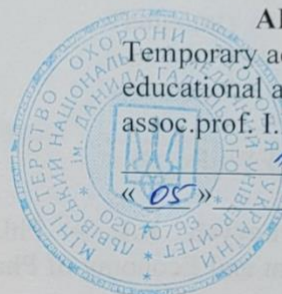


DANYLO HALYTSKY LVIV NATIONAL MEDICAL UNIVERSITY

Department of Drug Technology and Biopharmaceutics

APPROVED

Temporary acting vice-rector on
educational and pedagogical work,
assoc.prof. I.I. Solonyenko



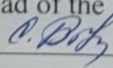
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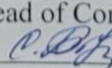
EDUCATIONAL PROGRAM

on discipline

**PROPAEDEUTIC PRACTICAL TRAINING
ON DRUG TECHNOLOGY IN PHARMACY**

for training specialists of the second (master's) degree of higher education
of the branch of study 22 "Health care"
of the specialty 226 "Pharmacy, industrial pharmacy"
for the 1st year students of Faculty of Pharmacy
of the full-time and part-time forms of education

Approved
at the meeting of Department of
Drug Technology and Biopharmaceutics
Minutes No.12
« 8 » June 2022
Head of the Department
 assoc.prof. S.B. Bilous

Approved
by the Methodological Committee on
Chemical and Pharmaceutical Disciplines
Minutes No.3
« 21 » June 2022
Head of Committee
 assoc.prof. S.B. Bilous

2022



DEVELOPERS OF THE PROGRAM:

Bilous S.B. – head of the Department, DSc, associate professor

Yakymiv O.V. – PhD, associate professor

Vashchenko O.O. – PhD, associate professor

REVIEWER:

Dorykevych K.I. – PhD, associate professor of the Department of Management and Economy of Pharmacy of Danylo Halytsky Lviv National Medical University

INTRODUCTION

Program of studying of educational discipline

«Propaedeutic practical training on technology of medicinal products in pharmacy»

according to Standard of higher education of *second (master's) level*

branch of knowledge 22 “*Healthcare*”

speciality 226 “*Pharmacy, Industrial pharmacy*”

educational program of *master of pharmacy*

Description of the educational discipline (annotation)

Propaedeutic practical training on technology of medicinal products in pharmacy is an initial stage at forming professional knowledge, skills and abilities of future master of pharmacy. Practical training includes familiarization with requirements for sanitary conditions in pharmacy and personal hygiene of personnel, with technological process of compounding of medicinal products, packaging preparations and preparing them for dispensing.

Structure of practical training

Structure of practical training	Number of weeks	Number of credits, hours	Academic year (semester)	Type of control
Propaedeutic practical training on technology of medicinal products in pharmacy	1	1.5 credits, 45 h	I year course (semester 2)	Graded credit

Object of propaedeutic practical training is familiarization with basic rules of compounding of drug products in pharmacy conditions.

Interdisciplinary links: propaedeutic practical training on technology of medicinal products in pharmacy is an important stage in the teaching of masters of pharmacy. It integrates with the disciplines, which the first year students study in accordance with educational plan: Latin, ethics and deontology in pharmacy, introductory practical training on management and economics in pharmacy etc.

1. Purpose and objectives of propaedeutic practical training

1.1. **Purpose of propaedeutic practical training on technology of medicinal products in pharmacy** is familiarization with principles of sanitary and anti-epidemic regime in pharmacy and personal hygiene of pharmacy staff, preparatory activities and technological processes of compounding different drug products in pharmacy conditions, packaging of these preparations and preparing for dispensing.

1.2. **Primary objectives of propaedeutic practical training on technology of medicinal products in pharmacy** are familiarization with the statements of current normative documents that regulate conditions and rules for preparing and storage of drug products in pharmacies; learning of technological operations of compounding, packaging and labeling of different dosage forms.

1.3. **Competencies and educational outcomes that discipline provides** (correlation with normative content of training of higher education graduates that is formulated in terms of educational results in Standard of Higher Education).

Propaedeutic practical training provides gaining the following competencies– general and professional.

