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Актуальні питання створення нових лікарських засобів: тези доповідей XXIV міжнародної науково-практичної конференції молодих вчених та студентів (20 квітня 2017 р.). в 2-х т., Т. 2. – Х.: Вид-во НФаУ, 2017. – 413 с.

Збірка містить матеріали науково-практичної конференції молодих вчених та студентів «Актуальні питання створення нових лікарських засобів». Матеріали згруповано за провідними напрямками науково-дослідної та навчальної роботи Національного фармацевтичного університету. Розглянуто теоретичні та практичні аспекти синтезу біологічно-активних сполук і створення на їх основі лікарських субстанцій; стандартизації ліків, фармацевтичного та хіміко-технологічного аналізу; вивчення рослинної сировини та створення фітопрепаратів; сучасної технології ліків та екстемпоральної рецептури; біотехнології у фармації; досягнень сучасної фармацевтичної мікробіології та імунології; доклінічних досліджень нових лікарських засобів; фармацевтичної опіки рецептурних та безрецептурних лікарських препаратів; доказової медицини; сучасної фармакотерапії, соціально-економічних досліджень у фармації, маркетингового менеджменту та фармакоеконіміки на етапах створення, реалізації та використання лікарських засобів; управління якістю у галузі створення, виробництва і обігу лікарських засобів; інформаційних технологій у фармації та медицині; основ педагогіки та психології; суспільствознавства; філології. Для широкого кола наукових і практичних працівників фармації та медицини.

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Topical issues of new drugs development: Abstracts of XXIV International Scientific And Practical Conference Of Young Scientists And Student (April 20, 2017) in 2 vol., Vol. 2. – Kh.: Publishing Office NUPh, 2017. – 413 P.

Book of Abstracts includes materials of Scientific and Practical Conference of Young Scientists and Students «Actual questions of development of new drugs». Materials are grouped according to the main directions of scientific, research and educational work of the National University of Pharmacy. Theoretical and practical aspects of the synthesis of biologically active compounds and development of medicinal substances on their basis; standardization of drugs, pharmaceutical and chemical-technological analysis, the study of raw materials and herbal remedies development, modern drug technology and extemporal recipe; biotechnology in pharmacy, modern advances in pharmaceutical microbiology and immunology, clinical trials of new drugs, pharmaceutical care for prescription and OTC-drugs, evidence-based medicine, modern pharmacotherapy, socio-economic studies in pharmacy, marketing management and pharmacoeconomics during the development, implementation and use of drugs, quality management in development, production and trafficking of drugs; information technologies in pharmacy and medicine; basics of pedagogy and psychology; social science; philology are presented. For a wide audience of scientists and pharmaceutical and medicinal employees.

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Dear colleagues!

This book contains 593 abstracts, that were send to the Organizing Committee of the XXIV International Scientific And Practical Conference Of Young Scientists And Students ‘Topical issues of new drugs development’ from Belarus, Kazakhstan, Uzbekistan, Turkmenistan, Armenia, Saudi Arabia, Lithuania, Poland, Germany, Russia and Ukraine.

All this materials have two features in common: they were written in English and their authors are talented youth together with their skilled scientific supervisors.

Nowadays English is the language of communication and modern science. It is the official language in 54 countries. English is native language to 335 million people and over 1.3 billion people speak it all over the world.

This is the main reason why our traditional Conference of young scientists and

students has been holding in English for the six years already.

We want our students and young scientists to be successful and to become well-known specialists not only in our native Ukraine. That's why they need to understand the importance of good knowledge of English language for their future career. And the first step on this way is to write abstracts, articles and prepare reports in English. Fortunately, scientific supervisors are always alongside with their students, because they do understand that youth is our future.

When I was a student I was also enchanted with the beauty of organic chemistry, especially – with organic synthesis. By the time of graduating from the university I have almost finished my candidate thesis. Today I am proud to represent pharmacy in the highest echelon of science of our country – in the National Academy of Sciences of Ukraine. And I am pleased to see new generation, that really enjoy scientific work.

22 key areas sessions are presented in this book of abstracts. Among them: synthesis, analysis, phytochemical, technological, biological, pharmacological research, social pharmacy, organization and economics, philology. That is because pharmacy begins with the tiniest atoms and molecules and resulted in preservation and maintenance of health of people. So everyone can find something interesting for scientific pharmaceutical research, while studying in National University of Pharmacy. Students' Scientific Societies of each department and Young Scientists' Council unite all our students and postgraduate students, who want to launch their scientific career. And International Scientific And Practical Conference Of Young Scientists And Students 'Topical issues of new drugs development' gives many of them the first chance to present the obtained results to a great audience.

I congratulate all the participants of the Conference and wish everyone good health, successful scientific career and, of course, love!

Rector of National University of Pharmacy,
Academician of NAS of Ukraine,
prof. Valentyn P. Chernykh

Section 8.

**PHYSIOLOGY OF MEDICINE AND PHARMACY:
CURRENT PROBLEMS AND MODERN
ACHIEVEMENTS**

**THE SUBSTANTIATION OF THE RIGHT CHOICE
OF ANTI-ANNIVERSARY CREAM
ON THE BASIS OF THE ANALYSIS
OF IT'S ACTIVE COMPONENTS**

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Introduction. Skin aging is an inevitable physiological process that reflects the aging of the body as a whole. The visible signs of skin aging include dry skin, dull, uneven complexion, clear folds and deep wrinkles on the skin, loss of skin density, pore enlargement and appearance of age spots. The correct choice of anti-aging face cream can slow down the natural processes of biological aging of the skin and protect it from the damaging effects of exogenous factors.

The purpose of this work was the theoretical substantiation of the correct choice of anti-aging cream based on the analysis of the composition of its active components.

Materials and methods. Analysis of scientific literature.

Results. According to the modern ideas, one of the first signs of skin aging is its dryness, which arises as a result of increase water losses due to disruption of the skin hydro barrier - complex of keratinocytes and epidermal lipids. The restoration of normal skin hydro barrier is promoted by such active components of cosmetics as hyaluronic acid, propylene glycol, soya hydrolyzate, carbamide (urea), panthenol, some kinds of vegetable oils and proteins.

Another visible sign of skin aging is a dull, uneven complexion that reflects the slowing down of regeneration processes in the skin: a decrease in the number of cell divisions of the basal layer and a disruption of the squamous cells of the stratum corneum of the epidermis. Active components for stimulating the regeneration of skin cells are hyaluronic acid, glycans, aloe extract. The enhancement of the effects of these components in combination with physical and chemical exfoliating agents is recommended.

The third visible sign of skin aging is the clear folds and deep wrinkles on the skin that result from the decreased synthesis of collagen and glycosaminoglycans in the dermis. Structural protein collagen provides network support and skin protection, and glycosaminoglycans affect the level of moistening of the dermis. With glycosaminoglycans deficiency, the collagen becomes brittle; its fibers break down faster. In addition to natural chronobiological reasons, there are a number of factors that affect the reduction of collagen levels: UV rays damage fibroblasts that produce

collagen; mechanical influence on the skin (permanent facial expression) leads to the destruction of collagen; free radicals damage collagen chains and stimulate the activity of collagenase, which leads to the formation of unstable collagen chains that weaken the skin. To prevent damage to fibroblasts and collagen fibers, the necessary component of anti-aging creams should be inorganic UV filters (zinc oxide / titanium dioxide). Coenzyme Q10, vitamins C and E, extract of green tea and some other plants can work as antioxidants in the cream.

Loss of skin density is another sign of aging as a result of increased synthesis of the hormone dihydrotestosterone in women with age. With an increase in the level of dihydrotestosterone, the production of elastin in fibroblasts, a structural protein of the dermis, is impaired, which ensures the elasticity of the skin. Among the exogenous factors that significantly affect the reduction of elastin, are UV rays that are capable of damaging the fibroblasts that produce elastin, as well as permanent mechanical deformation of the skin due to which the elastin fibers stretch. Recovery of skin elasticity is facilitated by exogenous elastin cosmetic products in combination with UV filters.

Extended pores and age spots are also a sign of skin aging. A pore seems extended because of the accumulation of dead cells around the pore and the reduction in the amount of collagen. Age spots appear under the influence of age-related hormonal imbalance, and the effects of UV radiation due to melanocyte grouping, on the one hand, and a decrease in the total number of melanocytes, on the other. It has been experimentally proven that the constant use of a sunscreen helps maintain the pore size unchanged and prevents the appearance of age spots.

Overview of components of anti-aging creams cannot be complete without indications of doubtful ingredients of anti-aging creams, which, in addition to the positive effect, may have an adverse side effect: glycerol, caffeine, propylene glycol, zinc sulfate, benzyl alcohol, mineral oils, octyl, parabens.

Conclusions:

1. Based on the analysis of modern scientific literature, the main active components of anti-aging creams with a essential effect on visible signs of skin aging are given in the work.
2. The work also shows doubtful ingredients of anti-aging creams, which, in addition to the positive effect, may have an adverse side effect.

THE NATIONAL SCHOOL OF PHYSIOLOGISTS AND ANATOMISTS.

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Introduction. Unfortunately, we know very little about the national school of scientists of physiologists and anatomists. Students study the sections of physiology and human anatomy, use of various scientific terms, conduct physiological experiments, but do not even think, to whom they owe these achievements. We have no idea what sacrifices were scientists, how much time they spent, so we now understand the structure and function of our body, the age characteristics of each systems and organs.

Aim. To acquaint students with prominent Russian physiologists and anatomists

Materials and methods. Students were given a form with 8 questions.

Results and discussion. A survey of students showed that most of the students have a vague idea of the personalities in the science of physiology and human anatomy, because never paid attention to the history of science. I. I. Mechnikov, an outstanding Ukrainian scientist, founder of evolutionary embryology, Microbiology and immunology, the Nobel prize winner. The Creator of the phagocytic theory. Thanks to him, was defeated rabies, saved the army from syphilis, developed the concept of immunity. Science has helped him not only to save many lives, but also to avoid the duel. Our compatriot V. P. Vorobyov, one of the first to develop a functional anatomy, to discover new laws of structural organization of the nervous system. Proposed method of in vivo monitoring using the enclosing electrodes. Developed the doctrine of the integrity of the organism, the influence functions and work on the formation of organs. Developed a method of embalming of dead bodies. V. Y. Danilevskiy - Ukrainian physiologist, founder and Director Organotherapeutic Institute in Kharkov. one of the first to study the physiological aspects of hypnosis in animals and humans. I. P. Pavlov first formulated the principles of the physiology of higher nervous activity, which he dedicated the next 35 years of his life. He became the first scientist who introduced the concept of "chronic experiment" on the basis of which it is possible to study the functioning of the organism. A follower of Pavlov A. P. Anokhin has introduced a new method to study conditioned reflexes. Anokhin carried out a number of researches on studying of features of blood supply of the brain, the effect of acetylcholine on the secretory and vascular effect of the salivary gland. He formulated the theory of sleep, biological theory of emotion, proposed the original theory of saturation and hunger. Ukrainian pathophysiology, Kiev A. A.

Bogomolets has created the doctrine about interaction of tumor and organism, the Founder of the Russian and the Ukrainian school of pathophysiology, endocrinology and gerontology. Took part in creating the world's first Institute of Hematology and blood transfusion. Developed a unique method of preservation of donor blood. N. M. Amosov, the world-famous cardiologist. Proposed the theory and proved in practice, that the physical labor can make a person not only healthy but also fit and happy. . He easily managed to operate on lungs, kidneys, stomach and other organs. Amosov was the first in Ukraine heart-lung machine, was engaged in the question of artificial intelligence, and even in the absence of materials to carve out a tricuspid heart valve made of a nylon shirt. V. U. Chagovets is a military doctor who studied physiology. Created ion (diffuse) theory of the origin of bioelectric potentials, according to which the formed in place of irritation or damage to tissues acidic metabolic products dissociate into positively and negatively charged ions, which have a different diffusion rate through the Biol. membrane that causes the electrical activity of nerves and muscles. They also developed a capacitor irritation theory explaining the mechanism of sensitizing action of electric current on living tissue. D. S. Vorontsov identified the temporal characteristics of electric currents, action of nerves and muscles. Found that anxiety, lost under the influence of monovalent cations, is recovered by the anode, and the change in excitability caused by the use divalent cations are reduced by the cathode. Opened and reviewed the so-called trace electronegativity, developing after action potential of the nerve, and found the origin of positive vibrations. Studied the nature of slow electrical oscillations occurring in the Central nervous system. Paid much attention to the production in Ukraine of electrophysiological equipment. In this presentation, we spoke only of some scientists. Of course, this list can and should continue. Unfortunately, we are unable to draw a clear line between the Russian and Ukrainian school, because before it was a unified state. In Kyiv city worked and worked well-known scientists, therefore, the Kharkiv school of physiologists and anatomists can rightly be considered one of the strongest in Ukraine.

Conclusions. Students should understand that knowledge of the names of outstanding scientists and their contribution to the development of science gives a deeper understanding of the subject of physiology and human anatomy. The history of the development of Russian science – a history of the development of the state. It is important to know the history of the development of domestic science and know personalities. After all, knowledge arises the love for the Fatherland. Spend more time not only science itself but also its history. Then the scientists will not go unnoticed. You cannot take physiology, anatomy or any other science. That is why, scientists are making discoveries in the same direction, contributing to other science.

THEORETICAL RATIONALE OF EFFICIENCY AND SAFETY OF THE USE OF COSMETOLOGICAL PREPARATIONS OF HYALURONIC ACID

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Introduction. Hyaluronic acid (HA) - non-sulfonated glycosaminoglycan, is part of the connective, epithelial and nerve tissues. There are about 15 grams of GK in the body of a person weighing 70 kg, a third of which is split and synthesized daily, participating in the processes of regulation of tissue hydrodynamics, migration, proliferation, cell interaction.

For the first time HA was used in medicine in 1943 to treat frostbite in the military. Later a wide range of biological activity of the HA has determined its successful application in various fields of medicine: urology, rheumatology, proctology, oncology, cell therapy.

At present, the use of HA has become widespread as cosmetic preparations for smoothing wrinkles and correcting other defects of epithelial tissue.

The purpose of this work was a theoretical justification of the effectiveness and safety of the use of cosmetological preparations of hyaluronic acid.

Materials and methods. Analysis of scientific literature.

Results and discussion. According to modern scientific data, the elasticity and resilience of young skin largely depends on its hydration. One molecule of HA is able to attract about five hundred molecules of water, in connection with which the preparations of the HA are today the drugs of choice for the natural moistening of the skin.

It has been established that HA of different molecular weights has different penetrating properties. Traditional for the cosmetic market component is high molecular weight HA, with a molecular weight of more than 800 kDa, which has been used for a long time in cosmetology and is known for its unique moisturizing properties. But comparative tests of 50, 300, 800 and 1500kDa HA showed that HA with a molecular weight of more than 300 kDa has very low penetration properties in the skin, providing only a surface moistening effect.

Low molecular weight HA (with molecular weight of 50 kDa) has optimal properties for penetration into the skin. The 50 kDa HA is also much more effective at the genoregulatory level. Unlike the 800 kDa HA, which affects 40

genes, the 50 kDa HA significantly affects more than 120 genes, including key genes involved in the regulation of keratinocytes and the formation of complicated complexes of compounds, such as occlusal and other claudins.

It was also found that further reduction of the molecular weight of HA in the preparations does not lead to positive effects: HA of less than 20 kDa contributes to the onset of skin inflammation caused by the reaction of the tol-like receptors 2,4.

An essential characteristic of HA preparations is also the duration of their action. It is established that the duration of action of HA directly depends on the form of release, the degree of purification and the presence of other components in the composition of the HA. The most effective are preparations of highly purified stabilized HA, which are able to stay in the skin for a long time, maintains the water balance of cells, promotes their regeneration and protection, improves blood circulation and restores the work of the sebaceous glands.

As for the combined use of HA with other components, the combination of HA with inorganic UV filters (zinc oxide / titanium dioxide) is effective and justified, since according to modern data, UV radiation is an important factor that reduces the synthesis of HA by fibroblasts and simultaneously enhances the processes of its decomposition.

The undoubted advantage of HA preparations is also their high degree of safety: HA preparations do not cause allergic reactions and have no contraindications.

The review of the effectiveness and safety of the use of HA preparations can not be complete without specifying the limitations in their use: after prolonged use of HA preparations, fibroblasts lose the capacity for independent production of endogenous HA.

Conclusions.

1. Based on the analysis of modern scientific literature, the multifunctionality of HA preparations is shown, as well as the effectiveness and safety of their use.
2. A comparative analysis of various preparations of CG on penetrating ability and duration of action was carried out.
3. A large number of advantages and minor drawbacks of HA preparations are sufficient grounds for the development of new anti-aging HC preparations for the skin.

GENE-ENGINEERING BIOTECHNOLOGIES – "FOR" OR "AGAINST"

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Introduction. The application of the achievements of genetically engineered biotechnology is now very widespread – in medicine, pharmacy, food products. And science recognizes them as absolutely harmless, but only if the third generation of consumers does not have changes at the genetic level. But we are the first generation. In addition, today in Ukraine there is no clear system of regulation and examination of such products regarding its possible negative impact on human health and the environment.

Aim. Therefore, the purpose of our studies was to study the level of awareness of the population in Kharkov and among the students of the NUPh in the matter of genetically modified organisms and to find out their relationship – «for» or «against» to the introduction of genetically modified organisms into food and medicines.

Materials and methods. To solve this problem, a sociological survey was conducted in the form of a survey using questionnaires of a closed type.

Results and discussion. The results of the survey in the city of Kharkov showed that at the age of 17 to 25 years 81% of women "for", 19% – «against». 15% of men are in favor, 85% are against. Women aged 25 to 55 years – 43% "for", 57% "against". Among the students of the NPAU at the age of 17 to 25 years, 36% of girls "for", 64% "against", 50% of young men "for", 50% "against". At the age of 25 to 35 years 27% of women "for", 73% "against", 100% of men "against". That is, the majority of those taking part in the survey were against the use of GMOs in the food and pharmaceutical industries. But the respondents do not know how to protect themselves, because, due to imperfect legislation in this sphere, a person is deprived of the opportunity to freely and consciously choose food and medicines containing transgenic components. That is, the hasty commercialization of the achievements of genetic engineering for the sake of momentary profit goes to the detriment of the safety of the person surrounding his natural environment and the future of civilization.

Conclusions. Undoubtedly, biotechnology is the future, this is environmental safety, but at this modern stage of development of biotechnological research, the widespread spread of GMOs is premature and poses a real threat to the existence of living organisms on Earth. The use of new technologies without a clear understanding of the consequences of their actions can damage the safety of the person, surrounding his natural environment and the future of civilization.

INFLUENCE OF INFORMATION TECHNOLOGIES ON PHYSICAL AND PSYCHOLOGICAL HEALTH

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Introduction. Without denying the advantages of the progress of internet technologies and the amenities that gadgets provide, the relationship with the information world still needs to be built consciously. However, isolating yourself from the impact of digital reality is not easy, because the best minds are working for them being in our life every second. Many kinds of psychotechnics are used for this, bewitching pictures, photos, colors and fonts; almost all types of perception are used-visual audial, tactile. Besides virtual reality creates an illusion of control and allow to experience strong emotions without risk. Psychologists set that the last years long-term memory became worse for people, that it is related to the colossal stream of informative garbage that is brought down an avalanche on us in the internet. Immoderate interest in computer can have it is harmful consequences, for physical and mental health. But how always do a computer and gadgets cause psychological dependence? Psychologists consider dependency upon the computer of those people that conduct too much time at the computer not in business, and here consciously (or unconsciously) harm to the health. An Internet-dependent (though and temporally) man falls out of society, from the real life, he have problems with studies or work. The internet does not bring together. This accumulation of loneliness, it is an illusion of communication, illusion of friendship, illusion of life. The real world much more interesting than virtual. Last years in a counterbalance to computer dominant influence in the whole world, including in Ukraine, measures are conducted in the format of device-free.

Aim. Therefore the aim of our researches was a study of degree of internet addicted among students of National University of Pharmacy of the first and second course.

Materials and methods. Students were given a form with 8 questions.

Results and discussion. From 87 examined 52% answered positively on 4 questions, and they are in danger of being internet addicted.

Conclusions. To be at leisure and independently to manage the life, it is necessary reasonably to use the newest facilities of communication, understand the mechanisms of mediaadvertisement and able to counterbalance the digital activity of the physical and periodically to arrange digital detox.

PHARMACOLOGICAL STUDY OF FUCUS VESICULOSUS

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Introduction. Thyroid disease is widespread in the world and is one of the most common endocrine pathologies. Therefore, one of the promising ways to improve the therapy of the main diseases of the thyroid gland – hyperthyroidism and hypothyroidism – is the use of drugs of plant origin. Herbal medicines are used in combination with pharmacotherapeutic treatment or independently for mild forms of the disease. Medicinal plants are the most promising source of biologically active substances of thyreotropic action. One of the plants used in folk medicine for diseases of the thyroid gland is *Fucus vesiculosus*.

Aim. To study the thyreotropic properties of the water extract of the thallus of *Fucus vesiculosus* on the model of the "goiter reaction" in rats.

Materials and methods. In the experiment, rats weighing 70-80 g were used. The duration of the experiment was 10 days, during which an aqueous extract of thallus of *Fucus vesiculosus* in doses of 1.0, 1.5, 2.0 and 2.5 ml was administered daily by means of a probe to animals. The animals of the control group received water in an equivalent amount. After 10 days, the animals were withdrawn from the experiment by means of instantaneous decapitation and serum levels of thyroid hormones, triiodothyronine (T3) and tetraiodothyronine (T4), were determined, the determination of which was carried out by the method of enzyme immunoassay using test systems.

Results and discussion. Analyzing the obtained data, it should be noted the thyreostatic action of the water extract of the thallus of *Fucus vesiculosus*. There was a significant decrease in blood serum T4 in all test doses compared with intact animals. In a dose of 1.0 ml, the level of the hormone T4 decreased by 1.2 times, 1.5 ml in 1.5 times, in a dose of 2.0 ml – by 1.6 times and at a dose of 2.5 ml – in 1,7 times. In doses of 1.0 ml, 1.5 ml and 2.5 ml the increase in the level of the hormone T3 in the blood serum was negligible, and only in a dose of 2.0 ml there was a significant increase in the level of the hormone in 1.6 times.

Conclusions. The screening studies made it possible to establish the thyreostatic effect of the aqueous extract of thallus of *Fucus vesiculosus* on the synthetic function of the thyroid gland. Thus, the experimental studies carried out by us make it possible to confirm the prospects and feasibility of further research with a view to developing drugs with antithyroid action.

Section 9.

**THE MECHANISMS
OF PATHOLOGICAL PROCESSES
AND THEIR PHARMACOLOGICAL CORRECTION**

THEORY OF CARCINOGENESIS

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Introduction. Carcinogenesis is a complex multi-stage process leading to tumor reorganization of normal body cells. As of today the problem of cancer occurrence has not been finally solved, as modern science develops new points of view on carcinogenesis occur.

Aim. The purpose of this work was to review existing theories of the origin of cancer.

Materials and methods. To achieve this goal, an analysis of the literature data and a generalization of obtained information was carried out.

Results and discussion. The main and generally accepted is the mutational theory, according to which in most cases, cancer develops from one tumor cell due to the accumulation of mutations in the genetic apparatus of cells.

The theory of chemical carcinogenesis considers chemical factors of the environment (carcinogen) as the main cause of cellular mutations leading to tumor development. Carcinogens are divided into two main groups: genotoxic carcinogens, which react directly with DNA, and epigenetic, causing changes in DNA and chromatin without changing the very DNA sequence.

The main postulate of the viral cancer theory is the assertion that the genome of a cell can be disrupted by the activation of an integrated DNA virus, which causes uncontrolled cell division. Currently, several types of viruses that cause malignant tumors have been detected in humans: human papilloma virus (provokes the development of cervical cancer), hepatitis B virus (leading to hepatocellular liver cancer), Epstein-Barr virus from the group of herpes viruses (Burkitt's lymphoma).

The theory of irritation is based on the fact that frequent traumatization of tissues accelerates the processes of cell division and can cause tumor growth. It is known that moles, which are often subjected to friction clothing, shaving injuries, etc., may eventually become malignant.

According to the immune theory, the root cause of cancer is a violation of the body's defense mechanisms for their detection and destruction. This is confirmed by the high incidence of tumors in patients receiving immunosuppressants. Based on this theory, one can explain why the risk of developing cancer progressively increases with age.

Conclusions. Thus, at present, there are a number of interrelated concepts that explain the mechanisms of tumor growth.

GONADOTOXICITY OF NANOPARTICLES FROM RARE EARTH METAL

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Introduction. The growth of occurrence of male hypofertility, the prevalence of reproductive diseases in people of reproductive and working age well as related processes of depopulation in many countries is one of the pressing problems of today. Existing therapeutic agents for the treatment of hypofunction are often ineffective and modern assisted reproductive technologies are used in single pairs and are too high price. This is the basis for the search of new directions the creation of drugs for the correction of disorders of the reproductive function of men. Vanadium-containing compounds are increasingly attracting attention due to the variety of biological effects, including the impact on the functioning of the reproductive system, and their use in nanoform may alter the bioavailability and provide new properties of nanomaterials, what makes them promising for development of new drugs and requires studies of their harmlessness.

Aim. Determination of gonadotoxicity of gadolinium orthovanadate nanoparticles (NPs GdVO₄) in the intact male rats under chronic intake of compound.

Materials and methods. The experiments were were conducted according to international principles of the “European Convention for the Protection of vertebrate animals used for experimental and other scientific purposes” (Strasbourg, 1986) and “General ethical principles of animal research” (Ukraine, 2001). Animals were kept under standard vivarium conditions with diet recommended for this type of animal and the principle of free access to drinking water. The distribution by the groups was done using a table of random numbers. Sexually mature male rats from 6 months of age for 70 days orally received the solution of NPs GdVO₄, that was synthesized in Institute for Scintillation Materials of the NAS of Ukraine, at doses of 0.03; 0.33 and 3 mg / kg b. w. or reference product tribestan at a dose 68 mg / kg b. w. Individual dose was adjusted by according to body weight, which was controlled once a week. As control were used animals of the corresponding age, which under similar conditions received the solvent of NPs without additional components. The animals were taken out of the experiment by rapid decapitation, the condition of internal organs, their weight and the state of spermatogenesis in rats were studied after 30 and 70 days. The total gonadotropic activity of nanoparticle suspensions also was

determined by biological testing rat pituitary. Statistical evaluation of differences of obtained data with the results of the control group was performed using the t-Student's test and U- criteria Wilcoxon-Mann-Whitney by using Statistica 6.0 and Exel 2003. The difference was considered statistically significant at $P < 0.05$.

Results and discussion. As a result conducted research it was found that the intake of nanoparticles GdVO₄ in all doses for 30 days was not lead to changes neither in absolute mass, nor in the mass indexes of organs, except spleen weight, which increased in group NPs GdVO₄ (0.03) compared with the control. Long-term admission of NPs was not affected on absolute weight of majority organs, was discovered only increase in weight of the ventral prostate in rats that were received the highest dose of NPs (3.0 mg / kg). In analyzing the mass ratios were not found differences between experimental groups other than the relative weight of the pituitary gland, which was higher in animals that received NPs at a dose of 0.3 mg / kg than benchmarks of animals treated solvent and tribestan. Therefore, long-term use of NPs GdVO₄ in intact sexually mature animals basically not found gonadotoxic impact on the organs mass.

In healthy male rats NPs GdVO₄ irrespective of dose influence on the processes of differentiation and morphogenesis of cells of the spermatogenic epithelium. 30-day receiving of NPs affected on the percentage of pathological forms of spermatozoa. At the longer term admission of NPs appeared dose-dependent effect, which consisted in the emergence of negative differences in the group that was received potentially therapeutic dose (0.3 mg / kg).

According to the results gonadotrophic activity NPs revealed an increase of uterus and ovaries of mice by which explored the suspension of rat pituitary of group NPs GdVO₄ (0.3), in the other groups the difference was not observed. That is the existing gonadotropic activity NPs GdVO₄, which is manifested in a therapeutic dose (0.3 mg / kg), indicates on increased production of gonadotrophins hormones, that can directly affect on the testes than may be conditioned the decline of parameters of semen in these rats.

Conclusions. Thus, NPs GdVO₄ do not demonstrate the gonadotoxic influence on the mass of organs of intact male rats, however, affect on spermatogenesis. The application of NPs for 30 days affected the percentage of pathological forms of gametes. At the longer term admission of NPs appeared dose-dependent effect, which consisted in the more expressive changes in semen quality, and correlated with increased weight of pituitary and the manifestation of gonadotropic activity NPs at a dose of 0.3 mg / kg b. w

SICKLE CELL ANEMIA

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Introduction. Sickle cell disease is one form of hemoglobinopathy - a structural abnormality in hemoglobin molecule. Sickle Cell Anemia (SCA) is a genetic disease based on a single base pair substitution which affects the body in multiple ways (substitution of glutamic acid by valine at the 6th position). The oxygen carrying protein in red blood cells causes them to sickle due to this mutation. SCA affects millions of people worldwide. SCA predominantly affects African-Americans. The region of the world most detrimentally affected by this disease is northern Africa, where one-third of inhabitants carry the gene. In Africa, 50% of children with SCA die within 1 year of life, less than 10% survive to adulthood. A genetic mutation has allowed sickle-cell carriers to be resistant to malaria.

Aim. Carry out an analytical review of SCA development mechanisms and the most promising methods of its treatment.

Materials and methods. Data analysis of literature and Internet sources.

Results and discussion. The hemoglobin in these sickled cells causes them to form long fibers which stick together because of an amino acid change from a polar residue to a non polar residue. This creates a patch of non-polar amino acids which can polymerize in hemoglobin's deoxygenated form. These fibers poke and damage the membrane warping it into a sickle shaped. This also causes ion transport leading to water loss. Calcium ions build up and active the Gardos channel, an exchange of calcium and potassium ions, which causes a vicious cycle as dehydrated cells are more likely to sickle. Under conditions of low oxygen, however, more cells begin to sickle. These sickled cells become more sticky and then they begin to clump together. This can clog these capillaries causing pain and damage to different organs due to lack of blood flow and oxygen. A sickle cell crisis occurs when the red blood cells sickle (become "C" shaped) and stick together in clumps. The main treatment options do not cure SCA but they do reduce the outbreaks and help keep symptoms under control. Current treatments include Hydroxyurea and nitric oxide. Research is being applied to butyrate and Clotrimazole which increase the unaffected fetal hemoglobin levels and help keep cells hydrated which reduces sickling respectively. Clotrimazole works by inhibiting the Gardos channel.

Conclusions. The high prevalence of SCA, the lack of conventional etiopathogenetic therapy, indicate the need for a further comprehensive study of the pathogenesis of SCA.

INFLUENCE OF NANOSIZED SILICA OXIDE SUSPENSION ON PRODUCTION OF REACTIVE NITROGEN AND OXIGEN SPIECES DURING NITRATE-FLUORIDE INTOXICATION

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Introduction. In the Poltava, Lvov and Kirovograd regions are known to have an increased content of fluorine in drinking water. The uncontrolled use of nitrates as fertilizers in agriculture can lead to an excessive income of these substances to wells and other sources of drinking water. Thus, simultaneous intake of nitrates and fluorides by humans and animals is possible. Fluorine ions in excess quantities are able to change the activity of NO-synthases (NOS) and lead to excessive production of reactive oxygen species (ROS). Nitrates, being exogenous donators of nitric oxide (NO), are also able to change the functional state of NOS and lead to increased production of ROS. Their combined influence on the production of NO and ROS has not been fully studied yet. The normal functioning of the myocardium largely depends on the activity of different NOS isoforms. Changes in their activity can lead to damage to cardiomyocytes due to ischemia or by activation of the processes of peroxide oxidation of biopolymers. The most cost-effective way to remove nitrates and fluorides from the body may be usage of enterosorbents.

The **aim** of our study is to study the effect of a suspension of nanodispersed silica on the production of superoxide anion radical ($\bullet\text{O}_2^-$), the total NOS activity and the content of nitrite ions in the myocardium of rats under combined nitrate fluoride intoxication.

Materials and methods. Studies were conducted on 35 rats of the Wistar line. To simulate chronic nitrate-fluoride intoxication, 500 mg / kg sodium nitrate solution and 10 mg / kg sodium fluoride solution were administered by a gastric probe for 30 days. A suspension of nanodispersed silica was introduced in dose 100 mg / kg of the active ingredient. Animals were sacrificed under thiopental anesthesia, by drawing blood from the right ventricle of the heart. Rat heart tissues were used to prepare a homogenate and conduct biochemical studies. Animals were divided into 3 groups: the first - intact animals, which were kept under standard conditions of the vivarium, 10 animals; the second - a group of

nitrate-fluoride intoxication (15 animals); the third - animals, which, on the background of nitrate-fluoride intoxication, received a suspension of nanodispersed silica (10 animals).

The activity of NOS was determined by the increase in the concentration of nitrites in a medium containing 0.3 ml of a 320 mM solution of L-arginine, 0.1 ml of a 1 mM solution of NADPH after 30-minute incubation at 37 ° C. Activity was expressed in $\mu\text{mol} / \text{min. per g}$ of protein. The concentration of nitrites was determined spectrophotometrically by the amount of diazo-compounds formed during the reaction with the Griss-Ilosvay reagent. The production of ($\bullet\text{O}_2^-$) was determined using a modified test with Nitro blue tetrazolium (Tsebzhinsky OI, 2004). The data were processed statistically using the Microsoft Office Excel software package and the Real Statistics 2007 extension. The results were compared in pairs using Student's t-test. The results were considered statistically significant if $p < 0.05$.

Results. Under combined nitrate-fluoride intoxication, the base production of $\bullet\text{O}_2^-$ increased by 37% comparing to the intact group, NOS activity increased by 23.2%, nitrite concentration increased by 42.6%. An increase in the concentration of nitrites can lead to nitration of myocardial proteins, and increased production of NO and $\bullet\text{O}_2^-$ can lead to the formation of peroxynitrite. When using a suspension of nanodispersed silica, the base production of $\bullet\text{O}_2^-$ decreased by 27.5%, NOS activity statistically significantly did not change, the concentration of nitrites decreased by 35.3%. The reduction in $\bullet\text{O}_2^-$ and nitrite concentrations indicates a decrease in the risk of nitrosative stress.

Conclusion: suspension of nanodispersed silica is effective for correcting excessive production of ROS and accumulation of nitrites under chronic nitrate-fluoride intoxication.

SEXUALLY TRANSMITTED DISEASES

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Introduction. Infectious diseases, transmitted predominantly through sexual transmission (STD) are one of the most significant problems of our time. Their social significance is determined by high prevalence, severity of the consequences for the health of the sick, danger to the society and effect on reproduction. According to World Health Organization experts, every sixth inhabitant (about 1 billion people) of the globe suffers from a sexually transmitted disease. STD incidence rates remain high in most parts of the world, despite diagnostic and therapeutic advances that can rapidly render patients with many STD noninfectious and cure most of them.

Aim. To carry out an analytical review of STD impact on reproductive health and the most promising methods of their treatment

Materials and methods. Literature and Internet sources data analysis.

Results and discussion. Along with "classic" syphilis and gonorrhea, there are about 20 other diseases that can be transmitted sexually, such as trichomoniasis, ureaplasmosis, chlamydia, mycoplasmosis, genitourinary candidiasis, genital herpes, genital warts, genital contagious molluscum, hepatitis B, C, cytomegalovirus infection and others. Annually approximately 200 million patients with gonorrhea, 250 million with trichomoniasis, 200-250 million with chlamydia, etc. are registered all over the world. HIV (human immunodeficiency virus) infection is among the most dangerous diseases and it can also be transmitted sexually. HIV, having got into the human body, eventually destroys immune system cells and leads to the development of the acquired immunodeficiency syndrome (AIDS). Without treatment, these diseases can lead to major health problems such as sterility, permanent brain damage, heart disease, cancer, and even death. Most STDs affect both men and women, but in many cases the health problems they cause can be more severe in women. STDs in women also may be associated with cervical cancer. Human papillomavirus infection (HPV) can cause genital warts and cervical and other genital cancers. STDs can be passed from a mother to her baby before, during or immediately after birth. Some of these neonatal infections can be cured easily, but others may cause a permanent disability or even death of the newborn. Development and spread of drug-resistant bacteria (e.g., penicillin-resistant gonococci) make some STDs harder to cure.

Conclusions. Thus, uncontrolled STDs pose a direct threat to reproductive and sexual health of the nation, which requires the development and implementation of therapeutic and preventive measures and organizational measures to combat STDs.

PHARMACOLOGICAL TREATMENT AND CORRECTION OF KELOID SCARS

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Introduction. To date, one of the topical issues in medicine is the treatment of patients with scar deformities of the skin that can form not only as a consequence of traffic injuries or surgery, but even with the slightest skin lesions (abrasions, scratches, dermatoses). One of the types of scar deformation of the skin is a keloid scar - a tumor-like growth of the coarse fibrous connective tissue of the skin. The causes of keloids are unclear. The most likely cause of formation of keloid scars is a violation of the mechanisms of autoregulation of connective tissue: the collagen-collagenase ratio shifts towards collagen.

The incidence of keloid scars is 15% for wound healing. The tendency to keloid scars is noted in people aged 10-40 years. Old people and children are much less likely to develop keloids, as children have a more elastic skin and heal normally, while older people often develop atrophic scars.

Formed keloid scar is not dangerous for human life and health. However, being located on the open parts of the body, it can bring the owner a serious psychological discomfort. In some cases, it can restrict and restrain limb movements.

There are many therapies, but none of the methods provide a complete guarantee of the absence of keloid recurrence because the nature of keloids has not been adequately studied. Pharmacological methods of treatment of this pathology are based on the use of corticosteroids, immunomodulators and enzyme preparations that affect the formation of collagen in the rumen.

Aim. To study the direction of pharmacological treatment and correction of keloid scars.

Materials and methods. For the expediency of creating new methods and preparations for the treatment of keloid scars, the assortment of existing preparations on the pharmaceutical market of Ukraine and their pharmacological action has been studied.

Results and discussion. Most often used for the treatment of keloids drugs: for injections: «Kenalog-40" – the manufacturer KRKA (Slovenia); "Diprosan" - KRKA, Slovenia (licensed by ScheringPlough, USA); "Lydase" - "Biopharma"

(Kiev, Ukraine); "Longidaza" – NPO Petrovax Pharm (Russia); For external use are used drugs "Contractubex" – MerzPharmaGmbH & Co. KGaA (Germany); "Fermenkol" - NPK (Russia); "Dermatix" - Advance Bio-Technologies Inc. (USA).

Kenalog-40 (average price 450-600 UAH.) – the active substance is triamcinolone acetonide 40 mg. Has anti-inflammatory and immunosuppressive effect. Reduces the synthesis of collagen, reduces the concentration of inflammatory substances. Diprosan (1180-1500 UAH.) – contains betamethasone dipropionate, betamethasone sodium phosphate. Has antiallergic, immunosuppressive, anti-inflammatory effect. However, long-term use of corticosteroids can cause such side effects as: skin atrophy, slowing of regeneration, suppression of adrenal cortex function, Itzenko-Cushing syndrome, hyperglycemia, mental disorders, hypertension, etc.

Lydase (130-150 UAH.) – enzyme preparations that help reduce keloid due to the destruction of its structural components - hyaluronic acid and collagen. Longidaza (1250-1400 UAH.) Is a combination of hyaluronidase with polyoxidonium (immunomodulator).

Scars of small and medium size can be almost completely removed with the help of ointments. Contractubex (280-310 UAH) - contains sodium heparin, allantoin, extract of onion Serai. The drug with a pronounced anti-inflammatory effect has been used for many years to treat post-burn hypertrophic and keloid scars. Fermenkol (500 UAH) - consists of collagenases of animal origin, due to which it has good efficiency in the treatment of keloid scars. Dermatix (890 UAH) - contains silicone and silicon dioxide. A strong film of silicone gel on the surface of the scar promotes its occlusion. It is used for scars of varying complexity, as well as for the prevention of their formation.

Conclusions. Based on the above, we can draw conclusions: insufficient study of the causes of keloid scars leads to the search for new methods of treatment of this pathology; The range of drugs for treatment is limited and represented by foreign manufacturers; Promising will be the development and production of drugs within the country, which will reduce the cost of production.

THE CYCLOPROLYLGLYCINE IS A NEW PROMISING PEPTIDERGIC NEUROPROTECTOR

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Introduction. The amelioration of CNS organic diseases therapy is thought to be high-priority purpose of the modern medicine and pharmacy. The pharmacological neuroprotection is one of directions which means the number of methods to increase survival of neurons, to promote the neuroreparation and neuroplasticity under the conditions of damage caused by the series of pathological factors (ischemia, hypoxia, neuroinflammation etc.). As of today the searching of new neuroprotectors is directed forward the study of pharmacological properties of the brain regulatory peptides and creation on their basis the new high-effectiveness and safe drugs with pleiotropic mechanism of action. It is very interestingly to study the novel diketopiperazines (dipeptides) taking into account their presence throughout neuronal tissue, particularly into brain, and their role of endogenous cognitive enhancers and protective biomolecules. First of all there are dipeptides cycloprolylglycine (cyclo(Pro-Gly)), cyclohistidylproline (cyclo(His-Pro)) and cycloprolylalanine (cyclo(Pro-Ala)). At the present moment the protective properties of both cyclo(Pro-Gly) and cyclo(His-Pro) are additional grounding needed. However, relatively recently it was found out that cyclo(Pro-Ala) exists into the brain as an endogenous product of N-terminal residues of the vascular endothelial growth factor (VEGF) biotransformation. It's highly probably that cyclo(Pro-Ala) provides pronounced neuroprotective properties of VEGF. Consequently, in the State Research Institute of Highly Pure Biopreparations (St. Petersburg) synthetic dipeptide cyclo(Pro-Ala) (laboratory code DKP-9, patent RU 2517209) has been created under the direction of doctor of biological sciences Alexander Kolobov. **The aim of investigation** is to find out neuroprotective and nootropic properties of the cyclo(Pro-Ala).

Materials and methods. The white random bred male mice and rats have been used for the experiment. Peptide DKP-9 was administrated i.n. or i.p. at the doses 0.02 mg/kg, or 0.1 mg/kg, or 1.0 mg/kg, or 10 mg/kg. The models of cerebral ischemia (irreversible bilateral carotid occlusion, iBCO, rats), hypoxia (normobaric hypoxic hypoxia with hypercapnia, NH, mice), anterograde amnesia (conditioned reflex of passive avoidance, CRPA, mice) and extrapolation escape (EE, rats) have been used. As the reference drugs were piracetam and peptidergic neuroprotector semax. The both of them are included in standarts of acute cerebral stroke therapy. Dependent on the variables and the character of their distribution the one-way

analysis of variations (ANOVA), or the Student's t-test, or the Mann-Whitney's T-test, or the Fisher's angular transformations ϕ have been used for statistical analysis.

Results. In the model of iBCO peptide DKP-9 at a dose 0,1 mg/kg has increased rats' survival up to 70% ($p < 0,05$ vs control pathology group) for acute period of cerebral ischemia (the first 4 days). According to activity, DKP-9 has exceeded semax (0.02 mg/kg i.n.). Under the same conditions DKP-9 demonstrated inherent to the peptidergic drugs return U-shaped dose-response relationship. Furthermore, DKP-9 reduced neurological and cognitive deficits which had manifested under the conditions of cerebral ischemia. This peptide improved the motility and the exploratory activity of rats in the open-field test, normalized the indices of antioxidant system of their brain tissue. On the model of NH anti-hypoxic properties of DKP-9 have been found out. It has increased the time of mice's life in the hermetic chamber by 17.1% – 20.1% ($p < 0,05$ vs intact animals) dependent on the administrated dose (0.1 – 10 mg/kg). According to the activity, reference drug piracetam at a dose 400 mg/kg did not exceed DKP-9 under the conditions of this hypoxia model. Thus, cyclic prolylalanine (DKP-9) protects nervous system against the pathological factors' influence such as hypoxia and ischemia. It characterizes DKP-9 as effective neuroprotective drug.

Pronounced neuroprotective properties of DKP-9 combine successfully with the advantageous nootropic activity. In the model of retrograde scopolamine-induced amnesia DKP-9 (0.1 mg/kg) has demonstrated the high anti-amnestic activity (54,8%) and increased the number of animals with the CRPA (up to 57.1%, $p < 0,05$ vs control of amnesia group), exceeding the piracetam (400 mg/kg) and semax (0.02 mg/kg) according to activity. According to the results of EE test the ability of DKP-9 to stimulate rats' cognitive function has been found out. The peptide decreased the time of the rats' conclusion to escape the dangerous and difficulty situation. This time has been reduced by 61,7% statistically significant comparing with the control group.

Conclusions. Cycloprolylalanine is a promising peptidergic neuroprotective and nootropic drug. It protects the nervous system against ischemia and hypoxia, which are key the factors of acute stroke pathogenesis. Not less important is that DKP-9 demonstrates the cognitive enhancing properties, complementing in so way itself neuroprotective activity. The intranasal administration of DKP-9 at a dose 0.1 mg/kg is effective. These results confirms the hypothesis about dependence of VEGF neuroprotective activity on its main metabolite, which is cycloprolylalanine. The future experimental such us clinical trials of DKP-9 as the neuroprotective and nootropic drug are expedient.

MORPHOLOGICAL CONTROL OF THE EFFECTIVENESS GEL "LYSOSTOM"

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Introduction. Inflammatory diseases of the periodontal tissues are one of the most difficult problems of modern dentistry.

