

**MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS  
EDUCATIONAL INSTITUTION  
BELARUSIAN STATE MEDICAL UNIVERSITY**

**Контрольный  
экземпляр**

**APPROVED**

by First Vice-Rector, Professor

I.N.Moroz

11.06.2019

Reg. # UD- L.605/1920/edu.



**FUNDAMENTALS OF PHARMACOECONOMICS**

**Curriculum of higher educational institution  
in the educational discipline for the specialty:**

**1-79 01 08 «Pharmacy»**

Minsk, BSMU 2019

Curriculum is based on the educational program «Fundamentals of Pharmacoeconomic», approved 11.08.2017, registration №УД-L.605/1718/уч.

**COMPILERS:**

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**RECOMMENDED FOR APPROVAL:**

by the Department of Clinical Pharmacology of the Educational Institution «Belarusian State Medical University»  
(protocol № 11 of 16.04.2019);

by the Methodological Commission of Pharmacy Disciplines of the Educational Institution «Belarusian State Medical University»  
(protocol № 9 of 23.05.2019)

## EXPLANATORY NOTE

«Fundamentals of Pharmacoeconomic» is the educational discipline containing systematized scientific knowledge and techniques in the field of pharmacoeconomic, studying relationship between the costs of pharmacotherapy and other medical technologies and their effectiveness, safety and quality of life of the patients.

The curriculum of the discipline «Fundamentals of Pharmacoeconomic» includes the latest scientific data about the evaluation of the cost of medical technologies, types of pharmacoeconomic analysis, methods of mathematical modeling, the basics of biostatistics and evidence-based medicine.

The aim of teaching and learning the discipline «Fundamentals of Pharmacoeconomic» is to provide the students with the scientific knowledge by assessing the ratio between the cost of treating a patient with drugs and the effectiveness and safety of this treatment for the subsequent formation of a rational pharmacy range and conducting information work with medical professionals and the public.

The tasks of studying the discipline are to develop the students' academic competences, based on the ability to self-search educational and information resources, as well as acquire and understand the knowledge of:

- basic statistical knowledge needed to interpret medical literature data;
- the basic principles of forming a formulary system;
- fundamentals of legislation in the field of circulation of medicines and drug supply, principles of organization of work with drugs and compliance with the rules of their storage;
- knowledge of planning and conducting randomized clinical trials (pharmacoeconomic studies), levels of evidence and grades of recommendations.

The tasks of teaching the discipline include the formation of students' social, personal and professional competences, based on the knowledge and application of:

- skills required to solve specific research and applied research tasks in the field of clinical pharmacoeconomics using knowledge of basic information security requirements;
- communication skills and interaction with the team, partners, patients and their relatives.

Teaching and successful learning of the discipline «Fundamentals of Pharmacoeconomic» is carried out on the basis of the knowledge and skills previously acquired by the students in the following disciplines:

**Fundamentals of medical statistics.** Basics of mathematical analysis. Processing and analysis of measurement results.

**Pharmacology.** General questions of pharmacology. Pharmacokinetics and pharmacodynamics of drugs.

**Clinical pharmacology, pharmacological pharmacotherapy.** Evidence-based medicine. Types of pharmacological therapy. Side effects. Information and advisory activities of a pharmacist in hospital, outpatient and pharmacy organizations.

**As a result of studying the discipline «Fundamentals of Pharmaco-economic» the student should**

**know:**

- methodology of pharmaco-economic analysis;
- stages of pharmaco-economic research;

**be able to:**

- use ABC-, VEN-, frequency analysis in the course of pharmaco-economic analysis;
- apply modeling when conducting pharmaco-economic studies;
- use the results of pharmaco-economic analysis when selling medicines from pharmacies;

**master:**

- methods of conducting pharmaco-economic analysis: estimating the cost of the disease, cost minimization; cost effectiveness; cost-utility; costs-benefit..

The structure of the curriculum in the educational discipline «Fundamentals of Pharmaco-economic» contains two thematic sections: «General issues of pharmaco-economics. Methods for conducting pharmaco-economic studies» and «Using the results of pharmaco-economic analysis in medicine and pharmacy».

**Total number** of hours for the study of the discipline is 54 academic hours. Classroom hours according to the types of studies: lectures - 8 hours, laboratory studies (practical classes - 27 hours), student independent work (self-study) - 19 hours.