General:

GC 2. The ability to use knowledge in practical situations.

GC 3. Desire of saving the environment.

GC 4. The ability for abstract thinking, analysis and synthesis; ability to study and to be modernly trained.

GC 6. The knowing and understanding of subject field and the understanding of profession.

GC 7. Ability to adapt and act in a new situation.

GC 10. The ability to choose communication strategy, ability to work in team and with experts from other fields of knowledge/types of economic activity.

GC 11. The ability to evaluate and ensure quality of performed work.

GC 12. The ability to conduct investigations in an appropriate level.

GC 13. Ability to exercise the rights and responsibilities as a member of society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, rights and freedoms of man and citizen in Ukraine.

GC 14. Ability to preserve and multiply moral, cultural, scientific values and achievements of the society on the basis of understanding of 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 technology, use different types and forms motor activity for active rest and leading a healthy lifestyle.

Professional:

PC 1. Ability to conduct health education among the population with the purpose of the prevention of common diseases, dangerous infectious, viral and parasitic diseases, as well as to facilitate the timely detection and maintenance of adherence to the treatment of these diseases in accordance with their medical and biological characteristics and microbiological features.

PC 7. Ability to ensure proper storage of medicines and other products of the pharmacy range in accordance with their physicochemical properties and the rules of Good Storage Practice (GSP) in health care facilities.

PC 12. Ability to use in professional activities knowledge of regulations, legislation of Ukraine, and recommendations of Good Pharmaceutical Practices.

Program learning outcomes (PLO), the formation of which is facilitated by the practical training:

PLO 1. To conduct professional activities in social interaction based on humanistic and ethical principles; to identify future professional activity as socially significant for the human health.

PLO 2. To apply knowledge of general and professional disciplines in professional activities.

PLO 4. To demonstrate the ability to independently search, analyze and synthesize information from various sources and to use these results for solving typical and complex specialized tasks of professional activity.

PLO 6. To argue the information for decision-making, to be responsible for the decisions in standard and non-standard professional situations; to adhere to the principles of deontology and ethics in professional activity.

PLO 7. To perform professional activities using creative methods and approaches.

PLO 8. To carry out professional communication in the official language, to use oral communication skills in a foreign language, to analyze specialized texts and to translate foreign language information sources.

PLO 10. To adhere to the norms of communication in professional interaction with colleagues, management, consumers, to work effectively in a team.

PLO 11. To use methods of evaluating performance quality indicators; to identify reserves for increasing labor efficiency.

PLO 12. To analyze information obtained as a result of scientific research, to generalize, systematize and use it in professional activities.

PLO 15. Provide pre-hospital care to patients in emergency situations and victims in extreme situations.

PLO 24. To plan and implement professional activities on the basis of normative legal acts of Ukraine and recommendations of good pharmaceutical practices.

PLO 25. To contribute to the preservation of health, in particular the prevention of diseases, the rational prescription and use of medicinal products. To conscientiously fulfill one's professional duties, to comply with the legislation on the promotion and advertising of medicinal products. To possess psychological communication skills to achieve trust and mutual understanding with colleagues, doctors, patients, consumers.

Matrix of competencies

No.	Competency	Knowledge	Abilities	Communication	Autonomy and responsibility
Integrative competency					
The ability to solve typical and complex specialized tasks and practical issues in the professional pharmaceutical practice using statements, theories and methods of fundamental, chemical, technological, biomedical and social-economic sciences; ability to integrate knowledge and solve complex issues, to formulate judgments in case of insufficient or limited information; to reveal clearly and unambiguously conclusions and knowledge, reasoning them, to the professional and non-professional audience.					
<i>General competencies</i>					
CG 2	Ability to use knowledge in practical situations	To know methods of knowledge implementation in solving practical issues	To be able to use professional knowledge for solving practical issues	To establish contacts with entities of practical activities	To be responsible for the timely taken decision
CG 3	Striving to preserve the environment	To know the problems of environmental protection, requirements of the sanitary and hygienic regime and conditions of labor protection	To be able to form the requirements for the preservation of the environment, compliance with the sanitary and hygienic regime and labor protection conditions; interpret the requirements of laws and regulations on labor protection; draw conclusions about the presence of harmful factors during the performance of professional duties; to ensure the safety of pharmaceutical staff	The ability to express their attitude to the environment	To be responsible for the implementation of environmental measures within its competence
CG 4	The ability for abstract thinking, analysis and synthesis, ability to study and to be modernly trained	To know current development trends of the branch and to analyze them	To be able to analyze professional information, make reasoned decisions, acquire up-to-date knowledge	To establish appropriate contacts for achieving the goals	To be responsible for timely acquisition of up-to-date knowledge
CG 6	The knowing and understanding of subject field and the understanding of profession	To know structure and features of professional activities	To be able to carry out professional activities that requires updating and integration of knowledge	To form communication strategy in the professional activities	To be responsible for professional growth with high level of autonomy