Aim. Morphological evaluation of the effectiveness of the gel "Lizostom" conducted after simulation experimental gingivitis and stomatitis

Materials and methods. Gingivitis is reproduced in two steps: first creating dysbiosis in oral (intra-gastric administration lincomycin dose of 60mg/kg for 5 days) and subsequent local lesions of the gums and tissues vestibule mouth applications suspensions bee venom (1mg/kg dose of 2 ml). Stomatitis caused a one-time 5-seconds applique sodium hydroxide at a concentration of 10 g / 100 ml, in the vestibule of the mouth between the lower lip and incisors of the lower jaw.

Results and discussion. Local mucosal lesions suspension of bee venom against the background of oral dysbiosis caused in most rats caused signs gingivitis, morphological pattern which consisted of focal epithelial hyperplasia multilayer with acanthosis and hyperkeratosis, moderate inflammatory response in the lamina propria mucosa. In some cases, microscopic pattern of focal epithelial hyperplasia complicated with acute inflammation of the alternative in which the observed changes of varying severity necrotic epithelial desquamation from his cell, inflammatory infiltration, necrobiotic changes in cellular elements and mucoid swelling fibrous stromal elements. After playing experimental models stomatitis, the control group rats pathology having ulcerative-necrotic lesions of the mucous membrane of the lips. In the control group after 10 days of pathology treatment gangrenous layers of mucus or part were more closely fused with the underlying tissues. Defects are quite common length (relative to the size of the sample), the depth impressed not only his own plate of mucous, but submucous. In the defective areas distinguished zone of necrotic tissue and cells festering inflammation zone. The blood vessels are dilated, trombouse of them, they can see the location of the boundary of blood cells. Signs of healing of defects in all cases weak. Boundary epithelization surface held sluggish.

Conclusions. Gel "Lizostom" reduces the severity of acute mucosal tissue inflammation alternative vestibule of mouth and acanthosis, proliferation of epithelial layer, destruction of stromal cells and epithelial mucosa in experimental gingivitis, and for therapeutic effect is not inferior to comparator «Metrogyl Denta».

LYSOZYME – AN ENZYME MURAMIDASE: CHEMICAL STRUCTURE, PHARMACOLOGICAL EFFECTS, CLINICAL APPLICATIONS

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Introduction. One of the main regulators and factors of nonspecific protection of the oral cavity, providing support homeostasis is the enzyme lysozyme, which is a universal factor of nonspecific antibiotic, antiviral and antitoxic resistance in the body. Lysozyme is involved in the regulation of mitotic and metabolic activity of cells, induction of synthesis of immunocompetent cells mediators such as interferons, interleukins, tumor necrosis factor, etc. The regulation of proteolysis of plasma - correction activity granulocyte elastase inhibitors and proteolysis. Lysozyme contains in saliva, tears, amniotic fluid, milk, sputum, duodenal and gastric juice and organs - heart, spleen, lymph nodes, kidneys, liver, lungs, cartilage, skeletal muscle , brain, placenta, pancreas and thyroid glands. The greatest amount of lysozyme contained in those secretions and tissues that are constantly in contact with microorganisms (saliva, tears). From a chemical point of view lysozyme is mukopeptyd-hlikohidrolaza, mukopolisaharyd enzyme action. Enzymatic properties of lysozyme manifested in the ability to cleave glycosidic bonds poliaminostructure bacterial peptidoglycans by hydrolysis of the beta glycoside bonds between residues N-atsetylmuramic acid and N-acetylglucosamyne, which constitute 50% of the cell wall of gram-positive bacteria, gram-negative and 10%, which makes it antimicrobial action. Accordingly, gram-positive bacteria more sensitive to lysozyme than gram-negative. In antimicrobial enzyme reveals regenerating and analgesic effect. Analgesic properties used in the treatment of peptic ulcers. In the treatment of burns with lysozyme there is a significant acceleration of the release of necrotic tissue mass, stimulation of granulation and epithelialization of wounds. With its anti-inflammatory action of lysozyme is widely used in the treatment of ENT diseases.

Conclusions: Underestimate the role of lysozyme in the body and it is very difficult to exogenous adjustment and creating drugs based on it are important issues. Preparations based on lysozyme have a greater affinity with the body compared with synthetic drugs, which are used in antibacterial and anti-inflammatory treatment of diseases of oral mucosa and periodontal tissue. Therefore, the problem of contemporary pharmacologists - the creation and study of drugs based on natural components such as lysozyme, which has a wide range of pharmacological effects, and selection of the dosage form for optimal bioavailability of the active ingredient in certain pathologies.

**THE STUDY OF INFLUENCE OF THE NICOTINE
FROM DIFFERENT DISPERSED SYSTEMS
ON WEIGHT OF BODY AND INTERNAL ORGANS
OF ANIMALS**

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Introduction. Body weight is the one of the most important indicators of the physical development of people and their state of health. Weight depends on gender, age, heredity, constitutional type, physical activity, profession, diet, lifestyle, habits, etc. Today various ways smoking presents, example conventional cigarettes or hookah smoking. Many people believe that the use of hookah is less harmful than cigarette consumption. But how hookah influences on human health veracious unknown. The cigarettes smoke is system consisting of solid particles. The hookah smoke unlike cigarettes is a system (aerosol) that consisting liquid particles. As result hookah smoke can penetrate deeper and condense on the surface of the lungs.

Aim. The aim of the study was to study the effect of nicotine from cigarettes and hookah on the on weight of body and internal organs of animals.

Materials and methods. The study was carried out on 18 rats weighing 220 ± 30 g for 15 days. Animals were divided on three groups of 6 animals each: 1st – intact control, 2nd – rats that have been subjected to cigarette smoke aspiration, 3rd – rats that have been subjected to hookah smoke aspiration. Rats of 2nd and 3rd groups placed to aspiration chamber volume of 0.08 m³ and subjected to influence cigarette or hookah smoke, respectively for 30 minutes. The dose of nicotine was calculated based on the equivalent dose for the rat from of average man's weight 70 kg, which receives daily 20 mg nicotine, which amounted to 0.043 mg per day for rat.

The mass is determined by weighing the animals at the beginning and end of the experiment. For internal organs calculated mass-weight coefficient.

All intervention and euthanasia of animals was performed according to the requirements of the Commission on Bioethics of the National University of Pharmacy (Kharkov, Ukraine) and "General ethical principles of experiments on animals", which are consistent with the provision of the European Convention for the Protection of Vertebrate Animals used for Experimental and Other Scientific Purposes (Strasbourg, 1986) and the I-st National Congress on Bioethics (Kyiv, Ukraine, 2001).

Statistical analysis included material using standard methods of variation statistics, calculating average values (M) and the average error (m). Statistical

significance was assessed using one-way ANOVA test, the difference was considered to be reliable at $p \leq 0.05$. The data processing was performed using Statistica 7.0 and Excel software.

Results and discussion. It was found that during the experiment the weight of animals in the intact group increased by 8 % compared to initial weight. Unlike rats of the intact control group, the weight of animals of the 2nd group increase was 6 % relative to the initial weight and in rats that inhaled hookah smoke decreased 2 % ($r \geq 0.05$). At the beginning of the experiment the difference between the weight of the animals of intact control and experiments groups been 7 and 1 % respectively. After 15 days of smoking weight of the animals 2nd group was 9 % lower than in control, and weight of 3rd group – 10 % lower.

In the calculating the mass-weight coefficient found that nicotine from various dispersion systems has a different degree of influence on internal organs. It is established that the weight of the lungs was higher 18 % in rats under the influence of cigarette smoke, and the animals under the influence of hookah smoke higher only 3 %, compared to the mass of intact control group animals. The weight of the liver in experimental groups was lower on 9 % and 14 % relative to control.

Significant changes occurred in the thymus weight of rats under the influence of cigarette smoke. It weight was smaller relative weight of thymus of intact control group on 25 % ($r \geq 0.05$). The difference in the group of rats, which were under influence of hookah smoke was 7 %. Thus, it was found that nicotine from various dispersion systems have negative influence on weight of body and internal organs animals like thymus and liver.

Lungs weight increased, especially in rats under the influence of cigarette smoke, which, in our opinion, due to the development of inflammation and edema.

Conclusions.

1. Decrease of the weight of the body more in rats that have been subjected to hookah smoke aspiration.
2. The most difference among mass-weight coefficient thymus and lungs relative to the control group observed in animals that were under the influence of cigarette smoke.
3. The mass of liver under the influence of hookah smoke was increased.

INJECTION DRUGS FOR TREATMENT OF DIABETES MELLITUS TYPE II

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Rationale. Near 425 millions of people worldwide suffer from diabetes. According to projections of the World Health Organization diabetes will take the seventh place among causes of death in 2030. Diabetes type 2 makes 85 – 90 % of all cases of diabetes mellitus in adults. At the present day there exists a variety of drugs for treatment of diabetes type 2, a part of which is represented with injection drugs. There also exist non-insulinic injection drugs.

Work objective consisted in the research of comparative effectiveness of new injection drugs for treatment of diabetes type 2.

Research methods. The analysis of market of pharmaceutical drugs used for treatment of diabetes type 2 in the form of solution for injection was conducted. Measures of effectiveness, duration of action and side effects of drugs and insulin preparations were compared.

Research results. Among non-insulinic injection drugs for treatment of diabetes type 2 the pharmaceutical market is represented with drugs of incretin-mimetic group. These are: synthetic analogs of Glucagon-like peptide-1 (GLP-1): Exenatide (Byetta) and Liraglutide (Victoza). Insulin preparations are effective only in the early stages of diabetes, as due to constantly high insulin concentration in blood stream eventually insulin resistance develops; besides, high insulin concentration causes obesity in patients. Incretin-mimetics provide secretion of genuine insulin in a glucose-dependent way, i.e. not only they increase insulin release from beta cells, but also stimulate the pancreas to produce just as much insulin as is required for the moment, which excludes the phenomenon of constantly high insulin concentration in blood, and the development of obesity, respectively. Also, due to low insulin concentration the resistance develops more slowly. The duration of action of incretin-mimetics amounts 12 hours for Exenatide and 24 hours for Liraglutide, which does not exceed the duration of action of insulin preparations. Among side effects of insulin preparations are: hypoglycemia, allergic manifestations, lipoatrophy and lipohypertrophy, insulin edema. Among side effects of incretin-mimetics are: allergic manifestations, and in rare cases vomiting. Even at large-dose administration of GLP-1 drugs the hypoglycemia was not revealed.

Summary. Incretin-mimetic preparations are preferable for patients with increased body weight and liability to obesity. The drawback of GLP-1 drugs is in their high costs as compared to insulin preparations.

**CHANGES OF AMMONIA AND pH IN BLOOD OF RATS
UNDER THE INFLUENCE OF NICOTINE
FROM CIGARETTES SMOKE AND HOOKAH SMOKE**

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Introduction. Today there are various ways of smoking, like conventional cigarettes or hookah smoking. Many people believe that the use of hookah is less harmful than cigarette consumption. But how hookah influence on human health veracious unknown. The cigarettes smoke is fine-system consisting of solid particles. The hookah smoke unlike cigarettes is a fine-system (aerosol) that consisting liquid particles. Therefore hookah smoke can penetrate deeper and condense on the surface of the lungs.

Aim. The aim of the study was to study the influence of nicotine from cigarettes and hookah on the pH and ammonia levels in blood serum.

Materials and methods. The study was carried out on 18 rats weighing 220 ± 30 g for 15 days. Animals were divided on three groups of 6 animals each: 1st – intact control, 2nd – rats that have been subjected to cigarette smoke aspiration, 3rd – rats that have been subjected to hookah smoke aspiration. Rats of 2nd and 3rd groups placed to aspiration chamber volume of 0.08 m³ and subjected to influence cigarette or hookah smoke, respectively for 30 minutes. The dose of nicotine was calculated based on the equivalent dose for the rat from of average man's weight 70 kg, which receives daily 20 mg nicotine, which amounted to 0.043 mg per day for rat.

Blood pH was determined by using pH-meter "pH-150ma" in the 1st day before and after the "passive smoking" and on the 15th day of the experiment. The determination of the state of the blood buffer systems was carried out by determining the free ammonia in blood plasma using a photometric method with Nessler reagent on the 1st day before and after "passive smoking" and on the 15th day of the experiment.

All intervention and euthanasia of animals was performed according to the requirements of the Commission on Bioethics of the National University of Pharmacy (Kharkov, Ukraine) and "General ethical principles of experiments on animals", which are consistent with the provision of the European Convention for the Protection of Vertebrate Animals used for Experimental and Other Scientific Purposes (Strasbourg, 1986) and the I-st National Congress on Bioethics (Kyiv, Ukraine, 2001).

Statistical analysis included material using standard methods of variation

statistics, calculating average values (M) and the average error (m). Statistical significance was assessed using one-way ANOVA test, the difference was considered to be reliable at $p \leq 0.05$. The data processing was performed using Statistica 7.0 and Excel software.

Results and discussion. It was found that under the influence of nicotine both from cigarette and hookah smoke after the first 30 minutes of aspiration the blood pH shifts to the alkaline side and rises by 1.2 % – from 7.52 to 7.61 against the background of cigarette smoke, and by 1.1 % – from 7.53 to 7.61 against the background of influence hookah smoke. After 15 days of daily "passive smoking", the pH blood in rats exposed to cigarette smoke was 7.56, which was 0.04 more than the initial data (7.52) and 0.02 more than the pH value of blood rats of the control group – 7.54. In rats that inhaled the hookah smoke, the changes between the pH blood of the control and experimental groups were not established.

The obtained data show that alkalosis, arising as a result of compensatory hyperventilation after the first 30 minutes of inhaled smoke, disappears against the background of a daily 15 days "passive smoking". It indicates a decrease in the excitability of the respiratory center, the adaptation of the organism to the conditions of chronic hypoxia and the development of depletion of buffer systems. In this case, the influence of hookah smoke on blood pH is more than that of a cigarette.

When determining the concentration of ammonia in the serum is found that under influence of cigarette smoke ammonia concentration decreased on 8 % at the first 30 minutes from 0.274 ± 0.021 mg/l to 0.251 ± 0.01 mg/l ($r \geq 0.05$) and decreased on 7 % ($r \geq 0.05$) after 15 days of the experiment – to 0.255 ± 0.017 mg/l. In rats under the influence of hookah smoke there was a reduction in the concentration of ammonia by 7 % during the first measurement from 0.257 ± 0.011 mg/l at the beginning of the experiment to 0.239 ± 0.009 mg/l after 30 minutes "passive smoking" and by 9 % on 15th day to 0.234 mg/l ($r \geq 0.05$). Therefore, hookah smoke leads to more noticeable changes in the concentration of ammonia in the serum within 15 days compared to cigarette smoke. It indicates on existence additional burden on the liver function.

Conclusions.

1. The results indicate that nicotine from hookah smoke and cigarette smoke influence on the pH and on the concentration of ammonia in the serum.
2. At the daily smoking the concentration of blood pH is lowering, that indicate on decrease in activity buffer systems.
3. Reduction of ammonia in the serum is the indicant loads on the liver function.

MALIGNANT TUMORS AND IMMUNITY

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Introduction. As of today oncological diseases occupy a leading place among the causes of death of the population. According to the forecasts of the World Health Organization International Agency of Cancer Research, by 2030 oncology will go to the first place, and the number of new diagnosed cancer diseases in the world will more than double. Among modern methods of therapy of malignant diseases, immunotherapy based on the enhancement of the functional state of natural antitumor immunity is promising.

Aim. The aim of this work was to study and summarize factors, that determine the lack of an adequate immune response against tumor cells.

Materials and methods. To achieve this goal, an analysis of the literature data and a generalization of an obtained information was carried out.

Results and discussion. The interaction of tumor cells with the immune system is multifaceted. It is generally accepted that spontaneously produced tumors contain weak tumor-associated antigens and the body's reactions against such tumors are extremely difficult to detect. Moderate immune reactions to the tumor or their complete absence have long been explained by the absence of foreign gene products in tumor cells, anatomical isolation of antigenic tumors from the immune system or generalized immunosuppression in an oncological patient. One of the main reasons for escaping the tumor from immunological surveillance is the lack of recognition of tumor cells by T-lymphocytes due to inadequate presentation of antigens. This often occurs due to the fact that cancer cells often lose the histocompatibility antigens I and II classes, which are necessary for the presentation of antigens. An important mechanism for escaping a tumor from immunological surveillance may be the absence of T-lymphocytes, capable to react with tumor cells. In addition, tumor cells are able to produce factors depressing the immune response. Recently, a new mechanism for protecting the tumor from immune influences has been described. It is based on the induction of apoptosis in activated T lymphocytes using the CD95 receptor-ligand system. The cellular immune system may not be able to block tumor growth, either because the tumor cells multiply too fast, or their number is initially too large.

Conclusions. Thus, modern oncology has quite extensive data on the relationship between the tumor and the immune system, which allows the development of new therapies based on the enhancement of the antitumor immunity of the body's response.

USE OF LIPOSOMES WITH α -TOCOPHEROL FOR CORRECTION OF DISBALANCE IN OXIDANT AND ANTIOXIDANT SYSTEMS IN LUNG OF NEWBORN GUINEA PIGS IN THE HYPEROXIA

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Introduction. Oxidative damage of pulmonary structures, low levels of antioxidants and an active immune response in premature infants are considered to be the leading pathogenetic factors in the development of bronchopulmonary dysplasia (BPD). At present, effective ways to prevent this pathology are absent. The study of metabolic disorders in the lungs under the influence of hyperoxia and the possibility of their correction is an actual task. Since hyperoxia stimulates the processes of peroxidation of biological membranes, it is pathogenetically justified to use antioxidants to prevent damage of pulmonary tissues in newborns.

The most important antioxidant in the lungs is fat-soluble vitamin E (tocopherol), its deficiency promotes the production of reactive oxygen species and increases the manifestations of inflammation and oxidative stress in the lungs under hyperoxia conditions. According to the literature, this vitamin most effectively enters the lung tissue with intratracheal administration compared with intramuscular or oral administration.

Aim. To study the possibility of using alpha-tocopherol in multilamellar liposomes to correct changes in the oxidant / antioxidant system in the lungs of newborn guinea pigs caused by prolonged hyperoxia.

Materials and methods. Four groups of newborn guinea pigs were used in the experiment: Group 1 - intact animals; Group 2 - intact animals that received inhalations of liposomal α -tocopherol; Group 3 - animals that have been exposed to hyperoxia; Group 4 - animals, which during the action of hyperoxia received inhalations with the multilamellar liposomes containing α -tocopherol. The animals of Groups 3 and 4 immediately after birth were placed in a chamber where an oxygen concentration of at least 75% was maintained for 14 days. Animals of Groups 1 and 2 breathed normal air for the same period of time. A-Tocopherol was administered by inhalation with the aid of a compressor nebulizer. Inhalations were performed 1 time per two days. The bronchoalveolar lavage fluid (BALF) was obtained for the study, in which the activity of glutathione peroxidase (GPx), the content of reduced glutathione (GSH) and other non-protein SH-compounds, the content of carbonyl derivatives of amino acid residues in proteins, products

reacting with thiobarbituric acid (TBA-reactive products), diene conjugates and Schiff bases have been studied. The content of tocopherol was determined in the homogenate of the lung tissue.

The statistical processing of the results was carried out using the Statistica 6.0 software package. To assess the reliability of differences between groups, a non-parametric Mann-Whitney test for independent variables was used. Differences were considered reliable at a significance level of $p < 0.05$.

Results and discussion. After the administration of liposomes with vitamin E, the content of α -tocopherol in the lungs of experimental animals exposed to hyperoxia increased 2 times ($p < 0.05$) and corresponded to the control values. It is known that α -tocopherol is the main lipophilic antioxidant in the lungs, as it is a part of the surfactant and protects it from oxidative damage. The mechanism of action of tocopherol is due to not only the ability to protect lipids from oxidation by neutralizing free oxygen radicals and lipid hydroperoxides, but also due to induction of enzymes for the synthesis of glutathione and the glutathione-dependent system.

It was established that the administration of aerosolized liposomes with α -tocopherol to animals exposed to hyperoxia was accompanied by a normalization of the parameters of the glutathione/glutathione-dependent enzyme system in BALF. The level of reduced glutathione increased 1.5 times ($p < 0.05$) compared to animals that had been exposed to hyperoxia for a long time and did not differ significantly from the control group. The activity of glutathione peroxidase in BALF also increased 4.1-fold ($p < 0.05$) compared to animals that were exposed to hyperoxia, with the difference with the control group being unreliable.

An increase in the content of tocopherol and glutathione contributed to a decrease in oxidative processes in the lung tissue of newborn guinea pigs exposed to high oxygen concentration. This is confirmed by a significant decrease in the amount of TBA-reactive products, Schiff bases, and carbonyl derivatives of proteins in BALF of animals.

Conclusions. Inhaled liposomes with α -tocopherol in hyperoxia-exposed newborn guinea pigs restore the oxidant-antioxidant balance in the lungs by increasing the content of tocopherol, normalizing the activity of glutathione peroxidase and the level of SH-compounds in BALF and reducing the content of lipid peroxidation products.

ETIOPATHOGENETIC FEATURES OF THE ANOMALIES OF THE URINARY SYSTEM

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Introduction. Anomalies of development of the genitourinary system usually appear due to a genetic mutation and can be expressed both in the underdevelopment of individual organs and in hyperdevelopment, up to doubling. They are widespread, make up about 40% of all congenital anomaly and are capable of leading to serious complications of a psychological and physiological nature. Specific causes of the most of anomalies are unknown. Renal agenesis, hydronephrosis, poly- and multicystosis of the kidneys, stenosis of the urethra are the most common anomalies of the urinary system. Due to the close interaction between the development of the urinary and reproductive system in 33% of cases, abnormalities of the organs of the urinary system are combined with anomalies of the genital organs, and the developmental defects of the genitourinary system are often associated with the developmental defects of other organs and systems.

Aim. To analyze the etiology and pathogenesis of agenesis and polycystic kidneys based on the study of modern scientific literature.

Results and discussion. The polycystic kidney is a genetically determined pathological process, which is associated with the formation and progression of cysts in the kidneys originating from tubule epithelial cells and (or) collecting tubules, represented by two types of disease - autosomal dominant and autosomal recessive. This is a difficult bilateral process leading to chronic pyelonephritis, arterial hypertension and chronic renal failure. Frequency of occurrence is 1 case per 400 autopsies. This anomaly is divided into polycystic kidney disease in children and adults. For polycystic childhood autosomal recessive inheritance is characteristic, for polycystic adults – autosomal dominant. In children, this anomaly is severe, most of them do not live to adulthood. Polycystic in adults has a more favorable course, manifested in young or middle age, is more common in women, and for many years has been compensated.

The autosomal dominant type of the polycystic kidney is caused by mutations in the genes PKD1 (chromosome 16p13.3) and PKD2 (chromosome 4q21). These genes code of proteins are called polycystins 1 and 2 (PC1 and PC2). The mutation PKD1 is main (85-90 %). Autosomal recessive polycystic kidney disease is caused by a mutation of the PKHD1 gene (chromosome 6p21), with a

25% risk of disease in the offspring. The protein product of the PKHD1 gene is fibrocystin found in the primary cilia and centrosomes. Allelic heterogeneity of the gene determines significant differences in phenotypic concordance both within the same family and between different families. The mechanism of development consists in the dissonance of the connection of the primary tubules of the metanephrogenic blastema with the methanephros flow, which leads to an incorrect development of the secretory and excretory segments of the nephron, i.e. straight and convoluted tubules. As a result, urine outflow from the proximal parts of the nephron is disturbed, an expansion of the blindly terminating tubules and the formation of cysts from them. The growth of cysts causes ischemia of unchanged renal tubules and death of kidney tissue. This process is facilitated by the adhering chronic pyelonephritis and nephrosclerosis.

Unlike polycystosis, renal agenesis is attributed to congenital diseases, which is formed in the first six weeks of fetal development, and refers to anomaly of quantity. This anomaly can be combined with a one- or two-sided absence of the ureters and bladder. The etiology is heterogeneous, possibly its multifactorial origin. In most cases, renal agenesis occurs sporadically. The causes of development include the effect on the mother's body of exogenous factors during pregnancy: viruses (measles, rubella, herpes), venereal diseases (especially syphilis), alcohol abuse, exposure to radiation or toxic substances (bilirubin, ammonia, phenol). A special risk group is women with diabetes. It is established that 4-8 % of children are born with renal agenesis. In boys, the disease occurs twice as often. At the basis of pathogenesis lies the absence or stoppage in the development of the Wolffian duct on the corresponding half of the urinary tract. A disturbance in the formation of the ureter of the embryo subsequently prevents the full development of the organ and is accompanied by the absence of the ureter, its mouth and the corresponding half of the urinary bladder.

Conclusions.

1. It is determined that polycystosis belongs to hereditary diseases, and agenesis – to congenital
2. There are gender differences in the frequency of occurrence of the anomalies studied – polycystosis is more common in women, and agenesis in men.
3. Polycystic is a defect in the structure, and agenesis is a defect in quantity.

NEW DENTAL GEL "LIZOSTOM": GENERAL CHARACTERISTICS, INDICATIONS FOR USE

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Introduction. On the Ukrainian and international pharmaceutical market there is a sufficiently a lot of drugs consist lysozyme. Preparations are in the form of tablets for sucking, lyophilisates for injection solutions, liquids for rinsing and lotions, and lysozyme is part of toothpastes. The common drawback of these drugs is to combine synthetic components, which often provoke allergic reactions in patients. Tablet form is not very convenient way to use in infants. In addition, tablets for sucking and rinsing solutions do not provide for a sufficient level of bioavailability of active ingredients. Such a dosage form as a gel with the active ingredient lysozyme hydrochloride, intended for the treatment of inflammatory diseases of the mucous membrane of the mouth and soft periodontal tissues, in domestic and foreign scientific literature was not discussed. Preference was given to gel form because it is well distributed and absorbed by the mucous membrane, it causes high bioavailability of the active ingredient. Rheological properties of selected bases gel help to reduce diffusion of lysozyme hydrochloride and slow erosion of saliva, making it possible to maintain the optimum concentration to the damaged area of the gums. The object of pharmacological research was dental gel based on lysozyme hydrochloride with the code name "Lizostom" whose composition has been developed at the Department of Industrial Technology of Drugs led by Professor O.A. Ruban. Study of a new dental gel "Lizostom" based on lysozyme hydrochloride The effective dose is defined on the model of burn wounds is 3 mg / kg. For the first time proved that the gel "Lizostom" has antimicrobial, antiexudative, haemostatic and restorative kinds of activities. Morphologically proven effectiveness gel "Lizostom" in experimental gingivitis and stomatitis. Determined that the gel "Lizostom" helps normalize cytokine profile in experimental gingivitis and stomatitis. Violation of prooxidant-antioxidant homeostasis in experimental gingivitis and stomatitis and conditions for the treatment gel "Lizostom." Proven role gel "Lizostom" in normalizing acid-base status and mobilize defense mechanisms of the body. Gel "Lizostom" normalizes parameters of cellular and humoral immunity. The influence of gel "Lizostom" the synthesis of nucleic acids. Scientific novelty confirmed by two patents.

Conclusions. Gel "Lizostom" effective in the treatment of experimental gingivitis and stomatitis and can be recommended for further clinical study in inflammatory diseases of the oral mucosa and periodontal soft tissues.

GINKGO BILOBA IN THE ALTERNATIVE MEDICINE OF THE ATTENTION DEFICIT HYPERACTIVITY DISORDER TREATMENT

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Introduction. The attention deficit disorder with hyperactivity (ADHD) is one of the most common neuropsychiatric disorders. In many countries (United States, Czech Republic, Slovakia, Great Britain) it is recorded in 2-18% or more of schoolchildren. The information has been received about 7-28% of prevalence of ADHD among schoolchildren. A large percentage of children have a dislocation of the cervical spine, which may lead to cerebrovascular accident and as a consequence ADHD. Therefore, the search for drugs that improve cerebral blood circulation and can be used for children with ADHD is an actual question.

Aim. The purpose of this article is to give an overview and determine the role of Ginkgo biloba in ADHD treatment.

Materials and methods. The analysis of literature and Internet sources, scientific journals and articles.

Results and discussion. For the treatment of ADHD is used alternative medicine. The medicines based on Ginkgo biloba have a special role in alternative medicine for ADHD treatment. The study by Eugenia Chan of Ginkgo biloba has been carried out to determine the effectiveness of it in Boston Children's Hospital. The use of extract of Ginkgo biloba three times a day at a dose of 80-120 mg for six weeks in children with ADHD reduced the symptoms of hyperactivity. The effectiveness has been increased in a dose of 240-360 mg. The effectiveness of Ginkgo biloba in a dose of 80 mg is equal to the effective dose of 30 mg of methylphenidate (Ritalinum).

Conclusions. According to the results Ginkgo biloba has a positive effect of the attention deficit disorder with hyperactivity in children, but its effectiveness is less than methylphenidate (Ritalinum).

EPILEPSY AND HOW TO BEAT IT WITH PHARMACOLOGICAL METHODS

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Introduction. Nowadays epilepsy is one of the most prevalent neurological diseases. 65 million of people are epileptics, and it's interesting that drugs are on the one level with surgery when we're talking about healing methods.

Aim. Identify the best way to deal with epilepsy.

Materials and methods. Epilepsy is brain disease which causes seizures of moving, feeling and mental disfunction. Only repeating spontaneous seizures can denote epilepsy. Pathogenesis of epilepsy. Organic or functional injury of part of the brain. It causes depolarisation of neurons because of opening Na⁺ canals. As a result – stable pathological connections. Seizures cause deep changes of brain metabolism and because of this forms circled pathological system named epileptical brain which can subdue new areas of cerebrum. Pathological processes lie on biochemical disfunction of Neurotransmitters' metabolism. Most of antiepileptical drugs work with phases of neurotransmission. Glutamate is the most important stimulating neurotransmitter. It's antagonists are strong anticonvulsants like GABA (gamma-Aminobutyric acid). GABA is the most significant inhibition neurotransmitter. Epilepsy is one of the most successfully curable disease. There are many functional and surgical methods of cure, but in 66% seizures are under control because of antiepileptical drugs like phenobarbital, carbamazepine, depakin. These drugs work with GABA mechanism or with Na⁺ canals.

Results and discussion. Drugs are the most effective and safe way to fight epileptic seizures. Surgical methods sometimes are not safe and have by-effects and, of course, it's harder to do. But we need to remember, that there are some medical cases, which cannot be solved just with drugs.

Conclusions. Epilepsy is very common disease in our world and it's better to fight seizures with drugs. People don't have to try surgical methods if it's not necessarily. Nowadays pharmacology is one of the most advanced medicine spheres, so, it can solve many problems much more softer and carefully than surgery.

HETEROCID-321 AWAKENING ACTION ON THE MODEL OF KETAMINE ANAESTHESIA

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Introduction. Natural disasters, wars and man-made disasters are accompanied by "traumatic" epidemics. It dramatically increases the role of urgent surgery, which effectiveness depends not only on qualified surgeons, but also the presence of extemporaneous preparations required during operations and rehabilitation activities.

A duration of operation plays an important role in the field conditions. It mainly depends not only on the duration of surgical procedures, but also on a duration of anesthesia that is very individual and varies in the range from 30 minutes to several hours. Due to limited amount of surgical and rehabilitation personnel it is a factor that determines the rate and effectiveness of rescue measures.

Medical preparations which are capable to interrupt anesthesia quickly, efficiently and harmlessly are absent now in the arsenal of modern pharmacology. This makes the development of appropriate drugs particularly an urgent problem.

The aim of our study was to find original substances with the wake-up action in the series of sulfur- and nitrogen-containing heterocycles.

Materials and methods. Evaluation of antinarcosis action (ANA) of the substances under study was performed on nonlinear white mice weighing 20-30g on the model of ketamine anesthesia. Animals were randomized into 4 groups, each received ketamine intra peritoneal (i.p.). The duration of the anesthetic sleep (DAS) of the first group was accepted as a control. At the fifteenth minute of the anesthetic sleep the second group was injected i.p. by Heterocid-321, the third one by the reference drug (sulfokamfokaine), and the fourth one by niketamidum, all of them same i.p. The main indicator of the ANA test substances was the reducing of the DAS (awakening effect).

The reliability of the results was evaluated by the nonparametric Newman-Keuls criteria using the Statistica 10.0 program.

Results and discussion (Table 1). During the studies, it was found that the optimal depth and duration of ketamine anesthesia was achieved at a dose of 150 mg/kg. The substances under study showed a significant awakening effect: Heterocid-321 at a dosage range from 7.5 to 2 mg/kg, sulfokamfokaine - at doses of 70 - 20 mg/kg.

The experiment showed that the DAS has a significant dose-dependence. Heterocid -321 at a dose of 2 mg/kg was 1.4 times more effective than at a dose of 7.5 mg/kg and 1.7 times than at a dose of 3.5 mg/kg. Sulfokamfokaine effectiveness

at 20 mg/kg was higher in 1.5 times and 1.6 times, compared with the drug at doses of 70 and 35 mg/kg, respectively. Niketamidum DAS and other doses of Heterocide - 321 turned out to be statistically insignificant.

Table 1

APA drugs under study on the model of ketamine anesthesia

| № | Substances injected to mice | Average DAS | | APA,% |
|----|----------------------------------|---|---------------|--------------|
| | | | | |
| 1 | Ketamine 150 mg/kg (control) | 33 minutes 37 seconds 2017,96±110,25 сек | 100% | 0 |
| 2 | <i>Heterocide -321 7,5 mg/kg</i> | <i>22 minutes 28 seconds *</i> <i>1288,00±109,47 seconds</i> | <i>62%*</i> | <i>38%</i> |
| 3 | <i>Heterocide -321 3,5 mg/kg</i> | <i>26 minutes 33 seconds *</i> <i>1592,50±251,67 seconds</i> | <i>76%*</i> | <i>24%</i> |
| 4 | Heterocide -321 2,5 mg/kg | 26 minutes 43 seconds 1603,83±168,94 seconds | 79% | 21% |
| 5 | <i>Heterocide -321 2,0 mg/kg</i> | <i>18 minutes 45 seconds *</i> <i>1124,86±153,85 seconds</i> | <i>44,3%*</i> | <i>56,7%</i> |
| 6 | Heterocide -321 1,5 mg/kg | 32 minutes 54 seconds 1975,33±95,76 seconds | 98% | 2% |
| 7 | Heterocide -321 1,0 mg/kg | 29 minutes 36 seconds 1779,33±288,04 seconds | 88,2% | 12,8% |
| 8 | Sulfokamfokaine 70 mg/kg | 43 minutes 42 seconds 2899,25±422,30 seconds | 130% | + 30 % |
| 9 | Sulfokamfokaine 35 mg/kg | 46 minutes 23 seconds 3442,2±197,89 seconds | 138% | + 38% |
| 10 | <i>Sulfokamfokaine 20 mg/kg</i> | <i>28 minutes 34 seconds *</i> <i>1767,67±51,74 seconds</i> | <i>85%*</i> | <i>15%</i> |
| 11 | Nikethamidum 63 mg/kg | 30 minutes 55 seconds 1876,33±21,57 seconds | 92% | 8 % |

Note. * Significant differences from the control index ($p < 0.05$) on parametric Newman-Keylsa criterion (Statistica 10.0);

Heterocide-321 substance significantly ($p < 0,05$) shows an expressed awakening effect reducing in 4.4 times the duration of the anesthetic sleep compared to the control group, and at a dose in 10 times lower than that of sulfokamfokaine increases its efficiency by 3.7 times.

Thus, the maximum of Heterocide-321 awakening effect was shown at 2 mg/kg, and for sulfokamfokaine it was 20 mg/kg.

Conclusions. Derivatives of sulfur- and nitrogen-containing heterocycles are prospective for the search of the original substance with wake-up action.

AROUSAL EFFECT OF HETEROCIDE – 321 ON A MODEL OF KETAMINE ANESTHESIA

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Rationale. The mechanism of action of any antidote (including antinarcosis) theoretically is reduced to a rapid decrease in the concentration of toxic substances (TS) in the body. In practice, it can be realized in several ways: by activation of the emetic and breathing reflexes; reaction of chemical transformation of TS to the less toxic structure, physical or chemical adsorption on a surface of the sorbent; stimulation of drainage systems (intestine, kidney, skin); metabolic degradation due to the activation of enzyme systems of the liver or sequential combination of the mentioned options.

The aim of our research was to study the possible effects of awakening substances on the respiratory center (RC) of the brain.

Materials and methods. Evaluation of the impact of the substances under study on the RC was performed on a model of ketamine anesthesia on nonlinear white mice weighing 20-30 g. The criteria of the efficiency of action on the RC served was a respiratory rate (RR) in several phases of anesthetic sleep before and after injection of awakening medicines.

The experiment involved three groups of animals, each one was injected intra peritoneally (i.p.) with ketamine. The respiratory rate (RR) was counted in the range of 60 seconds immediately after the mice got the lateral position (RR1), on the 5th (RR2), on the 10th (RR3) minutes of the anesthetic sleep, on the 15th minute (RR4) immediately after the i.p. injection with Heterocide-321 or sulfokamfokaine, as well as during the awakening of animals on the 20th (RR5), the 25th (RR6) and the 30th (RR7) minutes. Last counting (RR8) was carried out immediately after the mouse awakening (taking the position on all four legs).

The reliability of the results was evaluated by nonparametric Newman-Keuls criteria with the help of Statistica 10.0 program.

Results and discussion (Diagram 1). When ketamine was administered it showed that RR1, RR2, RR3 significantly ($p < 0,05$) decreased respectively from 116.31; 91.30 to 86.77 breaths per minute (B/min). This experiment confirms the inhibitory effect of the anesthetic drug on the central nervous system in general and for RC particularly. Counting the RR immediately after the injection of Heterocide -

321 and sulfokamfokaine showed a substantial increasing accordingly - RR4 by 79.7% () and 84.1%; RR5 by 61.5% and 69.2%; RR6 by 43.3% and 46.9%; RR7 40% and 38%; RR8 30% and 26% higher than in the control group.

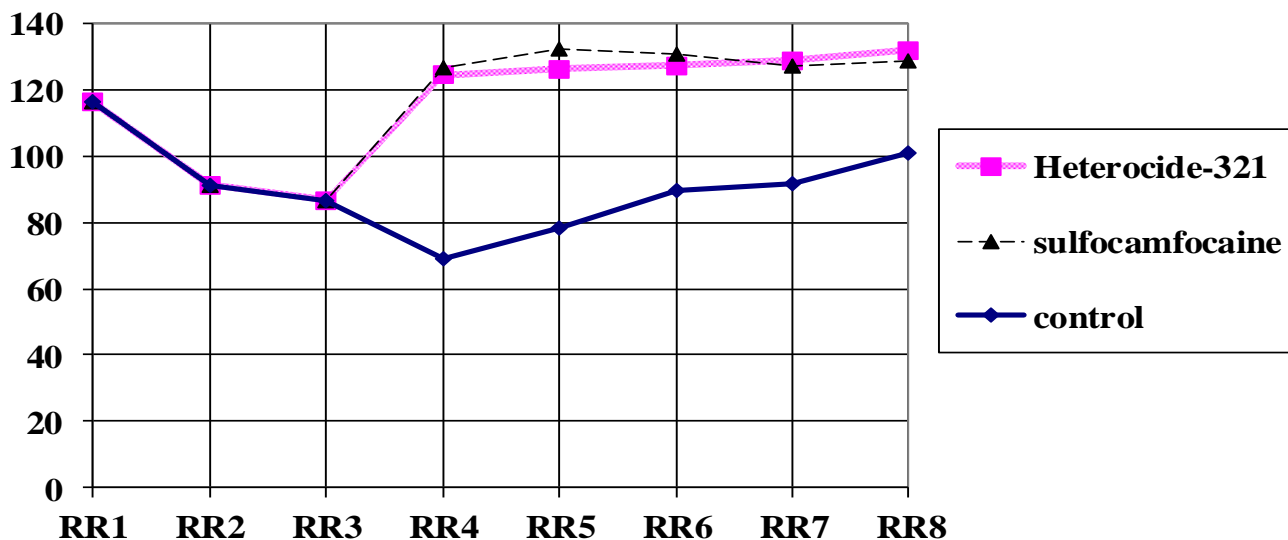


Diagram 1. RR change in the different phases of sleep anesthesia

Conclusions:

1. The studies established the dynamics of RR/min on the background of ketamine anesthesia for Heterocide -321 and sulfokamfokaine (reference drug).
2. One of the mechanisms of antinarcosis action of Heterocide-321 is the activation of the respiratory center of the central nervous system.
3. A sulfur- and nitrogen-containing heterocyclic groups are promising enough to use them for a search for the original analeptic drugs.

**PHARMACOLOGICAL EFFECTS' SPECTRUM
OF A PROMISING ANTICONVULSANT –
1-(4-METHOXYPHENYL)-5-{2-[4-(4-METHOXYPHENYL)PIPERAZINE-1-
YL]-2-OXOETHYL}-1,5-DIHYDRO-4H-PYRAZOLO[3,4-D]PYRIDINE-4-ON**

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Introduction. 1-(4-Methoxyphenyl)-5-{2-[4-(4-methoxyphenyl)piperazine-1-yl]-2-oxoethyl}-1,5-dihydro-4H-pyrazolo[3,4-D]pyridine-4-on (laboratory code - compound 78553) was synthesized by assoc. prof. G.I. Severina under the direction of prof. V.A. Georgiyants in National Pharmacy University. During preclinical studies this compound revealed strong anticonvulsant properties among 35 pyrazolo[3,4-D]pyridine-4-one derivatives, and high efficiency in several experimental models of seizures with different mechanisms of paroxysmal. These results gave a reason to consider this compound as leader. Given the fact that epilepsy is characterized not only by the complexity of treatment and a high frequency of drug-resistant cases, but the probability of personality changes and mental disorders in the form of anxiety, depression, anxiety, memory loss, etc., it is useful to evaluate the ability of leader compound to influence these disorders. In addition, according to the PASS prediction compound 78553 has a high probability to demonstrate an anti-inflammatory and analgesic effects. The presence of these additional properties is important in the prospects of introducing compound 78553 in clinical practice as antiepileptic drug.

Aim. Find out the existence of 1-(4-methoxyphenyl)-5-{2-[4-(4-methoxyphenyl)piperazine-1-yl]-2-oxoethyl}-1,5-dihydro-4H-pyrazolo[3,4-D]pyridine-4-on's influence on behavioral reactions, anxiety, depression, animal's memory, muscle tone and coordination, and the presence of anti-inflammatory and analgesic effects in the experiment.

Materials and methods. Studies were conducted in albino mature male mice. The compound 78553 was administered intragastric at the most effective anticonvulsant dose of 200 mg/kg 30 minutes before the experiments. To determine the effect on behavior and emotional state were elected the following tests: open-field test, elevated plus-maze test, immobilization test. Antiamnesic properties of the compound were studied in passive avoidance test in anterograde amnesia model induced by intraperitoneal injection of 1.5 mg/kg scopolamine hydrochloride. The effect on muscle tone and coordination was evaluated in a rota rod test (10 rotates/min). Anti-inflammatory properties – in the carrageenin-induced paw edema

model and analgesic – in a models of somatic (tail-flick test) and visceral (acetic acid-induced writhing) pain. All experiments were conducted in accordance with current guidelines. The results were processed statistically using STATISTICA® 13.0.

Results and discussion. Administration of compound 78553 caused decrease in motor activity by 60%, research activity - by 65% that generally reduced the total amount of all types of activity by 62% in open-field test. Reduction of locomotion indicates the prevalence of inhibitory over excitatory processes in the central nervous system. There was also a trend towards the emotion reduction that in total indicates the sedative properties of the test compound. In immobilization test compound 78553 didn't affect significantly the depressive behavior, there was only a tendency to increase the latent period of the first hovering at 40%. The results of elevated plus-maze test demonstrate a significant decrease in the number of visits dark parts of maze by 30% and vegetative response's markers of emotional reactions in 5.5 times, that indicating a decrease in anxiety animals. Compound 7553 reduced the effect of scopolamine in passive avoidance test, significantly increased the latent period of entry to the dark chamber to the level of intact mice and increased the number of trained mice. Anti-amnesic activity was 110%. Therefore, the passive avoidance test showed powerful positive effect of test compound on memory. There was not significant difference between groups' results of test compound and control in rota rod test, therefore compound 78553 has not myorelaxation and does not affect coordination of movement. Model of carrageenin-induced paw edema demonstrated that the average increase of paw mass in test compound's group was 1.5-fold lower than in control. Anti-inflammatory activity was 41%, which is rather significant, as far as the significant level is considered to be at least 20%. Increase of latent period of tail flicking out after 30 minutes in model of somatic pain indicated significant analgesic effect of compound 78553, that persisted for 2.5 hours of observation. The model of visceral pain also confirmed the presence of analgesic effect: observed a significant reduction of acetic writhing almost in 2-fold.

Conclusions. Promising anticonvulsant 1-(4-methoxyphenyl)-5-{2-[4-(4-methoxyphenyl)piperazine-1-yl]-2-oxoethyl}-1,5-dihydro-4H-pyrazolo[3,4-D]pyridine-4-on has tolerable profile of pharmacological properties, that characterized by sedative effect, weak anxiolytic effect without muscle relaxation, favorable effect on memory, as well as anti-inflammatory and analgesic effects.

