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SYLLABUS ON THE ELECTIVE DISCIPLINE PRODUCTION PRACTICAL TRAINING IN CLINICAL PHARMACY

EM 2.6

for training specialists for the second (master's) degree of higher education
branch of study 22 "Healthcare"
of specialty 226 "Pharmacy, Industrial Pharmacy"
(full-time education)

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INTRODUCTION

Syllabus of the discipline "Production practical training in Clinical pharmacy" compiled in accordance with the Standard of Higher education *for the second (master's) degree*
branch of study *22 "Healthcare"*
specialty *226 "Pharmacy, industrial pharmacy"*
educational program of *Master of Pharmacy*

Explanatory note (summary).

Under current conditions, professional skills of pharmacists consist of not only drug manufacturing and drug quality control, providing the population and healthcare establishments with medications and medical products, but patient-directed activity that is provided with the help of pharmaceutical care.

Theoretical knowledge and practical skills that help the pharmacist to provide patients with professional pharmaceutical care are gained by students during studying a number of medical and biological disciplines and consolidated while learning clinical pharmacy. Teaching of this discipline implies explanation of theoretical basics and practical approach to rational drug administration that is based on combination of pharmaceutical and clinical aspects of appropriate medication intake. Studying of clinical pharmacy by the students is continued during practical training that helps to deepen the gained knowledge and improve practical skills.

Fulfillment of syllabus for the practical training in clinical pharmacy provides acquirement of professional experience by the students. Practical tasks include providing patients with pharmaceutical care directed on different categories of patients, particularly those who require special attention (pregnant, lactating women, children of different age groups, elderly etc.) and involve prevention, detection and solution of drug-related problems, especially drug-drug interactions, inappropriate dosage of drugs or pharmacotherapy duration etc.

Thereby multifaceted approach of the practical training in clinical pharmacy gets the student prepared to reality of future professional activity.

The structure of the practical training in Clinical pharmacy

Title of practice	Duration (hours/ weeks)	Credits	Year of study / semester	Type of control
Full-time education				
Production practical training in Clinical pharmacy	30/1	1 credit	5^{th} year / 10^{th} semester	Graded credit (with the mark)

Interdisciplinary connections.

Production practical training in Clinical pharmacy is based on learning of biology with basics of genetics, normal physiology, human anatomy, microbiology with the basics of immunology, pathophysiology, pharmacology, clinical pharmacy and pharmaceutical care by students and is integrated with these disciplines.

1. The aim and tasks of practical training

1.1. The **aim** of the *production practical training in Clinical pharmacy* is as follows: consolidation of the theoretical knowledge in clinical pharmacy and improvement of practical skills in providing pharmaceutical care.

1.2. **Main tasks** of the practical training in Clinical pharmacy are as follows:

– mastering the principles and gaining skills of pharmaceutical care providing for the purpose of efficacy and safety of pharmacotherapy enhancement;

– gaining skills in search, analysis and presentation of information about drugs i.e. the implementation of information and consulting about drugs among healthcare professionals and different population groups;
– mastering of medical deontology principles and codes of conduct of a pharmacist, in particular in relationships with doctors, pharmacists and clinical pharmacists, patients;
– adoption of skills in pharmacotherapy assessment;
– acquaintance with medical documentation about drugs.

1.3. According to the requirements of the Educational program discipline, "Production practical training in Clinical pharmacy" promotes **competences** acquisition by students as follows:

- ***Integral:*** The ability to apply the acquired general and professional competences to solve complex problems in professional pharmaceutical activities, including those of a research and innovation nature; providing professional activities in the relevant position, including the manufacture/development of drugs, their storage, quality control, delivery, distribution, dispensing, and supply of drugs, as well as consulting, providing information on drugs, and monitoring adverse drug reactions and/or ineffectiveness of drug therapy; realization of innovation.

general:

GC-01. The ability to abstract thinking, analysis, and synthesis.
GC-02. The knowledge and understanding of the subject area; understanding of professional activity.
GC-03. The ability to communicate in the national language both orally and in writing.
GC-04. The ability to communicate in a foreign language (mainly English) at a level that ensures effective professional activity.
GC-05. The ability to assess and ensure the quality of work.
GC-06. The ability to work in a team.
GC-08. The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society, and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle.
GC-09. Skills in the use of information and communication technologies.

special (professional, substantive):

SC-01. The ability to integrate knowledge and solve complex pharmacy/industrial pharmacy problems in broad or multidisciplinary contexts.
SC-03. The ability to solve pharmacy problems in new or unfamiliar environments in the presence of incomplete or limited information, taking into account aspects of social and ethical responsibility.
SC-04. The ability to clearly and unambiguously convey one's own knowledge, conclusions, and arguments in the field of pharmacy to specialists and non-specialists, in particular to people who are studying.
SC-05. The ability to demonstrate and apply communication skills and fundamental principles of pharmaceutical ethics and deontology in practical activities.
SC-07. The ability to conduct sanitary and educational work among the population to prevent common diseases, to prevent dangerous infectious, viruses and parasitic diseases, as well as to promote the timely determination and maintenance of adherence to the treatment of these disease according to their medical-and-biological properties.
SC-08. The ability to provide counseling concerning OTC and prescription medications and others pharmaceutical products; to provide pharmaceutical care when selecting and dispensing OTC medications by assessing the risk/benefit, compatibility, taking into account the biopharmaceutical, pharmacokinetic, pharmacodynamic and physicochemical

characteristics of the medications, indications, and contraindications based on the patient's health status.

SC-09. The ability to provide first aid for patients and victims in extreme situations and emergencies.

SC-10. The ability to monitor the effectiveness and safety of the drug use based on their clinical and pharmaceutical characteristics.

SC-15. The ability to analyze the socio-economic processes in pharmacy, forms, methods and functions of the pharmaceutical supply system and its components in the world practice, indicators of need, efficiency and availability of pharmaceutical aid in terms of health insurance and reimbursement of the drugs.