CG 7	The ability to adapt and act in a new situation	To know elements of production and social adaptation, factors of successful adaptation to a new environment	To be able to form an effective strategy of personal adaptation for new conditions	To contact with a wide range of the public (colleagues, administration, professionals of other branches) in case of new situations with unpredictable elements	To be responsible for taking decisions
CG 10	Ability to choose communication strategies, ability to work in a team and with experts in other fields of knowledge / types of economic activity	To know the tactics and strategies of communication, laws, and ways of communicative behavior	To be able to choose ways and strategies of communication to ensure effective teamwork	To use communication strategies and skills of interpersonal interaction	To be responsible for the choice and tactics of communication
CG 11	The ability to evaluate and ensure quality of performed work	To know methods for evaluation of work quality	To be able to ensure competent performance of professional activities	To establish contacts for assurance of competent performance of activities	To be responsible for competent performance of activities
CG 12	The ability to conduct investigations in an appropriate level	To know the components of the health care system, planning and evaluation of scientific research	To be able to search for scientific sources of information; to choose the methods of scientific research; use methods of mathematical analysis and modeling, theoretical and experimental research in pharmacy	To use information data from scientific sources	To be responsible for the development and implementation of planned projects
CG 13	Ability to exercise the rights and responsibilities as a member of society, to realize the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine	To know the rights and responsibilities of members of society and values of civil democratic society	To apply their rights and responsibilities in practice, taking into account the values of civil society	-	To be responsible for their actions in civil society

CG 14	Ability to preserve and multiply moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area (pharmacy), its place in the general system of knowledge about nature and society and in the development of society, technique and technology, to use different types and forms of motor activity for active recreation and healthy living lifestyle	To know the moral, cultural, scientific values and achievements of society based on understanding the history and patterns of pharmacy, its place in the general system of knowledge about nature and society and in the development of society, technology types and forms of physical activity for active recreation and a healthy lifestyle	To use moral, cultural, scientific values and achievements of society based on understanding the history and regularities of the development of pharmacy in practical activity	The ability to communicate using established norms of Ukrainian language	To be responsible for the observance of moral, cultural and scientific values
<i>Professional competencies</i>					
PC 1	Ability to conduct health education work among the population in order to prevent common diseases, prevent dangerous infectious, viral and parasitic diseases, as well as to facilitate the timely detection and maintenance of adherence to the treatment of these diseases in accordance with their medical, biological and microbiological features	To know the clinical and pharmaceutical characteristics of dosage forms for the treatment of patients with dangerous infectious and parasitic diseases; principles of compiling pharmaceutical information and creation information products	To organize scientific and practical seminars for medical staff and lectures for the population on the rational administration of medicinal products, medicinal plant raw materials, the harmfulness of drugs and strong active drug abuse, measures for the prevention drug dependence; To compile information messages for doctors and junior pharmacy specialists about new medicinal products and new indications for the use of known medicinal products, data from automated information systems, etc.	To carry out preventive work and take antiepidemic measures to prevent diseases	To be responsible for the quality and timeliness of preventive and anti-epidemic measures
PC 7	Ability to ensure proper storage of medicines and other pharmaceutical	To know:	To provide conditions of the storage of medicines to prevent adverse effects; to anticipate the possible	To carry out constant monitoring of the	To be responsible for the storage of medicines and