FUNCTIONAL STATE OF THE NERVOUS SYSTEM IN STUDENTS

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Introduction. The nervous system is the main regulator of all body functions. Violation at any level of the nervous system leads to the development of various types of pathologies. One of the most common forms of pathology of the nervous system are neuroses. According to WHO, the incidence of neurosis in the world over the past 65 years has increased 24-fold and reaches 20-30%. Neuroses are a "disease of civilization". The widespread prevalence of neuroses is associated with the growing urbanization of the population, information overload, a decrease in the share of manual labor in the life of modern man, the impact on it of unfavorable social and domestic factors, numerous psychotraumatic situations. In connection with the situation in the east of Ukraine, economic changes, this issue is urgent, since the people living there, the returning military and the majority of the population are under constant stress. According to statistics, 50% of the population of our country, including students, suffer from borderline conditions (neuroses of all kinds, which include severe stress and depression). But only a third of them turn to doctors for help.

Aim. To study the functional state of the nervous system in the 2nd year students of the Faculty of Pharmacy

Materials and methods. The test for determining the level of anxiety among students.

Results and discussion. 70 students of 2 courses of the pharmaceutical faculty took part in the testing, 58 of them girls and 12 boys. Among the students surveyed, 54% (38 students) are constantly experiencing anxiety. 53% of students are in a state of tension. 96% are fatigued, irritability is observed in 90%. "Com in the throat" is experienced by 62% of students, a low mood is observed in 92%, 59% of students experience fears and grievances. To the specialists (psychologist or doctor), only 4 students from 70 applied, which amounted to 5.7%. Thus, most of the students (girls) interviewed are in a state of heightened anxiety. This indicates the borderline state of the nervous system of 2nd year students. The girls are characterized by a hysterical syndrome, the youth manifests more pronounced astheno-neurotic syndrome. The recommendations for students on the prevention and regulation of mental states were made.

PNEUMOCONIOSIS: MODERN APPROACH TO THE PROBLEM

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Introduction. In 1866 F.A. Zenker introduced a term «pneumoconiosis» (from Gr. pneumon-lung, conia – dust) it is chronic lung disease which is caused by continuous breathing in industrial dust pneumoconiosis are among the most wide spread professional diseases. Pneumoconiosis is most likely diagnosed with the coal workers of asbestos, machine-building, glass and some other industries. Foreign authors reveal some correlation between the disease and working experience: if working experience is less than 20 years, silicosis appears in 3 % of cases, if the experience in approximately 25 years, the disease will be detected amount 12 % and among people with the working experience of 30 years and more, the disease is to trouble 17 % of cases.

Because of that **the aim of our work** was analyses published data and a studying the importance of presented nosological unity in the field of professional pathology.

Materials and methods. Studying all possible published resources including the internet resources.

Results and their discussion. Busing on the published data it has been detected that according to MKB (1976) there were distinguished 6 groups of pneumoconiosis by etiological principle: silicosis, silicatosi, heavy metal conioses, carboconioses, pneumoconiosis caused by mixed dust. Pathogenesis of the development of the most widespread out of all the pneumoconiosis is silicosis caused by breathing in dust (which contains silica), its entering airways and directly teeth ridge. Dust particles are captured with teeth ridge macrophage which enables fibroblasts with excessive collagen formed and pneumoconiosis development. Thus, a nodal bilateral process is developing. A main part in pathogenesis is played by in immunity system problems: a lot of macrophages dies, enabling T-killers which contribute to fibrosis development. The clinical symptoms of pneumoconiosis are non-common: dyspnea, coughing, chest ache, there is no changes in blood analysis. That is why WHO recommends the workers who experience dust effect to have X-ray examination aiming at early diagnosis of pathological lung process. There is no specific therapy for pneumoconiosis. The disease prevention is first and foremost connected with working conditions improvement, technical modernization of industrial processes to reduce dust concentration in working area, improvement of means of individual protection of respiratory system.

Conclusions. The published data analysis has shown the relevancy of the problem of pneumoconiosis development among professional diseases.

OFF-LABEL USE OF DRUGS IN CHILDREN

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Introduction. Off-label use style preparations are defined as the use of drugs not according to indications for use, in another dosage form, dosage regimen, for the population, or according to the application parameters not mentioned in the approved instruction. In the United States, Europe and Australia, a high proportion of prescription off-label drugs have been identified: up to 72% of all prescriptions and 93% of them in pediatric practice.

The main reason is that pharmaceutical companies consider children as a market that brings only small financial benefit. For example, according to statistics, pulmonary hypertension has approximately 1.9 per 1000 children born annually, and the prevalence of pulmonary arterial hypertension is 15 cases per 1 million people. Such diseases are called orphans and require the development of special preparations that are uneconomical to produce, if consumers - less than 1% of the population. Nevertheless, the effectiveness of prescribing specific therapy for pulmonary hypertension in children is such that in 95% of cases the survival rate exceeds the five-year threshold.

Pediatricians are still often forced to use drugs whose efficacy and safety have been evaluated in adult studies, and the course of many diseases (like the result of the same intervention) in an adult and a child can be dramatically different. This can dramatically increase the risk of developing a toxic effect of the drug.

Aim. Study of the literature data on the prospects of the preclinical and clinical studies of off-label use of drugs in pediatric practice.

Materials and methods. It has been carried out the analysis of the review of sources, literatures relative to off-label use of the following prescriptions in pediatric practice: Omalizumab, Paracetamol, Rituximab, Octreotide, Sildenafil, Interferon-beta.

Results and discussion. Traditional indications for treatment with Omalizumab in pediatric patients are confined. There are moderate to-severe uncontrolled allergic asthma and chronic spontaneous urticaria. Any other prescription can only be off-label. Data available from clinical trials conducted in children suggest that Omalizumab is clinically effective and generally well tolerated to use in other IgE-mediated disorders, such as allergic rhinitis, food

allergy, and anaphylaxis. (Licari A., 2014).

Closure of the patent ductus arteriosus (the ductus Botalli), after off-label prescribing of oral Paracetamol (15 mg/kg per dose every 6 hours), was achieved within 48 hours in all infants who received the drug. No toxicity was observed (Hammerman C., 2011).

Pooled data from the four studies proving the efficacy of Rituximab in combination therapy with corticosteroids and/or calcium neurin inhibitors for the treatment of nephrotic syndrome (Maratea D., 2016).

The diagnosis most commonly associated with Octreotide use were chylothorax (50%), pleural effusion (32%), and hypoglycemia (22%). Hypotension requiring pressors was the most common clinical adverse event that occurred during exposure to Octreotide.

Sildenafil, which is prescribed to men with erectile dysfunction, is also a drug used to treat pulmonary arterial hypertension in children as off-label use style preparation. However, according to the recommendations of the USFDA, caution should be exercised with regard to its long-term use at higher doses (Dhariwal AK, 2015).

Interferon beta is used to treat viral infections. The nine-month research confirmed efficiency of this medicine in treatment of pediatric multiple sclerosis due to the absence of short-term complications and safety. Patients injected with a half dose interferon beta, gradually increasing to the full therapeutic adult dose. Nine patients (69.2%) had no relapses, and the remaining four suffered only one relapse (Basiri K., 2012).

Conclusions. Thus, prescribing off-label use style preparations remains an important health problem in infants, children and adolescents, since the vast majority of drugs have not been sufficiently studied by pharmaceutical companies with no information in the instruction for use. Therefore, studying and prescribing off-label use style preparations is a promising direction in the therapy of many diseases.

DRUGS CONTRAINDICATED IN THE III TRIMESTER OF PREGNANCY

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The degree of noci-influence of a drug during pregnancy is primarily defined with the gestational age, drug dose, individual sensitivity of pregnant woman's organism to a drug, as well as with duration of drug use. The third trimester of your pregnancy is from week 29 to week 40. III trimester of pregnancy is characterized by the most intensive growth of the fetus and the increase in the functional activity of its organs and systems.

On average, near 5% of fetal development defects are stipulated with drug therapy during pregnancy. Most guidelines on pharmacology, pharmacotherapy and obstetrics contain information on drugs contraindicated in the 1st and 2nd trimesters of pregnancy.

Work objective: analysis of data on drugs contraindicated in the 3rd trimester of pregnancy.

Research methods. The analysis of market of pharmaceutical drugs used for pathology treatment in women during pregnancy was conducted, the analysis of side effects from drugs in this patient population.

Research results. The 3rd trimester of pregnancy starts from the 27th week. During this term most nonsteroidal anti-inflammatory drugs (NSAIDs) are contraindicated due to risk of premature closing of arterial duct.

Beta-adrenergic blocking agents – propranolol, timolol, metoprolol, atenolol – used during the 3rd trimester cause neonatal hypoglycemia.

Besides, nonselective beta-adrenergic blocking agents increase uterine tonus and may cause premature labor. Antibiotic drug rifampicine in the 3rd trimester of pregnancy may cause postnatal hemorrhage in mother and fetus.

Tetracyclines cumulate in fetus bones and dental germs affecting their mineralization. Aminoglycosides cause high risks of complications in fetus kidneys and inner ear, and may cause newborn deafness.

Chloramphenicol inhibits fetus bone marrow and affects blood cell fission, especially in late pregnancy.

Summary. Instructions on drug administration must specify contraindications to use during pregnancy as per gestational age, as drugs allowed in one term may be strictly prohibited in another one.

EXPERIMENTAL STUDY OF FRIGOPROTECTIVE PROPERTIES OF DIETARY SUPPLEMENTS "GLUCOSAMINE C BHFZ"

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Introduction. Treatment and prevention of acute cold trauma is one of the most important problems of modern medicine and pharmacy both in peacetime and in wartime, and requires in-depth study of the mechanisms of adaptation to low temperatures. Cold trauma refers to serious bodily injury is an important cause of disability

In recent years, there is a clear trend towards increasing the number of injured victims of the cold in temperate regions. Every year in Ukraine recorded more than 12 000 such cases in Russia, more than 20000. Most of the victims of the cold need hospital treatment, mortality exceeding 10%.

Hypoxia of the brain and other organs, disorders of the central nervous, cardiovascular, respiratory, excretory, endocrine system, gastrointestinal tract and skin involved in the pathogenesis of acute cold trauma. The nature of these violations makes the complexity of treatment and the total cooling effects.

Thus, the search for new drugs with frigoprotective properties is the actual problem of modern pharmacology. Previous studies have found that glucosamine Hydrochloride and ascorbic acid have frigoprotective action. Glucosamine is an important component of biological membranes, he found in significant quantities in the brain, kidneys, liver and skin, has rich pharmacodynamics, at first, anti-inflammatory and chondroprotective properties. Vitamin C (ascorbic acid) has metabolic action, is involved in the regulation of redox processes, carbohydrate metabolism, blood coagulation, tissue regeneration, increases resistance to infection, reduces vascular permeability. Has antiplatelet and distinct antioxidant properties, regulate immunological reactions promotes phagocytosis, increases resistance to infections.

Aim. The aim of this work is the experimental study of the influence of dietary supplements "Glucosamine C BHFZ" which contains glucosamine hydrochloride and ascorbic acid, and its components on life expectancy of mice with acute general cooling.

Materials and methods. For the modeling of cold injury mice were placed in individual plastic canisters size $8 \times 8 \times 15$ cm, which do not restrict access of air, to the freezer «Nord Inter-300" at -18°C .

«Glucosamine C BHFZ» (82.5 mg/kg) and comparisons glucosamine hydrochloride (50 mg/kg) and ascorbic acid (4 mg/kg) were administered

intragastrically in preventive regime before 30 minutes to reproduce the model of pathology. The animals in the control group injected with 0.9% solution of NaCl. The indicator of frigoprotective action of these substances was the life of mice in acute general cooling.

Criteria Student's using for statistical analysis of the results in the case of normal distribution or nonparametric criterion W White - in his absence. The difference was considered statistically significant at $p < 0.05$.

Results and discussion. Determined that "Glucosamine C BHFZ", at a dose of 82.5 mg/kg significantly increased the life of the animals by 33% compared to the control group pathology. Under the influence of glucosamine hydrochloride 50 mg/kg of mice on a background of acute cold injury significantly prolonged by 33.5%, compared to the control disorders. Ascorbic acid at a dose of 4 mg/kg in animals with acute cold injury significantly increased life time by 20.2% compared to the control group pathology.

The results indicate about frigoprotective action of dietary supplement "Glucosamine C BHFZ" and glucosamine hydrochloride, the severity of which are significantly dominated by ascorbic acid. Frigoprotective effect of these substances can explain their anti-inflammatory, cerebroprotective properties that are associated with exposure to the neurotransmitter and metabolic processes in the brain, improving its blood supply, a possible positive effect on systemic blood circulation, microcirculation and energy metabolism and so on. In response to the stress involved in almost all body systems, but more stress associated with the chain of hypothalamic-pituitary-adrenal and immune system. Vitamin C plays a crucial role in the synthesis of steroids, which are important in the mechanism of resistance when cold injury. Thus, the adrenal glands of dead people from the general cooling of ascorbic acid completely absent. Vitamin C is also important for the formation of norepinephrine - the mediator of the sympathetic nervous system activation which is involved in stress reactions, it is cold injury. These aspects of the mechanism of action of ascorbic acid explain its protective effect we found for acute general cooling.

Conclusions. Dietary supplement "Glucosamine C BHFZ" at a dose of 82 mg/kg has expressive frigoprotective effect, increasing the life of mice against a background of acute general cooling by 33%. Protective action of dietary supplements "Glucosamine C BHFZ" due mainly effect of glucosamine hydrochloride, which at a dose of 50 mg/kg increased the life of animals by 33,5%. Ascorbic acid has moderate frigoprotective effect. The results obtained experimentally substantiate the expediency of dietary supplements "Glucosamine BHFZ C" in the treatment of acute cold injury.

**CHARACTERISTIC OF ABSORPTION AND METABOLISM
OF Fe, Zn, Ca IONS, METHIONINE, VITAMIN B₁₂
UNDER DIFFERENT TYPES OF VEGETARIAN NUTRITION**

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Introduction. What must feel true vegetarians and vegans, which do not eat food animal origin? Is justify for the organism this victim? Vegetarianism stir up many questions and disputes

Aim. To study the peculiarities of the metabolism of Fe, Zn, Ca ions, methionine, vitamin B₁₂ under different types of vegetarian nutrition using the analysis of modern literature.

Results and discussion. The iron exists in two forms necessary for our organism: heme and non-heme. Most of all heme iron contains in meat-and-milk products and assimilates for 15-35 %. Non-heme iron is mainly assimilated from vegetable products. It absorbed by our organism for 5-20%, that depends on the presence of vitamin C. Features of metabolism of Zinc is low adsorption from vegetable products. The reason is the formation of insoluble compounds with phytic acid, which is present in the main products of vegans – cereal, bean nuts, seeds and some root crops. Calcium is better absorbed from milk food, which rich by lactose. Foods containing oxalates (tea, herbs), salts of phytic acid (legumes, grains, nuts) and food with a large amount of cellulose reduces the absorption of calcium. Also absorption of calcium is affected by the protein content in the diet: the high protein content in the food contributes to absorption of calcium by 10% more than low protein content. Animals' proteins consist of essential amino acids, so they are qualitative and full-fledged source of energy. Soy is the most full in amino acid composition, but even it hasn't got an essential amino acid – methionine, which is found in meat products. The alternative can be eggs and milk.

The Vitamin B₁₂ take part in hemopoiesis, formation of the myelin sheath of nerve fibers, prevention of adipose degeneration of the liver, kidneys, spleen, heart and other organs and provides the normal functioning of the body. In plant products B₁₂ contains in very small amounts, which leads to the development of hypovitaminosis. In milk its amount is 1.95 µg/100 g.

Conclusion. Features of absorption and metabolism of Fe, Zn, Ca ions, methionine and vitamin B₁₂ in rigid vegetarian diet leads to the development of their deficit. The most favorable for the assimilation and metabolism this substances is the lacto-ovo-veggie type of nutrition.

CONTEMPORARY ASPECTS OF THE VERTEBRAL PAIN SYNDROMES TREATMENT

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Introduction. Myofascial dysfunction is one of the aspects of vertebral pain syndromes, the severity of which, in most cases, aggravates pain. Using the myorelaxants in the vertebral pain syndromes treatment may increase the efficacy of the treatment.

Purpose: to study the efficacy of the thiocolchicoside in the complex treatment of the vertebral pain syndromes.

Material and methods. Were investigated 40 patients with vertebral pain syndromes (lumboischialgia), at the age from 20 till 40 years old, which were treated at the Center of the medical and ecological investigations. All patients were divided into 2 groups: 1 – 20 people, which obtained in the complex treatment of non-steroid anti-inflammatory drug and vitamins of group B thiocolchicoside; 2- 20 people, which obtained only non-steroid anti-inflammatory drug and vitamins of group B. Were used clinical-neurological, instrumental methods of investigation, pain scales, Shober test. All data were statistically proceeded.

Results. Before treatment, in all patients with X-ray and MRI examination was founded osteochondrosis of the lumbar spine, disc protrusion. All patients has had the myotonic and pain syndromes. By the Shober's test before the treatment 3 patients has had significant disorders, in 32 patients were observed moderate disorders, 5 patients has had insignificant disorders. All patients obtained the treatment during 5 days. After treatment complete reduction of pain was observed in 12 patients of the first group and 7 patients of the second group; significant improvement occurred in 8 patients of the first group and 7 patients of the second group; a slight improvement was observed in 1 patient of the first group and 5 patients of the second group. Improvement of the myofascial dysfunction was observed only in the patients of the first group. Complete reduction of muscular-tonic syndrome was observed in 16 patients; significant improvement occurred in 4 patients; slight improvement occurred in 1 patient of the first group. Against the background of the therapy there was a positive trend that manifested itself in increasing the mobility of the spine and a significant increase in performance tests Schober

Conclusions. Thus, using the thiocolchicoside in the complex treatment of the vertebral pain syndromes helps to decrease the intensity of the pain and relief the muscle tone in the maximal short time.

INDOLINOREN IMPACT ON URINARY FUNCTION OF KIDNEYS WITH TERMS OF ALDOSTERONE RECEPTOR BLOCKADE

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Introduction. The presence of various pharmacological properties of compounds that contain 2-oxoindolin heterocyclic system are established, including diuretic effect. Available data show that diuretic effect of 2-oxoindolin derivatives can be expressed through the inhibition of aldosterone secretion and improved renal blood flow.

The aim of our study was to investigate the impact of new original 2-oxoindolin named “indolinoren” on kidney urinary function under the condition of aldosterone receptor blockade.

Materials and methods. Reduction of mineralocorticoid activity was simulated by injecting potassium-sparing diuretics spironolactone 20 mg/kg, which expresses anti-aldosterone activity. The investigated substance indolinoren was administered intragastric in average effective dose. The experiments were conducted on nonlinear white rats weighing 180-220 g. Experimental animals were separated into 4 groups: I group - intact, which was administered isotonic NaCl; group II - rats, which were administered indolinoren; III-animals, which were administered spironolactone; group IV - rats, which were simultaneously administered indolinoren and spironolactone. All animals were taken out of the experiment 2 hours after the study beginning. Diuresis, excretion of sodium and potassium were analysed.

Results and discussion. It was found that indolinoren increases urine output in 2.8 times and spironolactone in 1.5 times in comparison with intact group ($p < 0.05$). Concomitant use of indolinoren and spironolactone increased diuresis in 4 times, indicating the presence of diuretic activity inherent to indolinoren with condition of aldosterone receptor blockade. There is an increase of sodium excretion in the background administration of indolinoren in 3.6 times in comparison to intact group, and 2 times in comparison to spironolactone. This indicates a positive correlation between the diuretic and natriuretic activity of indolinoren. Excretion of potassium in urine has doubled after indolinoren administration in comparison to the intact group. The increase of potassium clearance in urine after indolinoren administration compared to spironolactone (in 1.42 times), testifies that indolinoren is less potent than aldosterone receptor blockers on potassium clearance.

Conclusion. Indolinoren shows diuretic activity under conditions of aldosterone receptor blockade.

THE METABOLIC AND RENAL EFFECTS OF GOUTWEED PREPARATIONS AND METFORMIN ON THE MODEL OF DYSLIPIDEMIA

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Introduction. Much efforts are directed towards the improvement of the therapy of metabolic syndrome and type 2 diabetes. Dyslipidemia is an important link of their pathogenesis and thus an important target of therapy. Combined use of the herbal medicines and conventional drugs is of current interest. Our research focuses on the preparations obtained from goutweed (*Aegopodium podagraria* L., GW). This perennial herb of the Apiaceae family has been used in folk medicine for a long time and consumed as vegetable. GW tincture renders antidiabetic activity on the several models, while GW extract is effective in alloxan-induced diabetic mice. It also has been shown that the tincture is able to increase the efficacy of metformin.

Aim. The aim of this work is to estimate efficacy of *Aegopodium podagraria* L. tincture and the extract, as well as their combinations with metformin, in animals with the primary disorders of lipid metabolism.

Materials and methods. Combined use of atherogenic diet and protamine sulfate administration was applied. GW extract and the tincture were used at doses effective in previous studies, per se or combined with metformin at a low dose. Lipid metabolism values were determined in liver and blood plasma. Uricemia was measured. Since hyperlipidemia as well as protamine sulfate are able to induce nephrotoxicity, the status of the excretory renal function was determined under the conditions of water loading.

Results and discussion. Previously it has been shown that the tincture exerts a permissive effect on metformin normoglycemic activity but such phenomena were not observed in regard to lipid exchange. All the drugs studied were able to partially normalize the lipid composition of the liver still the lipid metabolism values in blood plasma remained unchanged. Uricemia was significantly decreased in animals treated with the tincture per se. The combination of the tincture with metformin appeared to exert an antiproteinuric effect which was not seen in other experimental groups.

Conclusion. Combined use of GW tincture and metformin in dyslipidemic animals does not eliminate the positive effects of these drugs on lipid metabolism, and no signs of toxicity enhancement are observed. Antiproteinuric effect is an additional advantage of GW tincture and metformin combination.

MODERN METHODS OF TREATMENT OF ALLERGIC DISEASES

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Introduction. Allergic diseases are attracting closer attention of doctors of different specialties from year to year. Despite of the fact that allergic diseases have been known for more than 2500 years, the problems related with the diagnostic questions, therapy and prevention allergopathology remain highly relevant in a modern world. Allergy treatment is a rather difficult process but it amenable to complete healing. Nowadays there are a lot of methods among which are: SIT-therapy, plasmapheresis, quantum method, autolympocytotherapy and allergen-specific immunotherapy. **The aim of the work** was studying and analysis of literature sources for identification of the most efficient methods of allergy treatment.

Materials and methods. Such methods as: theoretical analysis, the study of scientific materials and periodicals on this problem have been used while working on this theme.

Results and their discussion. While studying the literary sources it has been found that each method has its specifics and is used only in a specific case. SIT - therapy – is one of the main methods of treatment of allergy, bronchial asthma attacks. The essence of the therapy is that the organism gradually accustom to the action of the main allergen, which provokes attacks.

Plasmapheresis principle is based on the fact that a portion of plasma is removed from the body replacing it with special plasma substituting solution.

Quantum method is intravenous laser blood cleaning (ILBC). Treatment allergy method ILBC of any its forms and kinds is expedient on any stage. The procedure consists of intravenous special optical – fiber catheter inserting, through which laser impulse with a certain set of specified characteristics and parameters gets into blood and has a detrimental effect on the majority of allergens.

Autolympocytotherapy is the most effective method in allergy treatment, the essence of which is the progressive introduction of the patient's own blood lymphocytes pretreated with a special method. Autolympocytotherapy practically of any origin: bronchial asthma, a pollen disease, atopic dermatitis, cold urticaria, angioedema. Allergen-specific immunotherapy (ASIT) – is the introduction of increasing doses of the allergen to which the patient revealed hypersensitivity and which is responsible for the clinical manifestations of the disease.

Conclusions. In the detection event of the patient's symptoms of allergic disease it is necessary to conduct thorough allegro-diagnostics and their therapy.

CARBOXYTHERAPY

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Introduction. About a third of the world's population suffers from various disorders in the locomotor system. Osteoarthritis is diagnosed in 20-45% of the population all over the world: every hundredth inhabitant of the planet, mostly older women (Statistics about Arthritis, 2014). Among the drugs chosen for the treatment of these diseases, nonsteroidal anti-inflammatory drugs (NSAIDs) and chondroprotectors hold a leading position. But, the traditional treatment of diseases of the joints is not always effective and safe. Medicine is the most dynamic area of science. Research in the field of medicine, pharmacy and aesthetic medicine opens new directions in the treatment of pathologies of various origins. The main task of medicine is to develop possible treatment technologies of locomotor system pathologies without surgical intervention and to limit medical treatment only to therapeutic remedies. Carboxytherapy is a promising direction – it is an effective aid for rehabilitation processes which are associated with restoration of affected cartilage and bone, eliminating pain and degenerative syndromes.

Aim. To investigate the current status and benefits of treatment with carboxytherapy in literary data. **Materials and methods.** Information on the application of carboxytherapy in medicine and aesthetic medicine was researched.

Results and discussion. Carboxytherapy is an innovative, affordable and convenient therapy for the patient, which is certified in Europe; it consists of safe invasive and non-invasive methods of injecting CO₂ that does not require an anesthetic. Carboxytherapy is effective both in the first and second phase of the pathological process (desynchronization and functional disorders), affecting all locomotor system segments' parts: muscles, ligaments, bones, joints. Carboxytherapy is used, primarily for diseases of the joints, which are weakly receptive to therapy (NSAIDs, chondroprotectors, rehabilitation exercises, physiotherapy, balneotherapy). In carboxytherapy, gas is injected into the patient's skin subdermally and intramuscularly. Excess of carbon dioxide in the tissue (hypercapnia) provides cells with oxygen. Approximately 70% of carbon dioxide in the body reacts with plasma, forming carbonic acid. And ultimately, bicarbonate dissolves in blood plasma. These reactions cause the blood's pH-balance to reduce the release of oxygen in the tissue cells, increasing capillary circulation. This, in turn, provokes the Bohr effect (Oxyhemoglobin curve) that shows how easy the hemoglobin gets and releases the oxygen molecules in the fluid that surrounds it. The increased concentration of carbon dioxide results in less ability of oxygen and hemoglobin to conjugate. Furthermore, there are growth factors, such as local angiogenic growth factors, that cause the circulation, stimulate lipolysis and skin regeneration.

Conclusions. Having analyzed the studied material, we can conclude that carboxytherapy is a very promising and modern direction in medical practice.

STUDYING THE FEATURES OF HELMINTHOTHERAPY

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Introduction. Is the use of helminths for medicinal purposes. This method is experimental. At the present time, clinical trials of the effectiveness of helminthotherapy in the treatment of autoimmune diseases are being conducted. Mechanisms of development of allergic reactions, immunodeficiency and autoimmune diseases are not fully understood, however, an important role in this process is played by disruptions in the work of regulatory T-lymphocytes, controlling the strength and duration of the immune response.

Aim. The purpose of the study was to study the specific features of helminthotherapy as an experimental method for treating autoimmune diseases.

Materials and methods. An alternative treatment method refers to a «hygienic» theory, according to which the origin of autoimmune diseases is due to the lack of involvement of the immune system in the fight against foreign infectious agents, why she starts to attack her own tissues. The hypothesis has been experimentally confirmed: mice exposed to intestinal bacteria, were protected from the development of type 1 diabetes, and the spread in the helminth population favorably influences the evolution of inflammatory mediators associated with Crohn's disease, ulcerative colitis and celiac disease.

Results and discussion. Analysis of the secretion secreted by *Ancylostoma caninum*, *Ancylostoma ceylanicum* and *Brugia malayi* showed the presence of specific proteins in it, and this AcK1 and BmK1, which can weaken the activity of immunity and reduce the risk of developing a number of autoimmune diseases. In experimental studies, widespread use of *Ancylostoma* and *Trichocephalus suis* for the purpose of the efficacy of helminth therapy for multiple sclerosis, allergies, celiac disease, Crohn's disease and ulcerative colitis. Helminthotherapy requires strict control. Therefore, the helminths used to infect the patient must be: not deadly in the therapeutic dosage; can not reproduce themselves in the human body; not to be carriers of other parasites, bacteria and viruses; not be transferred to other people; if necessary, «therapeutic» helminths should be easily expelled from the body. While there is only one patented drug containing larvae of helminths. It is called TSO, this is from the abbreviated name of worm-nematode larvae (*Trichuris suis ova*). The technology of its production was developed by German company Ovamed.

Conclusions. In this way, the isolated helminth peptides will allow to create probiotic preparations in the future for the treatment of autoimmune diseases.

CLINICAL AND PHARMACEUTICAL APPROACHES TO OPTIMIZATION IN FIBROMYALGIA TREATMENT

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Introduction. Fibromyalgia (FM) is a common disease that is difficult to diagnosis and treatment. Despite the availability of pharmacological approaches, based on current understanding of fibromyalgia pain, treatment has limited effectiveness and therapy aims to minimize symptoms. Pregabalin and serotonin reuptake inhibitors (duloxetine, milnacipran) have a leading role in management FM. The frequencies of discontinuation due to adverse events develop the same for all three drugs. Therefore, it is advisable to develop combination drug with one or more drug-free treatments, providing a potentiation of the main pharmacological effects of the drug and reduce the frequency of adverse reactions.

Aim. Evaluation of the advantages of combined fibromyalgia's treatment through the use injection of CO₂ and pregabalin.

Results and discussion. The therapeutic properties of the carbon dioxide are used in medicine for several centuries. Participation of carbon dioxide as a natural regulator of many systems: respiratory, cardiovascular, excretory, hematopoietic, immune, hormonal and so provides wide range effects of carboxytherapy - procedure subcutaneous injections of medical grade CO₂. The additional flow of carbon dioxide in the human body leads to intense dissociation of carbonic acid (H₂CO₃) in H⁺ and HCO₃⁻ ions and enhanced formation of calcium bicarbonate Ca (HCO₃)₂, sodium bicarbonate (NaHCO₃) and potassium bicarbonate (KHCO₃). As a result, the pH shifts in the alkaline side leads to analgesic effect. At the same time there is local vasodilation and accelerates circulation, relaxation of muscle fibers and improving trophic CO₂ at the injection site. During the years of practice using carboxytherapy there were no serious side effects.

Conclusions. FM symptoms can negatively affect quality of life. Management this disease should include a combination of pharmacological methods of its correction. Carboxytherapy procedure can be used in combination therapy fibromyalgia.

STUDY OF ANXIOLYTIC ACTIVITY OF THE NEW VAGINAL PHYTOGEL IN SPAYED FEMALE RATS

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Introduction. During menopause 31% of women with severe estrogen deficiency have psychoemotional abnormalities: irritability, emotional lability, obsessive fear, anxiety, etc.

The **aim** of this research was examination of psychotropic properties of a new vaginal gel containing hops extract (HE) and ascorbic acid (AA) in rats with hypoestrogenic state.

Materials and methods. Studies were performed with spayed female rats. On the 35th day after removal of the ovaries animals were intravaginally injected with HE+AA gel at a dose 0.06 mg/kg 1 time per day during 28 days. Behavioural reactions in them were studied with the test "elevated plus maze". The animal was placed in the center of the maze and its movement was being registered for 5 minutes. Anxiolytic properties of HE+AA gel were estimated by the latent period of entry into dark sleeve, the length of stay in light sleeves, the length of stay in dark sleeves and the number of transitions. The reference drug was vaginal suppositories "Ovestin", containing estriol in a dose of 0.03 mg/kg.

Results and discussion. It has shown that the locomotor activity was decreased in the females of the control pathology group and anxiety was increased (the time spent in the light arm decreased, the time spent in the dark arm decreased, and the number of transitions between the arms was 3 times less than in the intact control group). The animals that received the reference drug, there it was increase in locomotor activity and decrease anxiety, which corresponded to the factors of a group of intact rats. After treatment with the studied gel, the time of the latent period in the dark arm was statistically significantly increased in comparison with these factors in the rats of the control pathology group. The time spent in the light arm was increased on 75%, and the number of transitions between the arms was 1.9 times greater than the rats of the control pathology group.

Conclusions. Obtained results allow to do a conclude that the vaginal phyto gel containing hops extract and ascorbic acid has a moderate anxiolytic effect in spayed female rats.

**CARBOXYTHERAPY – A PROMISING METHOD
FOR THERAPY OF DEGENERATIVE CHANGES
IN THE SUBCUTANEOUS TISSUE AND THE DERMIS (CELLULITE)**

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Introduction. Over 95% of women of mature age have cellulite, which is directly related to the level of female sex hormones - estrogens. Cellulite is a kind of hypertrophy of adipose tissue, which is the result of the process of fat deposition due to the imbalance between its synthesis and decay, which is accompanied by the accumulation of water, toxic substances, changes in the vascular wall, damage to surrounding tissue. Factors that can cause cellulite are: exogenous (unhealthy diet, insufficient physical activity, bad habits) and endogenous (diseases of the endocrine, immune, cardiovascular, etc.). A variety of precipitating causes in the future may become more and more.

Aim. The pharmacological rationale for the use of carboxytherapy for the treatment of cellulite.

Results and discussion. Cellulite treatment consists of two problems: cleansing tissues from metabolic products of cells and restore normal blood and lymph flow in them; the destruction and removal from the body of excess fat. These tasks may work for carboxytherapy. CO₂ therapy-beauty treatments for face and body, which represent intradermal or subcutaneous injection of gaseous carbon dioxide (CO₂) for therapeutic purposes. Fat cells are very sensitive to the injection of CO₂ changes the acidity fat cells and part of them are destroyed mechanically, as CO₂ is injected into the subcutaneous fatty tissue under pressure, and parts of fat cells "burn" actively invades the tissues with oxygen. At the same time, the carbon dioxide causes vasodilation and increased blood flow in the subcutaneous tissue, which leads to increased lipolysis - the process of digestion of fat and eliminates stagnation of lymph in tissues and improves the elimination of toxins.

Conclusions. Carboxytherapy thanks fiziologicheskim properties of CO₂ enhances the effects of known treatments for cellulite: lymphatic drainage, compression therapy, different techniques of lipolysis and physiotherapy.

COMPARISON OF THE EFFECT OF CIGARETTE AND HOOKAH SMOKE ON THE BLOOD OF THE RATS

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Introduction. In the last years to the traditional ways of using tobacco in Ukraine - smoking cigarettes, cigars and smoking pipes - added and rapidly gaining popularity smoking hookah. The difference between the hookah and other methods of smoking tobacco products consists in the qualitatively different form of the disperse system, which enters the lungs of the smoker. If in cigarettes it is an aerosol of the smoke type, then in the hookah it is an aerosol of the fog type, where drops of water-glycerin mixture contain dissolved active substances. The result of this is the different influence of cigarette and hookah smoke on the smoker's organism.

The blood system is one of the most sensitive systems to toxic effect. As known the smoking may be the causes of hypoxia, which causes changes in the blood in the form of compensatory elevation of the erythrocytes and hemoglobin. At the same time, we have not come across any works devoted to the study of the effect on the blood system of nicotine and related substances from different dispersion systems.

Aim. Research the influence of the nicotine and related substances on the duration of bleeding, the count of erythrocytes and hemoglobin of the experimental animals which inhaling hookah or cigarette smoke.

Materials and Methods. Experiment was performed on 18 rats weighing 220 ± 30 g, divided into 3 groups of 6 animals each: 1st is an intact control, 2nd – the rats, exposed to cigarette smoke, 3rd – the rats, exposed to hookah smoke. The time of the experiment was 15 days. To simulate the process of passive smoking, a special plastic box volume of 8 m³ was used. Smoke delivery to the box was carried out within 30 minutes, by burning 4 cigarettes or 8 grams of hookah mixture, which corresponds to 0.043 mg of nicotine per day per rat. The level of hemoglobin was determined by the unified hemoglobincyanid method, which is based on the formation of colored cyanmethemoglobin. Extinction is measured on a photocolormeter at a wavelength of 560 nm in a cuvette with a wall thickness of 1 cm. The number of erythrocytes was studied by colorimetric methods at a wavelength of 750 nm. The duration of bleeding from the microvessels was calculated by the Duke method (modified).

All intervention and euthanasia of animals was performed according to the requirements of the Commission on Bioethics of the National University of Pharmacy

(Kharkov, Ukraine) and "General ethical principles of experiments on animals", which are consistent with the provision of the European Convention for the Protection of Vertebrate Animals used for Experimental and Other Scientific Purposes (Strasbourg, 1986) and the I-st National Congress on Bioethics (Kyiv, Ukraine, 2001).

Statistical analysis included material using standard methods of variation statistics, calculating average values (M) and the average error (m). Statistical significance was assessed using one-way ANOVA test, the difference was considered to be reliable at $p \leq 0.05$. The data processing was performed using Statistica 7.0 and Excel software.

Results and discussion. It was found that the time of spontaneous blood clotting after injury to the tail vein of the rat decreased in both experimental groups: decreased by 53 % under the influence of cigarette smoke ($p \leq 0.001$) and by 23 % under the influence of hookah smoke ($p = 0.06$). The time of blood coagulation against the background of cigarette smoke was 1.6 times less than under the influence of hookah ($p = 0.05$).

Also, there were changes in the red blood cell count and hemoglobin level at the rats of the 2nd experimental group. These indicators are higher than in the control group (table) by 1.2 % and by 10 %, respectively ($p \leq 0.05$). The rats of the 3rd experimental group showed no significant changes (table).

Table

Effect of cigarette and hookah smoke on blood parameters in rats

($\bar{X} \pm S_x, n = 6$)

| Groups / indicators | Red blood cells, $10^{12}/l$ | Hemoglobin, g / l |
|-----------------------|------------------------------|-------------------|
| 1 st group | 5.16±0.09 | 110.92±3.50 |
| 2 nd group | 5.22±0.10 | 121.51±4.37 |
| 3 rd group | 5.15±0.19 | 111.47±2.32 |

Based on the study of the blood has been determined that against the background of exposure to cigarette smoke for 15 days there is a tension of hemopoiesis caused by hypoxia, which occurs in the conditions of cigarette smoking.

Conclusions.

1. It has been established that against the background of the influence of both cigarette and hookah smoke, the blood clotting time in the rats of both experimental groups decreases.

2. Cigarette smoke has the greatest influence on the blood clotting time, the red blood cells count and the level of hemoglobin.

NEW DRUGS FOR GLAUCOMA TREATMENT

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Rationale. According to the data from WHO, glaucoma is the main disease, which without timely treatment causes irreversible blindness. Glaucoma incidence rate amounts from 0.01% in the newborns to 3% among persons older than 75 years.

Despite of this high incidence of disease since 1996 and until quite recently not a single new drug for glaucoma treatment appeared at pharmaceutical market.

Research objective. Analyze the modern market of pharmaceutical drugs for glaucoma and prospective pharmaceuticals and compare their advantages and drawbacks.

Materials and methods. The research was conducted on the basis of information freely available in the Internet.

Mechanisms of action, effectiveness and side effects of drugs for glaucoma treatment were compared.

Research results. Drugs for glaucoma treatment are divided into two basic groups – directed to the decrease of production (β -adrenergic blocking agent (β -ABA), carbonic anhydrase inhibitors (KI)) and to the enhancement of drainage (M-cholinomimetic (M-ChM), prostaglandins F 2α (PdF 2α)).

The newest drugs for glaucoma treatment are clinically studied Rho-kinase inhibitors. Rho-kinase inhibitors selectively act on actinic fibers of intracellular machinery relaxing the trabecular reticulum, which facilitates better outflow of aqueous humor, inhibit noradrenaline carrier decreasing secretion of aqueous humor, and reduce episcleral venous pressure, which facilitates IOP reduction.

Due to combination of different mechanisms of action, Rho-kinase inhibitors may be used in therapy of glaucoma of any kind. During clinical studies it was revealed that the Rho-kinase inhibitors are equally effective at any IOP level at the expense of action on different mechanisms of intraocular pressure regulation, whereas the analogs of F 2α prostaglandins possess maximum action only at high IOP.

Rho-kinase inhibitors side effect is in local hyperemia; no systemic response was observed.

Summary. The market of medications for glaucoma treatment continues to grow, the studies of a new class of drugs - Rho-kinase inhibitors - possessing combined mechanism of action, high effectiveness and minimum side effects are underway.

THE PROBLEM OF MULTIPLE SCLEROSIS

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Introduction. Multiple sclerosis is 5-11% among diseases of the nervous system. Multiple sclerosis is an autoimmune inflammatory process, which destroys the myelin sheath of nerve fibers of the central and peripheral nervous system. Demyelination in brain structures lead to disruption of the conducting and motor nerve pathways. Multiple sclerosis is characterized by a varied clinical picture: decreased visual acuity, blindness, loss of coordination, slurred speech, numbness of limbs and others. The first signs of multiple sclerosis are often ignored. That leads to serious consequences. Lifetime in multiple sclerosis depends on the physical and mental condition of the patient. Since the disease is not common, the public awareness is low. The main problem is the growth of the disease among young people age from 15 to 40 years.

Aim. To determine the level of awareness of different groups of the population on multiple sclerosis, to compile data on the disease and to inform about the importance of this problem.

Materials and methods. A small test survey of residents in Kharkiv of different age groups.

Results and discussion. We have compiled 5 questions that helped to assess the level of awareness of different groups of society about the problem of multiple sclerosis. The survey was attended by NUPh students of 1-5 courses, pharmacists and pharmacy respondents the age category from 30 to 60 years. The results of the survey showed that the majority of students from 1-3 courses (74%) had heard about the disease, but could not articulate what this disease is, the causes and symptoms. Of these, only 17% of students had a clear idea about the disease. The level of students' knowledge about this issue increased by 4-5 courses, which can be explained by specifics of the study subjects medical cycle. 65% of the interviewed men and women ages from 30 to 60 years aware of this problem even less. The most knowledgeable are pharmacists, medical representatives of pharmaceutical firms.

Conclusions. The analysis of the survey confirmed that the population is not sufficiently informed about the problem of multiple sclerosis. Knowledge about the disease is necessary to convey to the public, as Ukraine is at risk.

MEDICINAL COMBINATION OF NSAIDS AND CARBOXYTHERAPY.

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Introduction. The social danger of joint pathology lies in the fact that more than 15% of patients become disabled with time, with a decrease in life expectancy by an average of 10 years. Among drugs for the therapy of these diseases, non-steroidal anti-inflammatory drugs (NSAIDs) and chondroprotectors occupy leading positions. The doctor faces a dilemma, or reduce the dose of NSAIDs and thereby reduce their side effects, but the effectiveness of therapy will decrease.

Goal. To study the promise of a combination of modern NSAIDs and carboxytherapy in a dose of 0.5 and 2 ml and regimens for 30 minutes before and 30 minutes after the administration of phlogogen.

Materials and methods. On the basis of Central research laboratory of NUPh on the model of carrageenan inflammation of the paw in rats, the anti-inflammatory effect of CO₂ therapy was studied. CO₂ was injected invasively and subcutaneously with a dose of CO₂ INDAP gas injections in doses of 0.5 and 2 ml to 48 rats in the region of distal paw joints. Anti-inflammatory activity was assessed by the degree of edema reduction in animals treated with carboxytherapy, as compared to animals in the control pathology group.

Results. Analysis of the results of the preclinical study of the effect of invasive introduction of CO₂ on the background of inflammatory swelling of the paw of rats showed that CO₂ in all the doses and regimens administered has an anti-inflammatory effect (except for a dose of 2 ml / animal 30 minutes after the administration of phlogogen). The greatest effect of CO₂ was observed with its preventive administration 30 minutes before carrageenan: the antiexudative effect was at the level of 25.75-28.5%, which is significant in relation to the control pathology group. This effect of carboxytherapy was statistically significant in comparison with the results of the control pathology. When analyzing the dose-dependence of the anti-inflammatory effect of CO₂, the results of the experiment showed that CO₂ in a dose of 0.5 ml had a better effect than a 2 ml dose: a moderate decrease in the edema of the rats under the effect of a CO₂ dose of 2 ml was statistically not significant.

Conclusions. Thus, when modeling articular pathology, it is rational to administer a dose of 0.5 ml of carbon dioxide 30 minutes before the introduction of phlogogen.

EXCESS DIETARY FRUCTOSE AS A FACTOR OF DEVELOPMENT OF THE “DISEASES OF CIVILIZATION”

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Introduction. Metabolic syndrome and obesity are the urgent problems of the modern society that are becoming a “non-infectious pandemia.” Increased consumption of sugars, especially fructose, contributes to the development of these pathological conditions. Among the foods with “added sugars” high-calorie soft drinks are of special significance, and the decrease of their consumption could lead to the significant benefits in public health.

Aim. The aim of this work is to evaluate the data available in the literature about the effects of high-calorie soft drinks on the metabolic processes and about the prevalence of high-calorie soft drinks consumption among the Ukrainian children and teenagers. Besides, the effects of excess fructose intake not aggravated by other factors were determined in rats.

Materials and methods. The search of data in the literature was performed using Internet resources, including Medline database as well as domestic media resources. The experiments on rats were conducted using the model of the substitution of drinking water with 10% fructose solution for 10 weeks. The food regimen without an excess of lipids and with a limited quantity of sodium was used. Lipid and carbohydrate exchange values in blood plasma were determined.

Results and discussion. The analysis of the available data showed that the wide use of high fructose corn syrup in food industry lead to the dramatic increase in sugar consumption linked to the escalating worldwide obesity and type 2 diabetes epidemic. The negative impact of this factor on immune system and even cognitive processes is seen. WHO recommends the limiting of sugars and high-calorie soft drinks, including the implementation of taxes on soft drinks, which were applied by some countries together with the health warning labeling of these beverages. Such measures are not used in Ukraine, despite the recent opinion polls evidencing that 82% of Ukrainian children consume high-calorie soft drinks.

