation costs, needs and calculations of the quantity of purchased medicines, intermediaries in distribution channels, inventory structure.	and using it to solve specific professional problems, developing ideas and developing critical thinking and writing skills in scientific writing.
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**12. Prerequisites:** Good Distribution Practice.

**13. Postrequisites:** professional activity

**14.Literature**

**Main:**

1. Management and economics of pharmacy [Text]: textbook / ed. I. A. Narkevich. - M. : GEOTAR - Media, 2017. - 928 p.
2. Arystanov, Zh. M. Management and economics of pharmacy textbook - Almaty: Evero, 2015
3. Management and economics of pharmacy: textbook / ed. V. L. Bagirova. - M., 2008

**Additional:**

1. Murphy, P.R.Modern logistics: textbook / P.R.Murphy, A.M.Knemeyer;English language.aud.I.Baymuratova, K.M.Torekhanova.- 11th head.- Almaty: Davir, 2017. - 176 p.s
2. Entrepreneurship organization: textbook / K.N.Orazbaeva [y.p].- ;Atyrau Oil and Gas Ing.recommended by the council.- Almaty: Evero, 2010. - 204 pages.

**Electronic resource**

1. EMCD is posted on the educational portal ukma.kz
2. Electronic library "Student consultant". Access link: <http://www.studmedlib.ru>, LOGIN ibragim123, PASSWORD Libukma123
3. Website of the Library and Information Center of the Academy [lib.ukma.kz](http://lib.ukma.kz)
4. SKMA Media Library <https://media.skma.edu.kz/>
5. Digital library "Aknurpress" [www.aknurpress.kz](http://www.aknurpress.kz) register and enter the promo code SDH-28
6. SKMA Repository <http://lib.ukma.kz/repository/>
7. Electronic library of republican higher educational institutions <http://rmebrk.kz/>
8. Database of legal acts "Zan" <https://zan.kz/ru>
9. "Paragraph Medicine" information system <https://online.zakon.kz/Medicine/>
10. Code of the Republic of Kazakhstan dated July 7, 2020 No. 360-VI "On the health of the people and the healthcare system" (with amendments and additions). Ch. 2, art. 10; ch. 5, paragraph 3; ch. 27.28;  
[https://online.zakon.kz/document/?doc\\_id=34464437](https://online.zakon.kz/document/?doc_id=34464437)
11. Order acting Minister of Health of the Republic of Kazakhstan dated February 4, 2021 No. ҚРДСМ-15. "On Approval of Good Pharmaceutical Practices"  
<https://adilet.zan.kz/rus/docs/V2100022167#z13>
12. Order of the Minister of Health of the Republic of Kazakhstan dated February 16, 2021 No. KR DSM-19 "On approval of the rules for the storage and transportation of medicines and medical devices"

<https://adilet.zan.kz/rus/docs/V2100022230#z7>

13. Order of the Minister of Health of the Republic of Kazakhstan dated September 17, 2020 No. ҚРДЦМ-104/2020

14. On approval of the Rules for the wholesale and retail sale of medicines and medical devices.  
<https://adilet.zan.kz/rus/docs/V2000021229#z129>

15. About making changes to the order. Minister of Health of the Republic of Kazakhstan dated April 19, 2019 No. KR DSM-42 "On approval of the Rules for regulating prices for medicines"  
[https://online.zakon.kz/document/?doc\\_id=34490056](https://online.zakon.kz/document/?doc_id=34490056)

**1.Department** of organization and management of pharmaceutical business

**2. Level of education:** master's degree scientific and pedagogical

**3.Educational programme:** M142 -pharmacy

**4. Course:** 2

**5. Name of elective discipline: Management consulting**

**6. Number of credits:**4 credits

**7. Purpose:** formation of knowledge, skills and abilities of undergraduates in the organization of management consulting the use of specific tools and methods to ensure optimal results of consulting services in the organizational diagnosis of pharmaceutical organizations.