	products in accordance with their physicochemical properties and the rules of Good Storage Practice (GSP) in health care facilities	<ul style="list-style-type: none"> - classification of medicinal products and dosage forms; - physicochemical properties of medicinal substances; - types of containers, closures, and packaging materials used in medicine and pharmacy; - orders of the Ministry of Health of Ukraine on the organization of storage of various groups of medicinal products and medical devices in pharmacies; - general requirements for the storage of medicines; - rules of the storage of medicinal substances with different physicochemical properties; - stability and shelf life of medicinal products 	influence of storage conditions on the quality of pharmaceutical products, medicinal plant raw materials and medical devices; to control the conditions of the storage of raw materials at pharmaceutical enterprises; to determine the stability of medicines and medical devices during storage for the established shelf-life	proper storage of medicines and medical devices	medical devices in accordance with Good Storage Practice (GSP) in healthcare facilities
PC 12	Ability to use the knowledge of regulations, legislation of Ukraine and pharmaceutical practices in the professional activities	To know basics of the system of law and pharmaceutical legislation; principal mechanisms of the state regulation of pharmaceutical activity; legal and ethical norms of pharmaceutical activity	To use normative-legal acts regulating pharmaceutical activity in Ukraine and abroad; to monitor and determine changes and amendments in the domestic pharmaceutical legislation; to form relations with patients and doctors in order to meet the ethical criteria of the WHO and the principles of Good Pharmacy Practice (GPP) to promote medicinal products on the market, minimize abuse and misuse of medicinal products	To form conclusions and professionally to apply laws and normative documents	To be responsible for high-quality and timely use of normative documents in professional activity

2. Information volume of the academic discipline

1.5 credits ECTS, 45 hours are given for learning of the propaedeutic practical training on technology of medicinal products in pharmacy.

3. Structure of the academic discipline

Propaedeutic practical training on technology of medicinal products in pharmacy is performed in compounding pharmacies and at the Department of Drug Technology and Biopharmaceutics (final control). Changes in the order of performed activities given in the plan of propaedeutic practical training are permitted with the agreement of supervisor of practical training.

Plan of propaedeutic practical training on technology of medicinal products in pharmacy

No.	Description of activities	Number of days
1.	Passing the briefing on safety awareness, sanitary measures and pharmaceutical order. General familiarization with production rooms in pharmacy. Sanitary and anti-epidemic regime, pharmaceutical conditions. Production rooms of pharmacy, normative requirements and cleaning. Personal hygiene of personnel. Methods for receiving purified water, its quality control and storage conditions. Pharmacopoeial requirements to purified water	1
2.	Dosing in pharmacy practice. Weight measuring devices that are used in pharmacy practice. Normative requirements for deviations allowed in dispensing of drug preparations	1
3.	General requirements for preparing non-sterile preparations in pharmacy conditions. Dosing and packaging of solid and liquid preparations, semi-solid preparations for cutaneous application, vaginal and rectal suppositories. Pharmacopoeial requirements to compounded preparations	1
4.	General requirements for preparing sterile preparations in pharmacy. Providing of aseptic conditions. Methods of sterilization. Workplace of pharmacist, who compounds intra-pharmacy half products. Nomenclature of intra-pharmacy half products. Labor saving devices for preparing intra-pharmacy half products	1
5.	Modern types of containers and packaging materials for different dosage forms; requirements to pretreatment, washing and drying of pharmacy utensils. Types of labels (basic, additional, preventive) and their selection for dispensing of compounded preparations in accordance with administration	1
	Final control – graded credit	
Total		5 days

Thematic plan of individual work on propaedeutic practical training on technology of medicinal products in pharmacy

No.	Topic	Hours
1.	Writing the report on practical training	15 h (3 h for 5 days)
Individual study of topics which are not included in schedule of practical training		
1.	The main requirements of the current normative documents regulating the sanitary and anti-epidemic regime of pharmacies	3

2.	Requirements of regulatory documents for pharmacy personnel engaged in the compounding of medicines	3
	Total hours	6
	Total	21

