

**MINISTRY OF HEALTH OF UKRAINE
ODESSA NATIONAL MEDICAL UNIVERSITY
DEPARTMENT OF PHARMACEUTICAL CHEMISTRY AND DRUGS
TECHNOLOGY**

APPROVE

Vice-rector for scientific and pedagogical work

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«04» September 2023

**METHODOLOGICAL DEVELOPMENT OF A PRACTICAL LESSON
IN THE EDUCATIONAL DISCIPLINE «COSMETOLOGY RECIPE»**

Faculty Pharmaceutical Course 3

Educational discipline «Cosmetology recipe»
(*name of academic discipline*)

Approved:

Meeting of the Department of pharmaceutical chemistry and drug technology

Odessa National Medical University

Protocol № 1 «04» September 2023

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Practical lesson № 1

Topic: Cosmetics and medicated cosmetics, their characteristics. Features of the composition, application and effect on the skin of various groups of cosmetic products. (2 hours).

Purpose: to know the definition of a cosmetic and medicinal cosmetic product and the differences between them, the classification of cosmetic products, to orientate in the active and auxiliary substances included in the composition of cosmetic and medical cosmetic products, to have an idea about the modern directions of the development of the cosmetic industry and pharmaceutical care when dispensing products medicinal cosmetics/

Basic concepts: medicinal cosmetics, cosmetic products.

Equipment: samples of finished cosmetics.

Plan

1. Organizational moment (greetings, checking attendance, message of the topic, lesson goals, students' motivation to study the topic).

2. Control of reference knowledge (written work, face-to-face survey, etc.):

- requirements for student's theoretical readiness to perform practical classes (knowledge requirements, list of didactic units)

Cosmetic products are preparations that differ in an extraordinary variety of forms. All cosmetics can be classified by their physicochemical state, or by their consumer properties and purpose of use.

Cosmetic products (Ukrainian classification of goods of foreign economic activity 3304-3307) - this group includes cosmetics intended for the care of skin, hair, oral cavity and other parts of the body for the purpose of hygiene, prevention and improvement of appearance. This includes products for cleaning, moisturizing, makeup, hair removal, nail care, fragrances and more.

In accordance with the requirements of the State Standard of Ukraine 2472-94, cosmetic products include cosmetic products or their combination used for skin, hair, oral cavity care and perform hygienic, preventive and aesthetic functions. A similar definition of cosmetic products is given in the directive documents of the European Economic Community and other industrialized countries. In particular, according to the Directive on cosmetic products 76/768 EEC, "Cosmetic product" means any substance or product intended to come into contact with various external parts of the human body (skin, hair, nails, lips and external genitalia) or with teeth and mucous membranes of the oral cavity, exclusively or mainly for the purpose of cleaning them, giving them a smell, changing their appearance and improving the smell or protecting them and keeping them in good condition"

Cosmetics:

Purpose: Cosmetic products are designed to improve appearance, increase attractiveness and give skin, hair and nails a healthy and aesthetic appearance. They help to cleanse, moisturize, nourish and enhance natural beauty.

Composition: The composition of cosmetic products includes various components, such as water, emulsifiers, oils, plant extracts, fragrances and many other substances. They do not contain active pharmaceutical ingredients that are intended to treat specific problems and diseases.

The main purpose of cosmetic products:

- cleaning of the skin, its appendages, teeth, mucous membrane of the oral cavity and genitals from mechanical, fatty, protein and bacterial contamination;
- protection of the skin and its appendages from the adverse effects of environmental factors (increased insolation, dehydration, bacterial contamination, etc.);
- maintaining (or restoring) the functional state of the skin and its appendages at the level of 1 adequate physiological fluctuation of their functional state for a certain age category;
- beautifying and increasing attractiveness through the use of decorative cosmetics, means for fixing hairstyles, etc.;
- change in appearance without changes in body structure and functions (hair removal, hair styling, hair coloring, etc.).

The following assortment groups of products of the cosmetic industry enter the market of Ukraine:

1. **Cosmetics for lips and eyes** (State Classification of Products and Services 24.52.12): this category includes products for makeup of lips and eyes, such as lipsticks, lip gloss, mascara, eye pencils, etc.

2. **Means for manicures and pedicures** (State Classification of Products and Services 24.52.13): this includes nail care products, such as nail polishes, nail polish removers, angles and tools for manicures and pedicures.

3. **Powders, blushes, tonal creams** (State Classification of Products and Services 24.52.14): this group includes cosmetic products for the face, such as powders, blushes and tonal creams, which are used to even out skin tone and create makeup

4. **Skin care products** (State Classification of Products and Services 24.52.15): this subcategory includes various skin care products such as milks, creams, oils, make-up removers, sun creams and other hygienic and cosmetic products care

5. **Hair care products** (State Classification of Products and Services 24.52.16): This subcategory covers hair care products such as shampoos, hair sprays, curling, styling, coloring, balms and hair lotions.

6. **Hair products** (State Classification of Products and Services 24.52.17): this includes products for creating certain effects on the hair, such as diamonds, dyes, decolorants and other hair modeling products.

7. Toothpaste and oral hygiene products (State Classification of Products and Services 24.52.18): This category covers toothpastes and other dental and oral hygiene products, such as toothbrushes, mouthwashes, dental floss, etc.

8. Other toilet and hygiene products (State Classifier of Products and Services 24.52.19): this includes various personal hygiene and toilet products, such as deodorants, shaving products, bath salts and other body care products.

These assortment groups represent a wide range of products used for the care of appearance and hygiene, and they are regulated by the relevant standards and laws of the country to ensure safety and quality for consumers.

Medical cosmetics:

Medical cosmetics (Ukrainian classification of goods of foreign economic activity 3004) - this group includes products that have a medical function and are used to treat specific problems or conditions of the skin, hair, teeth, oral cavity and other parts of the body. This includes, for example, antiseptics for the oral cavity, drugs for the treatment of acne or other medical products for skin care.

Purpose: Medicinal cosmetics have a medical function and are used to treat certain skin problems, such as acne, eczema, seborrheic dermatitis, etc. They have active pharmaceutical ingredients that can treat or relieve certain skin conditions.

Composition: Medicinal cosmetics contain active pharmaceutical ingredients such as salicylic acid, benzoyl peroxide, hydrocortisone and others that can treat or relieve inflammation.

Medicinal cosmetics are produced in the following forms: cream, milk, oil, mask, balm, gel, lotion, shampoo, lipstick based on a mixture of fat-wax substances, pencil, bath salt, bath extract, toothpaste, dental elixir, means of protection against insects intended for direct application to the skin, soap with antiseptic properties.

Medicinal cosmetics in accordance with the "Regulations on registration and the procedure for issuing a permit for the import and use of foreign and domestic medicinal cosmetics", developed by the Pharmacological Committee of the Ministry of Health of Ukraine, include medicinal products intended for the prevention and treatment of diseases of the skin, its appendages and mucous membranes shells containing individual substances or mixtures of substances that are used for therapeutic or prophylactic purposes and are produced in the form of cosmetics. This definition of medical cosmetics is consistent with the definition of a medicinal product in WHO documents: "A medicinal product is a substance or product that is used or intended for use in order to change or study physiological systems or a pathological condition in the interests of the patient." That is, medical cosmetics are intended for the prevention and treatment of specific nosological forms of diseases of the skin, its appendages, teeth and mucous membranes with the aim of correcting the pathological process. Achieving a pharmacodynamic effect is possible only under conditions of introduction of medicinal substances into the formulation of medicinal

cosmetics. As a rule, medical cosmetics contain hormones, antiseptics, antibiotics, etc. as substances.

Medicinal cosmetics are produced in the same forms as products of the cosmetic industry (cream, milk, oil, mask, balm, gel, lotion, shampoo, lipstick, etc.). However, they differ from cosmetics in that they necessarily contain medicinal components that are intended for the prevention and treatment of specific diseases of the skin, appendages, teeth and mucous membranes.

These means have clearly defined indications for their use and contraindications for use, as well as an established course of treatment, including the dose, frequency and duration of administration. In contrast to the means of the cosmetic industry, the means of medical cosmetics are specially designed for the correction of specific pathological conditions and have a medical focus.

Features of the composition, application and effect on the skin of various groups of cosmetic products

1. *Skin care products (creams, lotions, oils):*

Composition: usually contain moisture-saving components, fats, vitamins and antioxidants.

Application: skin care products are designed to moisturize, nourish, protect and improve the condition of the skin. They can be prescribed for different types of skin (dry, oily, combination).

Effects on the skin: Skin care products can improve hydration, reduce dryness, inflammation and aging of the skin.

2. *Hair care products (shampoos, conditioners, masks):*

Composition: contain detergent components, moisturizers, proteins, vitamins and other active ingredients.

Application: hair care products are designed to clean, moisturize, nourish, style and restore hair.

Effect on hair: they can improve the structure of hair, give it shine, reduce brittleness and affect its softness.

3. *Means for oral hygiene (toothpastes, rinses):*

Composition: contain fluoride, antiseptic components, fragrances and moisturizers.

Application: intended for cleaning teeth from plaque, preventing caries and gum diseases.

Effects on the oral cavity: oral hygiene products help keep breath fresh, prevent plaque and gum inflammation.

4. *Make-up products (lipsticks, powders, mascara, tonal creams):*

Composition: contain pigments, moisturizers, texture components and flavorings.

Application: designed to create make-up, improve appearance and hide skin imperfections.

Effect on the skin: make-up products can give the face a smooth look, an even tone, highlight certain areas and create the desired image.

5. Nail care products (nail polishes, cuticle oils):

Composition: contain polymers, pigments, moisturizers and vitamins.

Application: intended for decorative design and care of nails and cuticles.

Effect on nails: nail care products can strengthen the nail plate, prevent brittleness and make nails more resistant.

Unlike medicinal products, which are produced in standard medical forms, such as ointment, liniment, solution, etc., medical cosmetics combine pharmacological properties with cosmetic and, in some cases, with decorative characteristics.

A typical example of medical cosmetics are nail polishes with antifungal components, in particular ketoconazole. This form of antifungal drugs, intended for the treatment of fungal infections of the nails, is characterized by excellent ease of use, creates stable and long-lasting contact between the affected tissues and the drug, prevents the spread of fungi in the environment and has a certain decorative effect. Similarly, lipstick containing acyclovir provides a therapeutic (antiviral) effect and also has decorative properties.

Anti-pediculosis shampoos can be mentioned as an example of a successful combination of therapeutic (anti-pediculosis) and cosmetology (washing) effects.

An example of the composition of an anti-pediculosis shampoo:

- Active anti-lice components: the shampoo contains special substances that are effective against lice. One such active ingredient is a pediculicide or other acaricide that kills lice and their eggs.
- Auxiliary antiseptic ingredients: some shampoos may contain additional antiseptic agents to increase effectiveness, such as chlorhexidine or permethrin.
- Emollients and humectants: Some shampoos may contain ingredients that help moisturize and soften the scalp to prevent irritation that may occur as a result of the treatment. For example, aloe vera extract has moisturizing properties and helps soothe irritated skin. It can be included in anti-lice shampoo to reduce itching and irritation. Glycerin is also a good humectant and can help retain moisture on the scalp.
- Preservatives: To ensure a long shelf life of the product and to prevent the growth of microorganisms, preservatives may be added to the shampoo. Parabens are one of the most common preservatives in cosmetic products. They have a wide range of action and effectively prevent the growth of bacteria and fungi. However, some people may be sensitive to parabens, and some anti-lice shampoos may choose other alternatives. Benzyl alcohol is a preservative that also has moisturizing properties. It can be useful in medicated shampoos as it helps to keep the product in good condition and retain moisture. Some natural essential

oils, such as tea tree oil, can be used as preservatives and have additional antiseptic properties.

- **Fragrances:** Some shampoos may contain fragrances that give the product a pleasant smell and color. Some medicinal and cosmetic shampoos may contain natural essential oils, such as tea tree oil, which not only have a pleasant aroma, but also have antiseptic properties. The lavender scent can be used as a natural fragrance and to soothe the skin and reduce itching.
- **Other auxiliary components:** the composition may include other substances that improve the consistency, fluidity and stability of the product. Such as citrates or citric acid can be added to adjust the pH of the shampoo. The correct pH level is important to maintain the stability of the formula and ensure the effectiveness of the treatment.

- **questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson:**

Answer the question

1. What are the main functions of cosmetic products specified in the State Standard of Ukraine 2472-94? How is a cosmetic product defined under the Cosmetics Directive 76/768 of the European Economic Community?
2. What are the main components of cosmetic products and what role do they play? What are the differences between cosmetics and medicated cosmetics in the context of their purpose and composition?
3. What medical functions do medicated cosmetics have, and in what cases are they used? What forms of release do medical cosmetics have, and how does this help in their use for medical purposes?
4. What pharmaceutical components can be included in medical cosmetics for the treatment of skin problems? What are the main ingredients commonly found in skin care products such as creams and lotions?
5. What are the functions of skin care products and how can they improve the condition of the skin? What ingredients are commonly found in hair care products such as shampoos and conditioners?
6. What active components are contained in oral hygiene products, and how do these products affect the health of teeth and gums?
7. What are the beneficial properties of make-up products and how can they improve the appearance of the face?
8. What ingredients are in nail care products and how can they improve the condition of nails?
9. Give examples of medical cosmetics that combine pharmacological and cosmetic characteristics and that have become popular in the care of appearance.

3. Formation of professional skills and abilities:

- **content of tasks (assignments);**

Task 1

Task 1. To describe the terms cosmetic and medicated cosmetics. Specify the main differences in the composition and purpose of these means. Fill in the table:

Main differences	Cosmetics	Medicinal cosmetics
Purpose of application		
Appointment		
Place of application		
Presence of medicinal substances		
The presence of a pharmacodynamic effect		
Action level		
Terms of retail sale		

Task 2. Conduct an analysis of a medical and cosmetic product for treatment (optional):

- lipsticks with aseptic properties
- shampoo for the treatment of seborrheic dermatitis
- means for the treatment of acne

- recommendations for the performance of the task;

According to the progress of the practical lesson, complete the individual task in your workbook.

- requirements for work results, including registration; The individual work task is filled in the workbook and handed over to the teacher for checking.

- control materials for the final stage of the lesson: problems, assignments, tests, etc.:

1. Which product group of the cosmetics industry includes lip and eye makeup products such as lipsticks, lip gloss, mascara, and eye pencils?

- a) Means for manicure and pedicure
- b) Hair care products
- c) Cosmetics for lips and eyes
- d) Skin care products

2. Which product group of the cosmetics industry includes nail care products such as nail polishes, nail polish removers, nail polish removers, and manicure and pedicure tools?

- a) Means for oral hygiene
- b) Cosmetics for lips and eyes
- c) Means for manicure and pedicure
- d) Hair care products

3. Which product subcategory of the cosmetic industry includes facial products such as powders, blushes, and foundations designed to even out skin tone and create makeup?

- a) Cosmetics for lips and eyes

- b) Means for oral hygiene
- c) Powders, blushes, tonal creams
- d) Nail care products

4. Summing up. Notification of current grades, comments of the teacher regarding the preparation of students for the practical lesson, announcement of the next topic of the lesson.

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Notification of current grades, comments of the teacher regarding the preparation of students for the practical lesson, announcement of the next topic of the lesson.