**8.The content of the discipline:** The head of the enterprise expects the consultant to receive expert opinions on specific solutions or situations, discuss their problems and the opportunity to learn from the consultant certain professional knowledge and skills. Management consulting includes the field of activity in transferring the experience of successful leaders to young employees, in training specialists in conducting research work on the problems of the functioning and development of organizations.

**9. Tasks:**

- provide systemic knowledge and develop skills in the application of specific tools, methods of organizing management consulting in organizational diagnostics of pharmaceutical organizations.
- to develop skills in organizing and conducting professional and managerial consulting in the management of pharmaceutical personnel and in applying tools and methods for organizing management consulting and organizational diagnostics of pharmaceutical organizations.

**10.Rationale for the choice of discipline:**

Management consulting, as a discipline, includes a very important and rapidly developing field of activity to transfer the experience of successful managers to young employees, in training specialists in conducting research on the functioning and development of organizations. The condition for the success of the development of modern pharmaceutical business is the ability to outpace the needs of the market of pharmaceutical products and services. In these circumstances, the need for management consulting increases, especially when the management capacity of a pharmaceutical organization is insufficient to solve the existing problems.

**11.Learning outcomes**

Knowledge (the cognitive sphere)	Skills (psychomotor sphere)	Personal and professional competences (relations)
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demonstrates developing knowledge and understanding of the system of management methods, forms of agreements, consulting process, specific tools of management consulting services for carrying out activities in the field of drug circulation.	conducts organizational diagnostics of a pharmaceutical enterprise using modern methods of analysis, collecting and processing information using computer technology; owns the methods of consulting, defining the criteria for the effectiveness of the work of a consulting organization; uses the matrix of organizational problems to identify the strengths and weaknesses of the organization, analyzing the organization's problems, test results, developing the contract structure, consulting model, methodological tools, business games and trainings.	owns the skills of public speaking with the presentation of their own judgments, analysis and synthesis of information, building partnerships, trusting relationships with colleagues and healthcare workers. demonstrating multiculturalism and openness in work; engages in professional growth by demonstrating introspective skills, teaching experience at the higher education level, systematizing information and using it to solve specific professional problems, developing ideas and developing critical thinking and writing skills in scientific writing.
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**12. Prerequisites:** management and marketing at pharmaceutical enterprises, personnel and financial management.

**13. Postrequisites:** professional activity.

#### **14.Literature**

Main:

1. Management and economics of pharmacy [Text]: textbook / ed. I. A. Narkevich. - M.: GEOTAR - Media, 2017. - 928 p.
2. Arystanov, Zh. M. Management and economics of pharmacy textbook - Almaty: Evero, 2015.
3. Shertaeva, K.D.Pharmaceutical consultation: textbook / K.D.Shertaeva, K.J.Mamytbaeva, G.J.Umurzakhova;Ministry of Health of the Republic of Kazakhstan;SKMPhA.- Shymkent: Zhasulan, 2013. - 96 pages.
4. Shertaeva K. D. Pharmaceutical consulting: textbook. / K. D. Shertaeva, G. Zh. Umurzakova, K. Zh. Mamytbaeva; Ministry of Health of the Republic of Kazakhstan; SKMPhA. - Shymkent: Zhasulan, 2013. - 81 p.

#### **Additional:**

1. Collection of Legislative and regulatory legal acts regulating pharmaceutical activities in the Republic of Kazakhstan: collection / comp. B.K. Makhatov [etc.]. - Shymkent: Zhasulan, 2017. - 380 p.

Electronic resource

1. Shertaeva, K. D. Fundamentals of pharmaceutical law [Electronic resource]: textbook = / K. D. Shertaeva, G. I. Utegenova. - Electron. text data. (463 KB). - Shymkent: SKMA, 2018. - 230 p. email opt. disk (CD-ROM)
2. EMCD is posted on the educational portal ukma.kz
3. Electronic library "Student consultant". Access link: <http://www.studmedlib.ru>, LOGIN ibragim123, PASSWORD Libukma123
4. Website of the Library and Information Center of the Academy [lib.ukma.kz](http://lib.ukma.kz)
5. SKMA Media Library <https://media.skma.edu.kz/>

