

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

**Контрольный
экземпляр**



APPROVED
by First Vice-Rector, Professor
I.N. Moroz

28.04.2019

Reg. № UD-199-1-018-1-3/1819/p.

PHARMACOGNOSTIC PRACTICE
Practical training
Curriculum for the Specialty: 1-79 01 08 «Pharmacy»

COMPILERS:

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RECOMMENDED FOR APPROVAL:

by the Department of Pharmacy Organization of the Educational Institution «Belarusian State Medical University»

(protocol # 10 of 18.04.2019);

by the Methodological Commission of pharmaceutical disciplines of the Educational Institution «Belarusian State Medical University»

(protocol # 8 of 25.04.2019);

EXPLANATORY NOTE

The curriculum of educational pharmacognostic practice determines the structure, content and test requirements for practice in accordance with the educational standard of the specialty.

The organization and procedure for conducting educational practice are established by the Council of Ministers Resolution of the Republic of Belarus dated 03.06.2010, № 860 "On the approval of the regulations on the practice of students, cadets, listeners"(in the edition of the Council of Ministers Resolution dated 04.08.2011 № 1049, dated 09.12.2011 № 1663, dated 11.09.2012 № 844) and the Regulation of January 29, 2014 "On the Practice of Students of Educational Institution "Belarusian State medical University".

Pharmacognosy with other pharmaceutical disciplines (pharmaceutical chemistry, pharmaceutical technology, management and economics of Pharmacy) forms professional knowledge and skills of a pharmacist. Educational pharmacognostic practice takes a special place in the professional training of a pharmacist. This is due to close practical activities that provide knowledge about the types of medicinal plants, medicinal plant materials and its standardization.

The purpose of the educational pharmacognostic practice is to consolidate the theoretical and practical skills in standardization, quality control, chemical composition and use of medicinal plant materials. These types of work form students' skills and abilities that make up the content of the professional activity of a pharmacist.

The objectives of the educational pharmacognostic practice for students are:

- securing the knowledge gained on the peculiarities of the growth of medicinal plants, procurement and drying of medicinal plant raw materials (MPRM) containing various groups of biologically active substances (BAS);
- the formation of skills for the determination of stocks of raw materials and rational methods for harvest of MPRM;
- familiarization with the basics of growing and methods of cultivation of medicinal plants;
- improving herbarization skills;
- acquaintance with the work of a pharmaceutical company engaged in the processing of MPRM;
- the formation of the foundations of professional competence for the storage, sale and recommendations for the use of MPRM, herbal medicines and dietary supplements on the basis of MPRM;
- the formation of the foundations of social and personal competence through the acquisition by the student of interpersonal communication skills with medical staff and patients in a pharmacy.

During the period of educational pharmacognostic practice, students will comply with the internal labor regulations of basic health care institution. A student is admitted to educational practice if there is a health certificate and after a briefing in the workplace on safe working conditions.

At the end of the educational pharmacognostic practice, the **student should know:**

- the features of the growth of medicinal plants, harvesting and drying of MPRM, containing various groups of biologically active substances;
- the theoretical bases of growing and methods of cultivation of medicinal plants;
- the rules for herbarization of medicinal plants;
- the system of standardization of MPRM and herbal medicines in the Republic of Belarus;
- the rules of acceptance of MPRM in a pharmacy from suppliers;
- the rules for storing MPRM in a pharmacy;
- the rules of storage, sale and recommendations for the use of MPRM, herbal medicines and dietary supplements on the basis of MPRM;

At the end of the educational pharmacognostic practice, the student **should be able to:**

- determine the stocks of raw materials and rationally harvest the MPRM wild plants in the selected area;
- herbarize plants correctly to obtain high-quality dry samples;
- standardize MPRM independently according to the instructions of regulatory documents;
- advise patients competently on the use of MPRM, herbal medicines and dietary supplements on the basis of MPRM containing different groups of biologically active substances;
- carry out the storage of herbal medicines in a pharmacy.