The Competence Matrix

№	Competences	Knowledge	Skills	Communication	Autonomy and responsibility
		Kn1 Specialized conceptual knowledge that includes current scientific achievements in the field of professional activity or field of knowledge and is the basis for original thinking and conducting research, critical understanding of problems in the field and at the boundaries of fields of knowledge.	**Sk1** Specialized problem-solving skills are needed to conduct research and/or implement innovative activities to develop new knowledge and procedures. **Sk2** The ability to integrate knowledge and solve complex problems in broad multidisciplinary contexts. **Sk3** The ability to solve problems in new or unfamiliar environments in the presence of incomplete or limited information, taking into account aspects of social and ethical responsibility.	**C1** Clear and unambiguous presentation of own knowledge, conclusions and arguments to specialists and non-specialists, in particular, to persons who are studying.	**R1** Managing work or learning processes that are complex, unpredictable, and require new strategic approaches. **R2** Responsibility for contributing to professional knowledge and practice and/or evaluating the team's activity results. **R3** The ability to continue learning with a high degree of autonomy.
General competences					
GC 01.	The ability to abstract thinking, analysis, and synthesis.		Sk2		
GC 02.	The knowledge and understanding of the subject area; understanding of professional activity.	Kn1	Sk1		
GC 03.	The ability to communicate in the national language both orally and in writing.			C1	
GC 04.	The ability to communicate in a foreign language (mainly English) at a level that ensures effective professional activity.			C1	
GC 05.	The ability to assess and ensure the quality of work.	Kn1	Sk1, Sk2, Sk3	C1	R1, R2, R3
GC 06.	The ability to work in a team.		Sk3	C1	R1, R2
CG 08.	The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society, and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle.		Sk3	C1	
GC 09.	Skills in the use of information and communication technologies.		Sk1		R1
Special (professional, substantive) competences					

SC 01.	The ability to integrate knowledge and solve complex pharmacy/industrial pharmacy problems in broad or multidisciplinary contexts.	Kn1	Sk1, Sk2		R1, R2
SC 03.	The ability to solve pharmacy problems in new or unfamiliar environments in the presence of incomplete or limited information, taking into account aspects of social and ethical responsibility.		Sk3		R1, R2
SC 04.	The ability to clearly and unambiguously convey one's own knowledge, conclusions, and arguments in the field of pharmacy to specialists and non-specialists, in particular to people who are studying.	Kn1	Sk1	C1	R1, R2
SC 05.	The ability to demonstrate and apply communication skills an fundamental principles of pharmaceutical ethics and deontology in practical activities.	Kn1	Sk1, Sk2, Sk3	C1	R1, R3
SC 07.	The ability to conduct sanitary and educational work among th population to prevent common diseases, to prevent dangerous infectious, viruses and parasiti diseases, as well as to promote the timely determination and maintenance of adherence to th treatment of these disease according to their medical-and biological properties.	Kn1	Sk2	C1	R2
SC 08.	The ability to provide counseling concerning OTC ar prescription medications and others pharmaceutical products to provide pharmaceutical care when selecting and dispensing OTC medications by assessing the risk/benefit, compatibility, taking into account the biopharmaceutical, pharmacokinetic, pharmacodynamic and physicochemical characteristic of the medications, indications and contraindications based on the patient's health status.	Kn1	Sk1, Sk2, Sk3	C1	R1, R2
SC 09.	The ability to provide first aid for patients and victims in extreme situations and emergencies.	Kn1	Sk1		R2
SC 10	The ability to monitor the effectiveness and safety of the drug use based on their clinical and pharmaceutical characteristics.	Kn1	Sk1, Sk2, Sk3	C1	R1, R2, R3
SC 15	The ability to analyze the socio-economic processes in pharmacy, forms, methods and functions of the pharmaceutical supply system and its components in the world practice, indicators of need, efficiency and availability of pharmaceutical aid in terms of health insurance and reimbursement of the drugs.	Kn1	Sk1, Sk2, Sk3		R1, R2

The learning outcomes:

PR 01. Possess specialized conceptual knowledge in the field of pharmacy and related fields, taking into account modern scientific achievements and being able to apply them in professional activities.

PR 02. Critically understand and analyze scientific and applied problems in the field of pharmacy.

PR 03. Possess specialized knowledge and abilities/skills for solving professional problems and tasks, including for the purpose of improving knowledge and procedures in the field of pharmacy.

PR 04. Communicate freely in the national and English languages orally and in writing to discuss professional problems and results of activities, presentation of scientific research and innovative projects.

PR 05. Assess and ensure the quality and efficiency of activities in the field of pharmacy in standard and non-standard situations; adhere to the principles of deontology and ethics in professional activity.

PR 06. Develop and make effective decisions to solve complex problems of pharmacy personally and based on the results of joint discussion; formulate the goals of one's own activity and the activity of the team, taking into account social and industrial interests, the general strategy, and existing limitations, determine the optimal ways to achieve goals.

PR 08. Develop and implement innovative projects in the field of pharmacy, as well as related interdisciplinary projects taking into account technical, social, economic, ethical, legal, and environmental aspects.

PR 09. Formulate, argue, clearly and concretely convey to specialists and non-specialists, including those seeking higher education, information based on own knowledge and professional experience, the main trends in the development of world pharmacy and related industries.

PR 10. To conduct sanitary and educational work among the population for the purpose of prevention and in the event of outbreaks of dangerous infectious, viral, and parasitic diseases.

PR 11. Determine the advantages and disadvantages of drugs of natural and synthetic origin of various pharmacological groups, taking into account their chemical, physicochemical, biopharmaceutical, pharmacokinetic, and pharmacodynamic features and the type of dosage form. Recommend drugs and other products of the pharmacy assortment with the provision of advisory assistance and pharmaceutical care.

PR 12. Provide pre-medical assistance to patients in emergency situations and victims in extreme situations.

PR 13. Record cases of adverse reactions when using drugs of natural and synthetic origin; evaluate factors that can affect the processes of absorption, distribution, deposition, metabolism, and excretion of drugs and are determined by the condition and characteristics of the human body and the pharmaceutical characteristics of drugs.

PR 24. Use the data from clinical, laboratory, and instrumental studies to monitor the effectiveness and safety of the use of drugs.

PR 26. Plan and implement professional activities on the basis of normative legal acts and recommendations for proper pharmaceutical practices.

PR 27. To contribute to the preservation of health, in particular the prevention of diseases, the rational prescription, and use of drugs.

2. Informational scope of the educational discipline

The educational discipline comprises 1.0 credits ECTS (30 hours). Duration of practical training – 1 week.