6. Digital library "Aknurpress" [www.aknurpress.kz](http://www.aknurpress.kz) register and enter the promo code SDH-28
7. SKMA Repository <http://lib.ukma.kz/repository/>
8. Electronic library of republican higher educational institutions <http://rmebrk.kz/>
9. Database of normative legal acts "Law" <https://zan.kz/ru>
10. "Paragraph Medicine" information system <https://online.zakon.kz/Medicine/>
11. Code of the Republic of Kazakhstan dated July 7, 2020 No. 360-VI "On the health of the people and the healthcare system" (with amendments and additions). Ch. 2, art. 10; ch. 5, paragraph 3; ch. 27.28;  
[https://online.zakon.kz/document/?doc\\_id=34464437](https://online.zakon.kz/document/?doc_id=34464437)

**1. Department** of organization and management of pharmaceutical business

**2. Level of education:** master's degree scientific and pedagogical

**3. Educational programme:** M142-pharmacy

**4. Course:** 2

**5. Name of elective discipline:** **Organizational behavior in pharmaceutical enterprises**

**6. Number of credits:** 4 credits

**7. Purpose:** Formation and consolidation of undergraduate's in-depth knowledge and skills necessary for effective professional communication with patients and colleagues in various situations; training of qualified managers who are able to make effective decisions in the field of organizational behavior management.

**8. The content of the discipline:** Communicative competence is necessary for a master's student to successfully interact with colleagues and work effectively in a team of healthcare professionals. Communicative competence requires constant development of communication skills and continuous improvement of acquired skills in the process of further education and professional activity. The object of study is the types of communication used in professional activities and aimed at ensuring effective interaction with the consumer of pharmaceutical services.

**9. Tasks:**

- to form knowledge on the basic theories of human behavior in an organization;
- give an idea of the life stages and cycles of organizations;
- to form systemic knowledge according to the principles of building organizational structures;
- master the basic principles of behavior management in the organization;
- give an idea of the psychology of relationships in the organization;
- study the personality characteristics of leaders and basic leadership theories;
- form an idea of staff motivation in the framework of organizational behavior;
- provide systemic knowledge on innovation management in the organization.

**10. Rationale for the choice of discipline:**

Stable organizational culture, strong management staff create a specific advantage over other firms, bringing additional profits. Organizational behavior is a subject that arose at the intersection of many disciplines: sociology, psychology, organization theory, personnel management, physiology of labor, scientific organization of labor. The reason for their Association was the increased and selective interest of specialists in the field of organizational behavior to the manifestations of the qualities of human activity at all levels of the organization. The program of the discipline "Communication skills" is aimed at studying the basic principles of effective communication of the pharmacist with colleagues, patients, their families, which contributes to the patient's understanding of the prescribed treatment.

**11. Learning outcomes**

Knowledge (comitiva sphere)	Skills (psychomotor sphere)	Personal and professional competences (relations)
demonstrates developing and knowledge and	analyzes interpersonal, group and organizational	searches for information in databases, systematizing,

<p>understanding of the basic principles of communication and the communicative process, the theory of human behavior in an organization, models of the motivational process, models of the life cycle of an organization, types of organizational management structures, strategic planning.</p>	<p>communications, organization development models and corporate culture models, factors influencing the organizational management structure (OMS), non-verbal behavior, informal relations in pharmacy organizations; owns the methods of personality research and methods of making effective decisions in the field of organizational behavior management, evaluating the consequences of organizational and managerial decisions.</p>	<p>analyzing information and using it to solve specific professional problems and when writing scientific papers; possesses the skills of public speaking with the presentation of their own judgments, using organization management tools, the methodology of psychological research for effective communication of a pharmacist with pharmacy patients, colleagues, healthcare workers; engages in professional growth by demonstrating introspective skills, teaching experience at the higher education level.</p>
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**12. Prerequisites:** management and marketing at pharmaceutical enterprises.