In total, 108 academic hours are allocated for educational pharmacognostic practice for 2 weeks after the end of the 5th and 6th semesters. Current certification is carried out in accordance with the curriculum for the specialty in the form of a differentiated credit (6th semester).

The current attestation is carried out in the form of a graded credit by oral interview with the provision of a journal, a report on the fulfilment of the practice program, an individual task for harvest (medicinal plant raw materials).

CONTENT OF THE CURRICULUM OF EDUCATIONAL PHARMACOGNOSTIC PRACTICE

1. State, industry and local regulatory framework

1.1 State documents regulating the work of a pharmacist

1.1.1. Pharmacognosy. Educational practice: study guide / ed. I.A. Samylinoy, A.A. Sorokina. - M.: LLC Publishers Medical information agency, 2001. - 432 p.

1.1.2. Determinant of higher plants of Belarus / ed. V.I. Parfenova. - Minsk, 1999. - 472 p.

1.1.3. Flora of the Republic of Belarus: medical and economic value: [In 3 tons.]. T. 3 / V.I. Karpova [et al.]. - Vitebsk: VSMU, 2005. – 654

1.1.4. State Pharmacopoeia of the Republic of Belarus in 2 volumes; under total ed. A.A. Sheryakov. - Molodechno: Victory Printing House, 2012.

1.1.5. Methodical materials, approved by the department.

1.1.6. A practical course of pharmacognosy: study guide / V.O. Antonyuk, R.M. Lysyuk, L.Ya. Antonyuk. - Lviv: Printing house of Danila Galitsky Lviv State Medical University, 2011. - 499 p.

2. Facilities and equipment

Thematic practice classes are organized on the basis of pharmacies and pharmaceutical companies that have all the necessary facilities and equipment in accordance with regulatory documents, regulating their activities. For carrying out the harvesting and herbarization of medicinal plant materials in the department there are herbarium nets, drying cabinets, scissors, shovels and other necessary inventory.

Safe working conditions, fire safety rules, rules asepsis and antiseptics, methods of processing and protecting the hands of medical staff, sanitary and anti-epidemic regime are regulated by Resolution of the Ministry of Health of the Republic of Belarus 1 October 2012 No. 154 On approval of Sanitary standards and regulations "Sanitary and epidemiological requirements for pharmacies."

To cultivate plants, students use inventory and sharp tools (shovels, rakes, pruners, knives, scissors, etc.). To determine the reserves of raw materials, a square grid is used.

3. Professional techniques and methods of work

3.1. Herbarization, harvesting, drying of medicinal plant raw materials, containing various groups of biologically active substances (BAS);

3.2. Storage, uses and sailing in a pharmacy MPRM, herbal medicines and dietary supplements on the basis of MPRM containing different groups of biologically active substances;

3.3. Quality control of medicines in the pharmaceutical company;

- 3.4. Determination of stocks of medicinal plants. Mastering the method of determination yield wild medicinal plants;
- 3.5. Acquaintance with the main cultivated medicinal plants and their cultivation techniques.
- 3.6. **Individual task:** preparation of medicinal plant raw materials (search for a place growing, harvesting, drying and primary processing in accordance with preparation instructions)

INFORMATION-METHODICAL PART

CREDIT STANDARDS ON EDUCATIONAL PHARMACOGNOSTIC PRACTICE

Type of practical training, the name of the reception (methodology)	Standard number of academic hours	Done	
		total	independently
Herbarization, harvesting, drying of medicinal plant materials containing various groups of biologically active substances (BAS), in total	30	18	12
1. Essential oils, polysaccharides vitamins and phenolic glycosides.	10	6	4
2. Anthracene derivatives, tannins, saponins and coumarins.	10	6	4
3. Flavonoids, alkaloids and cardiac glycosides	10	6	4
Storage, uses and sailing in a pharmacy MPRM, herbal medicines and dietary supplements on the basis of MPRM containing different groups of biologically active substances, in total	36	24	12
1. Essential oils and polysaccharides.	9	6	3
2. Vitamins and phenolic glycosides, anthracene derivatives.	9	6	3
3. Tannins, saponins, coumarins	9	6	3
4. Flavonoids, alkaloids and cardiac glycosides	9	6	3
Determination of stocks of medicinal plants. Mastering the method of determination yield wild medicinal plants, in total	20	12	8
Acquaintance with the main cultivated medicinal plants and their cultivation techniques	22	18	4