5. List of recommended literature:

Main:

1. Технологія косметичних засобів : підручник для студ. вищ. навч. закладів / О. Г. Башура, О. І. Тихонов, В. В. Россіхін [та ін.] ; за ред. О. Г. Башури і О. І. Тихонова. — Х. : НФаУ ; Оригінал, 2017. — 552 с.
2. Тихонов, О. І. Аптечна технологія ліків / О. І. Тихонов, Т. Г. Ярних. – Вінниця: Нова книга, 2016. – 536 с.
3. Посилкіна О. В., Котлярова В. Г., Чечетка О. В. Методичні рекомендації щодо оптимізації асортименту лікарських косметичних засобів в аптечних закладах : наук.- Харків : НФаУ, 2019. 31 с.
4. Технологія лікувально-косметичних засобів: навчальний посібник / упоряд.: Борисюк І. Ю., Фізор Н. С., Валіводзь І. П., Акішева А. С.. Одеса, ОНМедУ, 2020.-52 с. – Режим доступу: <https://onmedu.edu.ua/wp-content/uploads/2021/01/1.pdf>
5. Екстемпоральні прописи для терапії дерматологічних захворювань: навч. посіб. для студентів медичних та фармацевтичних вузів / Н. П. Половко, Л. І. Вишневська, Т. М. Ковальова та ін. – Х. : Вид-во НФаУ, 2017. – 91 с.

Additional literature:

1. Технологія виготовлення екстемпоральних лікарських апіпрепаратів і їх застосування в фармації, медицині та косметології : методичні рекомендації / О. І. Тихонов, Т. Г. Ярних, С. О. Тихонова, О. С., О. Г. Башура, О. С. Шпичак, Л. О. Бондаренко, П. С. Сирота, Б. Т. Кудрик, Р. І. Скрипник, Тихонов, Н. С. Богдан, С. Г. Бобро, Л. В. Каношевич, О. Є. Богуцька; за ред. О. І. Тихонова. – Х. : Изд-во НФаУ, 2016. – 75 с. 7.Гіалуронова кислота: біосинтез та використання / І. В. Лич, А. О. Угрин, І. М. Волошина // Український біофармацевтичний журнал. - 2019. - № 2. - С. 6-13.
2. Дедишина Л. Косметика в аптеці: престижно та прибутково. Фармацевт Практик. 2015. № 12. С. 28-29.
3. Маркетинг у фармації та парфумерно-косметичній галузі: навчально-методичний посібник для самостійної роботи студентів фармацевтичного факультету

спеціальності «Технології парфумерно-косметичних засобів», / Н.О. Ткаченко., В.О. Демченко, Н.М. Червоненко, Т.П.Зарічна. - Запоріжжя: ЗДМУ, 2016. - 100 с

4. Zujkina S.S. The pharmacotechnological studies of the phytoppecies composition for the complex therapy of mastopathy / S.S. Zujkina, L.I. Vishnevskya // Вісник фармації. – 2017. – № 2 (90). – С. 43-47.

15. Electronic information resources

1. [Department of pharmaceutical chemistry and drug technology of ONMedU](#) – website of the Department of pharmaceutical chemistry and drug technology of ONMedU
2. [Scientific library of ONMedU \(odmu.edu.ua\)](#) - Scientific library of ONMedU
3. [www.moz.gov.ua](#) – official website of the Ministry of Health of Ukraine
4. [Odessa National Medical University \(onmedu.edu.ua\)](#) – ONMedU official website
5. State Register of Medicinal Products of Ukraine. - [Electronic resource]. - Access mode: <http://www.drlz.com.ua/> – as of 10.01.2017.

Practical lesson № 2

Topic: Sanitary and hygienic examination of cosmetics. Toxicological and hygienic indicators and safety norms of cosmetic products. Certification of cosmetic products (2 hours).

Purpose: to acquaint students with the basic concepts and principles of sanitary-hygienic examination of cosmetics, toxicological-hygienic indicators and safety standards of cosmetic products, as well as with the procedure of certification of cosmetic products.

Basic concepts: toxicity index, sanitary and hygienic examination, certification, expiration date.

Equipment: normative documents regulating the safety and quality of cosmetic products.

Plan

1. Organizational moment (greetings, checking attendance, message of the topic, lesson goals, students' motivation to study the topic).

2. Control of reference knowledge (written work, face-to-face survey, etc.):

- requirements for student's theoretical readiness to perform practical classes (knowledge requirements, list of didactic units)

Basic concepts:

Cosmetic products - products used for skin, hair, oral cavity care; perform hygienic, preventive and aesthetic functions.

Expertise (from French expertise, Latin espertus – researched) – research by a specialist-expert of any issues, the solution of which requires special knowledge in the field

of science, technology, economics, trade, etc. Sanitary and hygienic examination of cosmetic products is a set of measures carried out in order to assess their safety for human health.

Certification of cosmetic products is a procedure that confirms the compliance of cosmetic products with the requirements of regulatory documents.

Toxicological and hygienic indicators and safety standards of cosmetic products are characteristics that characterize the safety of cosmetic products for human health. The modern beauty and cosmetics industry provides consumers with a wide selection of skin, hair and nail care products.

However, it is important that these cosmetics are safe to use and they must meet established safety and quality standards.

Sanitary and hygienic examination of cosmetics

Sanitary and hygienic examination of cosmetics is a set of measures aimed at assessing their safety for human health. Examination is carried out at all stages of the life cycle of cosmetic products: development, production, storage, transportation, sale. Sanitary and hygienic examination of cosmetic products in Ukraine is carried out on the basis of legal acts that establish requirements for the safety of cosmetic products.

Sanitary and hygienic examination of cosmetic products in Ukraine is carried out in several stages:

- The preliminary assessment stage - is carried out to determine the need for a full sanitary and hygienic examination.
- The stage of full sanitary and hygienic examination - is carried out to assess the safety of cosmetic products based on the data provided by the manufacturer.
- Stage of state registration - is carried out to obtain permission to introduce cosmetic products into circulation on the territory of Ukraine.
- Sanitary and hygienic examination of cosmetic products in Ukraine is carried out by the bodies of the state sanitary and epidemiological service.

Based on the results of sanitary and hygienic examination of cosmetic products, the following decision can be made:

- Cosmetic products meet safety requirements and may be allowed to be put into circulation.
- Cosmetic products do not meet safety requirements and cannot be put into circulation.

The main regulatory and legal acts that regulate the sanitary and hygienic examination of cosmetic products in Ukraine are:

1. State sanitary rules and product safety standards of the perfumery and cosmetics industry (DSanPiN 2782-99).
2. International standard ISO 22716:2007 «Good Manufacturing Practice for Cosmetics». The main document that regulates the composition and circulation of cosmetic products in Ukraine is the State Sanitary Rules and Regulations (**DSanPiN**) 2.2.9.027-99 «Sanitary

rules and safety regulations for products of the perfume and cosmetic industry», which define cosmetics as «means that are used for skin, hair, oral cavity care; perform hygienic, preventive and aesthetic functions».

The international standard ISO 22716:2007 «Good Manufacturing Practice for Cosmetics» establishes requirements for good manufacturing practice (GMP) for cosmetic products. It applies to all stages of the production of cosmetic products, from the purchase of raw materials to the storage and transportation of finished products.

Establishes requirements for good manufacturing practice (GMP) in the following areas:

Organization of production - ISO 22716:2007 establishes requirements for the organization of production of cosmetic products, including personnel management, documentation, quality control, risk management, etc.

Manufacturing processes - ISO 22716:2007 establishes requirements for manufacturing processes, including procurement of raw materials and materials, production, packaging, storage and transportation of cosmetic products.

Quality control - ISO 22716:2007 establishes requirements for quality control of cosmetic products, including control of raw materials and materials, control of production, control of finished products.

Implementation of ISO 22716:2007 ensures:

- Ensuring the safety of cosmetic products for human health.
- Improving the quality of cosmetic products.
- Increasing production efficiency.
- Cost reduction.
- Improving the company's reputation.

In Ukraine, ISO 22716:2007 is not a mandatory standard, but its implementation is appropriate for manufacturers of cosmetic products who seek to ensure compliance of their products with safety and quality requirements. Certification of conformity of cosmetic products to the requirements of ISO 22716:2007 is carried out by certification bodies that are accredited in accordance with the requirements of international standards. Certification allows manufacturers of cosmetic products to demonstrate compliance of their products with safety and quality requirements.

State regulation of the sale of cosmetic products requires passing a series of checks to obtain relevant documents. All perfumery and cosmetic products are subject to a mandatory hygienic evaluation with a check of product samples for compliance with the norms and safety requirements established by DSanPiN 2.2.9.027-99.

DerzhSanPiN 2.2.9.027-99 is the main document that regulates the safety of cosmetic products, and the permit for the production and use of perfumery and cosmetic products is a positive hygienic opinion on the recipe and technical conditions, followed by their registration and approval. SanPiN establish hygienic requirements and safety standards for human health of products of the perfume and cosmetic industry, as well as the procedure

for conducting state sanitary and hygienic examination at the stages of development, production, transportation, storage, sale and professional use of cosmetics.

DSanPiN 2.2.9.027-99 establishes 412 substances/substances of medicinal products that cannot be added to cosmetic products. Safety requirements regarding toxicological and hygienic indicators are also established.

Cosmetics must be manufactured in accordance with recipes and technical requirements according to technological instructions (regulations) approved in accordance with the established procedure.

The production of perfumery and cosmetic products is allowed if there is a positive conclusion of the state sanitary and hygienic examination of regulatory documentation.

The introduction into production of each cosmetic product is carried out with the approval of the state sanitary-epidemiological service on the ground.

Changes in formulations or the production of cosmetics with a change in formulation are carried out only with the approval of the specified authorities.

Addition of prohibited substances or medicinal substances to the cosmetic is prohibited.

Therefore, **DSanPiN 2782-99** establish requirements for the safety of cosmetic products that are produced and sold in Ukraine. Technical regulations of the Customs Union TR TS 009/2011 establish safety requirements for cosmetic products that are produced and sold on the territory of the Customs Union, which includes Ukraine. The international standard ISO 22716:2007 establishes requirements for good manufacturing practice (GMP) for cosmetic products.

Sanitary and epidemiological (hygienic) certification

According to the Law of Ukraine «On Ensuring the Sanitary and Epidemiological Welfare of the Population», a sanitary-epidemiological certificate (hygienic certificate) is required for the introduction of cosmetic products into circulation. Sanitary-epidemiological (hygienic) certificate is a one-time document issued by the bodies of the state sanitary-epidemiological service, which confirms the safety for human health and life of certain types of consumer goods (perfume and cosmetic products, children's range products, household products, etc.) based on the results of sanitary-chemical, toxicological, physico-chemical, radiological, microbiological and other studies.

Cosmetic products must meet the safety requirements for human health established by regulatory and legal acts. These requirements include:

- **Chemical indicators** - cosmetic products should not contain substances that can be harmful to human health.
- **Microbiological indicators** - cosmetic products must be safe from the point of view of microbiological purity.
- **Physico-chemical indicators** - cosmetic products must meet the requirements for their physical and chemical properties.

- **Labeling** - cosmetic products must be correctly labeled in accordance with the requirements of regulatory and legal acts.

The procedure for obtaining a sanitary-epidemiological certificate

To obtain a sanitary-epidemiological certificate, a manufacturer or importer of cosmetic products must apply to the body of the state sanitary-epidemiological service. For this, it is necessary to provide the following documents:

1. Application.
2. Certificate of registration of the manufacturer or importer.
3. Technical conditions (TC) or standard ("State Standard of Ukraine") for cosmetic products.
4. Documentation of raw materials and materials used for the production of cosmetic products.
5. Test results of cosmetic products for compliance with safety requirements.

The procedure for conducting sanitary and hygienic examination and issuing certificates is approved by the Order of the Ministry of Health of Ukraine No. 247 dated October 9, 2020.

The application for sanitary and hygienic examination contains information about the manufacturer, the Applicant (the owner of the opinion), the code of foreign economic activity, the name and the scope of application and sale of the products. The application may include a large list of similar products. Documentation for products and samples must be submitted together with the Application.

Production inspection is not carried out, GMP compliance is not required.

The State Service of Ukraine for Food Safety and Consumer Rights Protection conducts the examination and issues a conclusion based on the results of the examination. The examination includes laboratory studies of product samples, examination of submitted documents, scientific substantiation of safety criteria and conditions of use of products. Based on the results of the examination, a conclusion (certificate) is issued, approved by the Head of the State Service of Ukraine for Food Safety and Consumer Rights Protection, with an entry in the electronic register.

A sanitary-epidemiological certificate is issued for a period of up to 3 years. The validity period of the conclusion (hygienic certificate) for imported products is 5 years. After the conclusion expires, the procedure must be repeated.

Sanitary regulations prohibit the content of the following substances in cosmetics:

- Substances that may be dangerous to human health under normal or foreseeable conditions of use, in particular:
 - Substances that can cause cancer, mutations or reproductive disorders.
 - Substances that can cause allergic reactions.
 - Substances that may cause skin, mucous membrane or eye irritation.
 - Substances that can cause damage to the skin or hair.
 - Substances that can cause poisoning.

- Substances that can be harmful to the environment.

A specific list of prohibited substances is given in the following documents:

1. DSanPiN 2.2.9.027-99 «Hygienic requirements for the safety of perfumery and cosmetic products.».
2. Directive 76/768/EEC on cosmetic products.

For example, prohibited substances include:

1. Mercury and its compounds.
2. Formaldehyde.
3. Tin and its compounds.
4. Cadmium and its compounds.
5. Chlorophenol.
6. Toluene.
7. Methyl isobutyl ketone.
8. Phthalates.
9. Parabens.

Directive 76/768/EEC «Safety and quality of perfumery and cosmetic products» («Cosmetic products directive») uses the term cosmetic products. In November 2009, the new regulation of cosmetic products was approved - Regulation (EC) No. 1223/2009 Of the European Parliament and of the Council, which also uses the term cosmetic products.

The regulation states that «a **cosmetic product**» is any substance or preparation intended for application to various external human coverings (skin, hair, nails, lips, and external genitalia) or to the teeth and mucous membrane of the oral cavity, with a single or with the main purpose of cleaning them, giving them a pleasant smell, changing their appearance and/or correcting their natural smell and/or protecting and maintaining them in good condition.

Toxicological and hygienic indicators and safety standards of cosmetic products are criteria that cosmetics must meet in order to be safe for human health. Such indicators include:

1. Toxicity index. This is a quantitative characteristic of the toxicity of substances that are part of cosmetic products. It is defined as the ratio of the concentration of a substance at which a certain reaction is observed to the concentration of a substance at which this reaction is not observed.

2. Maximum permissible concentration (MPC) - the maximum concentration of a substance in cosmetic products that does not pose a danger to human health under normal or foreseeable conditions of use. The MPC of cosmetic products is established based on the results of laboratory tests on the toxicity of substances. At the same time, the route of penetration of the substance into the human body, its toxicity, as well as the duration and frequency of contact with the substance are taken into account.

3. Maximum permissible dose (MAD) - the maximum dose of a cosmetic product that does not pose a danger to human health with single or repeated use. The GDD of cosmetic products is established on the basis of the results of laboratory tests on the toxicity of substances that are part of cosmetic products. At the same time, the route of penetration of the substance into the human body, its toxicity, as well as the duration and frequency of contact with the substance are taken into account. For example, the MPC for formaldehyde in cosmetics is 0.2%. This means that the maximum concentration of formaldehyde in cosmetics should not exceed 0.2%. The SDS for body lotion is 100 ml. This means that the maximum dose of body lotion, which does not pose a danger to human health when used once, is 100 ml. MPC and MPC are two different concepts that are used to assess the safety of cosmetic products. That is, the MPC is established for substances that are part of cosmetic products, and the GDD is for the cosmetic products themselves.