**13. Postrequisites:** professional activity.

#### **14. Literature**

Main:

1. Asimova, T. A. Bioethics: textbook /. - Almaty: AKHYIP, 2017. - 240 p.
2. Dathaev, U.M. Communicative skills: textbook / - Almaty: Evero, 2016. - 260 pages.S.
3. Molotov-Luchansky, V. B. Communication skills: textbook. - Almaty: Evero, 2014. - 138 p.
4. Shertaeva, K.D. Communication skills in the field of pharmacy: textbook - Shymkent: Zhasulan, 2013. - 72 pages
5. Urkunchiev, E.M. Industrial management [Text]: educational tool / E.M.Urkunchiev, A.M.Zhusanbayev; Ministry of Education of the Republic of Kazakhstan; M.Kh. Balance named after Dulati. university;- M. to the press. Kh. Balance named after Dulati. recommended by the Scientific Council of the Univ.- Almaty: Evero, 2013. - 160 pages.S

#### **Additional:**

1. Communication skills: directory / L.L.Macievskaya [and others].- Almaty: Evero, 2014. - 118 pages.s.
2. Arystanov, Zh. M. Management and economics of pharmacy: textbook / Zh. M. Arystanov. - Almaty: Evero, 2015. - 728 p.
3. Arystanov, Zh. M. Fundamentals of management ethics in pharmacy - communication skills: textbook. - Shymkent: B. i., 2010

#### **Electronic resource**

1. Arystanov, Zh. M. Fundamentals of management ethics in pharmacy - communication skills [Electronic resource]: textbook. - Electron. search software (646 Mb). - Shymkent: B. i., 2010. - 84 p. = el. opt. disc (CD-ROM).
2. EMCD is posted on the educational portal ukma.kz
3. Electronic library "Student consultant". Access link: <http://www.studmedlib.ru>, LOGIN ibragim123, PASSWORD Libukma123
4. Website of the Library and Information Center of the Academy [lib.ukma.kz](http://lib.ukma.kz)
5. SKMA Media Library <https://media.skma.edu.kz/>
6. Digital library "Aknurpress" [www.aknurpress.kz](http://www.aknurpress.kz) register and enter the promo code SDH-28
7. SKMA Repository <http://lib.ukma.kz/repository/>
8. Electronic library of republican higher educational institutions <http://rmebrk.kz/>
9. Database of regulatory and legal acts "Zan" <https://zan.kz/ru>
10. "Paragraph Medicine" information system <https://online.zakon.kz/Medicine/>

11. Code of the Republic of Kazakhstan dated July 7, 2020 No. 360-VI "On the health of the people and the healthcare system" (with amendments and additions). Ch. 2, art. 10; ch. 5, paragraph 3; ch. 27.28;

[https://online.zakon.kz/document/?doc\\_id=34464437](https://online.zakon.kz/document/?doc_id=34464437)

**1. The department of Pharmacognosy**

**2. Level of training (magistracy)**

**3. Specialty: 6M110400 «Pharmacy»**

**4. Course: 2 (scientifically-pedagogical direction)**

**5. Name of elective discipline: «State registration and re - registration of medicinal raw materials, plant and animal origin»**

**6. Amount of credits: 3**

**7. Purposes:**

- Formation of theoretical knowledge (cognitive component)
- Mastering practical skills in conducting microscopy of medicinal plant raw materials and conducting a complete analysis of finished medicines used in phytotherapy
- Instilling communication skills to students on the professional presentation of the external description of LR and LRS, reasoned statement, defending their own point of view, the formation of logical thinking, the ability to participate in discussions, etc.
- Mastering legal competence by familiarizing regulatory documentation regulating the quality, effectiveness and safety of LR and LRS (GF RK, etc.)
- Motivated training of undergraduates for continuous improvement and development of abilities for independent and creative development of materials on medicinal plant raw materials

**8. Tasks:**

- to give a general idea to undergraduates about medicines used in standardization in phytotherapy and listed in the Register of the Republic of Kazakhstan
- mastering and familiarization with practical, communicative and legal skills of students with the basic provisions on medicinal plant raw materials and medicinal plants and prepared from them, dosage forms used in standardization in the Republic of Kazakhstan.
- formation of a holistic view of medicines from LRS used in standardization in the Republic of Kazakhstan.
- legal familiarization of undergraduates with the problems of medicinal plants used in standardization in the form of ready-made dosage forms in traditional medicine, disclosure of scientific approaches to their solution.
- familiarization with modern promising areas of application of medicinal plants and medicinal plant and factory-prepared ready-made dosage forms (tinctures, extracts, tablets, etc.) used in modern phytotherapy.
- to form the ability to independently understand medicinal plants and medicinal plant raw materials and finished medicines used in standardization in phytotherapy.

