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PHARMACEUTICAL CARE

PART 1

Study guide for practical classes for students
of specialty 226 – Pharmacy, industrial pharmacy

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Authors:

O. V. Kraydashenko - M.D., Full Professor
Kremser O.O. M.D., Full Professor;
Samura T.O. Ph.D, Associate Professor
Glavatskyi O.N. Ph.D

Reviewers:

I. M. Bilay- MD, PhD Professor, Head of the Department of Clinical Pharmacy, Pharmacotherapy, Pharmacognosy, and Pharmaceutical Chemistry of ZSMPU.

S. Ya. Dotsenko - MD, PhD, Professor, Head of the Department of Internal Medicine-3 of ZSMPU;

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The manual, in accordance with the pharmaceutical care program, presents the main symptoms and syndromes of internal organ pathologies, "alarming" symptoms that require medical intervention, clinical presentation of diseases, as well as modern approaches to drug treatment and prevention of these pathological conditions. It provides a comparative analysis and clinical pharmacology of modern drugs used for the correction of internal organ pathologies. The manual is intended for students of pharmaceutical faculties in higher medical institutions, master's students in pharmacy, clinical pharmacists, and pharmacists.

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In the light of the WHO strategy, the role of the pharmacist in the healthcare system is fundamentally changing, and the pharmacist can play a key role in public health, and especially in the field of medicines. Pharmacists and their professional associations around the world are required to "provide informed and objective advice on medicines and their use to the public". Today, the role of the pharmacist has evolved from one who manufactures and sells medicines to one who provides services and information. The most important thing is that a pharmacist provides assistance to a patient, exercising his or her professional care. Moreover, the pharmacist's task is to ensure that the care received by the patient is prescribed correctly, is the most effective among all available options, is the safest, and is also suitable for that particular patient."

Currently, the effectiveness and safety of drug therapy is determined by five main sets of rules designed to ensure the quality, efficacy, and safety of medicines:

1. Good Manufacturing Practice (GMP);
2. Good Laboratory Practice (GLP);

3. Good Clinical Practice (GCP);
4. Good Distribution Practice (GDP) for the wholesale of medicines;
5. Good Pharmaceutical Practice (GPP).

The first three codes of professional practice cover preclinical research, manufacturing and clinical trials of medicines, the GDP rules apply to their wholesale distribution, and the GPP covers the distribution of medicines, primarily through the pharmacy network.

Global changes in the global healthcare system are reflected in the healthcare system of Ukraine, in particular, its pharmaceutical sector. In accordance with the "Concept for the Development of the Pharmaceutical Sector in the Healthcare System of Ukraine for 2011-2020" approved by the Order of the Ministry of Health of Ukraine No. 769 dated 13.09.2010 and taking into account the provisions of the resolutions of the World Health Organization and the International Pharmaceutical Federation "Quality Standards for Pharmaceutical Services. Good Pharmacy Practice (GPP)" (1997), "Development of Pharmaceutical Practice. Focus on Patient Care" (2006), standards of pharmaceutical care in the dispensing of OTC medicines - "Protocols of a pharmacist (pharmacist)", approved by the Order of the Ministry of Health of Ukraine No. 284 of May 16, 2011, have been developed and implemented in pharmacy practice in Ukraine.

Responsible self-medication is an important part of the modern healthcare system

Changes in the professional activities of pharmacists are closely related to the development of the concept of self-medication. According to WHO documents, self-management activities are the main element of the AHP.

Self-medication is the use of commercially available medicines by a consumer to prevent and treat health disorders and symptoms recognized by the consumer. In practice, self-medication also includes the treatment of family members and friends, especially when it comes to treating children.

This is the definition of self-medication given in WHO documents. The key characteristic of self-medication is the patient's responsibility for his or her health, so in 1994 the European Association of Manufacturers of Over-the-Counter Drugs (AESGP) transformed the term ***"self-medication"*** into "***responsible self-medication"***.

It is very important to emphasize that taking medications that are not freely available on the market under your own responsibility, but without qualified supervision (on the advice of friends, from the leftover stocks of your home medicine cabinet) can in no way be considered self-medication and should be considered a completely unacceptable phenomenon, although it is widespread in real life.

The term ***"self-help" refers*** to cases when it is necessary to alleviate one's condition in case of certain ailments, at the time of an exacerbation of a chronic disease before visiting a doctor, and to provide first aid before the doctor arrives.

Disease ***self-prevention involves*** taking measures by the population to reduce the risk of disease, detecting symptoms of the disease at the earliest possible stage to prevent the development of the disease or to make it easier to treat, taking measures to prevent recurrence of the disease, and improving the quality of life of the sick person.

Self-help and self-prevention are integral components of the concept of

responsible self-management. They also include a healthier lifestyle, smoking cessation, moderate alcohol consumption, and proper use of medications.

In turn, responsible self-treatment is a part of the modern healthcare system aimed at fostering a sense of responsibility for one's health, educating citizens in this area, and providing medical and pharmaceutical services that allow them (citizens) to exercise the right to take care of their health independently. Responsible self-treatment is an objectively existing primary link in the modern healthcare system and does not require the creation of any special organization.

Objective reasons for the development of the concept of self-medication in modern conditions

I. Reduction of state involvement in public health issues due to the significant rise in the cost of the health care system.

1) Successes in the prevention and treatment of diseases lead to an increase in life expectancy. The majority of the population is reaching the age when chronic diseases prevail. The proportion of elderly people in need of support is increasing relative to people of working age. Older people need more medical care. Progress in medical science and the development of medical technology have significantly expanded the range of medical services and the cost of providing them.

2) The growth of general education and general living standards leads to the fact that people want to make more use of opportunities in the field of medical services and receive them in the most comfortable conditions.

3) Healthcare costs covered directly by the state and social security systems cannot grow faster than the gross national product.

4) In Central and Eastern European countries, these reasons are compounded by the difficulties of economic transition, economic restructuring, and national budget cuts.

II. Increasing the role of patients in maintaining their health.

1) Increased educational attainment increases the number of people who are more likely to make independent (without the help of a doctor) decisions about their health.

2) The spread of active promotion of a healthy lifestyle considers the improvement of health not only as a result of medical care and medications, but also in close connection with rational nutrition, sports, combating bad habits, ecology, etc.

3) A significant increase in the range of over-the-counter medicines and their active advertising in the media increases the patient's ability to treat themselves.

Pharmaceutical science and production are constantly providing doctors and patients with new medicines. Today, the global pharmaceutical market offers more than 350 thousand medicinal products, of which more than 20 thousand are registered in Ukraine. The number of medicinal products based on original substances is growing annually - from 20 to 30 innovative drugs per year. More than 700 new drugs of all therapeutic groups are currently in clinical trials, including 130 for HIV, more than 120 for cardiovascular diseases, 30 for arthritis, 25 for osteoporosis, 20 for diabetes, depression, asthma, Alzheimer's disease, schizophrenia, 10 for Parkinson's disease, epilepsy and inattentive sclerosis, and more than 300 for tumor treatment. Growth in the production of medicines is closely linked to growth in their consumption, as

illustrated by the steady growth in drug sales in the world's leading pharmaceutical markets with a projected trend of 8% annually.

Global changes in the economy, healthcare, pharmacy, information technology, and consumer psychology have led to a change in the relationship between the inextricably linked elements in the doctor-patient-pharmacist system.

On the one hand, a physician, unable to master the enormous amount of information associated with the rapid growth of the drug nomenclature, is excessively "forced" to be conservative in matters of pharmacotherapy. On the other hand, a patient who is quite literate, demanding of his or her health, saturated with information about medicines from the media, and does not have "extra" free time is increasingly turning to a pharmacist, bypassing the doctor. This situation is radically changing the role of the pharmacist, who is beginning to take a key position in the system of self-medication.

Self-treatment is a real way to reduce the burden of costs borne by healthcare organizations. The funds allocated by the state for healthcare can be saved by moderate consumption of self-treatment. This, in turn, encourages the government to pay special attention to the reasonable and responsible use of OTC medicines, which, as a result, puts the pharmacist at the forefront of the national healthcare system.

From the point of view of healthcare authorities, the adoption of the concept of self-treatment not only satisfies the growing desire of the population to manage their health, but also coincides with the need to keep public healthcare costs at a reasonable level.

Self-medication should in no way be considered an alternative to medical treatment. Moreover, it should have its limits where the picture of the disease and its causes are not clear to a layperson, and the use of medications at your own risk can cause harm.

The main characteristic of self-medication is the patient's responsibility for his or her health. The basis of a responsible approach to self-medication is the availability of complete information. A person needs to be made aware of when it is okay to self-medicate and when it is necessary to seek medical attention. The line between these cases should be clearly understood by the patient. If there is even the slightest doubt, it is better to guide the patient to visit a doctor.

Of course, if the patient fails to eliminate the symptoms of the health disorder within two, maximum three days by self-medication, then a visit to a doctor is strictly required. The same should be done in the event of certain "threatening" symptoms. A patient can get information about these symptoms from a pharmacist at a pharmacy when purchasing medicines for self-medication.

The concept of responsible self-treatment recognizes that in some cases, even a doctor may find it difficult to distinguish between a serious and a non-serious illness, especially since serious pathological conditions may be hidden under the mask of mild illnesses. Therefore, people who choose to self-medicate should be informed in which cases they can self-medicate and in which cases they should consult a doctor. In addition, the patient should be informed about effective and safe over-the-counter medicines that can be used for self-treatment in certain situations.

The undoubted positive aspects of introducing the concept of self-treatment into

the healthcare structure are as follows:

- saving patients' time and money;
- reducing the burden on healthcare facilities and doctors;
- saving budget funds;
- demand for a new generation of healthcare professionals - clinical pharmacists;
- active implementation of pharmaceutical care in the practice of pharmacies;
- increase in the profit of pharmacies;
- active participation of doctors in the formation of the OTC drug nomenclature.

At the same time, as with any phenomenon, the concept of self-medication has negative aspects, namely: the danger of untimely treatment and, as a result, a high risk of disease complications; high risk of drug complications.

Pharmaceutical care is a comprehensive program of interaction between a pharmacist and a patient, a pharmacist and a physician throughout the entire period of drug therapy, from the moment a medicine is dispensed until it is completely finished. It should be carried out by a pharmacist in close cooperation with other healthcare professionals (doctors, nurses) and patients.

Pharmaceutical guardianship implies that the pharmacist assumes responsibility to a particular patient for the outcome of treatment with medicines.

In the light of the requirements of Good Pharmacy Practice (GPP), the term pharmaceutical care has been established as the name of an ideology of practice that identifies the patient and society as the primary users of pharmacist activities. It is fair to say that good pharmacy practice is one of the most effective ways to implement pharmaceutical care.

Pharmaceutical care implies the involvement of a pharmacist (pharmacist) together with a doctor in active activities to ensure the health and prevent morbidity of the population. The pharmacist is obliged to provide the patient not only with high-quality medicines and medical devices, but also to promote their rational use.

The basis for proper pharmaceutical care is the professional knowledge and experience of the pharmacist, the norms of professional pharmaceutical ethics, the pharmacist's attitude to the patient and his/her duties.

In order to provide pharmaceutical care when dispensing OTC drugs in a pharmacy, a pharmacist must perform a number of mandatory actions stipulated by the GPP requirements.

1. Correctly assess the patient's test.

When a patient asks for a recommendation or requests a non-prescribed drug, the pharmacist must obtain information that allows him or her to properly assess the patient's specific health test. To do this, it is imperative to find out who has the test (to be able to assess whether the patient belongs to a risk group and use this information in further counseling), what the symptoms are, how long the illness has been going on, whether any measures have been taken, and other medications.

The pharmacist should determine whether the symptoms are associated with a serious medical condition; if so, the patient should be referred to a physician for immediate medical advice.

In case of a less serious health test, advice should be given, and the use of

medicines should be recommended only in case of real need.

2. Provide the patient with an OTC drug(s).

The pharmacist should make the most of his or her professional knowledge and experience when selecting OTC medicinal products, taking into account their efficacy, safety, quality and economic feasibility.

When dispensing an OTC drug, provide complete information on the drug's effect, method of administration (how, when, in what doses), duration of treatment, possible side effects, and compatibility with other drugs and food.

3. Ensure that the patient is followed up. The pharmacist should evaluate the effectiveness of the medicine with the patient.

The pharmacist should recommend that the patient consult a doctor if symptoms persist after a certain period of time.

Algorithm of pharmacist's actions in the implementation of pharmaceutical care during the dispensing of over-the-counter medicines for the symptomatic treatment of minor health disorders

In accordance with the GPP rules and recommendations, for each symptom or ailment that can be treated independently, there is a separately developed algorithm that a pharmacist working in a pharmacy must be familiar with. In general, the actions of a pharmacist in the implementation of pharmaceutical care for patients during the dispensing of OTC medicines can be presented in the form of the following algorithms.

Determine which symptom is being treated with the drug

Determine, based on a patient interview, whether this symptom is a manifestation of a disease that requires mandatory medical intervention

Determine the pharmacological (pharmacotherapeutic) group of drugs for the treatment of this symptom

Select the optimal drug for a given patient among the medicines of a certain group

Provide the patient with appropriate information about the selected drug

Practical functions of the pharmacist that are necessary for the implementation of care (methods of collecting medical history, development of a plan for monitoring the side effects of medicines, preventive measures against possible side effects, etc.) When choosing a drug for a particular patient, the medical history is of great importance - collecting information about previous drug therapy. The collection of medical history is necessary because in some cases, medications can be the cause of the disease or cause symptoms that simulate the disease.

An algorithm for providing pharmacists with appropriate information about a medicinal product when providing pharmaceutical care to patients:

INFORMATION ABOUT THE MEDICINAL PRODUCT

The effect of the drug.

Why is this medicine needed?

Which symptoms of the disease will disappear and which will not?

When will the effect of the drug show up?

What happens if the drug is taken incorrectly or is refused?

Side effects

What side effects can occur?

How to recognize them?
How long will they be stored?
How serious are they?
What should you start with**?**

Conditions for rational use of the drug.

How to take the medicine?
When should it be adopted?
How long should I continue treatment?
How to store a medicinal product?
What should I do with the remaining drug?

Warning.

When should I not take a medicine?
What is the maximum dose?
Why is it necessary to undergo a full course of treatment?
Why should you not be treated for more than a limited time and consult a doctor?

Control of information

Ask the patient if they understand everything?
Ask the patient to repeat the most important information?
Ask the patient if they have any questions?

Discontinuation of medications can lead to an exacerbation of the disease. Data on previous medications can help with the next choice of medications to prevent unwanted side effects and provide the most effective treatment.

After selecting an OTC drug, pharmaceutical care includes the following recommendations and consultations for the patient:

- selection of the optimal dosage form and route of administration;
- rules for the use of various dosage forms;
- features of individual dosage;
- peculiarities of interaction of this medicinal product with other medicinal products;
- peculiarities of interaction of this medicinal product with food, alcohol and nicotine;
- the time of day that is optimal for taking this medicine;
- possible adverse effects of medicines on the functions of human organs and systems;
- storage conditions for specific medicines.

To fulfill the above algorithm of pharmaceutical care, a pharmacist must be able to:

- initiate a dialog with the patient to obtain sufficient data about his or her disease;
- ask key questions to determine the patient's condition;
- be prepared to recognize specific conditions and symptoms of common diseases;
- within a short time, by asking 3-4 key questions, to make a decision on the

possibility of self-treatment;

- convince the patient of the need for a limited period of treatment and medical consultation in case of ongoing adverse symptoms;
- to convince the patient, if "threatening" symptoms are detected, of the need to visit a doctor;
- ensure confidentiality of information about the patient's condition;
- be well versed in the nomenclature of OTC drugs;
- have a good knowledge of chemical, pharmaceutical and pharmacological properties of OTC drugs;
- Provide objective information about medicines and transmit it in a form accessible to the patient;
- use additional sources of information about medicines to meet the patient's immediate needs;
- to help patients take responsible and adequate self-medication;
- Provide advice to consumers to help them take informed care of their health.

The following conditions are also necessary for high-quality pharmaceutical care:

- Pharmacists should have sufficient information about treatment regimens and the main drugs used to treat the most common diseases.
- Pharmacists must have knowledge of the basics of internal medicine.
- Pharmacists should know the basics of rational use of medicines.
- Pharmacists should know the rules for conducting patient consultations.
- It is also necessary to control the information that comes to the pharmacist from the drug manufacturer through their representatives and through advertising.

Practical functions of a pharmacist that are necessary for the implementation of care (methods of collecting medical history, development of a plan for monitoring the side effects of medicines, preventive measures for possible side effects, etc.)

With the development of the concept of self-treatment and the expansion of indications for the use of OTC medicines, the role of the pharmacist in the provision of primary health care is growing significantly. With proper knowledge of clinical pharmacy, a pharmacist can give the right advice to the consumer on the use of medicines based on the symptoms. He or she can explain what symptoms can be treated with medicines intended for self-administration and what symptoms require a doctor's consultation. In case of mild illnesses, a pharmacist can give advice as qualified as a doctor.

Since the patient comes to the pharmacy without a doctor's diagnosis, the patient's self-diagnosis is the starting point for self-medication. It follows that a pharmacist is a competent consultant to a patient who intends to start self-medication. Relying on his education, experience and specialized knowledge, in order to protect the patient, he is fundamentally and professionally obliged to check the appropriateness of the patient's actions.

The pharmacist's controlling function is expressed in communication, when, through a consultation conversation, he receives reliable information from the patient himself that is necessary to start self-medication. At the same time, the pharmacist is in no way a competitor to the doctor, but rather differentially selects the contingent of

patients who need medical care.

In addition, the pharmacist's control function extends to:

- preventing the use of medications that are not appropriate for the indications;
- indications of the conditions for rational use;
- explaining the risk of unwanted side effects of medicines;
- restrictions on the use of certain categories of medicines.

Over-the-counter drugs (OTC drugs)

Over-the-counter drugs (OTC drugs) are a large group of medicines that a patient can buy for self-treatment directly at a pharmacy (and some medicines not only at a pharmacy) without a doctor's prescription.

OTC drugs are an integral part of, and at the same time a prerequisite for, the successful development of the concept of responsible self-medication.

OTC drugs are represented by different pharmacological groups: analgesics-antipyretics, antacids, antihistamines, antitussives, etc. Among OTC drugs, there are a sufficient number of medicines that can have a pronounced side effect, especially when used irrationally.

The list of medicines authorized for self-medication may vary significantly from country to country, depending on existing healthcare systems and socioeconomic conditions. However, the criteria for selecting such medicines should be common and based on reliable data, broad therapeutic breadth, and cost.

In accordance with the provisions of the European Parliament and Council Directive, all medicines are available without a prescription, unless they are

- may pose a direct or indirect danger, even when used correctly, but without medical supervision;
- are usually prescribed by a doctor for parenteral use;
- are used frequently and in most cases incorrectly, which can pose a danger to human health;
- contain substances or ingredients whose activity or side effects require further study.

The final decision to classify a medicinal product as a prescription or OTC drug is made by the competent authorities of each state.

According to the Order of the Ministry of Health of Ukraine, medicinal products are divided into two categories:

1) prescription medicines;
2) over-the-counter medicines.

Criteria for classifying medicinal products as prescription or over-the-counter

1. Criterion one. Prescription drugs that may pose a direct or indirect threat to the health of the consumer if used without medical supervision, even if used correctly, are subject to prescription.

Before deciding whether to apply this criterion to a medicinal product, the following factors should be considered.

1.1. The ratio of "direct threat to health/safety":

a) a direct threat to health, even if the medicinal product is used correctly (in accordance with the instructions for use intended for patients), may be associated with its toxicity, interaction with other substances and adverse reactions. An OTC drug must

have the following properties:

- low general toxicity, no effect on reproductive function, no genotoxic or carcinogenic effects;
- low risk of severe adverse reactions of type A* in the general population;
- very low risk of severe adverse reactions of type B**;
- no interaction with commonly used drugs that can lead to severe adverse reactions;

b) when assessing the possible threat to the patient's health that a given drug may pose, the possibility of preventing it should be taken into account. For example, the presence of severe type A adverse reactions is permissible for an OTC drug if the relevant risk group can be easily identified and excluded without resorting to medical monitoring; c) the safety of the drug should be compared with that of alternative drugs.

1.2. The ratio of "indirect threat to health/safety":

a) an example of an indirect health hazard, even with the correct use of a medicinal product (when used in accordance with the instructions), is a situation where a decrease in the severity of symptoms may mask the disease itself, in connection with which the patient needs medical care and observation; the use of a medicinal product may lead to a later diagnosis, prescription of appropriate therapy, as a result of which the opportunity for more successful treatment may be lost; warnings on the use of a medicinal product

b) an indirect threat also exists if frequent use of a medicinal product increases the risk of developing drug resistance, especially among the general population, to the extent that the benefit of using this medicinal product may be questionable, or if the symptoms to reduce the severity of which the medicinal product is used are usually a manifestation of a number of diseases that the patient cannot diagnose on his/her own.