CALENDAR AND THEMATIC PLAN OF THE PRACTICE

№ by order	Description of activities	The number of study days
1	Introduction to practice. Safety Instructions. Determination of stocks of medicinal plants.	1
2	Mastering the method of determination yield wild medicinal plants.	1
3	Storage, uses and sailing in a pharmacy MPRM, herbal medicines and dietary supplements on the basis of MPRM containing different groups of biologically active substances	4
4	Acquaintance with wild medicinal plants in different habitats (forest, meadow, marsh, coastal phytocenoses) with visiting nature, as well as with cultivated medicinal plants. Features of herbarization, harvesting, drying of medicinal plant materials	3
5	Acquaintance with the main cultivated medicinal plants and their cultivation techniques	2
6	Differentiated test	1
Days in total		12

GUIDELINES FOR PRACTICE LEADERS AND STUDENTS

Educational-methodical and organizational guidance of educational pharmacognostic practice is carried out by teachers of the department of Pharmacy Organization. The teacher of the department of Pharmacy Organization is responsible for the quality of educational pharmacognostic practice:

- exercises control over the organization and conduct of practice;
- oversees the implementation of the practice program;
- provides students with organizational and methodological assistance during practical training;
- checks student's reports;
- takes credit on the basis of practice or in the training rooms of the department.

STUDENT'S RESPONSIBILITIES DURING PROGRESSING OF EDUCATIONAL PHARMACOGNOSTIC PRACTICE

A student in the course of study is required to:

- implement the program of educational practice;
- obliged to keep discipline strictly and follow internal labor regulations at the practice bases;
- need to be instructed on the basis of educational practice and to follow strictly all safety rules and sanitary and hygienic norms;
- during field work, not take or eat fruits, roots, rhizomes, leaves and other parts of plants because they may be poisonous;
- avoid to taste unfamiliar plants and drink water from random sources;
- protect the nose and mouth with gauze face-guard or respirators, and eyes - goggles to avoid allergic and inflammatory reactions and poisoning when working with poisonous plants or poisonous plant raw materials it is necessary;
- wash hands and face thoroughly with soap and water after working with plants and herbal products;
- follow all necessary precautions when working with inventory and sharp tools (shovels, rakes, pruners, knives, scissors, etc.);
- keep records in the diary (Appendix 1-3) of the practice every day and provide the teacher's signature;
- make entries in a neat, legible hand. Corrections, additions to the posting of records by the head of the practice are not allowed;
- issue a report on the implementation of the educational practice program (Appendix 4).