4. Expiry date. The shelf life of cosmetic products is usually 3 to 5 years. However, some cosmetics, such as foundation, powder or mascara, may have a shorter shelf life, such as 6 to 12 months. The expiration date of cosmetic products is usually indicated on the packaging. It can be marked in the form of a date, or in the form of a symbol of an open jar with a number that indicates the number of months during which the product can be used after its opening.

5. Other indicators established by regulations. Other indicators established by legal acts include: physico-chemical indicators (acid-alkaline balance (pH), concentration of preservatives, concentration of flavorings, microbiological purity, safety (allergenic effect, dermatotoxic effect, carcinogenic effect, mutagenic effect, reproductive toxicity), environmental friendliness (toxicity for the environment, degradability, environmental pollution).

Composition and labeling

Before introducing a cosmetic product to the market, it is important to check the correctness of its composition and labeling. Labeling should contain information on the composition of components, expiration date, instructions for use and storage. It is also necessary to specify the manufacturer and contact information.

Marking

Labeling of cosmetic products put into circulation according to a hygienic opinion must comply with the Laws of Ukraine «On the Protection of Consumer Right» «On the General Safety of Non-Food Products», State Standard of Ukraine ISO 22715:2019 «Cosmetic Products. Packaging and labeling» and other legislative acts.

Marking should include:

- product name, trade name;
- the name and address of the person responsible for providing the product on the market;
- name and location of the manufacturer;
- list of ingredients;

- purpose of the product;
- storage conditions;
- nominal amount;
- batch number, production date and other data for product identification;
- expiration date;
- precautions;
- instructions for use;
- information on the content of harmful substances and precautions for use;
- a note about the presence of genetically modified organisms in the composition;
- information about the necessary actions after the expiration date and about the possible consequences in case of failure to perform these actions;
- if applicable: if cosmetic products can be dangerous for the consumer's health or property, or for the environment - then information about such properties and possible consequences.

Information is provided in the state (Ukrainian) language. Stickering is not prohibited. Models for cosmetic products put into circulation based on a hygienic opinion do not require registration.

Basic requirements for cosmetic products:

- Cosmetic products must be safe for human health.
- Cosmetic products must have established expiration dates.
- Cosmetic products must meet the requirements of regulatory and technical documentation.

The quality of the cosmetic product must meet safety standards in accordance with legislation, state standards, norms and rules.

Ensuring this requirement is carried out by, in particular:

- approval of the recipe for each individual product, according to which the production should be carried out;
- an expert study of the manufactured samples with the provision of a sanitary and hygienic opinion on the compliance of the cosmetic product with the requirements of the state standard;
- selective inspections of the quality of cosmetics in production;
- the procedure of state registration in the Ministry of Health as a medical cosmetic product (depending on the composition of the substances).

With the content of medicinal substances, the cosmetic product must undergo a multi-step procedure of state registration of the Ministry of Health with the issuance of a registration certificate.

The law establishes requirements for the labeling of cosmetics, indication of ingredients and rules of use.

Violation of the recipe, the procedure for registration, non-compliance of the quality of the cosmetic product and labeling with the established norms causes legal consequences depending on the nature of the violation or the damage caused.

Cosmetic creams, balms, serums, etc. conventionally grouped into ordinary cosmetics and therapeutic cosmetics.

Conventional cosmetics - which are used for skin, hair, oral cavity care; are applied with the sole or main purpose of cleaning them, changing their appearance and (or) correcting body odor, and (or) protecting or preserving them in good condition perform hygienic, preventive and aesthetic functions (State Standard of Ukraine 2472:2006 «Perfume Products cosmetic», DSanPiN 2.2.9.027-99).

Medicinal cosmetics are medicinal products intended for the prevention and treatment of diseases of the skin and its appendages (hair, eyelashes, nails), contain separate substances or a mixture of substances that are used for therapeutic or prophylactic purposes and are produced in the form of cosmetic products («Regulations on Registration and the procedure for issuing a permit for the import and use of foreign and domestic medical cosmetics» of the Pharmacological Committee of the Ministry of Health of Ukraine No. 3 dated 05/23/1996).

Control of the formulation and quality of ordinary cosmetics is entrusted to the institutions of the state sanitary-epidemiological service. Admission to the production and circulation of medical cosmetics is a complex separate procedure, performed and controlled by the authorities of the Ministry of Health of Ukraine.

Separate state standards are often adopted for the production, labeling and packaging of certain types of ordinary cosmetics (for example, State Standard of Ukraine 4763:2007 «Cosmetic balms. General technical conditions», State Standard of Ukraine 5010:2008 «Perfume and cosmetic products. Packaging, labeling, transportation and storage»). For the production of cosmetic products, raw materials are used in accordance with the current regulatory documentation or of imported production, approved by the central executive authority in the field of health care of Ukraine for use in the production of cosmetic products.

It is forbidden not to indicate individual ingredients when labeling a cosmetic product or to add substances to cosmetics that are not in the originally approved formulation.

The sale of cosmetics is carried out in the presence of a positive hygienic conclusion of the state sanitary-hygienic examination regarding the quality of manufactured or imported products, which is approved by the chief state sanitary doctor of Ukraine or persons authorized by him.

Packaging and labeling of cosmetics must meet the requirements of state standards. Sanitary and hygienic examination and certification of cosmetic products are important procedures that ensure the safety and quality of cosmetic products for consumers.

Sanitary and hygienic examination is a procedure for assessing the compliance of cosmetic products with the requirements of legislation in the field of sanitary and epidemiological well-being of the population.

Certification is a procedure for confirming product compliance with established requirements.

The importance of sanitary and hygienic examination and certification of cosmetic products:

- Consumer health protection. Sanitary and hygienic examination and certification make it possible to ensure compliance of cosmetic products with established safety requirements, which prevents the negative impact of cosmetic products on the health of consumers.
- Ensuring the quality of cosmetic products. Sanitary and hygienic examination and certification ensure compliance of cosmetic products with established quality requirements, which guarantees their effectiveness and safety during use.
- Protection of consumer rights. Sanitary and hygienic examination and certification are a guarantee that the cosmetic products sold on the market meet the established requirements and do not pose a danger to the health of consumers.

The main stages of sanitary and hygienic examination and certification of cosmetic products:

1. Collection of documents. The manufacturer or importer of cosmetic products must provide the sanitary-epidemiological supervision authorities with a package of documents confirming the compliance of the cosmetic products with the established requirements.
2. Analysis of documents. Bodies of sanitary-epidemiological supervision conduct an analysis of documents provided by the manufacturer or importer of cosmetic products.
3. Laboratory studies. If necessary, the bodies of sanitary and epidemiological supervision conduct laboratory tests of cosmetic products.
4. Making a decision. Based on the results of the analysis of documents and laboratory tests, the sanitary-epidemiological supervision bodies make a decision on the compliance of cosmetic products with the established requirements.
5. Issuance of a conclusion of a sanitary-hygienic examination or a certificate of conformity. In the case of a positive decision, the sanitary-epidemiological supervision bodies issue a sanitary-hygienic examination conclusion or a certificate of conformity to the manufacturer or importer of cosmetic products.
6. The conclusion of the sanitary and hygienic examination is a document that confirms the compliance of cosmetic products with the established safety requirements.

A certificate of conformity is a document that confirms the compliance of cosmetic products with established safety and quality requirements.

The conclusion of the sanitary-hygienic examination or the certificate of conformity are mandatory documents for the production, import and sale of cosmetic products on the territory of Ukraine.

- **questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson:**

Answer the question

1. What is sanitary and hygienic examination of cosmetic products?
2. What stages does the sanitary and hygienic examination of cosmetic products include?

3. What are the toxicological and hygienic indicators and safety norms of cosmetic products?
4. What are the types of certification of cosmetic products?
5. How is the toxicity index of cosmetic products determined? Which substances with a high toxicity index are prohibited or restricted for use in cosmetics?
6. What is the maximum permissible concentration and maximum permissible dose of cosmetic products? How are the maximum permissible concentration and maximum permissible dose of cosmetic products established?
7. How is the expiration date of cosmetic products determined? What factors affect the shelf life of cosmetics?
8. What is the importance of sanitary and hygienic examination and certification of cosmetic products?
9. What documents are required for passing sanitary and hygienic examination and certification of cosmetic products?
10. What are the possible consequences for the manufacturer if his products do not meet safety standards and do not have a certificate?

3. Formation of professional skills and abilities:

- content of tasks (assignments);

Task 1

Task 1. Analyze the composition of the cosmetic cream under the conditional name «Night tenderness» for compliance with the requirements of regulatory and legal acts. At the same time, check whether the composition of the cosmetic does not contain substances that are prohibited or restricted in use.

Substance	Application	Regulatory base
Water		
Glycerin		
Cetearyl alcohol		
Paraffin		
Lanolin		
Perfume composition (jasmine aroma)		
Benzoic acid		

Task 2. Conduct an analysis of the composition of the cosmetic shampoo for hair under the conditional name "Forest Beauty" for compliance with the requirements of regulatory and legal acts. At the same time, check whether the composition of the cosmetic product does not contain substances that are prohibited or restricted in use in the form of a table.

Substance	Application	Regulatory base
Water		
Sodium laureth sulfate		
Cocamidopropyl betaine		
Dimethicone		
Glycerin		
Allantoin		
Jojoba oil		
Benzylparaben		

Describe proposals for improving the composition of cosmetic products. Task 3. Analyze cosmetic products:

Task 3. Analyze cosmetic products:



Substance	Application
Purified water (Aqua)	
Olive Oil	
Mineral Oil	
Isopropyl myristate	
Glyceryl Stearate	
Glycerin	
Stearic Acid	
Vitamin E (Tocopheryl Acetate)	
Cucumis Sativus Extract	
Ceteareth-20	
Ceteareth-12	
Cetearyl Alcohol	
Lanolin	
Sodium Hydroxide	
Phenoxyethanol	
Ethylhexylglycerin	
Parfum	

- recommendations for the performance of the task;

According to the progress of the practical lesson, complete the individual task in your workbook.

- requirements for work results, including registration; The individual work task is filled in the workbook and handed over to the teacher for checking.

- control materials for the final stage of the lesson: problems, assignments, tests, etc.:

1. What does the sanitary and hygienic examination of cosmetic products include?

- a) Only the safety assessment at the production stage.
- b) Safety assessment at all stages of the life cycle.
- c) Only the safety assessment at the implementation stage.
- d) Safety assessment only for popular cosmetic products.

2. Why is the preliminary assessment stage in the sanitary and hygienic examination of cosmetic products carried out?

- a) To assess the safety of cosmetic products.
- b) To determine the need for a full examination.
- c) For registration of cosmetic products on the territory of Ukraine.
- d) For the production of cosmetics.

3. What decisions can be made based on the results of sanitary and hygienic examination of cosmetic products?

- a) Only admission to circulation.
- b) Only refusal of admission to circulation.
- c) Both admission to circulation and refusal.
- d) Only refusal to register cosmetic products.

4. Which bodies carry out sanitary and hygienic examination of cosmetic products in Ukraine?

- a) State control bodies.
- b) Bodies of the state sanitary and epidemiological service.
- c) Private companies.
- d) Manufacturers of cosmetics.

5. What main document regulates the composition and circulation of cosmetic products in Ukraine?

- a) International standard ISO 22716:2007.
- b) State sanitary rules and regulations (State Sanitary Regulations) 2.2.9.027-99.
- c) Constitution of Ukraine.
- d) Law on cosmetics.

6. What areas of production does the ISO 22716:2007 standard cover?

- a) Only production of cosmetic products.
- b) Only the production of medical devices.
- c) All stages of production of cosmetic products, including procurement of raw materials, production, packaging, storage and transportation.

- d) Only packaging of cosmetic products.
7. What types of research are conducted to obtain a sanitary-epidemiological certificate?
- a) Only chemical and microbiological.
b) Physico-chemical, microbiological, toxicological, radiological and other.
c) Only toxicological studies.
d) Chemical and physico-chemical.
8. What does the sanitary-epidemiological (hygienic) certificate confirm?
- a) Product quality.
b) The price of consumer goods.
c) Safety for human health and life of certain types of consumer goods. d) Product expiration date.
9. What documents must be provided to obtain a sanitary-epidemiological certificate?
- a) Only the statement and certificate of registration of the manufacturing enterprise.
b) Application, certificate of registration, technical conditions and test results.
c) Only technical conditions and test results.
d) Application and documentation for raw materials and materials.
10. Which bodies in Ukraine control the formulation and quality of conventional cosmetics?
- a) Local self-government bodies.
b) Ministry of Health of Ukraine.
c) Ministry of Economy of Ukraine.
d) Law enforcement agencies.

4. Summing up

Notification of current grades, comments of the teacher regarding the preparation of students for the practical lesson, announcement of the next topic of the lesson.

5. List of recommended literature:

Main:

1. Технологія косметичних засобів : підручник для студ. вищ. навч. закладів / О. Г. Башура, О. І. Тихонов, В. В. Россіхін [та ін.] ; за ред. О. Г. Башури і О. І. Тихонова. — Х. : НФаУ ; Оригінал, 2017. — 552 с.
2. Тихонов, О. І. Аптечна технологія ліків / О. І. Тихонов, Т. Г. Ярних. – Вінниця: Нова книга, 2016. – 536 с.
3. Посилкіна О. В., Котлярова В. Г., Чечетка О. В. Методичні рекомендації щодо оптимізації асортименту лікарських косметичних засобів в аптечних закладах : наук.-Харків : НФаУ, 2019. 31 с.
4. Технологія лікувально-косметичних засобів: навчальний посібник / упоряд.: Борисюк І. Ю., Фізор Н. С., Валіводзь І. П., Акішева А. С.. Одеса, ОНМедУ, 2020.-52 с. – Режим доступу: <https://onmedu.edu.ua/wp-content/uploads/2021/01/1.pdf>

5. Екстемпоральні прописи для терапії дерматологічних захворювань: навч. посіб. для студентів медичних та фармацевтичних вузів / Н. П. Половко, Л. І. Вишневська, Т. М. Ковальова та ін. – Х. : Вид-во НФаУ, 2017. – 91 с.

Additional literature:

1. Технологія виготовлення екстемпоральних лікарських апіпрепаратів і їх застосування в фармації, медицині та косметології : методичні рекомендації / О. І. Тихонов, Т. Г. Ярних, С. О. Тихонова, О. С., О. Г. Башура, О. С. Шпичак, Л. О. Бондаренко, П. С. Сирота, Б. Т. Кудрик, Р. І. Скрипник, Тихонов, Н. С. Богдан, С. Г. Бобро, Л. В. Каношевич, О. Є. Богуцька; за ред. О. І. Тихонова. – Х. : Изд-во НФаУ, 2016. – 75 с. 7. Гіалуронова кислота: біосинтез та використання / І. В. Лич, А. О. Угрин, І. М. Волошина // Український біофармацевтичний журнал. - 2019. - № 2. - С. 6-13.
2. Дедишина Л. Косметика в аптеці: престижно та прибутково. Фармацевт Практик. 2015. № 12. С. 28-29.
3. Маркетинг у фармації та парфумерно-косметичній галузі: навчально-методичний посібник для самостійної роботи студентів фармацевтичного факультету спеціальності «Технології парфумерно-косметичних засобів», / Н.О. Ткаченко., В.О. Демченко, Н.М. Червоненко, Т.П.Зарічна. - Запоріжжя: ЗДМУ, 2016. - 100 с
4. Zujkina S.S. The pharmacotechnological studies of the phytoppecies composition for the complex therapy of mastopathy / S.S. Zujkina, L.I. Vishnevskaya // Вісник фармації. – 2017. – № 2 (90). – С. 43-47.