**9. Justification of the choice of discipline:**

Ensuring the proper quality of medicinal plant raw materials largely depends on the correct organization of control, its effectiveness and efficiency, as well as on the level of requirements laid down in regulatory documents (GF, AND, VAND) and the methods of analysis used. The study of the system of quality standards of medicinal plant raw materials, their products, testing methods, etc., established in a nationwide manner and mandatory for producers and consumers is currently a very urgent problem in the Republic of Kazakhstan.

## 10. Results of training (competence):

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personal and professional competences (relations)</b>
<p>-general concept of work safety in chemical testing laboratories, standardization, standards, laws used in standardization, medicinal plants, medicinal plant raw materials, the concept of biologically active substances, familiarity with the State Budget of the Republic of Kazakhstan, the Register of the Republic of Kazakhstan;</p> <p>-the general importance of medicinal plants and medicinal plant raw materials as a source of biologically active compounds used in standardization in modern phytotherapy;</p> <p>- to get acquainted with the general nomenclature of medicinal plants, medicinal plant raw materials and phytopreparations in finished form used in standardization and quality control in testing laboratories of the Republic of Kazakhstan;</p> <p>-to study, familiarize and master the necessary quality indicators used in the standardization of various ready-made dosage forms (tinctures, tablets, extracts, ointments, etc.) containing medicinal plant raw materials</p> <p>-recognize medicinal plants and medicinal plant raw materials used in standardization;</p> <p>- to carry out quality control according to the required indicators and analysis of medicinal products from medicinal plants and medicinal plant raw materials used in standardization;</p>	<p>- be able to correctly give a general description of medicinal preparations from medicinal plants and medicinal plant raw materials according to a common external feature, the main features characteristic of the LRS family, the main chemical composition and use in phytotherapy;</p> <p>- search and selection of material for the disclosure of the topic standardization of medicinal plants used in herbal medicine;</p> <p>-be able to use the necessary scientific, educational and professional literature for a future specialist, suitable for working with medicinal plants used in phytotherapy;</p> <p>- Be able to use regulatory documents (the Law on Medicines, the State Budget of the Republic of Kazakhstan, the Register of the Republic of Kazakhstan, standardization orders, standardization regulations, codes, etc.) on standardization of finished dosage forms used in herbal medicine;</p> <p>- Be able to state registration and re-registration of medicinal raw materials, plant and animal origin</p> <p>The concept of registration, re-registration and certification of pharmaceutical products from raw materials of animal and vegetable origin in the Republic of Kazakhstan.</p>	<p>- To carry out work with safety procedures of work in a chemical laboratory with medicinal plant raw materials and medicinal plants used in phytotherapy;</p> <p>- to carry out standardization and quality control of medicinal plant raw materials;</p> <p>- State registration and re-registration of some ready-made medicines: "Hawthorn tincture", "Motherwort Tincture", "Lily of the Valley Tincture" used in herbal medicine. General study of medicinal plant raw materials used in settings. Study of the general article on the GF of the Republic of Kazakhstan;</p> <p>- State registration and re-registration of some medicines: "Salvin – solution for external use", "Chlorophyllipt -alcohol 1% solution", "Infusion, tincture of birch buds", "Infusion of melissa herb" are derivatives of essential oils used in phytotherapy. Study of quality indicators for finished dosage forms.</p>

**11. Prerequisites:** bachelor degree

**12.Post-details:** doctorate

**13.Literature**

The main:



1. Лекарственное сырье растительного и животного происхождения. Фармакогнозия / Под ред. Г.П. Яковлева. – СПб.: СпецЛит, 2006. – 845 с.: ил.
2. Муравьева Д.А., Самылина И.А., Яковлев Г.П. Фармакогнозия. Учебник. – 4-е изд., перераб. и доп. – М.: ОАО Издательство «Медицина», 2007. – 656 с.: ил.
3. Руководство к практическим занятиям по фармакогнозии: Учебное пособие / Под ред. И.А. Самылиной, А.А. Сорокиной. – М.: ООО «Мед. информационное агентство», 2007. – 672 с.
4. Самылина И.А., Аносова О.Г. Фармакогнозия: учебное пособие: Атлас в 2 т. – М., 2007. – Т.1. – 192 с.; Т.2. – 384 с.
5. Самылина И.А., Ермакова В.А., Бобкова Н.В., Потанина О.Г. Фармакогнозия: учебное пособие: Атлас. – Т.3. – М., 2009. – 488 с.

**Additional:**

1. Головкин Б.Н., Руденская Р.Н., Трофимова И.А., Шретер А.И. Биологически активные вещества растительного происхождения. – М.: Наука, 2001. – 240 с.
2. Государственная фармакопея Республики Казахстан. Т.1. – Алматы: Издательский дом «Жибек жолы», 2008. – 592 с.
3. Машковский М.Д. Лекарственные средства. – 15-е изд., перераб., испр. и доп. – М.: РИА “Новая волна”: Издатель Умеренков, 2008. – 1206 с.: ил.

**1. Department: Pharmacology, Pharmacotherapy and Clinical Pharmacology**

**2. Level of training: master**

**3. OP: " Pharmacy ", 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 “ Pharmacy ” 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 complementing each other disciplines: pharmacology, pharmacotherapy, analytical chemistry, biochemistry, pharmacogenetics.**

**11. Learning outcomes (competency):**

<b>Knowledge (cognitive sphere)</b>	<b>Skills (psychomotor sphere)</b>	<b>Personalities and professional competencies (relationships)</b>
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<ul style="list-style-type: none"> <li>- Knows the features of the pharmacokinetics and pharmacodynamics of drugs and methods for assessing the quality of life of a particular patient</li> <li>- Knows risk factors and clinical manifestations of major adverse drug reactions.</li> <li>- 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.</li> <li>- Knows the main types of drug interactions.</li> <li>- Knows methods for assessing the clinical efficacy and safety of drugs, and methods of working with doctors to increase their knowledge of personalized medicine;</li> <li>- Knows about the tasks, place, methodology, achievements and problems of pharmaco-genetics and pharmaco-genomics.</li> </ul>	<ul style="list-style-type: none"> <li>- 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;</li> <li>- Able to choose methods of monitoring the safety of treatment and predict the risk of side effects of drugs;</li> <li>- Able to provide informational and advisory assistance to doctors in choosing the dosage form of the drug, dose, frequency and duration of drug administration.</li> <li>- Able to use types of literature (educational, scientific, reference) and computer databases on clinical pharmacology and evidence-based medicine.</li> <li>- Is able to control and make a forecast of the risk of side effects of drugs;</li> <li>- Able to prevent and apply correction methods when they occur;</li> <li>- Able to apply clinical protocols for diagnosis and treatment of diseases;</li> <li>- 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;</li> </ul>	<ul style="list-style-type: none"> <li>- Competent in determining the causes and consequences of irrational use of drugs;</li> <li>- Understands the strengths and weaknesses of various strategies to improve drug use;</li> <li>- Advises doctors on the rational use of drugs.</li> <li>- Consult doctors and patients;</li> <li>- Formulates the problems of rational use of medicines.</li> <li>- Arguments the formulary list based on the protocol of treatment;</li> <li>- Understands the essence and internal nature of pharmacogenetics and the main pharmacokinetic processes that determine the possibility of population analysis;</li> </ul>
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12. Prerequisites: pharmacology, personalized pharmacotherapy, interaction and interchangeability of drugs.

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. - M. : 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.-; Рек. 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).