3. The structure of the academic discipline

Production practical training in Clinical pharmacy takes place in an inpatient hospital and consists of the consolidation of knowledge of information and consulting about drugs,

pharmacotherapy assessment, and providing pharmaceutical care concerning rational medication administration.

Thematic plan of production practical training in Clinical pharmacy

№	Contents of the fulfilled work	Number of days
1.	Getting familiar with the work at the certain department of the inpatient hospital and medical documentation fulfillment. Providing recommendations on the rational administration of drugs from the medication list purchased by the hospital for budget funds and received by the hospital department in accordance with the order requirement.	1
2.	Systematization of information represented in the simulated inpatient prescription paper.	1
3.	Providing of pharmacotherapy assessment in the simulated inpatient prescription paper (analysis of prescriptions advisability, propriety of dosage, route of administration and duration of drug intake, detecting cases of prescribing contraindicated drugs etc.)	1
4.	Identification of potential drug interactions in a simulated inpatient prescription paper. Assessment of possible outcomes of simultaneous administration of several drugs.	1
5.	Forming elements of pharmaceutical care directed towards the patient, physician and the nursing staff. Final control.	1
	Total	**5**

4. Thematic plan of the lectures – unplanned.

5. A list of practical skills that a student must acquire during practice.

Immediate supervisor from practice base (inpatient hospital) inspects practical skills and abilities of the student under the below mentioned list and evaluates work undertaken by the student ranked according to the points scale – from 0 to 6.

***<u>Evaluation criteria for students' practical skills</u>*:**

"6 points" –	the task is completely fulfilled
"4.8 points" –	the task is fulfilled with a mistake which a student was able to fix himself
"3.6 points" –	the task is fulfilled with a mistake which a student was not able to fix himself (it was fixed by the supervisor)
"0 points" –	the task is not fulfilled

№	Titles of the practical skills or abilities	Score in points			
		□ **0 points**	□ **3.6 points**	□ **4.8 points**	□ **6 points**
1.	Identification of pharmacotherapeutic group of drugs represented in the requirement order	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
2.	Identification of the main indications of drugs represented in the requirement order	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
3.	Identification of the main contraindications of drugs represented in the requirement order	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
4.	Identification of the typical potential adverse reactions of drugs represented in the requirement order	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points

№	Titles of the practical skills or abilities	Score in points			
		□ 0 points	**□ 3.6 points**	**□ 4.8 points**	**□ 6 points**
5.	Ability to use Ukrainian State Register of Drugs	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
6.	Ability to use WHO Model Lists of Essential Medicines	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
7.	Detecting potential drug interactions in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
8.	Assessment of possible outcome of potential drug interactions in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
9.	Determining the correct dosage of drugs in the simulated inpatient prescription paper taking into the account patient's age, main disease and comorbid disorders	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
10.	Detecting the conformity of drug administration duration in the simulated inpatient prescription paper to the requirements of Good Clinical Practice	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
11.	Detecting the conformity of drug administration route in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
12.	Detecting the cases of administration of contraindicated drugs in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
13.	Detecting cases of absence of required (indicated) drugs in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
14.	Evaluating of rationality of drug administration in the simulated inpatient prescription paper due to activity of Formulary system	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
15.	expediency in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
16.	Estimating cases of simultaneous administration of drugs that belong to the same pharmacotherapeutic group or include the same active ingredient (in the simulated inpatient prescription paper)	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
17.	Providing pharmaceutical care directed on a physician	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
18.	Providing pharmaceutical care directed on a nursing staff	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
19.	Providing patient-directed pharmaceutical care	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
20.	Ability to devise a conclusion about rationality of pharmacotherapy according to the results of inpatient prescription paper analysis	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points
	Total points	**72-120 points**			

The student can get a grade from 72 till 120 points for the fulfillment of the practical skills, being examined by **the immediate supervisor from practice base** (inpatient hospital).

The minimal amount of points gained by the student that is required for admission to the final control equals 72 points.

6. Individual tasks are not provided by the practice program

7. Teaching methods. The following teaching methods are used in the process of studying the discipline "Production practical training in Clinical pharmacy":

- *by type of cognitive activity*:

– explanatory-illustrative;
– reproductive;
– logic of cognition;
– analytical;
– inductive;
– deductive;

- *by the main stages of the process*:

– formation of knowledge;
– formation of skills and abilities;
– application of knowledge;
– generalization;
– consolidation;
– audit;

- *by system approach*:

– stimulation and motivation;
– control and self-control;

- *by sources of knowledge*:

– verbal – explanation, conversation;
– visual – demonstration, illustration;

- *by the level of independent mental activity*:

– problematic;
– partial search;
– research;
– method of problem-based teaching.

8. Methods of control:

8.1. Current control

The immediate supervisor from practice base controls the fulfillment of practical skills daily. The supervisor verifies it in the student's journal of practical training and evaluates according to the ranked scale (see paragraph 5 of the program – "A list of practical skills that a student must acquire during practice"). The University practical training supervisor regularly monitors students keeping their journals of practical training.

8.2. Form of final control of learning success – graded credit (with the mark), which is to assess the student's mastery of program material in the discipline on the basis of control of theoretical training. The final control is carried out in writing and includes 80 test tasks on clinical pharmacy and pharmaceutical care of I and II levels, which are evaluated by 1 point. Students who have mastered practical skills submitted reporting documentation and scored a number of points not less than the minimum (72 points) are admitted to the final control.

9. Scheme of accrual and distribution of points received by students:

The minimum number of points, which must be scored by the student for the current performance of practice tasks for admission to the final control is 72 points.

The maximum number of points that a student can score for the current performance of practice tasks for admission to the final control is 120 points.