4. List of practical skills and abilities that student should get during the propaedeutic practical training, and the evaluation in points

No.	Practical skills and abilities	Mark in points
1.	To use normative, informative and study literature for solving professional problems	«5» – 5 points «4» – 4 points «3» – 3 points «2» – 0 points
2.	To characterize structural subdivisions of pharmacy, its production premises	- «» -
3.	To analyze requirements to sanitary conditions of production premises, pretreatment, washing and drying of pharmacy utensils	- «» -
4.	To analyze measures to personal hygiene of personnel	- «» -
5.	To choose methods for receiving purified water, and conditions for its storage and control	- «» -
6.	To choose suitable prescription and hand balances	- «» -
7.	To weigh dry active ingredients and excipients	- «» -
8.	To weigh viscous substances and thick liquids	- «» -
9.	To use dosing devices and other labor saving devices for compounding solid preparations	- «» -
10.	To dose liquid preparations using measuring devices	- «» -
11.	To calibrate empirical droppers	- «» -
12.	To use labor saving devices (e.g., burettes, apparatus for preparing of water extracts etc) for compounding liquid preparations	- «» -
13.	To perform basic technological operations for compounding solid preparations (grinding, mixing, sieving, packaging)	- «» -
14.	To perform basic technological operations for compounding liquid preparations (dissolution, filtration, packaging)	- «» -
15.	To perform basic technological operations for compounding semi-solid preparations and suppositories (melting of ingredients, mixing, packaging)	- «» -
16.	To choose labor saving devices for compounding semi-solid preparations and suppositories	- «» -
17.	To substantiate production conditions for injections, eye preparations and intra-pharmacy half products	- «» -
18.	To perform basic technological operations for preparing solutions for injection and liquid eye preparations (dissolution, filtration, packaging, sterilization)	- «» -
19.	To choose labor saving devices for preparing solutions for injection, liquid eye preparations and intra-pharmacy half products	- «» -
20.	To calculate deviations allowed in dispensing of solid preparations	- «» -
21.	To substantiate appropriate conditions for storage of medicines in pharmacy	- «» -

22.	To select packaging materials and containers in accordance with dosage form and physical and chemical properties of ingredients	- «» -
23.	To select labels (basic, additional, preventive) for dispensing medicines in accordance with the administration	- «» -
24.	To prepare medicinal products for dispensing	- «» -

5. Teaching methods

Explanation and illustrative examples, analytical and deductive methods, summarizing, formation of skills and abilities, revision and testing of knowledge are used in the process of propaedeutic practical training.

6. Methods of control

- Methods of control include current and final control.
- Form of **final control** is a *graded credit*.
- **Mark for propaedeutic practical training on technology of medicinal products in pharmacy** consists of sum of points for current educational activity (maximum – 120 points, minimum – 72 points) and sum of points for final control (maximum – 80 points, minimum – 50 points).

Evaluation criteria for practical skills and abilities

Excellent ("5") – student solved given task in a correct, logical and full manner. Student connects theory with practice, can generalize material, and demonstrates correct performance of practical skills.

Good ("4") – student completed given task correctly, demonstrates practical skills with slight mistakes. Student puts theoretical knowledge to good use for solving the practical tasks, can solve low and medium level tasks, has practical skills and abilities in a scope that does not exceed a required minimum.

Satisfactory ("3") – student performed given tasks incompletely and not clearly, student had solved only the easiest tasks. Student makes significant mistakes when demonstrating the practical skills and acquired only a minimum of technological knowledge.

Fail ("2") – student completed less than 50% of given tasks of practical training. Student is not able to give logical answers and does not understand content of material. Student makes essential mistakes when demonstrating practical skills.

7. Current control of propaedeutic practical training

Current control of propaedeutic practical training is conducted every day by the immediate supervisor of practical training from pharmacy. It includes evaluation of skills and practical abilities provided by the program.

Evaluation of current educational activity of student is performed using 4-graded (traditional) scale, which is then converted into the points.

8. Form of final control is a graded credit.

Final control is conducted in a written form. The form is standardized and includes tests. To write final control are allowed students, who have acquired required practical abilities, provided reported documents and scored for current educational activity not less than minimum.