1.3. Possibility of self-assessment:

a) It is very important that the patient can objectively assess his/her condition or symptoms for which the OTC medicine is indicated in order to use it without medical supervision. This means that the consumer should be able to exclude conditions for which the OTC medicinal product is not suitable but which are similar to those for which the product is indicated; consideration should be given to the availability of appropriate sources of information to help the consumer distinguish between such conditions (such as printed materials, the possibility of taking advice from a pharmacist or other healthcare professionals);

b) it is necessary for the patient to be able to correctly assess the course of the disease, their condition, the duration of symptoms, their recurrence and related consequences;

c) contraindications, interactions with other substances, warnings and cautions regarding the use of the medicinal product must be set forth in a form accessible to the consumer.

1.4. Risks and consequences of improper use of the medicinal product:

a) a large number of contraindications, cautions and warnings or a high frequency of use of drugs interacting with the drug in question increase the risk of misuse of the drug;

b) it is very important that the risk to the health of consumers is negligible,

even if the consumer uses the medicinal product for other reasons than indicated, uses it for a longer period than recommended, exceeds the recommended dose, or does not take into account warnings and contraindications. The analysis of the consequences of misuse of a medicinal product is an important component of the overall safety assessment of a medicinal product, which should be reflected in the information on the package and/or in the package insert.

1.5. Instructions for the patient:

a) the method of use of OTC and similar prescription medicinal products is different, even if the indications for their use are the same or if they are used in the same therapeutic area. The danger that a consumer may believe that an OTC drug is less dangerous than a similar prescription drug should be taken into account;

b) the information contained in the package insert and on the packaging should facilitate the safe and effective use of the medicinal product; the instructions should explain how to use the medicinal product correctly; the information contained in the instructions should be presented in an accessible form so that patients can correctly assess the possibility of using the medicinal product; the amount of information should be sufficient to allow the medicinal product to be used without medical supervision;

c) the information materials accompanying the medicinal product, in addition to the pharmacist's control (if necessary), should contain information that allows preventing the risk of using the medicinal product in case it is contraindicated or dangerous; contraindications, interactions with other substances, warnings and cautions should be set out in a form accessible to the consumer and in a manner that attracts the consumer's attention;

d) in order to minimize the risk and maximize the benefits of using the medicinal product, the attached package insert and packaging should indicate when the medicinal product should not be used, and this information should be no less detailed than the indications for use (see clause 1.4) and should attract the patient's attention; the information should be in accordance with the approved summary of the medicinal product.

Consumers need to know what to do if a medicinal product does not have the desired effect or causes an adverse reaction. Therefore, the package leaflet and packaging should contain recommendations on what actions to take, such as consulting a doctor or pharmacist within the time specified in the package leaflet or on the packaging.

2. Criterion two. Medicinal products are subject to prescription if many consumers often use them incorrectly, as a result of which the medicinal products may pose a direct or indirect threat to human health.

When considering whether this criterion is applicable to a drug, the following factors should be taken into account.

2.1. There is evidence of misuse of the medicinal product.

Evidence of misuse of an OTC drug (e.g., use to enhance the effects of alcohol) is grounds for restricting the use of this drug or changing its category of supply to a prescription drug. In this case, the medicinal product cannot be classified as OTC.

3. Criterion three. Medicinal products are subject to prescription if they contain

substances whose effect and/or side effects require further study.

When considering whether this criterion is applicable to a drug, the following factors should be taken into account.

3.1 Marketing Authorization for the medicinal product has been issued recently / experience in the use of the medicinal product is limited:

a) further study of the properties of the medicinal product may be required in cases where the trade license for it has been issued recently or the experience of use is small, for example, due to a small volume of sales; the experience of using the medicinal product in other EU states and other countries where sufficient data on its post-licensing (post-registration) use has been collected should also be taken into account."

b) despite the available and encouraging results of clinical trials, it is very important to have experience of widespread use of the drug after the issuance of a marketing license, which allows to obtain evidence of its safe use in those groups of patients who do not usually participate in clinical trials.

3.2. Other strength of the medicinal product, dose, route of administration, indications, age groups, other combination of substances:

a) additional studies are required if an application is submitted for the release of a medicinal product without a prescription with a different strength, with a different route of administration, used in a different dose, in a different age group or for a new indication, especially for an indication not previously approved for an OTC medicinal product; when using a medicinal product in a lower dose or with a lower strength, studies are not always required, but it should be confirmed that the reduction in dose does not affect the effectiveness of the medicinal product;

b) despite the fact that safety characteristics of a prescription drug are important, a reassessment of the risk/benefit ratio is necessary, but such an assessment may be difficult due to the lack of experience of widespread use of the drug in a new dose and for new indications, however, it is possible to extrapolate safety data for an existing prescription drug; the method should be used if there are few adverse reactions and/or

c) a medicinal product containing a combination of two active substances, each of which is included in OTC medicinal products, cannot be automatically classified as an OTC medicinal product; the evaluation of a combination product is carried out in accordance with the Guidelines for Medicinal Products with a Fixed Combination of Active Substances.

4. Criterion four. Medicinal products that are usually prescribed by a physician for parenteral use (e.g., intravenous) are subject to prescription.

When considering whether this criterion is applicable to a drug, the following factor should be taken into account:

Medicines intended for parenteral use are usually classified as prescription drugs because of the additional risk and complexity associated with the route of administration.

5. Other criteria. A medicinal product that meets the criteria to be classified as a prescription drug may be classified as an OTC drug if the maximum single dose, maximum daily dose, strength, dosage form, certain types of packaging and other conditions of use of the medicinal product allow it to be classified as an OTC drug.

5.1. The size and shape of the drug package:

a) the size of the packaging of the medicinal product should correspond to the expected duration of treatment; limiting the supply of the medicinal product due to the small size of the packaging may prevent the misuse of the medicinal product, especially its overdose, and facilitate timely referral of the patient to a doctor;

b) the design of the packaging (container) of OTC medicinal products should exclude the possibility of access to them by children.

5.2. Maximum single dose, maximum daily dose.

The maximum single dose or maximum daily dose is limited in order to protect the health of the consumer, regardless of whether he or she takes the drug correctly or incorrectly. However, it must be substantiated that reducing the dose of the medicinal product does not affect its effectiveness.

However, not all issues have been settled yet1, such as the unified criteria for including drugs in the OTC category and the mechanism for such inclusion, and clear rules for the sale of prescription drugs (with the exception of potent and narcotic drugs) are not implemented in practice.

Currently, over-the-counter drugs in Ukraine account for 20% to 30% of all registered medicines.

In some cases, individual ingredients can be licensed as both prescription and OTC products. In this case, the main thing is the disease itself and the effect of the drug on the patient. For example, in the UK, ibuprofen for the treatment of rheumatoid arthritis is licensed as a prescription drug, and as part of complex medicines for the treatment of muscle pain, it can be licensed as an OTC drug.

OTC drugs are symptomatic treatments, as they do not affect the cause and mechanism of the disease. All of them are designed to be taken for a short period of time and are not intended for long-term treatment. OTC drugs are used to treat minor conditions that can be easily corrected with medication and do not require medical intervention. The main purpose of their use:

- quickly and effectively alleviate the symptoms of diseases that do not require medical consultation;
- in the context of financial and staffing difficulties in the public healthcare sector, to enable patients to relieve minor symptoms of poor health on their own, which will reduce the burden on medical services;
- Increase the availability of medical care to people living in remote regions where it is difficult to obtain qualified medical advice.

An analysis of studies on self-treatment reveals more than 10 common conditions that are treated with OTC drugs. These include headaches, colds (cough, rhinitis, sore throat, fever), gastrointestinal disorders (heartburn, constipation, or diarrhea), central nervous system disorders (increased anxiety, emotional lability, insomnia, fatigue), acne, muscle and joint pain, cuts and abrasions.

III. Branded and generic drugs.

The concept of generic and therapeutic substitution. Competence of the pharmacist in choosing an OTC drug for responsible self-medication and in the implementation of OTC drug substitution.

In daily practice, when choosing the optimal drug for a patient, a pharmacist

must take into account not only the pharmacological properties of the drug, but also its cost. To solve this issue, the pharmacist must have a clear understanding of the characteristics of original (branded) and generic medicines.

An original (innovative) medicinal product (Latin: originalis - primary, initial, i.e., real, authentic) is a medicinal product first introduced to the pharmaceutical market containing a new synthesized or otherwise obtained active ingredient that has undergone a full cycle of preclinical and clinical trials, is approved for medical use and protected by a patent for a certain period of time.

Until the patent expires, no other pharmaceutical company has the right to synthesize and use this active substance for commercial or non-commercial purposes. Very often, the concept of "original medicinal product" is identified with the concept of "branded medicinal product".

The concept of "original medicinal product" should not be confused with the concept of "original (trade) name of a medicinal product", which is a patented name registered to protect the right of its exclusive use only by the company that owns a trademark or patent for this name (and not for the active substance). The name can be used to identify a particular drug or dosage form sold by its manufacturer.

Unlike a patent for an active substance, which is time-limited, ownership of an original (trade) name is retained even after the expiration of the patent for the active substance. Under the legal provisions of many countries, manufacturers are allowed to retain the trademark when substituting excipients in single-component medicinal products and even active substances in combination medicinal products.

A brand is a specific name, symbol, design, or combination of certain components used to distinguish a particular product of a seller. A brand is a reflection of individuality. A medicinal product (both original and essentially similar) can be considered a brand if it has a visual sign or brand name, and work has been done to strengthen its credibility, reliability or exclusivity, and to complement the valuable properties of the product (ease of administration, dosage, variety of dosage forms, speed of effect, duration of action, possibility of administration by different groups of patients - children, the elderly, etc.)

Branded medicines are the most studied medicines because the company creating the brand must conduct a number of studies when creating a new drug, and is further interested in collecting as much information as possible about its use in different categories of patients to improve its "brainchild". New original medicines are usually branded. The cost of these drugs is high.

A generic drug, or generic drug, is a drug whose patent protection for the active substance has expired, and it (or rather the active substance) is therefore not the exclusive property of the pharmaceutical company that developed it or held the first license to sell it. A generic medicinal product may be sold under the original (brand) name or under a common name. A generic or international non-proprietary name, unlike the original (brand) name, can be used by any manufacturer after the expiration of the patent for the active substance. In the United States, commonly used names are contained in the United States Accepted Names for Drugs (USAN). However, it should be noted that the list of generic names may differ from the list of international nonproprietary drug names.

In recent years, generic drugs have received increasing attention from both pharmacists and doctors. The interest is primarily driven by the desire of governments in all industrialized countries to reduce rapidly growing healthcare costs while maintaining a high level of treatment quality.

One of the advantages of the widespread use of generic medicines, which provides immediate economic benefits, is the ability to provide the general population with medicines that are equivalent in terms of treatment effectiveness to the original ones, but at a significantly lower cost. The use of generics also allows the saved funds to be used to finance other urgent healthcare needs. In addition, the presence of competitive generic drugs on the market encourages pharmaceutical companies to improve the quality of their medicines and stimulates the search for new, more effective medicines.

A generic drug contains an active drug substance identical to the active substance of the original drug, but the excipients (dyes, flavoring agents, etc.), tablet form, and manufacturing technology of generic drugs may differ from the original drug.

A generic medicinal product must meet the following requirements:

- contain the same active substance in the same dose and dosage form as the original medicinal product;
- to be identical to the original medicinal product in terms of its strength of action;
- have the same indications for use as the original medicinal product;
- be bioequivalent to the original drug.

If the drugs are not equivalent in biological content due to different manufacturing technologies and/or the presence of different excipients and fillers, their therapeutic effect may differ (not be equivalent). Therefore, when comparing drugs from different companies, the concepts of bioequivalence, pharmaceutical equivalence and alternative, and therapeutic equivalence are the main ones in pharmacological characterization.

Pharmaceutically equivalent drugs are drugs in the same dosage form that contain the same active substances in the same amount and meet the requirements of the same or similar standards.

In the United States, pharmaceutically equivalent drugs are those that contain the same active ingredients in the same dosage form, are intended for the same route of administration, and are identical in terms of strength or concentration of active substances.

Pharmaceutical alternative medicines are medicines that contain the same medicinal substance but differ in the chemical form of this substance (are different salts, esters or complexes of these substances), dosage form or strength of action.

Two medicinal products are considered to be bioequivalent if they are pharmaceutically equivalent, containing the same amount of active substance(s), in the same dosage forms that meet the requirements of the same or comparable standards, or pharmaceutically alternative (containing the same active ingredient, but differing in the chemical form of this ingredient (salt, ester, etc.) or dosage form, or strength of action).or dosage form, or strength of action) and if their

bioavailability after administration at the same molar dose is comparable to the extent that the effects of these drugs in terms of efficacy and safety are essentially the same.

Bioequivalence means that bioequivalent generic medicines provide the same pharmacodynamic effect, the same efficacy and safety of pharmacotherapy.

Bioequivalence studies are necessary to confirm the quality of generic drugs and their compliance with the original drug.

Therapeutically equivalent medicines are medicines that contain the same active ingredient or drug substance and, according to the results of clinical trials, have the same efficacy and safety.

When determining therapeutic equivalence, the investigational drug is compared to a drug whose efficacy and safety have already been established and generally recognized.

Medicines can be considered therapeutically equivalent only if they are pharmaceutically equivalent. In this case, they can be expected to have the same clinical effect and the same safety when administered to patients.

The concept of bioequivalence is closely related to the concept of bioavailability.

Bioavailability is the part of the drug that enters the systemic circulation through the extravascular route of administration.

When administered intravascularly, the drug completely enters the bloodstream and its bioavailability is 100%. With other routes of administration (even intramuscular and subcutaneous), bioavailability almost never reaches 100%, because the drug must pass through a number of biological cell membranes (gastric mucosa, liver, muscles, etc.), and only a part of it enters the systemic circulation. The effect of the drug largely depends on how large this part is.

Factors affecting bioavailability:

- route of administration of the drug;
- individual characteristics of the patient's body;
- the state of the gastrointestinal tract, cardiovascular system, liver, and kidneys;
- biopharmaceutical factors (dosage form, composition of excipients, specifics of the drug manufacturing technology).

Drugs containing the same drug substances but manufactured by different pharmaceutical companies can have significantly different bioavailability. Differences in bioavailability lead to differences in therapeutic efficacy and different frequency and severity of side effects.

Since physicians are responsible for diagnosing and treating patients, including prescribing appropriate medications, the choice of a prescription drug is the prerogative of the physician alone. National medical associations in most countries are actively working to ensure strict compliance with the rules for substituting medicines.

Generic substitution is the sale of a drug whose commercial name differs from the one prescribed by a doctor, but whose chemical composition and dosage of the active ingredient are identical.

There are three main systems for generic substitution.

The system of total generic substitution means that a generic drug is dispensed for each prescription issued for an original drug (which can be replaced by a generic drug). A number of tests may arise when using total generic substitution, the essence of which boils down to the test of liability in case of side effects associated with the replacement of the original drug with a generic. Especially often, undesirable effects and exacerbation of the disease may occur when the original drug is replaced with a generic drug from such clinical and pharmacological groups as antiepileptics, β-blockers, anticonvulsants, and calcium antagonists. Full mandatory generic substitution can cause many tests in the relations of all stakeholders, including significant damage to the healthcare system. Therefore, full mandatory generic substitution is not widespread.

The system of prohibitive marks in the prescription - a doctor must make a mark in the prescription if he or she objects to the substitution of any drug specified in the prescription. In this case, the drug can be substituted in the absence of a note, but the doctor is given the opportunity to prevent the substitution.

A system of decisive marks in the prescription - the doctor must make a special mark if he or she does not object to the substitution of the drug specified in the prescription. In this case, the substitution of another drug is not mandatory, and the doctor is given the opportunity to decide whether such a substitution is permissible.

Therapeutic substitution is the replacement of a drug prescribed by a doctor with another drug with a different chemical composition. In this case, although the substituted drug belongs to the same pharmacological and/or pharmacotherapeutic class, its chemical composition differs from the prescribed one, and therefore may cause a different effect in the patient. An example of a therapeutic substitution is the replacement of an H2-receptor antagonist with an antacid drug in the treatment of patients with gastric ulcers. However, therapeutic substitution is considered a violation of the doctor-patient relationship. Therefore, complete therapeutic substitution is prohibited in all countries.

Attitudes towards generic substitution vary from country to country, due to differences in the organization of healthcare systems and differences in the traditions of medical care. In the United States and Canada, pharmacists are allowed to provide generic substitution unless a doctor has prohibited it, which must be indicated on the prescription form. In the UK, generic substitution by a pharmacist is prohibited. Generic substitution is allowed only in hospitals. In Germany, the doctor must indicate in the prescription that he or she agrees to substitute the drug or immediately write a prescription with the generic name. In France, doctors face penalties if they exceed the permissible level of costs for prescriptions issued to patients, and the amount of the fee supplement is calculated based on cost savings when writing prescriptions. Despite this, the generics market in France is still underdeveloped.

Before prescribing a drug, a physician is obliged to make a choice of medicines, taking into account the individual characteristics of the patient, as well as the prices of similar drugs, in order to best meet the needs of a particular patient.

The choice of the optimal drug is greatly facilitated by the advice of a pharmacist. Once a drug has been selected, a generic substitution is not allowed without the permission of the patient and his or her doctor. Therapeutic substitution can only be made after approval by a physician. When authorizing such a substitution, the physician must have a clear understanding of the pharmacodynamics and pharmacokinetics of the generic drug, dosage form, and dosing regimens.

When OTC drugs are dispensed as part of self-medication, the patient chooses the drug with the help of a pharmacist, and the pharmacist can decide on a generic substitute for a particular OTC drug.

Thus, the development of the concept of responsible self-medication and the constant expansion of the range of over-the-counter medicines create conditions where more and more patients go to the pharmacy, bypassing the doctor. The pharmacist becomes a qualified interlocutor of the consumer-patient.

In this situation, the pharmacist is faced with the task of ensuring the proper quality of pharmaceutical care for each patient.

Pharmaceutical care as a pharmacist's responsibility for the effectiveness of drug therapy to a specific pharmacy visitor/patient.

Pharmaceutical care is the responsible provision of drug therapy with the aim of achieving a specific outcome that will improve the patient's quality of life. This result may be:

- treatment of the disease;
- elimination or reduction of symptoms;
- stopping or inhibiting the disease process;
- prevention of disease or symptoms.

Pharmaceutical care involves the process of interaction between a pharmacist and a patient and health care professionals in planning, implementing and monitoring a therapeutic plan that should provide a specific therapeutic outcome for the patient. This process has 3 main functions:

1) Identification of potential and actual tests associated with the use of medicines;

2) solving urgent tests related to the use of medicines;

3)preventing potential tests associated with the use of medications.

Pharmaceutical care is an essential element of health care and should be integrated with other elements. However, pharmaceutical care is provided for the direct benefit of the patient, and the pharmacist is directly responsible to the patient for the quality of care. The primary interaction in pharmaceutical care is a mutually beneficial exchange in which the patient delegates authority and the pharmacist accepts responsibility from the patient. These basic goals, processes, and relationships of pharmaceutical care exist regardless of the current pharmacy practice environment and professional background.

In order to disseminate this concept of pharmaceutical care and assess the quality of its provision in European countries, the Committee of Experts on Quality and Safety Standards for Pharmaceutical Practice and Pharmaceutical Care (CDP-PH/PC), under the coordination of the European Directorate for Quality of Medicines and Healthcare (EDQM) (Council of Europe), developed a work program

in 2009 to assess the quality of pharmaceutical care and use of medicines in Europe and their impact on the quality of life of patients. The purpose of the developed program is to support the legislative healthcare system and improve professional standards for pharmacists and pharmacists involved in the provision of pharmaceutical care. Taking into account the different degrees of prevalence of the concept of pharmaceutical care in the countries of the former Soviet bloc, as well as their geopolitical and social differences with the EU countries, in 2009 a separate working group "Specific Regions of Europe" was established within the project, which included experts from Ukraine, Moldova, Georgia, Albania, and Latvia.

The Council of Europe's vision of the concept of pharmaceutical care is reflected in a number of regulatory documents and implies continuous improvement of purely technical pharmaceutical services (such as dispensing prescription and OTC medicines, diagnostic services - measuring blood pressure, blood glucose levels in the pharmacy, etc.) Improvements include patient counseling, patient education, documentation of interactions (e.g., medication-related resolutions), medication-related resolution tracking (discontinuation, continuation, or modification of medication), interprofessional collaboration, and patient involvement in the treatment process based on the patient's desired quality of life, needs, and expectations. This concept simplifies the process of understanding and implementing the philosophy of pharmaceutical care in practice.