The calculation of the number of points is based on the grades obtained by the student on the traditional scale during the study of the discipline, by calculating the average number (CA), rounded to two decimal places. The resulting value is converted into points on a multi-point scale as follows:

$$x = \frac{CA \times 120}{5}$$

For convenience, the table of recalculation on a 120-point scale is given:

Recalculation of the average score for current activities in a multi-point scale for production practice, ending with a graded credit (with the mark)

4-point scale	200-point scale	4-point scale	200-point scale	4-point scale	200-point scale	4-point scale	200-point scale
5.00	120	4.45	107	3.91	94	3.37	81
4.95	119	4.41	106	3.87	93	3.33	80
4.91	118	4.37	105	3.83	92	3.29	79
4.87	117	4.33	104	3.79	91	3.25	78
4.83	116	4.29	103	3.74	90	3.20	77
4.79	115	4.25	102	3.70	89	3.16	76
4.75	114	4.20	101	3.66	88	3.12	75
4.70	113	4.16	100	3.62	87	3.08	74
4.66	112	4.12	99	3.58	86	3.04	73
4.62	111	4.08	98	3.54	85	3.00	72
4.58	110	4.04	97	3.49	84	Less than 3	Not enough
4.54	109	3.99	96	3.45	83		
4.50	108	3.95	95	3.41	82		

The mark for the discipline “Production practical training in Clinical pharmacy” consists of the sum of points for practical skills of the student, which are checked by the immediate supervisor from the base of practice (**minimum – 72 points, maximum – 120 points**) and points for final control exhibited during the graded credit (with the mark) (**minimum – 50 points, maximum – 80 points**).

Points from the discipline are independently converted into both an ECTS scale and a 4-point scale. Student scores are ranked on the ECTS scale as follows:

ECTS assessment	Statistical indicator
A	The best 10% of students
B	The next 25% of students
C	The next 30% of students
D	The next 25% of students
E	Last 10% of students

Points from production practical training in Clinical pharmacy for students who have successfully completed the program are converted into a traditional 4-point scale according to absolute criteria:

Points in the discipline	Score on a 4-point scale
170-200	5
140-169	4
139-122	3
<122	2

10. Methodical support (educational content, questions for the current and final control of knowledge and skills of students in the discipline).

1. Methodical materials for teachers and students – methodical recommendations to production practical training in Clinical pharmacy, in which the basic statements concerning its

organization and carrying out are presented, content and plan of practice, a list of skills and abilities that the student must master as a result of the practical training, and a list of reporting documentation on practice. The methodical recommendations also provide a sample journal of practical training and a list of practical skills and abilities that the student should acquire during the practical training. The main document of accounting for student work, mastery of skills and practical skills and implementation of the thematic plan of practice in clinical pharmacy is a journal in which the student must clearly record and describe all types of work provided by the program of production practical training. The immediate supervisor from the hospital checks the journal entries every day, evaluates practical skills and abilities. At the end of the practical training, the journal is certified by the signature and seal of the head of the hospital.

2. Evaluation criteria.
3. WHO Model Lists of Essential Medicines.
4. State drug formulary of Ukraine (1,2,3,4,5,6,7 issues).
5. Database of simulated inpatient prescription papers.
6. Information and reference publications on the administration of drugs.
7. On-line access to Internet resources, international databases, information materials.
8. Sample of the journal of the discipline "Production practical training in Clinical pharmacy" (Annex A, B).

The list of questions submitted for final control

1. Regulatory documents that correspond to medication administration.
2. Medical deontology principles and codes of conduct.
3. Algorithm of collecting anamnesis (morbi, vitae, medication history).
4. Principles of efficacy and safety of pharmacotherapy enhancement.
5. Criteria for determining OTC and prescription drug categories.
6. Original and generic drugs. Advantages and disadvantages.
7. Drug efficacy criteria. Groups of efficacy criteria.
8. Factors that influence on clinical efficacy of drugs.
9. Clinical and pharmacological characteristics of different routes of drug administration.
10. Informing the patient about the conditions of rational drug administration, combination with food, rules for storage of medicines.
11. Clinical and pharmaceutical aspects of drug interactions with food. Ways of prevention of negative manifestations of drug interactions.
12. Clinical and pharmacological aspects of alcohol application in medicine and peculiarities of its interactions with drugs.
13. Types of adverse drug reactions and complications of pharmacotherapy.
14. Professional activity of pharmacist directed on detecting adverse drug reactions and informing them by means of spontaneous reports.
15. Clinical and pharmacological approach to the drug disease pharmacotherapy.
16. Dermatological representation of adverse effects of drugs, principles of pharmacotherapy.
17. Drug-related problems. Main types.
18. Drug interactions, principles of prevention of objectionable outcomes of pharmacotherapy. Types of drug interactions. Clinical value of drug interactions.
19. Pharmaceutical care as a means of pharmacist's professional activity display.
20. The main pharmacokinetic parameters, their practical value.
21. Disorders of the internal organs that may significantly affect the pharmacokinetic parameters.
22. Pharmacotherapy monitoring. Factors that determine the necessity of conducting the monitoring of pharmacotherapy.
23. Anatomical and physiological features of the human body in different ages (infants, children, adolescents, aged and the elderly) that influence the pharmacokinetics and pharmacodynamics of drugs.
24. Anatomical and physiological features of the female body during pregnancy and lactation that influence the pharmacokinetics and pharmacodynamics of drugs.