QUESTIONS FOR DIFFERENTIATED TEST IN EDUCATIONAL PHARMACOGNOSTIC PRACTICE

1. Features of harvesting and drying medicinal plant raw materials

- 1.1. Features of harvesting and drying medicinal plant raw materials, containing polysaccharides: *Althea officinalis* and *Linum usitatissimum*.
- 1.2. Features of harvesting and drying medicinal plant raw materials, containing vitamins: *Rosa majalis/canina* and *Calendula officinalis*.
- 1.3. Features of harvesting and drying medicinal plant raw materials, containing essential oils: *Mentha piperita* and *Eucaliptus viminalis*.
- 1.4. Features of harvesting and drying medicinal plant raw materials, containing essential oils: *Valeriana officinalis* and *Pinus silvestris*.
- 1.5. Features of harvesting and drying medicinal plant raw materials, containing essential oils: *Betula pendula* and *Acorus calamus*.
- 1.6. Features of harvesting and drying medicinal plant raw materials, containing essential oils: *Matricaria chamomilla* and *Taraxacum officinale*.
- 1.7. Features of harvesting and drying medicinal plant raw materials, containing essential oils: *Thymus serpyllum* and *Foeniculum vulgare*.
- 1.8. Features of harvesting and drying medicinal plant raw materials, containing iridoids: *Viburnum opulus* and *Leonurus quinquelobatus*.
- 1.9. Features of harvesting and drying medicinal plant raw materials, containing cardiac glycosides: *Digitalis purpurea* and *Convallaria majalis*.
- 1.10. Features of harvesting and drying medicinal plant raw materials, containing saponins: *Glycyrrhiza glabra* and *Aesculus hippocastanum*.
- 1.11. Features of harvesting and drying medicinal plant raw materials, containing phenolic glycosides: *Arctostaphylos uva-ursi* and *Salix alba*.
- 1.12. Features of harvesting and drying medicinal plant raw materials, containing phenolic glycosides and lignans: *Rhodiola rosea* and *Sylibum marianum*.
- 1.13. Features of harvesting and drying medicinal plant raw materials, containing flavonoids: *Crataegus oxyocanta/sanguinea* and *Polygonum aviculare*.
- 1.14. Features of harvesting and drying medicinal plant raw materials, containing flavonoids: *Helicrysum arenarium* and *Ginkgo biloba*.
- 1.15. Features of harvesting and drying medicinal plant raw materials, containing flavonoids: *Equisetum arvense* and *Tanacetum vulgare*.
- 1.16. Features of harvesting and drying medicinal plant raw materials, containing anthracene derivatives: *Frangula alnus* and *Hypericum perforatum*.
- 1.17. Features of harvesting and drying medicinal plant raw materials, containing tannins: *Quercus robur* and *Vaccinium myrtillus*.
- 1.18. Features of harvesting and drying medicinal plant raw materials, containing tannins: *Alnus incana/glutinosa* and *Potentilla erecta*.

2. Pharmacological action and indication for medical use

- 2.1. Pharmacological action and indication for medical use of medicinal plant raw materials, containing polysaccharides: *Althea officinalis* and *Linum usitatissimum*.
- 2.2. Pharmacological action and indication for medical use of medicinal plant raw materials, containing vitamins: *Rosa majalis/canina* and *Calendula officinalis*.
- 2.3. Pharmacological action and indication for medical use of medicinal plant raw materials, containing essential oils: *Mentha piperita* and *Eucaliptus viminalis*.
- 2.4. Pharmacological action and indication for medical use of medicinal plant raw materials, containing essential oils: *Valeriana officinalis* and *Pinus silvestris*.
- 2.5. Pharmacological action and indication for medical use of medicinal plant raw materials, containing essential oils: *Betula pendula* and *Acorus calamus*.
- 2.6. Pharmacological action and indication for medical use of medicinal plant raw materials, containing essential oils: *Matricaria chamomilla* and *Taraxacum officinale*.
- 2.7. Pharmacological action and indication for medical use of medicinal plant raw materials, containing essential oils: *Thymus serpyllum* and *Foeniculum vulgare*.
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- 2.12. Pharmacological action and indication for medical use of medicinal plant raw materials, containing phenolic glycosides and lignans: *Rhodiola rosea* and *Sylibum marianum*.
- 2.13. Pharmacological action and indication for medical use of medicinal plant raw materials, containing flavonoids: *Crataegus oxyocanta/sanguinea* and *Polygonum aviculare*.
- 2.14. Pharmacological action and indication for medical use of medicinal plant raw materials, containing flavonoids: *Helicrysum arenarium* and *Ginkgo biloba*.
- 2.15. Pharmacological action and indication for medical use of medicinal plant raw materials, containing flavonoids: *Equisetum arvense* and *Tanacetum vulgare*.
- 2.16. Pharmacological action and indication for medical use of medicinal plant raw materials, containing anthracene derivatives: *Frangula alnus* and *Hypericum perforatum*.
- 2.17. Pharmacological action and indication for medical use of medicinal plant raw materials, containing tannins: *Quercus robur* and *Vaccinium myrtillus*.
- 2.18. Pharmacological action and indication for medical use of medicinal plant raw materials, containing tannins: *Alnus incana/glutinosa* and *Potentilla erecta*.