15. Electronic information resources

1. [Department of pharmaceutical chemistry and drug technology of ONMedU](#) – website of the Department of pharmaceutical chemistry and drug technology of ONMedU
2. [Scientific library of ONMedU \(odmu.edu.ua\)](#) - Scientific library of ONMedU
3. [www.moz.gov.ua](#) – official website of the Ministry of Health of Ukraine
4. [Odessa National Medical University \(onmedu.edu.ua\)](#) – ONMedU official website
5. State Register of Medicinal Products of Ukraine. - [Electronic resource]. - Access mode: <http://www.drlz.com.ua/> – as of 10.01.2017.

Practical lesson № 3

Topic: Biological role of the skin, functions and physiological properties of the skin and its appendages. General principles of care for different types of skin (2 hours).

Purpose: to generalize the knowledge of the main functions of the skin, the characteristics of the main types of skin and the methods of its determination, to know the principles of using medicinal cosmetics according to different types of skin.

Basic concepts: makeup removal, moisturizing, cosmetic care, cleaning, peeling, toning, skin.

Equipment: methodological developments, manual.

Plan

1. Organizational moment (greetings, checking attendance, message of the topic, lesson goals, students' motivation to study the topic).

2. Control of reference knowledge (written work, face-to-face survey, etc.):

- requirements for student's theoretical readiness to perform practical classes (knowledge requirements, list of didactic units)

The **skin** is a multifunctional organ that performs protective, thermoregulatory, sensory, secretory, exchange, respiratory and immune functions.

Protective function of the skin. The skin protects the internal organs from the physical, chemical and biological effects of the environment. The mechanical protection of the body from external factors is provided by the dense stratum corneum of the epidermis, the elasticity of the skin, its elasticity and the cushioning properties of the subcutaneous tissue. Thanks to these qualities, the skin is able to resist mechanical influences. The skin largely protects the body from radiation exposure. Infrared rays are almost completely blocked by the stratum corneum of the epidermis; ultraviolet rays are partially blocked by the stratum corneum. Penetrating the skin, UV rays stimulate the formation of a protective pigment - melanin, which absorbs these rays. Protection against microorganisms is provided by the bactericidal properties of the skin. Healthy skin is impervious to microorganisms. Microorganisms and various chemicals that enter the skin from the environment are removed from the surface of the skin with horny scales of the epidermis, sebum and sweat. In addition, sebum and sweat create an acidic environment on the skin that is unfavorable for the reproduction of microbes. The stratum corneum plays the most important role in protecting against toxins and dehydration. Most toxins are non-polar compounds that can relatively easily pass through the lipid-rich intercellular spaces of the stratum corneum, but the convoluted boundaries between cells in the stratum corneum and the underlying layers are a reliable barrier against them.

Thermoregulatory function of the skin. The skin regulates body temperature. When the temperature of the environment increases, the blood vessels of the skin expand - the blood circulation of the skin increases. At the same time, sweating increases with subsequent evaporation of sweat and increased heat transfer of the skin. When the ambient temperature drops, there is a reflex narrowing of the blood vessels of the skin; the activity of sweat glands is inhibited, the heat transfer of the skin is noticeably reduced. The layer of subcutaneous tissue and the lipid layer on the surface of the skin are poor conductors of heat, so they prevent excess heat or cold from the outside, as well as excess heat loss.

Sensory function of the skin. The skin is responsible for touch, temperature and pain sensitivity. Secretory function of the skin. Fat, sweat and metabolic products are released through the skin. The excretory function of the skin, which is in direct contact with the external environment with a large surface area, is mainly carried out thanks to the activity of sweat and, to a lesser extent, sebaceous glands.

Exchange function of the skin. The skin ensures the exchange of substances and energy between the body and the environment.

Respiratory function of the skin. The human body emits 7-9 g of carbon dioxide per day through the skin and absorbs 3-4 g of oxygen, which is 2% of the total gas exchange.

Immune function of the skin. Langerhans cells, as well as mast and plasma cells located in the skin are elements of the immune system.

General principles of care for different types of skin

In the classical sense, there are 4 types of skin: dry, oily, normal and combined.

Dry skin

- The lipid layer is very thin, due to which the skin ages faster and is covered with a network of wrinkles.
- Pores are almost invisible, the face almost never shines.
- Often feels a feeling of dryness, tightness, frequent peeling and redness.

Dry skin is characterized by a lack of oily sheen, peeling of the epidermis, early wrinkles, a feeling of "tightness", which is associated with poor activity of the sebaceous glands. The glands produce less oil than is needed for the formation of a natural protective film, due to which the skin loses moisture.

Oily skin

- Very dense, easily tolerates peelings and scrubs.
- Has enlarged pores, after washing it starts to shine after a couple of hours.
- Prone to the appearance of comedones and blackheads.
- Aging slowly

Oily skin is characterized by an oily sheen, a tendency to acne breakouts, and enlarged pores. A special case when the skin is oily, but also very dry - this condition is called dry seborrhea. The reason is a lack of moisture and, in addition, an excess of fat, which is absorbed by almost the entire stratum corneum. Such skin is oily with pimples and sebaceous crusts, but it is still very flaky and rough.

Normal skin

- Has a normal density.
- Inflammation occurs rarely.
- Greasy shine occurs only on the T-zone (forehead, nose, chin) and is practically not disturbing.
- Resistant to external irritants: neither hot summer nor cold winter suffers. Normal skin has a matte tone, is not prone to peeling, does not have an oily sheen, rashes, etc. In most cases, the skin is combined - that is, it combines different types of skin, especially in the middle zone - the T-zone. Combination or mixed skin

- Has oily (T-zone) and dry (U-zone) areas.
- Pores are enlarged, but only in the T-zone.

- Pimples and blackheads sometimes appear, especially before and during menstruation. Cosmetic care is a combination of various procedures that have a preventive, curative and decorative effect. Cosmetic skin care consists of 4 procedures - moisturizing, toning, protection and special care.

The first step is cleaning. The skin constantly feels the influence of environmental factors - dust, cold, changes in pressure, heat. In addition, the skin is contaminated with the remains of cosmetics, exfoliated epidermal cells mixed with sweat, etc. That is, the skin must be cleansed depending on the type of skin: oily skin should be cleansed with soap, preferably with antiseptic additives, lotions, foams, cleansing gels, dry skin should preferably be cleansed with tonics, cleansing creams, normal skin can be cleansed with any of the listed products.

The second step is ionization. Performs the following functions - restores the protective acid mantle of the skin, removes excess (remnants) of makeup, maintains skin tone, controls and normalizes the activity of sebaceous and sweat glands, as a result, the skin becomes matte and normalized.

The third step is moisturizing the skin. It can be carried out in two directions. The first is based on the creation of a protective film that prevents evaporation. The second method is based on increasing the moisture-holding capacity of the skin due to special hygroscopic substances. Substances that prevent evaporation include sorbitol, dimethicone, plant extracts and oils. Polyvinylpyrrolidone, pyrrolidone-caproic acid, hyaluronic acid and its derivatives belong to substances that increase moisture-retaining properties.

And the last step is skin protection. This step is aimed at reducing the negative impact of environmental factors. (UV radiation - leads to pigmentation disorders, early aging, exhaust gases that contain lead, cadmium, etc., lead to the formation of free radicals - this is the main factor in skin aging, as well as pollen, gunpowder, etc.). To protect the skin, a short-term care product containing antioxidants is used.

Special care is aimed at eliminating 5 main problems: disruption of the exfoliation process, pollution, pigmentation disorders, rashes, dryness and aging of the skin.

Scrubs, masks containing abrasive substances, peeling creams and masks are used to exfoliate the epidermis. It is advisable to use a short circuit in combination. It should be noted that during a person's life, more than 50 kg of epidermis peels off. To clean and moisturize the skin, use lotions, masks, creams that remove excess fat, improve blood circulation, and smooth the skin.

The process of absorption of substances by the skin (bioavailability of cosmetics). The process of absorption of substances into the skin is affected by the following factors:

1. Type of cosmetic product
2. Physico-chemical properties of ingredients
3. Size of molecules, electric charge of substances
4. The degree of dispersion
5. Type and amount of excipients
6. Age of a person (in older people, blood circulation, metabolism, work organs and tissues slowed down)
7. Cleanliness of the skin

8. The method of applying the substance to the skin.

Principles of normal skin care

Normal skin has a beige-pink shade, is characterized by a smooth surface, sometimes with a slight shine in the middle part of the face, due to the much larger sizes of the mouths of the excretory ducts of the sebaceous glands and their number, as well as more noticeable pores. Normal skin has good tension, sufficient moisture and lipid coating, without acne. With age, normal skin usually becomes drier, and care for it should change accordingly. The pH level of normal skin is 5.5.

Features of daily care of normal skin.

- When washing, the cells of the stratum corneum of the skin swell and are rejected together with dust, dirt, fat, and the remains of sweat that settled on them. Care instructions recommend patting and stroking the face while washing, this complements the cleansing effect of water. At the same time, blood circulation increases, metabolism increases, nutrition and normal skin tone improve.
- Do not wash with too cold or hot water. Cold water makes the skin dry and flaky, while hot water, with long-term use, causes permanent expansion of blood vessels - normal skin becomes flabby, lethargic, and tolerates cold worse. If the skin is normal but sensitive, you can use herbal infusions (chamomile, violet or dill) for washing.
- Tone normal skin after cleansing.
- It is necessary to moisturize and nourish normal skin every other day with creams that compensate for the skin's loss of fat and other substances that maintain its tone. It is good when the cream contains vitamins A and D, lanolin and menthol. If normal skin is prone to dryness, then use creams for dry and normal skin. If the slope is in the direction of increased sebum production, then it is for oily and normal skin. Weekly care for normal facial skin.
- Deep cleaning should be done once a week. Special scrubs and pads are used for this.
- Masks should also be applied 1-2 times a week. Masks for normal skin provide additional hydration and nourishment to the skin, keeping it in a normal state.

Principles of oily skin care

In the evening, oily skin should be thoroughly cleansed, removing the remnants of make-up. Cleansing of oily skin is carried out with the help of scrubs or masks, as well as cleansing wipes (without alcohol) and a face brush. For cleaning, water-soluble preparations with which you can really wash the skin are suitable: cleansing creams, gels or cosmetic soap. It is necessary to use soft toning lotions that increase blood circulation and improve the structure of the skin. With the help of a brush, you can apply nourishing and protective masks. Deep enlarged pores are difficult to clean with a cotton ball or gauze pad. The bristles of the brush should be soft and elongated. Peelings, cryoprocedures, astringent creams, emulsions and masks help to solve the problem of enlarged pores. It is not necessary to moisturize oily skin, but you can use a non-greasy moisturizing cream during the day. As for night care, in younger years, you can skip the other evening, and apply a moisturizing

cream only on the neck and around the eyes. In the morning, oily skin should be cleaned as in the evening. Once or twice a week in the morning, a soft cream scrub will not hurt, after which you need to apply a moisturizing day cream for oily skin or a hydrogel.

Mistakes in caring for oily skin

1. Overuse of antibacterial drugs. Many useful microorganisms live on the skin, and their death will cause the skin to deteriorate.
2. Use of alcohol-containing lotions. Their use causes dehydration of the skin, dries it out, disrupting the natural water-fat balance, which only worsens the condition of oily skin. It is best to clean the skin with the help of scrubs or masks, and to remove comedones, you need to resort to the help of cosmetologists. And after the procedures carried out in the salon, you can take care of oily skin at home.

Cosmetic care for oily skin in the cosmetologist's office

In the presence of comedones and single inflammatory elements on oily skin, the order of procedures is as follows:

- make-up removal or cleaning (at the same time, rationally use gel-based cleaning products);
- toning;
- vaporization (in the presence of inflammatory phenomena, the procedure is shortened to 3 minutes or replaced with emollients);
- mechanical cleaning (in the absence of inflammatory elements to avoid intensifying the process) or desincrustation (deep cleaning of skin pores using galvanic current);
- skin toning with tonic;
- darsonvalization;
- mask (it is rational to use masks based on kaolin, salicylic acid, bisabolol, azulene).

Features of care for dry facial skin

Dry skin has a pink-yellow color, characterized by a very smooth matte surface; a very thin epidermis is often observed, through which a network of capillaries shines through. The skin is delicate, sensitive, has a tendency to peel, especially on the forehead and cheeks, as well as to the formation of fine wrinkles. Dry skin is not a disease, but a set of symptoms (roughness, reduced elasticity, microcracks, a feeling of tightness, fine wrinkles, irritation, increased sensitivity) that develop due to a decrease in moisture content in the upper layer of the epidermis - the stratum corneum.

Causes of dry skin

1. Endogenous: hormonal imbalance (presence of endocrine diseases); taking some groups of medicines (including oral contraceptives); diseases of the genitourinary system; digestive problems; infectious diseases; genetic syndromes.
2. Exogenous: UV radiation, strong wind, cold, dust, mechanical friction (on clothing), dry climate, chemical substances that destroy barrier structures, or on the basis of unbalanced nutrition.

3. Factors causing real dryness of the skin (Atopic dermatitis, psoriasis, ichthyosis).

Basic care strategies:

1) increase in water content in the upper layers of the skin;

2) restoration of the barrier;

3) softening of the skin with emollients. The pH level for dry skin is in the range of 3 to 5.5.

Principles of care for dry skin Dry skin needs, first of all, moisturizing and protection from external influences that can harm it. Soap is contraindicated for it. It is necessary to use a special gel or milk, which is then washed off with warm water. If the tap water is too hard, you can remove the cleaning agent with a cotton swab dipped in boiled or mineral water. After washing, the skin should not be wiped, but wet with a towel or napkin.

In a cosmetology office, the sequence of procedures for dry skin can be as follows:

- make-up removal;
- toning;
- peeling (without using abrasive particles);
- ionization (to increase hydration);
- massage;
- mask;
- vacuum spray;
- cream application.

- **questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson:**

Answer the question

1. General structure of the skin. Name the main functions of the skin.
2. Describe the general principles of care for different types of skin
3. Principles of care for normal skin type. Features of daily care, basic cosmetics.
4. Principles of care for oily skin type. Features of daily care, basic cosmetics.
5. Mistakes in caring for oily skin 6
- . Basic cosmetic procedures in the care of oily skin.
7. Principles of dry skin care. Features of daily care, basic cosmetics.
8. Basic cosmetic procedures in the care of dry skin.

3. Formation of professional skills and abilities:

- **content of tasks (assignments);**

Task 1. To work out the technology of using cosmetic preparations for different types of skin.

Type cosmetic product	<i>Dry skin type</i>	<i>Oily skin type</i>	<i>Normal skin type</i>
Water			
Foaming agents			

Cosmetic milk (lipophilic)			
Cosmetic milk (hydrophilic)			
Lotion (alcohol- based)			
Tonic			
Vegetable oils			
Masks			

Task 2. Determine your skin type by visual method.

Sign / Characteristic	Dry skin	Normal skin	Oily skin	Combination skin
Type				
Pores				
Texture				
Propensity to rashes				
Age changes				
Sensitivity				

Task 3. Determine your skin type using an oiliness test.