25. Characteristics of drug use in pregnant and lactating women. The algorithm of optimal drug, drug formulation, route of administration selection.
26. Pharmaceutical care of children in different periods of development in childhood (infants, teenagers). The algorithm of optimal drug, drug formulation, route of administration selection for the symptomatic treatment.
27. Pharmaceutical care of aged and elderly people. The algorithm of optimal drug, drug formulation, selection of route of administration for the symptomatic treatment.
28. Symptoms and syndromes of the most common cardio-vascular diseases: atherosclerosis, stable angina pectoris, acute myocardial infarction, hypertension, congestive heart failure, heart dysrhythmias.
29. Clinical and pharmacological approach to treatment of atherosclerosis, stable angina pectoris, acute myocardial infarction, hypertension and hypertension crisis, chronic congestive heart failure.
30. Features of use of the following groups of drugs: nitrates, beta-blockers, calcium channel blockers, ACE inhibitors, diuretics, cardiac glycosides.
31. Features of use of anticoagulants, antiplatelet drugs, lipid-lowering agents, and angioprotectors.
32. Efficiency criteria for treatment and safety of pharmacotherapy of the following diseases: atherosclerosis, stable angina pectoris, acute myocardial infarction, hypertension and hypertension crisis, chronic congestive heart failure, heart dysrhythmias.
33. Signs and symptoms of chronic atrophic gastritis (type A), chronic H. pillory-associated gastritis (type B), peptic gastric and duodenal ulcer, chronic pancreatitis, chronic hepatitis, chronic cholecystitis, cholelithiasis.
34. Clinical and pharmacological approach to treatment of chronic atrophic gastritis (type A), chronic H. pillory-associated gastritis (type B), peptic gastric and duodenal ulcer, chronic pancreatitis, chronic hepatitis, chronic cholecystitis, cholelithiasis.
35. Anti-Helicobacter therapy. H. pylori eradication schemes and clinical pharmacological characteristics of drugs for H. pylori eradication
36. Clinical pharmacology of antacids, histamine H2 antagonists and selective M1 choline receptor blockers, PPIs, poly-enzyme preparations, hepatic protectors.
37. The influence of functional state of stomach and liver on clinical efficacy of medications.
38. Safety of pharmacotherapy and treatment efficiency criteria of chronic atrophic gastritis (type A), chronic H. pillory-associated gastritis (type B), peptic gastric and duodenal ulcer, chronic pancreatitis, chronic hepatitis, chronic cholecystitis, cholelithiasis.
39. Clinical and pharmaceutical aspects of gastrointestinal bleeding management.
40. Signs and symptoms of acute and chronic pyelonephritis, acute and chronic glomerulonephritis, cystitis, urethritis, nephrolithiasis, acute and chronic kidney failure.
41. Clinical and pharmaceutical aspects of urinary tract disorders pharmacotherapy.
42. Characteristics of immune-inflammatory kidney disorders treatment with immune suppressants.
43. Signs and symptoms of allergic rhinitis and allergic conjunctivitis (hay fever), urticaria, Quincke's edema, acute anaphylaxis and anaphylactic shock.
44. Clinical and pharmacological approaches to the treatment of allergic rhinitis and allergic conjunctivitis (hay fever), urticaria, Quincke's edema, acute anaphylaxis, and anaphylactic shock.
45. Clinical pharmacology of antihistamines and topical anti-allergic agents.
46. Safety of pharmacotherapy and treatment efficiency criteria of allergic rhinitis and allergic conjunctivitis (hay fever), urticaria, Quincke's edema, acute anaphylaxis and anaphylactic shock.
47. Signs and symptoms of rheumatoid arthritis, arthrosis, osteoporosis.
48. Peculiarities of steroidal and non-steroidal anti-inflammatory drugs administration.
49. Peculiarities of disease-modifying antirheumatic drugs (DMARDs) application including medications that suppress connective tissue proliferation
50. Clinical and pharmaceutical aspects of drug application in surgical practice: local anesthetics, narcotic analgesics, skeletal muscle relaxants, analeptics, infusion solutions.

51. Pain, its causes, mechanisms of development, principles of pharmacotherapy.
52. Clinical and pharmaceutical aspects of antimicrobals application: penicillins, cephalosporins, macrolides, carbapenems, lincosamides, glycopeptides, fluorquinolones, tetracyclines, aminoglycosides etc.
53. Physiological and biochemical peculiarities of pregnancy.
54. Complications of pregnancy, their etiology and signs.
55. Clinical and pharmacological characteristics of drugs that are used for prevention of pregnancy complications.
56. Principles of rational drug application in cases of functional gynecological disorders.
57. Preparations for replacement hormone therapy in gynecology, principles of their application, assessment of efficacy and safety.
58. Clinical and pharmaceutical approach to treatment of inflammatory gynecological disorders.
59. Principles of vitamins rational use in clinical practice. Classification of vitamins, their biochemical, physiological, clinical and pharmacological value.
60. Principles of adequate supply of nutrients during their massive loss. Enteral and parenteral nutrition, indications and contraindications.
61. Medications used for parenteral nutrition. Methodological approaches to the selection of drugs, their composition and dosage.
62. Metabolic syndrome, etiology, main clinical signs, pharmacotherapy principles.
63. The concept of obesity and metabolic disorders like anorexia. The principles of their treatment.
64. Signs and symptoms of diabetes mellitus type 1 and 2. Clinical and pharmaceutical approach to pharmacotherapy.
65. Pharmaceutical care of patients with diabetes mellitus type 1 and 2. Complications of Insulin therapy. Types of insulins. Clinical and pharmaceutical aspects of oral hypoglycemic drugs intake.

11. Requirements for the practice report

The report on the practical training in clinical pharmacy is made by entries at the end of the journal or on separate sheets of paper. The report lists all types of work that the student has got acquainted with and performed during the practical training.

The report is signed by the student and considered by the University practical training supervisor together with the journal and the characteristic of activity of the student at drawing up the final control.

12. Summing up the practice

Summarizing the results of production practical training in Clinical pharmacy is carried out in the presence:

1. duly executed **journal** signed by the immediate and general supervisors from the base of practice (inpatient hospital);

2. practical training **report** (signed by the student).

Assessment of the student's acquisition of practical skills and abilities is carried out using the criteria set out in paragraph 5 of the program – "A list of practical skills that a student must acquire during practice", also specified in the student's journal.

The grade for the practical training consists of the sum of points for the student's performance of practical skills and points for the final control.

Students who have received at least 72 points for practical skills, submitted a report for practice and a positive characterization are allowed to the final control of practice. Final control students make on the last day of practice in the presence of the commission, which includes practice University practical training supervisor and, if possible, supervisor from the base.

The form of final control should be standardized and include control of theoretical and practical training in the form of a test colloquium (80 test questions, each of which is evaluated in 1 point).

The grade for the practical training is entered by the University practical training supervisor in the student's record book and academic record. Within three days after the end of the practical training, the University practical training supervisor submits academic record to the relevant dean's office, a report on the practical training – to the practice department of the University.

The grade for practice is taken into account when considering scholarships along with grades for exams and other graded credits.

Students who do not complete the practical training program without significant reason, receive an unsatisfactory grade, and do not eliminate academic debt by the beginning of the next semester are expelled from the University.

The results of the practice are annually heard and discussed by the relevant departments, profile methodological commissions, Academic councils of the faculties, and the University.