Experimental data confirmed the negative impact of fructose: atherogenic shift of cholesterol fractions in blood plasma developed in rats under its influence, despite the low food intake of lipids, short term of the study and the absence of glucose metabolism disorders as well as other factors influencing on lipid metabolism.

Conclusion. Further work is needed to counteract excess fructose intake.

RATIONALITY OF DEVELOPING DOMESTIC DRUGS FOR THE TREATMENT OF HYPERTROPHIC SCARS

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Introduction. Postoperative or traumatic wounds often not heal as well as desired, first of all from an aesthetic point of view. The reason for that is most often excessively active work of our body in the regeneration process. Hypertrophic scar appears after excessive formation of fibrous tissue as a result of prolonged inflammation, hypoxia, addition of secondary infection, reduction of local immunological reactions. Skin damage can lead to the appearance of hypertrophic scars. The growth of such a scar begins immediately after healing, characterized by rough scar formation, that rises above the skin level and causes esthetic discomfort. As for today, there are many methods for treating hypertrophic scars: surgical excision(allows to get rid of the expressed hypertrophic scars and replace with more accurate), microdermabrasion (grinding the skin with solid microscopic crystals) and others. However, the method of local treatment of hypertrophic scars remains convenient and cost-effective.

Aim. The purpose of this work is to study the rationality of developing domestic drugs for local treatment of hypertrophic scars.

Materials and methods. Investigating necessity of developing new drugs for the local treatment of hypertrophic scars, analysis of the modern pharmaceutical market in Ukraine was held on the following parameters: assortment, manufacturer, pharmacological effects, dosage form and the price.

Result and discussion. Recent research has shown that 5 drugs are registered on the market. All preparations of foreign production: USA – «Advanced Bio-Techologies» (Kelo-cote), Russia – the firm "SPb-Technology" (Fermenkol), Holland – company «ICN Pharmaceuticals Holland BV» (Dermatix), Germany - the German companies "Polytech Health & Aesthetics" (MEDGEL) and "Merz Pharma" (Contractubex).

The presented drugs have an emollient, remodeling, antiproliferative and anti-inflammatory effect, destroys pathological collagen and hyaluronic acid until they become molecules of amino acids and oligosaccharides, which are further used as a building material for skin regeneration. Average course of treatment with drugs costs 600-700 UAH. That is expensive for the population of Ukraine. Therefore, it is rational to develop domestic, budgetary preparations for the local treatment of hypertrophic scars.

Conclusions. Development of available and high quality medicines is a top priority of the Ukrainian pharmaceutical industry. Considering the small and expensive assortment of existing drugs it is rational to create domestic drugs for the treatment of hypertrophic scars.

PATOLOGICAL INFLUENCE OF ECHINOCOCCOSIS ON THE HUMAN BODY

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Parasitic diseases, caused by helminths, one-celled and arthropods, are a wide group of illnesses, that largely determine the state of health of the population. According to the official statistics of the WHO 4.5 billion of people suffer from parasitic diseases annually. Every third person is ill in Europe. It is proved today that 95% of the population is infected with parasites. The share of parasitic diseases account for one in four death.

The most important place among the complex of parasitic disease belongs to cestodosis and echinococcosis should be distinguished between them. More than 1 million people is affected by this disease worldwide. Echinococcosis cases in Ukraine are recorded among its inhabitants everywhere, but the southern regions, such as Odesa, Kherson, Mykolayiv, stay dominant.

Echinococcosis - severe chronic human disease caused by parasites helminth larvae of *Echinococcus granulosus*. Echinococcosis infection happens per os by swallowing infective eggs of the parasite by close contact with the animals of the family Canidae.

The pathological effect of echinococcosis is caused by increasing of echinococcal cysts. Mechanical pressure, caused by the growing larvae, leads to dysfunction of the organ where it is localized. 3 stages are distinguished in the course of disease: 1 - characterized by the penetration of *Echinococcus* into the body; 2-stage is caused by pressure of cysts on the organs tissue; 3- complications in the parasites: perforation, suppuration, petrification.

Treatment of echinococcosis is surgical. The best way to treat – ehinokokektomia. Its ideal form used in small size of cysts, with their complete removal. Mortality of these operations is 1-5% relapse - 2-25%. In the course of medical treatment used albendazolum or mebendazolum. But the drugs are used mainly as a complement to surgery.

Prevention of echinococcosis disease is based on the complex veterinary and medical measures with purpose to destroy the sources of infestations, holding regular prophylactic dehelminthization of animals, keeping rules of personal hygiene.

Following the foregoing, it should emphasize the importance of learning all complex of problems connected with echinococcosis and the necessity to find solutions of this problem, because echinococcosis is a disease that continues to spread among people worldwide and claims to be one of the most dangerous for mankind.

DRY EXTRACT OF THE OREGANO AS PERSPECTIVE RAW MATERIAL FOR CORRECTION OF CLIMACTERIC SYNDROME

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Relevance. According to statistics in Ukraine, more than one-third of the women living in it are in "transitional" and elderly people. The average age of women in menopause is 48 years, and in 23.1% of women there is an early menopause (up to 45 years). Every 3-4th woman even before menopause develops autonomic disorders - "hot flashes", fluctuations in blood pressure, pain in the heart and other vegetative disorders, irritability, depression. These are the so-called early complications of the climacteric period, caused by the physiological restructuring of the female body and changes in the production of sex hormones. In the future, urogenital disorders, osteoporosis and other disorders join. These changes are due to hormonal changes in the body of a woman and are often caused by a decrease in the level of estrogen.

The mechanism of negative feedback increases the level of gonadotropins. For the therapy of dyshormonal disorders in women, menopause is used for hormonal replacement hormone replacement therapy. However, due to many contraindications to its use and adverse reactions to drugs, many women prefer to use the so-called. "Phytoestrogens".

The purpose of the study was to study the prospects of using an extract of common oregano as a promising phytoestrogen for correcting climacteric disorders.

Materials and methods: literature data, patent database of Ukraine, international patent databases (PCT Newsletter, Worldwide and others).

The results of the research showed that due to a unique set of biologically active substances (flavonoids, bitter substances, tannins, phytoncides, essential oil, vitamins C, B1, B2, as well as the presence of phytoestrogens, *Oregano vulgaris* can be a promising raw material for the treatment of the climacteric syndrome.

Conclusion. On the basis of the results obtained, it can be concluded that the dry extract of oregano is a promising development for the creation on its basis of a drug for the correction of dyshormonal disorders in women in the climacteric period.

DEMODECOSIS PHARMACOTHERAPY PECULIARITIES

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Introduction. Demodecosis is one of the most common parasitogenic skin diseases sickness rate of which is 2-5% and takes the 7th place as to frequency rate. Follicle mite (*Demodex folliculorum*) is the most frequent to be found, it can be observed in hair follicles, sebaceous glands of human's skin and glands of eyelids. When mites eat cells destruction by helicers occurs which causes keratinization, pigmentation and inflammatory infiltrates forming.

Aim. Study of the mechanism of development, clinical manifestations and pharmacotherapy of demodecosis.

Materials and methods. Scraping produces a scalpel or eye with a spoon. Material for the study can be obtained also when squeezing the contents of the follicle. The test material is applied on a glass slide in a drop of 10 % lye, cover with a cover glass and browsing for 5-10 minutes after intake of the material under a microscope.

Results and discussion. To act on follicle mites directly miticidal agents are used such as derivatives of nitroimidazole group. The most effective agent is metronidazole. Ornidazole is also used. Not only antiparasitic effect of the medicine is to be noted but bacteriostatic action that increasing neutrophils activity, stimulating adrenergic structures and amplification of restorative processes. Among local agents miticidal agents are used such as benzyl benzoate emulsion, 5-10 % sulfuric ointment/liniment, 1-5 % trichopol paste, metrogil jelly, cryomassage. Any ointment due to viscosity of ointment base makes mites' migration and reproduction difficult. Corticosteroid ointments lower local immunity and cause their quantity increasing. In a case of repeated infection combination local antibacterial therapy is necessary. The difficulties of demodecosis therapy which is far from being always successful even with using the most effective miticidal agents, are connected with peculiarities of mites' integument texture. Passing of large molecules of exogenous substances such as miticidal agents of contact effect through the cuticle of demodicides is difficult or impossible. This is the reason of difficulty of antiparasitic therapy in the case of demodecosis, necessity of lingering course of medical treatment and choosing medicine with the smallest sized molecules.

Conclusions. Thus, the therapy should be phased and include symptomatic agents, anti-inflammatory, antibacterial, desensitizing and antiparasitic drugs as well as treatment of concomitant diseases and preventive measures.

COMPARATIVE EVALUATION OF CHRONIC IRON OVERLOAD WITH LONG-TERM USE OF IRON PREPARATIONS IN THE EXPERIMENT

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Introduction. The prevalence of anemia in the world in different countries and on average (according to who), about 25%. In Russia, according to the Ministry of health of Russia, suffer from anaemia and 15% of the population, especially women of childbearing age (18-25%), pregnant (40%), children up to 2 years (18-25%), girls 14-18 years old (10-20%). Most common iron-deficiency anaemia, for which treatment is prescribed drugs containing iron – its organic (e.g., hydroxide polymaltose) or inorganic (e.g., sulfate) salt. Given a single overdose may develop picture of acute poisoning with tissue injury, violation of hemodynamics. Prolonged uncontrolled intake of iron supplements in the range of therapeutic doses is also dangerous, causing chronic iron overload, and even the development of hemosiderosis. Excessive accumulation of iron in the liver in the form of hemosiderin significantly slows down the process of liver regeneration and triggers the development of cirrhosis of the liver and other organ.

Aim. Comparative evaluation of chronic iron overload with long-term use of drugs inorganic (sulfate) and organic (hydroxide polymaltose) iron at maximum therapeutic doses.

Materials and methods. The study used 24 white rats of both sexes weighing 200-250 g, divided into groups: intact control; groups treated with iron sulfate (aktiferrin) syrup at a dose of 0.6 ml/kg into the stomach using a probe and polymaltose iron (antibiotic) syrup at a dose of 0.5 ml/kg into the stomach through a tube. Iron supplementation was administered for 2 months. Then the animals were placed for a day in exchange cells for the determination of renal excretory function, and then scored the guillotine method. The blood was determined by the activity of ALT, AST, bilirubin, total protein and creatinine, urinary protein concentration (using the standard sets). Made the fence of the liver, kidney and brain for histological examination (fixation in 10% neutral formalin solution; the posting of tissues according to the standard scheme), in the histopathology laboratory determined iron in the tissue by reaction of Prussian blue in the color duplicate slices by Perls. Statistical processing of results was performed using the program «Statistics 6».

Results and discussion. Biochemical blood analysis showed that long-term use of ferric sulfate having a damaging effect on hepatocytes, as evidenced by a significant rise in ALT activity (78.8 ± 15.4 against 52.93 ± 9.59 U/l in control). The use of hydroxide of iron polymaltose not significantly increased the activity of hepatic transaminase. In addition, changed and renal function: for example, there has been some increase in urine output by administration of hydroxide of iron polymaltose (6.03 ± 1.85 ml against 4.26 ± 2.02 ml in control), and proteinuria, which when applied aktiferrin was statistically significant (26 ± 8.02 against 12 ± 8.1 mg/100ml in control). Histopathological changes in the liver in rats in the latter group was characterized by focal vacuolar degeneration of hepatocytes in the Central zone of hepatic lobules. Perls reaction was weakly positive, and expressed by the painting of the Prussian blue intralobular sinusoidal walls of blood capillaries, a single small granules of salt in the cytoplasm of individual hepatocytes. Histological examination of the liver tissue of intact rats showed that in all cases the cytoplasm of the hepatocytes contained evenly distributed fine granules of iron-containing salts, which is likely due to the metabolism of liver cells with the formation of transferring. All rats receiving the drug aktiferrin the maximum dose, in terms of plethora central veins and sinusoids precentral areas of the hepatic lobules, the hepatocytes were in a state of moderate hydropic (vacuolar) degeneration. In the study of the brain in one case revealed focal formation of Prussian blue in subependymoma department (paraventricular area) of the left hemisphere of the brain. In the kidneys of two animals reaction Perls gave a weakly positive result, which was expressed by the formation of fine granules of Prussian blue in the cytoplasm of kidney cells causes significant release of the proximal convoluted tubules.

Conclusions. Long-term (within 2 months) oral administration of iron preparations at doses close to the maximum causes in rats with chronic iron overload. This is manifested in the deposition of ferric iron in the liver, in hepatocytes and in the course of sinusoidal capillaries and degenerative changes in the hepatocytes. In some cases it is possible to accumulation of iron in tissues of the kidneys and brain, as well as proteinuria (especially when taking ferrous sulfate). Noticed that the damage of the liver tissue confirmed by increased levels of hepatic transaminases (ALT) in the blood. It should be noted that the hydroxide polymaltose iron has the advantage with long – term use when used damage to the liver and the deposition in the hepatocytes of ferric iron is less pronounced.

Section 10.
LABORATORY RESEARCHES
IN CLINICAL MEDICINE

STUDY OF HYPOGLYCEMIC ACTIVITY OF A MALABEN ON THE MODEL OF ADRENALINE HYPERGLYCEMIA

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Introduction. A diabetes mellitus of II type is one of main problems of modern health protection. Together with a disease grows not only quantity of new preparations, but also resistance to the already existing. Important stage of studying of a new preparation is the stage of preclinical researches. Exists not so many techniques allowing to estimate quickly hypoglycemic activity of substance now, and one of them is modeling of a hyperglycemic state with adrenaline use.

Aim. The purpose of this work is approbation of model of an adrenaline hyperglycemia for fast screening of new substances, and also detection of possible hypoglycemic activity of a malaben . Malaben - 4,4' - (propanediamide) dibenzoate of sodium - original biologically active material, the derivative of malonic acid.

Materials and methods. All experiments were executed in accordance with the national standard of the Russian Federation ALL-UNION STATE STAN. R - 53434-2009 «The principles of the good laboratory practice» and by the order of Ministry of Pub. Health RF from 01.04.2016 g. of №199n «About the assertion of the rules of the good laboratory practice». The subjects of a study are malaben - new substance with the assumed hypoglycemic activity, metformin - widely used preparation for the therapy of II type diabetes mellitus with the proved effectiveness.

The state of hyperglycemia was simulated by the introduction of adrenaline at the dose of 1mg/kg hypodermically. The initial level of glucose in the blood on an empty stomach was determined, and also the level of the glucose through 1, 2 and 3 hours after the introduction of adrenaline. Experiment was made on 21 animals - rats males of the Wistar line weighing 150 g. Animals were divided into 3 groups, on 7 animals in each group. Animals of the first group received metformin in a dose 300 mg/kg (with recalculation of a dose on rats) orally in 30 minutes prior to adrenaline introduction. Animals of the second group received malaben in a dose 60 mg/kg orally in 30 minutes prior to adrenaline introduction. Animal of the third group – control animals, to them entered the equal volume of the water cleared in 30 minutes prior to adrenaline introduction. Results of experience are presented in the Table 1. All values in the table are average. The standard deviation is calculated using the Microsoft Excel function.

Table 1. Results of approbation of adrenaline model of hyperglycemia with single administration of substances.

| | Control animals | Metformin | Malaben |
|----------------------------------|-----------------|------------|-----------|
| Initial level of glucose, mmol/l | 5.8±0.81 | 6.0±1.05 | 5.5±0.89 |
| One hour after | 14.3±1.57 | 10.11±1.99 | 11.5±2.08 |
| Two hours after | 20.5±1.71 | 13.1±2.01 | 12.2±2.52 |
| Three hours after | 21.3±1.74 | 14.1±2.16 | 12.7±3.31 |

In the following stage the activity of substances during a constant application was checked. Animals were divided into three groups of 5 animals in each (control - 4 animals). They received, respectively, metformin (300 mg/kg with recalculation of a dose on rats), malaben (60 mg/kg) and water purified of 1 times in day during five days. On the sixth day, adrenaline was administered in a similar manner without prior administration of the substances. Results of measurements are presented in the Table 2. All values in the table are average. The standard deviation is calculated using the Microsoft Excel function.

Table 2. Results of approbation of adrenaline model of hyperglycemia with long-term administration of substances.

| | Control animals | Metformin | Malaben |
|----------------------------------|-----------------|------------|------------|
| Initial level of glucose, mmol/l | 5.6±0.35 | 6.2±0.63 | 5.6±0.39 |
| One hour after | 17.4±1.66 | 10.6±0.87 | 10.54±0.89 |
| Two hours after | 19.0±1.71 | 13.3±1.37 | 12.58±1.51 |
| Three hours after | 17.7±1.61 | 14.14±0.84 | 14.06±1.04 |

Results and discussion. The initial level of glucose in all groups is normal - from 5.5 to 6.0 mmol/l. After the introduction of adrenaline in the control group values rapidly grow up to 21.3 mmol/l. Metformin and malaben hold in control the development of hyperglycemia. The effect of metformin develops faster, however, the effect of malaben persists longer. This tendency remains with the long-term introduction of substance.

Conclusions. The adrenaline model of a hyperglycemia can be used for initial screening of substances with potential antidiabetic activity. Malaben showed hypoglycemic activity at the level of the preparation of comparison - metformin.

**A STUDY IN CHINODICHLIZINE EFFECT
ON LYMPH SYSTEM COAGULATION ACTIVITY
UNDER CARDIAC INFARCTION**

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Violation of lymph outflow from cardiac muscle damage area leads to development of interstitial edema, aggravates microcirculation disturbance in coronary vessel obliteration area.

The object of work is to study the effect of chinodichlozine (chinoline derivative of carboxylic acids) on lymph circulation wrapping activity and lymph drainage function of cardiac muscle under acute cardiac infarction.

Research material and methods Experiments were performed on 35 rats with weight of 180 – 200 g. In 5 rats the lymph coagulation condition and lymph outflow rate (lymphorrhagic syndrome) was studied in intact condition. In the rest of animals acute cardiac infarction was imitated by tying upper third of anterior interventricular artery. The dynamics of acute cardiac infarction progress was monitored by ECG registration and determination of creatine phosphokinase (CPK) in blood serum by spectrophotometry using Chemaiol standard reagent set. The blood was taken from auricular limbic vein. ECG was registered in intact condition and within 30 days, CPK at the beginning of experiment as well as within 8 days after imitation of infarction.

Results and discussion In animals of Group 2 after administration of chinodichlozine substance the course of infarction was more favorable. Alterations of lymph coagulation were marked by reduction of heparin tolerance by 69%, more than 1.8 times decrease of prothrombin index as compared with control group, substantial increase of heparins and thrombin time (222 and 245% respectively), fibrinogen concentration was reduced 1.5 times. Lymph outflow velocity increased more than 3 times as compared with controls (0.135 ± 0.017 mL / min) which was indicative of intensified lymph drainage, thus, better removal of cardiac metabolism toxic products.

Conclusion It must be noted that within the following periods of study heparin and thrombin time values were higher than initial ones, whereas prothrombin index and fibrinogen concentration remained reduced up to the end of observation. Consequently, we may state that chinodichlozine administration has an expressed hypocoagulation effect and stimulated lymph anti-coagulation activity. Chinodichlozine showed an expressed hypocoagulation effect in experiment as well as assisted in acceleration of cardiac lymph draining function.

LABORATORY DIAGNOSTICS OF VIRAL HEPATITIS B IN KHARKIV

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Introduction. Viral hepatitis is one of the most pressing and social problems in the world. Hepatitis ranks eighth among the main causes of death. Among infectious diseases of human viral hepatitis occupy third place follow after an acute respiratory viral infections and infections of the gastrointestinal tract. In particular, as the WHO has written that 2 billion people on Earth suffered hepatitis B in some forms, as nearly a third of the world's population currently affected by viral hepatitis. The rate of spread and scale of infection are impressed: the number of carriers of the virus hepatitis B reaches 400 mln people. This situation contributes greatly to the spread of the disease at all areas. Epidemic process in most cases is hidden because official statistics show a low prevalence of the disease.

Around 2 million people are infected by hepatitis in unsafe injections. WHO notes that health services need to minimize the risks of transmission of hepatitis by using only sterile equipment, testing all donated blood and blood components for hepatitis.

The aim of the study was to study a state of laboratory diagnosis of viral hepatitis by using modern methods in Kharkiv.

Materials and methods. The study included 115 patients (groups are included 70 men and 45 women, whose average age is $38,5 \pm 1,5$ years) who were treated in Kharkiv Regional Clinical Infectious Hospital № 22. Patients were diagnosed and suffered viral hepatitis B during 2015 an average 1 month.

Laboratory methods for diagnosis of HBV are included an estimation of the concentration of alanine aminotransferase (ALT), aspartate aminotransferase (AST); total, direct and indirect bilirubin; alkaline phosphatase (ALP), γ -glutamyl transferase (γ -GT), lactate dehydrogenase (LDH), total protein, albumin and cholesterol, markers of replication virus hepatitis B (HBsAg, HBeAg, DNA HBV).

Results and discussion. Identification of markers cytolytic syndrome is showed increased content ALT (2426 ± 30 U/L), AST (1998 ± 27 U/L) and lactate dehydrogenase (255 ± 10 U/L) in 50 times the norm on 5-th day the course of disease in women and men. These changes reflect the typical course of HBV. There is a large amount of necrotic hepatocytes, which release a large quantities of enzymes in the blood. At the 4-th week of disease the dynamic of parameters was positive, because there was reduction of these markers almost to normal. Thus, we made findings that

liver enzymes ALT and AST are used as a laboratory parameter for diagnosis of viral hepatitis B, but determination the concentration of LDH in this case is less informative.

In the study group of patients with hepatitis B, we identified a high concentration of total bilirubin, which we are observed in women and men. It was happened in indirect bilirubin and it was increasing in 10 times, $p < 0,05$ compared with the control group. Clinically it was accompanied by the development of jaundice syndrome. At 4-th week of patient's hospitalization analyzes have shown that the level of total bilirubin was getting to normal. It was markers the state of the hepatobiliary system patients. Thus, the study of total bilirubin in hepatitis B can be used for diagnosis of liver damage caused by virus.

The main indicator of cholestatic syndrome is concentration of ALP, γ -GT. We have found that patients suffered hepatitis B, both women and men had a high concentration of ALP, which is increased in 37.5 times at women and 48.7 times in men, and γ -GT (which is increased in 8.4 times) than in healthy control group. At the 4 week stay of patient's hospitalization analyzes have shown that the ALP levels of γ -GT has tended to decrease and normalization.

We have analyzed the levels of total proteins, albumins and cholesterol in the blood serum. These parameters are indicators of hepato depressive syndrome. In the study we have found a moderate reduction of the levels of total proteins and albumins at patients with hepatitis B, both women and men and, when compared with the control group. It is characterized that the hepatitis B in our cases had a middle forms of severity. Cholesterol was within normal limits.

According to the data of this investigation for identify antigens HBsAg and HBeAg in the serum of patients and the control group (healthy) by immunosorbent assay, it has found that all patients ($n = 115$) revealed antigens of virus hepatitis B at 100%. Thus, immunoassay method for detection of hepatitis B markers gives us 100% result in the detection of virus in the blood.

According to the data of this study to identify the DNA of virus hepatitis B in patients and control group (healthy) by polymerase chain reaction (PCR), it was found that all patients ($n = 115$) revealed DNA of virus hepatitis B is 100%. Thus, the method of PCR in the diagnosis of hepatitis B gives us 100% result in the detection of virus in the blood.

Conclusions. We carried out a study of 115 patients Kharkov regional clinical hospital with a diagnostics of viral hepatitis B. We have analyzed the methods of laboratory diagnostics which are used in the hospital. Diagnostics of viral hepatitis B should include the diagnostics of antigenic structures by PCR, markers of cytolytic, cholestatic, hepatodepressive syndromes. The data coincide with literature data on the course of hepatitis B.

IMMUNOGENETIC MARKERS OF DIABETES COMPLICATIONS IN CHILDREN AND ADOLESCENTS

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Introduction. In recent years, the increasing interest of researchers is a major histocompatibility complex genes (HLA), localized on the short arm of chromosome 6, and is closely associated with the functioning of the human immune system, in particular, with the activation of autoimmune processes in the body. A significant relationship between the presence of certain genotype human HLA and a number of diseases, including systemic connective tissue diseases, chronic kidney disease and insulin-dependent diabetes mellitus, in which the pathogenesis of autoimmune processes play a significant role. There are also data indicating an increased risk of developing diabetes in DR4 antigen.

Aims. To study the frequency occurrence of class II antigens HLA complex in children and adolescents, patients with diabetes mellitus, subject to their available materials and methods of disease complications. Immunogenetic study was performed in 56 children admitted for hospital treatment in the State Institution "Institute of the health of children and adolescents of NAMS of Ukraine" typing antigens of HLA DR locus was performed using prolonged version mikrolimphotoxic samples of B-lymphocyte populations using the sera test panels (class DR).

Results and discussion. In the study of the distribution system in the HLA-antigens in children and adolescents with type I diabetes has been found that the presence of haplotypes DR2DR3, especially DR3DR4, determine the severity of the disease with frequent episodes of hyperglycemia and ketosis, microangiopathy LL - III century., Disorders of lipid metabolism. Combinations DR3DR4 DR2DR3 antigens occurs with high frequency in patients with severe hepatopathy, hyperlipidemia - 37.5% and 25% of cases, respectively, in patients with growth retardation - 40% and 50% of cases, respectively.

Conclusions:

1. Severe diabetes trends among children and adolescents is associated with HLA phenotype, including some options DR2DR3, DR3DR4, DR5DR7.
2. Conducting research immunogenetic patient with diabetes in the early stages of the disease allows to predict type I diabetes at the beginning of the disease allows to predict the subsequent development of diabetic complications and to carry out preventive therapy in a timely manner.

MORPHO-FUNCTIONAL STATE OF ENDOTHELIUM IN DIABETES MELLITUS

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Introduction. The prevalence of diabetes mellitus (DM) has acquired the character of a noninfectious pandemic of the XXIst century. The disease inevitably progresses and leads to complications, among which the main place is occupied by micro- and macroangiopathies. According to the current hypothesis of vascular complications, the primary damage begins at the level of the vascular endothelium and, thus, endothelial dysfunction (ED) is considered as an early predictor of damage to the vascular system.

The presence of endothelial damage in diabetes can be established even before macroscopically significant damage to the vessel. At the same time, there is no summary ED characteristic for diabetes.

The objective of the study: to make a comprehensive evaluation of ED in DM-1 and DM-2 types.

Materials and methods. 60 persons, including 53 DM type 1 and type 2, with a severe course (state of decompensation) participated in the present study. The control group consisted of 7 persons without endocrine pathology. Among the patients with diabetes there were 32 men (60.4%) and 21 women (39.6%), aged 19-80 y.o. The average age of the patients was 56.2.

Endothelial dysfunction in DM was determined by the number of circulating desquamation endothelial cells (CDE) in the blood plasma, by the concentration of nitric oxide and its metabolites. Concentration of CDE was determined by phase contrast microscopy.

Results and discussion. The level of CDE in DM ranged from 1900 to 5600 cells/ml in 1 ml of plasma, in one patient the number of CDE in a ml was 11.200 cells, while the average plasma CDE in the group under study was 3270 cells/ml. In the control group, the amount of CDE ranged from 800 to 2700 cells/ml, with the average value of 1500 cells/ml. The amount of CDE in DM-1 and DM-2 was increased more than 2-fold, relative to the control group.

Conclusions. Endothelium is involved in the pathological process at DM. This is evidenced by a significant increase in CDE in the blood plasma. Endothelial dysfunction appears at different stages and correlates with the duration and severity of diabetes.

THE CONSEQUENCES OF THE ACTION OF VITAMIN K FOR HEMOSTASIS OF PREGNANT RAT-FEMALES AND THEIR DESCENDANTS

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Introduction. The severity of the lesion in the liver of pregnant rats determines the risk of complications and adverse effects to the fetus, including development of the "hypoprotrombinaemiya"-hemorrhagic disease of the newborns.

Aim. Creation the model of the state of hypoprotrombinaemiyaï in newborns rats, caused a breach of the blood coagulation system of pregnant rats-females by liver damage.

Materials and methods The investigation was conducted in three series. Rats-females were injected with drugs which exhibit hepatotokik properties and application, which is a risk factor for hemorrhagic disease of the newborn. Studies performed on rats-females weighing 150-200 gr. In the first series of experiment pathology was made by typing rats-females tetracycline group at a dose of 500 mg/kg for 5 days followed by fertilization. A second series of experiments rats-females with 16-to 20-day pregnancy ampicillin injected at a dose of 300 mg/kg.

Results and discussion Pathology that developed in pregnant rat- females after the application of the tetracycline group and ampicilin, was a violation of physiological norms for their descendants: decreasing body weight and increasing the time of bleeding. Proof that the descendants were novital capacity were manifestations of cannibalism that were in 50% research females. The clinical status of the newborn rats gave the possibility to extrapolate the data on newborns with k- vitamìnnoû insulfience. These results confirm allknown fact that using the antibiotics during pregnancy is a factor of development of hypoprotrombinaemiya-hemorrhagic disease of the newborns. In the 3-series experiment for the development of in newborn rat-females with 16-to 20-day pregnancy injected varfarin in two doses and 1.0 0.3 mg/kg. The obtained results showed that the introduction of indirect anticoagulant warfarin at a dose of 1 mg/kg in last 1/3 period of pregnancy causes serious condition in pregnant rats-females. We observed bleeding, violation of labor activity and death of animals. Using in pregnant females dose of warfarin-0.3 mg/kg caused heavy destruction of the system of hemostasis for their descendants.

Conclusion. The conducted experiments confirmed the strong risk of hemorrhagic disease in the newborns when theirs mothers were treated by antibiotics and anticoagulants.

**USING THE METHOD
OF GAS CHROMATOGRAPHY-MASS SPECTROMETRY
DURING CONFIRMATORY DIAGNOSTIKS OF HOMOGENITISURIA**

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Introduction. Among the genetic children's diseases much more common widespread hereditary metabolic disease or metabolic diseases - with monogenic disease genes in which mutations lead to pathochemical disorders leading to clinical and biochemical picture of the disease.

Aim. The object of work was to determine the optimal methods of diagnosis in patients with homogentisuria.

Materials and methods. Clinical research methods, medical history, physical examination of patients with homogentisuria. Laboratory methods included: gas chromatography, mass spectrometry, urine screening diagnostics, analysis of synovial fluid. We used rapid tests using urine analyzer and urine Arkray test strips (Aution Sticks AE 10).

Results and discussion According to the 2016 GC-MS, we have examined 924 patients, performed 243,313 investigations, of which in 2 were found homogentisuria sick child. The study was fulfilled at the HSMHTS-CA (O) C. When the biological materials were accepted in the laboratory we performed selective screening urine. Most often detected changes were in the proportion (increasing in 34.8% of patients, decreasing -in 2.5%); increasing of sulphites - in 16.2%; the presence of reducing substances - 1.8 (in trace amounts - in 27.5% patients). After receiving the total ion chromatograms, we have carried out the identification of detected organic compounds, searching trivial items adopted in the clinical practice and determine the individual characteristics of each organic acid release time (RT) for total ion chromatogram and retention index (RI). In the course of this work we have identified 117 organic compounds. On the basis of preparation of the mother liquor and preparation working solutions of organic acids graphs of calibration dependence were made for 25 organic acids (OK).

Conclusion. Analysis of urine organic acids- a highly informative method of laboratory diagnosis of metabolic disorders. This allows to doctor can get accurate information about the quantitative characteristics of the available biochemical markers of hereditary metabolic disorders and various exogenous toxins.

ASPECTS OF THE LABORATORY DIAGNOSTICS OF CYSTIC FIBROSIS

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Introduction. Cystic Fibrosis(CF) – is the most common hereditary striking many organs pathology, which characterized by a pronounced genetic and clinical polymorphism. It is a monogenne disease caused by a mutation of a gene and is characterized by lesions of the hemadens of vital organs and is usually a heavy current and forecast. CF is an important medical and social problem. Previously, this disease is attributed to the category of "fatal" or "lethal" because life expectancy does not exceed 5 years. In our days, thanks to the deepening of knowledges about the CF and the elaboration of effective methods of therapy, the disease is diagnosed much earlier, and the average life expectancy of patients has increasedis.

Aim. The object of work is the determination of the optimal methods of diagnostics of this hereditary disease.

Materials and methods. Our research carried out on the basis of Kharkiv specialized medical-genetic Center and included molecular genetic study, neonatalstudy, pilokarpin test, neonatal, screening of new-born, which includes diagnosis of immunoreactive tripsin.

Results and discussion. Investigated levels of immunoreactive tripsin (IRT) in dry blood spots 191 newborn that has been done by means of fluorescent immune assay using multifunction Analyzer test and VICTOR DELFIA Neonatal IRT kit. Screening on the CF allows timely and appropriate treatment and rehabilitation measures that have a positive impact both on the condition of the patients and the average duration of their lives. Early detection of patients with cystic fibrosis, creates the possibility of adequate medical and genetic counseling based on DNA diagnosis and selection of rare forms forms of CF. Screening will determine the frequency of the CF in different regions of the country and/or ethnic groups, which is important for planning the amount of medical and preventive care for this category of patients. According to preliminary data falsely positive results (transient gipertripsinemia) may occur in infants with low APGAR scale, indicators, as well as healthy carriers of mutations (3 times more frequently than in a population) that require further study. The value of the chlorides of sweat has fluctuated from 50 mmol/l to 120 mmol/l among the patients with a positive test was 94.3% of the patients, in others-boundary numbers.

Conclusion. Main in diagnostics and research of CF is a sweat test that detects a larger (2-5 times compared to normal) concentration in sweat chlorides. Research of sweat in terms of elektroforez stimulation is considered the single most credible test in diagnosis of cystic fibrosis. The test gives positive results during first 3-5 weeks of life most affected children. Sweat chlorides increased in CF (in 98% of patients).

USE OF MICROBIOLOGICAL ANALYZERS FOR AUTHENTICATION OF ANTIBACTERIAL SENSITIVENESS OF PATHOGENIC MICROORGANISMS

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Introduction. Pathology of organs of the urinary system, including infections of the urinary system, presently behaves to one of major problems of medical science and practice.

Aim. The object of work is analysis of the efficiency use automatic microbiological to the analyzer of VITEK 2COMPACT in modern laboratory diagnostics.

Materials and methods. It is inspected 40 patients with the infection of the urinary system, from that the first group (21 patient - students of institutions of higher learning of Kharkiv) was on stationary treatment in the separations of therapeutic profile of student municipal hospital of Kharkiv №20 .The second group made 19 patients, standards of urine of that were researching the laboratory of Synevo in Kyiv. Diagnostics of disease was conducted on the basis of totality of anamnestic and objective clinical data, laboratory-instrumental methods. Biological material for realization of microbiological research was urine.

Results and discussion. The results of our research defined the most wide's preadetiologic factors at pathology of organs of the urinary system: in 65 cases of infection of the urinary system a basic role belongs to the bacteria of family of Enterobacteriaceae, 15 cases representative of family Enterococcus, at 10 cases-this was the mixed flora, in 10 cases a etiological factors were to the bacterium of family Staphylococcus. Also as are salt of our research by means of microbiological to the analyzer of VITEK 2 Compact is set more wide urology landscape that folded in 50cases from the bacteria of family of Enterobacteriaceae, 15 cases - bacteria of sort of Enterococcus, those microorganisms(Kocuria of krisrinae ,S. Warneri, Candidacruseri) that it was impossible to educe the conservative methods of laboratory diagnostics were also identified.

Conclusion . Use of analyzer of VITEK 2 COMPACT in practice of doctor-microbiologist is perspective enough direction that, no doubt, allows to promote the labor of doctor productivity -laboratory assistant.

Section 11.
MODERN ASPECTS
OF PHARMACEUTICAL MICROBIOLOGY
AND IMMUNOLOGY

THE IMPORTANCE OF PREVENTIVE STUDIES IN THE ELIMINATION OF MENINGOCOCCAL INFECTION

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Introduction. Meningococcal meningitis is a bacterial form of meningitis, a serious infection that affects the shell of the brain. It can lead to severe brain damage, and in the absence of treatment in 50% of cases ends in a fatal outcome.

The causative agents of meningitis are a number of different bacteria. One of these bacteria, capable of causing major epidemics, is *Neisseria meningitidis*.

Aim. Study meningococcus background prevalence among different age groups of healthy individuals.

Materials and methods. The material for the study was mucus from the back wall of the nasopharynx. Detection meningococcus are performed by standard methods in accordance with the order of the Ministry of Health of Ukraine of 15.04.2005 № 170 "On Approval of guidelines on microbiological diagnosis of meningococcal infection and purulent bacterial meningitis."

Results and discussion. The prevalence of meningococcus among different age groups of healthy individuals, massiveness indicators of meningococcus and dominant serogroups pathogen, which are important components of epidemiological surveillance, prognosis and control of purulent meningococcal meningitis of bacterial etiology are analyzed by the example of Kharkiv region. It is noted that despite the decrease in the incidence, the total number of studies on meningococcus in the Kharkiv region over the past 2 years has increased by almost 30 % due to preventive researches and epidemiological indications. The share of preventive research amounted to 20% of the total. Among strains formed by groups in the laboratory of the region, meningococcus of serogroup B – 62,5 % are prevailed. Meningococcus strains that cannot be put into serogroup amounted to 16,7 % of all allocated. The study involved 200 healthy individuals (children and young people) who are in closed groups (specialized boarding schools) aged from 6 to 20, it was found that 2,5 % of them are carriers of *N. meningitidis*. The most vulnerable have turned to be children age 6 – 7 (1 % of carriers).

Conclusions. Thus, preventive studies are important for the detection of *N. meningitidis* carriers. This allows it possible to conduct timely sanitation and prevent the spread of infection.

BACTERIOPHAGES: THE PRESENT AND FUTURE

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Introduction. Bacteriophages are modern antimicrobials, which contain the viruses that infect bacteria. Each bacteriophage has almost absolute selective selectivity for one type of microorganism, so the effect of bacteriophages is strictly specific.

Aims. To review the educational materials published within recent years, which show the prospects of using bacteriophages for the diagnosis, treatment and prevention of infectious diseases.

Materials and methods. The analysis of the scientific materials and the results of the modern research in the field of the bacteriophages usage.

Results and discussions. During their history, bacteriophages have survived both a general interest in them in the era of their inception and almost complete oblivion within the 60-80 years. Nowadays the interest in phages has awakened again due to the growing number of microorganisms' resistant to antibiotics. Bacteriophage medications are used in the clinic along with the antibiotics for the treatment of infections caused by Klebsiella, Escherichia, Shigella, Pseudomonas, Streptococci, Staphylococcus, Proteus. Bacteriophages have shown themselves in the treatment of urological diseases, purulent processes in surgery, as well as in the treatment of infectious diseases of the intestines in newborn children. The advantages of bacteriophages lay in the fact that they do not cause side toxic and allergic reactions, have no contraindications, can be combined with any drugs, do not affect the normal human microflora.

The hypothesis of cancer cells destruction by bacteriophages has been described. It is possible to introduce a selected microorganism into the cancer cells (for example, staphylococcus), which could distinguish bacteriophages and, by multiplying in cells, cause their lysis, thereby killing the cancer cell. After the described mechanism, the bacteriophages are expected to be neutralized and the organism must be recovered.

Conclusions. Natural physiological mechanisms of the interaction of phages and bacteria allow predicting an infinite variety of both bacteriophages themselves and possible ways of their application. As the collections of bacteriophages expand, the spectrum of diseases in which phages can be used both in monotherapy mode and complex treatment regimens will expand.

INFECTIOUS DISEASES IN MOROCCO

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Climate change is affecting ecosystems and may have direct or indirect effects on human and animal health. Climate change also acts on viruses, bacteria or parasites pathogens, forcing a selection of populations better adapted to environmental conditions. Within a Moroccan perspective, the main health vulnerabilities to climate change include the following risk of reactivation of certain diseases sensitive to climate change, such as malaria, typhoid, leishmaniasis, dengue and cholera; possibility of reemergence of infectious diseases, vector-borne diseases as well as diseases and deaths related to extreme weather events, especially among the most vulnerable groups and increased water and food-borne diseases.

In Morocco, infectious diseases such leishmaniasis, malaria and schistosomiasis are still a public health problem and the situation may be more complicated in light of climate change despite the adoption of a domestic program to fight against these parasitic diseases. Currently, they are a federally reportable disease and the number of reported cases -indigenous and -imported is increasing. According to the Moroccan Ministry of Health, 2 086 cases of malaria were imported between 2005 and 2014. The risk of autochthonous malaria resumption is important in Morocco because of the possible presence of gametocytes carriers in the last malaria focus.

Leishmaniasis is a complex disease caused by *Leishmania* species and transmitted by a phlebotomine sand fly. Two forms are known, cutaneous and visceral leishmaniasis. The main reservoirs are dogs for zoonotic visceral leishmaniasis (ZVL), rodents for zoonotic cutaneous leishmaniasis (ZCL) and human for anthroponotic cutaneous leishmaniasis (ACL). Actually, three parasite species co-exist in Morocco. *Leishmania infantum* causes mainly ZVL and is transmitted by species of the subgenus *Larroussius*. It is widespread in the whole country and is more frequent in its northern part. *Leishmania infantum* can cause CL as well even if it is a rare condition with a few sporadic cases in the North of the country (especially in Sidi Kacem Province) with little epidemiological data available. Malaria is a mosquito-borne infectious disease caused protozoans of the genus *Plasmodium* and is transmitted by female mosquito vectors of the *Anopheles* species. The cycle of *Plasmodium* is carried out in several stages which spread between mosquitoes and humans. Malaria raged in Morocco for centuries and was an endemic disease in the majority of provinces. In 1960, a domestic program to fight the disease was launched.

It allowed to control the situation after 40 years of bitter struggle. By 1999, malaria was occurring as sporadic cases of *Plasmodium vivax* in some residual foci in the north. The epidemiological assessment undertaken by the Moroccan Ministry of Health showed a shift towards the elimination of indigenous cases and the last indigenous case was reported in 2004. Malaria is now certified free in Morocco by World Health Organization but imported cases are reported constantly. Schistosomiasis is a disease caused by parasitic worms belonging to the class of trematodes and genus *Schistosoma*. The parasite develops successively in two hosts: mollusk and human. This parasite is commonly found in ponds, streams and irrigation canals, housed in freshwater mollusks, and infests humans through the skin via contact with contaminated water. In Morocco, the disease had spread in the oases in the south and along the southern side of the Atlas. The majority of cases have been filed in the Province of Tata, Chtouka, Taroudant, and Errachidia. In recent years, many *S. haematobium* foci are proved to be unstable and some even disappeared. However, creating large water supply for irrigation may lead to the onset of new foci.

In 2004 the minister of health announced that the country had eradicated a variety of childhood diseases, specifically diphtheria, polio, tetanus, and malaria, but other diseases continue to pose challenges. According to estimates for 2013, 21,000 people or approximately 0.16 percent of the population between the ages of 15 and 49 was infected with human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS). UNAIDS (Joined United Nations Programme on HIV/AIDS) have stated that around 270 000 people in the Middle East are currently living with HIV. Research from between 2001-2012 have shown that adults and children living with HIV had increased significantly by 73%. The predominant cause of HIV transmissions, are caused by the lack of knowledge and education to help prevent the likely spread. Treatment services are also lacking significantly in the Middle East to help treat the infection before passing in on. Research is showing that particularly in Morocco, 89% of HIV infections are amongst men having sexual intercourse with other men, female sex workers and shared contaminated needles. New research is revealing that Morocco's newest HIV infections are amongst females with three quarters receiving it from their husbands.

On march 2016, King Mohammed VI proceeded to the Military Instruction Hospital Mohammed V in Rabat, at the inauguration of the Virology Center for Infectious and Tropical Diseases. This center has mobilized investments in the order of 210 million dirhams. It is equipped with state-of-the-art equipment and is responsible for the diagnosis and treatment of infectious viral, bacterial, parasitic and mycotic diseases. It will also be responsible for the management of highly contagious diseases requiring confinement, including tropical pathologies and travel.

CONTACT LENSES: IS THERE A RISK DAMAGE?

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Introduction. Everyone can have a bad vision. This can be congenital, acquired (due to an accident, after surgery, a violation in the body) and hereditary. In order for a person to see better, an ophthalmologist appoints glasses, lenses and operations to replace the lens of the eye.

Aim. Comparative monitoring of conjunctival microbiocenosis in persons with normal vision and wearing contact lenses.

Materials and methods. Analysis of scientific literature and the results of advanced research in the field of medicine and pharmacology

Results and discussion. The microflora of the human eye is represented by saprophyte cultures of pneumococci and staphylococci, which are found in the conjunctival sac. Constantly present in the environment (in soil and dust), and representatives of the genus *Bacillus* (*Bac. subtilis*, *Bac. megatherium*, *Bac. mesentericus*, *Bac. perfringens*). On cleanliness conjunctival sac and the composition of the normal flora of the conjunctiva is influenced by a variety of factors: geographical area, time of year, the nature of production and the related purity of the air in the premises, the age of the individual, respect for the rules of personal hygiene, and others. When air is saturated with dust, the number of microbes inhabiting a normal conjunctiva increases significantly. The composition of the microflora is predominantly mixed in nature and is represented by two, three or more species of bacteria. Bacteriosis in urban and rural residents is different. In the first case, it is 49-55%, in the second - 58.3-57.3%.