3. Resource management of medicinal plants

- 3.1. The definition of the concepts of "thicket", "commercial massif". Describe the yield method of accounting sites.
- 3.2. The definition of the concepts of "yield", "projective cover". Describe the yield method of model specimen.
- 3.3. The definition of the concepts "accounting site", "product exemplar". Describe the yield method of projective cover determination.
- 3.4. The definition of concepts "transect", "possible annual yield". Describe the yield method of accounting sites.
- 3.5. The definition of the concepts of "biological reserve", "operational reserve". Describe the yield method of model specimen.
- 3.6. The definition of the concepts of "yield", "frequency of harvesting" Describe the yield method of projective cover determination.

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

**PHARMACOGNOSTIC PRACTICE
DIARY**

(Surname, name, middle name)

Faculty

Year of study

Academic group №

Base of practice

(name of healthcare supervisor)

The supervisor from BSMU

(Surname of the Deputy)

Date

Topic title

Types of work performed

Description of plants during excursions, decorated by the table:

Latin name of MP, family and MPRM	Group of BAS	Conditions of preparation, drying	Pharmacological action, indications for use	Herbal medicines based on MP

Student Signature (daily) _____

Date, the signature of the head (daily) _____

Date

Topic title

Types of work performed

Description of plants during excursions, decorated by the table:

Characteristics of medicines and dietary supplements on the basis of MPRM during a visit to the pharmacy and the study of the pharmacy assortment, decorated by the table:

Medicine name, dosage form	Source of production (name of MP, family and MPRM)	Country and factory manufacturer	The main group of compounds in the composition of MPRM	Pharmacological effects	Indications for use

Student's signature (daily) _____

Date, manager's signature (daily) _____

Notes:

1. Entries are written in a neat, legible hand. Corrections, additions to the posting of records by the head of the practice are not allowed.
2. Registration of the diary, report, characteristics is carried out on paper A4 format using the application MS Word-2003 (or older) and is carried out in accordance with the requirements of the state standard STB 6-38-2004 to the details, text, design of the document and data in tables.
3. The signature of the head in the practice diary is certified in the prescribed manner.
4. Diaries, reports, characteristics, and other documents for each type of manufacturing practice are stored in accordance with the nomenclature of affairs of the departments of BSMU responsible for the organization of production practices.

Report of _____
(Name Surname)

about educational pharmacognostic practice
in the period from _____ 20 to _____ 20

Type of practical training, the name of the technique (method)	Done	
	Under the direction	independently

You must indicate the period of the practice, short characteristic of the practice base, studied materials and completion of the practice program, conclusions of practice program.

Appendix to the report. Individual task for the preparation of medicinal plant materials.

Student's signature (daily) _____

Practice Supervisor _____
Surname and Name


COMPILERS:

Head of the department of Pharmacy
Organization of the Educational
Institution «Belarusian State Medical
University» PhD in Pharmacy,
Associate Professor


signature

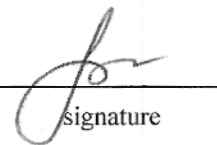
R.I. Lukashou

Associate Professor of the Department
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Educational Institution «Belarusian
State Medical University», PhD in
Biology;


signature

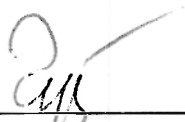
O.A. Kuznetsova

Senior Lecturer of the Department of
Pharmacy Organization of the
Educational Institution «Belarusian
State Medical University»


signature

N.I. Grischenko

Dean of the Pharmaceutical Faculty of
the Educational Institution «Belarusian
State Medical University», DSc,
Professor;


signature

N.S. Gurina

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

Dean of the Medical Faculty for
International Students
15.04 2019



O.S. Ishutin

Head of practice of the Educational
Institution " Belarusian State
Medical University»
15.04 2019



L.I. Zilinskaya

Head of the Foreign Languages Department



M.N. Petrova

Methodologist of Educational Institution
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24. Dec 2019



O.R. Romanovskaya

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