13. Recommended literature

Basic literature:

1. Atkinson A. J. Principles of clinical pharmacology. – M.: Practical Medicine, 2013. – 532 p.
2. Clinical Pharmacology: Ref. for students / Ed. O.Ya. Babak, O.M. Belovola, I.S. Chekman. – K.: Medicine, 2012. – 728 p.
3. Clinical pharmacology: Textbook / O.M. Bilovol, O.F. Vozianov, I.K. Latoguz et al. / Ed. O.M. Bilovola, I.K. Latogusa and A.Ya. Tsiganenko: In 2 vols. – K.: Health, 2005. – Vol. 1. – 608 p.
4. Clinical pharmacology: Textbook / O.M. Bilovol, O.F. Vozianov, I.K. Latoguz et al. / Ed. O.M. Bilovola, I.K. Latogusa and A.Ya. Tsiganenko: In 2 vols. – K.: Health, 2005. – Vol. 2. – 684 p.
5. Clinical pharmacology: textbook for students higher education: in 2 volumes / S.V. Nalyotov, I.A. Zupanets, T.D. Bakhteeva et al.; Ed. I.A. Zupantsya, S.V. Nalyotov, O.P. Viktorova. – Kh.: NUPh, Publishing House: Golden Pages, 2007. – Vol. 1. – 348 p.
6. Clinical pharmacology: textbook for students higher education: in 2 volumes / S.V. Nalyotov, I.A. Zupanets, T.D. Bakhteeva et al.; Ed. I.A. Zupantsya, S.V. Nalyotov, O.P. Viktorova. – Kh.: NUPh, Publishing House: Golden Pages, 2007. – Vol. 2. – 312 p.
7. Clinical pharmacy (pharmaceutical care): textbook for higher medical students. (pharm.) / I.A. Zupanets, V.P. Chernykh, T.S. Sakharova, S.B. Popov et al. – Kharkiv: NUPh: Golden Pages, 2012. – 776 p.
8. Clinical pharmacy (pharmaceutical care): textbook for higher medical students. (pharm.) / I.A. Zupanets, V.P. Chernykh, T.S. Sakharova et al. / Ed. V.P. Chernykh, I.A. Zupanets – Kharkiv: NUPh: Golden Pages, 2011. – 704 p.
9. Clinical pharmacy: textbook for higher education institutions / Ed. V.P. Chernykh, I.A. Zupanets, I.G. Kupnovytska – Kharkiv: NUPh: Golden Pages, 2013. – 912 p.
10. Complications of pharmacotherapy. Adverse drug reactions. / Ed. D.W. Reichart. – M.: Litterra, 2007. – 98 p.
11. Emergency medical care / Ed. F.S. Glumcher, V.F. Moskalenka. – K.: Medicine, 2006. – 632 p.
12. Fundamentals of clinical medicine: symptoms and syndromes in practical pharmacy: Educ. tool. / I.A. Zupanets, S.B. Popov, Yu.S. Rudyk et al.; Ed. V.P. Chernykh, I.A. Zupanitsa. – Kh.: Golden Pages, 2010. – 92 p.
13. Fundamentals of internal medicine: textbook for higher medical students / Perederiy V.G., Tkach S.M. In 2 volumes. – Vinnitsa: The New Book, 2009. – Vol. 1. – 640 p.
14. Fundamentals of internal medicine: textbook for higher medical students / Perederiy V.G., Tkach S.M. In 2 volumes. – Vinnitsa: The New Book, 2009. – Vol. 2. – 784 p.
15. Kukes V.G., Starodubtsev A.K. Clinical pharmacology and pharmacotherapy: textbook. / Ed. V.G. Kukes, A.K. Starodubtsev – 2nd ed. dispatch – M.: GEOTAR-Media, 2006. – 640 p.
16. Petrov V.I. Clinical pharmacology and pharmacotherapy in real medical practice: master class: textbook. – M.: GEOTAR-Media, 2014. – 880 p.
17. Pharmaceutical care: Atlas / I.A. Zupanets, V.P. Chernykh, S.B. Popov et al. / Ed. I.A.

Zupantsa, V.P. Chernykh, 2nd ed. revised. – K.: Pharmaceuticals, 2007. – 146 p.
18. Pharmaceutical care: Course of lectures for pharmacists and family physicians / I.A. Zupanets, V.P. Chernykh, S.B. Popov et al. / Ed. V.P. Chernykh, I.A. Zupantsa. – Kh.: Pharmaceuticals, 2006. – 536 p.
19. Pharmacotherapy: a textbook for students of pharmacy. faculties / Ed. O.V. Kraydashenka, I.G. Kupnovytska, I.M. Ticks, V.G. Lizoguba. – Vinnytsia: Nova Kniga, 2010. – 644 p.
20. Rational pharmacotherapy. Therapist's directory: hands. for practicing physicians: L.I. Dvoretskiy, P.R. Abakarova, N.S. Alekseeva et al. – M.: Litterra, 2007. – 976 p.
21. Regeda M.S., Kresyun V.Y., Fedorov Y.M. Clinical allergology. – The fourth edition, supplemented and revised. – Lviv: Spolom, 2004. – 210 p.
22. Seredyuk N.M. Internal medicine and therapy. – К.: Медицина, 2007. – 686 с.
23. State Drug Formulary. URL: https://www.dec.gov.ua/materials/chinnij-vipusk-derzhavnogo-formulyara-likarskih-zasobiv/?role=ua
24. Unified method of evaluation of pharmacotherapy according to the prescription's papers. Methodical recommendations of the Ministry of Health of Ukraine / Zimenkovsky A.B., Morozov A.M., Stepanenko A.V. et al. – К., 2011. – 38 с.
25. Zborovsky A.B., Tyurenkov I.N., Belousov Yu.B. Adverse side effects of drugs. – M.: LLC "Medical Information Agency", 2008. – 656 p.
26. WHO Model Lists of Essential Medicines. URL: https://www.who.int/groups/expert-committee-on-selection-and-use-of-essential-medicines/essential-medicines-lists

Additional literature:

27. Clinical Pharmacology: Textbook / Ed. O.Ya. Babak, O.M. Bilovol, I.S. Checkman. – К.: Medicine, 2008. – 656 с.
28. Goodman & Gilman's. The Pharmacological Basis of THERAPEUTICS / Laurence L. Brunton, Jons S. Lazo, Keith L. Parker. – New York: McGraw-Hill Medical, 2006. – 2021 p.
29. Harrison's Principle of Internal Medicine. – 17th ed. / editors, Anthony S. Fauci et al. – McGraw-Hill Professional. – 2008. – 1263 p.
30. International Statistical Classification of Diseases and Related Health Problems, 11th Revision. WHO, 2021 URL: https://www.who.int/standards/classifications/classification-of-diseases.
31. Organizational and methodological principles of creation and activity of clinical and pharmaceutical service in inpatient hospitals of Ukraine. Methodical recommendations of the Ministry of Health of Ukraine / Zimenkovsky A.B., Morozov A.M., Pariy V.D. et al. – К., 2012. – 39 p.
32. OTS™: Responsible self-medication / Ed. I.A. Zupanets, I.S. Checkman. – 6th ed., reworked and supplemented. – К: Pharmacist Practitioner, 2010. – 208 p.
33. Patient care in the practice of a physician and a pharmacist. Guide to the use of drugs: a manual / ed. I.A. Zupanca, V.P. Chernykh. – K.: Ukrainian Medical Bulletin, 2011. – 480 p.
34. Rational use of medicines: progress in implementing the WHO medicines strategy Report by the Secretariat, EB118/6, 11 May 2006. URL: www.who.int/gb/ebwha/pdf_files/EB118/B118_6-en.pdf/
35. Shaw C (2003). How can hospital performance be measured and monitored? Copenhagen, WHO Regional Office for Europe (Health Evidence Network report. URL: http://www.euro.who.int/document/e82975.pdf, accessed 14/09/2009).
36. Textbook of Therapeutics: Drug and Disease Management – 8th ed. / Eds Richard A. Helms. – Williams & Wilkins, 2006. – 2780 p.
37. Zimmerman Y.S. Clinical gastroenterology: selected sections. – M.: GEOTAR-Media, 2009. – 416 p.

Annex A

THE SAMPLE OF JOURNAL OF PRODUCTION PRACTICAL TRAINING IN CLINICAL PHARMACY

MINISTRY OF HEALTHCARE OF UKRAINE
Danylo Halytsky Lviv National Medical University

Department: Healthcare management, Pharmacotherapy and Clinical pharmacy

Head of the department: DSc, MD, prof. Zimenkovsky A.B.

STUDENT'S JOURNAL
"PRODUCTION PRACTICAL TRAINING IN CLINICAL PHARMACY"

Student (full first and last name) _____

Faculty of: Pharmacy (full-time education)
Year 5 Group __

Practice base (hospital) _____

Lviv-20 __

Student _____
(full first and last name)

carries out practical training in Clinical pharmacy at

_____
(name of the inpatient hospital)

in _____
(city, region)

Terms of the practical training: from "___"_____ 20 ___ till "___"_____ 20 ___

University practical training supervisor _____
(official position, surname, name, and patronymic)

Immediate supervisor from practice base (inpatient hospital) _____
(official position, surname, name, and patronymic)

The student started on "___"_____ 20 ___ finished on "___"_____ 20 ___

Signature of the responsible person _____

L.S.

The journal of production practical training in Clinical pharmacy is an official document that reflects the daily work of the student, its character, and volume.

In the journal, students present the results of an individual task consisting of 2 parts.

The first part of the individual task consists in providing recommendations for rational administration of medications included into the list of drugs procured by the hospital for budget funds and are directed to the certain department according to the requirement order (provided by the Nursing staff supervisor at the certain department of the inpatient hospital).

Recommendations for proper application of each drug included into the requirement order are represented by the students in the form of a list of 13 items as follows:

1. Trade name (TN) of the drug*
2. International Nonproprietary Name (INN) of the drug**
3. ATC-code of the drug and the pharmacotherapeutic group it belongs to**
4. Availability of the drug in the WHO Model Lists of Essential Medicines (URL: *https://www.who.int/groups/expert-committee-on-selection-and-use-of-essential-medicines/essential-medicines-lists*).
5. Indications for the drug application (according to the specifics of the hospital department)**
6. Dosage form and route of administration, its correctness**
7. Correct dosage (single dose, dosage regimen (frequency), duration of administration of the drug)**
8. Potential and real interactions of the drug**
9. Contraindications for drug use**
10. The most often predictable adverse drug reactions (ADRs)**
11. Elements of the pharmaceutical care directed on the patient.
12. Elements of the pharmaceutical care directed on a physician.
13. Elements of the pharmaceutical care directed on a nursing staff.

Footnotes: * according to the requirement order; ** according to the data from patient information leaflets (PILs) represented in State Register of Drugs or at Medscape Drug Reference of WebMD Health Professional Network http://www.medscape.com (URL: http://reference.medscape.com/drugs).

Such a list of recommendations for the proper prescription of drugs, the student forms for all drugs that are purchased by the hospital for budget funds and come to the hospital in accordance with the requirements of the order.

The second part of the individual task is the simulated inpatient prescription paper analysis (the prescription paper is given to the student by the University practical training supervisor), The students analyze the inpatient prescription paper using the unified methodology of pharmacotherapy assessment that includes five stages as follows:

1) Processing the table (sample see Table 1) in which all the drugs from the simulated inpatient prescription paper are transferred.

Table 1

The list of drugs used for pharmacotherapy of (name of the disorder) **according to the simulated inpatient prescription paper**

№	**TN of the drug***	**Pharmacotherapeutic group of the drug according to the ATC-classification)***	**INN****	**Drug dosage***	**The real duration of pharmaco-therapy***
Drugs for oral (PO) administration*					
1.					
2. etc					

Drugs for intravenous (IV) drip*					
..					
..					
Drugs for IV bolus etc.*					
..					
..					

Footnotes: * data from simulated inpatient prescription paper; ** according to the data from patient information leaflets (PILs) represented in State Register of Drugs or at Medscape Drug Reference of WebMD Health Professional Network http://www.medscape.com (URL: http://reference.medscape.com/drugs).

Table 1 has to reflect the simulated inpatient prescription paper. The difference lies in the fact that the drugs and related information are specifically systematized, first of all, by the route of administration. This will help to assess the correctness of route selection and cases of simultaneous administration of certain drugs in different dosage forms (e.g., tablets and IV solution).