1. How often does your skin feel shiny or oily?
 - Constantly
 - Often
 - Rarely
 - Almost never
2. How does your skin feel after washing?

It is very dry

 - It is very dry
 - It feels comfortable and soft
 - It is moist, but quickly becomes greasy
 - Part of the face is dry; the other part is oily
3. How often do you notice enlarged pores on your face?
 - Constantly expanded
 - Constantly expanded
 - Sometimes extended
 - Not extended
4. How does your skin react to new cosmetics?
 - Irritations and rashes occur
 - The skin easily accepts new products
 - Sometimes there is redness because of itching
 - The reaction to new products varies depending on the area of the face
5. How often do you notice rashes near the T-zone (forehead, nose, chin)?
 - I constantly have rashes
 - Rashes often occur
 - Sometimes there are rashes
 - I rarely notice rashes
6. How does the skin react to seasonal changes?
 - I constantly have rashes
 - Rashes often occur
 - Sometimes there are rashes
 - I rarely notice rashes

To the task:

More Answers 1: You have a dry skin type.

More Answers 2: You have a normal skin type.

More Answers 3: You have an oily skin type.

More Answers 4: You have a combination skin type. Please note that this is a general estimate and actual skin type may vary depending on many factors. An exact determination can be made by a cosmetologist or dermatologist.

- recommendations for the performance of the task;

Methods of determining skin type:

1. Visual method.

2. Oiliness test.

3. Instrumental methods of analysis:

a) absorption – quantitative Strauss-Pochi gravimetric method;

b) extraction - Jarre method;

c) physical: Method of Schaefer and Kuhn-Bassin; the Andersen and Fulton method;

d) method of determining lipid fractions;

e) planimetric.

- **requirements for work results, including registration;** According to the recommendations for the tasks, draw up a report on your skin type and suggest the principle of care and basic cosmetics for its care.

- **control materials for the final stage of the lesson: problems, assignments, tests, etc.:**

1. Which of the following vitamins is synthesized in the skin under the action of UV radiation:

- a) A
- b) C
- c) D
- d) K
- f) F

2. What are the characteristic signs of dry skin?

- a) Enlarged pores and greasy shine
- b) Constant redness of the face
- c) Absence of greasy shine, exfoliation and early wrinkles
- d) Rashes and comedones

3. What features characterize oily skin?

- a) Rashes and comedones
- b) Normal skin density and resistance to external irritants
- c) Enlarged pores, oily sheen, tendency to acne breakouts
- d) Dryness and roughness of the skin

4. What features characterize normal skin?

- a) Rashes and redness
- b) Enlarged pores and oily sheen on the T-zone
- c) Matte tone, not prone to flaking, lack of greasy shine
- d) All the above signs

5. What types of leather can be combined into a combined leather?

- a) Dry and normal skin
- b) Dry and oily skin
- c) Oily and normal skin
- d) Dry, oily and normal skin

6. What factor can cause real dryness of the skin?

- a) Chemicals that improve barrier structures
- b) Use of strong soap for cleaning
- c) Use of skin bleaches
- d) Vitamin complex for dry skin

7. What are the endogenous causes of dry skin?

- a) UV radiation and strong wind
- b) Hormonal imbalance and genetic syndromes

- c) Presence of endocrine diseases and heart disease
 - d) Use of oral contraceptives and vision problems
8. What mistakes can occur when caring for oily skin?
- a) Use of alcohol-containing lotions and excessive use of antibacterial drugs.
 - b) Use of kaolin-based masks and regular visits to a beautician.
 - c) Skin irritation by massage and use of strong detergents.
 - d) Using sunscreen and regularly opening comedones.
9. What factors contribute to the development of oily skin?
- a) Regular cleaning of the skin with oils.
 - b) Use of many antibacterial drugs.
 - c) Hormonal changes and genetic predisposition.
10. What are the functions of ionization in cosmetic skin care?
- a) Restores the protective acid mantle, controls the work of sebaceous and sweat glands.
 - b) Protects the skin from UV radiation and pollution.
 - c) Exfoliates the epidermis and reduces pigmentation.
 - d) Increases the moisture-holding capacity of the skin due to hygroscopic substances.
11. What sequence of procedures for dry skin can be in a cosmetology office?
- a) Massage, peeling, makeup removal
 - b) Mask, ionization, vacuum spray
 - c) Make-up removal, toning, mask
 - d) Peeling, massage, cream application

4. Summing up

Notification of current grades, comments of the teacher regarding the preparation of students for the practical lesson, announcement of the next topic of the lesson.

5. List of recommended literature:

Main:

1. Технологія косметичних засобів : підручник для студ. вищ. навч. закладів / О. Г. Башура, О. І. Тихонов, В. В. Россіхін [та ін.] ; за ред. О. Г. Башури і О. І. Тихонова. — Х. : НФаУ ; Оригінал, 2017. — 552 с.
2. Тихонов, О. І. Аптечна технологія ліків / О. І. Тихонов, Т. Г. Ярних. – Вінниця: Нова книга, 2016. – 536 с.
3. Посилкіна О. В., Котлярова В. Г., Чечетка О. В. Методичні рекомендації щодо оптимізації асортименту лікарських косметичних засобів в аптечних закладах : наук.-Харків : НФаУ, 2019. 31 с.
4. Технологія лікувально-косметичних засобів: навчальний посібник / упоряд.: Борисюк І. Ю., Фізор Н. С., Валіводзь І. П., Акішева А. С.. Одеса, ОНМедУ, 2020.-52 с. – Режим доступу: <https://onmedu.edu.ua/wp-content/uploads/2021/01/1.pdf>

5. Екстемпоральні прописи для терапії дерматологічних захворювань: навч. посіб. для студентів медичних та фармацевтичних вузів / Н. П. Половко, Л. І. Вишневська, Т. М. Ковальова та ін. – Х. : Вид-во НФаУ, 2017. – 91 с.

Additional literature:

1. Технологія виготовлення екстемпоральних лікарських апіпрепаратів і їх застосування в фармації, медицині та косметології : методичні рекомендації / О. І. Тихонов, Т. Г. Ярних, С. О. Тихонова, О. С., О. Г. Башура, О. С. Шпичак, Л. О. Бондаренко, П. С. Сирота, Б. Т. Кудрик, Р. І. Скрипник, Тихонов, Н. С. Богдан, С. Г. Бобро, Л. В. Каношевич, О. Є. Богуцька; за ред. О. І. Тихонова. – Х. : Изд-во НФаУ, 2016. – 75 с. 7. Гіалуронова кислота: біосинтез та використання / І. В. Лич, А. О. Угрин, І. М. Волошина // Український біофармацевтичний журнал. - 2019. - № 2. - С. 6-13.
2. Дедишина Л. Косметика в аптеці: престижно та прибутково. Фармацевт Практик. 2015. № 12. С. 28-29.
3. Маркетинг у фармації та парфумерно-косметичній галузі: навчально-методичний посібник для самостійної роботи студентів фармацевтичного факультету спеціальності «Технології парфумерно-косметичних засобів», / Н.О. Ткаченко., В.О. Демченко, Н.М. Червоненко, Т.П.Зарічна. - Запоріжжя: ЗДМУ, 2016. - 100 с
4. Zujkina S.S. The pharmacotechnological studies of the phytoppecies composition for the complex therapy of mastopathy / S.S. Zujkina, L.I. Vishnevskaya // Вісник фармації. – 2017. – № 2 (90). – С. 43-47.

15. Electronic information resources

1. [Department of pharmaceutical chemistry and drug technology of ONMedU](#) – website of the Department of pharmaceutical chemistry and drug technology of ONMedU
2. [Scientific library of ONMedU \(odmu.edu.ua\)](#) - Scientific library of ONMedU
3. [www.moz.gov.ua](#) – official website of the Ministry of Health of Ukraine
4. [Odessa National Medical University \(onmedu.edu.ua\)](#) – ONMedU official website
5. State Register of Medicinal Products of Ukraine. - [Electronic resource]. - Access mode: <http://www.drlz.com.ua/> – as of 10.01.2017.

Practical lesson № 4

Topic: The most common diseases of the skin and its appendages. Acne, seborrhea, allergic rashes, dermatitis, fungal and other skin diseases. Formulation of prescriptions of cosmetic and medical products for individual use for problematic facial skin. (2 hours).

Purpose: to know the definition of a cosmetic and medical cosmetic product and the differences between them, the classification of cosmetic products, to be oriented in the active and auxiliary substances included in the composition of cosmetic and medical cosmetic

products, to have an understanding of the current trends in the development of the cosmetic industry and pharmaceutical care when dispensing products medicinal cosmetics

Basic concepts: medicinal cosmetics, cosmetic products.

Equipment: samples of finished cosmetics.

Plan

1. Organizational moment (greetings, checking attendance, message of the topic, lesson goals, students' motivation to study the topic).

2. Control of reference knowledge (written work, face-to-face survey, etc.):

- requirements for student's theoretical readiness to perform practical classes (knowledge requirements, list of didactic units)

The skin is the largest organ of the human body, and it is susceptible to various diseases and problems. The most common diseases of the skin and its appendages, in particular, include acne, seborrhea, allergic rashes, dermatitis, fungal diseases, and we will also consider the possibilities of creating individual formulations of cosmetic and medical products for problematic facial skin.

The most common diseases of the skin and its appendages

Human skin diseases are divided into the following types, depending on which of the layers deviations from the norm occur.

Type of disease	Its characteristics
Pathologies of the epidermis	Such representatives of this group as psoriasis and scabies are widespread
Diseases of the dermis	This layer is most often affected by pathogens that carry furunculosis, in some cases hidradenitis
Diseases of the subcutaneous fat layer	At this level, the formation of small boils, blackheads and pimples occurs. Acne is the most common disease for this skin layer. It is periodic in nature and occurs in varying degrees of severity in almost every person.

In addition to the fact that skin diseases are divided into groups depending on their distribution in different layers, some doctors also prefer to classify the infection by character. example:

- Infectious.
- Non-infectious.

However, many dermatologists do not agree with this. For example, the microorganisms of seborrheic dermatitis live on the surface of the epidermis of each person, but the disease can never develop without significant deviations from the normal state of the immune system.

Skin diseases can be of various origins. All of them differ in their appearance, symptoms and cause of formation. The most common of them are:

Fungal diseases of the skin in humans are usually caused by parasitic fungi of plant origin. Such diseases usually affect: nail plate, hair, skin. Fungal diseases are contagious, which means they can easily be transmitted from one organism to another.

Abscesses. Provocators of pustular skin diseases are staphylococci and streptococci. Also, the cause of the formation of abscesses can be infections as a consequence of cooling and mental trauma. Pustular skin diseases are divided into two main types: superficial pyoderma and deep pyoderma.

Skin diseases caused by animal parasites. Such diseases include: pediculosis and scabies. The first is quite easy to cure. Scabies is usually caused by a scabies itch or a tick. It is necessary to start treatment at the first symptoms of scabies, as, otherwise, it can lead to the formation of eczema.

Ringworm is an infectious fungal disease. Ringworm can be contracted from a sick animal or person through contact with clothes, towels, bedding. Lichens have several types. The most common of them: lichen rosacea (its causative agent is not yet known, it is believed that its occurrence is associated with colds, flu, SARS, when the body is weakened, it manifests itself as a cold on the skin), lichen planus, ringworm (the causative agent is fungi one type of which is transmitted from animals, the other occurs only in humans), shingles (the most studied type of ringworm, the causative agent of which is the herpes zoster virus), ringworm.

Each species has its own characteristics and causes of formation.

Diseases of skin glands. The most common types of these diseases are: seborrhea and acne. Acne is one of the most common dermatological problems, especially among teenagers and young adults. It is characterized by the formation of comedones (blackheads) and inflamed pimples on the face and other areas of the skin. Treatment includes the use of antiseptic and anti-inflammatory agents, as well as correction of the hormonal background.

Seborrhea, or oily skin, is characterized by excessive secretion of sebum, which can cause dandruff, itching and inflammation of the skin. For the treatment of seborrhea, antifungal and antiperspirant agents are used. If seborrhea affects the head, then hair loss begins. Acne most often appears at a young age, most often on the basis of seborrhea.

The disease is characterized by the appearance of inflammatory processes in some areas of the sebaceous gland, specifically inflammation of hair follicles and, directly, the area of the gland below them.

The appearance of acne is associated with propionium bacteria, which are found on the surface of the skin of every person. Their active life activity provokes a violation of the integrity of the bactericidal mechanism of sebum.

Allergic rashes. Allergic skin reactions can occur after contact with allergens, such as some food products, plants, medicines, inhaled allergens, etc. Allergic rash differs from

other types of rashes primarily in appearance - it is characterized by the appearance of bright pink or red swellings on the skin. In some cases, rash elements can have clearly defined borders and a pale area in the center. It is noteworthy that in almost all patients with allergies, the appearance of a rash is accompanied by severe itching. Most allergic diseases are accompanied by other characteristic symptoms of runny nose, itching and redness of the eyes, sneezing, coughing, shortness of breath, etc. The reason for the appearance of these symptoms is the degranulation of mast cells and the release of so-called allergy mediators - substances that provoke the appearance of itching, redness and swelling of the skin, as well as other unpleasant phenomena. Histamine plays the biggest role in the development of these symptoms. These reactions can manifest as rashes, itching, redness and swelling of the skin. Treatment includes the appointment of antihistamines and external means to reduce symptoms.

Dermatitis is an inflammatory skin condition that can be caused by a variety of factors, including allergies, contact with irritants, infections, and more. A common cause of dermatitis is contact with something that irritates the skin or causes an allergic reaction, such as antiseptics, latex gloves, detergents, poisonous plants, perfumes, skin care products, jewelry containing nickel, etc. Other causes of dermatitis are the tendency of the skin to dry out, viral infections, bacteria, stress, genetic predisposition, problems with the immune system (overactive immune system). Treatment consists in the elimination of the causative factor and the use of anti-inflammatory drugs.

Fungal skin diseases. Fungal disease (mycosis of the skin) is an infectious dermatological lesion of the skin, mucous membranes, internal organs and nails caused by pathogenic fungi. The most common type of infection is toenail fungus. Fungal skin infections can cause a scaly rash, itching, redness, and peeling of the skin. Antimycotic ointments and creams are used for treatment.

Dermatomycosis. The disease implies a serious fungal infection of the human epithelium. The reason, respectively, is a fungus. It is transmitted through contact and household contact through infected people, animals, as well as everyday objects. The affected skin becomes inflamed, swollen by the owner, a chain of pimples and wounds appear, severe itching occurs.

Eczema. This is a skin disease that looks like small blisters, scales, cracks and miniature sores. In addition to the obvious symptoms, the patient also suffers from constant severe itching. Unlike the previous 4, this disease is not contagious. It has an inflammatory nature and is often chronic. The causes of eczema are external and internal. The first are chemical or physical damage to the skin, followed by inflammation. The second is the result of the course of various diseases of the liver, nervous and endocrine systems in the body.

Herpes. This is a very common viral disease. It is small abscesses and bubbles of mucus, which are grouped in one area, most often: in the corners of the lips; on the mucous membrane; under the nose; on the genitals. Despite the fact that the disease is very common

and with a timely and correct approach is easily curable, the virus becomes very dangerous against the background of other diseases. If the patient is ill with encephalitis, meningitis, mucosal disorders, herpes can become a very serious problem for him, and it will be difficult to treat in this case.

Scabies is one of the contagious infectious diseases, the first symptom of which is considered to be severe itching, redness and excessive drying of the skin. The cause is a scabies mite. You can catch the disease in almost any public place, if you do not follow the rules of hygiene.