In order to cope with the tasks of providing quality pharmaceutical care, pharmacists need to combine a number of functions in their professional activities. The seven-star pharmacist concept, proposed by the WHO and endorsed by the IFF in 2000 as part of its policy document on Good Pharmacy Education Practice, identifies 7 main functional responsibilities of a pharmacist:

- caregiver - the services of pharmacists are to provide the highest quality care;
- decision-maker - evaluates and synthesizes data and information to make decisions on the most appropriate course of action;
- contact person, communicator - is a link between the patient and the doctor, as well as a source of information for the public on health issues and medicines;
- manager - effectively manages resources (human, material or financial), is responsible for disseminating information about medicines and other products for medical use, as well as ensuring their quality;
- teacher, mentor - is obliged to help educate and train future generations of their colleagues;
- life-long-learner - a lifelong learner, starting with basic education and continuing throughout their professional career;
- leader - in the framework of interdisciplinary (or team) health care, or in cases of shortage and absence of specialists in other medical fields, is obliged to take on the leadership mission to ensure the well-being of the patient and society. Leadership also implies compassion and benevolence, as well as the ability to make decisions, communicate and manage effectively;
- additional function of a researcher - must be able to effectively use the evidence base and can contribute to the evidence base in order to improve patient

care and therapeutic outcomes. As a researcher, he or she can improve the provision of reliable information about medicines to the public in general and to other healthcare professionals in particular.

IV. Medical and socio-economic importance of drug therapy safety

Drug safety is an extremely important not only clinical but also social and economic issue. On the one hand, the results of large-scale clinical trials and post-marketing monitoring indicate an increase in morbidity, mortality and disability due to irrational use of medicines, which is increasingly becoming the basis for withdrawing drugs from the pharmaceutical market or imposing strict restrictions on their use. On the other hand, the development of adverse reactions when using medicines is one of the reasons for the increase in the cost of treating a disease. The financial costs incurred by the state and the patient due to adverse effects of pharmacotherapy depend on the type and severity of adverse reactions. They are associated with an increase in the duration of treatment, the need for additional specialist consultations, diagnostic and therapeutic measures related to both the treatment of the underlying disease and the correction of adverse drug reactions and complications of pharmacotherapy. At the same time, the treatment of some relatively rare complications can be so expensive that it significantly exceeds the cost of previous therapy with a relatively cheap drug.

To obtain a complete picture of the clinical harmlessness of medicinal products, data on their adverse reactions are collected worldwide throughout the entire life cycle of a medicinal product, both before registration and after its entry into the pharmaceutical market. Given the ever-increasing number of medicinal products authorized for use in Ukraine, control over the safety of medicinal products is carried out through the creation and development of the State Pharmacovigilance System and is one of the most urgent tasks of healthcare. Obtaining reliable information on the frequency and severity of adverse reactions of certain medicinal products is a prerequisite for conducting a qualitative pharmacoeconomic analysis of various medical technologies.

Terminology used in the study of drug safety.

Adverse reaction is any undesirable negative reaction that occurs when medicinal products are used in the usual doses recommended for the prevention, diagnosis and treatment of diseases, or to modify physiological functions of the body.

Anticipated adverse reaction - an adverse reaction, the nature or severity of which is consistent with the available information on the medicinal product (for example, the investigator's brochure for an unregistered medicinal product or the package leaflet for a registered medicinal product).

Unanticipated adverse reaction - an adverse reaction whose nature or severity is not consistent with the available information on the medicinal product (for example, the investigator's brochure for an unregistered medicinal product or the package insert/instruction for use of a registered medicinal product).

A serious adverse reaction is any adverse clinical manifestation with the use of a medicinal product (regardless of dosage) that is life-threatening, leads to death, hospitalization or prolongation of its duration, prolonged or significant incapacity or disability, fetal abnormality or congenital anomaly.

A non-serious adverse reaction is any adverse clinical manifestation with the

use of a medicinal product (regardless of dosage) that does not pose a threat to life, does not lead to death, hospitalization or prolongation of its duration, prolonged or significant incapacity or disability, fetal abnormality or congenital anomaly.

A signal is information about a possible causal relationship between the clinical manifestations of an adverse reaction and the medical use of a medicinal product, about which nothing was previously known or the existing data are insufficient.

Suspected medicinal product is a medicinal product, when prescribed, there is a causal relationship between the clinical manifestations of any adverse reaction and its medical use,

Cause and effect relationship between clinical manifestations of any adverse reaction and medical use of a medicinal product is the connection between the reaction observed in a patient and the use of the medicinal product. This relationship meets certain criteria .

Factors contributing to the development of adverse drug reactions (medical, biological and pharmaceutical)

The main factors that influence the occurrence of adverse drug reactions can be divided into the following groups:

1. Factors not related to the effect of medicines:

- characteristics of the patient's body (gender, age, genetic characteristics, bad habits, etc.);
- inadequate clinical assessment of patients' condition;
- drug overdose;
- inadequate control of treatment during long-term therapy;
- age-related changes in pharmacokinetics;
- violation of the patient's medication regimen:
- Factors external to the patient (environmental environment, working conditions, psychological environment, etc.)

2. Factors related to the effect of medicines;

- clinical and pharmacological features of the medicinal product;
- inadequate choice of medicinal product;
- dosage form and method of administration of the medicinal product;
- the result of drug interaction in complex drug therapy.

V. Methods for detecting adverse drug reactions.

Currently, the following methods are used to collect information on adverse drug reactions during their medical use:

1. Collection of spontaneous reports. ***Spontaneous reports are*** signal information about suspected adverse reactions of all medicinal products authorized for medical use in the country. The amount and speed of signal information depends on the activity and number of medical and pharmaceutical workers. Healthcare professionals of all specialties voluntarily (e.g., the yellow card scheme in the UK) or in accordance with the law (e.g., the card-notification of adverse drug reactions - Form 137/o Annex 1, Order of the Ministry of Healthcare of Ukraine No. 898 of 27.12.2006) inform the regulatory authorities about identified adverse drug reactions during their medical use. In Ukraine, the method of spontaneous reporting

is one of the most important methods for identifying adverse drug reactions.

2. Active monitoring of inpatient facilities is a method based on identifying all medicines that were prescribed to all inpatients in a certain period of time, all adverse reactions that occurred, and, ultimately, determining the frequency of adverse reactions.

3. Prescription monitoring is a method of obtaining information on adverse drug reactions based on determining the number of registered adverse reactions, the number of patients who used the drug, and, ultimately, identifying the relationship between the adverse reaction and the use of the drug through the accounting of prescriptions.

4. Cohort studies.

Characteristic features of the method are:

- identifying a group of patients who use a particular drug;
- Identification of the group of patients using placebo or comparison drug;
- comparing the safety of pharmacotherapy between these groups of patients;
- assessment of the risk and frequency of adverse reactions.

5. Comparative study (case-control study).

The method is based on the selection of patients who have experienced a certain negative reaction when prescribed the relevant drug and patients who have not experienced it when prescribed the drug. Subsequently, the frequency of medication use in each group is assessed, as well as the impact of various factors.

VI. Pharmacovigilance: definition, organization of activities.

The pharmacovigilance system assesses and monitors the safety of medicines when they are used in general medical practice.

Pharmacovigilance is a state system of collecting, scientific evaluation and control of information on adverse reactions of medicinal products in the conditions of their normal use in order to make appropriate regulatory decisions regarding medicinal products registered in the country.

The pharmacovigilance system should also study data on the frequency of misuse and abuse of medicines.

In many countries of the world, national pharmacovigilance centers have been established (in Ukraine - since 2002), whose activities are coordinated at the international level by the WHO Center for Monitoring of Medicines. The WHO Center is located in Uppsala (Sweden), with formal management and coordination carried out by the WHO Central Office in Geneva (Switzerland). To date, thanks to the efforts of the WHO, a system of information exchange on adverse drug events has been formed and continues to be formed worldwide. As part of the international Program for the Control of Adverse Drug Events, which involves more than 80 countries, all national data on adverse drug reactions are submitted to the WHO Center's information bank, which currently contains more than 3.5 million reports. On a quarterly basis, information is transmitted to the WHO Center by means of a unified notification card from the national centers for pharmacovigilance:

- about registered cases of adverse reactions to "new" medicines;
- unexpected reactions to "old" medicines;
- serious adverse reactions to all medicines or the results of their interaction;

- negative impact of medicines on the fetus and newborns;
- cases with a fatal outcome

For its part, the WHO is carrying out the following work on pharmacovigilance:

- informs the countries participating in the Program about adverse drug reactions in the form of information letters (WHO Notwsletters) containing data from national centers for pharmacovigilance and bulletins on drug safety in different countries;
- works with them to create adverse reaction reporting systems;
- organizes a system of regular exchange of information on the safety and efficacy of medicines between the participating countries through a network of specially appointed staff in national centers for pharmacovigilance;
- promotes contacts between the regulatory authorities of the participating countries to combat the production of counterfeit medicines;
- ensures prompt transmission of new information on serious adverse drug reactions to national health authorities;
- develops and disseminates guidelines for the establishment of national centers for monitoring the safety of medicines;
- conducts training for doctors and specialists in drug safety monitoring in the use of new and combined drugs.

Department of Pharmacovigilance of the State Expert Center of the Ministry of Health of Ukraine: main tasks and activities, legislative framework

In Ukraine, adverse drug reactions are monitored by the Pharmacovigilance Department at the State Expert Center (SEC) of the Ministry of Health.

Main tasks and activities of the Pharmacovigilance Department of the SEC of the Ministry of Health of Ukraine:

- implementation of pharmacovigilance in the healthcare system;
- development of a modern methodology for organizing control over the safety of medicines in their medical use;
- development and implementation of a modern methodology for studying adverse drug reactions;
- Participation in the development and implementation of regulatory documents on the organization and monitoring of adverse reactions, as well as the examination of materials on adverse reactions in Ukraine;
- carrying out advisory, methodological and educational activities in the field of drug safety control;
- continuous analysis and summarization of information on adverse drug reactions to provide the Ministry of Health of Ukraine with reasonable recommendations for safe pharmacotherapy and pharmacoprophylaxis in patients;
- Implementation of measures to improve pre- and postgraduate training of doctors in higher medical education institutions and postgraduate education institutions of III-IV accreditation levels on the issues of medicines safety control in cooperation with the Main Department of Education, Science, Information and Analytical Support and the Central Methodological Cabinet for Higher Medical Education of the Ministry of Health of Ukraine;
- control over the implementation by doctors and heads of medical institutions

of Ukraine "by manufacturers of medicinal products or their authorized representatives of the instructions governing pharmacovigilance;

- exchange of information on adverse drug reactions with the WHO;
- publishing materials on adverse drug reactions in periodicals and other specialized publications.

In order to implement the pharmacovigilance system in all regions of Ukraine, 14 regional offices were established and are now operating within the structure of the Pharmacovigilance Department of the State Expert Center of the Ministry of Health of Ukraine.

The pharmacovigilance system in Ukraine is regulated by the following legislative documents:

- Order No. 347 of 19.12.2000 "On Approval of the Instruction on Supervision of Adverse Reactions / Effects of Medicinal Products";
- Order No. 51 of 08.02.2001 "On Organization of Provision of Information on Side Effects of Medicinal Products";
- Order No. 52 dated February 08, 2001 "On Amendments to Annex 3 of Clause 5.1 of the Instruction on Supervision of Adverse Reactions/Acts of Medicinal Products";
- Order No. 292 of 16.07.2001 "On Improvement of Organization of Submission of Information on Side Effects of Medicinal Products";
- Order No. 898 of 27.12.2006 "On Approval of the Procedure for Supervision of Adverse Reactions of Medicinal Products Approved for Medical Use".
- Order of the Ministry of Health of Ukraine No. 1005 of December 29, 2011 "On Amendments to the Order of the Ministry of Health of Ukraine No. 898 of December 27, 2006".

In accordance with the above documents, the Pharmacovigilance Department of the SEC of the Ministry of Health of Ukraine initially collected information on adverse drug reactions during clinical trials and in medical use. Currently, the scope of this organization's activities extends only to medicinal products approved for medical use (Order of the Ministry of Health of Ukraine No. 898 of 27.12.2006). The Department of Coordination and Control of Clinical Trials of Medicinal Products at the SEC of the Ministry of Health of Ukraine collects information on adverse reactions of medicinal products identified during clinical trials (Order of the Ministry of Health of Ukraine No. 66 of February 13, 2006),

Sources of information on adverse reactions of medicines during their medical use

The Department of Pharmacovigilance of the State Expert Center of the Ministry of Health of Ukraine may receive information on adverse drug reactions:

- from doctors of all healthcare institutions, regardless of their subordination and form of ownership;
- all healthcare institutions regardless of their subordination and form of ownership,
- State Inspectorate for Quality Control of Medicines;
- from manufacturers (or their representatives);
- authorized international organizations (WHO, EU);

- medical information and scientific publications;
- organizations representing the interests of consumers of medicines authorized for medical use in Ukraine.

In Ukraine, in accordance with the Order of the Ministry of Health of Ukraine No. 898 of 27.12.2006, it is mandatory to inform the pharmacovigilance department of adverse reactions of medicinal products during medical use by means of specially developed documents:

- doctors - Form 137/o. Card of spontaneous reporting of adverse drug reactions (Annex 1);
- heads of healthcare institutions - form No. 69 (Annex 2);
- manufacturers of medicines:
- notification of an adverse reaction or lack of efficacy of the medicinal product in medical use (Annex 3);
- a regularly updated safety report on a medicinal product (PRS) authorized for medical use;
- a form for submission of summary data by the manufacturer/applicant (or his representative) on the safety status of medical use of the medicinal product in Ukraine for the period of validity of the last registration certificate (Annex 4);
- safety study protocol for a medicinal product approved for medical use;
- notification of the start of a safety study of a medicinal product approved for medical use:
- notification of the completion or temporary termination of a safety study of a medicinal product approved for medical use;
- report on safety studies of a medicinal product approved for medical use.

Procedure for submission of information on adverse reactions of medicinal products approved for medical use by doctors, healthcare institutions, manufacturers (or their representatives) to the Department of Pharmacovigilance of Ukraine

In the event of an adverse drug reaction, the physician fills out Form 137/o and sends it to the national center for pharmacovigilance (in the case of a non-serious adverse reaction - within 15 days, serious - within 48 hours). At the same time, a copy of the card remains in the drug facility (with the person responsible for pharmacovigilance) for the preparation of annual reports in accordance with Form 69. In the event of a serious adverse drug reaction, in case of suspicion of its inadequate quality, in the presence of a causal relationship with the administration of the suspected drug, the physician submits the completed Form 137/o simultaneously to the national center for pharmacovigilance and to the territorial State Inspectorate for Quality Control of Medicines within 48 hours. Information on adverse reactions of the medicinal product. The physician must enter into the primary medical records ("Medical record of an outpatient" (form No. 025 / o), "Statistical coupon for registration of final (clarified) diagnoses" (form No. 0252 / o), "Outpatient coupon" (form 025 - 6 / o), "Outpatient coupon" (form 0257 / o), approved by the Order of the Ministry of Health of Ukraine dated 27.12.99 No. 302;" Medical record of an inpatient" (form 003/o), "Statistical record of a patient who has been discharged from the hospital" (form 066/0 approved by the Order of the Ministry of Health of Ukraine No. 184 dated 26.07.99),

All healthcare facilities, regardless of their subordination and form of ownership, shall compile and submit a report on cases of adverse reactions during the medical use of medicinal products in a healthcare facility using the form No. 69 no later than January 20 of the current year to the Ministry of Health of the Autonomous Republic of Crimea, all regional health departments. Sevastopol city state administrations and the Main Department of Healthcare and Medical Support of the Kyiv City State Administration. They, in turn, send the report to the National Center for Pharmacovigilance no later than January 30 of the current year. The report of healthcare facilities is based on copies of the completed forms of notification cards on adverse reactions and lack of efficacy of the medicinal product in medical use, as well as the primary medical records discussed above.

The manufacturer (or its representative) must provide information to the national center for pharmacovigilance:

- all cases of serious adverse reactions of the medicinal product that were recorded during its medical use in Ukraine;
- cases of suspected serious, unexpected adverse reactions that resulted in the death of the patient and/or a threat to the patient's life;
- Suspected cases of transmission of infection by a medicinal product that were recorded in the territory of another country and of which he/she became aware.

The notification must be made immediately, but no later than 15 days from the date of receipt of information identifying the case. This information must be provided in accordance with the form set forth in Annex 3 or in another form that meets the requirements for the preparation of the notification.

Reports on all other identified cases of adverse drug reactions must be submitted by the manufacturer (or its representative) at the request of the national center for pharmacovigilance in the form of a list that is an integral part of the PSMR. The submitted PSMRs allow for a periodic comprehensive assessment of global safety data on registered medicinal products or biological products. The preparation of the PSMD does not depend on the date of re-registration of the medicinal product in the countries where it is registered. The manufacturer (or its representative) must conduct safety monitoring on an ongoing basis throughout the entire period of the medicinal product's presence on the global pharmaceutical market. The countdown starts from the international "date of birth". In Ukraine, the current regulatory documents stipulate that the manufacturer (or its representative) is obliged to submit the PRS of the medicinal product to the national center of pharmacovigilance at the following intervals: after the first registration in Ukraine as the first country in the world or from the international "date of birth" of the medicinal product:

- once every 6 months - during the first 2 years after obtaining the registration certificate;
- once a year for the next 3 years;
- then once per 5 lots, provided that the medicinal product is on the Ukrainian pharmaceutical market:
- immediately upon request of the Center.

In case of failure to submit the RPZB of the medicinal product to the pharmacovigilance department, re-registration of the medicinal product becomes

impossible.

When re-registering a medicinal product in Ukraine, the manufacturer (or its representative) must submit to the National Center for Pharmacovigilance summary data on the safety of medical use of the medicinal product in Ukraine for the period of validity of the last registration certificate in the established form set out in Annex 4, together with the latest RPMP of the medicinal product.

Procedure for conducting safety studies of medicinal products authorized for medical use by the manufacturer (or its representative)

In Ukraine, manufacturers (or their representatives) must conduct safety studies of medicinal products in the post-registration period. They are conducted once during the entire period of the medicinal product's presence on the market in the following cases:

- for a medicinal product with a new chemical structure or a new mechanism of action;
- when there is uncertainty about clinical efficacy or toxicity in animals:
- in case of uncertainty about the safety profile of the medicinal product;
- if necessary, more thoroughly determine the number of adverse reactions identified during clinical trials and substantiate the risk factors;
- if the medicinal product has a highly specific area of application that necessitates the need for observation by a specialist.

Post-registration safety studies of medicinal products can be conducted as clinical trials (according to the Order of the Ministry of Health of Ukraine No. 66 "On Approval of the Procedure for Conducting Clinical Trials of Medicinal Products and Examination of Clinical Trial Materials and the Model Regulations on the Ethics Committee" dated 13.02.2006) or as pharmacoepidemiological studies - in the form of a case-control study or a cohort study (according to the Order of the Ministry of Health of Ukraine No. 898 dated 27.12.2006).

The main documents that determine the procedure for conducting post-registration safety studies of medicinal products include: a study protocol, a notification of the start of a safety study of a medicinal product approved for medical use, a notification of the completion or temporary termination of a safety study of a medicinal product approved for medical use, and a safety study report. The results of safety studies are published in specialized medical publications.

Main functions of the pharmacovigilance department SEC of the Ministry of Health of Ukraine when working with information on adverse drug reactions

The Pharmacovigilance Department of the SEC of the Ministry of Health of Ukraine receives information on adverse drug reactions, assesses its quality, systematizes, analyzes, identifies duplicate information; assesses the cause and effect relationship between the clinical manifestations of any adverse reaction and the use of the suspected drug: assesses the risk/benefit ratio. Based on the results of the work performed, he prepares informational messages, analytical reviews, express information for doctors and gives recommendations to manufacturers (or their representatives) on making clarifications, additions or changes to the Instruction for medical use of the medicinal product.

In the event of an urgent notification, identification of previously unknown

hazardous properties of a medicinal product that have led or may lead to serious consequences for human health and life, as well as based on the results of a safety study, the Pharmacovigilance Department submits proposals to the Ministry of Health of Ukraine for making decisions on a complete or temporary ban on the medical use of a medicinal product.

TOPIC 2
PHARMACEUTICAL CARE FOR PATIENTS WITH DISEASES OF THE DIGESTIVE SYSTEM.