Also affects the age factor on the ratio of the conjunctival flora. It is believed that the entry into the conjunctival sac of microorganisms such as *E. coli* and *Vibrio cholerae*, is due to violation of rules of personal hygiene. The microbial composition of the conjunctival sac can change even within a day. So, for example, in the morning after sleep, due to the stoppage of blinking at night, which plays a big role in the self-cleaning of the conjunctiva, it is much richer, and during the day the bacteria in the conjunctival sac can't be found at all.

When performing ophthalmic invasive procedures, the spectrum of

microflora often does not correspond to the microflora revealed several days before the operation, and the sterility of the mucous membrane of the eye is often violated. It is possible that in case of surgery on the eye in the conjunctival sac there will be a pathogenic microflora that is resistant to the antibacterial drug used to sanitize the conjunctiva based on the results of bacteriological studies performed in patients in the preoperative period.

On the conjunctiva of people wearing contact lenses, recorded a large concentration of microorganisms entering the eye from the eyelid skin compared with those with normal vision. The conjunctiva of the eye lens carrier detect obligate skin bacteria century (*Metilobacterium*, *Lactobacillus*, *Acinerobacter u Pseudomonas*) is 3 times more than those who do not use lenses. It has also been established that cultures of staphylococcus, which provokes the infection, are isolated from the conjunctiva of the contingent without eye problems.

Bacteriological examination of smears from the conjunctiva in 20 volunteers, of which 9 people regularly wore contact lenses found that users of lenses composition of the surface microflora eye was close to the age of the skin microflora, and the number of some bacteria exceeded the norm almost 3 times. Almost all surveyed who wore lenses, seeded bacteria of *Pseudomonas*, the ability to cause corneal ulcers. The researchers considered two main hypotheses: according to one, this is due to the touch of the fingers to the surface of the eye; On the second - a prolonged pressure of the lens on the eyeball leads to changes in local immunity.

Conclusions. These studies confirm the fact that the introduction of an object into the eye, even if it is a contact lens, is not such an inoffensive manipulation. If you need to wear contact lenses, you should follow the rules of hygiene and asepsis as much as possible, use one-day wearing lenses. The implementation of such rules will preserve the health of the eyes and prevent the occurrence of conjunctival diseases.

MICROBIOCENOSIS OF COSMETIC SNAILS: POSITIVE AND NEGATIVE ROLE FOR HEALTH

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Introduction. Today great popularity in medicine, namely in cosmetology poorly studied beings, such as snails or in other words slugs get. Scientists claim that these crumbs have appeared more than 500 million years ago. They can adapt to any environment, don't demand a lot of food. Application of snails arkhakhatina in cosmetology is the new and perspective direction of noninvasive therapy of age injuries of skin. One of shortcomings of this procedure is use of one individual of an arkhakhatina on several patients.

Aim. To define a range of bacterial microflora of snails arkhakhatina in dynamics when holding cosmetology procedures.

Materials and methods. Materials – secret samples from a sole of a snail: 1 – prior to a procedure and processing by boiled warm water; 2 – prior to a procedure, but with implementation of processing of a snail; 3 – right after the cosmetology procedure; 4 – on the expiration of 30 minutes after the procedure without additional processing by boiled water of a snail. It has been used transport the environment (Amies without coal), a t_ogl_kolyova the environment (TGS), an elektivno-salt agar (ESA), the blood agar (BA), Endo's agar, Olkenitsky's circle, Mueller-Hinton an agar, standard paper disks. When performing experience used officially dozvoleny techniques accepted in microbiological researches.

Results and discussion. Results of a research of cochleas cosmetic showed existence of the following microorganisms. Staphylococci are opportunistic organisms. In small amounts can be on mucosas and in internals. For life the quantity which doesn't exceed norm – 10⁵ microbial bodies (mb) is considered safe. Staphylococcus saprophyticus (10⁵ m of t.) – is the reason of such diseases of urinary tract as cystitis and an urethritis; Staphylococcus haemolyticus (10⁵ m of t.) – affects generally top airways, is the originator of an angina, pharyngitises, bronchitis and pneumonia. Therefore above the specified originators aren't dangerous at this cosmetology procedure.

Enterobacter agglomeras (10⁴ m of t.) – causes infectious diseases of kidneys and urinary tract (an acute pyelonephritis, an exacerbation of a chronic prostatitis), genitals and respiratory diseases. T m number. in the studied material exceeds norm. The following factors act as primary sources of this intrahospital infection: lack of high-quality sterilization of materials, not compliance beauty shop to norms and

standards, insufficient processing both rooms, and cochleas, non-compliance with their storage and leaving, etc.

Clostridium spp. (102 m of t.) – attracts a watery diarrhea and fever. Clostridia participate in protein processing, a processing product

such substances as indole are and I have rolled – the known poisons. However their quantity in this experiment is an admissible norm.

The assessment of sensitivity of microbes to antibiotics is the major laboratory indicator which allows to prognosticate efficiency of antibacterial therapy, and also to use it as weed a marker for identification of sources of a becoming infected and ways of distribution refractory strains for diagnostics of intrahospital infections.

According to the received results (prior to a procedure and processing warm boiled water and right after the cosmetology procedure) has established stability of the isolated cultures to the following medicines: Ampicillin, Cefazolin, Cefalexin, Lincomycin and Erythromycin. Sensitivity of the marked-out cultures to Gentamitsin, Streptomitsin, Ofloksatsin, Tsiprofloksatsin, Levofloksatsin, Gatifloksatsina, Oksitetratsiklin, Doksitsiklin is revealed. To a number of medicines which caused a growth inhibition of bacterial microflora at the beginning of the experiment and have gained stability on completion of an experiment, the carried Tseftriakson, Azitromitsin, Chloramphenicol, Hlorgeksidin, Dioksidin.

Slime of cochleas contains a collagen, an elastin, an allantoin, natural antibiotics, amino acids, vitamins A, With and E. This substance saves from an acne eruption, an acne, warts and a nevus pigmentosus. But, unfortunately, after presence of enterobakteriya at the values exceeding norm proves a harmfulness snail therapy . Existence in samples of group of intestinal infections shows that a cochlea I crept on soil, containing the remains of excrements. Other bacteria (on a skin infected with bacteria) the person which also are dangerous could kontam_nuvat of a cochlea after the session. This fact proves that it a cochlea has to be used at a time, or be is assigned to one patient.

Conclusions. So, snails cosmetic is means for face care, have the rejuvenating, regenerating, strong antioxidant properties, and also antibacterial. Though it is rather on the contrary, after the data read above. Before this procedure, it is necessary to think, what is more important: beauty or health, but it solves everyone independently. If your desire to have beautiful and well-groomed skin stronger, than our facts about danger of use arkhakhatina , then our recommendations following: to visit the checked beauty shops (which have the corresponding licenses and permissions to implementation of cosmetic procedures), to control work of the doctor, to be interested about places of stay of snails and correctness of care of them, and the most important before the procedure to consult with the cosmetologist, and if necessary to carry out test control on the small site of the skin.

MICROBIOLOGICAL RESEARCH: NECESSITY AND BIOSAFETY

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Introduction. Microbiology as a science, including, including, the issues of biotechnology, develops rapidly, covering various areas of human life. The process of developing scientific knowledge determines, first of all, the problems that specialists face on a daily basis. As a result, the emergence of new problems confronts scientists around the world with major tasks in finding solutions to problematic issues. Among the main areas of microbiological research should be called the development of vaccines, eubiotics, antimicrobials, preservatives and much more. Given all the above and the intervention levels, biosafety issues are at the forefront.

Aim. Analyze the literature data published in recent years, revealing the issues of biological safety in the conduct of scientific research.

Materials and methods. Analysis of the scientific literature and the results of modern research in the field of safety of carrying out biological research and evaluating the medical, environmental and social consequences of the use of new technologies.

Results and discussion. The level of modern research, including microbiological ones, is associated with a high biorisk. So, according to statistics, over the past 70 years, more than 5,400 laboratory accidents, more than 100 incidents of biological pathogens entering the environment from biotechnological productions, have been registered. In the history of human development, biocatastrophes were recorded in the form of pandemics of plague, epidemics of cholera, smallpox, typhoid, etc. Today, the risk of developing a biological disaster is preserved and includes accidents at biological plants, military research institutes, the implementation of environmentally hazardous man-made works (mining of fossils, exploration of the Far North, excavation, which leads to the extraction of ancient bacteria), natural disasters leading to outbreaks of infectious diseases.

Microbiological research aimed at selection and selection of antibiotic-resistant pathogenic and conditionally pathogenic microorganisms, the creation of antimicrobial drugs based on nanoparts, and genetically engineered technologies for the development of new generation drugs and cosmetics are of particular interest in this regard.

Conclusions. A high level of biological risks when working with pathogenic agents causes the obligation to ensure biosafety when working in microbiological laboratories and industries.

FEATURES VAGINA MICROBIOTA WOMEN WITH INFLAMMATORY DISEASES OF THE URINARY TRACT

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Introduction. Inflammatory diseases of the urinary tract of women can be caused by both pathogens, sexually transmitted diseases and opportunistic microflora. In today's world, an increase in the incidence of which is associated with opportunistic microorganisms. Therefore regular monitoring of microbiological pathogens opportunistic infections remains relevant.

Aim. To study the characteristics of vaginal microbiota of women of reproductive age with inflammatory diseases of the urinary tract, which were caused by pathogens opportunistic infections with sensitivity remote definition of microorganisms to antibiotics of different groups.

Materials and methods. Investigated biological material (excretion from the urethra, cervix, vagina, urine) 75 patients, who were hospitalized in STI department with the inflammatory diseases of the urinary tract. Methods: bacteriological, disco-diffusion.

Results. As a result of bacteriological research laboratory was seized 98 strains that were assigned to 8 genera. The lack of growth was identified in 11.2% samples of clinical material. In 62.5% of cases were highlighted aerobic gram-positive cocci (Staphylococcus, Streptococcus, Enterococcus, Micrococcus) microflora, 23.9% – gram-negative rod-shaped bacteria (representatives of Enterobacteriaceae, Pseudomonadaceae). In other samples (13.6%) was found rod-shaped gram-positive microflora (non-pathogenic members of the genus Corynebacterium) and mushrooms genus Candida. It was determined the prevalence of staphylococcal component of vaginal habitat (32 strains – 32.7%). Most often allocated coagulase-negative the genus. The second position in the structure microbiocenosis occupied by representatives of the family Enterobacteriaceae (23 laboratory strains - 22.8%). In analyzing the species composition established dominance *E. coli*, *Klebsiella* species. Determination of the sensitivity remote laboratory strains of Staphylococcus showed a high frequency of resistance to benzylpenicillin, doxycycline and lincomycin. Sensitivity laboratory strains of Enterobacteriaceae high to ciprofloxacin, doxycycline, chloramphenicol. Sensitivity to cephalosporins III generation amounted to an average of 55.7%.

Conclusions. Therapy vulvovaginitis, caused by opportunistic pathogens, must be made individually based on the results determine the sensitivity of aerobic microorganisms to antibiotics, drugs of choice can serve as ceftriaxone and quinolones, which observed the highest sensitivity opportunistic agents.

FUNGI AS A SOURCE OF PHARMACEUTICAL RAW MATERIALS AND MODEL OBJECTS IN BIOTECHNOLOGY

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Introduction. In ancient times, there was a tendency to perceive fungi as a panacea. Some species were used in medicine due to their external signs (magic of similarity), rather than the presence of active substances. Fungotherapy - the science of mushroom treatment - originated about 5000 years ago and is preserved in the modern world. Very often, medical and food use of fungi is combined, and the same species is cultivated both as food and as medicinal.

Aim. Study of scientific literature on microbiological and pharmaceutical aspects of biologically active substances from fungi.

Materials and methods. Various information sources of Internet system, interlibrary loan and scientific library were used. An analysis of the pharmacological substances from fungi with antimicrobial antitumor and immunomodulation activity.

Results and conclusions. The following types of effects and prospects for the use of fungi are shown: immunomodulatory activity; anti-inflammatory activity; antitumor activity; antiviral activity (including, against HIV); antibiotic activity against fungi and bacteria, as well as protozoa; toning action; in the treatment of Alzheimer's syndrome; as a supplements, a source of antioxidants and vitamin precursors.

In the medicinal properties of fungi contribute both any chemical compounds: polysaccharides, proteins, lipids, terpenoids, polyketides, alkaloids and intermediate compounds of protein synthesis. These substances are both primary, as well as secondary (not associated with growth, development and reproduction) metabolism. Bazidial macromycetes can have application as tonic, immunomodulating and anticancer agents, as well as antiviral and antimicrobial, but the active principle is not always known.

The active substances of macromycetes are the structural polysaccharides of fungi contained in the cell wall. These are various glycans, predominantly beta-glycans, as well as glycoproteins acting on the human immune response and suppressing (indirectly or directly) the growth and development of cancer cells, affecting apoptosis and gene expression.

In addition, terpenoid compounds (a class of hydrocarbons - biosynthetic products of the general formula $(C_5H_8)_n$, with a carbon skeleton formally derived from isoprene, inhibiting the growth of tumors can be used.

Anticancer activity due mainly to structural polysaccharides, it was reliably detected and studied in 28 species of fungi, mainly basidial (Zhang et al., 2007). Peptides and other compounds also have activity. Gregory, 1966: active compounds are known from fruit bodies of more than 200 species and from 7000 samples of culture fluid when immersed in culture. The main ways of action: strengthening the body's immune response (the predominant type of beta-glucans influence); direct exposure to cancer cells (De Silva et al., 2012). The most promising species of fungi are *Schizophyllum commune*, *Lentinula edodes*, *Ganoderma lucidum*, *Grifola frondosa*, *Trametes versicolor*.

Demonstration of the effect: prevention of carcinogenesis (in Japanese villagers, constantly consuming winter fungus, *Flammulina velutipes*, as well as the Brazilians who fed *Agaricus blazei*, the cancer mortality was 40% lower than. On average in the region's population, was subsequently confirmed by experiments with the induction of cancer in mice. Increased immune response (inhibition of tumor growth); direct activity that causes apoptosis of cancer cells (in general, the effect on cell culture in vitro has unclear mechanisms, but in some cases the effect of stopping the cell cycle and stimulating apoptosis, including at the level of gene expression) is shown. Lentinan is a glucan used since 1985 in Japan for the treatment of stomach cancer. Lentinex is a food supplement.

Micromycetes from Ascomycetes are recognized producers of antibiotics that suppress the development of Gram-negative and Gram-positive bacteria, Fungal antibiotics were in their heyday in the so-called "fungi". "The era of antibiotics", the second surge of interest in them began in the last years of the XX century. And is observed now.

The first survey of fungal antibiotics was made by G. Flory (Florey, 1949) and included more than 2000 species of fungi. The chemical groups of beta-lactam, terpenoid, furan, and other fungal antibiotics. Cephalosporins are the most commonly used antibiotics, to the present moment 5 generations have been known. Discovered in 1948 by Giuseppe Brotz, who showed the activity of cultures against the causative agent of typhus. More than 10,000 β -lactam antibiotics are now known, but semisynthetic ones predominate. In medicine, about 70 preparations are used.

Fuzidine is similar in structure with steroid hormones and cholesterol. Effects on Gram-positive bacteria, including those resistant to penicillins. Relatively non-toxic, although allergic reactions are known. It is used mainly for the treatment of bronchitis and skin diseases.

Griseofulvin is result of action on mycelial fungi. Dermatophytes (disturbance of mitosis, protein synthesis and formation of the cell wall due to influence on the cytoskeleton). It has no acute toxicity, a selective effect on the division of tumor cells is shown.

MONITORING OF MULTIDRUG RESISTANCE STRAINS MRSA

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Introduction. MRSA – is any strain of *Staphylococcus aureus* that has developed, through horizontal gene transfer and natural selection, multi-resistance to beta-lactam antibiotics, which include the penicillins (methicillin, dicloxacillin, nafcillin, oxacillin, etc.) and the cephalosporins. The circulation of MRSA in the last 10 years is increasing rapidly not only in the EU and America, but all over the world because of uncontrolled use of antibiotics.

Aim. Install polyresistance strains of MRSA isolated from the nasopharynx of clinically healthy population.

Materials and methods. Material for the study consists of 24 sample of biological material from the nasopharynx from clinically healthy population. Used transport medium (Amies without charcoal), topolo environment (TGS), elective-salt agar (ESA), blood agar (KA), Wednesday Altnickol, Mueller-Hinton agar, standard paper discs. The studies were conducted using laboratory (microbiological) methods of research, in accordance with the orders and guidelines of the MOH of Ukraine on the basis of research laboratory of microbiological and immunological research at the Department of Microbiology, Virology and immunology National University of pharmacy

Results and discussion. The result of this work revealed the following: there is a dependence of the resistance of MRSA to other antibiotics, relative to methicillin. If the percentage rezistentnosti great to methicillin, and other antibiotics (Amoxicillin, Amoxiclav, Ampicillin, Cephalexin, Cefepime, Streptomycin, Lincomycin, Clindamycin, Erythromycin, Ciprofloxacin, Gatifloxacin, Chloramphenicol, Nifuroxazide, Chlorhexidine, Dioxidine) she rises, too. But if there is sensitivity to oxacillin to other antibiotics *Staphylococcus aureus* is also sensitive (Amoxicillin, Amoxiclav, Cefazolin, Ceftriaxone, Cephalexin, Cefepime, Gentamicin, Streptomycin, Tobramycin, Azithromycin, Clindamycin, Erythromycin, Ofloxacin, Levofloxacin, Gatifloxacin, Doxycycline, Chloramphenicol) but not for all antibiotics (Ampicillin, Lincomycin, Oxytetracycline, Nifuroxazide, Chlorhexidine, Dioxidine). Sensitivity to certain antibiotics is saved in both cases. Also in this work, we can say that at this point in time, MRSA is especially dangerous to the hospital and nosocomial infections, in a large risk are small children, as they can use only a small number of existing drugs.

Conclusions. Unfortunately, the problem of antibiotic resistance cannot be overcome, it only can be controlled. To overcome this problem, there are complex methods, but first we need to ban the uncontrolled use of antibiotics and misuse of antibiotics in the treatment of viral and fungal infections.

EPIDEMIOLOGICAL CLINICAL AND LABORATORY CHARACTERISTICS OF SALMONELLOSIS

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Introduction. Among acute infectious lesions of the digestive system such diseases as salmonellosis and food poisoning occupy a large portion. Nowadays salmonellosis is one of the most common antropozoonosis in developed countries. Morbidity tends to increase, especially in large cities with centralized food supply. Important role belongs to social factors relevant for Ukraine - expanding catering, violation of technology of preparation and storage of food products, non-compliance with personal hygiene, poor sanitary culture among certain population groups. Salmonella, introduced in the body, in some cases, cause poisoning, in others – generalized infection. Bacteria carrying is diagnosed by bacteriological and serological studies in the absence of clinical symptoms.

There are several variants for salmonella carrying – acute or convalescent, chronic and transient bacterial excretion.

Aim. Provide comparative characteristic of methods of salmonellosis laboratory diagnosis.

Materials and methods. Analysis of scientific literature and the results of advanced research in medicine and pharmacology.

Results and discussion. Laboratory diagnosis is critical in the diagnosis of salmonella, especially in sporadic cases. Bacteriological study involve patient's stool, vomiting, gastric washings, blood, urine, bile, remains of suspicious products, in some cases, punctate material form abscesses, cerebral spinal fluid. Material sampling should be performed at the early stages and before etiotropic treatment.

Test for Salmonella antigen CITO TEST Salmonella (Pharmasco), immunoassay method for detection of Salmonella pathogens (S. Typhi, S. Typhimurium, S. Enteritidis) in human stool samples, is highly sensitive test that allows fast diagnosis. Serological methods include agglutination assay and indirect hemagglutination and special reaction of determination of antigens in biological fluids. Diagnostic increase of antibody titer is 4 times or more. Indirect hemagglutination is more sensitive and provides positive results an average after

the 5th day of disease.

In recent years, in order to diagnose infectious diseases so-called rapid tests for etiologic determination are used. They are quite easy to use diagnostic kits that allow us to obtain results within 5-10 minutes. They are an alternative to classical diagnostic test systems use. These tests become important in case of necessity to obtain quick and inexpensive result.

During testing Salmonella antigens contained in a sample of clinical material interact with red latex microspheres which were previously deposited and dried on test membrane.

Then mixture migrates along the membrane by capillary forces. In case of a positive result the specific antibodies in the test region of the membrane capture the complex conjugate antigen, forming a sandwich: AG-conjugate fixed antibodies which turns test line in red.

The mixture continues to move forward in the direction of the control line, where excess monoclonal antibodies to Salmonella interact with secondary antibodies, staining line in green.

The presence of a control line confirms that sufficient volume is added and membrane capillaries are filled as well as it is internal quality control for reagents. In the absence of Salmonella in a sample of clinical material conjugate antibody binds only to the control line, forming only one green line.

Conclusions. Salmonellosis, especially in spreading epidemic, has great economic loss, can trigger the emergence or worsening of chronic diseases, and in severe cases – lead to the patient death. Prevention: veterinary and sanitary supervision of slaughter cattle, monitoring of preparation and storage of meat, dairy products and eggs. Convalescents are to be discharged from the hospital after full clinical recovery and double bacteriological study of feces with negative results.

MICROBIOLOGICAL EXAMINATION OF DAIRY PRODUCTS OF UKRAINIAN PRODUCTION

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Introduction. Dairy products are important in human nutrition through dietary and medicinal properties, pleasant taste, easy digestibility. Dairy products, among which occupy a prominent position yogurt, fermented milk produced pure cultures of lactic bacteria thus formed is dense, homogeneous blob of yogurt pronounced taste.

In the production of some dairy products used for food, flavor and aroma substances that increase their nutritional value, but at the same time can influence the microbiological composition of the product and change its useful properties. Due to the extensive use of dairy products microbiological research in their composition of microorganisms that do not relate to specific cultures of lactic acid producers have considerable theoretical and practical importance. However, the search for such data in the available scientific literature showed fragmentation that information on various dairy products production. According to current technological standards and technological conditions using modern manufacturers, microbiological food containing of specific microflora (lactic culture) is optional. However, the experimental results indicate significant microbial contamination dairy products useful properties are widely advertised, mesophilic microorganisms, which are the type of breathing culture have nothing to do with lactic acid bacteria and are either saprophytic or potentially pathogenic.

Aim. The work consisted of two parts: theoretical and experimental. Conducted self-study of scientific literature in the field of basic microflora and related dairy products, allowing the algorithm to justify experimental studies in this area. For this aim, made following objectives: 1) the theoretical literature review concerning microbiological composition of dairy products; 2) the comparative microbiological studies of 10 samples of dairy products produced domestically; 3) experimentally studied the morphological characteristics of the microorganisms in microscopic preparations of the samples of dairy products; 4) conducted microbiological research samples of dairy products by a number of bacteria and micromycetes; 5) receive cultural characteristics of the description obtained colonies and growth in dense medium – nutrient agar and Saburo media and Endo media.

Materials and methods. The objects for research were 10 samples of dairy products of Ukrainian manufacturing. To perform the tasks used microbiological methods, including using light microscopy using immersion system increase, the

method of production of microscopic preparations from thermal fixation method Gram staining, a mechanical method of isolation of pure cultures of microorganisms - depleting stroke and methods of microbial contamination by direct seeding.

For the study of physical and chemical properties of samples of dairy products a uniformity of texture, viscosity and degree of transparency in the method of visual observation and study of the organoleptic properties of samples of dairy products, color, taste and smell held performer in direct contact with the samples.

Results and conclusions. Past physical, chemical and organoleptic study samples of dairy drinks showed similar characteristics: opacity, dense, uniform soft texture, color variations from white to pink, typical cheese and sweet varying degrees.

Conducted microbiological research representative's transient microorganisms in samples of dairy products produced domestically. Microscopic study and in vitro bacteriological samples fermented beverages demonstrated significant multitude of gram-positive and gram-negative bacteria in various morphological characteristics that are universal growth in nutrient media in the presence of oxygen and do not require special conditions for cultivation.

Microbiological examination of samples of dairy products showed significant morphological diversity and multiplicity of microorganisms, the type of metabolism, ability and character growth on nutrient media not related to the lactic acid bacteria and not part of the dairy starters.

Thus, studies have shown the presence in all samples of dairy products "transit" additional microflora, which does not apply to producers of dairy products.

In terms of compliance with sanitary and hygienic standards of production research our results total mesophilic aerobic and facultative anaerobic microorganisms in samples of particular importance given the fact that the production of milk products in accordance with the manufacturers designed by different conditions.

Experimental microbiological study of samples of yogurt different manufacturers have demonstrated a significant level of microbial contamination of some of them aerobic and facultative anaerobic microorganisms that morphological and cultural features not related to the strains of lactic cultures-producers. The results are promising base for further research in this area as yogurt products are widely use as consideration of such issues attracted the attention of the public and professionals in this area to address the urgent problem of increasing food quality.

This work also has a social aspect, since the consideration of such issues attracted the attention of the public and professionals in this area to address the pressing problem of increasing food quality. The data can be considered in nutrition, the development of algorithms function fore-specific food groups and should bear in mind those skilled in technology and health care to food containing lactic acid bacteria.

INFECTIOUS MONONUCLEOSIS IN CHILDREN OF THE CITY OF DOBROPOLYE, DONETSK REGION

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Introduction. Infectious mononucleosis is an acute viral disease caused by a herpesvirus Epstein — Barr type IV (EBV), that mainly affects B-lymphocytes, which is the reason for the change in impostership bodies. Bodies which affects the mononucleosis of the liver, spleen, all lymph nodes, tonsils. A feature of the EBV virus is that it, unlike other herpes viruses do not destroy target cells, but rather stimulates their formation. Infectious mononucleosis in the acute form are mostly children and young adults. Adults and children who develop chronic EBV infection (about 98% of the adult population of Ukraine and other countries), will never fall ill in an acute form. Virus stands out with saliva, through blood transfusion and bone marrow transplantation. Detect EBV in saliva of HIV-positive healthy people and a quarter of them, he is released from the saliva almost constantly.

Aim. In the Donetsk region annually registered cases of infectious mononucleosis. The clinical manifestations of this disease is very variable, known atypical and erased form. In this regard, detection of infectious mononucleosis it is important to prevent the spread of the disease.

Materials and methods. Material for study – blood, saliva. Methods of diagnosis: hemograms – to check for the presence of specific cells – mononuclear cells; PCR to detect viral DNA in whole blood and serum; serodiagnosis – detection of specific antigens: the capsid (VCA), nuclear (EBNA), early (EA) and membrane (MA). The analysis of statistical studies.

Results and discussion. The studies were conducted in Dobropolye city district of the branch of the State institution "Donetsk regional laboratory center of State sanitary and epidemiological service of Ukraine". Among applicants for medical assistance patients, infectious mononucleosis acute diagnosed: children up to four years – 36% in children 5-15 years – 25%. The analysis of statistical data for the last five years has been carried out. Among other infectious diseases, acute mononucleosis in children in Dobropolye occupies the fourth place after acute respiratory infections, acute intestinal infections, chicken pox. In addition, the number of cases of sickness increased by 10,2%, which indicates a decrease in immunity among children.

Conclusions. The disease infectious mononucleosis has important role in the overall infectious morbidity of children population and is one of the leading causes of hospitalization children. The course of infectious mononucleosis in children retains the typical clinical signs, however, more than a third of patients do not exist in the blood atypical mononuclear cells. The disease leads to secondary immunodeficiency on the background which can cause complications such as angina, otitis and pneumonia.

TUBERCULOSIS IN EGYPT

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M. tuberculosis (Koch's rod) - the type of mycobacteria causing tuberculosis in the person in 92% of cases. The bacterium was opened in 1882 by Robert Koch. The mycobacteria of bovis cause tuberculosis both in cattle, and in the person. The main ways of spreading of *M. tuberculosis* are aerogenic (main), nutritional, through the damaged skin or mucosal and through a placenta. Bovine tuberculosis (TB) can be transmitted by consuming unpasteurized dairy products from infected cattle.

Any person can infect tuberculosis, but some factors enlarge risk of infection: the weakened immunity, some diseases and drugs weakening immune system, a bad delivery, early or advanced age, regional distribution, poverty and an alcohol abuse and narcotics, smoking.

Tuberculosis (TB) is endemic in Egypt. 10 more years ago the Egypt had a TB case rate of 20/100K or more. When assessing the epidemiological situation, we use the main statistical indicators - incidence, morbidity, mortality, and est. Incidence - the number of persons, for the first time the patients with tuberculosis within a year, on 100 thousand populations. Morbidity - quantity having tuberculosis on 100 thousand population found and registered on the end of the year. Mortality - the number of the dead from tuberculosis within a year on 100 thousand populations. Contamination - the part of the persons which are positively reacting on tuberculin during diagnostic, expressed as a percentage.

Measures to combat tuberculosis, developed by the Egyptian Ministry of Health, have proved effective. This conclusion was reached by experts of the World Health Organization, which recently included Egypt in the list of countries with a low incidence of tuberculosis. According to the latest statistics, an average of 100 thousand Egyptians is 26 cases of tuberculosis, this figure in the near future are planning to reduce almost threefold. The strategy for combating the disease includes mass vaccination of the population, equipping hospitals with modern equipment and providing preferential assistance to citizens who are unable to pay for a course of medical treatment.

DOTS. Now WHO lays great hopes on introduction of the new technology of identification and treatment of tuberculosis called DOTS (Directly Observed Treatment Short-course) providing strictly controlled treatment by rather short course of chemotherapy.

**THEORETICAL JUSTIFICATION OF FORMULATION
AND EXPERIMENTAL EVALUATION OF ANTIVIRAL ACTIVITY
OF SOME COMPONENTS OF A COMPLEX NASAL DRUG
BY *IN VITRO* AND *IN VIVO* METHODS**

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Introduction. Currently, limited number of active substances for etiotropic and symptomatic treatment of ARVI are available, especially those for local administration.

The **aim** is conducted a preliminary *in vitro* and *in vivo* study of interferon induction and antiviral activity of para-aminobenzoic acid (PABA), ϵ -aminocaproic acid (ACA) and their mixtures against influenza virus.

Materials and methods. For *in vitro* study of anti-influenza activity of PABA, ACA and their mixture we used 24-hour passed culture of MDCK cells, test-strain influenza virus A/FM/1/47 (H₁N₁), with infected titer in MDCK cell culture – 3.0 – 9.0 lgID₅₀.

For *in vivo* study of interferon induction, we used outbred white mice which were administered intraperitoneally PABA solutions at various doses.

Interferon activity in mouse serum was determined by a standard technique suppressing cytopathic effect of vesicular stomatitis virus on mouse passed lymphoma cells culture (OH-1), virus test-strain Indiana.

Results and discussion. In our *in vitro* studies we found lower value concentrations of test substances with antiviral activity. For example, for PABA, it is $C=0.00781$ mcg/ml (lgID₅₀/lgID₀=4.0/9.0), for PABA+ACA, it is $C=0.62$ mcg/ml (with the ratio of components 1:100 and lgID₅₀/lgID₀=5.0/9.0), and for ACA, it is $C=0.78$ mcg/ml (lgID₅₀/lgID₀=3.0/6.0). In addition, mixture of PABA+ACA demonstrates synergetic effect of antiviral activity.

Conclusions. In our *in vivo* studies we found a dependence of interferon activity in blood serum of mice on time and dose of PABA.

At the same time, maximum level interferon activity in mouse serum was seen in 24 hours after administration of PABA.

Accordingly to our initial *in vitro* and *in vivo* studies we have shown to be promising for further research and development of complex nasal compositions with antiviral activity.

TYPES OF INFECTION IN A COSMETOLOGICAL SALON IF THE ASEPTIC ARE NOT RESPECTED

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Introduction. The development of beauty parlors is growing every year, but are the rules of disinfection observed in each of the salons? If the cosmetologist does not follow the rules of disinfection, then there is a contamination of the skin, which leads to serious illnesses. Afterwards, more infection occurs in cosmetological rooms and beauty parlors and Ukraine is no exception.

Aim. Monitoring risks of infection contingent at cosmetological procedures in terms salons beauty.

Materials and methods. Analysis of the scientific literature and the results of advanced research in the field of medicine and pharmacology.

Results and discussion. The most common problem of salon infections is the Fungus. When doing a manicure or a pedicure, you can pick up the Fungus through an unsterilized nail file, a not very clean towel, a wet floor or a poorly sanitized bath. Treatment of Fungus is a complex and long process. Fungal nail infections are extremely common throughout the world. According to statistics, from 10 to 25 % of Ukrainians suffer from this infectious disease.

The next in the list of infections is Herpes. For infection, it is enough that the virus with a drop of blood settles on the instruments and passes into the body of the next client through a scratch on his skin. Herpes can be earned during the following procedures: manicure and pedicure, mesotherapy or face cleansing, using tools. Such treatment should be carried out not with alcohol solutions, but in a special portable autoclave, which every self-respecting salon should have. In addition, during all cosmetic procedures: tattooing, facial cleansing, piercing – the master should be wearing disposable gloves.

In third place in the list of prevalence – Staphylococcal infection. It can be infected not only in the cosmetic room, but also in the hairdresser. This disease manifests itself on the skin of the head with small pustules. When infection with staphylococcal infection during dermatologic cleansing, such a rash appears on the face. In addition to Hepatitis C, which in itself is a very serious disease, when you apply the tattoo you can get 22 diseases: Tetanus, Hepatitis B, Tuberculosis, AIDS, etc. The source of danger can be not only needles, but even the hands of the master. Bacteria of *Staphylococcus aureus* cause a number of dangerous purulent skin diseases: boils, abscesses, phlegmon.

The term "Hepatitis" unites a number of acute and chronic inflammatory diseases of the liver, but in the beauty salon it is most likely to meet its forms, transmitted instrumentally: Hepatitis B, C and D.

Can customs get HIV during the procedure? The answer is positive: the wound with the instrument on which the blood of the infected person is left promises a disappointing prognosis. But it should be remembered that the HIV virus quickly perishes – for this it is enough for 30 minutes. At the risk of HIV infection are fans of express manicure, where the masters often do not have time to properly process their belongings.

To avoid infection in the cosmetology room, the beautician should follow the rules of disinfection or use disposable instruments. In order to minimize this, it is recommended that local exhaust ventilation systems are installed near work stations so that vapors, dust, and chemical particles are trapped and expelled from the workplace.

Stages of processing tools: Stage 1. Disinfection - disinfection of environmental objects from pathogenic Microorganisms. Stage 2. Pre-sterilization cleaning (PSO) - mechanical removal from tools. Stage 3. Sterilization is the complete destruction of the vegetative forms. A) Chemical - 8% of the solution of Lysophormina 3000, heated once to 50 degrees, exposure - 1 hour, is used once. The tool is washed under running water, dried and stored in UV-Sterilizer (to maintain sterility). B) Physical: glasperlene sterilizer (ball): at a temperature of 220-230 degrees for 15 Seconds, only the working surface of the instrument is processed; shuffle cabinet: the temperature is 180 degrees for 1 hour.

Conclusions. It is very important to maintain personal hygiene in beauty shops. This is because salons are accessible to all and sundry and the salon equipments are used by all. So, make sure your therapist or the beautician is clean and has maintained hygiene in the beauty shop. Cleanliness is a must in the beauty shops. This will minimize the chances of picking up infection from the parlors. Absolutely safe cosmetic procedures simply do not exist. Even the good old trimmed manicure is associated with a breach of the integrity of the skin, which means it can lead to infection. Caution should be applied to procedures with mandatory preliminary preparation of the skin: phototherapy, fractional rejuvenation, RF-lifting and medial peelings. Before these methods, it is necessary to conduct dermal hydration procedures to ensure a period of adequate rehabilitation without consequences. Cosmetic procedures can be considered safe if they are performed by an experienced cosmetologist. The success of the procedure depends not only on the professionalism and conscientiousness of the cosmetologist, but also on the drugs that he uses for the procedure. The composition of the drugs used can include anything: bacteria, viruses, fungi, mycobacteria that cause tuberculosis.

ANTIBIOTICS: THE SEARCH FOR NEW TARGETS

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Introduction. Antibiotics are the main group of drugs for the etiotropic treatment of infections. The multiple drug resistance of pathogens significantly reduces the effectiveness of therapy of infectious diseases. The traditional way to combat the problem is to develop new antibiotics that can destroy resistant mutants.

But at the modern time new antibiotics are structural analogues of existing chemical structural groups. The therapeutically significant resistance of bacteria to existing antibiotics has reached such a level that only the emergence of completely new antimicrobial agents can resolve the situation. Therefore, the search for new targets for antibiotics in a microbial cell is an urgent task of modern pharmacy.

Aim. Study of scientific literature on microbiological and pharmaceutical aspects of the search for new targets for antibiotics.

Materials and methods. Various information sources of Internet system, interlibrary loan and scientific library were used. An analysis of the ways of improving antibiotic therapy and creating fundamentally new groups of antibiotics.

Results and conclusions. The methods used in medicine for the development of bactericidal preparations are based on the identification of natural and synthetic compounds that affect actively dividing cells of microorganisms (staying in the logarithmic phase), as well as modifications of existing ones. For the production of analogues, natural base structures are used, such as 6-aminopenicillanic acid, the base of amoxicillin. Combined bactericidal agents, such as co-amoxiclav (complex of amoxicillin and clavulanic acid) are developed to suppress drug resistance.

The creation of derivatives of existing drugs is the most productive way of developing new antibacterial agents. New drugs are obtained and by artificial connection of components. To create new antibiotics, screening of compounds with enzymes or whole cells that are capable of disturbing the regulation of microbial RNA is also used.

The development of structural and functional genomics and the decoding of genomes of the main causative agents of human infectious diseases made it possible to identify potentially new targets in a microbial cell. It is known that the cell target can be a ligand-receptor, an enzyme or a certain pathway of metabolism. The main condition for using a new target of the pathogen is its absence in the human body, and this condition has proved very difficult to implement.

New targets for inhibitors in a bacterial cell can in principle be those that are

synthesized only in the infectious process and whose functions are realized only in vivo. Identification and study of such targets at the molecular level are possible with the help of such screening systems, where the genes encoding these targets are expressed in vitro. It is in vitro that infectious properties and the ability to survive in a human organism should be demonstrated. Scientists have developed a new technique for searching for new cellular targets - "In vivo gene expression technology" (IVET) with which it is possible to control precisely those genes that are selectively expressed in infection. Are induced in the pathogen only in vivo. In this way, the genes for the synthesis of some lipopolysaccharides expressed in vivo and not previously described, genes encoding the structure of enzymes that destroy the pathogen-toxic metabolites of the host, etc., were detected in this way.

Paradoxically, it is a fact: for twenty years of development in this direction, at the present time in medical practice there are no antimicrobial drugs created on the basis of genomics. This is primarily due to the fact that the defeat of the target does not always cause adequate bactericidal action, and the process of converting the resulting compound into a drug is quite complex and time-consuming. For example, with the help of genomics, deformylase was discovered, to suppress the action of which inhibitors that participated in clinical trials were developed. Deformylase is an enzyme that catalyzes the cleavage of formyl methionine from the newly synthesized polypeptide chain in prokaryotes. However, it was noted that the administration of these drugs causes bacterial mutations, and from further promotion of drugs refused.

Another example, GlaxoSmithKline used a genomic approach for 7 years. Over 300 genes were discovered during the research. However, none of the detected targets led to the development and market entry of a new antibacterial agent. While the failure of genomics in the development of antimicrobial drugs reduces the enthusiasm of pharmacists. It is still relevant to screen databases of natural compounds.

Combinatorial genetics will allow the creation of antibiotic-forming recombinant organisms. Another promising way of obtaining new antimicrobials is biologically active compounds of plant origin. But so far the most effective way of obtaining bactericidal medicines is to create new derivatives of existing antibiotics.

Potentially effective way of developing new antimicrobials is to develop antibacterial drugs based on bacteriophage genes. A promising example is lysine, which is an enzyme with hydrolase activity against the cell wall of Gram-positive pathogens. It does not cause bacterial resistance, does not neutralize antibodies; It is active against resting forms of bacteria and biofilms.

Thus, analysis of scientific literature has shown that data from genomics, bacteriophages and resting microorganisms are potential sources for the creation of new effective antimicrobial agents.

TRICHINOSIS: THE EPIDEMIC SITUATION IN UKRAINE

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Introduction. Trichinosis is one of the most dangerous helminthic diseases of humans and animals. It is established that infection occurs when eating meat or meat products containing invasive larvae of trichinella. In recent years, more than 10 million people have been diagnosed with the disease. Parasites are adapted to a very wide range of hosts: a natural invasion is established in 150 mammalian species from 12 orders. In recent years, it has been found that trichinella, which does not form a capsule in the host's muscle tissue, can infect 13 species of birds and reptiles.

Conducting molecular-genetic and biochemical studies of parasites made it possible to establish that the genus *Trichinella* is a complex of morphologically closely related species. To date, 5 species of *Trichinella* have been identified which form the capsule in the muscle tissue of the host (*T. spiralis*, *T. nativa*, *T. nelsoni*, *T. britovi*, *T. murrelli*) and 3 capsulless species (*T. pseudospiralis*, *T. papuae*, *T. zimbabwensis*).

Three genotypes (*Trichinella* T6, *Trichinella* T8, *Trichinella* T9) that do not have a clear taxonomic status are also described. All described species and genotypes of *Trichinella* are dangerous for humans. It is established that infection with "natural" species of parasites often has a lethal outcome. Thus, the study of distribution, the main hosts and the identification of *Trichinella* in the territory of Ukraine is an urgent task for today.

Aim. To study the spread of trichinosis in Ukraine and to analyze the current epidemic situation in our country.

Materials and methods. Study materials of the Central Veterinary Laboratory of Ukraine and the State Sanitary and Epidemiological Service of Ukraine, use of data from the State Statistics Committee of Ukraine; review of the history of studying trichinosis.

Results. In Ukraine, the study of the spread of trichinosis among the synanthropic animals started at the end of the XIX century. Currently, parasites are found in 7 species of animals: a domestic pig, a domestic dog, a domestic cat, a gray rat, a house mouse, a European mink and nutria. To date, trichinosis of domestic pigs is registered in all regions of Ukraine. The greatest number of infected animals is found in Mykolaiv and Dnipropetrovsk regions. Study of wild animals for invasion with *Trichinella* in Ukraine for a long time was not conducted, as the main masters of parasites were confidently considered only domestic pigs and rats. The first studies of wild carnivores (bear, wolf, fox) date from the end of the last century (1980-1989).

Throughout 1970-2005, *Trichinella* are found in such wild animals as wild boar, bear, wolf, raccoon dog, fox, European wild cat and forest cat, ferret, badger, field and yellow-necked mice, common vole, and also common hedgehog.

Natural foci of *Trichinella* infestation are recorded in the Transcarpathian, Lviv, Rivne, Zhitomir, Chernigov, Poltava and Dnepropetrovsk regions, as well as on the Crimean peninsula. The most persistent focus of trichinosis was recorded in the Transcarpathian region, where almost 70% of the animals studied were found to be infected with *Trichinella*. *Trichinella* larvae are isolated from the most important species of hunting and commercial animals, which are often the basis of the diet of the population of the western regions of Ukraine. Thus, the role of wild animals as a source of human trichinosis is exceptionally high.

Molecular genetic studies of *trichinella* isolated from domestic pigs made it possible to establish that *T. spiralis* circulates in the synanthropic foci of trichinosis in Ukraine. This species of *Trichinella* is most often recorded in domestic and synanthropic animals, not associated with natural foci of invasion, as well as humans.

Parasites from wild ungulates and predatory mammals have been identified as *T. britovi* and *T. nativa*. Cases of mixed invasion of *T. spiralis*-*T. Britovi* and *T. britovi*-*T. nativa* not identified.

Thus, at the present stage it is established that on the territory of Ukraine there are relatively both natural and synanthropic foci of trichinosis. The main reservoir of invasion in natural conditions are predatory mammals - the wolf and the fox, and in the synanthropic - the domestic pig and the gray rat. A man has an enormous influence on the formation and support of the long existence of foci of invasion in different conditions: hunting and fishing, violation of conditions for keeping domestic pigs, increasing poaching, increasing the risk of trichinosis infection through meat of wild animals that has not undergone the corresponding veterinary and sanitary expertise. For example, the extent of invasion of wild boars is more than 3%. Therefore, if according to the State Statistics Committee of Ukraine the number of wild boars in 2002 was about 19000 individuals, then infected trichinosis may be more than 600.

Conclusions. The available data point to the importance and necessity of antitrichinella measures aimed at preventing infection of people whose main tasks will be the rupture of trophic chains between wild and domestic, as well as wild and synanthropic animals. It is also important to educate the population and hunters about the dangers and ways of spreading trichinosis.

THE STUDY OF THE INFLUENCE OF AQUAFRESH TOOTHPASTE AND ORAL RINSES ON MICROBIAL COMPOSITION OF TOOTH DEPOSIT

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Introduction. The accumulation of tooth deposit consisting of microorganisms of normal oral microflora and food debris, can lead to gingivitis, tooth decay and other problems. Rational oral hygiene with the use of targeted treatments is one of massive and the most effective methods of dental diseases prevention. Among modern hygiene products there are toothpastes and oral rinses.

The goal of research is optimizing the choice of toothpastes and oral rinses and studying their impact on tooth deposit microflora.