9. Scheme of evaluation and distribution of points which students gain:

Maximum score that student can get for current educational activity is 120 points (24x5).

Minimum score that student can gain for current educational activity to be allowed to pass graded credit is 72 points (24x3).

Maximum score that student can get for final control is 80 points.

Minimum score that student can gain for final control to pass credit is 50 points.

Mark for propaedeutic practical training on technology of medicinal products in pharmacy is calculated as sum of points for current educational activity (not less than 72) and for final control (not less than 50).

Points for practical training are then converted into both ECTS scale and traditional 4-graded (national) scale. ECTS points into 4-graded points are not converted and vice versa.

Points for practical training on technology of medicinal products in pharmacy are then converted into the traditional 4-graded scale using absolute criteria shown in Table:

Points for propaedeutic practical training	Mark according to 4-graded scale
170 - 200	5
140 - 169	4
122 - 139	3
less than 122	2

ECTS mark is not converted into the traditional mark, since these scales are independent.

Objectivity of evaluation of students' educational activity is controlled by statistical methods (correlation coefficient between ECTS and traditional-graded marks).

10. Methodical support

Methodical guide for tutors and students – methodical guide for propaedeutic practical training on technology of medicinal products in pharmacy that contains general information on the organization of practical training, plan of practical training, list of practical skills and abilities, which student should get in the result of practical training, information on the reporting documents. The example of title page of the report on propaedeutic practical training on technology of medicinal products in pharmacy is also given in the methodical guide.

Report on practical training is a main document of student's performance during the practical training, acquisition of practical skills and abilities, implementation of practical training plan. Student should clearly document and describe all performed types of work, determined by the program of practical training, in the report. Immediate supervisor of practical training from pharmacy should check records in the report every day, and evaluate skills and practical abilities.

The following information must be given in the report:

- structure, floor area and layout plan of premises of pharmacy;
- normative requirements to sanitary and anti-epidemic regime, pharmaceutical conditions, personal hygiene of personnel;

- disposition and equipment of work places in assistant room;
 - normative requirements to production rooms of pharmacy and their cleaning;
 - methods for receiving purified water, its quality control and storage conditions.
- Pharmacopoeial requirements to purified water;
- types and rules of dosing in pharmacy practice; weight measuring devices used in pharmacy practice;
 - construction of prescription and hand balances, metric weights;
 - allowed deviations in packaging of drug products;
 - pharmacopoeial requirements to compounded preparations;
 - general requirements for compounding non-sterile preparations in pharmacy conditions;
 - dosing and packing of solid and liquid preparations, semi-solid preparations for cutaneous application, vaginal and rectal suppositories;
 - general requirements for preparing sterile preparations in pharmacy conditions; providing aseptic conditions, methods of sterilization;
 - work place of pharmacist who compounds intra-pharmacy half products; assortment of intra-pharmacy half products; labor saving tools used for compounding intra-pharmacy half products;
 - modern types of containers and packaging materials for different dosage forms; requirements for pretreatment, washing and drying of pharmacy unesils;
 - types of labels (basic, additional, preventive) and their choice for dispensing of compounded preparations in accordance with administration.

The report is verified by the sign of supervisor from pharmacy and the pharmacy's stamp.

Student should write the following information on the title page of the report:

DANYLO HALYTSKY LVIV NATIONAL MEDICAL UNIVERSITY

Department of Drug Technology and Biopharmaceutics

REPORT

on propaedeutic practical training on drug technology in pharmacy

Full name of student _____

Faculty: ***pharmaceutical*** Course year 1 Group _____

Base of practical training _____
(name of pharmacy, address)

Period of practical training
from «___» _____ 20 ___
to «___» _____ 20 ___

Supervisor of practical training from the Pharmacy: _____
(post, full name)

Supervisor of practical training from the Department: _____
(post, full name)

List of skills and practical abilities with marks given by supervisor from pharmacy should be filled on a separate sheet of paper. This list is given to supervisor from the Department together with report.

Supervisor from the Department conducts final control – graded credit, and gives the mark for practical training.