I. QUESTIONS FOR SELF-STUDY.

1. General concepts of heartburn, diarrhea, constipation, flatulence, dysbiosis, and functional dyspepsia.
2. Heartburn: causes of occurrence. "Threatening" symptoms of heartburn.
3. Over-the-counter medications used for the symptomatic treatment of liver.
4. Constipation: the most common causes. "Threatening" symptoms of constipation. General approaches to the treatment of constipation.
5. Over-the-counter medicines used for constipation, conditions for their rational use.
6. Diarrhea: causes of occurrence. "Threatening" symptoms of diarrhea.
7. Over-the-counter medicines used for diarrhea, conditions for their rational use.
8. Flatulence: causes of occurrence. "Threatening" symptoms of flatulence.
9. Over-the-counter medicines used for flatulence, conditions for their rational use.
10. Dysbiosis: causes of occurrence. "Threatening" symptoms of dysbiosis.
11. Over-the-counter medicines used in dysbiosis, conditions for their rational use.
12. Functional dyspepsia: causes of occurrence. "Threatening" symptoms in functional dyspepsia.
13. Over-the-counter drugs used in functional dyspepsia, conditions for their rational use.
14. Digestive disorders in case of liver and biliary tract dysfunction: causes of occurrence. "Threatening" symptoms.
15. Over-the-counter medicines used in case of liver and biliary tract disorders, conditions for their rational use.

I. HEARTBURN

Heartburn is a burning sensation in the epigastric region and behind the sternum, accompanied by a sour taste in the mouth. Heartburn is associated with the ingestion of acidic stomach contents and their entry into the lower esophagus. It can be a sign of serious diseases of the gastrointestinal tract, as well as one of the manifestations of dyspepsia or an independent symptom.

The most common causes of heartburn

Heartburn in patients with diseases of the gastrointestinal tract:

- chronic Helicobacter pylori type B gastritis);
- gastric ulcer and duodenal ulcer;
- chronic cholecystitis;
- gastroesophageal reflux.

Heartburn in healthy individuals:

- irrational diet: overeating; abuse of rich and fatty, as well as spicy and spicy foods;
- consumption of a large number of sweets and foods containing caffeine (coffee, tea, chocolate);
- quick meals on the go, in a stressful environment
- individual hypersensitivity to foods such as citrus fruits, onions, garlic, and tomato products (juices, pastes, sauces);
- the first half of pregnancy;
- taking medications (NSAIDs, steroid hormones, cholinomimetics, and some other drugs).

Factors contributing to heartburn:

- alcohol abuse;
- smoking;
- sleep or rest lying down immediately after eating;
- wearing tight clothing;
- physical inactivity;
- obesity.

"Threatening" symptoms of heartburn:

- vomiting of "coffee grounds" color or blood;
- the presence of black (tar-like) feces;
- persistent heartburn for 3 days or more;
- heartburn accompanied by shortness of breath, sweating, and difficulty swallowing;
- heartburn is combined with abdominal pain;
- progressive weight loss;
- heartburn is associated with taking certain medications.

Treatment of heartburn is based on identifying its cause. In case of gastritis and peptic ulcer, long-term (4-8 weeks or more) treatment under medical supervision is performed with drugs that reduce gastric secretion (H2-histamine receptor blockers, proton pump inhibitors, etc.). At the same time, antihelicobacterial therapy is carried out, gastroprotective agents (protecting the gastric mucosa) are used.

In case of heartburn caused by gastroesophageal reflux, medications that reduce gastric secretion in combination with antacids and prokinetics - drugs that accelerate the evacuation of gastric contents (metoclopramide, domperidone) - are also used. To prevent heartburn in healthy individuals (without organic diseases of the gastrointestinal tract), you should eat a healthy diet, avoid spicy and fatty foods, quit smoking, and monitor your weight. These measures will help to eliminate gastrointestinal tests. However, in real life, it is difficult, and often even impossible, to follow all these rules. Therefore, in a number of cases, heartburn requires the use of medications.

Non-drug methods of heartburn treatment:

1) do not abuse foods that stimulate acid formation in the stomach: spicy, spicy foods, citrus fruits, tomato pastes and juices, onions, garlic;

2) avoid overeating and fast eating;

3) eliminate or reduce smoking;

4) avoid lying down after eating;

5) limit the consumption of foods containing gases (pastries, soufflés, carbonated drinks);

6) in case of heartburn during sleep, sleep with the headboard raised;

7) reduce overweight.

Clinical and pharmaceutical characteristics of the main monocomponent antacid drugs

Antacids are the most common group of over-the-counter medications used for heartburn. Antacids are drugs that reduce the aggressiveness of the contents of the stomach and duodenum through direct chemical interaction. This group of drugs does not affect the physiological mechanisms of gastric secretion. Most antacid drugs gradually reduce the acidity of the gastric environment, forming a uniform protective layer in the stomach that prevents gastric juice from coming into contact with the excited areas of the stomach wall. To date, there is no consensus among the medical community as to whether alginic acid salts used for heartburn are antacids or an independent group of drugs. Alginates are often referred to as antacids and adsorbents in the pharmacological index, although they have different mechanisms of action from antacids. The mechanism of action of alginates is that when alginate interacts with gastric juice's NSAIDs, a gel "raft" is formed, which prevents further ingress of acid and pepsin into the esophageal mucosa. By forming a mechanical barrier, sodium alginate has an antireflux effect without selectivity to the type of reflux, i.e. it prevents the ingestion of both acidic gastric and alkaline duodenal contents into the esophagus. The antireflux mechanisms of action of alginates can be described as "universal" not only in terms of the degree of importance and time interval (up to 4 hours), but also in terms of the quality of the reproduced effect. In Ukraine, alginic acid salts are represented by Gaviskon (forte) in suspension, tablets and sachets.

1. Absorbable antacids.

Sodium bicarbonate (soda). In the stomach, irreversible one-sided interaction with hydrochloric acid occurs: NaHCO3 + HCl = NaCl1 + H2O + CO2. The main effect of the product is instant neutralization of hydrochloric acid. For this quality, baking soda is figuratively called the "nitroglycerin of heartburn." However, sodium bicarbonate has a short duration of action. After 15-20 minutes, there is a sharp alkalization of the environment (up to pH 7 and above), which, in combination with the stretching of the stomach walls by carbon dioxide, causes a secondary increase in secretion ("ricochet" syndrome). In the presence of an ulcerative defect that penetrates deeply into the stomach wall, stretching the wall with carbon dioxide is dangerous - perforation is possible. Excess endogenous alkali, as well as residues of sodium bicarbonate taken by the patient, are absorbed and increase the alkaline reserve of blood plasma, which is the cause of the systemic effect of this antacid. These phenomena can occur especially rapidly in patients with impaired renal function. Systemic alkalosis is accompanied by decreased appetite, nausea, vomiting, weakness, abdominal pain, muscle spasms, and sometimes convulsions. Excretion of additional amounts of sodium bicarbonate in the urine leads to its alkalization, which contributes to the formation of phosphate stones in the urinary tract. Prolonged use of sodium bicarbonate in the body leads to the accumulation of sodium ions, which is accompanied by an

increase in blood pressure and the development of edema.

Calcium carbonate. The following reaction occurs in the stomach: $CaCO_3 + 2HCl = CaCl_2 + H_2O + CO_2$. Usually, calcium carbonate reacts with hydrochloric acid rather slowly. It is believed that calcium carbonate causes secondary secretion of hydrochloric acid more strongly than all other antacids, which is associated with a direct stimulating effect of calcium on gastrin secretion by gastric mucosal cells. About 10% of calcium chloride is absorbed, which can lead to hypercalcemia, especially in case of reduced renal function, if calcium carbonate is taken continuously.

Prolonged intake of calcium carbonate may be accompanied by constipation.

2. Non-absorbable antacids.

Aluminum hydroxide. It has an enveloping and adsorbing effect. It is able to bind pepsin. The effect develops slowly. Even an excess of the drug does not cause complete neutralization of hydrochloric acid, which is very important for preserving the activity of pepsin, which digests food proteins. Adsorbs bile salts, which reduces their damaging effect on the gastric mucosa. Increases synthesis of prostaglandins in the gastric mucosa, which improves blood supply to the mucosa and increases secretion of protective mucus. It does not disturb the acid-base balance in the blood. Prolonged use in case of renal insufficiency can lead to accumulation of aluminum in tissues (bones, muscles, brain), which leads to pain in bones and muscles, Alzheimer's type encephalopathy. Causes hypophosphatemia (weakness, malaise, impaired thinking, decreased appetite), hyperphosphaturia, hypercalciuria and calcium nephrolithiasis. Osteoporosis may occur due to decreased calcium absorption in the intestine and calcium leaching from bones. It inhibits gastrointestinal motility, promotes constipation.

Aluminum phosphate. It has buffering and antacidic (reduces high acidity to normal, does not cause acid ricochet) and adsorbing properties: binds bacteria, endogenous and exogenous toxic substances, as well as gases formed as a result of pathological noise and putrefaction in the large intestine. It does not cause constipation, shifts in acid-base balance, and does not disrupt phosphate absorption.

Magnesium oxide. It does not cause secondary hypersecretion of gastric juice ("kickback" phenomenon). Does not disturb the acid-base state. It accelerates gastrointestinal peristalsis, due to which it has a laxative effect. This is due to the osmotic capacity of magnesium ions, their ability to increase intestinal cholecystokinin secretion, which stimulates peristalsis; in case of renal failure, neurological and cardiovascular disorders are possible.

Basic bismuth nitrate. It has astringent and anti-inflammatory effects. It does not disturb the acid-base balance. When using drugs containing bismuth, dark (black) stool coloration is possible, which is important to consider when diagnosing gastric bleeding. Combined antacids are widely available in Ukraine, combining a positive effect and offsetting the negative effects of the active ingredients.

Characteristics of combined antacid preparations

Drug.	Composition	Features.
Almagel	Aluminum hydroxide, magnesium hydroxide	It can be prescribed to patients with diabetes mellitus because it does not contain sugar
Almagel Neo	Aluminum hydroxide, magnesium	Simethicone reduces the

	hydroxide, simethicone	phenomena of flatulence
AlmagelA	Aluminum hydroxide, magnesium hydroxide, benzocaine	additionally has a local anesthetic effect because it contains benzocaine
AlmagelT	Magaldrat	
Aluminum	Aluminum hydroxide, magnesium hydroxide	
Altacid	Aluminum oxide, magnesium oxide	
Henri	Calcium carbonate, magnesium carbonate	
Gaviscon forte mint suspension	Sodium alginate, potassium bicarbonate	It has a local physical effect. No dose adjustment is required in the elderly. Recommended use during pregnancy and lactation
Gaviscon mint suspension	Sodium alginate, calcium carbonate, sodium bicarbonate	
Gaviscon mint tablets	Sodium alginate, sodium bicarbonate, calcium carbonate	
Gastal	Aluminum hydroxide, magnesium carbonate, magnesium hydroxide	Enhances the effect of levodopa, aspirin, nalidixic acid
Gelusil - Lacquer	Symaldrite	
Digel	Magaldrite, simethicone	
Contraband	Aluminum hydroxide, magnesium trisilicate, simethicone	Has a windbreaker effect
Maalox	Aluminum hydroxide, magnesium hydroxide	
Maalox mini	Aluminum oxide, magnesium hydroxide	Contains 230 mg of aluminum oxide, as opposed to the classic Maalox, which contains 400 mg of aluminum hydroxide
Relzer	Aluminum hydroxide, magnesium hydroxide, simethicone, licorice root powder	Licorice has anti-inflammatory, enveloping antispasmodic and anti-ulcer effects
Reni without sugar	Calcium carbonate, magnesium carbonate	The drug can be used by patients with diabetes mellitus (contains saccharin and 400 mg of sorbutol)
Reni with orange flavor	Calcium carbonate, orange flavored magnesium carbonate	Patients with diabetes should note that one tablet contains 475 mg of sucrose
Reni with menthol flavor	Calcium carbonate, magnesium carbonate flavored	

Pharmaceutical care in the use of over-the-counter medicines for the symptomatic treatment of heartburn

- All antacids are taken orally only - when heartburn occurs or 1 hour after a meal.
- Non-absorbable antacids inhibit the absorption of certain drugs: tetracycline, norfloxacin, cardiac glycosides, corticosteroids.
- To avoid drug interactions, antacids should be used 2 hours before or 2 hours after taking other drugs.
- Antacids containing aluminum are indicated in case of diarrhea, and those containing magnesium - in case of constipation.
- All aluminum-containing antacids disrupt phosphorus absorption by forming insoluble aluminum phosphate salts. With prolonged use, this is manifested by muscle

weakness, malaise, and osteoporosis.

- An increase in the aluminum content in the body due to excessive use of drugs can cause encephalopathy (speech impairment, muscle twitching, seizures), and subsequently dementia.
- Excess aluminum in the use of non-absorbable antacids accumulates in the renal glomeruli, which can lead to the development of renal failure. '
- The use of absorbed antacids is often accompanied by a "ricochet" syndrome - a repeated increase in hydrochloric acid secretion after the initial neutralizing effect.
- Antacids absorbed in higher doses can cause systemic metabolic reactions, such as alkalosis and lactic acid syndrome.
- Sodium bicarbonate is contraindicated in patients with hypertension, heart and kidney failure, and liver cirrhosis. As a result of a chemical reaction with hydrochloric acid, it forms sodium chloride, which is well absorbed and causes water retention in the body.
- Antacids containing silicon (in the form of magnesium trisilicate) should not be recommended for patients with urolithiasis, as it is excreted in the urine and contributes to the formation of urinary tract stones.
- Prolonged use of antacids leads to a tendency to gastrointestinal infections as a result of a decrease in the protective role of hydrochloric acid.
- Antacids should not be combined with De-Nol (pharmacodynamic incompatibility).
- The only OTC pantoprozole product is Tekta Control (20 mg pantoprozole), which is indicated for the treatment of reflux disease and its symptoms.
- $_2$ F or the symptomatic treatment of heartburn, small doses of histamine receptor blockers, such as ranitidine at a dose of 75 mg (Ranigast) and famotidine at a dose of 10 mg (Kvamatel Mini), which are approved for over-the-counter sale in Ukraine, can be used.
- Antacid effect due to a special mechanism is exerted by alginic acid preparations - Gaviscon mint suspension and tablets, Gaviscon - forte mint suspension. The drug has a local effect without systemic effects and drug interactions. It is recommended for use during pregnancy and lactation, in children from 6 years of age; the forte form is recommended for patients with cardiovascular and renal diseases.

For the symptomatic treatment of heartburn, the over-the-counter drug Pepsan is used. Its constituent guaiazulene inhibits the secretion of hydrochloric acid, has anti-inflammatory and regenerative effects. Dimethicone has an adsorbing and enveloping effect.

II. CONSTIPATION

Constipation is a disorder of the intestinal function, which is expressed in an increase in the intervals between bowel movements (more than 48 hours) compared to the individual physiological norm or in systematically insufficient bowel movements. The most common causes of constipation:

- painful defecation (hemorrhoids, fissures of the anus);
- intestinal diseases (colitis, intestinal atony, spasm of the large intestine, megacolon - Hirschsprung's disease, Crohn's disease, colon polyposis);

- metabolic disorders (dehydration, hypothyroidism, adrenal hypofunction);
- dietary habits: a sharp change in diet, lack of vegetable fiber (dietary fiber), excess fat in the diet, insufficient fluid intake, excess iron in the diet, folic acid deficiency;
- the use of many medications, including antacids containing aluminum salt; antihistamines; antidepressants, neuroleptics and psychotropic drugs; opiates (codeine); antihypertensive drugs (calcium channel blockers); iron and calcium supplements.

Factors contributing to constipation:

- insufficient physical activity;
- prolonged use of laxatives;
- frequent use of enemas.

"Threatening" symptoms that require medical intervention:

- temperature increase;
- traces of blood in the feces;
- severe abdominal pain, sharp bloating;
- vomiting;
- body weight loss.

Non-drug treatment of constipation:

- Eating foods rich in dietary fiber, primarily pectin, and soluble dietary fiber (beets, apples, plums, oatmeal and other whole grain cereals, as well as leafy vegetables, cabbage, and bran bread);
- Reduced consumption of animal fats;
- Drinking at least 8 glasses of fluids a day;
- if you need to take iron or calcium supplements, give preference to vitamin and mineral complexes;
- Increased physical activity;
- defecate slowly, in a calm environment that promotes relaxation;
- treatment of hemorrhoids or fissures of the anus (anus hygiene, use of emollients and creams);
- avoidance of frequent use of cleansing enemas and laxatives that stimulate peristalsis.

Before recommending a drug, it is necessary to find out the possible causes of constipation. Eliminating the cause often leads to normalization of the stool.

Patients suffering from constipation often have a decreased appetite, belching, and an unpleasant taste in the mouth. Feelings of weight and fullness in the abdomen are characteristic. Due to constant intoxication, weakness, headaches, low mood and performance (in severe cases, depression), disturbed sleep, and complaints of memory loss are common. The skin is affected in most patients. Pallor with an earthy tint, dryness, increased flaking, and dermatitis are characteristic. The nails become flaky, dandruff appears, hair falls out easily and splits. Disorders of the motor function of the colon are possible in hypertensive or atonic type.

Chronic constipation contributes to the development of secondary enterocolitis, hemorrhoids, and anal fissures. It is usually accompanied by dysbiosis, immune system disorders, and metabolic disorders. Slow bowel movements lead to an increase in the

concentration of various toxins in the blood and lymph, including carcinogenic substances. Severe constipation can provoke complications of cardiovascular diseases, especially in the elderly (strokes, heart attacks, thromboembolism). The success of constipation therapy consists of three components:

1. Degree of detection and completeness of elimination of the causes of stool retention.

2. The patient's readiness to change their lifestyle, eating habits, and follow the recommendations of the doctor and pharmacist (i.e., full compliance).

3. The ability of the physician and pharmacist to provide comprehensive, individualized therapy that does not complicate the patient's life with side effects. Medications used for symptomatic treatment of constipation and conditions for their rational use.

The action of laxatives is based on mechanical or chemical irritation of the intestinal mucosa receptors. Laxatives can be classified according to their main mode of action:

- stimulating intestinal motor function;
- drugs that soften feces;
- that increase the volume of intestinal contents.

The largest group of laxatives is composed of agents that stimulate intestinal motility. Most of them are herbal preparations containing anthraglycosides. Anthraquinic glycosides (anthranoids) are contained in senna leaves, preparations: Xena, Senade, Senadexin, Senadexin-Zdorovye, Senalde, Senalex, Senadex, Senna leaves, Regulax; and senna - preparations: Zhoster bark, Zhoster syrup; arable stalking - preparations: Stalnik, Stalnik tincture.

The non-sugar part of these glycosides includes emodin, chrysophanic acid and other anthraquinone derivatives, which irritate the receptors responsible for stretching the intestinal lumen under pressure, which in turn stimulates peristalsis. Laxatives of this group act 8-12 hours after administration. Senna and zhostir preparations are not used for spastic constipation, as they can cause pain in the colon. Anthraquinic glycosides penetrate into the mother's milk, so they should not be prescribed to breastfeeding mothers. These drugs are not recommended for long-term use. The majority of patients taking anthraquinones develop dyskinesia, and one third develop an inert colon.

Laxatives that stimulate intestinal function and do not contain anthraglycosides include bisacodyl and sodium picosulfate.

Bisacodyl, a diphenylmethane derivative, stimulates the sensitive receptors of the colon wall through direct contact. As a result, mucus secretion in the colon increases, absorption of electrolytes and water decreases, and its peristalsis accelerates and intensifies. It does not penetrate into breast milk, does not affect uterine tone. With prolonged use, prostatitis may develop in men. Bisacodyl preparations: Bisacodyl, Bisacodyl-Darnitsa, Bisacodyl-Nizhpharm, Stadalax.

Sodium picosulfate. The drug is activated in the colon under the influence of bacterial sulfatases; the substance formed in this process stimulates the nerve endings of the mucous membrane, enhancing its motility. In infants, the drug is ineffective due to a small amount of bacterial flora and, accordingly, sulfatases. Simultaneous

treatment with antibiotics may reduce the laxative effect.

Picosulfate preparations: Agiolax pico, Gutalax, Regulax, Picosulfate drops, Enterolax.

Castor oil also belongs to this group. In the small intestine, it is broken down by lipase to form ricinoleic acid and glycerol, which irritate intestinal receptors along the entire length and increase reflex intestinal peristalsis. These substances simultaneously inhibit the processes of water and electrolyte absorption, disrupting the activity of the intestinal surface epithelium, and contribute to an increase in the volume of intestinal contents. Castor oil, in addition to the above effects, is partially excreted unchanged and in the form of glycerin, softening feces, the effect is observed after 5-6 hours.

Stool softeners include liquid paraffin (petroleum jelly). **Vaseline oil is** a mineral substance that is not absorbed in the intestines and is not broken down. It mechanically facilitates the passage of feces and causes their loosening. Vaseline oil reduces fluid absorption, accelerating the movement of the contents through the small intestine. Thus, the oil acts throughout the intestine. Its prolonged use reduces the absorption of fat-soluble vitamins (A and E) and increases the risk of malignant tumors in the gastrointestinal tract, especially in gastric and duodenal ulcers.