Objects and methods. 9 people aged 16 to 25 were involved into the experiment which lasted 28 days, the test persons were divided into groups and 5 stages. All of them used Aquafresh toothpaste. Group 1 used the toothpaste only, while group 2 used toothpaste + Lesnoi Balsam oral rinse and group 3 used toothpaste + Colgate "Plax tea freshness" oral rinse. Before the beginning of the research study the test persons used various other toothpastes. The methods used were microscopic, bacteriological, mycological, statistical.

Results and discussion. The substitution of pathogenic to saprophytic microflora was taking place among test persons in group 1 from 1 to 4 state; the substitution of opportunistic pathogenic fungi to saprophytic bacteria was taking place among test persons in group 2; no representatives of opportunistic pathogenic and pathogenic microflora were found among test persons in group 3. However, from the beginning of stage 5 the increase in the number of microorganisms and the increase of quality representation in tooth deposit microflora was observed in all the groups.

Conclusions. It was confirmed that the toothpaste and oral rinses used in the study demonstrated preventive effect, but their use within a period exceeding 3 weeks was accompanied by the formation of microbial resistance to them.

Using complex toothpaste + softener oral cavity is more effective for people with gum disease than using only toothpaste.

Practical recommendations. When using toothpastes and oral rinses as preventive means, their obligatory change every 3-4 weeks is required. The use of oral rinses with treatment effect shall fully meet the purpose, mentioned in the package leaflet to the concrete product, or shall be agreed at the consultation with the dentist.

STUDY OF THE MICROBIAL CONTAMINATION OF COSMETIC CREAMS

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Intraduction: Among all types of cosmetic products the most susceptible to microbial contamination of cosmetic creams. Large water content, organic and mineral components, storage at room temperature, failure to observe hygienic rules of taking the cream creates favorable conditions for the development of different groups of microorganisms. Contaminated with pathogenic and conditionally pathogenic microflora creams can be sources of biological hazards for users.

Aim: The study of the dynamics of microbial contamination of cosmetic creams after opening in the process of applying for three weeks and influence the rules of taking the cream to the level of microbial contamination.

Materials and methods. Have identified bacterial and fungal contamination, 6 samples of cosmetic moisturizing creams for the face after opening and use within three weeks. Three samples of cream users before applying to the face took arms, three specimens with special applicators. In accordance with the requirements of regulatory documents in Ukraine in the safety assessment of cosmetic products evaluated total microbial count and presence of bacteria *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Enterobacteriaceae*.

Results and their discussion: Total microbial count in creams after opening the package did not exceed 30 CFU/g After 3 weeks of use and storage at room temperature total microbial count in samples of cream that people took arms made 96-109 CFU/g in one of samples of creams were identified fungi of the genus *Candida*. In creams applied applicators - total bacterial count amounted to 35-50 CFU/g. Among the identified microflora dominated coagulase positive staphylococci, spore-forming bacteria of the genus *Bacillus*. Bacteria of the family *Enterobacteriaceae*, *P. aeruginosa* and *S. aureus* was not detected.

Conclusions: Despite all the beauty creams after opening stored at room temperature, those specimens which were taken by the applicators, had lower level of microbial contamination, which proves the importance of the observance of hygienic rules in the capture of beauty creams.

STUDY OF ANTIMICROBIAL ACTIVITY OF DIFFERENT TYPES LATHYRUS

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Introduction. Traditional medicine of different nations widely used kinds of plants Lathyrus as medicines. These are used for diseases of the stomach and intestines, kidney and sexually transmitted diseases and others.

Of particular interest are the data on the antimicrobial properties of certain types of orders.

The aim of our study was to investigate the antimicrobial activity of extracts of works of different types: *L. aureus*, *L.pratensis*, *L.niger*, *L.tuberosum*, *L. vernus*, *L.sylvestris*, *L. Litvinovii*, *L. pratensis*, *L.sativus*.

Methods: Antimicrobial activity of the extracts studied works of conventional microbiological practice agar diffusion method of modifying wells. As test strains using reference strains regulated SPU 1: *S. aureus* ATCC 25923, *E. coli* ATCC 25922, *P. aeruginosa* ATCC 27853, *B. subtilis* ATCC 6633, *C. albicans* ATCC 885-653. As a comparison drug used propolis tincture.

The obtained results. All works are studied extracts showed antibacterial activity spectrum and level of which depended on the type of orders. The high level of activity showed relatively Culture *S. aureus* was detected in extracts of *L. niger* and *L. vernus*, which exceeded the activity of propolis tincture. All investigated extracts showed activity level is high enough, some propolis tincture by doing relative to culture *P. aeruginosa*. Note the active extracts ranks relatively spore-forming culture of *B. subtilis*, the level of which ranged from minor to commit golden extracts (*L. aureus*), Litvynova to rank higher in the ranks of extracts of black (*L. niger*), ranks the spring (*L. vernus*) ranks meadow (*L. pratensis*), in the absence of activity with respect to that culture ranks sowing (*L.sativus*). Concerning culture of *E. coli* a higher level of activity was detected in extracts ranks klubnenosnoyi (*L.tuberosum*) and ranks forest (*L.sylvestris*).

Conclusions. Discovered a wide spectrum of antimicrobial activity of different types of orders. The level of activity of extracts of black ranks and ranks of spring activity than propolis tincture. Proved promising for further study of antimicrobial activity of extracts of other types of orders.

MICROBIOLOGICAL RESEARCH OF OBJECTS OF THE ENVIRONMENT

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Introduction. Microorganisms are around us all the time. Live microorganisms are present in the surrounding objects of life, on our skin, in the middle of our intestines and invisible to the eyes. With different microorganisms, our human body meets every second. Pathogenic microflora in the environment is an invisible part of our daily life.

Aim. Conduct research on the microbiological environment of the keyboard, mobile phone cases and door handles for the presence of pathogenic microflora.

Materials and methods. The object of our study were washings from different objects. We used standard microbiological methods of investigation.

Results and discussion. As a result of the research (the experiment was carried out three times) it was found that most bacteria were detected on keyboards and door handles. In the samples of smears from the keyboard, mobile phones and door handles, *E. coli* bacteria were not detected. When determining the total number of bacteria, microorganisms such as staphylococci, sarciny, saprophytic cocci and fungi were found. Our studies have shown that the most common microorganisms are staphylococci. *Staphylococcus* is a conditionally pathogenic microorganism that normally resides on the skin of a person, but when ingested, pathogenic species can cause skin diseases and suppuration.

Conclusions.

1. Sanitation-indicative microorganisms that indicate fecal contamination of the environment are: bacteria of the *Escherichia coli* group, fecal streptococci (enterococci), sulfate-reducing anaerobes (*Clostridium perfringens*), bacteria of the proteus group, thermophils, coliphages. In our study they were not found.

2. On the surface of the keyboard, of the mobile phone and door handles are conditionally pathogenic microorganisms - staphylococci, which are normally found on every human cover, but when ingested, they can cause skin diseases and suppuration.

3. Our whole life is a contact with the microcosm of different organisms. How do microorganisms affect our health depends only on us. Protect yourself from dangerous microbes in various ways: cleaning the house, strengthening your own body, observing the rules of personal hygiene. Take care of your health.

ROLE OF THE EUROPEAN SCIENTISTS IN THE HISTORY OF MEDICAL MICROBIOLOGY: THE NAMES AND PATHOGENS

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Introduction. The emergence of microbiology as a modern science is closely related to the names of scientists who have contributed to its development. The discovery of causative agents of human infectious diseases by European scientists is recorded in the history in the name of microorganisms, which are the etiological factors of common infections.

Aim. Study of scientific literature of the history of medical microbiology.

Materials and methods. Various information sources of Internet system, interlibrary loan and scientific library were used. An analysis of the literature of the history of medical microbiology.

Results and conclusions. There are names in the history of microbiology that marked the stages of its development. Heinrich Hermann Robert Koch (1843-1910) – germane microbiologist. He opened an anthrax bacillus, a cholera vibrio and a tubercle bacillus sticks of Koch. On March 24, 1882, when he announced that he had managed to isolate the bacterium causing tuberculosis, Koch achieved the greatest triumph in his entire life. At that time, this disease was one of the main causes of death, even in Germany. And in our time, tuberculosis is the main cause of death in developing countries. More people die from tuberculosis than from all other infectious diseases, including AIDS and other diseases caused by HIV. In his report of March 24, 1882, Koch stressed: "As long as there are slums on the ground where the sun's ray does not penetrate, consumption will continue to exist. The sun's rays are death for bacilli of tuberculosis. I undertook my research in the interests of people. For this I worked. I hope that my works will help doctors to lead a systematic struggle against this terrible scourge of mankind." In his publications, Koch developed the principles of "obtaining evidence that a particular microorganism causes certain diseases." These principles still form the basis of medical microbiology.

Alexandre Émile Jean Yersin (1863-1943) -the frenches bacteriologist. Together with Emile Ro discovered the diphtheria toxin (1888). In 1894 he discovered the causative agent of the plague, named after him, *Yersinia pestis*. Author of works on serology. Several species of bacteria (*Yersinia*) are named after Yersen, one of which (*Yersinia pseudotuberculosis*) causes pseudotuberculosis, another (*Yersinia enterocolitica*) – intestinal yersiniosis, and one (*Yersinia pestis*) - plague.

Alvin Klebs (1834-1913) – germane bacteriologist, pathologist and physiologist. Works on the study of pathogens of infectious diseases. A. Klebs studied the etiology and ways of transmission of malaria. In 1883 he discovered a bacterium that caused diphtheria. Identified the first filtering virus of animals – the virus of foot and mouth disease. *Klebsiella pneumoniae* is type of gram-negative facultative-anaerobic conditionally pathogenic bacteria. Are located singly, in pairs and in clusters. The species *Klebsiella pneumoniae* is a member of the *Klebsiella* genus, a family of Enterobacteriaceae. Old name of *Klebsiella pneumoniae* is *rod* of Friedländer. Carl Friedländer (1847-1887) is germane pathologist and microbiologist, is the author of pure culture of *Klebsiella pneumoniae* in 1882 year.

The causative agent of typhus – a disease that killed millions of people in the history of mankind – is called "*Rickettsia prowazekii*." This scientific name became a kind of monument to two scientists, thanks to which people learned who exactly from microorganisms excites this disease. And although they were not familiar with each other, their fates were similar. American Howard Taylor Ricketts and Czech Stanislav Provachek are scientists who solved the mystery of the deadly disease, died of typhus, studying its pathogen.

The name of Howard Ricketts is not particularly known to a wide range of readers, although during his short life (he lived 41 years) this outstanding microbiologist made many remarkable discoveries. Having brilliantly graduated from Northwestern University in 1897, Ricketts decided that his knowledge was not enough to successfully fight infectious diseases, and continued his studies in Berlin - Robert Koch himself later trained at the University of Pasteur in Paris, after which he received. The most highly qualified training, became a professor at the Department of Pathology at the University of Chicago. In 1909, an epidemic of typhus broke out in Mexico City, and Howard Ricketts, who has already earned the fame of a successful fighter with infections, was invited to help. His research has shown that this disease is caused by rickettsia, which is transmitted by bloodsuckers. However, the scientist did not succeed in completing his work, since on May 5, 1910, he died of typhus.

With the outbreak of the First World War, Stanislav Provachek concentrated on studying the causative agent of typhus. As predicted by the predecessor of Provachek, the causative agent of typhus was rickettsia. Moreover, the scientist convincingly proved that lice are its carriers. Having established the cause of the epidemic, Provachek started developing a vaccine, but he could not complete his work to the end. He, like Ricketts, contracted typhus, and on February 17, 1915 Stanislav Provachek died. It is interesting that he, like Ricketts, lived in this world only forty-one years.

ENZYBIOTICS: A NEW APPROACH TO ANTIMICROBIAL THERAPY

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Introduction. The total spread of antibiotic-resistant clinical strains of bacterial pathogens requires an intensification of the search for new ways to improve the effectiveness of etiotropic therapy of modern infections. Modern medicine is increasingly using the achievements of biological and medical chemistry, and enzymology in particular. One of the topical areas for improving antimicrobial therapy is the use of enzyme preparations.

Aim. Study of scientific literature on the biological, medical and pharmaceutical aspects of the use of enzymes in medical practice.

Materials and methods. Various information sources of Internet system, interlibrary loan and Kharkiv scientific library were used. An analysis of the literature of the history of the issue and the results of modern developments of enzymes is carried out.

Results and conclusions. Preparations of proteolytic enzymes of plant and animal origin in the 60-70s of the last century were successfully used in purulent surgery, in the complex treatment of pulmonary tuberculosis

Along with antimicrobial agents, proteases are extremely effective in diseases of the respiratory tract due to their fibrinolytic and mucolytic effect. Research is developing on the use of lytic enzymes for the prevention and treatment of human and animal infectious diseases: laryngitis, bronchitis, pneumonia, adnexitis, salpingitis, metritis, parametritis.

There is evidence that proteases contribute to the healing of furuncles, carbuncles, deep abscesses and fistulas. The important role of lytic enzymes as immunity factors has been revealed.

Enzibiotics as a fundamentally different group of drugs than antibiotics, are of an enzymatic nature and have the ability to induce lysis of a microbial cell. A special group consists of phage-guided enzymes of bacteria. Enzymes induced by phages are not synthesized by bacteria in the absence of phage, their action is directed to the destruction of a specific polymeric skeleton of bacteria.

The real results of scientific developments in this direction are preparations: lysostaphin against *Staphylococcus aureus*; dispersin - with a broad spectrum of antibacterial action. The real disadvantage of enzyme preparations can be side effects at the cellular level associated with insufficient specificity of the biological effect of individual enzyme systems.

**COMPARATIVE EVALUATION
OF ANTIMICROBIAL ACTIVITY OF ESSENTIAL OILS
OF PEPPERMINT, SALVIA OFFICINALIS,
SCOTS PINE AND MELISSA OFFICINALIS**

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Introduction: In recent years, numerous studies have shown the presence in essential oils of antibacterial, antifungal, antiviral, antitumor, antioxidant activity. This allows us to consider new options for creating alternative preparations from plant materials.

At present, a huge number of microorganisms, especially nosocomial strains, represent a serious problem for people's health due to the wide spread of multidrug resistance, which complicates the choice of adequate chemotherapy. One of the reasons for its formation is the massive use of antimicrobials, which is complicated by a number of side effects: dysbiosis, allergic reactions, formation of cross-resistance. In this regard, a constant search for new drugs with antimicrobial activity, but having a different mechanism of action compared with the known antibiotics, and deprived of side effects of antibiotics.

The basis for the creation of such drugs are ethereal-oil plants, which can exhibit antimicrobial activity. Such plants include: peppermint, common oregano, *Salvia officinalis*, yarrow, *Melissa officinalis*, common pine, almost all kinds of juniper and other ether-plants.

Aim: The purpose of our research was the study of the antimicrobial activity of essential oils of Peppermint, *Salvia officinalis*, Scots pine and *Melissa officinalis* for *Staphylococcus aureus*, *Escherichia coli* and *Bacillus subtilis*. Screening of the antimicrobial activity of essential oils was performed by a disco-diffusion method.

The 18 hour cultures of the test strains were incubated in a thermostat at a temperature of 37 ° C, suspended in sterile saline, to a concentration of 105 CFU / ml according to the McFarland turbidity standard. We evenly distributed 500 l of the suspension on the surface of the agar Mueller - Hinton for equitable growth. The essential oil was dissolved in 10% aqueous dimethylsulfoxide (DMSO) with the addition of Tween-80 and sterilized by filtration through membrane filters with a pore size of 0.45 nm. In sterile conditions, empty sterile disks 6.0 mm in diameter were impregnated with 50 µl of essential oil and applied to the surface of sown agar. For inspection, a disk impregnated with a suitable DMSO concentration was placed to monitor the solvent. The standard disk with gentamicin was used as reference

control. The dishes were left for 30 minutes at room temperature and then placed in a thermostat for 24 hours. The growth retardation zone was measured with a ruler.

Results: The results obtained demonstrate the presence of antimicrobial activity of all the essential oils studied, although the degree and spectrum of antimicrobial activity are different.

The most pronounced antimicrobial activity is found in the essential oils of peppermint, *Salvia officinalis* and Scots pine. The largest growth retardation zone was in peppermint and *Salvia officinalis* with respect to *Staphylococcus aureus*, a slightly smaller zone of growth retardation under the influence of these oils was in *Bacillus subtilis*. Weak antimicrobial activity was noted in relation to *Staphylococcus aureus* and under the influence of essential oils of Scots pine and *Melissa officinalis*.

On growth *Escherichia coli* essential oils of Scots pine, *Melissa officinalis* and *Salvia officinalis* had a lesser effect: the zones of growth retardation around the discs with oil of medicinal sage and Scots pine were insignificant, and around the disks with essential oil of *Melissa officinalis* - there were practically none. At the same time, the greatest activity under the influence of peppermint was noted in relation to staphylococci – the growth inhibition was observed on all the dishes.

Escherichia coli growth inhibition zones under the influence of peppermint essential oil were the most significant in comparison with the effect of other oils. The inhibition of the growth of *Bacillus subtilis* was also the greatest under the influence of peppermint oil. The obtained results indicate the presence of high antimicrobial activity of peppermint essential oil with respect to *Staphylococcus aureus*, *Escherichia coli* and *Bacillus subtilis*, which we took for the experiment.

Conclusions: Analysis of the results leads to the conclusion that *Melissa officinalis* exhibits the least antimicrobial effect with respect to the microorganisms under study, although it does exist. Essential oils of *Salvia officinalis* and Scots pine have antimicrobial activity against *Staphylococcus aureus* and against *Escherichia coli*, but their activity is lower in comparison with the antimicrobial effect of peppermint.

In this connection, it is of interest to further study the antistaphylococcal activity of essential oils with further determination of their minimum inhibitory concentration. These and other plant-ester-bearing plants grow on the territory of Ukraine and can become an excellent source of raw materials for the creation of effective antimicrobial agents.

STUDY LACTOBACILLUS PROBIOTIC STRAINS EFFECT ON THE MICROBIOCENOSIS OF THE MUCOUS MEMBRANES OF THE UPPER RESPIRATORY TRACT

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Introduction. Diseases caused by *Staphylococcus aureus*, characterized by severe complications and intensive spread of the pathogen in the form of bacteria that is a serious problem of clinical medicine. Today probiotic preparations are widely used to restore normal flora and urogenital tract, and now there is a need microbiological justify the use of probiotic preparations in the treatment of people with chronic diseases of the upper respiratory tract of staphylococcal origin.

Aim. To study the effect of probiotic strains *Lactobacillus* microbiota in the mucous membranes of the upper respiratory tract.

Materials and methods. *S. aureus*, isolated from patients with chronic forms of ENT diseases (tonsillitis and rynyty) and bacilli carriers (hospital staff) and the probiotic strains *Lactobacillus* seized the drugs that are available in pharmacies in the public domain. Methods: bacterioscopic, bacteriological, biochemical.

Results. Among the surveyed health care workers were identified that 30.3% persons were carriers *Staphylococcus aureus*. In patients with chronic forms of ENT diseases (tonsillitis and rhinitis) lecithinase was found in all strains isolated us *S. aureus*. Determined that all investigated strains of *S. aureus* have plasmacoagulose activity. Investigation of *S. aureus* cultures showed that all clinical isolates were able to form biofilms.

Studies have been conducted on the possibility of recovery of colonization and resistance antiinfectious mucous membranes of the upper respiratory tract in carriers of *S. aureus* using probiotic strain *L. rhamnosus* GG, because to him had a high sensitivity 88.0% clinical strains of *S. aureus*.

The use of probiotic strain *L. rhamnosus* GG for sanitation carriers reduced level of *S. aureus* colonization of mucous membranes in 7 and 14 days after the reorganization of lactobacilli suspension, and after 21 days took place complete eradication of *S. aureus* from the mucous membranes of the nose. Reduction of *S. aureus* colonization of mucosal carrier has been accompanied by an increase of the mucous membranes of the number of *Lactobacillus* spp.

Conclusions. Established that the use of probiotics for sanitation nasal carriers of *Staphylococcus aureus*, leading to the gradual eradication of the pathogen (*S. aureus*) and improving resistance antiinfectious mucous membranes of the upper respiratory tract.

Section 12.
CLINICAL PHARMACY

ADHERENCE PATTERNS OF DOCTOR'S PRESCRIPTIONS FOR PATIENTS WITH CHRONIC HEART FAILURE ON BASE OF ARTERIAL HYPERTENSION AND CORONARY ARTERY DISEASE IN UKRAINE

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Introduction. CHF is the inevitable outcome of all cardiovascular disease first of all CAD and AH. The morbidity of CHF in the general population is only 3.1 %, but at age more than 70 years, it is above 10 %. About 60-70 % of patients die within five years after the first hospitalization. The treatment of CHF on base of CAD and AH should include first-line therapy by beta-blockers or ivabradine (in contraindication to beta-blockers), combination of ACE inhibitors or ARBs with diuretics, nitrates (for African Americans in combination with Hydralazine). Amlodipine could be reserve drug in the absolute contraindications of beta-blockers (or ivabradine). The additional treatment should include Aldosterone antagonists, CCBs of non-dihydropyridine derivate or Amiodarone, Digoxin, Aspirin, Statins, Omega-3 polyunsaturated fatty acids.

Aim. The purpose of our research was to analyze practical doctor's prescriptions for patients with CHF on base of CAD and AH.

Methods. We have studied 57 case history of patient with CHF, CAD and AH from one of therapeutic hospital in Ukraine. Doctor's prescriptions were analyzed according to modern guidelies. There are no cases of African patients.

Results. Beta-blockers were prescribed to 41 patents (71.92 %), in 2 cases (3.51 %) it was non-selective one. ACE inhibitors were prescribed to 33 patients (57.89 %), ARBs to 22 (38.60 %), diuretics to 20 (35.09 %), nitrates to 6 (10.53 %), Hydralasin to no one. CCBs of dihydropyridine derivate were in 5 case history (8.77 %), 3 of them (5.26 %) Amlodipine and 2 (3.51 %) Nifedipine. CCBs of non-dihydropyridine derivate (Verapamil) were met in 2 cases (3.51 %). Cardiac glycoside have received 5 patients (8.77 %), 3 of them (5.26 %) digoxin, and rest sol. Corgliconi. Acetyl salicylic acid were prescribed to 40 patients (70.17 %), Statins only to 2 persons (3.51 %). Ivabradine, Amiodaron, Omega-3 polyunsaturated fatty acids doctors have not prescribed. Patients have received 5.83 ± 1.02 drugs for treatment of CHF in average. But, there were metabolic, sedative, other drugs in case history, that were increased the number of prescriptions till 10.10 ± 2.16 .

Conclusions. The therapy of particular patient with CHF on base of CAD and AH should minimizing the amount of prescription drugs through the correct use of clinical pharmacological aspects of active ingredients, avoiding prescription drugs that are contraindicated in this case.

**CLINICAL AND PHARMACEUTICAL RESEARCH USING
IN THE PRACTICE OF HOSPITAL PHARMACIST
ABOUT BREAST CANCER IN LEBANON**

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Cancer is a group of diseases that cause cells in the body to change and grow out of control. Breast cancer begins in the breast tissue that is made up of glands for milk production, called lobules, and the ducts that connect the lobules to the nipple. Breast cancer typically is detected either during a screening examination, before symptoms have developed, or after symptoms have developed, when a woman feels a lump. About 5% Lebanese women will develop invasive breast cancer over the course of her lifetime. In 2016, an estimated 10000 new cases of invasive breast cancer are expected to be diagnosed in women in the Lebanon.

The aim of our research - to study the spectrum of breast cancers at an international level, and then compared with those in Lebanon. Taking into account the openness of the Lebanese doctors' point of view, they are determined to provide a proper diagnosis, modern medical and surgical treatment and care, as well as psychological and financial support.

Materials and methods. To clarify the issues of awareness, we interviewed 37 patients with breast cancer aged 42-64 years using a specially designed questionnaire. In addition to the standard, it included questions about the knowledge of the disease, its symptoms and the ability to self-diagnose.

Results and discussion. In general, there are two important aspects of breast cancer prevention: early detection and risk reduction. Screening can detect early non-invasive cancers and allow treatment before they become invasive, or identify invasive cancers at an early stage of treatment. But screening does not prevent cancer. We found that only 27% of the respondents knew the initial symptomatology of breast cancer and only 4 of them could conduct self-diagnosis (palpation).

Conclusions. Awareness of the population is an important aspect of the successful treatment of breast cancer. Early diagnosis allows for much better results. And the prevention of breast cancer really should be understood as a risk reduction. Including a reduction in the number of neglected forms of the disease. Based on the results of the study, appropriate recommendations for training in self-diagnosis of breast cancer have been prepared.

MODERN APPROACHES TO TREATMENT OF ARTERIAL HYPERTENSION IN PATIENTS WITH SUGAR DIABETES AND CORONARY HEART DISEASE

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Introduction. To date, diabetes mellitus (DM) and arterial hypertension (AH) are two interrelated pathologies, which are the most unfavorable factors in the development of coronary heart disease (CHD), stroke, heart and kidney failure. At the same time, the level of blood pressure (BP) is one of the most important risk factors in the development of CHD. It can occur in people, both elderly and young, often accompanied by concomitant diseases, which are not only complicate the course of the disease, but also its treatment.

Today, DM and AH are two interrelated diseases, which are the most unfavorable risk factors for the development of CHD. About half of people with diabetes have arterial hypertension.

Aim. To study modern approaches for the treatment of arterial hypertension in patients with diabetes mellitus and in patients with CHD, which are presented in the recommendations on arterial hypertension (2013), developed by the European Society of Hypertension (ESH) and the European Cardiology Society (ESC).

Materials and methods. Guidelines ESH/ ESC 2013. meet certain fundamental principles, namely: (I) to summarize the recommendations of adequately performed experiments found thorough literature analysis, (II) the highest priority is given to data from randomized controlled trials (RCTs) and meta-analysis of these studies, and (III) according to the recommendations of the ESC, to indicate class of scientific evidence and recommendations on general issues of diagnosis and treatment.

Investigation of the potential modified risk factors for myocardial infarction in 52 countries (INTERHEART) showed that in the general population about 50% of heart attack risk is due to dyslipidemia, and about 25% is due to hypertension. Several risk factors for CHD, particularly SBP and DBP, are in close contact with body mass index (BMI) which is a fact that underscores the need to prevent the spread of modern sudden increase of obesity in the general population. Results for antihypertensive therapies in RCTs have not showed conclusive evidence that the target SBP in hypertensive patients with clinically manifests of CHD should be of <130 mm Hg. Similarly, there is no conclusive evidence that antihypertensive treatment should start with high normal blood pressure. Recommendations to reduce the level of SBP <140 mm Hg received indirect confirmation during unplanned

protocol analysis of international research of verapamil MB/T and trandolapril (INVEST) results (all patients were suffering from CHD). It showed that the incidence of end points is reversible due to stable control of SBP (<140 mm Hg) during repeated visits to the physician for dynamics monitoring. Regarding what drugs patients with hypertension need, there are conclusive data on a more pronounced preference for beta-blockers (BB) after recent myocardial infarction. In this situation ACE inhibitors are successfully applied. You can then use any antihypertensive agents further. US Joint National Committee (JNC-V11) recommended for the CHD treatment, hypertension accompanied with the evidence-based medicine to take drugs of four groups: diuretics, BB, ACE inhibitors and calcium antagonists (verapamil, diltiazem). In the consensus of American experts, under the combination of two diseases, it is recommended the use of BB and one of the blockers of the renin-angiotensin system (ARB or ACE inhibitors), thiazide diuretic can also be used. If basic therapy is not effective, dihydropyridine calcium antagonists for prolonged exposure are added. ACE necessarily recommended in persons who have had a myocardial infarction.

According to the results of the meta-analysis, all classes of antihypertensive agents can be used to treat hypertension in patients with diabetes, however, the choice of drug for a particular patient should take into account co-morbidities in order to individualize therapy. It is advisable to use combined application. The most preferred are the renin-angiotensin system (RAS) blockers and calcium antagonists, as they potentially improve — or at least not worsen — the sensitivity to insulin. Not less effective is the combination of thiazides, and thiazide-like diuretics or calcium antagonists together with PAC inhibitors. However, the appointment of two blockers (RAS) simultaneously (including the renin-inhibitor — aliskiren) should be avoided.

It should be remembered that beta-blockers and diuretics are only additional drugs and should be prescribed primarily in small doses.

The results and conclusions. Hypertension is one of the strongest factors that influence the occurrence of CHD. There are four groups of drugs that can be taken for treatment of hypertension with concomitant coronary artery disease, calcium antagonists, BB, ACE inhibitors, diuretics. Preference should be given to beta-blockers and calcium antagonists, at least, in the event that the patient has symptoms of angina pectoris. In choosing a rational therapy for the treatment of hypertension in patients with diabetes, it is extremely important to recognize and diagnose both diabetes mellitus and associated hypertension early in order to schedule appropriate treatment and stop the development of severe vascular complications. It is advisable to choose a combined application of antihypertensive drugs for the treatment of this disease, avoiding the occurrence of side effects of concomitant diseases.

HEPATITIS C: THE ROLE OF A PHARMACIST AND A CLINICAL PHARMACIST

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Introduction: Hepatitis C is a global health problem as the World Health Organization reported 3-4 million people are newly infected with Hepatitis C virus (HCV) per year and 130-170 million people are chronically infected. In Ukraine over 5% of people are infected with Hepatitis C, in absolute numbers it is more than 2 million people.

Aim: To study the role of a pharmacist and a clinical pharmacist in management of Hepatitis C, investigate pathogenesis and latest approaches to rational treatment and diagnostics of Hepatitis C. **Materials and methods:** We searched Google, Google Scholar and PubMed for relevant scientific articles on the topic and examined national guidelines of Ukraine, Britain, Europe and USA.

Results: Nowadays the conditions, triggered by hepatotropic viruses have a very significant place among other global diseases. Hepatitis C is a liver HCV infection, which in most cases leads to chronic inflammation and severe complications. HCV is a spherical, enveloped, single-stranded RNA virus belonging to the family Flaviviridae, genus *Flavivirus*. It was discovered in 1989 in the U.S. HCV has high mutation ability: there are 6 known genotypes of HCV and each of them has a number of quasispecies. The source and reservoir of infection is an infected person. Infected bodily fluids may also pose a threat. HCV is primarily transmitted through percutaneous exposure to blood. Other modes of transmission include mother-to-infant and contaminated devices shared for non-injection drug use, sexual transmission. The level of contamination is higher in less-developed countries (India 1.5%, Malaysia 2.3%, and the Philippines 2.3%, Ukraine 5%. Alarming rates were reported for many African nations, reaching as high as 14.5% in Egypt). Pathogenesis of Hepatitis C is not yet completely understood and is complex. Acute infection often occurs without any symptoms and develops into chronic inflammatory process. It may lead to serious complications, such as fibrosis, cirrhosis, and hepatocellular carcinoma. Symptoms may become evident only in terminal stages. Testing algorithm includes primal HCV antibody test (anti-HCV). A positive test result for anti-HCV indicates either current (active) HCV infection (acute or chronic), past infection that has resolved, or a false-positive test result. Therefore, an HCV nucleic acid test (NAT) is necessary to confirm current (active) HCV infection. Ukrainian national guidelines for HCV infection treatment recommend interferon regimens combined with Ribavirin and Boceprevir. Recommended treatment regimen provides SVR (Sustained virologic response) in 30 to 70% of cases, depending on the HCV genotype and concomitant factors and also has a large number of adverse effects (AEs). Non-interferon regimens with NS5A viral protein inhibitors (Daclatasvir, Paritapevir etc.) are recommended in the U.S. and Europe due to higher SVR rate (up to 99%) and

fewer AEs. In February 2017 U.S. FDA has granted Priority Review to AbbVie for its Investigational Regimen of Glecaprevir/Pibrentasvir (G/P) for the Treatment of Chronic Hepatitis C in All Major Genotypes (GT1-6). High and frequent doses, cost concerns, toxic drug interactions, and AEs create perfect breeding ground for patient nonadherence.

These issues also create a clear role for pharmacists. The management team includes a professional pharmacist, clinical pharmacist and other healthcare professionals in collaboration with the patient, insurance company, and pharmaceutical manufacturer. Pharmacists review patients' clinical history and select the optimal treatment regimen; they also counsel patients on pathology, treatment regimens, AEs, and costs and help eligible patients in obtaining HCV medication through pharmaceutical company-based support programs. Pharmacists are vital for patients' compliance.

| Role | What the Pharmacist Can Do |
|---|---|
| Encourage preventive measures | Help patients adhere to immunization schedule for adults because patients with chronic liver disease are at increased risk of contracting other viruses. |
| Monitor adverse effects and recommend alternative drug regimens | Know each agent's adverse effects and the best ways to deal with them. Depression is a significant and threatening problem for patients infected with HCV. |
| Help prescribers and patients find appropriate and cost-effective therapies | HCV-infected patients can incur, on average, \$64,490 in disease-related, out-of-pocket costs over a lifetime, and often more. ³ Treatment costs are serious concerns for most patients and insurers; look for patient assistance programs. |
| Manage drug toxicity | With treatment discontinuation rates as high as 14% (especially with peginterferon alfa and ribavirin), and new agents available, selecting nontoxic therapy is easier now. |
| Promote adherence | Adding first-generation direct-acting antivirals can reduce pill burden, duration of treatment, and adverse effects, but increase the likelihood of drug interaction. Pill boxes, alarms, and pocket cards are almost necessities for complex regimens. (Pocket cards are small cards that list drugs, doses, and times). |
| Refer patients to health providers | Rates of HCV testing and diagnosis are poor, and many patients receive inadequate care following diagnosis. Link HCV-infected patients to providers who deliver comprehensive HCV care. |

Conclusions: In summary, it is safe to say, that Hepatitis C is not only a significant global problem, but also a complicated multifactorial disease, which often remains undiagnosed until the late stages. By 2035, HCV-related morbidity and mortality will increase, and experts expect 38,000 cases of end-stage liver disease, 3200 cases requiring referral for liver transplantation, and 36,100 deaths across the US. The Ukrainian standards for HCV infection treatment are inferior to those in the US or Europe in terms of safety and efficacy. Clearly, HCV infection burdens patients' health and wallets, as well as the national economy. Wide enrollment of pharmacists and clinical pharmacists in the treatment process is able to rationalize treatment of Hepatitis C providing medical, social and economic benefits. It's time to employ experience of our foreign colleagues for the good of our society.

THE FREQUENCY OF OFF-LABEL DRUGS USE IN MEDICINE

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Introduction. Today we know about the off-label use of drugs is widespread in worldwide clinical practice because there are no drugs that are perfectly effective and safe for the most patients. According to medical practice off-label drugs used when the basic therapy does not help. But off-label drugs use can lead to adverse effects and the risk may outweigh the potential benefits. In Ukraine, as well as the worldwide, statistics of off-label drugs assignments frequency is poorly studied. So the study of the frequency of the off-label drugs use in the world and Ukrainian medical practice is relevant and appropriate.

Aim. The aim of this work is to study the frequency of the drugs use in medicine outside the instruction (off-label) for diseases treatment.

Materials and methods. Literature and electronic information sources on the frequency of drugs use in medicine according to indications which are not specified in the instructions (off-label) were chosen as the study subjects. Methods of logistics, statistics and generalization were used to evaluate the results

Results and discussion. The results of the Ukrainian scientist T.B.Rivak show that in 88% of irrational pharmacotherapy of traumatology department patients the treatment was not in compliance with instructions for the medical use of drugs. In Spain a metacentric prospective cohort study of 226 patients treated with off-label medicines was carried out in five hospitals from May 2011 to May 2012. It was established the frequency of off-label drugs use for 226 patients in such clinical services as gastroenterology – 33 (14,6%), internal medicine – 30 (13,3%), neurology – 28 (12,4%), pediatrics – 24 (10,6%), oncology – 14 (6,2%), allergology – 14 (6,2%), nephrology – 13 (5,8%), hematology – 13 (5,8%), dermatology – 12 (5,3%) and others – 45 (19,9%). The most frequent drugs were rituximab (21,1 %), botulinum toxin (10,7 %), omalizumab (in 6,0 %) and in 51,8 % of cases the level of clinical evidence for their use was low. The reasons for off-label drug use in patients were showed: in 72,1% of patients – lack of clinical response (or suboptimal) to the previous treatments; in 12,4% – no other drugs which are approved for that indication/condition; in 11,5% – intolerance to the previous treatments.

Conclusions. So the high frequency of the off-label drug use in patients of Ukraine (88%) and Spain (72%) was shown. Although clinical data on off-label drugs were often low, a clinical response was noted in many patients with previous multiple failure of treatment, which were due to some adverse effects and high costs. Therefore, the problem of frequent off-label drug use is relevant and requires further study.

CIRCADIAN DEPENDENCE OF THE ANTRAL INFLUENCE TO THE INDICES OF PROTEIN METABOLISM IN CONDITIONS OF CHRONODETERMINATED PARACETAMOL HEPATITIS IN RATS.

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Introduction. Perspectivity of the chronopharmacological attitude in the medicine appointment is absolute because it allow us to use well-known and well-studied medicines minimizing and totally neutralizing it's side effects. However at this moment there are more questions than answers in chronofarmacology.

Aim. This work is devoted to studying the daily dependence of the hepatoprotector carsil effect to the indices of protein metabolism in conditions of chronodetermined paracetamol hepatitis in female rats.

Materials and methods. The research was carried out on the model of acute paracetamol hepatitis (APH) in female rats. Injection of paracetamol (1000 mg/kg) was in such periods of the day as: night(03.00), morning (09.00), afternoon (15.00) and evening (21.00). Carsil was injected in therapeutic and preventive regime in dose of 100 mg to one rat's kilogram. As indicators of protein metabolism the level of albumin, total protein and carbamide were determined.

Results and discussion. During the time of modeling APH was registered insignificant reduction of the total protein level (on 7-12% concerning an intact animals), while the content of albumin wasn't changed during the day. The level of carbamide as the basic product of the protein metabolism , in APH conditions was reduced for certain in the evening (21.00) and night (03.00) on 25 and 28 % accordingly, while in the afternoon was observed only the tendency to reduction of it's index (on 15%) and an absence any changes in the morning. Using antral against the background of APH was conductive to content of total protein only in night-group of medicine, while the albumin level under the antral action wasn't changed during twenty-four hours. Antral injection was reflected by increasing level of carbamide (on 20-30%) in the evening and night (21.00-03.00), while it was not essential changes in another research-hours. Thus, antral injection against the background of APH was characterized by changing the content of the total protein only at night and increasing level of carbamide in the evening and night, and absence of practically significant changes albumin's content.

Conclusions. The results that were taken about daily influence of antral to protein metabolism indices against the background of chronodetermined paracetamol hepatitis should be taken into account during the development of antral «chronoportrait».

STUDY OF NEEDS IN CLINICAL TRIALS QUALITY MANAGEMENT APPROACHES IMPROVEMENT

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Background. The organization and conducting of the clinical trial (CT) of any new drug is a complex and responsible process, because the decision on withdrawal of the drug to the market depends on the quality of the data. Compliance with high accuracy of research results and proper execution of all procedures require constant monitoring of their quality. Constant revision and improvement of the quality control ways implementation is needed for the effectiveness of quality control measures. In our previous studies we have highlighted four main types of risks that may affect the CT quality: risks related to CT preparation and organization at clinical site (CS); risk for investigator associated with responsibility for CT conducting; the risk for trial subjects associated with participation in CT; the risk of incorrect assessment of the effectiveness / safety of the studied drugs. The results of experts who participate in CT opinion survey showed that the risks related to CT preparation and organization at CS, the risk for investigator associated with responsibility for CT conducting have an average degree of influence on the quality of the CT of drugs procedures. This means that specialists who participates in CT do not associate these risks with high or maximum impact on the quality of the CT of drugs that can reduce the amount of attention paid to these types of risks control. This in turn may lead to their influence increase on the quality of the CT of drugs.

Thus, **the aim** of this study is to determine the need of CT of drugs quality management practical approaches improvement in Ukraine.

Materials and methods. To achieve this goal, we conducted a survey of 294 specialists with experience of participation in CT of drugs. The proposed to respondents questionnaire consisted of general part and questions to assess the opinion of participants regarding aspects that should be paid attention to the of CT of drugs quality management. The analysis of the results was performed using statistical analysis methods.

The results. Among the CT participants who was surveyed 95% had medical education; 30% of respondents participated in more than 10 CT of drugs, and 27% - in 5-10 trials. Since the majority of respondents had a great experience in CT of drugs, then during their work in this field they performed different functions, namely 71% of the respondents served as the physician-researcher, 21% as the study coordinator and 17% as Principal Investigator.

Since the respondents in their work all the time facing the organization and conducting CT, they were asked to choose from a list of evaluation criteria, which they believe could be used efficiently in practice for the CT of drugs quality control at CS. From the nine proposed criteria, most respondents (68%) selected from seven to nine criteria. Most participants of survey chose the following criteria affecting the quality of CT: "performance of clinical procedures according to the CT protocol " (90%), "the proper maintenance of CT documents according to GCP, their proper archiving and storage" (85%), "trial subjects' protection (filling the informed consent, providing emergency medical care)" (83%). A more detailed analysis of selected by the experts criteria dependence on their experience in CT field showed that more than 85% of specialists with experience in more than 10 CT chose four criteria: "performance of clinical procedures according to the CT protocol", "compliance with all requirements for subjects inclusion in the trial," "the presence of CS staff necessary preparation for participation in CT (certified training on GCP, documents confirming experience in CT and others)", "the proper maintenance of CT documents according to GCP, their proper archiving and storage". Also, more than 80% of respondents with experience of participation in 5-10 CT of drugs chose only three criteria: "performance of clinical procedures according to the CT protocol", "the proper maintenance of CT documents according to GCP, their proper archiving and storage" and "trial subjects' protection (filling the informed consent, providing emergency medical care)". The analysis of selected by the experts criteria dependence on their functions during CT participation showed that more than 80% Principal Investigators chose five criteria, more than 80% of physician-researchers — three criteria, and more than 85% of the study coordinators — six criteria. This means that CT of drugs participants believe that very close attention to this procedures during organizing and conducting of CT of drugs has to be paid.

Conclusions. Summarizing the findings, we can conclude about the need for continuous improvement of quality control approaches during organizing and conducting of CT of drugs by the practical specialists in the field of CT opinion. This requires a constant work on risk assessment, development of methods for their prevention and elimination, as well as continuous improvement of CT of drugs quality management. In future studies it is planned to improve existing ways of CT quality control and develop new approaches to improve them.

CIPROFLOXACIN: INSTRUCTION AS A SOURCE OF INFORMATION AND THE DEGREE OF ITS RELIABILITY

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Introduction. In the modern world, antibacterial therapy is a kind of panacea that saves humanity from serious bacterial infections and epidemics. The search, creation and study of new groups of antibacterial drugs is intensively progressing. Fluoroquinolones are the one of the relatively new groups of antibacterial agents. Despite the intensive synthesis of new fluoroquinolones, the first drug of this group, ciprofloxacin, is still relevant and is widely used in medical practice.

Aim. Our task was to study the nomenclature of ciprofloxacin-containing medicines at the Ukrainian pharmaceutical market, as well as a comparative study of the content of package insert for patients to determine their compliance with the official instructions for medical use.

Materials and methods. The study has been conducted using official instructions for the medical use of the drug presented at the electronic resource <http://www.drlz.com.ua/>, as well as package insert to the corresponding medicine.

Results and discussion. At the time of the study, 54 names of ciprofloxacin were registered in Ukraine, including 44 trade names of finished pharma products. Finished ciprofloxacin-containing pharma products were presented by: 2 concentrate solution for infusion, 8 solutions for infusion (including one in combination with metronidazole), 2 combined with fluocinone or dexamethasone ear drops, 6 drops for ear/eye (including one in combination with dexamethasone), 2 names of prolonged-action OD tablets (1000 and 500 mg), 5 tablets combined with tinidazole or ornidazole, 2 tablets of 750 mg, 10 tablets of 500 mg and 7 tablets of 250 mg each. For further study, 10 tablets of 500 mg tablets were selected: Ciprinol®, Ciprofloxacin-Darnitsa, Flaprox, Medociprin, Ciprolet®, Ciprobel®, Ciprobay®, Cital® and Cifran. Analyzing the official instructions for medical use, we found almost 100% coincidence in all points of the instruction, including pharmacokinetics, despite the presence of some differences in the composition of adjuvants. At the same time, the differences between the official instruction and the package insert of the corresponding preparation were significant and they concerned the dosing regimens - there was no clear indication of the duration of application of the drug.

Conclusions. The package insert is the primary and most important source of information for the patient. Therefore, its content should be carefully monitored by the competent authorities. Otherwise, the risk of irrational application increases.

THE STUDY OF GANCICLOVIR'S CLINICAL SAFETY IN PATIENTS WITH CYTOMEGALOVIRUS INFECTION

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Introduction. Ganciclovir is intended for the prophylaxis and treatment of life-threatening or sight-threatening cytomegalovirus (CMV) infection in persons with immunodeficiency and for the prevention of manifest CMV infection in patients after organ transplantation. Such indications, despite the sensitivity to ganciclovir of such viruses as herpes simplex-1 and -2 (Herpes simplex 1 and 2), human herpesvirus types 6, 7 and 8 (HHV-6, HHV-7, HHV-8), Epstein-Barre (EBV), chicken pox (Varicella / zoster) and hepatitis B, are caused by significant toxicity of the drug, therefore it is used to prevent and treat the most severe CMV infections.

Aim. The aim of this work is study of the ganciclovir's clinical safety in patients with cytomegalovirus infection.