RESULTS OF PRACTICAL TRAINING

Підсумки практики заслуховуються на засіданнях кафедри технології ліків і біофармації, профільної методичної комісії з фармацевтичних дисциплін, Вченої ради фармацевтичного факультету.

Summing up the results of propaedeutic practice on technology of medicinal products in pharmacy is carried out if students have submitted the reported documents and have written the final control.

Students write final control on the practical training on technology of medicinal products in pharmacy on the last day of practical training at the Department of Drug Technology and Biopharmaceutics.

Supervisor from the Department puts the mark for practical training into report, student's credit book and credit-and-examination register.

Report for practical training is stored for 1 year at the Department.

LIST OF QUESTIONS FOR FINAL CONTROL

1. Requirements to sanitary and anti-epidemic conditions of pharmacy, normative standards
2. Washing and disinfection products used in pharmacy to provide appropriate sanitary conditions of premises and equipment.
3. Receiving purified water in pharmacy. Apparatus.
4. Conditions and time of storage of purified water in pharmacy.
5. Devices for dosing of dry, viscous and liquid substances in pharmacy.
6. Types of balances. Prescription and hand balances, construction.
7. Weights. Weighing techniques.
8. Classification of dosage forms.
9. Types of dosage forms that can be compounded in pharmacy.
10. General technological operations for compounding powders.
11. Packaging material for powders.
12. Types of labels used for drug products compounded by individual prescriptions and for intra-pharmacy half products.
13. General technological operations for preparing liquid preparations.
14. Measuring (volumetric) apparatus and its use for preparing liquid preparations.
15. Materials for filtration of solutions.
16. Labor saving devices for filtering and dosing of solutions.
17. Containers and sealing materials for dispensing of liquid preparations.
18. Technological operations for compounding of semi-solid preparations for cutaneous application.
19. Technological operations for compounding of rectal and vaginal suppositories.
20. Production conditions for injections and eye preparations.
21. Aseptics. Aseptic conditions in pharmacy.

22. Sterilization. Methods for sterilization of pharmacy utensils, drug products and other objects.
23. Apparatus for sterilization.
24. Containers and sealing materials for eye preparations and solutions for injections.
25. Preparation of compounded drug products for dispensing.

RECOMMENDED LITERATURE

1. Державна Фармакопея України: в 3 т. / Державне підприємство «Український науковий фармакопейний центр якості лікарських засобів». – 2-е вид. Харків: Державне підприємство «Український науковий фармакопейний центр якості лікарських засобів», 2016. – Т. 1. - 1128 с., Т. 2. - 724 с., Т. 3. – 732 с.
2. Закон України № 123/96 - ВР від 04.04.96 “Про лікарські засоби”.
3. Наказ МОЗ України № 44 від 16.03.1993 р., “Про затвердження Інструкції по організації зберігання в аптечних установах різних груп лікарських засобів та виробів медичного призначення”.
4. Наказ МОЗ України № 275 від 15.05.2006 р. “Про затвердження Інструкції із санітарно-протиепідемічного режиму аптечних закладів”.
5. Наказ МОЗ України № 812 від 17.10.2012 р. „Про затвердження Правил виробництва (виготовлення) та контролю якості лікарських засобів в аптеках”.
6. Наказ МОЗ України № 500 від 20.07.2006 р. “Про затвердження Переліків назв лікарських форм та упаковок для лікарських засобів”.
7. Постанова КМ України № 906 від 04.10.2010 р. „Про затвердження форми паспорта аптечного закладу (структурного підрозділу)”.
8. Фармацевтичне законодавство (Нормативні акти з організації роботи аптечних підприємств) // Під редакцією проф. Т.А.Грошового. – Тернопіль: Укрмедкнига, 2012. – 569с.

Information sources

Верховна Рада України	www.rada.gov.ua
Міністерство охорони здоров'я України	www.moz.gov.ua
Спеціалізоване медичне інтернет-видання для лікарів, провізорів, фармацевтів, студентів медичних та фармацевтичних вузів	www.morion.ua
Фармацевтична енциклопедія	www.pharmencyclopedia.com.ua