Current assessment is carried out according to the syllabus of the specialty in the form of a credit (8 semester).

Form of higher education – full-time.

#### **ALLOCATION OF ACADEMIC TIME ACCORDING TO THE SEMESTERS OF STUDY**

Code, name of the specialty	semester	Number of academic hours					Form of current assessment
		total	in-class	including		out-of-class self-studies	
				lectures	laboratory studies (practical classes and seminars)		
1-79 01 08 «Pharmacy»	8	54	35	8	27	19	Credit

## THEMATIC PLAN

Section (topic) name	Number of class hours	
	lectures	practical (laboratory or seminars)
<b>1. General issues of pharmacoeconomics. Methods of conducting pharmacoeconomic studies</b>	<b>8</b>	<b>12</b>
1.1. Introduction to the academic discipline «Fundamentals of pharmacoeconomics». Methods and stages of pharmacoeconomic research	2	2
1.2. Estimation of the cost of medical technologies. Pharmacoeconomic studies of cost-effectiveness, cost minimization	2	3
1.3. Conducting pharmacoeconomic research «cost-utility», «cost-benefit»	2	3
1.4. Modeling, ABC-, VEN- and frequency analyzes in healthcare	2	4
<b>2. Using the results of pharmacoeconomic analysis in medicine and pharmacy</b>	<b>-</b>	<b>15</b>
2.1. Evidence-based medicine. Basics of biostatistics when conducting pharmacoeconomic studies	-	4
2.2. Criteria of the effectiveness of medical care	-	2
2.3. Pharmacoeconomics and formulary system	-	4
2.4. Pharmacoeconomics in the work of the pharmacy organization	-	2
2.5. Pharmacoeconomic management in the systems of drug provision of the population abroad. Pharmacoeconomic justification for the production of medicines	-	3
<b>Total hours</b>	<b>8</b>	<b>27</b>

## **CONTENT OF THE EDUCATIONAL MATERIAL**

### **1. General issues of pharmacoeconomics. Methods of conducting pharmacoeconomic studies**

Methods of conducting pharmacoeconomic studies.

#### **1.1. Introduction to the academic discipline «Fundamentals of pharmacoeconomic». Methods and stages of pharmacoeconomic research**

Pharmacoeconomics as a science. Basic concepts and terms of pharmacoeconomics. The purpose, objectives, principles, the relationship of pharmacoeconomics with pharmaceutical disciplines. The choice of pharmacoeconomic research method. Stages of pharmacoeconomic analysis.

#### **1.2. Estimation of the cost of medical technologies. Pharmacoeconomic studies of cost-effectiveness, cost minimization**

Costs as a pharmacoeconomic category. The problem of increasing the cost of health care. Classification of pharmacoeconomic costs: direct, indirect, indirect and intangible medical costs. Ways of identifying and estimating costs. Analysis of the cost of the disease.

Discounting in pharmacoeconomic analysis. Factors taken into account in discounting. Discounting method. Constant and dynamic discount factors. The influence of the choice of the discount factor on the result of the study

Conducting cost-effectiveness analysis, cost minimization. ATC classification. DDD system. Defined daily doses (DDD).

#### **1.3. Conducting pharmacoeconomic research «cost-utility», «cost-benefit»**

Pharmacoeconomic research methods and techniques: cost-benefit analysis, cost-benefit analysis.

Quality of life as a pharmacoeconomic category. Methods for assessing the quality of life. Role of assessment of quality of life in pharmacoeconomic analysis.

Indicator QALY (Quality-adjusted life years - acquired years of quality life): definition, purpose. Methodology of using QALY (questionnaires, direct estimation method, visual analogue scale method). Methodological problems of assessing the quality of life in medicine.

Indicator DALY (Disability-adjusted life year) - years of life, adjusted for disability. Use of the DALY indicator in pharmacoeconomic studies. Willingness-to-pay threshold.

#### **1.4. Modeling, ABC-, VEN- and frequency analyzes in healthcare**

Possibilities of pharmacoeconomic analysis to optimize the economic efficiency of drug use in the hospital. Pharmacoeconomic research methods: ABC-, VEN- and frequency analyzes in health care.

Modeling in pharmacoeconomic analysis. Building a «decision tree». Markov's model. Modeling process.