Materials and methods. Literature and electronic sources of information about the ganciclovir's clinical safety in patients with cytomegalovirus infection were chosen as subjects of the study. Methods of logistics, statistics and generalization were used to evaluate the results

Results and discussion. Analysis of literature sources showed that due to high toxicity, ganciclovir is used only in severe CMV infection and is not used in other viral diseases. As a result of long-term patient treatment Ganciclovir CMV retinitis in AIDS patients, 85% of patients in this study appeared adverse effects that required shortening the period of treatment and dosage or interruption of therapy: neutropenia, thrombocytopenia, drug fever, and neuropathy. The patients treated with ganciclovir detected cases of severe leucopenia, neutropenia, anemia, thrombocytopenia, pancytopenia, myelosuppression and aplastic anemia. In the treatment of ganciclovir CMV retinitis in AIDS patients is installed it myelotoxic effect at the highest dose of 5 mg/kg daily and is a major factor which limiting its long-term effectiveness, so as retinitis usually repeated when using the product ends. It is recommended during the treatment to continuously monitor the developed blood test, including the number of platelets.

Conclusions. So based on the analysis of the above data all the side effects of ganciclovir did not require cancellation, although they forced to reduce the period of treatment and dosage. All of the above and the results of the benefit / risk ratio analysis show that when using the nucleoside Ganciclovir for the prevention and treatment of CMV infections in patients with immunodeficiency (HIV, AIDS and after organ transplantation), the benefit over risk prevails.

**PRIMARY ASSESSMENT OF SUSCEPTIBILITY
TO THE SYNDROME OF PROFESSIONAL "BURNOUT"
OF PRACTICAL PHARMACISTS IN UKRAINE**

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Background. Syndrome of professional "burnout" (SPB) of practical pharmacists is a syndrome of physical and emotional exhaustion with the development of negative self-esteem, negative attitude towards work and pharmacy visitors. The profession of a practical pharmacist is among the most vulnerable to emotional burnout, as it refers to a group of occupations with increased moral responsibility for the people's fate, health and life. Negative influence on health is rendered by constant stressful situations in which the practical pharmacist gets into during the process of social interaction with the visitors, the inevitable insight into his problems, and also due to other moral and psychological factors: insufficient experience of the pharmacy worker, critical professional, personal and age periods in life of the employee, negative motivation, organizational shortcomings in work.

The aim of this study was the level of psychological perseverance and diagnostics of SPB presence in practical pharmacy workers of Ukraine.

Materials and methods. To achieve the aim of the study the pool of 64 Ukrainian practical pharmacy workers was carried out. The questionnaire for respondents consisted of four parts: general questions, questionnaire for assessment the general quality of life and scales for diagnostics of anxiety, depression and SPB. The results were processed with the help of statistical methods.

The results. The pool showed that 97% of respondents were women and 3% — men, most respondents were aged 20-29 years (28%) and 30-39 years (31%). Most of respondents (75%) have higher education, specialty - Pharmacy (92%). The majority of respondents (30%) had more than 20 years of experience in the field of practical pharmacy. The majority of participants (84%) hold the position of pharmacist. In general, respondents to relieve stress from work prefer to communicate with friends (75%) or nature (59%).

Specialists distinguish three phases of SPB formation — the phase of tension, resistance and exhaustion. Interpretation is based on qualitative and quantitative analysis, which is carried out by comparing the results within each phase by calculating the parameters of the 3 phases of SPB formation, consisting of 12 symptoms (in each phase 4 symptoms). The proposed methodology gives a detailed picture of the SPB. So, in the "Tension" phase, the symptom "Experiencing psycho-

traumatic circumstances" dominated in the majority of respondents (30%), in the phase "Resistance" — the symptom "Emotional and moral disorientation" (59%), in the phase "Exhaustion" — the symptom "Personal detachment (depersonalization)" (78%). The obtained results indicate that these symptoms are most burden the emotional state of the individual. It was found that the "Tension" phase was formed only in 3% of the participants, 25% of respondents are in the formation stage and in 69% of the respondents this phase didn't form; the "Resistance" phase was formed in 41% of the respondents, 31% of respondents are in the formation stage and in 25% of the participants the phase didn't form; the phase "Exhaustion" was formed only in 3% of respondents, 25% are in the stage of formation and in 69% of participants the phase didn't form. It shows that in general the majority of respondents have forming SPB, but the formed one isn't so common.

In addition, the formation of SPB is influenced by the presence of anxiety and depression symptoms among practitioners. So the next step of our study was the evaluation of the anxiety and depression levels in survey participants. For this purpose, hospital scales of anxiety and depression were applied. In assessment by the anxiety scale, subclinical and clinically expressed anxiety was detected in 42% of the respondents, absence of anxiety symptoms — in 6%. Evaluation by the depression scale showed that the absence of severe symptoms of depression is observed in 14% of the survey participants, subclinical depression — in 44%, clinically expressed depression — in 33%. Such results indicate that among practical pharmacy workers the problems associated with the high prevalence of depression symptoms are presented.

Conclusions. Based on the obtained results, it can be concluded about the high risk of SPB formation in practical pharmacy workers, taking into account the peculiarities of their professional activity (constant stresses, high psycho-emotional load). The presence of such symptoms as anxiety, depression, experiencing psycho-traumatic circumstances, depersonalization, emotional and moral disorientation in future can lead to the higher percentage of pharmacists with formed SPB. This can effect pharmacists' work quality, which are inattention to the pharmacy visitors, mistakes number increase, higher risk of medicine for patients' needs mixing up, etc. in general, for pharmacies the development of SPB in its workers can lead to staff turnover, decrease in profit caused by medicine realization cutback and others. So, further it is necessary to continue the study of the SPB prevalence among Ukrainian practical pharmacy workers to have more clear data on psycho-emotional state of pharmacists. Also it is needed to apply methods of its prevention in order to prevent and stop its further spread.

THE SIMILAR NAMES OF OTC-DRUGS IN THE PHARMACEUTICAL CARE PRACTICE

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Introduction. One of the main task of pharmaceutical care is the patient's counseling about the rational choice of the over-the-counter drugs in case of responsible self-medication. Therefore, the competence of the pharmacist and his ability to navigate in the names of medicines is very important and relevant. Essential problems are drugs that have similar names.

Aim. Identification of drugs with similar names among non-prescription drugs registered in Ukrainian pharmaceutical market and recommended for self-medication.

Materials and methods. The study has been carried out by studying the nomenclature of OTC-drugs included in the order of the Ministry of Health of Ukraine No. 283 of May 18, 2015, using the State Form of Ukraine of the 8th edition, the reference book "Compendium 2016 medicinal preparations" and information about drug's registration at the electronic resource <http://www.drlz.com.ua/>.

Results and discussion. A group of OTC drugs in which similar names were found most often was identified. This group was laxatives. The main similarity of the names of the preparations was the combination of the letters "lax", which is undoubtedly useful in determining what pharmacological group does medicine belong. However, in some cases, similar trade names denoted the drugs not only of different active substances, but also with different mechanisms of action, which have indications for different types of constipation and, accordingly, exclude each other. For example, Laxarin (lactulose) and Laxigal (sodium picosulfate), Agiolax (plantain) and Alax (bark buckthorn). A survey of pharmacy visitors showed that 75% of patients don't pay attention to the composition of laxatives and don't know about the difference between senna-based drugs (Regulax) and sodium picosulphate (Regulax pico), considering them the same drug.

Conclusions. There are problems with similar names among non-prescription drugs. This phenomenon significantly increases the risk of improper selection and use of medicines by the patient during self-treatment. In addition, it complicates the process of pharmaceutical care by a pharmacist. To prevent these phenomena, it is recommended that the pharmacist, when advising the patient, be guided first and foremost by the international non-proprietary name of the drug. When teaching pharmacists, attention should be paid to medicines with similar names, to emphasize their composition and application features.

RISK ASSESSMENT OF THE DIRECT INFLUENCE OF VARIOUS DRUGS AND RELATED DISEASES AT THE LEVEL OF GLYCOSYLATED HEMOGLOBIN IN PATIENTS WITH DIABETES TYPE II

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Introduction. Diabetes mellitus type II (DMII) has assumed epidemic proportions worldwide, causing much morbidity and mortality on account of its various complications. The development of chronic vascular complications of diabetes such as retinopathy, nephropathy, and cardiovascular disease is intimately linked to the level of glycemic control attained by the individual with diabetes. Therefore, it is essential to have an index of the long-term glycemic control in diabetes patients, which in turn can be used to guide therapy and predict the likelihood of complications. Studies showed that the level of HbA1c correlated well with the glycemic control over a period of 2 to 3 months, leading to the gradual incorporation of the test into clinical practice in the 1980s. With the publication of the Diabetes Control and Complications Trial and the United Kingdom Prospective Diabetes Study both of which correlated the HbA1c levels to the development of diabetes complications, HbA1c estimation has become established as a cornerstone of diabetes management.

The efficacy of anti-diabetic medications is also assessed based on their HbA1c lowering capacity. Many algorithms for the management of diabetes utilize HbA1c as the basis for major therapeutic decisions. Recently, HbA1c has also been recommended as a tool for the diagnosis of diabetes. At the same time, a number of factors have recently been identified that can significantly affect the levels of HbA1c detected. And, accordingly, to influence the choice of diabetes treatment regimens and the evaluation of their results. These include certain conditions and diseases, as well as medications taken.

Aim. The purpose of our study was to assess the risk of direct effects of various drugs and concomitant diseases on the level of glycosylated hemoglobin in patients with DMII. The remainder of this review will focus on (non-diabetic) drugs which may falsely increase or decrease the HbA1c level.

Materials and methods. In order to achieve the targets and objectives of the study we retrospectively analyzed the medical records of 87 patients with diabetes mellitus (DMII) who were treated in departments of Saint James Hospital at Tripoli (Libya) for the first half of 2016. Among them were 53 women and 34 men aged from 42 to 72 (average 53 ± 2.14). The average duration of the disease was 6.4 ± 1.8

years. The main criterion of selection was the character of the conducted treatment. Patients with decompensated forms of the disease were excluded from the study.

Results and discussion. In 12 patients (13.8%) were identified concomitant diseases that significantly reduced the HbA1c values. These included 9 patients with high level of triglycerides in blood and three patients with signs of liver failure. According to the information from the medical history and anamnesis, 10 of them clinically did not achieve the required level of diabetes control. Another 11 patients (12.6%) had conditions that contributed to the overestimation of HbA1c. Thus, 8 women had iron deficiency anemia, and three patients had the renal failure with a significant decrease in glomerular filtration. According to the literature, falsification of the detectable level of HbA1c can also be caused by chronic use of opiates, alcoholism, congenital hemoglobinopathies, and a number of malignant tumors. Such patients in our study were not identified.

The change in the level of the detected glycosylated hemoglobin in practice can also often be caused by the taking of certain medications. Thus, in 20 patients (23% of survey contingent) there was a decrease in the level of HbA1c due to cotrimoxazole (treatment of lower urinary tract infections). And in 7 patients due to the continuous use of aspirin in order to prevent complications of IHD and another three as a result of taking vitamin E. It should be noted that if in the first case, false-low values were obtained due to an increase in the systemic destruction of red blood cells, in the second and third cases falsification of the level of HbA1c was due to a change in the process of glycation of hemoglobin. Drugs can theoretically interfere with HbA1c levels in several ways. However, only a few instances of drug-induced variability in HbA1c have actually been reported in the literature. Among widely used drugs with such capabilities are a number of antiretroviral drugs, hydroxycarbamide, vitamin C, ribavirin and antileprotic drug dapsone.

Conclusions. HbA1c is now universally accepted as an index of long-term glycemic control and major therapeutic decisions are undertaken based on it. While the availability of newer assays has removed many of the technical problems associated with the estimation of HbA1c, several fallacies remain. In our study, about 25% of patients had high risks of falsification of the detectable level of glycosylated hemoglobin. Approximately equally they were distributed in the direction of possible overestimation of indicators, and their underestimation. It was equally caused by concomitant diseases and conditions, as well as by the administration of a number of drugs. There are a number of drugs, some of them quite commonly used, which can cause inappropriately high or low HbA1c levels for the degree of glycemia. It is essential that clinicians be aware of these interactions, and exercise caution in interpreting the HbA1c levels of such patients so that potentially serious errors can be avoided.

BRAIN, KIDNEY AND LIVER DAMAGE IS THE CAUSE OF DEATH OF RATS IN ACUTE TOXICITY STUDIES OF DICLOCOR

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Introduction. NSAIDs are associated with various adverse effects. Thus, vigorous work is being carried out throughout the world to make these drugs safer. Diclocor, a newly developed drug containing 25 mg of diclofenac and 40 mg of quercetin, is a promising medicine in this regard.

Aim. To study acute toxic effects of Diclocor on viscera of rats.

Materials and methods. Acute toxicity was studied by Prozorovsky method on 36 rats, which were divided into 6 groups (6 animals in each group). Diclocor was administered in doses 500, 700, 900, 1100, 1300, and 1500 mg/kg, respectively for different groups of rats. In case of death of an animal, the procedure included autopsy with macroscopic analysis of viscera in order to exclude death due to operational mistakes and determine probable causes of death. In the end of experiment autopsy was performed in survived animals as well. The viscera (brain, heart, kidneys, liver and spleen) were weighed and calculation of their mass coefficients was carried out.

Results and discussion. No animals died in group 1, in contrast to other groups, where mortality was proportional to the dose of the drug. Macroscopic analysis of the viscera of abdominal cavity of the dead rats showed signs of stomach damage, namely, oedema of mucosa and many pinpoint hemorrhages. This is typical for diclofenac. Moreover, kidney and hepatic necrosis were evident. The results of weighing of the rats' viscera are shown in the table below.

Mass coefficients of the rats' viscera (M±m, n=6)

| Group | Dose, mg/kg | Mass coefficient, % | | | | |
|-------|-------------|---------------------|-----------|------------|------------|-----------|
| | | brain | heart | kidney | liver | spleen |
| 1 | 500 | 1,05±0,02 | 0,40±0,02 | 0,32±0,01 | 3,26±0,04 | 0,35±0,01 |
| 2 | 700 | 1,23±0,21 | 0,39±0,06 | 0,36±0,03 | 3,50±0,07* | 0,37±0,01 |
| 3 | 900 | 1,19±0,07 | 0,39±0,03 | 0,42±0,10 | 3,58±0,19 | 0,34±0,05 |
| 4 | 1100 | 1,29±0,12 | 0,39±0,04 | 0,45±0,04* | 3,62±0,13* | 0,35±0,02 |
| 5 | 1300 | 1,32±0,10* | 0,42±0,02 | 0,42±0,04* | 3,68±0,16* | 0,39±0,05 |
| 6 | 1500 | 1,36±0,09* | 0,40±0,02 | 0,40±0,02* | 3,72±0,19* | 0,38±0,03 |

Footnote. * – $p < 0.05$ compared to group 1

Conclusions. Significantly increased mass coefficients of the brain, kidneys and liver in rats having received high toxic doses of Diclocor compared to rats having received 500 mg/kg dose are evidence of oedema and destruction in these organs, which, in our opinion, is the main reason of animals' death.

THE ROLE OF CLINICAL PHARMACIST IN REDUCTION OF RISK DEVELOPING OF CARDIOVASCULAR TOXICITY OF SELECTIVE AND NON-SELECTIVE NSAIDs

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Introduction. Non-steroidal anti-inflammatory drugs (NSAIDs) are the most common prescribed medications purchased over the counter for treatment of acute and chronic pain and inflammation associated with a list of medical conditions. Like any drugs, the benefits of NSAIDs should be considered in tandem with the potential adverse effects: dyspepsia, gastric or duodenal ulceration, sodium retention and subsequent arterial hypertension, as well as increased incidence of cardiovascular (CV) adverse events. Unfortunately, all NSAIDs, as selective (COX-2) and non-selectivity (COX-1 and COX-2) have been associated with an increased risk of adverse CV events.

Aim. To conduct a systematic analysis of sources of modern scientific literature about the manifestations of cardiotoxicity of NSAIDs and develop an algorithm of actions for clinical pharmacist to minimize the possibility of CV side effects.

Materials and methods. For realization of research were used methods of systematic analysis of 20 scientific literature sources (articles) about the manifestations of cardiotoxicity of NSAIDs. All articles were published from 2007 to 2017. The criteria for inclusion in the analysis was the availability of data about clinical trials, observation studies, systematic reviews or CV side effects of NSAIDs. The data should be containing information about serious coronary heart diseases (myocardial infarction, any stroke, CV death, composite CV outcomes), as their baseline risk of CV events is increased. For further study, rofecoxib, ibuprofen, naproxen, diclofenac were selected, because they had similar risk assessment criteria. In this group, rofecoxib was classified as a selective COX-2 NSAID, all other drugs were non-selective NSAIDs. An algorithm of actions for clinical pharmacist was based on such sources: EULAR recommendations for cardiovascular disease risk management in patients with rheumatoid arthritis and other forms of inflammatory joint disorders: 2015/2016 update and The American College of Cardiology/American Heart Association recommendations.

Results and discussion. According to the results of the analysis, selective and non-selective NSAIDs have a risk of developing of CV outcomes. The connection between the risk of developing of myocardial infarction was significantly described in 55 % of analyzed data for rofecoxib, in 40 % for diclofenac, in 35 % for ibuprofen.

The development of stroke in patients who used NSAIDs was significantly noted in 50 % of analyzed data for rofecoxib, in 40 % for diclofenac, in 25 % for ibuprofen.

A provocation of CV death was significantly marked in 40 % of analyzed data for rofecoxib, in 30 % for diclofenac, in 25 % for ibuprofen. The cardiovascular toxicity of naproxen has not been proven. In different 7 studies negative impact of the CV development was not been found. The most commonly prescribed doses of naproxen were 500-1000 mg/d or greater, and there was no evidence of increased CV risk at these higher doses. The reviews suggested that 5 key variables affect the extent of CV risk associated with NSAIDs: 1) COX-2 selectivity, 2) dose responsivity, 3) plasma half-life, 4) blood pressure and 5) interaction with acetylsalicylic acid (ASA). Available data on platelet effects suggest no reduction in cardioprotection when ASA is used concomitantly with naproxen, diclofenac or celecoxib; however, ibuprofen may interfere with ASA. Based on the obtained data and international recommendations, the algorithm of actions for clinical pharmacist should include such basic principles: 1) It is not recommended the appointment of prescription and non-prescription NSAIDs refineries to patients who have preliminarily CV outcomes. If severe pain syndrome exists, acetaminophen will be the drug of choice for them. 2) If it is necessary to use NSAIDs, they should be administered at the lowest effective doses. 3) To recommend prescribing 500-1000 mg/d doses of naproxen, there was no evidence of increased CV risk for them. 4) Strictly, to consider plasma half-life when NSAIDs are co-administered with other drugs. 5) To inform the doctor about the neediness for constant blood pressure monitoring. 6) To avoid any potential negation of ASA antiplatelet effects, it should be administered a minimum of 30 minutes prior to or 8 hours after ibuprofen or others NSAIDs. 7) According to international guidelines there is additional evidence showing a reduction of CV risk in patients treated with disease-modifying antirheumatic drugs: methotrexate or TNF inhibitors. 8) Total cholesterol and high-density lipoprotein cholesterol should be measured in CV risk assessment. 9) When elaborate the lifestyle recommendations to emphasize the benefits of a healthy diet, regular exercise and smoking cessation. 10) To inform the patients about negative consequences of the disturbance of antihypertensives and statins admission regimens, that will increase the patient's compliance to the therapy.

Conclusions. To summarize briefly, conducted systematic analysis showed that such NSAIDs, as rofecoxib, diclofenac and ibuprofen had significantly increase of cardiotoxicity. It was proved in 55 % to 25 % of data of scientific literature sources. In regular practical activities, as an algorithm of actions, a clinical pharmacist should use the statements of international recommendations and guidelines, which will lead the minimization of side effects and will increase the safety of NSAIDs using.

**QUALITY OF BIOCHEMICAL STUDIES
USING VALIDATED PROCEDURES
IN CLINICAL DIAGNOSTICS LABORATORY
OF THE CLINICAL DIAGNOSTIC CENTER
OF THE NATIONAL UNIVERSITY OF PHARMACY**

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Introduction. The main strategic direction of modern laboratory diagnostics development is to create a quality management system, constant improvement of the clinical laboratory tests quality. Quality in laboratory diagnostics understand means the presence of confidence that is designed to timely patient test performed at a sufficient analytical level and accompanied by the necessary information for its interpretation.

One of the stages of development and implementation of quality system is validation work, which is confirmed by research and provide objective evidence that the particular requirements for a specific target application run. The main object of evaluation are methods used to conduct the measurement of various parameters in the laboratory, and in order to guarantee reliable and accurate analysis, a procedure for validation of laboratory methods.

Aim. The aim was to study the factors of quality assurance in Laboratory of Clinical Diagnostics of Clinical Diagnostic Center of the National University of Pharmacy through the validation work to assess the suitability of biochemical methods and determine the features, approaches and requirements to assess the suitability (validation) laboratory techniques and key moments of uncertainty.

Materials and methods. At the Laboratory of Clinical diagnostics validation methods were conducted: "Comparison of the quality and reliability of determining the level of total cholesterol in biological liquids by photometric method using biochemical analyzer Express Plus" and "Comparison of the quality and reliability of determining the level of triglycerides in biological liquids by photometric method using biochemical analyzer Express Plus".

These biochemical techniques that characterize lipid profile, can objectively assess the disturbances in lipids metabolism. Deviation in indicators of lipidogram of their reference values indicates the likelihood of a human atherosclerosis, liver and gallbladder diseases, as well as to predict the risk of these pathologies.

In our work we used analytical, statistical and biological methods.

First of all, the validation script was compiled: set data features of methods; analyzed the parameters to evaluate. Then we developed a validation protocol which

defines the personnel involved in the validation procedure under development; provides information on the proper functioning of equipment used; established a list of tests (methods), conducted during the validation and selection is made suitable for assessing the statistical methods of processing measurement results.

Researches were conducted using on standard samples with known concentrations of investigated analytes using automatic biochemical analyzer Express Plus. Over the methods validated characteristics were determined: specificity, and reproducibility of convergence, correctness of methods, uncertainty of measurements.

In assessing convergence and reproducibility of an analysis of the possible causes loss of accuracy in the determination of biochemical parameters. The main source of loss of precision when working on the device is operator-technician that performs research. From his skills and skill levels depends on the accuracy and reliability of measurements validation conducted.

To test the impact factor "assistant operator" for convergence and reproducibility within the laboratory two equal laboratory operator-training measurements conducted five observations on standard specimens total cholesterol ($C = 7.55$ U/l) and triglycerides ($C = 2.02$ U/l). Based on these data it was concluded that the homogeneity of variances and that the sample belonging to the same general population. Thus, these techniques are intra-laboratory test on the convergence factor.

The next step was conducted correctness of methods, which evaluated using standard samples in the laboratory. Subject to the requirements of the State Pharmacopoeia of Ukraine held in each series of five measurements. The study found that conducting all measurements with the same accuracy (convergence measurements) and confirmed the correctness of methods at different times of Biochemical analyzer Express Plus.

It was also calculated the expanded measurement uncertainty in terms of convergence, reproducibility and accuracy of this technique as metrological evaluation date. Expanded uncertainty showed that the values of total cholesterol and triglycerides can be considered accurate and reliable result indicates no gross errors in the analyzer and statistically significant differences in the measurements, laboratory operators.

The results and conclusions. Validation of methods for determining of total cholesterol and triglycerides in biological liquids the during work on the biochemical analyzer Express Plus in the Laboratory of Clinical Diagnostics of Clinical Diagnostic Center of the National University of Pharmacy proved that these methods have performance meet regulated, meet the established criteria, and measured them using the proper match.

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Section 13.

MODERN PHARMACOTHERAPY

FIRST AID FOR CHEMICAL BURNS

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Introduction. For chemical burns accounted for the highest percentage of all injuries occurring in the chemical industry. The frequency of chemical burn injury is 20-24% of all types of injuries. Chemical burns occur when exposed to skin and mucous membranes of concentrated acids (nitric, sulfuric, hydrochloric, acetic), bases (potassium hydroxide, sodium hydroxide, quicklime, ammonia, caustic soda), salts of heavy metals (silver nitrate, zinc chloride) and some gases. In most cases, chemical exposures are exposed parts of the body: arms, neck, face, scalp.

Aim. Study the procedure for rendering first aid to victims with chemical burns.

Materials and methods. We reviewed the clinical protocols of medical care to victims with chemical burns, approved by Order of the Ministry of Health of Ukraine.

Results and discussion. The algorithm of first aid for chemical burns depends on the chemical agent. If the burns caused by an unknown chemical substance, it is necessary to remove clothing, wash the affected parts of the body with water (with acid damage 30-60 minutes, alkalis - several hours). The criteria for the completion of washing is, as far as possible, complete removal or significant dilution of the chemical, reducing pain and burning sensation at the site of injury. Some substances (quicklime, triethylaluminum, diethylaluminum hydrate, sulfuric acid) in combination with water enter into chemical reaction with release of heat. Therefore, it is necessary to carefully remove these substances mechanically, to dry sulfuric acid with a dry cloth and only then to start washing with water. If the burns are phenol or its derivatives, you must rinse the damaged tissues with water; treat the surfaces with ethanol or polyethylene glycol alternately with water. If burns caused by hydrofluoric acid, the burn surface rinsed with water, rinsed with aqueous solution of benzalkonium or magnesium oxide, apply an ointment containing hydroxide and magnesium sulfate. With phosphorus burns, it is necessary to put the damaged part of the body in water, remove the phosphorus residues, treat the burn with 5% solution of copper sulfate, and apply a dressing moistened with 3% sodium bicarbonate solution. After removing the chemical substance from the burn surface, it is necessary to cover the affected area with dry gauze dressings, clean diapers and transport it to the hospital.

Conclusions. Thus, for the provision of first aid, special knowledge and skills are needed, assistance must be provided urgently and as soon as possible, it is necessary to consult a doctor.

STUDY OF THE STABILITY OF THE LIPOSOMAL DOSAGE FORM OF ORMUSTINE

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Introduction. Preparations of the class of nitrosoureas have found wide application in combined therapy of solid tumors. A liposomal dosage form have being developed, based on the new substance from this class that demonstrated a high antitumor activity in studies in vitro.

The purpose. Study of stability of the lyophilized liposomal dosage form of ormustine during storage.

Materials and methods. The study of the drug stored for temperature(- 18 °C) carried out at the time required by the State Pharmacopoeia according to the following criteria: description, authenticity, pH, particle size, incorporation of the active substance into liposomes, quantitative determination. The electronic absorption spectrum was taken to determine the authenticity, the size of the liposomes was determined by the correlation spectroscopy of light scattering on a device of Subicron Particle Sizer Nickomp 380 (USA), the pH was determined potentiometrically, the inclusion of the active substance in the liposomes was determined by gel filtration using a chromatographic column C 10/20 (Sweden), the quantitative content of the active substance was determined spectrophotometrically at the wavelength 396 ±2 nm.

Results and discussion. For the year of storage of the preparation in the refrigerator at (-18 ° C), all the lyophilizers remained light yellow, dissolved well, the pH of the solution formed after hydration was the same and was 3.6±0.2, the size of the liposomes remained in the range of 180±10 nm, the content of the active substance and the incorporation of ormustine into the liposomes remained practically unchanged and remained within the limits set in the draft regulatory document for this drug.

Conclusions. The developed lyophilized dosage form of ormustine was found to be stable during storage for a long period (one year). Studies of its stability will continue to determine the expiration date of this drug.

VACCINATION OF THE FLU IN THE SEASON 2016-2017

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Introduction. Currently, influenza is the most common infectious disease in the world. Everyone in his life a few times ill with influenza. Epidemics occur in the northern hemisphere, usually in the fall or winter. During the epidemic ill 25-40% of the population covered by the flu in the region. Epidemics of influenza caused by influenza virus type A, occur every 1-2 years, type B – every 3-4 years. Following the Ministry of Health last season in Ukraine there were 5,8 million cases of influenza and acute viral respiratory infections. According to statistics, the incidence of influenza was 1294,6 per 100000 population, on 12,1% more than the previous season. 259 000 people (4,5% of patients) were hospitalized. 391 confirmed death (including 5 children). According to the World Health Organization (WHO), the epidemic season 2016-2017 years in Ukraine will circulate influenza strains: A / California / 7 / 2009 (H1N1) pdm 09-like virus; A / Hong Kong / 4801 / 2014 (H3N2) like virus; virus B / Brisbane / 60 / 2008.

Aim. Study the WHO recommendations on influenza vaccination in the 2016-2017 season.

Materials and methods. The analysis of the recommendations of WHO and Ministry of Health of Ukraine regarding the flu vaccination in the 2016-2017 season.

Results and discussion. Annual vaccination is the most effective means of defense against influenza viruses, recognized evidence-based medicine. Recommended vaccinations hold people who are in the categories of risk: the elderly, patients with chronic lung diseases; with chronic heart disease; with chronic liver disease; with chronic kidney disease; with immunosuppressed; persons living in organized groups; medical staff (for the prevention of influenza illness and transmission of patients); pregnant women. As of today, Ukraine registered and allowed to use such vaccines for the prevention of influenza with renewed strain composition: Vaxigrip Split is vaccine inactivated influenza liquid (Sanofi Pasteur SA, France) and GC Flu (Green Cross Corporation, Korea). Both vaccines contain three strains of influenza strains that will circulate in season 2016-2017. The vaccine is injected IM or deeply SC.

Conclusions. It is proved that the main measures of preventing influenza is annual vaccination against influenza. Timely vaccination prevents the flu or developing serious complications of flu.

FEATURES PHARMACOTHERAPY OF DEEP VEIN THROMBOSIS

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Deep venous thrombosis is a pathological condition characterized by the formation of blood clots in the deep veins, most often of the lower extremities. Deep venous thrombosis is a common cause of morbidity and mortality in bedridden or hospitalized patients, and healthy people in general.

Numerous factors, often in combination, contribute to deep venous thrombosis such as age more than 40 years, obesity (body mass index > 30 kg/m²), oncological diseases, varicose veins, the presence of thrombosis and embolism in the anamnesis, the use of estrogens. There are three factors that are critical in the development of venous thrombosis: venous stasis, activation of blood coagulation and vein damage. Methods for diagnosis of deep venous thrombosis of the lower extremities are venography, d-dimer test, radioisotope study and ultrasound.

Nonspecific prophylaxis of deep venous thrombosis of the lower extremities is performed in all patients in the early postoperative period, and in the presence of a high risk of this complication in combination with anticoagulant and disaggregant therapy.

Due to the risk of increased bleeding, the introduction of the standard heparin use at a dose of 12000 – 24000 units per day (depending on body weight) or low molecular weight heparin should be started in the morning the next day after the surgery for 7-10 days. Heparin use for prophylaxis in a dose 5000 units every 8-12 hours or 7500 units every 12 hours.

Low molecular weight heparins are Fondaparinux, Rivaroxaban, Apixaban. Fondaparinux use from 5 to 10 mg subcutaneously once a day for 5-9 days for treat and for prophylaxis use 2,5 mg. Rivaroxaban use 15 mg orally every 12 hours during a meal, then 20 mg orally every day for 6 months, and for prophylaxis use 2,5 mg. Apixaban use 10 mg orally 2 times a day for 7 days, then 5 mg 2 times a day, for prophylaxis use 2,5 mg.

Alteplase is a tissue plasminogen activator (tPA). It works by helping to break down unwanted blood clots. Alteplase use 0,05-0,1 mg/kg/h with transcatheter intra-arterial infusion for 1-8 hours or before lysis of thrombus.

Warfarin reduces the formation of blood clots. Warfarin use 2-5 mg orally 4 times a day for 2 days, 10 mg orally for 2 days. Need to check the INR every 2 days and use the dose depending on the results.

VACCINOPROPHYLAXIS OF POLYOMYELITIS IN UKRAINE

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Introduction. Poliomyelitis is a highly infectious viral disease transmitted from person to person by the fecal-oral route, and is characterized by the defeat of the nervous system, predominantly the gray matter of the spinal cord, with the development of flaccid paresis and paralysis. There are no specific medicine for the treatment of poliomyelitis. In the 50 years of the last century, 2 vaccines were received: the inactivated (inanimate) Salk vaccine (IPV) and the live Sabin vaccine (OPV) (both preparations contain all 3 types of poliovirus). After this was beginning of mass vaccination against poliomyelitis and the incidence of this infection began to decline dramatically. In 2014, only 359 cases were registered in two countries (Afghanistan and Pakistan). The main disadvantage of OPV is the probability of development in vaccine and contact with them vaccine-associated paralytic poliomyelitis (VAPP). The frequency of VAPP development ranges from 500,000 to 1,000,000 first doses of OPV per case of paralytic poliomyelitis. The most frequently called VAPP is type 2 poliovirus. WHO recommends the use of a bivalent OPV vaccine that does not contain a strain of type 2 poliovirus. Ukraine joined the WHO Global Strategy – the transition from trivalent OPV to bivalent OPV.

Aim. To study the features of vaccine prevention of poliomyelitis in connection with the emergence of an outbreak in Ukraine.

Materials and methods. We have studied the WHO resolution on poliomyelitis eradication in the world, the strategic polio eradication plan and the implementation of the final phase in 2013-2018.

Results and discussion. For today in Ukraine there is an active immunization of children. In connection with the emerged deficit polio vaccine for 2015, as humanitarian aid to Canada with the support of UNICEF, Ukraine was delivered 3700000 doses OPV and 1100000 doses IPV produced by the French company Sanofi Pasteur. IPV (IMOVAKS POLIO) and OPV (OPVERO) vaccines are distributed in the regions of Ukraine. During the immunization period, out of the planned 3798258 children from 2 months to 10 years of age, received at least 1 dose of OPV, which is 90,1%. The UN Children's Fund "UNICEF" conducted a series of trainings to raise awareness of physicians in each area.

Conclusions. Due to additional immunization against poliomyelitis, it was possible to increase the level of protection of children from the disease and thus the circulation of the virus was suspended.

LYSATES OF BACTERIA IN PREVENTION OF ACUTE RESPIRATORY VIRAL INFECTION

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Introduction. In Ukraine, in the 2015-2016 seasons, 5,8 million cases of acute respiratory viral infections (ARVI) were registered among the Ukrainian population, that is 1294,6 per 100,000 people. ARVI is the most widespread in the world group of clinically and morphologically similar acute inflammatory diseases of the respiratory organs, the originators of which are viruses. Viral infections of the upper respiratory tract are often complicated by the development of bacterial superinfection of exogenous or endogenous nature. In this connection, immunomodulators of microbial origin acquire special relevance.

Aim. Study the possibility of using bacterial lysates in the prevention of ARVI.

Material and methods. Analysis of data from Ukrainian and foreign literature on the possibilities of using bacterial lysates in the prevention of ARVI.

Results and discussion. Bacterial lysates are ground particles of bacteria that most often cause inflammatory diseases of the upper and lower respiratory tract and which are used to prevent and treat bacterial infections. Bacterial lysates initiate a specific immune response to bacterial antigens due to stimulation of phagocytosis and presentation of the antigen by macrophages to lymphocytes located in the mucosa of the respiratory and gastrointestinal tract, enhancing the production of anti-inflammatory cytokines, the development of an adjuvant effect, that is, the enhancement of the T- and B-cell response. Insufficient effectiveness of bacterial lysates can be caused by a short contact time of preparations with mucous membranes or a constant flushing of the preparation with saliva or removal of ciliated epithelium. Bacterial lysates can be obtained by chemical (IRS 19, Broncho-munal, Broncho-Vax, Imudon) or mechanical (Ismigen, Respibron) pathways. Also, there are lysates of topical action (with intranasal and sublingual mode of administration) and systemic actions are isolated. In clinical practice, bacterial lysates of systemic action became more widespread. Bacterial lysates are indicated for the prevention of the development of rhinitis, sinusitis, tonsillitis, adenoiditis, otitis, pharyngitis, laryngitis, tracheitis, bronchitis, pneumonia as complications of ARVI. Common contraindications to the use of bacterial lysates are the individual intolerance of the ingredients of the drug, pregnancy, the period of breastfeeding, children under 2 years

Conclusions. Bacterial lysates are an effective remedy of preventing bacterial complications in ARVI.

DEVELOPMENT OF THE FIRST RUSSIAN STANDRANT SAMPLE FOR THE DETERMINATION OF ANTI-COMPLEMENTARY ACTIVITY OF HUMAN IMMUNOGLOBULINS

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Introduction. The problem of developing domestic / national pharmacopoeial reference designs is relevant, both in Ukraine and in Russia, as well as in the world practice as a whole. According to the recommendations of the World Health Organization for the production and evaluation of the quality of manufactured medicines, it is more economical to use national standard samples.

The purpose. Creation of the first national standard sample of human immunoglobulin for the determination of anti-complimentary activity in Russia.

Materials and methods. Standard sample of human immunoglobulin BRP (anticomplementary activity and molecular parameters) № Y0001504, series 1. The studies were carried out using the complement fixation reaction according to the procedure of OFS.1.8.2.0007.15 of the State Pharmacopoeia of the Russian Federation of the 13th edition.

Results and discussion. According to the results of the standard sample attestation, anticonfection activity values were obtained $40.5 \pm 7.2\%$ for negative control and $76.6 \pm 6.2\%$ for positive control with an odds ratio of 0.95. The standard sample is additionally characterized by the protein content (in a colometric method with a biuret reagent) 103.1 ± 3.6 mg / ml with a confidence probability of 0.95. Data on the stability of the developed standard sample confirmed the expiration date, which was 3 years.

Conclusions. The developed first national standard human immunoglobulin sample (№ OCO 42-28-430) is intended for use in the pharmacopoeial procedure OFS.1.8.2.0007.15 "Determination of the antikomplementary activity of drugs of human immunoglobulins for internal administration" (State Pharmacopoeia of the Russian Federation 13th editions) to assess the stability and acceptability of test results.

MODERN PHARMACOTHERAPY OF ONYCHOMYCOSIS

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Introduction. Onychomycosis is a fungal infection of the toenails or fingernails that may involve any component of the nail unit, including the matrix, bed, or plate. Onychomycosis is a widespread disease. It accounts for half of all nail disorders. The incidence of onychomycosis has been reported to be 2-13% in North America, 6.5% in Canada and 3-8% in United Kingdom, Spain, and Finland. Onychomycosis affects persons of all races. The incidence of onychomycosis has been increasing, owing to such factors as diabetes, immunosuppression, and increasing age.

Aim. Reviewing of evidence-based guidelines and treatment recommendations for the management of onychomycosis.

Materials and methods. **Investigation of medical guidelines from Medscape and MSD Manual Professional Edition.**

Results and discussion. The goals of pharmacotherapy for onychomycosis are to reduce morbidity and to prevent complications. Medications for onychomycosis can be administered topically or orally. A combination of topical and systemic treatment increases the cure rate.

A systemic treatment is always required in proximal subungual onychomycosis and in distal lateral subungual onychomycosis involving the lunula region. Systemic treatment recommendations are as follows: Terbinafine as first line of treatment 250 mg once/day for 12 weeks (6 weeks for fingernail) achieves a cure rate of 75 to 80% (level A); Itraconazole as first line of treatment 200 mg twice/day, 1 week on, 3 weeks off, for 12 weeks achieves a cure rate of 40 to 50% (level A); Fluconazole may be an alternative in patients unable to tolerate terbinafine or itraconazole 150 mg once/week for 6-12 months (level B); combination treatment recommended if response to topical monotherapy is likely to be poor (level D).

White superficial onychomycosis and distal lateral subungual onychomycosis limited to the distal nail can be treated with a topical agent. Topical treatment recommendations are as follows: Amorolfine once/week for 9-12 months (6 months for fingernail) (level D); Ciclopirox is useful for patients in whom systemic therapy is contraindicated once/day for 48 weeks (level D); Efinaconazole once/day for 48 weeks (level D); Tavaborole once/day for 48 weeks (level D).

Conclusions. Systemic treatment is more effective than topical. A combination of systemic and topical treatment increases the cure rate.

OFF-LABEL USE OF DRUGS IN ONCOLOGY

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Introduction. The new method of prescribing drugs has appeared in oncology in recent decades – "out of instructions", which is designated by the term "off-label use" in the world healthcare. Unfortunately, the analysis and systematization of the experience of its use for clinical medicine are insufficient.

The purpose of study. To analyze the experience of oncologists about the appointment of anti-blust drugs according to the indications, doses and age categories that are do not point out in the instructions of these medications.

Materials and methods. To analyze the world experience of using anti-blast drugs in off-label use over the past 10 years.

Results. Over the past 10 years the cancer centers of the world have found that from 50 to 75% of drugs use in oncology were an innovative off-label appointment. So, the narcotic analgesic Fentanyl is prescribed according to the instructions with severe pain in cancer patients, and recently 80% of its prescriptions for the treatment of migraine and back pain. An example of the use of off-label in oncology is the simultaneous administration of hormonal therapy, immunotherapy and targeted drugs. Tricyclic antidepressants are rarely used in the clinic now due to side effects. But nevertheless, these drugs are often effective for pain in oncology, and there is no such indication in the instructions of these drugs. Tranquilizer Lorazepam is used against nausea in cancer sublingually, also not indicated in the instructions.

Conclusions. If all traditional medicines are exhausted, doctors prescribe unlicensed drugs that do not have oncological indications in the instructions, but practitioners have established their effectiveness in certain oncological diagnoses. This style of prescribing medicines is recognized throughout the world, but this experience does not systematized by clinicians.

THE MODERN PHARMACOTHERAPY OF PRIMARY OPEN-ANGLE GLAUCOMA

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Introduction. Primary open-angle glaucoma (POAG) is a chronic progressive disease, that insults the optic nerve with evolution of specific optical neuropathy, characteristic changes of view field and is accompanied by periodic or temporal increasing of ophthalmotonus. The paropsiss and blindness could be the result of glaucoma. POAG is the most widespread form of glaucoma among the population of Ukraine.

Aim. The aim lies in studying of modern standards of POAG pharmacotherapy.

Materials and methods. The adapted clinical recommendations, compatible clinical protocols of medicare of patients with POAG were analysed.

Results and discussion. The exact pathophysiology of POAG is not known. It is supposed that myocilin gene mutations cause the dysfunction of trabecular network cells with subsequent decrease in outflow facility and elevation of intraocular pressure (IOP). Modern pharmacotherapy includes using medications that decrease IOP. Such medication classes as prostaglandin agonists, β -blockers, carbonic anhydrase inhibitors, α -agonists and combos are recommended. Prostaglandin agonists increase uveoscleral outflow. Among them as eye drops are recommended: latanoprost, bimatoprost, travoprost, unoprostone, tafluprost. The Beta-blockers lowers IOP by reducing the production of aqueous humor possibly thanks to blocking adrenergic beta receptors present in the ciliary body. The selective (betaxolol) and nonselective (cartenolol, timolol, levobunolol) beta-blockers are used as eye drops. Carbonic anhydrase inhibitors inhibit carbonic anhydrase in the ciliary body, that causes decreasing aqueous humor secretion. Among them brinzolamide, dorzolamide as eye drops and acetazolamide, methazolamide per os are recommended. Alpha-agonists, such as apraclonidine, brimonidine as eye drops, are used too. The most reasonable therapy is using the combined medications: brimonidine/timolol, timolol/dorzolamide, brinzolamide/brimonidine. It is necessarily to take into account the concomitant diseases of patient during making choice of therapy.

Conclusions. Modern pharmacotherapy includes using medications that decrease IOP. The most reasonable therapy is using the combined medications. It is necessarily to take into account the concomitant diseases of patient during making choice between different ways of therapy.

PHARMACOTHERAPY FOR INSOMNIA

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Introduction. Insomnia is a sleep disorder which is characterized by difficulty during falling asleep or staying asleep as long as desired. Moreover, unsatisfactory quality of sleep causing physical and emotional symptoms during daytime is characteristic of insomnia which influences social and cognitive activity. More than 50% of population suffer from insomnia throughout their life. Elderly people wake up at night or early in the morning. Women suffer from insomnia twice as much as men. Only 5 of all those suffering from insomnia seek medical attention.

Depending on the type of insomnia the algorithm of its treatment is chosen. Pharmacological as well as non-pharmacological approaches can be chosen during the treatment of insomnia (separately or in combination).

Aim. The aim of our research was to study pharmacotherapy of insomnia in the international medical practice.

Materials and methods. Pharmacological treatment of insomnia consists in applying hypnotics which induce sleep mostly through their impact on the main inhibitory GABA-system of the central nervous system (CNS). Additionally sedating medications are used. Recently medications/substances which influence melatonin receptors have started to be used. Their application is considered a perspective direction in pharmacological treatment of insomnia.

Results and discussion. The aim of effective therapy of sleep disorders is recovery of its structure. Trasdodone is the first antidepressant which has double mechanism of action. Trasdodone inhibits serotonin transfer protein and is the serotonin receptors antagonist of the 2nd type) T (5-HT₂; blocks 5-HT_{2A}, as well as 5-HT_{2C}-receptors).

Unlike tricyclic antidepressants Trasdodone doesn't reduce the fourth orthodox sleep. Thus with the help of favorable sedative and hypnotic effect which benzodiazepine doesn't have, trasdodone can be used in treatment of the state of increased anxiety which is accompanied by insomnia caused by depression.

Trasdodone is registered in Ukraine under trade name Trittico. Its starting dose is 100 mg, single dose at bedtime, orally. If necessary, the dosage is increased by 50 mg/day every 3-4 days until the therapeutic effect is achieved.