After this, the student identifies the TN of drugs. He gives INN, pharmacotherapeutic group (to estimate cases of simultaneous administration of drugs that belong to the same group or include the same active ingredient) for each drug. Further he indicates dosage and duration of drug administration (in process of treatment duration analysis not only inpatient treatment should be taken into account, but also recommended treatment after discharge from the hospital). In addition, the student assigns a number to each drug to facilitate calculation of the total number of prescribed drugs.

2) Presentation of the results of pharmacotherapy assessment (see Table 2) in order to identify:
   - dosage (according to principles of good clinical practice of drug prescription);
   - route of drug administration (according to patient's condition, age and physical-chemical properties of the drug);
   - duration of drug administration.

The student also estimates expediency of drug prescription (the expedient drug is marked as «+», an inexpedient one – as «–». If the case is controversial – he puts «?»). With the help of «+» and «–» signs the student indicates presence or absence of the drug in the WHO Model Lists of Essential Medicines.

If a student detects caution regarding dosage, route of administration, duration of use and appropriateness of drug prescribing he suggests comments in Table 2.

Table 2

Results of the simulated inpatient prescription paper assessment

№	TN*	Pharmacotherapeutic group of the drug (according to the ATC-classification)**	INN**	Drug dosage (real)*	Drug dosage (appropriate)**	Pharmacotherapy duration (real)*	Pharmacotherapy duration (appropriate)**	Clinical and pharmaceutical assessment of the simulated inpatient prescription paper					
								Dosage correctness ***	Pharmacotherapy duration correctness***	Route of administration correctness***	Comment***	Advisability of the drug prescription***	Availability of the drug in the valid WHO Model Lists of Essential Medicines****
Drugs for oral (PO) administration*													
1.													
2. etc													
Drugs for IV drip*													
..													
..													
Drugs for IV bolus etc.*													
..													
..													

Footnotes: * data from simulated inpatient prescription paper;

** according to the data from patient information leaflets (PILs) represented in Ukrainian State Register of Drugs (access mode: http://www.drlz.kiev.ua/) or at Medscape Drug Reference of WebMD Health Professional Network http://www.medscape.com (access mode: http://reference.medscape.com/drugs);

*** result of the clinical and pharmaceutical assessment of the simulated inpatient prescription paper carried out by the student;

**** according to the valid WHO Model Lists of Essential Medicines.

3) Analysis of potential drug interactions ЛЗ (see Table 3). The student identifies possible drug-drug interactions using information from corresponding paragraphs in the patient information leaflets (PILs) or Medscape Drug Reference of WebMD Health Professional Network. He assesses the potential outcome of the simultaneous use of several drugs and briefly describes the results of interactions (the increased or reduced effect, incompatibility etc.) the student also puts into Table 3 information on advisability of the drug interaction: the useful interaction is marked as «+», useless interaction – as «–», dangerous – as «!».

Table 3

Systematization of detected potential drug interactions in the simulated inpatient prescription paper

TN		**Pharmaco-therapeutic group** (according to the ATC-classification)		**INN**		**Comment on the possible result of drug interaction *****	**Interaction assessment*****
Drug 1*	**Drug 2***	**Drug 1****	**Drug 2****	**Drug 1****	**Drug 2****		

Footnotes: * data from simulated inpatient prescription paper;
** according to the data from patient information leaflets (PILs) represented in State Register of Drugs or at Medscape Drug Reference of WebMD Health Professional Network http://www.medscape.com (URL: http://reference.medscape.com/drugs);
*** the result of the clinical and pharmaceutical assessment of the simulated inpatient prescription paper fulfilled by the student.

4) Analysis of cases of contraindicated drugs prescription or non-prescribing the indicated drugs (e.g. the patient who takes a loop diuretic is not prescribed a potassium supplement.
5) Devising a final conclusion about rationality of pharmacotherapy according to the results of simulated inpatient prescription paper analysis and providing pharmaceutical care directed on the patient, physician and the nursing staff for quality band safety of pharmacotherapy improvement.

At the end of the diary there is a table containing a list of completed practical skills, and assessments made by the immediate supervisor from practice base (inpatient hospital) (Table 4).

Table 4

№	**List of practical skills or abilities**	**Score in points**				**Signature of the immediate supervisor from practice base**
1.	Identification of pharmacotherapeutic group of drugs represented in the requirement order	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
2.	Identification of the main indications of drugs represented in the requirement order	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
3.	Identification of the main contraindications of drugs represented in the requirement order	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
4.	Identification of the typical potential adverse reactions of drugs represented in the requirement order	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
5.	Ability to use Ukrainian State Register of Drugs	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	

№	List of practical skills or abilities	Score in points				Signature of the immediate supervisor from practice base
6.	Ability to use WHO Model Lists of Essential Medicines	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
7.	Detecting potential drug interactions in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
8.	Assessment of possible outcome of potential drug interactions in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
9.	Determining the correct dosage of drugs in the simulated inpatient prescription paper taking into the account patient's age, main disease and comorbid disorders	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
10.	Detecting the conformity of drug administration duration in the simulated inpatient prescription paper to the requirements of Good Clinical Practice	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
11.	Detecting the conformity of drug administration route in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
12.	Detecting the cases of administration of contraindicated drugs in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
13.	Detecting cases of absence of required (indicated) drugs in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
14.	Evaluating of rationality of drug administration in the simulated inpatient prescription paper due to activity of Formulary system	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
15.	expediency in the simulated inpatient prescription paper	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
16.	Estimating cases of simultaneous administration of drugs that belong to the same pharmacotherapeutic group or include the same active ingredient (in the simulated inpatient prescription paper)	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
17.	Providing pharmaceutical care directed on a physician	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
18.	Providing pharmaceutical care directed on a nursing staff	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
19.	Providing patient-directed pharmaceutical care	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
20.	Ability to devise a conclusion about rationality of pharmacotherapy according to the results of inpatient prescription paper analysis	□ 0 points	□ 3.6 points	□ 4.8 points	□ 6 points	
Total score for practical skills						

Table 5

Report
about the production practical training in Clinical pharmacy
on the basis of

_____

(name of the hospital department)

5th-year student of specialty 226 “Pharmacy, Industrial Pharmacy” (full-time form of education)

_____

(full first and last name)

List of types of work	Total
Analysis of inpatient prescription papers	
Identification of drug-related problems	
……..	
……..	

Date **Signature**