Softening laxatives are used mainly when a quick effect is required, for example, in case of poisoning, in patients in the postoperative period, in preparation for a diagnostic bowel examination.

The larger group of laxatives that increase the volume of intestinal contents includes plant fibers and hydrophilic colloids (osmotic laxatives). Their laxative effect is associated with the ability of high molecular weight polysaccharides of plant material to swell in the gastrointestinal tract due to binding with water and, increasing in volume, irritate the receptors of the intestinal mucosa, promoting its emptying.

Preparations made from the seeds of plantain ovate - Mukofalk Orange, Defenorm, Transilan, Fiberlex - increase the volume of intestinal contents and, thus, enhance peristalsis. The plant fibers that make up the composition of the drug have the property of swelling, increasing in volume many times over, so you should drink at least 1.5 liters of liquid per day.

Magnesium sulfate, lactulose, and macrogol are osmotic laxatives.

Magnesium sulfate is poorly absorbed and creates increased osmotic pressure throughout the intestine, which prevents the reabsorption of water. The increase in volume leads to stretching and reflex stimulation of peristalsis, as well as to an increase in the amount of cholecystokinin released from the small intestinal mucosa, which also increases peristalsis. Atrophic and inflammatory changes of the mucous membrane due to local irritant action are observed in the setting of laxatives. Salt laxatives are contraindicated during pregnancy, as increased peristalsis can stimulate uterine contractility.

Lactulose is a synthetic disaccharide that is not destroyed by small intestinal disaccharidase and is not absorbed after ingestion. In the large intestine, under the influence of intestinal microflora, it is transformed into low molecular weight organic acids (lactic, acetic). As a result, osmotic changes occur that stimulate peristalsis and normalize the consistency of feces. Lactulose is effective for constipation against the background of adhesions in the abdominal cavity, in the elderly, and for constipation

in women after gynecological operations. A special committee of the American College of Gastroenterology, based on the results of a systematic review of chronic constipation drugs, classified lactulose as a drug with the highest degree of evidence (grade A).

Lactulose products include *Dufalak, Bioflorax, Lactulax, Normase, and Normolact*. The original lactulose product is ***Dufalac,*** which has the largest evidence base in terms of efficacy and safety. Dufalak can be used by almost all categories of patients: adults, including the elderly, children from the first days of life, patients after hemorrhoid removal, it can be used in diabetes mellitus, during pregnancy and lactation, for the treatment of hepatic ecephalopathy, etc. There is information on the possible use of dufalac in the treatment of urinary tract infections, cholelithiasis, for the treatment of intestinal and vaginal mycoses; for preventive measures to reduce the risk of colon cancer, etc.

Due to its high molecular weight, ***macrogol is*** not absorbed in the gastrointestinal tract. It causes an increase in the volume of intestinal contents and their softening due to the formation of additional hydrogen bonds with water molecules, its retention and accumulation in the intestinal lumen, increasing intracellular osmotic pressure. Macrogol can be used by patients with diabetes mellitus, pregnant and lactating women, and for the treatment of constipation in the elderly. Macrogol preparations include *Transipeg and Forlax*. To prepare the intestine for endoscopic examination, complex preparations based on macrogol Fortrans and Endofalk are used.

Some laxatives are administered by direct injection into the rectum, where they soften the feces and initiate a voiding reflex. The effect occurs quite quickly - up to 20 minutes. These drugs contain sodium docosate: Norgalax and Normacol in the form of an enema, and glycerin suppositories - Ameda.

Complex preparations of herbal products have a laxative effect: Proctolax, Laxative Collection No. 1, Softovak.

Pharmaceutical care in the use of drugs for the symptomatic treatment of constipation (laxatives)

- The drug of choice among lactulose-containing drugs is Dufalac, given the evidence of its effectiveness and safety.
- Lactulose and macrogol preparations can be administered to infants, as well as to pregnant and lactating women.
- Hypokalemia occurs with prolonged use of laxatives, so laxatives should be combined with potassium supplements.
- Laxatives containing anthraglycosides take effect 8-12 hours after ingestion, so it is recommended to use them in the evening, before going to bed.
- Laxatives containing anthraglycosides should not be used for spastic constipation, as they can cause pain in the large intestine.
- Anthraquinone glycosides pass into breast milk, so drugs containing them should not be prescribed during lactation.
- Laxatives from the anthraglycoside group are not recommended for long-term use.
- Laxatives from the anthraglycoside group can turn urine intensely yellow in case of acidic reaction, and red in case of alkaline reaction.

- Sodium picosulfate is ineffective in infants.
- Prolonged use of petroleum jelly reduces the absorption of fat-soluble vitamins (A, E) and increases the risk of malignant tumors in the gastrointestinal tract
- Castor oil has a laxative effect after 5-6 hours.
- Castor oil should never be prescribed to pregnant women.
- Castor oil is contraindicated in case of poisoning with fat-soluble poisons.
- Magnesium sulfate has a laxative effect in 4-6 hours.
- Magnesium sulfate is contraindicated during pregnancy, as increased peristalsis can stimulate uterine contractility.
- When taking laxatives containing plant fibers, you should drink at least 1.5 liters of liquid per day.

III. DIARRHEA

Diarrhea (diarrhea) is an accelerated (more than 2-3 times a day) bowel movement with the release of liquid or mushy stools, sometimes with the appearance of pathological impurities (mucus, blood). But not always in case of diarrhea, stool is more frequent than 1-2 times a day. Sometimes a daily single bowel movement, but of a less frequent consistency than normal, can be a variant of diarrhea. In other cases, bowel movements with a frequency of 2-3 times a day, in which the feces are formalized, are not considered diarrhea. An important sign of diarrhea is a higher than normal water content in the feces. In case of diarrhea, it increases from 60-75% (in cases of hard or formed feces) to 85-95%. Often, when determining diarrhea, an increase in the weight (volume) of stool excreted by a patient during the day is also indicated. According to many authors, the presence of diarrhea should be considered only in cases where the weight of feces exceeds 200 g/day. When the weight of feces of liquid consistency is less than 200 g, it is recommended to use the term "pseudodiarrhea".

Diarrhea is considered acute if it lasts no more than 2-3 weeks, and chronic if it lasts 4-6 weeks or more.170 There are 4 mechanisms involved in the pathogenesis of diarrhea: intestinal hypersecretion, increased osmotic pressure in the intestinal cavity, accelerated intestinal peristalsis, and intestinal hyperoxidation.

Etiology of acute diarrhea: - infection (viral, bacterial, parasitic, fungal); - inflammatory processes in the intestine; - use of medications (laxatives, antibiotics, cardiac glycosides, potassium supplements, anticoagulants). Etiology of chronic diarrhea: - inflammatory bowel disease (ulcerative colitis, Crohn's disease); - liver and pancreas diseases; - endocrine diseases (hyperthyroidism, diabetes mellitus); - functional bowel disorders (irritable bowel syndrome); - congenital enzyme deficiency (milk intolerance; fiber intolerance). Threatening symptoms that require immediate medical attention: - general serious condition of the patient caused by diarrhea; - diarrhea lasts more than 48 hours; - diarrhea is accompanied by fever; - a lot of mucus and/or blood is present in the stool; - often painful urges and painful defecation; - diarrhea is accompanied by nausea and vomiting; - there are signs of general dehydration: severe thirst, dry mouth, wrinkled skin, weight loss, significant decrease in urine output; - diarrhea in pregnant women; - diarrhea in children under 1 year of age; - several family members have diarrhea at the same time.

Attention: Prior to pharmacotherapy of diarrhea, the patient should follow general dietary recommendations: avoid spicy, fatty foods, carbonated beverages, alcohol, and coffee; consume fermented milk products; and drink plenty of fluids.

The following groups of OTC medicines are used for the symptomatic treatment of diarrhea:

1. Antimicrobial drugs for the treatment of intestinal infections (phthalyl sulfathiazole).
2. Electrolyte preparations with carbohydrates, salt compounds for oral rehydration.
3. Antidiarrheal microbial preparations (probiotics).
4. Enterosorbents (activated charcoal, diosmectite, methyl silicic acid hydrogel).
5. Drugs that inhibit peristalsis (loperamide).
6. Enzyme preparations (not containing bile acids).

The main groups of drugs are used in the treatment of diarrhea:

I. Antibacterial drugs - for diarrhea of bacterial origin.

Integrix - 1 capsule contains tiliquinol 50 mg, tiliquinol-H-dodecyl sulfate 50 mg, tilbroquinol 200 mg. Pharmacological properties: antiparasitic amebicidal agent. The therapeutic effect in chronic amebiasis is achieved due to the synergistic action of three antiseptic components in the intestinal lumen, which are part of the drug. Effective against vegetative forms of amoebae, it also has a wide range of antimicrobial (bactericidal and bacteriostatic) effects against Streptococcus faecalis, E. coli, Salmonella enteritidis Danysz, Salmonella paratyphy B, Pseudomonas aeruginosa, Proteus vulgaris, Vibrio cholerae Ogava, Vibrio cholerae Inaba, Serratia marceseens, etc, antifungal effect against Sandida albicans. Intestinal amoebiasis in adults: as an adjunct to therapy with tissue amoebicides; as monotherapy in asymptomatic amoebiasis. In the complex treatment of intestinal dysbiosis.

Phthalazole - contains phthalyl sulfathiazole.

Pharmaceutical form: 0.5 g tablets.

Pharmacological properties. Phthalazole is a sulfonamide drug. It has bacteriostatic effect. The main mechanism of action is due to disruption of the synthesis of their growth factors in microorganisms - folic and dihydrofolic acids. Indications: acute dysentery, chronic dysentery in the acute stage, colitis, enterocolitis, gastroenteritis, to prevent infectious complications during intestinal surgery.

Nifuroxazide (Enterofuril) Nifuroxazide

Pharmaceutical form: 0.1 and 0.2 g film-coated tablets. Suspension for oral administration: 100 g (90 ml) of suspension contains 4.0 g of nifuroxazide (220 mg/5 ml).

Enterofuril - 1 capsule contains nifuroxazide 0.1 mg and 0.2 mg; suspension 200 mg/ml, 90 ml vial. Pharmacological properties: antimicrobial agent of the 5-nitrofuran group, belongs to intestinal antiseptics. It blocks the activity of dehydrogenases, inhibits cellular respiration, the cycle of tricarboxylic acids, and also disrupts protein synthesis in the microbial cell. It reduces the production of toxins by microorganisms. The drug is active against gram-positive microorganisms: Staphylococcus aureus, Streptococcus faecalis and gram-negative microorganisms: Campylobacter jejuni, Citrobacter spp., Enterobacter spp. including Enterobacter

cloacae, Escherichia coli, Hafnia spp., Salmonella spp., Shigella spp., Vibrio cholerae, Yersinia enterocolitica.

II. Drugs for rehydration (oral - Regidron, Oralit, Gastrolit; parenteral solutions - Trisol, Acesol, Chlorol, etc.) Use solutions containing a balanced amount of sodium, potassium, chlorine, bicarbonate, citrate, glucose, sucrose ions.

III. Drugs for the treatment of intestinal dysbiosis. Normal (obligate) intestinal microflora is the most important component of the body's defense system as a whole. With normal qualitative and quantitative ratio of its main representatives (lacto, bifidobacteria, Escherichia coli, bacteroides, enterococci, etc.), its suppressive effect on pathogenic and opportunistic microorganisms is ensured by competing with them for adhesion receptors and nutrients, as well as by producing substances with bactericidal properties. The participation of normal microflora in the processes of food digestion, synthesis of vitamins, essential amino acids, metabolism of bile acids, cholesterol, and neutralization of exo- and endotoxins is essential. This is the basis for the use of pro and prebiotics in the treatment of diarrhea of any genesis.

IV. Enterosorbents. Administration of enterosorbents helps to prevent and treat endogenous intoxication syndrome. Some enterosorbents are able to sorb microorganisms and viruses on their surface.

V. Regulators of intestinal motor activity. They are prescribed for almost any type of diarrhea. They reduce intestinal tone and motility, but have little effect on absorption processes.

Loperamide (Imodium, Lopedium)

Pharmaceutical form: 2 mg capsules; 2 mg tablets.

Pharmacological properties: synthetic antidiarrheal agent. It binds to opiate receptors of the intestinal wall; as a result, the release of acetylcholine and prostaglandins is inhibited, thus reducing propulsive peristalsis and increasing the time of passage of the contents through the intestines. It increases the tone of the anal sphincter, thereby reducing fecal incontinence and the urge to defecate. Reduces water secretion into the intestinal lumen. The drug practically does not enter the systemic bloodstream. It does not pass through the blood-brain barrier. Even in doses 10 times higher than the therapeutic dose, it does not cause euphoria and is not addictive.

VI. Enzyme preparations. They are used for diarrhea associated with impaired digestive enzyme function. Enzymes containing bile components are not used for diarrhea.

VII. Herbal remedies. Their main property is an astringent effect. Substances contained in plants (tannins, tannins, polyphenols) have the ability to form albuminates on the cell surface when interacting with proteins of cells, tissues, and enzymes of tissue fluids. Herbal remedies also have some anti-inflammatory, cytoprotective and antiseptic effects. All these properties of herbal preparations allow them to be used in mild forms of diarrhea, as well as in complex therapy. They are used in the form of decoctions and teas.

Medicinal plants - common anise, common immortelle, elecampane, tall elecampane, oregano, St. John's wort, blueberry fruits, medicinal chamomile, licorice, etc.

Pharmaceutical care in the use of diarrhea medicines

Remedy.	Pharmaceutical care of a doctor	Pharmaceutical care of the patient
Gastrolit	It can be used to treat women during pregnancy and lactation. Initially, 500-1000 ml is prescribed depending on age, and then 100-200 ml after each bowel movement. If symptoms of dehydration persist after 12-24 hours from the start of treatment, especially in infants, the dose should be adjusted	Dissolve the contents of the sachet in 200 ml of boiled hot water and cool to room temperature. The solution is drunk frequently, in small portions. Dyspeptic phenomena (nausea, vomiting) are possible
Normohydron	During pregnancy and lactation, the drug should be administered with caution, as there is no data on the hazards of using the drug during these periods	Dissolve the contents of the sachet in 1 liter of freshly boiled cooled water. In case of diarrhea, the drug is used every 3-5 minutes in portions of 50-100 ml.
Regidron	The drug solution has a slightly alkaline reaction, so it may affect drugs whose absorption depends on the pH of the intestinal contents. Overdose may be accompanied by water and electrolyte imbalance. When administering a very large amount or a very concentrated solution, hypernatremia may occur, which is manifested by weakness, neuromuscular excitement, drowsiness, confusion	Dissolve 1 g of Regidron sachet powder in 1 liter of boiled water; cool the solution to room temperature and stir again before use. Cool the solution to room temperature and mix again before use. Take after each liquid stool, in small sips
Loperamide	The drug is contraindicated in children under 6 years of age, in ulcerative colitis in the acute stage or associated with antibiotic treatment (pseudomembranous colitis), in pathologies with undesirable inhibition of peristalsis (ileus, subileus), during pregnancy, lactation, hypersensitivity to the drug. In acute diarrhea in adults and children over 12 years of age, the first dose is 4 mg (2 tablets), followed by 2 mg (1 tablet) after each liquid stool. In chronic diarrhea, the initial dose is 2 mg (1 tablet) twice daily. **CAUTION!!! It is contraindicated in dysentery** (especially in the presence of blood in the stool and accompanied by fever). In cases of constipation, flatulence, or phenomena characteristic of intestinal obstruction during therapy, discontinue the drug. If there is no effect after two days of use, the diagnosis should be clarified. Concomitant use with opioid analgesics increases the risk of severe constipation. May be used during pregnancy only if absolutely necessary, use with caution during lactation	During treatment with the drug, you should refrain from driving vehicles and from work requiring significant concentration. In acute diarrhea, do not take more than 16 mg (8 tablets) per day; in chronic diarrhea, up to a maximum of 12 mg (6 tablets) per day. In case of prolonged diarrhea, do not use the drug for more than 10 days
Integrix	It is used for the treatment of intestinal amebiasis in adults, as monotherapy for asymptomatic amebiasis, in the complex	Take the capsules whole, before meals, with a sufficient amount of water. Take 2 capsules in the morning and 2 capsules in

	treatment of intestinal dysbiosis. It is not recommended for use during pregnancy and lactation, in children under 14 years of age. Caution should be exercised when prescribing the drug to patients with hepatic impairment. If jaundice occurs during treatment, discontinue treatment. With prolonged use, peripheral neuropathy or optic nerve damage may develop. The drug should not be administered concomitantly with drugs containing hydroxyquinolines. To prevent interaction between several drugs, they should be taken separately with an interval of at least 2 hours.	the evening The duration of treatment should not exceed 10 days
Entoban	The drug is used for amoebiasis, bacillary dysentery and other acute intestinal infections of a bacterial nature. Contraindications: hypersensitivity to the drug components, first trimester of pregnancy, lactation, children under 2 years of age	The drug contains sucrose, which should be taken into account by patients with diabetes mellitus and people on a low-calorie diet
Nifuroxazide	It is used in case of infectious diarrhea in children and adults, chronic colitis, enterocolitis; as an adjuvant for complex treatment of intestinal dysbiosis. It does not disturb intestinal microbiocenosis. The drug should be used with caution during pregnancy and lactation. Adults and children over 6 years of age: 0.2 g every 6 hours (daily dose: 0.8 g). Children under 3 years of age are prescribed in the form of a suspension. It is not recommended for use in combination with sorbents and drugs containing alcohol. In rare cases, individual hypersensitivity to the drug (shortness of breath, skin rashes, itching) may occur, which requires discontinuation of the drug	It is used orally, regardless of food intake. During treatment, do not drink alcohol and do not take it with sorbents. The course of treatment is 5-7 days
Phthalazole	In the treatment of diarrhea (in the absence of dysentery), the drug is prescribed to adults in the first 2-3 days at 1-2 g every 4-6 hours, in the next 2-3 days - in a half dose. Adverse reactions include allergic reactions (rash, fever, agranulocytosis, aplastic anemia). Contraindications include hypersensitivity to the drug, basal disease, blood disorders, acute hepatitis, and children under 2 years of age. Use with caution in patients with nephrosis and nephritis. Concomitant use with salicylates, diphenylamine leads to increased toxicity; with calcium chloride and vitamin K reduces blood clotting; incompatible with nitrofurans (increased risk of anemia and	During the period of taking Phthalazole, patients should take B vitamins (thiamine, riboflavin, nicotinic acid)

	methemoglobinemia)	

IV. Flatulence

Flatulence is an objective or subjective feeling of excessive gas accumulation in the stomach or intestines, which may be accompanied by abdominal pain, belching, rumbling, and increased gas passage.

Etiological factors of flatulence. Flatulence can be the result of physiological and pathological factors.

Physiological reasons. One of the main sources of air entering the stomach is swallowing it - aerophagia. It most often occurs when eating food and using chewing gum, and can also occur when chewing tobacco, sucking on caramel, smoking cigarettes or a pipe. Every day, about 2-3 liters of air are swallowed into the stomach (2-3 ml of air with each swallow). It takes about 35 minutes to transit the gastrointestinal tract. A significant part of the swallowed air is carbon dioxide.

Most intestinal gas is produced in the colon. Its amount depends on the characteristics of the diet and varies from 500 to 1500 ml per day. The source of gas is microbial metabolism of carbohydrates. Therefore, the amount of gas in this part of the gastrointestinal tract depends on the quantity and quality of carbohydrates consumed. At the same time, a number of gases are formed in the intestine during the vital activity of microorganisms and enzymatic breakdown (fermentation and decay) of dietary fiber residues, cell membranes, and connective tissue: carbon dioxide, hydrogen, methane, sulfur dioxide, indole, scatol, etc. An increase in the amount of gases is facilitated by dry food, excessive consumption of sugary drinks, consumption of large amounts of fiber and lactose with fructose, which are poorly resorbed. Pathological causes. Flatulence can be acute and chronic. Acute flatulence is a consequence of mechanical and dynamic intestinal obstruction. It can be an early symptom of peritonitis as a manifestation of paralytic obstruction. Chronic flatulence is quite common, the possible causes of its occurrence are shown in the table.

The main factors and mechanism of chronic flatulence development.

Causes of chronic flatulence	Development mechanism
Aerophagy	Neurosis Disorders of saliva formation
Increased generation of gases	Excess substrate for microflora: overeating, malnutrition, malabsorption
Excessive bacterial growth in the small intestine	Ileoascendoanastomosis, blind bowel syndrome, small bowel stenosis, etc.
Giardiasis	Reduced suction area
Dysbiosis of the colon	Reduced hydrogen utilization by intestinal flora
Insufficiently active transport of CO_2	Portal hypertension, right ventricular failure
Impaired motor skills	Functional Organic Surgery Endocrinopathy

"Threatening" symptoms of flatulence that require a doctor's consultation:

- Intense pain in the abdomen.
- Nausea and vomiting.
- Fever.
- A sharp and significant weight loss.
- Excessive body weight.
- Abdominal distension after taking medications.
- Flatulence accompanied by fever.