Keratosis - this type of abnormality is rather not a separate disease, but a general condition of the skin, in which a large area of tissue becomes coarse, horny, and a dense crust forms. The form of the disease is non-inflammatory.

Erythema is a disease of a viral nature, often relapsing. The cause and main causative agent is streptococcus. Ways of transmission - virus. It is extremely undesirable for a healthy person to contact a sick person. Symptoms - reddening of skin areas, most often on the face or lower legs, increased temperature.

The disease is caused by the human **papilloma virus**. This is a benign tumor of a tumor-like nature. It affects epithelial cells. It is localized in the form of a papilla, is not symptomatic and is subject to removal. There are cases when the number of papillomas exceeds the permissible norm, then you need to consult a dermatologist and undergo complex treatment.

Psoriasis is a chronic non-infectious disease that primarily manifests itself on the skin in the form of characteristic rashes and peeling, but it can also affect other organs. More than 2% of the population lives with psoriasis in developed countries. Most often, the disease makes its debut at the age of 15 to 20 years.

The main components of medical and cosmetic products for skin diseases

Skin diseases can have different causes and manifestations, so the composition of medical and cosmetic products for their treatment will also be different. However, there are some ingredients that are common to most skin care products.

For the treatment **of acne**, agents are used that have antiseptic, anti-inflammatory and sebum-regulating properties. Such components include:

- Antibiotics: clindamycin, erythromycin, benzoyl peroxide
- Retinoids: tretinoin, retinol
- Salicylic acid
- Green tea
- Aloe extract
- Seborrhea

For the treatment **of seborrhea**, agents are used that have anti-inflammatory and sebum-regulating properties. Such components include:

- Antiseptics: chlorhexidine, zinc

- Fungicides: clotrimazole, ketoconazole
- Salicylic acid
- Green tea
- Aloe extract

For the treatment **of allergic rashes**, agents with anti-inflammatory and antihistamine properties are used. Such components include:

- Glucocorticoids: hydrocortisone, prednisolone
- Antihistamines: diphenhydramine, loratadine
- Allantoin
- Chamomile extract
- Dermatitis

For the treatment **of dermatitis**, agents with anti-inflammatory and regenerating properties are used. Such components include:

- Glucocorticoids: hydrocortisone, prednisolone
- Chamomile extract
- Aloe extract
- Panthenol
- Vitamins A and E

Fungal diseases

For the treatment of fungal diseases, agents that have fungicidal properties are used. Such components include:

- Clotrimazole
- Ketoconazole
- Miconazole
- Itraconazole

Additional components that have specific properties can be used to treat other skin diseases. For example, products that have anti-inflammatory and moisturizing properties are used to treat psoriasis. For the treatment of eczema, agents are used that have anti-inflammatory and regenerating properties.

Thus, in extemporaneous means intended for the care of problematic facial skin, in particular, for the treatment of cosmetic defects caused by impaired functions of the sebaceous glands (acne disease), ethyl alcohol is used in high concentrations - 60-96% (more often 70% alcohol without diluting with water), as well as tinctures of medicinal plants with 70% alcohol. In addition, chloroform and medical ether are effective - liquids that dissolve well and remove residual fat from the skin.

Among medicinal substances, antiseptics (resorcinol, boric acid, sodium tetraborate, etc.) that disinfect the skin, keratolytics (sulfur, salicylic acid, etc.) that help cleanse the skin and drain the secretion of sebaceous glands are widely used; antibacterial agents

(levomycetin, tetracycline, etc.), which suppress the lipolysis of sebaceous secretion by bacteria and block the inflammatory process.

4 recipes of the most optimal external means are given. Using their example, we will analyze the principles of an individual approach to the selection of means, depending on such a parameter of the patient's skin as the amount of sebaceous secretion and the resulting cosmetic defects in the form of acne (Table 1).

Table 1

External means for the treatment of acne of various degrees of severity

Recipe No. 1 (External remedy for mild acne)	Recipe No. 2 (External remedy for acne)	Recipe No. 3 (External remedy for moderate-to- severe acne)	Recipe No. 4 (External remedy for severe acne)
70% ethyl alcohol 64 ml	70% ethyl alcohol 67 ml	70% ethyl alcohol 50,4 ml	70% ethyl alcohol 48 ml
-	Camphor alcohol 25 ml	Camphor alcohol 23 ml	Ether medical 48.0
-	-	Calendula tincture 23 ml	-
Levomycetin 3.0	Levomycetin 4,0	Levomycetin 2,0	Levomycetin 2,0
Boric acids 1.0	Boric acids 2,0	-	-
Resorcinol 0.5	-	Resorcinol 1,6	-
Salicylic acid 2.5	Salicylic acid 2,0	-	Salicylic acid 2,5
Purified water 29 ml	-	-	-

In the recipe No. 1 of the external remedy, which is recommended for mild acne, ethyl alcohol is used in a concentration of less than 70%, antiseptics - resorcinol and boric acid (up to 2%), keratolytics - salicylic acid (2.5%), an antimicrobial agent - chloramphenicol (3%).

In recipe No. 2 of the remedy prescribed for acne, the concentration of alcohol is already higher and is about 70%. To potentiate the bactericidal effect, camphor alcohol is introduced and the concentration of antiseptic (2%), keratolytic (2%) and antibiotic (4%) is increased.

In recipe No. 3 of the remedy used for medium-severe acne, the concentration of alcohol is the same - 70%. However, to enhance the bactericidal and anti-inflammatory effects, not only camphor alcohol is used, but also tincture of calendula leaves. A certain decrease in the concentration of chloramphenicol (2%) is not reflected in the antimicrobial effect of the drug, because it is enhanced by the presence of a keratolytic and an antiseptic - resorcinol in a sufficiently high concentration (1.6%).

70% alcohol and medical ether in equal quantities are introduced **In recipe No. 4** of the remedy used for severe acne. This is necessary for more effective removal of residual fat. The antimicrobial activity of chloramphenicol (2%) is potentiated by a sufficiently high concentration of keratolytic, antiseptic and fungicide — salicylic acid (2.5%).

The following factors must be taken into account when preparing prescriptions for cosmetic and medical products for individual use for problematic facial skin:

Examples of recipes of cosmetic and medical products for individual use for problematic facial skin:

Lotion for problematic facial skin:

Purified water - 100 ml

Glycerin - 10 ml

Allantoin - 5 ml

Salicylic acid - 2 ml

Ethyl alcohol - 10 ml

Effect of the lotion: gently cleanses the skin, removing excess sebum and pollution.

Reduces inflammation and redness. Fights pimples and acne.

How to use: lotion is applied to clean facial skin in the morning and evening.

Mask for problematic facial skin:

Oat groats - 2 tbsp.

Milk - 100 ml

Honey - 1 tbsp. Egg yolk - 1 pc.

Aloe vera - 1 tbsp.

Effect of the mask: moisturizes the skin, preventing its dryness and peeling. Heals and restores damaged skin. Reduces inflammation and redness. Fights pimples and acne.

How to use: the mask is applied to clean facial skin for 15-20 minutes. Then rinse with warm water.

Cream for problematic facial skin:

Purified water - 100 ml

Glycerin - 10 ml

Allantoin - 5 ml

Retinol - 2 ml

Ethyl alcohol - 10 ml

Effect of the cream: moisturizes the skin, preventing its dryness and peeling. Gently cleanses the skin, removing excess sebum and pollution. Heals and restores damaged skin. Reduces inflammation and redness. Fights pimples and acne. Method of application: the cream is applied to the clean skin of the face in the morning and in the evening.

- **questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson:**

1. What are the main groups of skin diseases depending on their distribution in different layers of the skin? Why do some doctors prefer to classify skin diseases by nature rather than distribution?
2. How to distinguish seborrhea from other skin diseases and what methods of treatment exist for it?
3. What symptoms and characteristic signs of eczema distinguish it from other skin diseases?
4. What is a fungal skin disease, and what symptoms can indicate its presence?
5. How does herpes appear on the skin, and what can be the consequences if the disease is not treated properly?
6. What is the main character of recognition of keratosis, and what factors contribute to its development?
7. What do you know about psoriasis, and what are the characteristic features of this skin disease?
8. What components are used to treat seborrhea? Which of these components have an anti-inflammatory effect? Which of these components have a self-regulating effect?
9. What components are used to treat dermatitis? Which of these components have an anti-inflammatory effect? Which of these components have a regenerating effect?
10. What folk remedies can be used to treat skin diseases? Examples of medicinal plants for the treatment of certain diseases.

3. Formation of professional skills and abilities:

- content of tasks (assignments);

Task 1. Fill in the table, indicating the name of the disease, its nature, symptoms and causes.

Type of disease	Character	Medicinal cosmetics	Symptoms	Causes
Acne				
Seborrhea				
Allergic rashes				
Dermatitis				
Fungal diseases				

Task 2. Analyze recipes for the treatment of problematic facial skin. Determine which components are used in each formulation, what properties these components have, and what results can be expected from the use of each tool.

Task 3. Describe one of the types of skin diseases. Specify the following items: name of the disease, nature of the disease, symptoms of the disease, causes of the disease. Give an example of the formulation of a medicinal and cosmetic product to reduce the manifestation

or prevention of a disease. Describe the main components included in the composition, the main effect of the product, the method of preparation and application.

Task 4. A middle-aged man asked you to recommend an effective remedy for the treatment of seborrhea. It is accompanied by severe dandruff and irritation on the scalp. What would be your recommendations and advice in this case?

- **recommendations for the performance of the task;**

According to the progress of the practical lesson, complete the individual task in your workbook.

- **requirements for work results, including registration;** The individual work task is filled in the workbook and handed over to the teacher for checking.

- **control materials for the final stage of the lesson: problems, assignments, tests, etc.:**

1. What are the main types of pustular skin diseases?

- a) Superficial and deep pyoderma.
- b) Infectious and non-infectious.
- c) Fungal and bacterial.
- d) Pink and flat.

2. What causes the formation of abscesses on the skin?

- a) Mental trauma.
- b) Infections due to cooling.
- c) Fungal parasites.
- d) Fear.

3. What diseases of the skin glands are the most common?

- a) Blackheads and abscesses.
- b) Fungal diseases and seborrhea.
- c) Ringworm and acne.
- d) Pediculosis and scabies.

4. What substances provoke the appearance of itching, redness and swelling of the skin during allergic reactions according to the text?

- a) Bacteria
- b) Viruses
- c) Fungi
- d) Allergy mediators, in particular histamine

5. How is the activity of mast cell degranulation expressed in dermatitis?

- a) An increase in the number of cells in the skin
- b) Release of allergic mediators
- c) Reduction of sebum secretion
- d) Increase of immunity

6. Which skin disease is not infectious?

- a) Fungal disease

- b) Papilloma
 - c) Herpes
 - d) Dermatitis
7. What components are used to treat acne?
- a) Antiseptics and fungicides.
 - b) Glucocorticoids and antihistamines.
 - c) Antibiotics, retinoids, salicylic acid, green tea, aloe extract.
 - d) Clotrimazole, ketoconazole, miconazole, itraconazole.
8. What components are used to treat seborrhea?
- a) Antiseptics, glucocorticoids, allantoin.
 - b) Antibiotics, fungicides, chamomile extract.
 - c) Chlorhexidine, zinc, salicylic acid.
 - d) Hydrocortisone, prednisolone, diphenhydramine.
9. What components are used to treat fungal diseases?
- a) Glucocorticoids, aloe extract, panthenol.
 - b) Clotrimazole, ketoconazole, miconazole, itraconazole.
 - c) Hydrocortisone, prednisolone, diphenhydramine.
 - d) Antiseptics, salicylic acid, green tea.
10. What components are used to treat dermatitis?
- a) Glucocorticoids, chamomile extract, vitamins A and E.
 - b) Antibiotics, fungicides, salicylic acid.
 - c) Antiseptics, fungicides, green tea.
 - d) Itraconazole, antiseptics, antihistamines.

4. Summing up

Notification of current grades, comments of the teacher regarding the preparation of students for the practical lesson, announcement of the next topic of the lesson.

5. List of recommended literature:

Main:

1. Технологія косметичних засобів : підручник для студ. вищ. навч. закладів / О. Г. Башура, О. І. Тихонов, В. В. Россіхін [та ін.] ; за ред. О. Г. Башури і О. І. Тихонова. — Х. : НФаУ ; Оригінал, 2017. — 552 с.
2. Тихонов, О. І. Аптечна технологія ліків / О. І. Тихонов, Т. Г. Ярних. – Вінниця: Нова книга, 2016. – 536 с.
3. Посилкіна О. В., Котлярова В. Г., Чечетка О. В. Методичні рекомендації щодо оптимізації асортименту лікарських косметичних засобів в аптечних закладах : наук.- Харків : НФаУ, 2019. 31 с.

4. Технологія лікувально-косметичних засобів: навчальний посібник / упоряд.: Борисюк І. Ю., Фізор Н. С., Валіводзь І. П., Акішева А. С.. Одеса, ОНМедУ, 2020.-52 с. – Режим доступу: <https://onmedu.edu.ua/wp-content/uploads/2021/01/1.pdf>
5. Екстемпоральні прописи для терапії дерматологічних захворювань: навч. посіб. для студентів медичних та фармацевтичних вузів / Н. П. Половко, Л. І. Вишневська, Т. М. Ковальова та ін. – Х. : Вид-во НФаУ, 2017. – 91 с.

Additional literature:

1. Технологія виготовлення екстемпоральних лікарських апіпрепаратів і їх застосування в фармацевтичній, медицині та косметології : методичні рекомендації / О. І. Тихонов, Т. Г. Ярних, С. О. Тихонова, О. С., О. Г. Башура, О. С. Шпичак, Л. О. Бондаренко, П. С. Сирота, Б. Т. Кудрик, Р. І. Скрипник, Тихонов, Н. С. Богдан, С. Г. Бобро, Л. В. Каношевич, О. Є. Богуцька; за ред. О. І. Тихонова. – Х. : Изд-во НФаУ, 2016. – 75 с. 7. Гіалуронова кислота: біосинтез та використання / І. В. Лич, А. О. Угрин, І. М. Волошина // Український біофармацевтичний журнал. - 2019. - № 2. - С. 6-13.
2. Дедишина Л. Косметика в аптеці: престижно та прибутково. Фармацевт Практик. 2015. № 12. С. 28-29.
3. Маркетинг у фармацевтичній та парфумерно-косметичній галузі: навчально-методичний посібник для самостійної роботи студентів фармацевтичного факультету спеціальності «Технології парфумерно-косметичних засобів», / Н.О. Ткаченко., В.О. Демченко, Н.М. Червоненко, Т.П.Зарічна. - Запоріжжя: ЗДМУ, 2016. - 100 с
4. Zujkina S.S. The pharmacotechnological studies of the phytoecies composition for the complex therapy of mastopathy / S.S. Zujkina, L.I. Vishnevskaya // Вісник фармацевтичної науки. – 2017. – № 2 (90). – С. 43-47.

15. Electronic information resources

1. [Department of pharmaceutical chemistry and drug technology of ONMedU](#) – website of the Department of pharmaceutical chemistry and drug technology of ONMedU
2. [Scientific library of ONMedU \(odmu.edu.ua\)](#) - Scientific library of ONMedU
3. www.moz.gov.ua – official website of the Ministry of Health of Ukraine
4. [Odessa National Medical University \(onmedu.edu.ua\)](http://onmedu.edu.ua) – ONMedU official website
5. State Register of Medicinal Products of Ukraine. - [Electronic resource]. - Access mode: <http://www.drlz.com.ua/> – as of 10.01.2017.