## **2. Using the results of pharmacoeconomic analysis in medicine and pharmacy**

### **2.1. Evidence-based medicine. Basics of biostatistics when conducting pharmacoeconomic studies**

The concept of rational use of drugs. Evidence-based medicine and pharmacoeconomics. Using the results of randomized controlled clinical trials, data of meta-analyses and systematic reviews in conducting pharmacoeconomic studies.

### **2.2. Criteria of the effectiveness of medical care**

Types, selection and evaluation of the results of the implementation of medical programs. Final and surrogate points as a criteria of the effectiveness of pharmacotherapy. The main criteria for effectiveness in pharmacoeconomic analysis. Attitude of various subjects of the health care system to possible criteria of the effectiveness of medical care.

### **2.3. Pharmacoeconomics and formulary system**

The concept of the form and formulary system. Pharmacoeconomic assessment in taking the decision on the inclusion of a drug in the formulary list. The list of essential drugs as the basis of the formulary list.

### **2.4. Pharmacoeconomics in the work of the pharmacy organization**

Procurement of medicines based on the results of the ABC analysis. Formation of a rational pharmacy range in terms of pharmacoeconomics. The problem of generic drug replacement.

### **2.5. Pharmacoeconomic management in the systems of drug provision of the population abroad. Pharmacoeconomic justification for the production of medicines**

Pharmacoeconomics as a methodology of a rational management in healthcare abroad. Activity of the International Society for Pharmacoeconomics and Outcome Research (ISPOR - International Society for Pharmacoeconomics and Outcomes Research). Application of pharmacoeconomics evaluation at the stage of drug development and registration.

## EDUCATIONAL DISCIPLINE CURRICULAR CHART

Section, topic	Section (topic) name	number of class hours			Equipment	Mode of control
		lectures	practical (laboratory or seminars)	self-studies		
1.1	Introduction to the academic discipline «Fundamentals of pharmacoconomics». Methods and stages of pharmaco-economic research	2	2	2		Interviews, colloquiums, seminar reports, tests, control questioning, essays, reports on home practical exercises with oral defense.
1.2	Estimation of the cost of medical technologies. Pharmaco-economic studies of cost-effectiveness, cost minimization	2	3	2		Interviews, colloquiums, seminar reports, tests, control questioning, essays, reports on home practical exercises with oral defense.
1.3	Conducting pharmaco-economic research «cost-utility», «cost-benefit»	2	3	2		Interviews, colloquiums, seminar reports, tests, control questioning, essays, reports on home practical exercises with oral defense.
1.4	Modeling, ABC, VEN, and frequency analyzes in healthcare	2	4	2		Interviews, colloquiums, seminar reports, tests, control questioning, essays, reports on home practical exercises with oral defense.
2.1	Evidence-based medicine. Basics of biostatistics when conducting pharmaco-economic studies	-	4	3		Interviews, colloquiums, seminar reports, tests, control questioning, essays, reports on home practical exercises with oral defense.
2.2	Criteria of the effectiveness of medical care	-	2	2		Interviews, colloquiums, seminar



Section, topic	Section (topic) name	number of class hours			self-studies	Equipment	Mode of control
		lectures	practical (laboratory or seminars)				
2.3	Pharmacoeconomics and formulary system	-	4	2		reports, tests, control questioning, essays, reports on home practical exercises with oral defense. Interviews, colloquiums, seminar reports, tests, control questioning, essays, reports on home practical exercises with oral defense.	
2.4	Pharmacoeconomics in the work of the pharmacy organization	-	2	2		Interviews, colloquiums, seminar reports, tests, control questioning, essays, reports on home practical exercises with oral defense.	
2.5	Pharmacoeconomic management in the systems of drug provision of the population abroad. Pharmacoeconomic justification for the production of medicines	-	3	2		Interviews, colloquiums, seminars reports, tests, control questioning, essays, reports on home practical exercises with oral defense, credit	
	<b>Total hours</b>	<b>8</b>	<b>27</b>	<b>19</b>			

## INFORMATION-METHODOLOGICAL AND INSTRUCTIONAL UNIT

### LITERATURE

#### **Basic (relevant):**

1. Michael F. Drummond; Mark J. Sculpher; Karl Claxton; Greg L. Stoddart; George W. Torrance *Methods for the Economic Evaluation of Health Care Programmes* (4th edition). – 2015 - 464 p.