General recommendations for the treatment of flatulence

- Quitting bad habits (talking while eating, chewing gum, smoking, etc.).
- Increase physical activity.
- Eat regular small meals 4-5 times a day.
- The food is mechanically and chemically gentle.
- Remove poorly digestible fats, raw vegetables and fruits from the diet. In case of poor tolerance to milk, sugar, mushrooms and starch, an appropriate individual elimination diet is prescribed.

Drug therapy for flatulence Drug therapy should be aimed at improving intestinal digestion, suppressing pathogenic microflora, regulating motor skills and reducing visceral sensitivity, and using drugs that directly reduce flatulence. The following groups of drugs are used in the treatment of flatulence:

I. Enterosorbents - adsorb various toxins from the intestine, help reduce flatulence and other dyspeptic disorders.

Enterosorbents are classified:

- By dosage form and physical properties - granules, powders, tablets, pastes, gels, colloids, encapsulated materials, food additives, fibers.
- The chemical structure includes activated carbon, silica gels, zeolites, alumina, oxide and other inorganic sorbents, dietary fiber, organomineral and positioning sorbents.
- According to the mechanism of sorption - adsorbents, absorbents, ion exchange materials, sorbents with a combined mechanism of action.
- According to selectivity, there are non-selective, selective, bi and polyfunctional sorbents.

Basic rules for taking sorbents.

As a rule, it is prescribed 1.5-2 hours before meals. For most sorbents, the daily therapeutic dose is 0.2-1 g/kg body weight, with a shock dose of up to 2 g/kg body weight. The daily dose is evenly divided into 3-4 doses, between breakfast, lunch and dinner. The course of treatment is 6-8 days (not more than 14 days) with a gradual dose reduction over the last 2-3 days. When taking enterosorbents, bowel movements should be daily, and laxatives are prescribed if necessary. When taking enterosorbents, it is recommended to increase drinking and eating foods with a high fiber content. General contraindications for the use of enterosorbents: erosive gastritis, gastric ulcer and duodenal ulcer, intestinal atony, intestinal obstruction, decreased intestinal peristaltic activity, gastrointestinal bleeding. Side effects: constipation, allergic reactions to some components of the drug (polypepan). With prolonged use - hypocalcemia, hypovitaminosis B, D, E. Interaction with other drugs: simultaneous intake of sorbents

and drugs is excluded, the difference in intake between them should be 2-3 hours (taken 1.5-2 hours before and not earlier than 2 hours after meals or medication).

The main products from the sorbents group are represented by in the Ukrainian pharmaceutical market

International name	Trade name. Manufacturer	Form of issue
Diosmectite	Smecta BeaufourIpsen, France	Powder for preparation of suspension for internal use in sachets 3 g, No. 10, No. 30
Atapulgite	Atapulgit-Darnitsa Darnitsa	Film-coated tablets 0.315 g, No. 10, in a jar No. 20
	Pfarmacia & Upjohn's caopectate	Tablet 750 mg, No. 20 Suspension for internal use 750 mg/15 ml vial 236 ml, No. 1
Pectin	Medetopekt, Herbstreith & Fox	Tablets 550 mg, No. 225
Acid methyl silicon (hydrogels)	Enterosgel Creoma Farm, Ukraine	Gel in jars and sachets - 45 g, 135 g, 225 g, 450 g, 650 g, 900 g
	Enterosgel with sweet taste, Creoma-Pharm	Paste for oral administration, 135 g, 225 g, 450 g containers.
	Sorbogel, Hephaestus-M	Gel 180 g, 450 g, 900 g packet
	Sorbogel, Sorby	Gel 180 g, 450 g, 900 g packet
Highly dispersed silicon dioxide	Atoxil Orisil Farm Lviv PF	Powder for suspension preparation 12 g bottle
	Polysorb MP, Dzhankoy-Sivash SEZ	Powder for suspension preparation 12 g glass bottle Powder for suspension preparation 24 g glass bottle
	Silix, Biopharma	Powder 12 g bottle
Alginic acid	Algisorb, Biotechnology	Powder in sachets 2.5 g, No. 10; 5 g, No. 10; 10 g, No. 10.
	Canalgate, Lubnyfarm, OJSC	Granules 2 g in disposable sachets
Polyphene	Polyphene Ecosphere, Russia	Powder 250 g bag, No. 1
Medical activated carbon	Carbolong, Ecosorb	Powder 5 g packet No. 30, 10 g, 100 g, 150 g packet
	Activated carbon tablets, Ecosorb	Tablets 0.25 g contour, cell-free, no. № 6, № 10
	Activated carbon, Stoma	Tablet 250 mg contour cellular pack, No. 10 Tablet 250 mg jar, No. 20
	Activated coal, Darnytsia	Tablet 250 mg contour cellular, No. 10, No. 50, No. 100
	Ultrasorb, Farm-Holding	Vial 0.5 g; vial 1 g; portable sachet 2 g No. 1 portable jar 5 g; portable jar 10 g
Granular activated carbon	Sorbex™, "Ecosorb"	Capsules containing 300 mg of granular activated carbon No. 20

II. Enzyme preparations. In the symptomatic treatment of flatulence, the purpose of prescribing enzyme preparations is not replacement therapy, but to provide functional rest to the pancreas, which is overloaded by excessive food intake. It is

advisable to use preparations that contain a moderate amount of lipolytic enzymes and a sufficient amount of proteolytic enzymes, as well as foaming agents. Enzyme preparations should be taken during or immediately after meals. Tablets and capsules containing enzyme preparations should not be chewed or broken.

Enzymes containing pancreatin, bile components, hemicellulose

Name of the drug	Composition of the drug	Other components
Digestal (dragees) Galenika	Lipase - 6000 U, amylase - 5000 U, protease - 300 U	Bile - 25 mg, hemicellulase - 50 mg
Digestal forte (dragees) Galenika	Lipase - 12000 U, amylase - 9000 U, protease - 600 U	Bile - 25 mg, Hemicellulase - 50 mg
Inozyme (enteric-coated tablets) Neuron	Pancreatin - 192 mg: lipase - 6000 U, amylase - 4500 U, proteases - 300 U	Bile - 25 mg, Hemicellulase - 50 mg
Ipental (table in the box) Neuron	Pancreatin - 192 mg	Bile - 25 mg, hemicellulase - 50 mg
Panzinorm forte (table in capsule) KRKA	Lipase - 6000 U, amylase - 7500 U, protease - 2000 U (trypsin 450 U, chymotrypsin - 1500 U)	Pepsin 50 U, Cholic acid - 13.5 mg, Hydrochloric acid. Amino acids
Sanofi Aventis **Festal** (coated dragee)	Lipase - 6000 U, amylase - 4500 U, protease - 300 U	Bile - 25 mg, hemicellulase - 50 mg
Enzystal (table in capsule) Torrent	Lipase - 6000 U, amylase - 4500 U, protease - 300 U	Bile - 25 mg, hemicellulase - 50 mg
Kirschner's pancreas	Lipase - 5500 U, amylase - 5300 U, protease - 300 U	Papain - 50 mg, Mushroom cellulose - 27.3 mg

Bile-containing medications are used in conditions accompanied by biliary tract hypokinesia and impaired fat solubilization. These drugs help to increase the production of bile and pancreatic juice. They are indicated for patients with gastric secretion disorders (hypo- and antacid chronic gastritis, condition after gastric resection).

These medications are taken 1-3 tablets during or immediately after meals, without chewing, 3-4 times a day for up to 2 months. Healthy individuals can take them to relieve dyspeptic symptoms after an excessive meal.

Bile-containing medications should be used with caution in patients with chronic hepatitis or cirrhosis, as bile acids enter the liver via the enterohepatic route, where they are metabolized, as well as in cholestatic diseases, peptic ulcer disease, and inflammatory bowel disease.

Preparations based on pure pancreatin

Trade name	Form of issue	Composition
Creazim 10 000 Technologist	Gelatinous hard enteric capsules containing granules No. 10, No. 20	Pancreatin - 0.14 g Lipase - 10,000 U Ph. Amylase - 8,000 U Ph. Eur Proteases - 600 U Ph. Eur
Creatizim 20,000, Technologist	Gelatinous hard enteric capsules containing granules No. 10, No. 20	Pancreatin - 0.28 g Lipase - 20,000 U Ph. Eur. Amylase - 16 000 U Ph. Eur Proteases - 1200 U Ph. Eur
Creon 10 000 (microspheres) Solvay Pharmaceuticals	Capsules 150 mg, No. 20	Pancreatin - 150 mg
Creon 25 000 (microspheres) Solvay Pharmaceuticals	Capsules 300 mg, No. 20, No. 50, No. 100	Pancreatin - 300 mg
Mezim forte 3500 Berlin-Chemie (Menarini Group)	Film-coated tablets, No. 20, No. 40, No. 80, No. 100	Lipase - 3500 U Amylase - 4200 U Protease - 250 U
Mezim forte 10 000 Berlin-Chemie (Menarini Group)	Film-coated tablets, No. 10, No. 20, No. 50	Lipase - 10,000 U Amylase - 7,500 U Protease - 375 U
Mezim forte 20 000 Berlin-Chemie (Menarini Group)	Film-coated tablets, No. 50	Lipase - 20,000 U Amylase - 12,000 U Protease - 900 U
Pancreatin 8000 Technologist	Enteric tablets 0.24 g, No. 10, No. 50	Pancreatin - 240 mg
Pancreatin ICN Yugoslavia, Leiras	Dragees 250 mg, No. 50 Tablets 500 mg, No. 20, No. 100	Pancreatin - 250 mg Pancreatin - 500 mg
Pangrol 10 000 (mini-tablets) Berlin-Chemie (Menarini Group)	Capsule with mini-tablets No. 50	Pancreatin with lipase activity - 10,000 U, amylase - 9,000 U, protease - 500 U
Pangrol 20 000 Berlin-Chemie (Menarini Group)	Enteric soluble tablet, oral, No. 20, No. 50	lipase - 20,000 U, amylase - 12,000 U, protease - 900 U
Pangrol 25 000 (mini-tablets) Berlin-Chemie (Menarini Group)	Capsule with mini-tablets No. 50	Pancreatin with lipase activity - 25,000 U, amylase - 22,500 U, protease - 1,250 U
Panzinorm Forte-N KRKA	Tablets, film-coated, No. 10, No. 30	Lipase - 20,000 U, amylase - 12,000 U, protease - 900 U
Trade name	Form of issue	Composition
Granules of orazza Biostimulant	100 g of granules in a glass jar	A complex of amylolytic and proteolytic enzymes from the culture of Aspergillus oryzae

Ornizym-D 03 GSCLC	Granules in a sachet - 0.7 g	Oraza - 0.1 g Nigedase - 0.1 g Sodium alginate - 0.015 g Sorbic acid - 0.003 g Sugar - 0.485 g
Solizym Vitamins, Technologist	Enteric tablets, contoured cell pack, No. 10, 20, 50	Solubilize 20,000 LOs
Somilase Vitamins	Enteric tablets, oral, No. 10, No. 20	Lipase - 60,000 LOs Amylase - 1500 LOs
Enzymtal Genom Biotech	Dragee No. 100	Fungal amylase (1:1200) - 50 mg Papain - 30 mg Activated charcoal - 75 mg Simethicone - 50 mg Nicotinamide - 25 mg
Unigenzyme C MPS Unichem Laboratories	Sugar-coated tablets No. 10, No. 20	Fungal diastase - 20 mg Papain - 30 mg Activated charcoal - 75 mg Simethicone - 50 mg Nicotinamide - 25 mg
Pepzyme Genom Biotech	Syrup in a bottle 100 ml, 200 ml No. 1	Papain - 100 ml/10 ml Fungal diastase (1:800) - 100 mg/10 ml Cinnamon essential oil - 0.4 mg/10 ml Thyme essential oil - 0.8 mg/10 ml Cardamom essential oil - 0.8 mg/10 ml
Pepfiz Ranbaxy	Fast-dissolving effervescent tablets with orange flavor No. 50	Papain - 60 mg, Fungal diastase (1:2000) - 20 mg Simethicone - 25 mg
Digestin Pharco Pharmaceuticals	Syrup vials 120 ml, No. 1	Papain - 80 mg / 5 ml pepsin - 40 mg / 5 ml sanzyme - 2000 (multi-enzyme complex, which includes protease, amylase, lipase, cellulase, ribonuclease and other effective enzymes)

The positive properties of this group of drugs are the stability of enzymes of plant and fungal origin in the acidic environment of the stomach, but their activity is lower compared to enzymes of animal origin.

III. Herbal carminatives. These include dill preparations (dill fruits, dill water), fennel fruits, caraway fruits, chamomile flowers. They are used more often in the form of infusions and decoctions, which are stored in the refrigerator for no more than 3 days. The effectiveness of herbal remedies for flatulence is due to their antispasmodic and mild antiseptic effects. They improve digestion, increase gastric juice secretion and intestinal motor activity, prevent gas formation and relieve spasms caused by flatulence. Infusions of dill, fennel, and caraway seeds stimulate milk production in breastfeeding women. Dill fruit is contraindicated during pregnancy. Hypersensitivity to drugs is possible. Special pediatric dosage forms are available for use in infancy.

Plantex (Sandoz Lek) - contains fennel fruit, glucose and galactose.

Pharmaceutical form: (instant tea) 5 g sachet, No. 1, No. 10, No. 50.Enteroplant (Schwabe) - contains 90 mg of peppermint oil, 50 mg of caraway oil.

IV. Organosilicon compounds (silicones) - dimethicone and simethicone.

Dimethicone is a silicon oil consisting of dimethylsiloxane polymers.

Simethicone is an activated dimethicone, a mixture of dimethicone (polydimethylsiloxane) and finely dispersed silica, therefore it is more effective than dimethicone.Pharmacological properties: the mechanism of action of the drugs is to reduce the surface tension of gas bubbles in the intestine and intestines, their rupture and merging. The released gas is absorbed by the intestinal walls or excreted by its peristalsis. Foaming is reduced by 84-87%. During radiological examination of the gastrointestinal tract, dimethicone and simethicone ensure uniform distribution of the contrast agent over the mucous membrane. These medicinal products are completely inert - they are not destroyed by hydrochloric acid, enzymes, intestinal microflora, they are not absorbed by the intestinal mucosa and are excreted unchanged. The drugs are non-toxic and can be prescribed to pregnant and lactating women and children. Side effects: in rare cases, an allergic reaction (rash, itching, Quincke's edema) is possible. Unlike activated charcoal, they can be used for a long time, as they do not cause hypovitaminosis, decreased absorption of substances, parietal digestion, changes in the pH of gastric juice, constipation, microtrauma to the mucous membrane and stool coloration. Contraindications: mechanical intestinal obstruction and hypersensitivity to the drug components.

Comparative characteristics of silicones

Trade name	Form of issue	Composition
Preparations based on dimethicone		
Contraband *(Norgine Pharma)*	Suspension for internal use in a bottle 250 ml	Aluminum hydroxide - 10 g Magnesium trisilicate - 20 g Dimethicone - 25 mg
Zeolate *(Egis)*	Chewable tablets. 80 mg, No. 20	Dimethicone - 80 mg
Pepsan *(Lab. Rosa-Phytopharma)*	Gel for oral use, 10 g sachet, No. 30	Guaiazulene - 4 mg Dimethicone - 3 g
Preparations based on simethicone		
Disflatyl *(Solso Basel AG, Switzerland)*	Tablets 40 mg, No. 30, No. 100 Drops 40 mg/ml in 30 ml vial No. 1	Dimethylpolysiloxane 40 mg
Espumizan (Espumizan L) *(Menarini Group, Germany)*	Caps. 40 mg No. 25, No. 50, No. 100 Emul. 40 mg/ml fl. 30 ml No. 1	Simethicone - 40 mg Simethicone - 40 mg in 1 ml
Infacol *(ForestLab. UK, Great Britain)*	Oral suspension 40 mg/ml in a vial. 50 ml, 75 ml, 100 ml	Simethicone - 40 mg in 1 ml
Simethicone-Avant *(Seda Pharma, Avant, Ukraine)*	Capsules 40 mg, blister, No. 30, No. 50	Simethicone - 40 mg

Simot *(Norton Healthcare)*	Capsules 40 mg, No. 30, No. 50	Simethicone - 40 mg

Prokinetics - improve intestinal motility and promote gas elimination.

Classification of prokinetics:

I. Dopamine receptor blockers:

a) non-selective (metoclopramide)

b) selective 1st generation (domperidone)

c) selective 2nd generation (itoprid)

II. 5HT4 receptor agonists (tegaserod)

III. 5HT3 receptor antagonists (ondansetron, granisetron, tropisetron, alosetron, silansetron)

This group of drugs belongs to prescription drugs and is therefore prescribed by a doctor.

VI. Probiotics. Drugs of this group inhibit the vital activity of putrefactive and gas-forming microorganisms in the intestine, which contributes to the disappearance of flatulence, normalization of digestion and absorption in the digestive tract.

Pharmaceutical care in the use of various dosage forms for the treatment of flatulence.

Pharmaceutical form	Pharmaceutical care of patients	Pharmaceutical care of doctors	Features of use in different groups of patients
Tablets, enteric-coated	Usually, the drug is taken 1-4 tablets before meals 2-3 times a day, without chewing and with a sufficient amount of liquid, for example, a glass of water or juice. If the single dose is more than one tablet, it is recommended to take half or one third of the total number of tablets before meals, and the rest after meals. The drug contains active enzymes that can damage the oral mucosa, so the tablets should be swallowed whole without chewing	Do not use in case of hypersensitivity to pork protein or other components of the drug. In the presence of symptoms resembling intestinal obstruction, one should be aware of possible intestinal strictures. Given the composition of the tablets, they should not be used in patients with rare congenital galactose intolerance, lactase deficiency, or glucose and galactose malabsorption syndrome	During pregnancy and lactation, the medicinal product should be taken as prescribed by a physician if the expected benefit to the mother outweighs the potential risk to the fetus/child. It is used in children from 3 years old
Capsules containing microspherite mini-tablets	Capsules and mini-microspherical granules should be swallowed whole, without chewing, with a sufficient amount of liquid (approximately 100 ml). Do not wash down with alkaline water or liquids that have an alkaline reaction, as this may	During treatment with enzyme preparations, it is very important to consume enough fluids, especially during periods of increased fluid loss. Fluid deficiency can aggravate constipation. Contraindications to the use of enzyme preparations are acute	If the capsule cannot be swallowed whole (children and the elderly), it can be opened and the mini-microspherical granules added to liquid food that does not require chewing

	lead to dissolution of the drug in the stomach and reduce its effectiveness	inflammation of the pancreas in the early stages and hypersensitivity to pancreatin of pig origin or to any other component of the drug	or to liquids that have a pH of less than 5.0 (e.g. grated apple, yogurt). This mixture should be taken immediately and should not be stored
Syrups for oral administration	It is taken orally during or immediately after meals. Therefore, in each specific case (pregnant, lactating, diabetic patients, children, etc.), it is necessary to conduct individual patient care, taking into account each component and the manufacturer's recommendations on the safety of using these products in general		Contain sugar or sweeteners. Patients with diabetes mellitus should consult a doctor before using them. Can be used by children. In each specific case (pregnant, lactating, diabetic patients, children, etc.), it is necessary to conduct individual patient care, taking into account each component and the manufacturer's recommendations on the safety of using these products in general

Some features of the use of drugs for the treatment of flatulence

Remedy.	Pharmaceutical care of a doctor	Pharmaceutical care of the patient
Diosmectite	It has a high enveloping effect on the mucous membrane of the digestive tract. Indications are not only diarrhea, but also symptomatic treatment of pain in esophagitis, gastritis, irritable bowel syndrome. It can be used in early childhood (including in premature infants)	Very rarely, there is the appearance and intensification of constipation, which disappears after a dose reduction
Highly dispersed silicon dioxide	It is contraindicated in children under 1 year of age, in gastric and duodenal ulcers in the acute stage, in ulcers and erosions of the intestinal mucosa, intestinal obstruction. Use during pregnancy and lactation is not recommended. When used with acetylsalicylic acid, the disaggregation process is enhanced	It is strictly forbidden to use the dry powder internally
Activated carbon	For a faster and more pronounced effect, it is crushed and taken as a water mixture (in 0.5 cups of water). In case of poisoning and gastric lavage, the same form, but in a larger amount of water, is taken orally in a dose of 20-30 g per dose. Prolonged use may result in deficiency of vitamins, hormones, fats, proteins, which requires appropriate medical and nutritional correction	When taking the drug, the feces turn black

Enterosgel	In patients with severe renal and hepatic insufficiency, individual intolerance may be observed when using the drug due to severe dyspeptic syndrome, which disappears after the first dose	Take 3 times a day between meals. Grind 1 tablespoon of the drug, add 30 ml of water and stir until a pasty suspension is obtained. The duration of treatment is determined by the physician individually.