Practical lesson № 5

Topic: Skin aging. Factors provoking aging mechanisms. Physiology and types of skin aging. General principles of formulation, technology and quality control of antiaging cosmetics. (2 hours).

Purpose: to get acquainted with the mechanisms of aging, factors that provoke aging, with modern methods of combating aging, and on the basis of this, learn to formulate recipes of cosmetics with anti-aging effects, draw up a flowchart of production, and conduct quality control of the finished cosmetic.

Basic concepts: wrinkles, free radicals, peeling, aging, photoaging.

Equipment: ready samples of cosmetics.

Plan

1. Organizational moment (greetings, checking attendance, message of the topic, lesson goals, students' motivation to study the topic).

2. Control of reference knowledge (written work, face-to-face survey, etc.):

- **requirements for student's theoretical readiness to perform practical classes (knowledge requirements, list of didactic units)**

Aging is a complex biological process of structural and functional changes in the body, long and unevenly occurring, affecting both internal organs and systems and the skin.

Factors provoking the start of aging mechanisms:

1. External:

- UV radiation;
- free radicals;
- adverse environmental conditions;
- allergens;
- mechanical damage to the skin;
- smoking; • unbalanced nutrition.

2. Internal:

- genetic;
- nervous (mental stress);
- immune (violation of the immune status);
- hormonal.

External factors

Free radicals. A free radical is a molecule that has a "vacant" place for an electron particle. Therefore, it "tries" to take the insufficient electron from other molecules. When it succeeds, the injured molecule is oxidized and becomes a free radical. Oxygen, which is necessary for our body, has a high oxidizing capacity. Even stronger oxidizing agents are free oxygen radicals. For example, normal collagen fibers are unable to bond with each other. And collagen molecules that have become free radicals, colliding with oxygen radicals, become so active that they bond with each other, forming a so-called dimer. Such collagen is less elastic than normal, so the accumulation of collagen dimers in the skin leads to the appearance of wrinkles. The process of formation of free radicals occurs as a chain

reaction. This process is also called oxidative stress. The avalanche-like occurrence of free radicals causes changes at the cellular and tissue levels, which ultimately leads to the development of various pathological processes and accelerated tissue aging.

To protect cells from oxidative stress, the body has an antioxidant system. Antioxidants are molecules capable of blocking oxidation reactions by reducing oxidized compounds. That is why the human body needs vitamins E and C, as well as beta-carotene - they are antioxidants. Today, not a single multivitamin complex, not a single anti-wrinkle product can do without these substances. But in addition to the usual antioxidants, bioflavonoids, selenium, superoxide dismutase and other substances, the names of which are found in the annotations of cosmetic products and food additives, quickly entered our lives. However, despite powerful antioxidant protection, free radicals still have a rather destructive effect on biological tissues and, in particular, on the skin.

Smoking. The smoker's face looks pale, has a grayish color, facial features are marked by deep wrinkles. Smokers develop wrinkles five times faster than non-smokers, when comparing people of the same age. Cigarette smoke has the same negative effect on the skin as UV radiation.

Environmental pollution. We are talking about emissions into the atmosphere of products of the breakdown of chemical compounds, industrial waste, which disrupt the natural composition of the environment for our vital activities. Sulfur dioxide, or sulfur dioxide, is a gas that has an irritating effect. It is released during the combustion of liquid fuel (fuel oil), diesel fuel and coal. In other words, its appearance in the atmosphere is mainly related to the processes of heating and industrial production. Therefore, cities with developed industry are prone to this kind of pollution to the greatest extent. Oxygen atoms, which are part of the molecule of this gas, have high reactivity. They give the entire molecule the ability to easily enter into chemical reactions with the molecules that form the structures of skin cells, and thus lead to serious violations of the biochemical balance of the skin. Suspended from the combustion products of gasoline in car engines, fuel in industrial enterprises, in heating systems, etc., is visible to the naked eye as black smoke and is measured using the atmospheric gas index. It is this type of pollution, apparently, that leads in the "conquest" of dense layers of the atmosphere. Individual particles included in the composition of such black smoke have a diameter of less than 13 microns, they can firmly stick to the surface of the skin, covering it like dense clothing and preventing the exchange of substances between the body and the environment. In this case, the intensity of the processes of water exchange in the skin and the degree of its oxygen saturation are sharply reduced. Nitrogen oxides released into the atmosphere, mainly in the composition of exhaust gases of automobile engines, contain, among other compounds, a gas with an exceptionally pronounced irritating effect - nitrogen dioxide. This gas is able to penetrate the smallest branches of the respiratory tract, as well as the surface layers of the epidermis. Ozone (O₃) in small quantities is an integral component of air. It is formed in the atmosphere from

volatile organic compounds and nitrogen oxides under the influence of sunlight. In the lower layers of the atmosphere, ozone plays the role of a bactericidal and antiseptic agent (thanks to these properties, it is used in cosmetology procedures). But, despite this, ozone can cause eye irritation and is very poorly tolerated by sensitive or so-called hyperreactive skin. Moreover, ozone can cause a chain reaction of formation of free radicals.

Internal factors

Internal factors that affect the skin include genetics, hormones, and special conditions such as diabetes.

Genetic aging. Your genetic characteristics determine your skin type. Genetic features also determine the biological aging of the skin. A person's genetic characteristics determine his skin type (normal, dry, oily or combination) and affect his overall skin condition.

Hormonal aging. This theory links changes in the body with a decrease in hormone synthesis. As a result, cells lose their ability to self-reproduce. When the level of sex hormones decreases, the skin loses turgor and becomes dry.

Hormone replacement therapy improves these indicators, but, unfortunately, does not slow down aging. Hormonal changes can affect the skin and cause acne. Pregnancy can cause hyperpigmentation and affect the water balance of the skin.

Hormones and changes in their levels can have a significant effect on the skin:

- Hormonal changes can cause acne during puberty.
- During pregnancy, hormones can contribute to increased melanin production and a form of hyperpigmentation known as melasma.
- Female estrogen levels decrease during biological aging and especially after menopause. Estrogen has a beneficial effect on the moisture balance in the skin, so its decrease leads to structural changes and age-related atrophy of the skin.

Physiology of skin aging

The aging of the body is genetically programmed, and each body has an individual aging program that is practically impossible to interfere with. You can only prevent the influence of external factors that contribute to premature aging. Age-related changes affect all layers of the skin. The amount of water in the epidermis decreases, which leads to peeling, disruption of keratinization and desquamation of the epithelium, as a result, the epidermis becomes thinner, a network of fine wrinkles forms, skin turgor decreases, and pigment spots appear. In the basal layer of the epidermis, cell mitosis and the differentiation of new cells are disrupted, which, in turn, leads to the slowing down of the advancement of keratinocytes to the surface of the skin, as a result of which the rate of renewal of the epidermis decreases and the barrier function of the skin weakens. At the same time, the boundaries between the epidermis and the dermis are smoothed. A similar process occurs in the dermis, but these changes occur in the intercellular matrix, the main substance of the dermis. With age, the synthesis slows down and the destruction of this substance increases.

This is associated with both aging and damage to fibroblasts - the most numerous group of cells, in which the synthesis of fibrillar proteins (collagen and elastin), glycosaminoglycans, and some enzymes takes place, followed by their release into the intercellular substance. The activity of fibroblasts is associated with the formation of the main substance and fibers, wound healing, development of scar tissue, etc. Along with the accelerated destruction of normal collagen, there is a gradual accumulation of defective, "aging" collagen, which cannot be destroyed by collagenase. This leads to a weakening of the network of collagen and elastic fibers, a decrease in its elasticity, turgor, and the formation of wrinkles.

Processes occurring in aging skin:

- peroxidation of cell membrane lipids;
- glycation processes;
- slowing of mitosis and differentiation of cells;
- slowing down the rate of advancement of new cells to the surface of the skin;
- thinning of the granular layer and thickening of the stratum corneum of the epidermis;
- violation of the functions of fibroblasts;
- violation of the barrier function of the skin;
- violation of synthesis and destruction of collagen and elastin;
- slowing down the process of exfoliation of the epithelium of the stratum corneum;
- increase in transepidermal water loss.

Sitting: during the anagen period, the melanocytes of the hair matrix membrane are located under the dome of the papilla. The dendrites of melanocytes, advancing between the cells of the cortical and medullary layers of the hair, give the "grain" of pigment to its cells. During the catagen period, melanocytes return to the dermal part of the papilla, and after the change of hair, they again give melanin to the next hair. With age, a large part of people lose coordination between the transition of hair into catagen and the departure of melanocytes, which are retained, remain in the bulbs that are formed, and fall out with telogen hair or move to the periphery of the epithelial part of the papilla. As a result, melanin is not transferred to new growing hair and an irreversible process of graying occurs.

Photoaging is permanent damage to the skin by sunlight. Oxidative reactions induced by free radicals play the main role in the development of photoaging. UV radiation penetrates into the deep layers of the skin and causes damage not only to cells of the basement membrane, but also to dermal fibroblasts and macrophages. Photoaging is expressed in elastosis (accumulation of atypical elastic fibers), dimerization and degeneration of collagen, thickening of the epidermis (hyperkeratosis), hyperpigmentation.

Table 1

Clinical stages of skin photoaging

Stage	Average age	Clinical picture
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Initial	20-30 years	<ul style="list-style-type: none"> • moderate pigmentation disorders, • minimal wrinkles, • no signs of hyperkeratosis
moderate	30-40 years	<ul style="list-style-type: none"> • a slightly yellowish shade of the skin, • foci of keratosis are palpable, but not visually determined, • noticeable mimic wrinkles, • the first elements of lentigo
expressed	After 40 years	<ul style="list-style-type: none"> • dyschromia, • telangiectasias, • pronounced keratosis, • static wrinkles
Catastrophic	After 60 years	<ul style="list-style-type: none"> • yellowish-ashy skin tone, • multiple lentigo, neoplasms, • wrinkles on the entire surface of the skin

Table 2.

Comparative characteristics of photoaging and chronoaging

Sign	of Photoaging	Chronoaging
Cause	Ultraviolet and infrared radiation	General mechanisms of aging of the body
General characteristics	Uneven skin thickening against the background of chronic subclinical inflammation	Uneven skin thickening against the background of chronic subclinical inflammation
Localization	Skin of open areas	The entire surface of the skin
Clinic	Uneven nodular surface, deep premature wrinkles, uneven pigmentation, yellowish tint, dryness, telangiectasias	Atony, increased facial folds, slow wound healing, tendency to hematomas, dryness, thinning against a background of uniform texture, gravitational tissue ptosis
Derma	Increase in the number and activation of fibroblasts, increase in the number of mast cells, inflammatory infiltration, thickening of the dermis	Reduction in the size and functional activity of fibroblasts, decrease in the level of mast cells
Glycosamines-glycans	Level up	Gradual age-related decrease in level

Elastic fibers	Increase in the level of elastin, elastosis (pronounced clusters of pathologically changed, dense elastic fibers)	Reduction in the number of elastic fibers and their uneven arrangement
Collagen	Reduction of the amount of basophilic degeneration due to increased production of proteolytic enzymes in conditions of photoinduced inflammation	Reduction in the number, orderliness of their structures, decrease in hydrophilicity and increase in resistance to proteolytic enzymes.
Small vessels	Degeneration of capillaries, their dilatation (telangiectasia, hemorrhagic rash)	Violation of microcirculation
Additional structures	Neoplastic processes in the sebaceous glands, comedones, especially around the eyes	A decrease in the activity of sweat and sebaceous glands, up to their atrophy; reduction of hair growth in areas of traditional hair growth (due to atrophy of hair follicles)
Neoplasm	Increased risk of developing pigmented and non-pigmented neoplasms of the skin (the probability of tumor malignancy is directly proportional to the radiation dose).	A decrease in the immunoprotective properties of the skin leads to an increased risk of malignancy of tumors

Atrophic and dystrophic changes occur in skin appendages. The number of sweat glands decreases, the sebaceous glands atrophy after hyperactivation in adulthood during age-related involution, while the sebaceous glands associated with hair atrophy first. The excretory ducts of atrophic sebaceous glands can be dilated and closed with horny plugs. After 50-60 years, and sometimes earlier, in men, bristly hair begins to grow on the eyebrows, the skin of the auricles, external auditory canals, the skin in front of the nasal cavity, and in women after 40-50 years - in the chin area, on the cheeks and lips: the so-called "senile beard" is often observed in women in the climacteric period. External irritating factors (thermal, chemical, mechanical) can contribute to the strengthening of hypertrichosis, and sometimes - provoke its development. During the period of age-related involution, eyelash reduction is observed. Types of wrinkles. Modern research conducted in the field of studying age-related changes in the skin has shown that the speed of appearance of wrinkles, their localization, as well as the degree of their expressiveness (from barely

noticeable fine lines to deep folds) depends on numerous reasons: gender, age, race, as well as on intensity of influence of environmental factors.

Chronology of wrinkles. So, the first wrinkles usually appear at the age of 20-25 in the upper third of the face. Most often, they are associated with active facial expressions, so they are called facial wrinkles. With age, facial wrinkles become more visible, especially in the area around the eyes, becoming a concern for ladies who have active facial expressions, wear glasses or often squint. By the age of 35-45, facial wrinkles become deep and permanent, do not disappear when the facial muscles are relaxed, and are often combined with a change in the quality of the skin itself in the area of the wrinkle. The skin becomes dry, flaky, its tone and elasticity decrease. Static wrinkles are gradually joining facial wrinkles, i.e. those whose mechanism of formation is related to natural genetic aging (chronoaging) and photoaging. They most often appear on the skin of the forehead, cheeks and neck, they can form after sleeping in one position or with incorrect posture. Static wrinkles have different depths: from superficial to deep folds of the skin and are not related to facial expressions. After 50 years, as a result of a change in the hormonal status, there is an increase in the expressiveness of wrinkles, the formation of gravitational changes: nasolabial and lipo-chin folds, deformations of the oval of the face, the appearance of so-called "bullets", "second chin", increased skin changes in the area around the eyes, a decrease in of the cheekbones, strengthening of the lacrimal, buccal, furrow, etc.

Types of aging:

- deformation;
- finely wrinkled;
- mixed.

With the deformational type of aging, the oval of the face is disturbed, the cheeks are sagging, the second chin, folds on the neck, and often there are telangiectasias (couperosis). This type of aging occurs in people who had oily, thick and porous skin in their youth. In the case of deformational aging, the following are recommended: chemical peels, vacuum and mechanical cleaning if necessary, vacuum massage (lymphatic drainage), microcurrent therapy, massage, lifting masks. People who had dry skin usually have a fine-wrinkled type of aging - small wrinkles all over the face, deepening with age, facial wrinkles, gray skin color, pronounced dryness. For the fine-wrinkled type of aging, the following are indicated: chemical peeling, microdermabrasion, electrophoresis, paraffin therapy, microcurrent therapy, massage, moisturizing, nourishing, thermoactive masks, etc.

Types of wrinkles by place of formation:

- facial wrinkles (wrinkles in the area of the forehead, corners of the eyes, around the mouth);
- neck wrinkles. They can have a longitudinal or transverse arrangement.