#### **Additional:**

2. Brazier J, Ara R, Azzabi I, et al. Identification, review, and use of health state utilities in cost-effectiveness models: an ISPOR Good Practices for Outcomes Research Task Force Report. *Value Health*. 2019;22(3):267–275 p
3. Wolowacz SE, Briggs A, Belozeroff V, et al. Estimating health-state utility for economic models in clinical studies: an ISPOR Good Research Practices Task Force Report. *Value Health*. 2016;19(6):704-719 p.
4. Walton MK, Powers JH III, Hobart J, et al. Clinical outcome assessments: a conceptual foundation – report of the ISPOR Clinical Outcomes Assessment Emerging Good Practices Task Force. *Value Health*. 2015;18(6):741-752 p.
5. Sullivan SD, Mauskopf JA, Augustovski F, et al. Principles of good practice for budget impact analysis II: report of the ISPOR Task Force on Good Research Practices – Budget Impact Analysis. *Value Health*. 2014;17(1):5-14 p.
6. Husereau D, Drummond M, Petrou S, et al. Consolidated health economic evaluation reporting standards (CHEERS)—explanation and elaboration: a report of the ISPOR Health Economic Evaluations Publication Guidelines Good Reporting Practices Task Force. *Value Health*. 2013;16(2):231-250 p.
7. Hay JW, Smeeding J, Carroll NV, et al. Good research practices for measuring drug costs in cost effectiveness analyses: issues and recommendations: the ISPOR Drug Cost Task Force Report-part I. *Value Health*. 2010;13(1):3-7 p.

### LIST OF AVAILABLE DIAGNOSTIC TOOLS

The following forms are used for competence assessment:

1. Oral form:
  - interviews;
  - colloquiums;
  - seminar reports.
2. Written form:
  - tests;
  - control questioning;
  - essays.
3. Oral-written form:
  - reports on home practical exercises with oral defense;
  - credit.

## LIST OF PRACTICAL SKILLS

- To analyze the results of randomized controlled clinical trials, the data of meta-analyses and systematic reviews.
- To analyze the quality and results of pharmacoeconomic studies.
- Have the skills to form and use the healthcare organization form.
- To use ABC-, VEN-, frequency analysis during pharmacoeconomic analysis.
- To apply modeling during pharmacoeconomic studies.
- To possess the methods of conducting pharmacoeconomic analysis: estimating the cost of the disease, minimizing costs; cost effectiveness; cost-utility; costs-benefit.

## LIST OF LECTURES

1. Introduction to the academic discipline «Fundamentals of pharmacoeconomics». Methods and stages of pharmacoeconomic research.
2. Estimation of the cost of medical technologies. Pharmacoeconomic studies of cost-effectiveness, cost minimization.
3. Conducting pharmacoeconomic research «cost-utility», «cost-benefit».
4. Modeling, ABC-, VEN- and frequency analyzes in healthcare.

## LIST OF LABORATORY (*PRACTICAL*) STUDIES

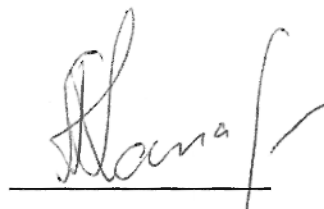
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5. Evidence-based medicine. Basics of biostatistics when conducting pharmacoeconomic studies.
6. Criteria of the effectiveness of medical care.
7. Pharmacoeconomics and formulary system.
8. Pharmacoeconomics in the work of the pharmacy organization.
9. Pharmacoeconomic management in the systems of drug provision of the population abroad. Pharmacoeconomic justification for the production of medicines.

**PROTOCOL OF THE CURRICULUM APPROVAL  
BY OTHER DEPARTMENTS**

Title of the discipline requiring approval	Department	Amendments to the curriculum of the academic discipline	Decision of the department, which designed the curriculum (date, protocol # )
1. Pharmacology	Pharmacology	no offers	14.05.2019, Protocol № 9

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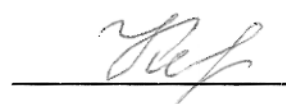
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Curriculum content, composition and accompanying documents comply with  
established requirements.

Dean of the Medical Faculty of  
International Students

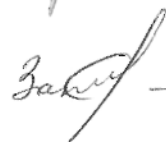
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Head of the Foreign Languages  
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