V. DYSBIOSIS

Dysbiosis is a qualitative (changes in the biological properties of intestinal microflora, reduction of beneficial functions and increased toxicity) and quantitative (reduction of beneficial microflora and increase of pathogenic microflora) changes in the normal human flora characteristic of a given biotype, which lead to pronounced clinical reactions of the macroorganism or are the result of various pathological processes in the body. The main causes of dysbiosis are antibiotic therapy, intestinal infections and enzyme disorders of primary (lactase, gluten deficiency) and secondary (in many gastroenterological diseases) nature. The microflora of the digestive tract is a factor of nonspecific defense of the body.

Classification of normal microflora

Type - permanent (indigenous, resident)

1. Obligate (main) - makes up 95% of the total microflora, represented by anaerobic microorganisms (bifidobacteria, lactobacilli, propionic acid bacteria).

2. Facultative (additional) - represented mainly by facultative aerobic bacteria of the species Escherichia coli and Streptococcus faecium (enterococci). Normally, the concentration of these bacteria does not exceed 5%. These are conditionally pathogenic microorganisms that, despite playing a significant role in microbiological processes, can cause severe infectious diseases under adverse conditions.

Type II - transient (residual, allochthonous) microflora - is represented by conditional pathogens - clostridia, proteus, yeast, Klebsiella, staphylococci, cytobacter, pseudomonads (Staphylococcus, Clostridium, Enterobacter, Proteus, Klebsiella, Pseudomonas, Candida).

The main functions of the intestinal microflora are normal:

1. Detoxification (inactivation of enterokinase, alkaline phosphatase).

2. Enzymatic (hydrolysis of metabolic products of proteins, lipids, carbohydrates).

3. Synthetic (synthesis of vitamins, antibiotics and other biologically active substances).

4. Digestive (increased physiological activity of the digestive tract).

5. Anti-anemic (promotes iron absorption).

6. Antirachitic (promotes the absorption of calcium and vitamin D).

7. Immune (activation of the immune system, synthesis of immunoglobulins, interferon).

8. Intermicrobial antagonism.

When a patient seeks help, it is necessary to find out: - who has the test (patient, family members, acquaintances - children or adults); - how long ago the deterioration

occurred and how long it lasts; - what measures were taken before going to the pharmacy; - what medications have already been taken to alleviate the condition.

Threatening symptoms that require immediate medical attention:

- impaired bowel movements accompanied by an increase in body temperature;
- discoloration of the stool, traces or presence of blood in the feces;
- severe pain in the ileum;
- sudden bloating of the abdomen;
- dizziness or loss of consciousness associated with pain in the abdominal cavity;
- a noticeable decrease in body weight against the background of a bowel movement disorder;
- a young child has regurgitation, vomiting, abdominal pain, which is paroxysmal, accompanied by bloating and appears 2-3 hours after eating; stools are abundant, liquid, with foam and a sour or putrid odor; body weight growth rate decreases

Attention: Treatment of dysbiosis should be started after bacteriological examination of the patient's microflora.

Recommendations for self-treatment:

1. Providing recommendations on the dosage regimen of the medicinal product, conditions of administration, duration of treatment, and storage rules.

2. Precautions for use (peculiarities of administration, side effects, effects of diet, etc.).

3. General recommendations for rational dietary therapy:

- The food should be nutritious, chemically, mechanically and thermally gentle;
- It is necessary to eat low-fat foods (boiled meat, fish, cottage cheese), cereals (rice, oatmeal, buckwheat), stale white bread, fruits and vegetables in large quantities;
- in case of diarrhea, black bread, whole milk, raw vegetables and fruits (they should be consumed in boiled and baked form), fatty and spicy seasonings are temporarily excluded from the diet;
- in case of constipation, it is necessary to eat foods rich in dietary fiber - bread with bran, sour fruits, raw vegetables, juices, buckwheat porridge, fermented dairy products; - in case of flatulence, it is necessary to limit the consumption of legumes, cabbage, foods with a high glucose content
- honey, jam, sweets, grapes;
- It is advisable for children to use traditional fermented milk products and adapted milk formulas. Medication treatment of intestinal dysbiosis In order to correct intestinal dysbiosis, dietary therapy and biotherapeutic agents are traditionally used, which can be divided into three groups:

Probiotics are living microorganisms from genera that are part of the normal human intestinal flora (e.g., Lactobacillus (L) spp., Bifidobacterim spp., E. coli Nissle, Enterococcus faecium, Streptococcus thermophilus). Within the group of probiotics, a subgroup of ***bioenteroseptics is*** distinguished - living microorganisms that are not found in the human microbiota, but are able to eliminate opportunistic intestinal microorganisms (e.g. Bacillus subtilis, Saccharomyces boulardii, Saccharomyces cerevisiae). Prebiotics are stimulants of the growth of human intestinal normobiota (e.g., lactulose, vegetable fiber, pectin, low molecular weight organic acids, vitamins).

Synbiotics are combined preparations that include bacterial preparations and growth stimulants. Probiotics (eubiotics) - freeze-dried live attenuated strains of normal intestinal microflora, which, after ingestion, colonize the intestines. Pharmacological properties: the microorganisms that make up probiotics are non-pathogenic, non-toxic, and their vital activity continues during storage. Microorganisms that are symbionts of humans (lacto-, bifidobacteria, enterococci and E. coli) are mainly used, as they are adapted to the human internal environment. Non-symbionts can also be used in treatment regimens, for example, Saccharomyces boulardii, Bacillus subtilis, which are antagonists to pathogenic microflora. Moving through the digestive tract, they come to life and produce acetic and lactic acids, acidifying the environment; this inhibits the growth of putrefactive and gas-forming microorganisms (clostridia, proteus, bacteroids); produce antibacterial substances that inhibit the growth of various opportunistic bacteria and pathogens of intestinal infection (salmonella, shigella). The stomach with hydrochloric acid and pepsin is not an obstacle for microorganisms that are used orally, but their use with food increases the survival of bacteria, as food acts as a buffer and creates a favorable environment for their existence. After ingestion, the bacteria are detected in the feces for one to three weeks. In order to achieve a therapeutic effect from the use of lactic acid bacteria, they must be taken continuously for a long time. Indications: probiotics are prescribed not as a substitute therapy, but as a means of providing conditions for the restoration of normal microflora. They are used both for treatment and prevention of dysbiosis, especially in children. Probiotics can be included in foods as dietary supplements in the form of lyophilized powders containing bifidobacteria, lactobacilli and their combinations, which are intended for daily use and have a regulatory effect on physiological functions and biochemical reactions of the human body. Functional food products include Biokefir, Bifidokefir, Actimel, Narine, Yogurt, Activia. Application features: All probiotics are not recommended to be taken with hot liquids and should not be taken with alcohol. Lactobacillin and Lactobacillus acidophilus are recommended to be taken with milk. The effectiveness of the "engraftment" of the obligate microflora is increased when used simultaneously with lactulose. All drugs except Flonivin BS can be used by children and pregnant women. Bifiform, Linex, Lactovitforte, Yogurt, Enterol, Hilak and Hilakforte, Lactulose can be used simultaneously with antibiotics.

Elements of pharmaceutical care directed to the doctor and the patient in the use of drugs for the treatment of intestinal dysbiosis

Bifiform	It is used for the prevention and treatment of intestinal dysbiosis of various etiologies (during treatment with antibiotics, sulfonamides; in gastroenteritis, colitis, hypo- and anacidic conditions); diarrhea, flatulence; in the complex therapy of allergic skin diseases. For the treatment of children aged 2 months to 2 years, the drug should be used only on the recommendation of a physician. Lactobacilli, like other bacteria, are sensitive to antibiotics, so it is recommended to take the drug no earlier than 3 hours after taking	To prevent the capsule from entering the respiratory tract in children aged 2 months to 2 years, open the capsule and mix the contents with food

	antibiotics	
Linex	Can be used in combination with antibiotics and chemotherapeutic agents	For children under 3 years of age or if the child cannot swallow the capsule, it is recommended to open it and mix the contents with a small amount of liquid (tea, juice)
Lactovit forte	It is prescribed for adults and children twice a day, 40 minutes before meals. Daily doses for adults and children depending on age: for children under 2 years of age - 1 capsule, open the capsule and dissolve the contents in milk; over 2 years of age - 2 capsules; for adults - 2, maximum 4 capsules. If there are indications for use, during pregnancy and lactation, it is taken in normal daily doses. It can be prescribed after a course of bacteriophage treatment, simultaneously with antibiotic therapy. When taken concomitantly, folic acid reduces the effects of phenytoin, pyrimidine, PASC, sulfosalazine, oral contraceptives	Not recommended for patients with hypersensitivity to lactose or other components of the drug. To preserve the viability of the drug components, it is advisable not to drink hot drinks. The drug can be given to infants immediately before feeding by opening the capsule and mixing it with milk
Hilak, Hilak forte	The drops are prescribed 3 times a day; after improvement, the daily dose can be halved. The treatment duration is usually 2-4 weeks. It should be administered with caution to patients with high acidity of gastric juice in the presence of reflux esophagitis. Under the influence of antacids, the lactic acid in the drug may be neutralized. If a child accidentally takes the drug undiluted, reflex regurgitation may occur, which can lead to aspiration pneumonia. In this case, the child should be taken to a hospital	The drops are taken orally, before or during meals with a small amount of liquid (excluding milk). **!!! The drug should not be used without preliminary dilution with water.** Can be used by infants, pregnant and lactating women
Enterohermin	The drug has a high degree of heterologous resistance to antibiotics, which allows it to be used both to prevent changes in the intestinal microflora from the selective action of antibiotics (especially broad-spectrum antibiotics) and to restore the already disturbed balance of intestinal microflora. If the drug is prescribed concomitantly with antibiotics, it should be used between two doses of the antibiotic	The suspension should be taken at regular intervals. Before use, shake the contents of the vial and dilute in sweetened water, milk, tea or orange juice. The presence of visible particles in the vial (due to spore aggregation) does not affect the quality of the product. It can be used during pregnancy and lactation.
Enterol	Adults and children over 6 years of age: 1-2 capsules 1-2 times a day. For children under 6 years of age, it is recommended to take Enterol 250 in the form of lyophilized powder for oral administration. Do not take concomitantly with antifungal	Do not use with very hot or cold food or liquid

	agents in their oral or complex use	
Yogurt	It is taken for the prevention and treatment of acute and chronic gastroenteritis in children and adults. Prevention of dysbiosis during and after taking antibiotics, chemotherapy, radiation therapy, etc. In the complex therapy of allergic diseases (atopic dermatitis, food allergies). It is recommended for patients who do not consume fermented milk products. It is prescribed for children aged 1 to 3 years: 1-2 capsules a day with meals; from 3 to 12 years - 1 capsule 3 times a day; adults and adolescents over 12 years of age: 1-2 capsules 3 times a day. The course of treatment is 25-30 days. If necessary, the course can be repeated	The drug is taken with meals. Children or adults who cannot swallow the capsule are advised to open the capsule and mix its contents with a small amount of food or liquid. For the treatment of children under 1 year of age, take 0.5-1 capsule daily with meals (open the capsule and mix its contents with a small amount of food or liquid)

VI. FUNCTIONAL DYSPEPSIA

Functional dyspepsia - the presence of one or more dyspeptic symptoms originating from the gastroduodenal zone (feeling of heaviness after eating; feeling of early satiety; epigastric pain, burning sensation in the epigastrium) in the absence of any organic changes (according to endoscopy), systemic or metabolic changes that can explain the symptom.

Depending on the predominance of certain clinical symptoms, there are 3 variants of functional dyspepsia. In epigastric pain syndrome (ulcer-like variant), nighttime and "hungry" pains in the supra-abdominal region are noted, which disappear after eating. In postprandial distress syndrome (dyskinetic variant), there is heaviness and a feeling of overflow in the subpelvic area after eating, early satiety. In the mixed (nonspecific variant), it is difficult to unambiguously assign the patient's complaints to one group or another. It should be emphasized that the dyskinetic variant of functional dyspepsia is more common.

It should be borne in mind that dyspepsia can be either one of the symptoms of another disease or act as a separate disease (functional dyspepsia).

Dyspepsia is considered functional if the following criteria are met:

- the presence of permanent or intermittent dyspepsia for at least 12 weeks a year;
- absence of organic diseases of the gastrointestinal tract with similar symptoms;
- dyspepsia does not decrease after defecation and is not associated with changes in the frequency and nature of stools (no signs of irritable bowel syndrome).

The most common causes of functional dyspepsia:

Functional dyspepsia is based on pathophysiological changes in the motor activity of the gastrointestinal tract. The physiological response of the stomach to the ingestion of a food lump is to relax its proximal section. This is followed by relaxation of the stomach floor and body, which is necessary for the intake of relatively large amounts of food without increasing the tension of the gastric wall. With the help of

stomach floor contractions, the contents are pushed into its distal part for evacuation. Food fragments are evacuated from the stomach when their diameter reaches 1 mm or less. Normally, the contractions of different parts of the stomach are strictly sequential and synchronized in time.

Motility disorders may include gastric accommodation disorder (i.e., the ability to relax when a food lump enters the stomach); disturbance of the sequence (synchronization) of contractions of different parts of the stomach; weakening of motility followed by relaxation and complete "stopping" of the stomach.

Factors contributing to the development of functional dyspepsia:

- excessive reaction to stimuli of normal intensity (visceral hypersensitivity);
- psycho-emotional stress ;
- Reduction of the threshold of sensitivity of mechanoreceptors of the stomach wall to stretching;
- individual intolerance to certain types of food;
- Helicobacter pylori can cause impaired gastric motor function, but a clear link between these factors has not yet been proven.

"Threatening" symptoms that make it possible to suspect a patient of a serious condition that requires a mandatory visit to a doctor in case of dyspepsia are:

- development of sharp pain in the upper (or other) part of the abdomen;
- gradual increase in soreness or change in the nature of discomfort in the epigastrium;
- heartburn that lasts more than three days;
- the occurrence of vomiting of the color of "coffee grounds" or blood;
- the presence of black (tar-like) stool;
- progressive weight loss ;
- symptoms of dyspepsia are associated with taking certain medications (a doctor's consultation is required for adequate drug replacement).

General approaches to the treatment of functional dyspepsia with over-the-counter medications

Given that impaired motor activity of the gastrointestinal tract is the basis for the formation of the disease, the drugs of choice in this case are peristalsis stimulants (prokinetics). By their mechanism of action, they are dopamine receptor antagonists. The gastrokinetic effect is due to the blockade of peripheral dopamine receptors, as well as the effect on the hypothalamus and parasympathetic nerves. The drugs have antinausea and antiemetic effects associated with both gastrokinetic action and inhibition of the receptors of the brainstem trigger zone, resulting in a decrease in the sensitivity of the nerves that transmit impulses from the stomach and duodenum to the vomiting center. As a result of these actions, the duration of peristaltic contractions of the antrum of the stomach and duodenum increases, and the tone of the lower esophageal sphincter increases. Prokinetics do not affect gastric secretion.

Drugs: Domidone, Domidone Hexal, Motilium, Motilium Lingual, Motricum, APO-Domperidone, Gastropom-APO, Domperidone-Stoma.

Empirical therapy with antispasmodics, carminative agents, polyenzyme preparations, and acid-reducing drugs is also used.

Pharmaceutical care in the use of drugs for the symptomatic treatment of

functional dyspepsia

- Prokinetics should be taken 15-30 minutes before meals. When taken after meals, the drug absorption is slightly slower.
- When combining domperidone with antacids or antisecretory drugs, the latter should be taken after meals.
- It is not advisable to combine domperidone with cholinolytics, which neutralize its antidyspeptic effect.
- Domperidone is not recommended for pregnant and lactating women.
- Domperidone in therapeutic doses does not affect the speed of psychomotor reactions, so it can be used by drivers of vehicles.

IMPAIRED LIVER FUNCTION AND

BILIARY TRACT

The liver is the largest of the human internal organs. Its average weight is 1500 g. Outwardly, the liver is a homogeneous tissue, which, upon deeper examination, has a much more complex structure. A honeycomb-like, endlessly branching labyrinth of cavities, irrigated from all sides by blood, is a three-dimensional complex structure. The functions of the liver are diverse, but they are all closely interrelated. The main ones are:

- maintaining a constant blood glucose level;
- maintaining a stable content of amino acids and proteins in the blood, regulating their synthesis and catabolism;
- neutralization of end products of nitrogen metabolism by converting ammonia into urea;
- regulation of blood acid-base balance;
- production of bile, including the synthesis of its two components - cholesterol and bile acids;
- maintaining a constant level of cholesterol due to catabolism and excretion of excessive amounts with bile;
- lipoprotein synthesis;
- participation in the metabolism of hormones, vitamins, enzymes, regulation of pigment metabolism;
- Participation in the metabolism of xenobiotics (foreign chemicals, including drugs)

Various liver diseases occur in more than half of gastroenterology patients. The most common types of liver pathology are inflammatory liver lesions - hepatitis (acute and chronic) caused by hepatitis viruses or other infectious pathogens, protozoa, helminths, as well as exposure to toxic substances (primarily alcohol, toxins of chemical and plant origin, heavy metal salts, etc.) Progressive hepatitis develops into liver cirrhosis. Pathology of the gallbladder and biliary tract is caused by the development of inflammation and stone formation in them, as well as motor disorders - dyskinesias (hypokinetic or hyperkinetic type).

Clinical manifestations of liver and biliary tract diseases in patients with mild manifestations of pathology can be grouped into syndromes.

Mild hepatic insufficiency syndrome is manifested by complaints of weakness,

lethargy, rapid mental exhaustion, and increased irritability. Patients note a clear, apparently unmotivated decrease in performance. Frequent headaches, a tendency to fainting, sweating, light dizziness, combined with a feeling of heaviness in the supra-abdominal region and right hypochondrium, metallic or bitter taste in the mouth are often disturbing. All these phenomena are especially pronounced after alcohol or spicy food abuse, as well as in case of insufficient intake or overconsumption of vitamins. There are often complaints of increased bleeding of the gums, the appearance of "bruises", mainly on the legs and thighs, as well as on the bending surfaces of the forearms.

Portal hypertension syndrome is an increase in blood pressure in the portal vein system manifested by abdominal distension, profuse gas discharge, hemorrhoids, increased abdominal volume due to ascites, and swelling of the legs.

Cholestatic syndrome - skin itching, jaundiced skin, including "liver palms", dark urine color, discolored feces.

Biliary dyskinesia is a disorder of coordinated motor activity of the gallbladder and biliary tract, which leads to deterioration of digestion and further absorption of food. This primarily applies to lipid substances.

Normal bile contains 0.15% cholesterol, 1% bile acids and their salts, 0.05% phospholipids, and 0.2% bilirubin. The composition of bile is fairly constant and ensures the soluble state of cholesterol, which is practically insoluble in water. Violation of the ratio of bile components leads to its instability, which may result in crystallization of the contents and create prerequisites for the development of gallstone disease.

The biliary tract originates from the bile ducts, which form the common hepatic duct, into which the gallbladder duct flows. The common bile duct opens into the duodenum at the fathers' nipple, the opening of which is surrounded by the sphincter of Oddi.

Bile is produced by the liver constantly, but its flow into the duodenum is irregular. In the intervals between digestive processes, it accumulates in the gallbladder and enters the duodenum after the stimulating effect of food. Its flow depends on such characteristics of the gallbladder and biliary tract as tone, force of contractions and their coordination, as well as relaxation of the sphincter of Oddi.

Clinical manifestations of motor disorders (dyskinesia) of the gallbladder and biliary tract will depend on their type. In case of atonic phenomena (hypokinetic type), slow emptying of the gallbladder is marked by a feeling of discomfort in the right hypochondrium, dull, aching, prolonged pain. In case of excessive motor activity (hyperkinetic type), intense, cramping pains are noted, radiating to the back, right shoulder blade, right supraclavicular region. In both the first and second types of motor disorders, pain can be accompanied by nausea, a feeling of bitterness in the mouth, belching after eating, a feeling of heaviness and distension in the right hypochondrium, flatulence, and episodes of loose stools.

The most common causes of liver and biliary tract diseases:

- development of an inflammatory process caused by viruses or other infectious pathogens, protozoa (giardia) or helminths (liver fluke);
- exposure to significant amounts of toxic substances, primarily alcohol, as well

as chemical and plant toxins, heavy metal salts, etc;

- secondary liver damage in diabetes mellitus, lung and cardiovascular diseases, severe pancreatitis and enteritis;
- Slow movement (stasis) of bile associated with changes in its chemical composition due to medication (anabolic steroids, thiazide diuretics, estrogens, sulfonylurea derivatives, tetracycline, acetaminophen, indomethacin, chlazepide, etc.)