Types of wrinkles by depth of location:

- superficial (concerning only the upper layers of the skin);

- deep (lay in the deep layers of the skin, can be traced even after correction). As a rule, the depth of wrinkles depends on the age of their owner, the characteristics of skin metabolism and the intensity of the influence of negative environmental factors. It is known that surface wrinkles, as well as deeper wrinkles, are characterized by changes in the structure and functions of the skin: thickening and dehydration of the epidermis, thinning of the dermis and destruction of its fibrous structures (collagen, elastin). Depending on the level of expression of such changes, the depth of wrinkles can be different.

Types of wrinkles according to the mechanism of formation:

- expressive wrinkles (mimic);
- wrinkles of herbitation;
- skin sagging and a decline in muscle tension (muscle tone) – affect the appearance of weak and hanging skin: in the corners of the mouth, the folds of the jaw and the neck.

Types of wrinkles by origin:

- dynamic wrinkles (appear during conversation, smiles);
- static wrinkles (visible on the face at rest - motionless state).

Mimic (dynamic) wrinkles are formed as a result of the contraction of facial muscles during various facial movements. Yes, if we frown, facial wrinkles appear between the eyebrows, if we often raise our eyebrows, for example, in surprise, then facial wrinkles appear on the forehead, but if we smile a lot, facial wrinkles appear around the eyes . Botulinum toxin injections can eliminate such mimic wrinkles, and chemical peels, mesotherapy, biorevitalization, and contour plastic will help to restore skin condition and eliminate skin blemishes. Static (age, gravity) wrinkles. Static (age-related, gravitational) wrinkles arise from irreversible age-related changes in the soft tissues of the face under the influence of gravity. The older a person becomes, the less elastic and elastic his skin becomes, the amount of subcutaneous fat decreases, muscle atrophy develops. As a result, the oval of the face is disturbed, deep wrinkles and folds appear, the volume of the cheekbones decreases, the tip of the nose drops, etc. These changes give a woman a sad and tired expression. Age-related changes are aggravated by the negative impact of UV rays on the skin (photoaging), as well as by hormonal changes in the body. The key to successful correction of static wrinkles is the restoration of cellular activity of the epidermis and dermis, adequate moisturizing and normalization of the skin's barrier properties, restoration of lost volume of soft facial tissues, filling of wrinkles and folds, modeling of the contour and volume of the lips. This is facilitated by numerous hardware techniques, laser skin polishing, photorejuvenation, as well as chemical peels and injection methods of correction, such as contour plastic, mesotherapy, and biorevitalization.

Modern anti-aging methods:

- use of antioxidant therapy;
- mechanical and chemical protection against UV radiation;
- use of retinoids and regenerating additives containing growth factors;

- performing the chemical peeling procedure;
- performance of the dermabrasion procedure;
- injection of hyaluronic acid, vitamins, antioxidants into the skin;
- hormone replacement therapy (estrogen-containing creams, phytoestrogens);
- use of cosmetology products containing coenzyme to slow down cellular aging. The listed means make it possible to achieve a noticeable improvement in the condition of aging skin and can slow down the onset of age-related changes. Withering skin requires constant and intensive care in the salon and at home, but, unfortunately, even the most thorough care both at home and in the cosmetology office can only slow down the processes of withering and only allow you to age beautifully. In case of irreversible changes, plastic surgery and dermabrasion are indicated. It is necessary to explain to clients of this age that the climacteric period is accompanied by a restructuring of the body and a change in the hormonal background, which in turn is reflected in the condition of the skin.

Hardware rejuvenation methods are a rapidly developing field of cosmetology. It is difficult to name the most efficient, effective hardware procedures for facial rejuvenation, as they require individual selection. These are expensive types of health care, but their popularity is growing.

- Ultrasonic (UZ) peeling - the effect of ultrasonic waves on the skin helps exfoliate the surface damaged cells of the epidermis and slightly massages the deeper layers located below them.

- Microdermabrasion (diamond peeling) - allows you to remove the surface layers of the epidermis without injuring the living cells underneath. A mechanical massage is carried out, which promotes the activation of metabolism, the production of elastic proteins of connective tissue.

- Radio frequency RF-lifting (thermasage) - The effect on the skin occurs with the help of a high-frequency current. The outer and middle layers of the epidermis are warmed up, which contributes to the activation of metabolism. High temperature promotes the breakdown of fat, the products of which are removed through the lymphatic vessels. The skin is tightened, creating the effect of a non-surgical lift.

- Microcurrent therapy - Weak electrical impulse currents of low frequency affect. This has a stimulating and rejuvenating effect: blood circulation, metabolism improves, collagen and elastin synthesis is activated.

- Laser rejuvenation - laser grinding, which eliminates significant defects (wrinkles, scars) with simultaneous stimulation of the deep layers of the epidermis, which leads to rejuvenation; the procedure is performed under anesthesia and laser nanoperforation is a new technique, a gentle laser effect that allows you to tighten the skin; the method has a stimulating effect on blood circulation and metabolism, contributing to the restoration of youth; no pain relief required

- Photorejuvenation - light waves have different lengths, therefore they affect the surface of the epithelium, penetrating into its different layers. There is stimulation of metabolic processes, production of additional elastin and collagen, return of skin youth. It tightens (lifting effect), becomes more elastic and fresh.

- LPG massage - blood circulation is activated, toxins and tissue decay products are removed through venous and lymphatic vessels. After the course of treatment, the skin revives, becomes more elastic, young.

Antiaging cosmetics are designed to reduce the signs of skin aging, such as wrinkles, lines, loss of elasticity and other signs.

Serums with vitamins and antioxidants: Serums contain high concentrations of vitamins C and E, retinol, hyaluronic acid and other active ingredients that help maintain the youthful appearance of the skin.

Eye creams: These creams are specially designed to care for the delicate skin around the eyes, where the first signs of aging, such as facial wrinkles, are usually visible.

Creams with SPF: Sun protection is one of the key components of antiaging skin care. Creams with a high SPF help prevent photoaging and sun damage.

Face masks: Anti-aging masks can contain various beneficial ingredients such as peptides, clay, plant extracts and many others to improve the condition of the skin.

Peels and Exfoliants: Exfoliants help remove dead skin cells and stimulate the skin's repair process, which can make skin look younger and fresher.

Retinol creams: Retinol (vitamin A) is known for its effectiveness in fighting signs of skin aging such as wrinkles and dull spots.

Serums and creams with hyaluronic acid: Hyaluronic acid provides moisture to the skin and increases its elasticity, making the skin smoother and healthier.

The study of modern cosmetic products for the face with an antiaging effect is an important and relevant area of cosmetology and dermatology, as scientists are constantly working on the development of new and more effective formulas that help prevent skin aging and improve its general condition.

The main active substances that can be contained in the composition of anti-aging cosmetics include:

1. Retinol: This is a form of vitamin A that accelerates cell turnover in the skin, stimulates collagen production and reduces wrinkles.
2. Vitamin C: This antioxidant helps protect skin from free radical damage, supports collagen production, and reduces wrinkles.
3. Hyaluronic acid: this substance helps to moisturize the skin, reduces the appearance of wrinkles and increases its elasticity.
4. Peptides: These protein compounds help maintain healthy collagen in the skin and reduce the appearance of wrinkles.

5. Alpha Hydroxy Acids (AHAs): These substances help exfoliate dead skin cells, support collagen production and reduce the appearance of wrinkles.

Antiaging cosmetics that contain medicinal plants have become increasingly popular in recent years. Medicinal plants are known for their healing properties and the wealth of beneficial components that can be beneficial for the skin. Aloe vera, ginseng, rosehip, hibiscus, and others are among the most popular medicinal plants used in antiaging cosmetics.

- **questions (test tasks, tasks, clinical situations) to check basic knowledge on the subject of the lesson:**

Answer the question

1. The concept of skin aging. Exo- and endogenous factors provoking skin aging.
2. Physiology of skin aging. Leading processes in aging skin and their characteristics.
3. Concept of photoaging. Name the main clinical stages of skin photoaging.
4. Describe the chronology of wrinkles.
5. Comparative characteristics of photoaging and chronoaging: main factors and changes in the body.
6. Types of aging. Classification of skin aging types: by place of formation, by depth of location, by mechanism of formation, by origin.
7. Name and describe the main methods of combating skin aging. Hardware techniques in the fight against skin aging.
8. Modern cosmetics with antiaging effect.

3. Formation of professional skills and abilities:

- **content of tasks (assignments);**

Suggest a choice of ingredients for the formulation of the following cosmetics for facial skin care: anti-aging cream.

Task 1. Describe the composition of antiaging cream and serum. Give the composition of an antiaging cosmetic product.





Task 2. Propose the composition and justify the functional purpose and quantitative composition of the ingredients of the recipe, compile and justify the rational technology of the production of the cosmetic product, evaluate the quality of the prepared product and prepare a report.

Formulation of the cosmetic cream for the care of mature skin (%):

Aloe extract 5.0

Avocado oil 10.0

Glycerin 10.0

Retinol 0.2

Tocopherol acetate 0.2

Twin-80 6.0

Air pressure 0.2

The water is purified to 100.0

Requirements for the report:

- Topic and purpose of the practical session.
- Working prescription of the cosmetic product.
- Block diagram of cosmetic product production.
- Technology of production of cosmetics.
- Methods of cosmetic product analysis.
- Conclusions regarding the quality of the finished product in accordance with the requirements of NTD.

Task 3. Specify the main changes occurring in aging skin. Recommend the basic principles of daily skin care for this type.

Task 4. Suggest the composition of an antiaging cream for problem skin and signs of aging. What ingredients would you choose to create an anti-aging cream that fights ulcers and has an anti-aging effect?

- **recommendations for the performance of the task;**

According to the progress of the practical lesson, complete the individual task in your workbook.

- **requirements for work results, including registration;** The individual work task is filled in the workbook and handed over to the teacher for checking.

- control materials for the final stage of the lesson: problems, assignments, tests, etc.:

1. To care for the skin in order to prevent its aging, use:
 - a. therapeutic massage;
 - b. hygienic massage;
 - c. cosmetic massage;
 - d. segmental-reflex massage;
 - e. sports massage;
2. Which of the methods uses laser grinding to remove defects and stimulates the deep layers of the epidermis?
 - a) Laser rejuvenation
 - b) Photorejuvenation
 - c) LPG massage
 - d) Ultrasonic peeling
3. Which ingredient contributes to the preservation of moisture in the skin and increases its elasticity?
 - a) Retinol
 - b) Vitamin C
 - c) Hyaluronic acid
 - d) Alpha hydroxy acids (AHA)
4. Which of the procedures is used to activate metabolism, produce elastic connective tissue proteins and tighten the skin?
 - a) Radio frequency RF-lifting
 - b) Microdermabrasion
 - c) Microcurrent therapy
 - d) Photorejuvenation
5. What types of environmental pollution can affect the condition of the skin?
 - a) Light pollution.
 - b) Gas emissions into the atmosphere.
 - c) Cigarette smoke.
 - d) All answers are correct.
6. What factor can affect the skin in the same way as UV radiation?
 - a) Smoke from cigarettes.
 - b) Air pollution with gases.
 - c) Sulfuric anhydride.
 - d) Oxygen free radicals.
7. What process occurs during photoaging and leads to hyperpigmentation?
 - a) Glycation.
 - b) Increase in collagen synthesis.
 - c) Collagen degeneration.

- d) Slowing of mitosis and differentiation of cells.
8. Which type of wrinkles is characterized by changes in the structure and function of the skin, including thickening of the epidermis and destruction of collagen?
- a) Surface wrinkles
 - b) Deep wrinkles
 - c) Dynamic wrinkles
 - d) Static wrinkles
9. Which means for anti-aging care provides protection against ultraviolet radiation?
- a) Serum with hyaluronic acid
 - b) Cream for the eye area
 - c) Cream with SPF
 - d) Photorejuvenation
10. What substance helps to moisturize the skin and increase its elasticity in antiaging products?
- a) Retinol
 - b) Hyaluronic acid
 - c) Vitamin C
 - d) Alpha hydroxy acids (AHA)

4. Summing up

Notification of current grades, comments of the teacher regarding the preparation of students for the practical lesson, announcement of the next topic of the lesson.

5. List of recommended literature:

Main:

1. Технологія косметичних засобів : підручник для студ. вищ. навч. закладів / О. Г. Башура, О. І. Тихонов, В. В. Россіхін [та ін.] ; за ред. О. Г. Башури і О. І. Тихонова. — Х. : НФаУ ; Оригінал, 2017. — 552 с.
2. Тихонов, О. І. Аптечна технологія ліків / О. І. Тихонов, Т. Г. Ярних. – Вінниця: Нова книга, 2016. – 536 с.
3. Посилкіна О. В., Котлярова В. Г., Чечетка О. В. Методичні рекомендації щодо оптимізації асортименту лікарських косметичних засобів в аптечних закладах : наук.-Харків : НФаУ, 2019. 31 с.
4. Технологія лікувально-косметичних засобів: навчальний посібник / упоряд.: Борисюк І. Ю., Фізор Н. С., Валіводзь І. П., Акішева А. С.. Одеса, ОНМедУ, 2020.-52 с. – Режим доступу: <https://onmedu.edu.ua/wp-content/uploads/2021/01/1.pdf>
5. Екстемпоральні прописи для терапії дерматологічних захворювань: навч. посіб. для студентів медичних та фармацевтичних вузів / Н. П. Половко, Л. І. Вишневська, Т. М. Ковальова та ін. – Х. : Вид-во НФаУ, 2017. – 91 с.

Additional literature:

1. Технологія виготовлення екстемпоральних лікарських апіпрепаратів і їх застосування в фармації, медицині та косметології : методичні рекомендації / О. І. Тихонов, Т. Г. Ярних, С. О. Тихонова, О. С., О. Г. Башура, О. С. Шпичак, Л. О. Бондаренко, П. С. Сирота, Б. Т. Кудрик, Р. І. Скрипник, Тихонов, Н. С. Богдан, С. Г. Бобро, Л. В. Каношевич, О. Є. Богуцька; за ред. О. І. Тихонова. – Х. : Изд-во НФаУ, 2016. – 75 с. 7. Гіалуронова кислота: біосинтез та використання / І. В. Лич, А. О. Угрин, І. М. Волошина // Український біофармацевтичний журнал. - 2019. - № 2. - С. 6-13.
2. Дедишина Л. Космецевтика в аптеці: престижно та прибутково. Фармацевт Практик. 2015. № 12. С. 28-29.
3. Маркетинг у фармації та парфумерно-косметичній галузі: навчально-методичний посібник для самостійної роботи студентів фармацевтичного факультету спеціальності «Технології парфумерно-косметичних засобів», / Н.О. Ткаченко., В.О. Демченко, Н.М. Червоненко, Т.П.Зарічна. - Запоріжжя: ЗДМУ, 2016. - 100 с
4. Zujkina S.S. The pharmacotechnological studies of the phytoppecies composition for the complex therapy of mastopathy / S.S. Zujkina, L.I. Vishnevskya // Вісник фармації. – 2017. – № 2 (90). – С. 43-47.

15. Electronic information resources

1. [Department of pharmaceutical chemistry and drug technology of ONMedU](#) – website of the Department of pharmaceutical chemistry and drug technology of ONMedU
2. [Scientific library of ONMedU \(odmu.edu.ua\)](#) - Scientific library of ONMedU
3. [www.moz.gov.ua](#) – official website of the Ministry of Health of Ukraine
4. [Odessa National Medical University \(onmedu.edu.ua\)](#) – ONMedU official website
5. State Register of Medicinal Products of Ukraine. - [Electronic resource]. - Access mode: <http://www.drlz.com.ua/> – as of 10.01.2017.