Factors contributing to liver and biliary tract diseases:

- irrational diet (excess of high-calorie foods and lack of vegetable fiber);
- impaired innervation of the gallbladder by the autonomic nervous system;
- congenital abnormalities of the gallbladder and biliary tract (non-functional form of the gallbladder - arched, tortuous, elongated, etc., the presence of ligaments, narrowing of the ducts, etc;)
- physical inactivity and obesity;
- increased intra-abdominal pressure due to pregnancy or intense sports (especially weightlifting).

"Threatening" symptoms that make it possible to suspect a patient of a serious condition that requires mandatory medical intervention are in diseases of the liver and biliary tract:

- appearance of jaundice, itching;
- symptoms of gallbladder and biliary tract dysfunction have been increasing over the past 2-3 days;
- an attack of hepatic colic with characteristic pain in the right hypochondrium develops;
- against the background of discomfort in the right hypochondrium, there is a pronounced fatigue and general loss of strength, yellowing of the skin and sclera, which increases over time;
- a feeling of discomfort in the right hypochondrium, nausea, stool disorder have been bothering for more than 2 weeks;
- a feeling of discomfort in the right hypochondrium accompanied by an increase in body temperature.

General approaches to the treatment of liver and biliary tract diseases

For the normal functioning of the liver, the most important conditions are the "working condition" of its parenchyma and the full flow of bile.

In order to restore the parenchyma, drugs with hepatoprotective properties are used. It should be borne in mind that the use of hepatoprotectors may cause discomfort in the epigastric region, nausea, and stool disorders. The listed symptoms are not always a reason for drug discontinuation and can be minimized by taking the drug after meals, To restore impaired liver function, it is rational to combine hepatoprotectors with B vitamins, ascorbic acid, and trace elements. The use of multivitamin complexes with trace elements is recommended. To eliminate dyspepsia, flatulence in liver diseases, the use of enzyme preparations, carminative agents - laxatives or choleretic drugs - can be recommended, as constipation is often caused by impaired bile flow into the digestive tract.

Choleretic agents. These are substances of plant or synthetic origin that increase bile production (choleretic) and promote its excretion into the duodenum (choleretic).

Bile acids included in combination preparations (cholenzyme, allochol, festal), as well as various biologically active substances (flavanoids, bitter, saponins, essential oils, etc.) contained in medicinal plants (milk thistle, rose hips, sand immortelle, yarrow, mint, celandine, turmeric, etc.) stimulate bile formation.) Cholecinetics irritate the duodenal mucosa, cause the release of cholecystokinin, which promotes gallbladder contraction and relaxes the sphincter of Oddi (magnesium sulfate, xylitol, sorbitol; medicinal plants: barberry and tansy, sunflower, olive, sea buckthorn oil). It should be borne in mind that medicinal plants usually have both choleretic and cholecinetic effects. Taking drugs that affect the formation and secretion of bile is contraindicated in obstructive biliary obstruction, acute hepatitis, exacerbations of chronic kidney and urinary tract diseases. Taking into account the influence of the functional state of the nervous system on bile secretion, herbal sedatives should be used in case of emotional agitation, increased anxiety, irritability, and anxiety. Choleretic drugs should be taken in courses of 10-20 days.

Non-drug methods of normalizing liver function and biliary tract

In people with liver and biliary tract pathology, meals should be frequent (up to 5-6 times a day), in small portions, at the same time. The last meal should be no later than 3 hours before bedtime. The qualitative composition of the diet should be adjusted depending on the phase of the disease. In the period between attacks, it is advisable to eat foods rich in dietary fiber, exclude fried, spicy, fatty foods, and alcoholic beverages. In case of a tendency to gallstones formation, the consumption of flour products, cereals, meat (pork, beef, lamb), fish, eggs is limited. In case of exacerbation of the disease, the diet should be chemically and mechanically sparing, coarse vegetable fiber is excluded. An anti-inflammatory diet involves limiting the use of table salt and enriching food with proteins.

The optimal amount of fluid consumed per day is 1.0-1.5 liters (the main intake in the morning).

To prevent bile stagnation, it is recommended to stay in a horizontal position for 30-40 minutes after eating.

At home, you can perform a tube test ("blind probing"). In the morning, on an empty stomach, the patient drinks 500 ml of warm mineral water and lies in bed on the right side with a heating pad on the liver for 40-60 minutes. The procedure is performed in 1-2 days, 4-6 procedures in total.

The complex treatment of biliary dyskinesia includes the intake of mineral water (Borjomi, Essentuki, Polyana Kvasova, etc.). It is drunk warm (42-45 °) before meals, one glass three times a day. The time of intake is determined by the secretory activity of the stomach: with low acidity - 10-20 minutes, with normal acidity - 40-60 minutes, with high acidity - 1.5 hours before meals. The course of treatment with one type of water lasts an average of three weeks.

It is necessary to ensure regular bowel movements. When using laxatives, preference should be given to osmotic "fillers".

Patients with liver and biliary pathology are contraindicated to work involving physical exertion, forced body position, constant trauma to the supra-abdominal area,

and shaking driving.

Comparative characteristics of OTC medicines used to treat the liver and biliary tract

International name	Trade name	Clinical and pharmacological characteristics
Hepatotropic drugs		
Arginine glutamate	Glutargen	A combination of arginine and glutamic acid, which ensures the process of biochemical neutralization and excretion of the end product of nitrogen metabolism, ammonia. Highly toxic ammonia is neutralized by converting into substances harmless to the body - urea and glutamate. In addition to the general detoxifying effect, the drug has a direct hepatoprotective effect due to its antioxidant, antihypoxic and membrane stabilizing activity. It is used for a wide range of hepatic pathologies. Caution should be exercised in patients with concomitant inflammatory diseases of the stomach and duodenum
Silimarin	Darsil Carsil Heparsil 140 Legalone 70 Legalone sil Sillegor Silibor 140 Silibor 70 Silibor 35 Silimarol Silimarin	The hepatoprotective effect is associated with the antioxidant and membrane-stabilizing activity of silymarin, a bioflavanoid from milk thistle fruit. It inhibits lipid peroxidation, stimulates protein synthesis, normalizes phospholipid metabolism, and stabilizes hepatocyte membrane. It is used in acute and chronic hepatitis, dystrophy and fatty liver infiltration, as well as for prevention of toxic-chemical liver damage (alcohol, drug, etc.).
Complex preparations based on silymarin		
Levasil Gepabene Simepar	Silymarin, Vitamins B_1 , B_2 , B_6 , B_{12} , B_{15} , nicotinamide, milk thistle extract (silymarin silybinin), milk thistle extract (fumarin)	The effect of medicinal plants is added to the above-described effect of silymarin. The medicinal chickweed contains the alkaloid fumarin, which normalizes the quantitative and qualitative composition of bile, has an antispasmodic effect on the biliary tract, reduces the tone of the sphincter of Oddi, facilitating the flow of bile into the duodenum
Various hepatotropic drugs		
Essentiale Forte H Essentiale H	Essential phospholipids	The product contains highly purified phospholipids that are superior in their functional activity to those produced in the body. Phospholipids are the main structural elements of both cell membranes and intracellular structures. They regulate the permeability of the cell membrane, ion transport through it, the process of intracellular respiration and energy production. In case of liver diseases, phospholipid synthesis is affected, and the deficiency of these biological substances is accompanied by hepatocyte dysfunction. Due to its pharmacological properties, Essentiale Forte H eliminates these disorders, promotes regeneration of cell membranes, activates

		impaired membrane-enzyme systems, increases the detoxification capacity of the liver and thus restores its function
Liventale Forte	Natural phospholipids from soybeans	See "Essentiale Forte H"
Enerl	Low-fat enriched soybean phospholipids	See "Essentiale Forte H"
Phospholip	Lecithin	Div "Lecithin"
Esavit	Essential phospholipids, Vitamins B1, B2, B6, B12, E, nicotinamide	Div "Essentiale Forte H"
Essel Forte	Essential phospholipids, Vitamins B_1 , B , B_{26} , B_{12} , E, nicotinamide	Div "Essentiale Forte H"
Livolin Forte	Essential phospholipids, vitamins B_1 , B , B_{26} , B12, E, nicotinamide	Div "Essentiale Forte H"
Antral	Antral	Hepatoprotector, which, when used in a course, normalizes the level of bilirubin in the blood, gamma globulins, cholesterol, prothrombin index, the activity of "liver" enzymes (transaminases and alkaline phosphatase). Antral has anti-inflammatory, analgesic, antipyretic effects, as well as immunomodulatory properties, and exhibits antiviral activity against hepatitis A, B and E viruses. It is used for hepatitis of various origins, liver cirrhosis
Citrarginine	Neutral Arginine Citrate Betaine Hydrochloride Betaine Basic	A complex preparation based on two amino acids - arginine and betaine. Arginine is involved in protein synthesis and utilization of nitrogen metabolism end products by converting ammonia into urea. Betaine is involved in the biosynthesis of phospholipids. It has the ability to prevent fatty degeneration of the liver in case of unbalanced diet high in fats and in case of alcohol abuse
Hepatophage planta	Milk thistle extract, celandine extract, javanese turmeric extract	See "Silimarin"
Hepafil	Phyllanthus bittergum powder, turmeric extract	See "Febihol"
Galsten	Milk thistle, dandelion, celandine, sodium sulfate, phosphorus	A homeopathic medicine for the treatment of the liver and biliary tract. The hepatoprotective effect is to reduce hepatocyte cytolysis and cholestasis. It normalizes the tone and motor activity of the biliary tract, has anti-inflammatory effect on the organs of the hepatobiliary system. Normalizes the colloidal state of bile, which is manifested in increased excretion of bile acids and lecithin

Apcosul	Seven ingredients of plant origin	Combined phytopreparation, he-pathoprotective agent
Bonjigar	Extracts: white verbena, curroa picroris, black nightshade, chicory, licorice, naked licorice, tamarisk, seed radish, spinach, Indian sphincter, berhavia	Combined phytopreparation, gene-protective agent
Milk thistle composite	Five ingredients used in homeopathic pharmacy	Homeopathic hepatoprotective agent
Lecithin	Soy lecithin	Lecithin has a wide range of effects on physiological functions of the body. Lecithin components are structural elements of liver cell membranes. Thus, the substance has a hepatoprotective effect. Lecithin regulates the synthesis of bile and its components, prevents the formation of gallstones, and due to its emulsifying properties, it promotes the absorption of dietary lipids
LIV-52	Yarrow, chicory, eastern cassia (senna), black nightshade	The complex of biologically active substances contained in herbs has hepatoprotective and choleretic effects
Milk thistle fruits	Milk thistle fruits contain up to 32% fatty oil, essential oil, resins, mucilage, biogenic amines (taramine, histamine), flavonoids, trace elements (copper, zinc, selenium, nickel, etc.)	The complex of biologically active substances contained in milk thistle causes hepatoprotective effect, helps preventing disorders of liver enzymes activity. In addition, it has choleretic, choleretic and anti-inflammatory effects
Piflamine	Dry extract from the herb of pea seed	The complex of biologically active substances (polyphenolic compounds - flavonoids and oxycinnamic acids, amino acids, polysaccharides, etc.) contained in the extract has a hepatoprotective effect
Hepel	Eight ingredients used in homeopathic pharmacy	Homeopathic hepatoprotective agent
Choleretic agents		
Artichoke extract-Health	Artichoke extract	Div "Hofitol"
Herbion drops choleretic	Extract of mint, artichoke, burdock, chamomile, cumin	Div "Hofitol"
Holliver	Medical bile extract, artichoke, turmeric powder	The drug helps to increase the secretory function of hepatocytes, which is manifested in increased bile secretion (moderate choleretic effect) and stimulation of bile acid synthesis. It reflexively inhibits the motor-secretory function of the digestive tract, suppressing fermentation processes in the intestines, the effect of the drug is due to biologically

		active substances contained in bile extract and medicinal herbs. Bile acids stimulate bile secretion, which promotes the absorption of fats and fat-soluble vitamins from the intestines. Bile also stimulates intestinal motility and has antiseptic properties. Seed artichoke - div. "Hofitol", Turmeric - dev. "Febichol"
Hofitol	Artichoke extract	A thick aqueous extract from the juice of fresh leaves of the artichoke plant contains biologically active substances (cynarin, phenolic acids, bioflavanoids, etc.), which have hepatoprotective, choleretic and diuretic effects. The drug promotes excretion of urea and toxins from the body. Carotene, inulin, vitamins C, B_1 , B_2 , contained in artichoke contribute to normalization of metabolic processes
Allohol	Dry bile, garlic powder, nettle leaves, activated charcoal	Div "Holenzim"
Rafaholin C	Black radish extract with activated charcoal, artichoke extract, mint oil, dehydrocholic acid	Div "Hofitol"
Febihol	Phenipentol	A derivative of substances contained in the turmeric plant. It increases the volume of bile, as well as the content of bile acids and cholesterol in it. Increases gastric secretion and pancreatic juice secretion
Holosas	Rosehip extract	Flavanoids and organic acids contained in the fruit have a choleretic effect
Cinacholine.	Alcoholic extract of artichoke seed	Div "Hofitol"
Corn stigmas	Corn stigmas	Contains biologically active substances (sitosterol, stigmasterol, essential and other oils, bitter glycoside substance, saponins, vitamins C and K, etc.), has a choleretic effect. There is also a diuretic effect and increased blood clotting.
Flamin	Dry extract of sand immortelle	Contains biologically active substances (flavonoids, essential oils, oils, etc.) from the plant immortelle (cumin) sandy, has a choleretic effect
Choleretic collection # 2	Sand immortelle flowers, yarrow herb, mint leaves, coriander fruits	Div "Flamin", "Holagogum R Nattermann"
Hepatophyte	Immortelle flowers, galega grass, calendula flowers, nettle leaves, dandelion roots, milk thistle fruits, corn stigmas, bean pods, rose hips	Contains biologically active substances (sitosterol, stigmasterol, essential and other oils, bitter glycoside substance, saponins, Vitamins C and K, etc.), has a choleretic effect.
Coriander fruits	Seed coriander fruits	Contain biologically active substances (linalool, pinene and

		terpene, felandrene, ascorbic acid, carotene, alkaloids, etc.) that have choleretic and analgesic effects
Chollegran	Five ingredients used in homeopathic pharmacy	Homeopathic choleretic remedy
Holedius	Greater celandine, spotted milk thistle, common barberry, shielded podophyllum	Homeopathic choleretic remedy

Pharmaceutical care in the use of drugs for the symptomatic treatment of liver and biliary tract diseases

- Hepatoprotectors should be taken after meals.
- The course of treatment with hepatoprotectors should be 1 month or more.
- It is advisable to combine the use of hepatoprotectors with B vitamins, ascorbic acid, and trace elements.
- Intake of hepatoprotectors may be accompanied by a feeling of discomfort in the epigastric region, nausea, and stool disorders. These phenomena can be reduced by taking the drug after meals or by taking symptomatic medications.
- To eliminate dyspepsia in patients taking hepatoprotectors, the use of polyenzyme preparations is indicated.
- In connection with long-term use of the drugs, the dosage regimen should be strictly followed to avoid the development of undesirable effects.
- Glutargine can increase the secretion of insulin and growth hormone, which should be taken into account in patients with concomitant endocrine pathology.
- Choleretic drugs are taken before or during meals with a small amount of liquid.
- The course of treatment with choleretic drugs should be 10-20 days.
- Drinking alcoholic beverages is contraindicated for people taking hepatoprotective agents and choleretic drugs.
- During the course of treatment with hepatoprotectors and choleretic agents, fried, spicy, fatty foods should be excluded. The diet should include foods rich in dietary fiber and vitamins.
- Patients taking hepatoprotectors and choleretic drugs should drink 1.0-1.5 liters of fluid per day, with the bulk of it in the morning.
- For optimal bile secretion, while using hepatoprotectors and choleretic agents, patients are recommended to stay in a horizontal position for 30-40 minutes after eating.
- Take medications that affect the production and secretion of bile should be discontinued if there is difficulty in its outflow (skin itching, jaundice).
- Choleretic drugs containing bile components are not recommended for those prone to diarrhea and irritable bowel syndrome.
- In case of an overdose of herbal choleretics, stool may become loose. In this case, reduce the dose or discontinue the drug. If necessary, symptomatic treatment with antidiarrheal drugs is prescribed.
- In the period after the disappearance of symptoms of exacerbation of biliary

dyskinesia, choleretic agents are indicated to improve bile flow.

- Do not combine choleretic agents and drugs with known hepatotoxicity (antibiotics, sulfonamides, NSAIDs, etc.), as this creates an additional burden on the liver and can aggravate its pathology.
- After completion of treatment with drugs with known hepatotoxicity, choleretic agents are indicated to improve the excretion of drug metabolites from the body.
- It should be borne in mind that most polyenzyme preparations prescribed in the complex therapy of diseases of the digestive system contain bile components and have a choleretic effect.
- It is advisable to combine choleretic drugs with herbal sedatives to eliminate emotional arousal, increased anxiety, irritability, and anxiety.
- Corn stigma extract has the ability to increase prothrombin levels and thereby increase blood clotting. It is contraindicated in patients with thrombophlebitis and hypercoagulable states, and in other cases, blood clotting control is required.
- Choleretic preparations containing artichoke have diuretic and laxative effects.
- Magnesium sulfate used for choleretic purposes has a laxative effect. The use of magnesium sulfate as a laxative is contraindicated in the first days after an attack of hepatic colic.

RECOMMENDED LITERATURE

Basic

1. Clinical pharmacology : manual for practical classes / O. V. Krajdashenko [et al.] ; Ministry of Health of Ukraine . - 3rd ed. updat. - Vinnytsia : Nova Knyha, 2019. - 232 p.
2. Samura I. B. Pharmacology : textbook for English-speaking students in the higher medical educational institutions of Ministry of Health of Ukraine / I. B. Samura, I. F. Belenichev, A. V. Nerush. - Vinnytsia : Nova Knyha, 2020. - 632 p.
3. Pharmacology : study guide. Tutorial for students / O. M. Vazhnycha [et al.] ; рец. S. Yu. Shtrygol [et al.]. - Vinnytsia : Nova Knyha, 2021. - 368 p.
4. Побічна дія ліків = Side Effects of Medications : навчальний посібник у 2 т. Т. 1 / [В. М. Бобирьов , М. М. Потяженко, О. М. Бєляєва та ін.; за заг.
5. ред. В. М. Бобирьова , М. М. Потяженка]. – Вінниця : Нова Книга, 2020. – 360 с.

Additional

1. Clinical pharmacology. Textbook for medical students, interns, general practitioners and family doctors / Compiled by: A.N. Belovol, L.R. Bobronnikova, V.V. Zlatkina, Y.N. Shaposhnikova, V.D. Nemtsova, I.A. Ilchenko - Kharkiv: Planeta-Print LLC, 2016. 336 p.
2. Pharmacology-Cito! (The pharmacological logic) : textbook / ed. by S. M. Drogovoz. - Kharkiv : [s. n.], 2018. - 192 p.
3. Clinical Pharmacology: Textbook for medical universities of IV accreditation level / Edited by O.Y. Babak, A.N. Belovol, I.S. Chekman - K.: Medytsyna, 2014. - 728 p.
4. Side effects of drugs : textbook for English-speaking students of the higher medical educational establishments of the Ministry of health of Ukraine / I. B. Samura [et al.]. - Kharkiv : Brovin O. V., 2018. - 200 p.
5. Pharmacotherapy: a textbook for students of pharmaceutical faculties / [Edited by O.V. Kraydashenko, I.G. Kupnovytska, I.M. Klishch, V.G. Lizogub] - Edition 2: Nova Knyha, 2013. - 644 p.

Information resources

1. Kompendium. Likarski preparaty [Compendium. Medicines]. URL : https://compendium.com.ua/uk/
2. Derzhavnyi reiestr likarskykh zasobiv Ukrainy. URL : http://www.drlz.com.ua

3. Derzhavnyi formuliar likarskykh zasobiv (Iss. 16). 2024. URL : https://dec.gov.ua/materials/chinnij-vipusk-derzhavnogo-formulyara-likarskih-zasobiv?role=ua
4. Apteka online.ua. URL : https://www.apteka.ua/
5. Farmatsevtychna entsyklopediia. URL: https://www.pharmencyclopedia.com.ua/about
6. Protokoly Farmatsevta. URL : https://www.dec.gov.ua/wp-content/uploads/2022/01/2022_7_pf.pdf.– Назва з екрану.
7. Cochrane Reviews. Cochrane Library. URL : https://www.cochranelibrary.com/