Conclusions. Use of Trasdodone increases total sleep time through reduction of cases of waking up at night and shortened phase of fast sleep which has been confirmed with the help of polysomnography.

MODERN FACILITIES OF PREVENTION INFECTION FROM HPV

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Globally, cervical cancer ranks second in terms of prevalence among malignant neoplasms in women, causing about 500 thousand new cases a year, and third after breast cancer and lung cancer among the leading causes of death of women from oncopathology. Every year, about 270 thousand women die from this disease. In all countries of the world, cervical cancer is the main medical, psychological and social problem of women. The main cause of cancer is the Human Papilloma Virus.

Fighting this disease is possible by vaccination. There are 2 vaccines on the market: Gardasil and Cervarix. Gardasil is a vaccine for use in the prevention of certain strains of human papillomavirus types 6, 11, 16 and 18. HPV types 16 and 18 cause an estimated 70% of cervical cancers, and are responsible for most HPV-induced anal, vulvar, vaginal, and penile cancer cases. HPV types 6 and 11 cause an estimated 90% of genital warts cases. HPC rates are grooving rapidly in young life, but chance are decreasing as people reach the age of about twenty. Merck was denied FDA approval to market Gardasil to women aged 27 to 45. Gardasil is given in three injections over six months. The second injection is two months after the first, and the third injection is six months after the first shot was administered and need to repeat a revaccination every 2 years. Alternatively, in some countries it is given as two injections with at least six months between them, for individuals aged 9 years up to and including 13 years.

The second vaccine is Cervarix. Cervarix is indicated for the prevention of the following diseases caused by oncogenic HPV types 16 and 18 ((highly oncogenic)): cervical cancer, cervical intraepithelial neoplasia (CIN) grade 2 or worse and adenocarcinoma in situ, and CIN grade 1. Additionally, some cross-reactive protection against virus strains 45 and 31 were shown in clinical trials. Cervarix also contains AS04, a proprietary adjuvant that has been found to boost the immune system response for a longer period of time (more 7 years). Therefore revaccination is not needed. Immunization with Cervarix consists of 3 doses of 0.5-mL each, by intramuscular injection according to the following schedule: 0, 1, and 6 months.

Cervarix included in the national vaccination programme for teenage and pre-teenage girls aged 12–13 and 17–18, because the efficacy of Cervarix against cervical cancer is higher than Gardasil.

In conclusion, it can be said that Cervarix need to use for prevention cervical cancer, Gardasil - prevention genital warts and cancer.

MODERN PHARMACOTHERAPY OF ANXIETY DISORDERS

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Introduction. Statistic shows that 50-65% of people during the life are affected at least one traumatic event, and many are exposed to two or more events such as a large disaster, war, sexual or physical violence, traffic accidents, torture, etc., which are related to the threat to their own life (or the life of another person) and cause intense fear, helplessness or horror. Psychological reactions on stressful events occur for all people, but may vary in strength severity and the consequences for the common condition. In medical practice distinguish the acute stress disorder (ASD) and posttraumatic stress disorder (PTSD).

Aim. The study of modern standards of emergency medical care for patients with anxiety disorders.

Materials and methods. We have analyzed articles, adapted clinical guidelines, unified clinical protocols of medical care to patients with anxiety disorders.

Results and discussion. ASD and PTSD have the following basic symptoms: re-experiencing, avoidance and emotional stupor, excessive excitement. In addition, acute stress disorder includes dissociative symptoms such as alienation, emotional deafness, derealisation, and depersonalization and dissociates amnesia.

On time prescribed treatment, which includes psychological support and, if necessary, the prescribe of drugs to reduce misery and improve health, create conditions for a return to normal life. Pharmacotherapy is indicated when the severity of distress rights can not be controlled using only a psychological means especially when there is an extreme type hyperexcitability, sleep disturbances or nightmares. Drug therapy, if necessary, is prescribed individually. They use mostly antidepressants from the group of serotonin reuptake inhibitors (fluoxetine, paroxetine, sertraline, escitalopram). These drugs are well tolerated, does not cause dependence and addiction. Other general classes: reuptake inhibitors of serotonin-norepinephrine (venlafaxine); selective reuptake inhibitors of norepinephrine (maprotiline); reuptake inhibitors of norepinephrine-dopamine (bupropion); and noradrenergic and specific serotonergic antidepressant (mitrazapin).

Conclusions. In this way we studied and analyzed the current standards of emergency medical care for patients with anxiety disorders and found that modern pharmacotherapy used as the primary treatment method, that aimed at reducing the symptoms of PTSD.

PHARMACOTHERAPY OF VENTRICULAR PREMATURE BEATS

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Introduction. Despite the undeniable advances in the treatment of heart disease, the development of new and advanced technologies of diagnosis and treatment, cardiovascular diseases are one of the first causes of death in all countries. One of the majority of these deaths is ventricular premature beats. Ventricular premature beats is version cardiac arrhythmia, characterized by extraordinary reductions whole heart or its individual parts. Studying this issue will help to better understand with quality and effective treatment of this disease.

The aim of this report is a study of modern approach treatment of ventricular premature beats in Ukraine.

Materials and methods. We learned pharmacotherapy recommendations for patients with ventricular premature beats, which are in Clinical protocol of care for patients with ventricular premature.

Results and discussion. According to our research, if ventricular premature beats developed in individuals without pathology of the heart, but it bothers them, then start pharmacotherapy with beta-blockers especially in the presence of additional indications: ischemic heart disease, arterial hypertension, sinus tachycardia. The drugs of choice are propranolol, metoprolol, atenolol, betaxolol, bisoprolol, nebivolol, esmolol. You can also apply calcium antagonists: verapamil, diltiazem. In the case of a combination of ventricular premature beats with sinus bradycardia the drug of choice may be allapinin. In other cases, use of antiarrhythmic drugs I class in the following sequence: propafenon, etmozin, etatsizin. The lack of effectiveness of β -blockers and antiarrhythmic drugs of class I administered amiodarone is the most powerful of the existing antiarrhythmic drugs with minimal risk of arrhythmogenic effects. Amiodarone is also the drug of choice in patients with threatening and clinically significant arrhythmias on the background of severe structural heart disease, patients with systolic myocardial dysfunction and chronic heart failure. An alternative treatment for patients with ventricular arrhythmia on the background of coronary artery disease is sotalol – class III antiarrhythmic with β -blocking properties.

Conclusions. Thus, the most effective groups of drugs for pharmacotherapy ventricular premature beats are beta-blockers, calcium antagonists and antiarrhythmic class I or III. The choice of the drug depends on the specific clinical situation and concomitant diseases in the patient.

OFF-LABEL USE OF DRUGS IN PSYCHIATRY

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Introduction. Drugs are the strictly controlled products in the world and prescribed by a physician in accordance with the instructions. But a new style of using "off-label use" drugs has appeared in medical practice in recent decades, when doctors prescribed medications for other indications, dose, route of injection and other age group, which instructions had not have.

The purpose of study. To analyze the frequency and range of prescription off-label drugs in psychiatry.

Materials and methods. Analysis and systematization of the experience of psychiatrists in using off-label style.

Results. Psychiatry is the second area in medicine after pediatrics, where the off-label style is widely used: 1/5 of all off-label drugs are the medications used in psychiatry. An examples of the use of such drugs are the appointments: Carbamazepine (anticonvulsant) for the treatment of bipolar disorders; Gabapentin (anticonvulsant) – for the treatment of psychosis, migraine; Midazolam, as a sedative, antipsychotic and antidepressant drug, and as an additional therapy for insomnia; Buprenorphine (narcotic analgesic) – with depression. There were changes among the used antipsychotic off-label drugs from 84% in 1995 to 93% in 2008. With insomnia, off-label antidepressants are used for 45% of patients. Clonidine, as an off-label drug, is used to treat attention deficit disorder.

Conclusions. Today, off-label medications are an important part of psychiatric practice worldwide and knowledge of off-label drug information will allow practicing clinicians to be more aware of alternative treatments and innovative use of traditional medicines.

ANTI-INFLAMMATORY EFFECT OF LEDUM PALUSTRE

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Introduction. Upper respiratory tract accompanied by coughing and inflammation. Drug needed for treatment should be effective, safe, combine the complex pharmacological activities.

Aim. To find and explore extract, which has not only antitussive effect, but also anti-inflammatory. Therefore, we decided to investigate the anti-inflammatory effects of conventional Ledum palustre: a complex with arginine, purified extract Ledum palustre using ethyl acetate and polysaccharide complex Ledum palustre.

Materials and methods. Study of anti-inflammatory activity of extracts obtained from conventional Ledum palustre by edema induced by carragenin in rats.

The method is based on an assessment of the acute exudative inflammation. Acute inflammation (swelling) reproduce the introduction for plantar of 0.1 ml 1% solution of carragenin. The initial volumes of the paw experimental animals were measured by onkometr before the start of experiment. Investigated probe extracts were injected into the stomach 1 hour before administration of carragenin. The volumes of the paw experimental animals were re-measured by onkometr after an hour post entering carragenin. Anti-inflammatory response was assessed every hour for 4 hours after induction of inflammation. We used saline-drug as a control and diclofenac sodium as referent-drug, the "gold standard" of anti-inflammatory therapy.

Results and discussion. The study confirmed the anti-inflammatory effect Ledum palustre. Polysaccharide complex Ledum palustre demonstrated anti-inflammatory activity in a dose of 50 mg / kg. Edema decreased by 84% compared with the control. Other complexes showed lower activity.

Conclusions. Study of anti-inflammatory activity of extracts Swamp conventional yielded positive results, allowing to expand the range of normal usage Swamp, potentiation of pharmacological effects. Anti-inflammatory effect will reduce inflammation in the respiratory organs. The combination of anti-inflammatory and antitussive effect provide complex effects on the respiratory tract and provide greater therapeutic efficacy.

FEATURES PHARMACOTHERAPY OF HYPOTHYROIDISM

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Hypothyroidism is a clinical syndrome caused by a prolonged, persistent deficiency of thyroid hormones in the body or a decrease in its biological effect at the tissue level.

Hypothyroidism occurs more often in the age group over 60 years. In women, hypothyroidism is more common 2 times than in men.

The causes of primary hypothyroidism (thyroid disease) are factors such as autoimmune processes, treatment with radioactive iodine, iodine deficiency, rare hereditary enzymes, drugs (lithium, amiodarone, etc.), radiation therapy and surgical treatment. Secondary hypothyroidism is an inadequate function of the hypothalamus and pituitary gland (TSH, tiroliberin).

Signs of hypothyroidism can be fatigue, loss of energy, lethargy, weight gain, decreased appetite, dry skin, pallor, hair loss, drowsiness, muscle aches, joint pains, depression, mental disorders.

Various thyroid hormone preparations are available for replacement therapy, including synthetic preparations of T₄(L-thyroxine), T₃(liothyronine), combinations of the 2 synthetic hormones, and desiccated animal thyroid extract. The starting dose L-thyroxine in young or middle-aged patients who are otherwise healthy can be 100 mcg or 1.7 mcg/kg po once/day. The dose is adjusted every 6 wk until maintenance dose is achieved. Liothyronine (a synthetic analogue of T₃) is taken at a dose of 25-100 mcg / day, maintaining a dose of 25 to 75 mcg / day. Lytryronin is not used alone, mainly in combination with thyroxine 1: 10-14 (T₄ / T₃) with ineffective monotherapy T₄. h. Additionally, patients receiving liothyronine are chemically hyperthyroid for at least several hours a day, potentially increasing cardiac risks.

The drug Thyroid gland of animals (pig or cow thyroid glands) should be taken before breakfast, its initial dose is 15-30 mg per day orally, but may increase by 15 mg / day every 2-3 weeks (or 30 mg / day every 30 days), maintenance dose: 60-120 mg per day.

Prevention of hypothyroidism is a balanced diet (sufficient intake of iodine in the body), preventive counseling of an endocrinologist for people living in areas that are poor in iodine and therapy of endocrine pathologies, including thyroid diseases.

POTENTIAL ANTIPSYCHOTIC-LIKE ACTIVITY OF NOVEL SALICYLAMIDE DERIVATIVE

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Introduction. Schizophrenia is a severe mental disorder which affects about 1% of population, resulting in considerable disability. The main limitations of available antipsychotic drugs are their undesirable side effects as well as inadequate treatment efficacy. Consequently, there is an urgent need to develop novel antipsychotic agents.

Purpose of the study. The aim of this study was to evaluate potential antipsychotic-like activity of novel salicylamide derivative with high affinity against 5HT_{1A}, 5HT₇, 5HT_{2A} and D₂ receptors.

Materials and methods. The hyperlocomotion test induced by amphetamine and MK-801 were performed to evaluate the potential antipsychotic-like activity of tested compound. The compound was administered intraperitoneally, 30 minutes before the experiment, at three doses: 0.625, 1.25 and 2.5 mg/kg. The locomotor activity test was conducted to verify if obtained results were specific. The experiments were performed using adult male mice and were approved by Local Ethics Committee.

Results. The tested compound statistically significantly reversed the hyperlocomotion induced by amphetamine and MK-801 in mice at the dose 2.5 mg/kg, which indicates its potential antipsychotic-like activity (*p<0.05). The compound did not affect locomotor activity in mice at active dose, what suggest that observed effects were specific and the tested compound did not possess potential sedative or psychostimulating properties. Statistical analysis was performed using one-way ANOVA test with Newman Keuls post hoc test (GraphPad Prism 5.0).

Conclusions. The obtained results suggest that the tested compound possesses potential antipsychotic-like activity in behavioral tests in mice. Further studies are necessary to develop full pharmacological profile and mechanism of action of novel salicylamide derivative, which could be a new candidate for the schizophrenia treatment.

IMMUNOTHERAPY – A NEW PERSPECTIVE IN THE TREATMENT OF CANCER

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Introduction. Immunooncology is a new direction in the investigation of cancer and immunotherapy is a new strategy in the treatment of oncological diseases.

A lot of clinical trials testing therapeutic antibodies against immune checkpoints in more than 20 types of cancer, including solid tumors and haematological malignancies, have been conducting in different countries and their results lead to registration of such drugs as ipilimumab, pembrolizumab, nivolumab, atezolizumab.

Materials and methods. Information search and analysis of data of modern foreign and national literature.

Results. There are a lot of mechanisms of tumor escape from immune system: low immunogenicity of tumor antigens, disbalance between proliferation of tumor and immune cells, selection of immune resistant cancer cells, production of immunosuppressive substances, ability to induce apoptosis of cytotoxic T-lymphocytes, expression by tumor cells of receptor-traps (TRAIL-3, TRAIL-4) etc.

The development of new immune drugs gave an opportunity to treat many types of cancer increasing overall survival and progression free survival (PFS) in comparison with conventional chemotherapy and even targeted therapy. Median overall survival of metastatic melanoma on chemotherapy is nearly 11 months while with the use of immune agents it increases up to 24 months.

PD-1 (programmed cell death -1 protein) is a regulative peptide, expressed on T-lymphocytes. When this protein interacts with PD-L1, PD-L2 (programmed cell death -1, 2 ligands presented on tumor cells) the activation of T-cells suppresses and occurs their apoptosis. Using monoclonal antibodies (MA) against PD-1 receptor, PD-L1, PD-L2 promotes the development of antitumor immunity.

Ipilimumab (Yervoy) – is a MA against cytotoxic antigen CTLA-4 (negative regulator of the activity of T-cells) presented on T-lymphocytes. It was approved by FDA in 2011 for the treatment of unresectable or metastatic melanoma. Besides this drug was approved by FDA as adjuvant therapy in stage III melanoma because in EORTC 18071 phase III trial this MA significantly improved recurrence-free survival in high-risk patients.

Pembrolizumab (Keytruda) – is anti PD-1 MA, which makes tumor visible for immune system. In September 2014 it was registered for treatment of patients with

unresectable and metastatic melanoma and for treatment of this tumor after progression on ipilimumab and BRAF inhibitors (in BRAF-mutated melanoma).

According to clinical trials KEYNOTE-001, 002, 006 this drug improves the level of objective response, progression free survival during 12 months and overall survival in comparison with ipilimumab and chemotherapy.

In October 2015 FDA approved pembrolizumab for the treatment of patients with progressive metastatic non-small cell lung cancer (NSCLC) with expression PD-1 after chemotherapy with platinum failed and in NSCLC with EGFR and ALK mutations after progression on targeted agents. According to KEYNOTE-24 the use of immune drug decreased the risk of progression and death from lung cancer by 50% and 40% .

Nivolumab (Opdivo) – is a MA against PD-1 protein. Is is used as a first line therapy for unresectable or metastatic melanoma (without BRAF mutation) in combination with ipilimumab, as second-line treatment in ipilimumab ineligible melanoma, as second-line therapy for squamous NSCLC with progression on or after platinum-based chemotherapy, and renal carcinoma (after anti-angiogenic treatment has failed).

According to the results of Checkmate 066, Checkpoint 037, nivolumab showed increased overall survival, PFS and objective response rate in comparison with chemotherapy.

Atezolizumab (Tecentriq) – is a fully humanised MA against PD-L1 and in October 2016 it was approved for the therapy of patients with metastatic NSCLC whose disease progressed during or following platinum-containing chemotherapy.

Besides it received FDA accelerated approval for the treatment of locally advanced or metastatic urothelial carcinoma progressed after platinum-containing chemotherapy.

Conclusions. Immunotherapy is a quickly developing direction and opens wide opportunities for treatment of great amount of cancer types. A lot of immune drugs are testing now in clinical trials in glioblastoma, ovarian cancer, triple-negative breast cancer, gastrointestinal tumors and many others so in the future we could receive new therapeutic agents improving patient's overall survival and quality of life.

So immunotherapy has shown promising results and could be considered one of the most significant achievements in modern oncology.

Key words: immunotherapy, programmed cell death -1 protein, T-lymphocytes, immune checkpoints.

Section 14.

PHARMACOECONOMIC STUDIES OF DRUGS

ABC- ANALYSIS OF PHARMACOTHERAPY OF CHRONIC GASTRODUODENITIS IN CHILDREN

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Introduction. Chronic gastroduodenitis is one of the most common gastrointestinal diseases in pediatric patients. The disease has a chronic course, reduces the quality of life of patients, often accompanied by the occurrence of complications and significant financial costs for treatment and prevention of recurrence.

The **aim** of this study: ABC-analysis of pharmacotherapy chronic gastroduodenitis in the gastroenterology department of children's clinic in Kharkiv.

Materials and methods. The analysis of 94 disease histories of children with chronic gastroduodenitis at the age of 10 to 16 years was conducted. Besides in disease histories there were also such recorded diagnoses: biliary dyskinesia, chronic cholecystitis, chronic pancreatitis, irritable bowel syndrome, cholelithiasis, chronic non-specific non-ulcer colitis. The average period of staying in hospital was 12 days. The research lasted during 2016. Clinical and economic method named ABC-analysis was used.

Results. According to the analysis of disease histories of patients with chronic gastroduodenitis 46 trade names (TN) of drugs, which are consisted to 36 international nonproprietary name from 23 pharmacological groups were identified. Correlation of Ukrainian and foreign drugs is 1:1.3.

The results of the ABC-analysis showed that the group A consisted of 15 TN, which spent 79.88% of the total expenditure for all investigated TN, in group B - 14 TN with moderate cost (15.31%) in groups C – 17 TN with low cost (4.81%).

The drugs, which included in the most costly group A, were used to treatment both chronic gastroduodenitis and associated diseases. They were representatives of the following pharmacological groups: medicines for the treatment of functional disorders from the gastrointestinal tract, antacids, cholagogic drug, antispasmodics, gastroprotectors. Among them cholagogic drug "Artihol" (Kyiv Vitamin Factory, tabl. 0.2g №30) has the largest costs (16.32%).

Conclusion. The results of the ABC-analysis of pharmacotherapy of pediatric patients with chronic gastroduodenitis identified the structure of the cost of drugs and the most expensive among them. These results can serve as a basis for the further study of the question of rational pharmacotherapy of pediatric patients with chronic gastroduodenitis at this department.

ANALYSIS OF THE MARKET OF ORAL ANTI-DIABETIC MEDICINAL PRODUCTS IN UKRAINE

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Introduction. Over the last 5 years, the prevalence rate of diabetes mellitus (DM) in Ukraine has increased by 6%, and the number of the ill is increasing primarily on account of DM type 2. Nowadays, pharmaceutical market provides a limited assortment of oral anti-diabetic medicinal products (OADMP) for treatment of DM type 2, and low level of availability of complex OADMP, which have a benefit of declining a dosage of an active pharmaceutical ingredient and side effects.

Aim. Study of the assortment, social and economic availability, as well as consumption of OADMP in the Ukrainian pharmaceutical market over the last two years (2015-2016).

Materials and methods. Analysis of the assortment and cost of the medicinal products in the market of Ukraine was conducted based on the data from analytical company “Pharmstandart” of “Morion” company. When analyzing the assortment, the number of manufacturers, variety of product forms, and cost of the package of OADMP were determined over the period of study.

Results and discussion. In 2015, the assortment of OADMP was represented by 148 trade names (TN) based on 18 international nonproprietary names (INN), and in 2016 by 149 TN. Ukrainian market of OADMP is formed of manufacturers from 15 countries, among which a majority is represented by: Ukraine (69 TN), Germany (17 TN), Great Britain (15 TN), Japan (12 TN), the USA (11 TN), Israel (8 TN), and Switzerland (7 TN). All OADMP in the market are represented as 2 pharmaceutical forms: tablets and granules, as well as medicinal products in the form of solution for injections in a pre-filled syringe. Most frequently used form of OADMP is tablets (166 TN). Retail price range for OADMP varies from 10.27 UAH to 5,071.32 UAH. The cheapest OADMP is a product Glibenclamide, Lekhim PJSC (Ukraine), tablets 5 mg, No. 30, and the most expensive one is a medicinal product Victoza®, Novo Nordisk (Denmark), 6 mg / mL, No. 2.

Conclusions. During 2015-2016, minor changes in the assortment of OADMP, provided in the pharmaceutical market of Ukraine, occurred. The number of domestic medicinal products increased, and the number of imported medicinal products reduced, what is considered a positive result, since domestic products are more affordable for consumers. Depending on the manufacturer, prices varied from low to high, which provided a possibility of individual choice of the product, taking into account its active ingredients, pharmaceutical form and price.

**COMBINED ORAL CONTRACEPTIVE PILLS:
STUDY OF THE PRODUCT RANGE AND
SOCIAL AND ECONOMIC AVAILABILITY IN UKRAINE**

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Introduction. Planned parenthood is one of the most topical medical and social issues all over the world. According to the definition given by the WHO, health and planned parenthood provide prevention of unwanted pregnancies, free choice of the number of children and the time of their birth depending on the parents' age and health. Absence of an integrated approach to the solution of this problem led to induced termination of pregnancy becoming the main means of birthrate regulation.

Aim. Currently, a large number of medicinal products including those used for prevention of unwanted pregnancy are registered in the pharmaceutical market.

Materials and methods. Analysis of the range of combined oral contraceptive pills and their social and economic availability was conducted in 2013-2015, according to the data from "Morion" system.

Results and discussion. 55 medicinal products were analyzed based on 11 international nonproprietary names (INN), which are produced only by foreign manufacturers. When analyzing the product range in the market as for 2013, the INN group of Desogestrel + Ethinylestradiol, the number of products of which constituted 8 trade names (TN), prevailed in the Ukrainian market. In 2014, the number of TN remained virtually unchanged. Medicinal product "TRI-MERSI" (Desogestrel + Ethinylestradiol) was withdrawn from the Ukrainian market. According to the data for 2015, the number of TN increased insignificantly. A leading position by the number of TN proved to hold Drospirenone + Ethinylestradiol with the TN number of 9. Analysis of social and economic availability showed that during the years of study there were no highly available medicinal products among the ones under study; the majority of the products were of low availability over this period.

Conclusions. From analytic data a conclusion about low availability of combined oral contraceptive pills was drawn. This leads to small demand for this group of medicinal products among women with low income level. The reason of this issue is a complete absence of analogues of combined oral contraceptive pills (COCP) produced by domestic manufacturers, which causes low availability of these medicinal products for population.

MARKETING ESTIMATION OF THE POSITIONS OF ASSORTMENT OF ANESTHETIC MEDICINES DERIVATIVES OF ACETIC ACID

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Introduction. Selection of the composition and development of high-efficiency combined preparations of acetic acid derivatives (diclofenac sodium), belonging to the pharmacotherapeutic group of NSAID, currently relevant and carrying out these studies provides rationale for the development and localization of these combined drugs. In the world, studies are under way on a number of priority areas for the development of NSAID, including: the development of convenient dosage forms for monoactive and combination drugs belonging to this pharmacotherapeutic group.

Patients wishing to purchase tool for the treatment of pain, constitute a significant part of the visitors to the pharmacy. Consequently, well-formed assortment of drugs of this group is of great importance in improving the economic performance of the pharmaceutical industry. The development of domestic generic drugs – generics of the most important pharmacotherapeutic groups, which have efficiency, safety, included in the tasks of the strategic import-substituting program of the Government of the Republic of Uzbekistan.

Aim. The aim of the study is to study the factors influencing the position of medicinal combined preparations based on diclofenac sodium.

Materials and methods. The studies were carried out using the method of content analysis of official sources of information about LP. Analyzed according to the database data "Drug audit" for 2014, 2015 and 2016gg. And on the State Register of Medicinal Products using basic marketing principles. The object of the study were tablets, which contain diclofenac sodium.

Results and discussion. According to the results of the study, it is determined that the diclofenac sodium contained in its composition in the local pharmaceutical market can be found in the following dosage forms: solutions, tablets, suppositories, gels, drops, suspensions and injectable solutions. Analysis by types of dosage forms showed that solutions predominate in the assortment structure (29%), tablets (24%), followed by suppositories (19%), gels (13%), ointments (5%), capsules (4%), Drops (3%) and solutions for injection (1%).

Of the total number of drugs based on diclofenac sodium, the proportion of monocomponent is 98.5%, the remaining 1.5% is a combination. Analysis of the ratio of foreign and domestic drugs to the number of registered assortments of a group of these drugs among foreign countries in terms of the number of proposals in the ranking of tableted drugs are leading - Russia, India, Uzbekistan, etc. The results of injecting drugs show the leadership of Russia and Ukraine. It should also be noted that the combined drugs with diclofenac in the local pharmaceutical market are all within 3-5%.

The next stage of the study was the questioning of patients taking these drugs, as a result of which 50 consumers were interviewed. On the basis of the data obtained demographic portrait of the consumer. This is a woman between the ages of 53 and 74

Years, with a higher education, living in the city, an employee. Among the consumers surveyed, the majority (58%) noted improvement after application of these drugs. Respondents prefer foreign NLP (53%), but also many (47%) choose these drugs of domestic production. For 59% of respondents, tablets are the most preferred dosage form, 28% are capsules, and 25% are considered the most optimal dosage form of the ointment, etc.

Thus, monitoring the state of the target segment of the domestic pharmaceutical market of this group shows positive trends in its development. The constantly expanding range of this group indicates their significant role in the treatment of joint diseases.

Conclusions. the study of the aspects of formation of demand for medicinal products containing diclofenac sodium in its composition, characterizing the market situation, and determining the prospects for its development. The expediency of improvement of information support, advertising of domestic combined preparations based on diclofenac sodium medicines on the pharmaceutical market, with the purpose of improving their market positions, was revealed.

RESEARCH ASSORTMENT OF STATINS IN THE PHARMACEUTICAL MARKET OF UKRAINE IN 2013-2016

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Introduction. According to WHO data every year from cardiovascular disease (CVD) 17 million people die. According to the data of the Ministry of Health of Ukraine from heart attacks each year, 400 thousand Ukrainians die. In Ukraine the mortality rate from CVD is about 67% it is the highest in the world. 80% of deaths from CVD could be avoided by means of timely treatment and prevention. An important risk factor for CVD is hyperlipidemia. The main drugs for its correction are statins.

The aim of research. Analysis of the assortment of statins in the pharmaceutical market during 2013–2016.

Materials and methods. For the analysis information of retrieval «Pharmstandard» system was used, which allows to analyze INN, manufacturer, assortment, average retail prices of medicines.

Results and discussion. Statins for years of creation and entering in the pharmaceutical market can be divided into four generations: I generation – lovastatin, pravastatin, simvastatin, II generation – fluvastatin, III generation – atorvastatin, cerivastatin, IV – rosuvastatin, pitavastatin. Last statin, unlike other statins, acts in minimal doses 1–4 mg and does not react with cytochrome P450 in the liver, so it is safer than other. During 2013-2016 years the main part of the range of statins was foreign and consisted of 82-86%. The range of drugs gradually increased, starting from the 144 trade names (TN) in 2013 to 172 TN – in 2016. The prices for statins were increased gradually every year starting from 4.59 UAH. – in 2013 to 1604.85 UAH – in 2016. In 2016 on the basis of 6 INN of statins (simvastatin, lovastatin, fluvastatin, atorvastatin, rosuvastatin, pitavastatin) 172 TN were presented in the pharmaceutical market of Ukraine. Among them 29 TN of domestic manufacturers and 143 TN of foreign. Prices for statins varied over a wide range from 9 UAH to 1605 UAH. Number of producers in 2016 was 33 from 18 of countries. Pharmaceutical market mostly was submitted atorvastatin – 79 TN (46%) 21 manufacturers.

Conclusions. Statins in the pharmaceutical market of Ukraine presented in a wide range (6 INN, TN 144-172), with a wide range of prices for the package, which allows the choice of drug based on their efficacy, safety and financial capacity of patients. The 48.4% TN presented on the basis of the atorvastatin INN, having sufficient evidence and high efficiency.

UKRAINIAN PHARMACEUTICAL MARKET: ANALYSIS OF THE ASSORTMENT OF ANTIHYPERTENSIVE DRUGS

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Introduction. Cardiovascular diseases are the main cause of death of the population of Ukraine. Hypertension is one of the most common cardiovascular diseases. It gives many complications, increases the death rate from myocardial infarction and stroke. According to evidence-based medicine use of antihypertensive drugs can reduce risk of major complications of diseases of the cardiovascular system by 25-40%. For the individual treatment of hypertension in the pharmaceutical market should be a lot of drugs. Drugs for pressure reduction should be from different pharmacological groups. They must have a different price. Under such conditions, rational therapy of high blood pressure is possible.

Aim of reseach. the analysis of assortment of Ukrainian market of antihypertensive drugs in 2016.

Material and methods. The analysis of the assortment of antihypertensive drugs on the pharmaceutical market of Ukraine was conducted according to the information-analytical system "Morion". We used structural analysis of the pharmaceutical market.

Results. At present, all five main groups of antihypertensive drugs are represented in the pharmaceutical market in Ukraine, namely: B-andrenoblockers, ACE inhibitors, calcium channel antagonists, antagonists of the receptors for angiotensin II-Sartans and diuretics. The preparations of these groups are represented by 38 INN, which corresponds to 734 TN. Preparations of domestic production make up 31% of the assortment. They are represented in all pharmaceutical groups. The largest assortment is represented by ACE inhibitors. In the general range of antihypertensive drugs, their share is 28%. The share of Sartans is 22% of the total assortment. Betalocators and calcium antagonists have an equal share in the assortment - 17% each. The smallest assortment in the diuretic group is 8%. The price of analog preparations differs by 2-7 times.

Conclusions: The Ukrainian pharmaceutical market is currently quite saturated with antihypertensive drugs. The range of drugs is dominated by imported drugs. Domestic medicines are in all pharmacological groups of antihypertensive drugs. They are cheaper than imported medicines. The doctor and patient have a real possibility of individualized therapy of hypertensive disease.

ANALYSIS OF PHYTOIMMUNOSTIMULANTS IN THE UKRAINIAN PHARMACEUTICAL MARKET IN 2016

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Introduction. Immune system performs protective functions and prevents the emergence of infectious, allergic and other diseases. The development of science and technology, environmental degradation, increased stress have negatively impact on the immune system. This requires pharmacologic correction of immunodeficits. Meeting the needs of doctors and patients in immunotropic phytomedications depends on their assortment in the pharmaceutical market and affordability.

Aim. Analysis of phytoimmunostimulants that are registered in Ukraine for justification of development of new drugs of plant origin with immunostimulative effect.

Materials and methods. Analysis of phytoimmunostimulants assortment in Ukrainian pharmaceutical market in 2016 year.

Results and discussion. Immunostimulators of plant origin in Ukrainian pharmaceutical market are presented by 43 trade names (TN). They belong to 4 pharmacotherapeutic groups. The biggest group is phytomedications with Echinacea. 25 TNs of monodrugs of echinacea are registered. Domestic drugs constitute 76%. The majority combinations that contain Echinacea and other herbs are domestic productions (67%). Range of average retail price per one package ranges from 5.30 to 410.10 UAH.

The majority TNs of phytoimmunostimulators (70%) in Ukrainian pharmaceutical market in 2016 year are liquid forms: tinctures and extracts – 45%, drops for internal use – 15%, syrups – 10%. Solid dosage forms of phytoimmunostimulators compile 28%, of which tablets – 20%.

Conclusions. 43 TNs of phytoimmunostimulators are presented in Ukrainian pharmaceutical market, mostly domestic production. The biggest group is phytomedications of Echinacea.

Range of the average retail price for the package of the medicinal product is various. This indicates the possibility of doctor and patient to choose the drug, taking into account the efficacy, safety and affordability.

Most TNs of plant immunostimulants in Ukrainian pharmaceutical market is in liquid form, that is less compliant than solid dosage forms. Therefore, further research and scientific developments should be aimed at creating more compliant drug forms (tablets and capsules).

THE RATIONALITY OF THE DRUGS PRESCRIPTIONS FOR PATIENTS WITH CORONARY HEART DISEASE IN MEDICAL INSTITUTIONS OF UKRAINE

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Introduction. Coronary heart disease is the leading cause of death in the world and in Ukraine. The results of clinical and economic analysis of efficacy and safety of therapy enhances its rationality.

Aim. Assessment of the rationality of pharmacotherapy of patients with coronary heart disease according to the results of VEN-analysis.

Materials and methods. The formal VEN-analysis was used in accordance with the state normative documents: Unified clinical protocol of primary, secondary (specialized) and tertiary (highly specialized) medical care "Stable coronary heart disease" (2016) and the State Formulary of drugs in Ukraine (2015). VEN-analysis assumes the distribution of drugs in terms of their importance in two categories: "V" – vital and "N" (non-essential). In the presence of an international non-proprietary name in the specified normative documents, which were developed taking into account the modern requirements of evidence-based medicine, these drugs were classified as "V".

Results and discussion. A retrospective analysis of prescribing lists of 100 patients from the average statistical treatment and prophylactic institution of Ukraine was carried out. "Coronary heart disease" was the main diagnosis in all patients. The patients had polymorbidity of the pathology, which caused polypragmasia. The main directions of pharmacotherapy of coronary heart disease were: anti-ischemic, antiplatelet and lipid-lowering, which correspond to normative documents. The number of prescriptions per patient – 11.1. A formal VEN-analysis of treatment of patients with coronary heart disease showed that there were 52 (75%) of the 69 international nonproprietary names that were vital (category "V"), non-essential (category "N") were 17 (25%). Group of drugs of the category "N" were: mexidol, meldonium, citicoline, L-lysine escinate, dexketoprofen, piracetam+tiotriazoline, actovegin, corvitin etc.

Conclusions. The results of VEN-analysis show that the main directions of therapy for patients with coronary heart disease corresponded to the requirements of the current clinical protocol and the State Formulary of drugs of Ukraine (2015), in general, but it is possible to improve the rationality of prescriptions by reducing the prescriptions of secondary drugs.

Section 15.
MANAGEMENT AND MARKETING
IN PHARMACY

EVALUATING THE EFFECTIVENESS OF THE PHARMACY NETWORK

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Introduction. The effectiveness of the pharmacy organization activity depends on many factors: commodity policy adopted by the pharmacy, its location, financial capacity and solvency of the social structure of the population in the service area of the pharmacy, the competitive environment, training of personnel, quality of work with suppliers. Recently, the organization and functioning of pharmacy networks enables them to achieve significant competitive advantage in the pharmaceutical market.

Aim. The purpose of our scientific work is to study effectiveness of activity the pharmacy network, to develop and propose recommendations to optimize the management process to improve its efficiency.

Materials and methods.

According to the purpose the following tasks have been formulated:

- To determine basic concepts of effectiveness of organizations;
- Analyze the overall activity of the test structure of pharmaceutical companies,
- To analyze the internal and external environment investigational pharmaceutical companies,
- To assess strengths and weaknesses of the pharmacy using SWOT-analysis
- To study the efficiency of pharmacy branches, using ABC analysis,
- To assess sales growth through BCG matrix,
- To analyze the main indicators of financial and economic activity of the pharmacy network.

Results and discussion. Group A consists of branches with share in total sales of each more than 10% (3 pharmacies), combined share in sales of this pharmacies' group is 68%. The group B includes the branches, each share is from 5% to 10% (2 pharmacies). Their combined share in sales is 12%. The group C consists of the rest of the branches of pharmacy network (13 pharmacies), share of each less than 5%. Their combined share in sales at 20%. An analysis of indicators of financial and economic activity indicators such as financial stability, solvency, business activity and profitability results show stable development of the pharmacy network.

Conclusions. Pharmacies should be given the most attention, carefully follow the maintenance of their range, availability of sufficient inventory, quality of service rating pharmacy, maintaining a positive image among consumers, development of loyalty programs.

**STUDY OF NARCOTIC DRUGS AND PSYCHOTROPIC SUBSTANCES
AVAILABILITY REGARDING STANDARDS OF TREATMENT
ON THE EXAMPLE OF UKRAINE**

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In Ukraine, in connection with the decline in the level of public financing of the health care system, as well as the economic crisis, the issue of ensuring the availability of drug, in particular narcotic drugs and psychotropic substances, is especially urgent. The reduced availability of drug is due to low social protection of the population in the provision of medicines, as well as low purchasing power of the population. The increase in the cost of medicines due to the addition of 7% VAT to the structure of their prices is also one of the reasons for the reduced availability of medicines. **The aim** of the work was to study the availability of narcotic drugs and psychotropic substances in relation to treatment standards in the example of Ukraine.

Research methods: content analysis was used in the work.

Results and discussion: the concept of "availability of drugs" according to WHO is considered in such aspects: physical and economic. Physical availability is understood as providing consumers with quality, effective and safe medicines in the required quantity, that is, their availability in the pharmacy's assortment. The economic accessibility of medicines requires public funding and compensation (benefits). Most products containing narcotic drugs and psychotropic substances are dispensed from pharmacies by prescription. The right to purchase medicines for free and discounted prescriptions in Ukraine in accordance with the Decree of the Cabinet of Ministers №1303 from 17th of August, 1998 city have a certain category of citizens, including the treatment of cancer. Drugs to be compensated in the case of outpatient treatment of diseases in accordance with the Resolution of Cabinet of Ministers of Ukraine No. 1303, determined by the Decision of CMU No. 1071 from 5th of September, 1996, constitute a list of medicines that can be purchased for budgetary funds. In the course of the study, treatment standards were analyzed and diseases were identified that required the use of narcotic drugs and psychotropic substances. During the research it was established that narcotic drugs and psychotropic substances are used for the treatment of all oncological diseases, and are also very widely used in acute conditions and colic for the treatment of pain.

Conclusions: the current standards of treatment have been analyzed and diseases and conditions have been established in which patients are prescribed narcotic drugs and psychotropic substances.

RESEARCH OF MANAGEMENT METHODS AT THE PHARMACY

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Introduction. Managers have responsibility for enabling an organization to achieve its objectives. They are therefore responsible for planning, organizing, and controlling organizational activities. Managers set budgets, monitor those budgets, and identify ways of making sure that the budget is kept to. In addition managers manage resources - people, plant, time, materials, finance, etc. Managers operate in a whirl of activity, constantly having to switch their attention from one subject, problem or task to another. They act in an uncertain external environment, where relevant and useful information is often mixed up with gossip and speculation. At the same time the main task of the head is to organize the work of subordinates in accordance with their qualifications, abilities, inclinations, to create on this basis, a model of organizational relations, monitor the effective execution of the works.

Aim. The purpose of our work is to study methods of personnel management used by the head of the pharmacy, to develop recommendations to optimize the management process.

Materials and methods.

To achieve the goal the following tasks have been formulated:

- To study the theoretical principles of personnel management;
- To identify the human resource management techniques that are used by head of the pharmacy using the questionnaire of pharmacy staff, and including the head;
- To identify the head of the pharmacy management style;
- To analyze the motivational relations at the pharmacy.

Results and discussion. In the course of human resource management as an important component of the organization, the head, as a rule, uses different methods of management. According to results of our questionnaire survey of management staff and subordinates, the head of the analyzed pharmacy use methods of management in such percentage ratio: organizational - 29%, legal – 14%, economic – 19% and social-psychological – 28%. The social- psychological management style of the head has been determined as liberal with elements of democratical one.

Conclusions. In the course of human resource management as an important component of the organization, the head uses different methods of management, the main ones being: organizational, legal, economic and socio-psychological. Social-psychological management style defines the common head's manner of behavior and it is important part of successful activity of each organization.

ANALYSIS OF APPROACHES TO THE FORMATION OF ASSORTMENT IN PHARMACY NETWORKS

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Introduction. Assortment management is one of the most important functions of any enterprise. It is from the assortment largely depends the effectiveness of its work and success in general. At the present stage of development of the retail segment of the pharmaceutical market in Ukraine, which is characterized by a large number of pharmacy chains and single pharmacies, each pharmacy is forced to resolve the issues of assortment management on its own. And if you consider that more than 9000 trade names of medicines are sold in Ukraine, it becomes obvious that this is not an easy task. It is also quite natural when doing this work many people rely on expert opinions of specialists in purchasing departments or on the activities of their competitors. Nevertheless, today there are many methods of assortment management that are able to qualitatively change the activity of the pharmacy – to increase its efficiency.

The aim of the work is to analyze of approaches to the formation of assortment in pharmacy networks.

Materials and methods. The method of peer review has been used in the study and in practical activities to improve the management of assortment policy of pharmacy chains.

Results and discussion. Based on the results of a study of employees of network pharmacies in 2016-2017, 421 questionnaires were analyzed from different regions of Ukraine. During the research, information on the features of analysis and the formation of an assortment of medicines and medical products in network pharmacies was of interest. It was established that 46,32% of experts use a centralized approach to the formation of the assortment of drugs and medical products (when the assortment of pharmacies entering the pharmacy network is formed in the office); 19,00% of respondents use the decentralized approach (the assortment is created directly in the network pharmacies); 34,68% of specialists apply a mixed approach to the formation of the assortment of medicines and medical products (when the main assortment of pharmacies is formed in the office, and part of the assortment is formed at the level of the network pharmacy).

Conclusions. Thus, during the research, the approaches used to analyze and form the assortment in pharmacy chains have been analyzed.

MARKETING RESEARCH OF MEDICINES FOR RHEUMATOID ARTHRITIS TREATMENT

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Introduction. Rheumatoid arthritis (RA) is a chronic systemic disease of the connective tissue with peripheral joints lesions and characteristic extraarticular manifestations. Rheumatic diseases lead to significant health care costs, affect the national economy and reduce quality of life.

According to the Ministry of Health, the prevalence of rheumatoid arthritis is approximately 116,492 patients, including 52,000 of working age people. Disability and disablement growth are the most important social and economic consequences of RA. Each year, 90 % of patients with an aggressive form of the disease are disabled. The average life expectancy of patients with rheumatoid arthritis is reduced by 10-15 years, thus it is an important therapeutic disease.

Aim. The aim of our study was to analyze the pharmaceutical market of Ukraine regarding the drugs used to treat rheumatoid arthritis.

Materials and methods. Systematic, structured, logical analysis methods and method of data summarizing were used.

Results and discussion. A treatment should be carried out comprehensively in several stages: medical therapy, local therapy with gels and ointments on the basis of NSAIDs, spa treatment, physical, medical and social rehabilitation.

According to the ATC system, drugs for the rheumatic diseases treatment belong to the group of M01-inflammatory and antirheumatic drugs. This group includes M01A-steroidal anti-inflammatory and antirheumatic drugs, L03-immunostimulants, J05 antivirals of systemic use administration, A11-vitamins. According to the system, the pharmaceutical market of Ukraine accounts about 60 drugs for the treatment of rheumatic diseases. Segment covers various pharmacological groups, a wide range of manufacturers and pharmaceutical companies such as: SANDOZ, KRKA, Novartis Pharma, Berlin-Chemie AG, Teva, Gedeon Richter, Darnytsia Health. One of the rheumatoid arthritis treatment methods is herbal medicine. Phytomedicines help to relieve the state of the disease and reduce pain in joints' affected areas. Individual herbs and their combinations can be applied in rheumatoid arthritis: birch leaves, nettle, white willow bark, juniper fruits, strawberries herb, sage herb, etc.

Conclusions. Development of new medicines for rheumatoid arthritis treatment is the topical task of the modern Ukrainian pharmacy.

STUDY OF THE NEEDS AND MOTIVATING FACTORS OF PHARMACISTS

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Introduction. Today, human resource management is one of the most important functions of a manager. It seems widely accepted fact that the effectiveness of the organization largely depends on the human resources – the skills, abilities and knowledge of the staff. The strategy of operation and development of any company is inconceivable without reference to personnel. In order to ensure the effective functioning of the enterprise, it must be formed by a strong team capable of maintaining its high professional credibility

The aim is to study the needs and motivating factors of pharmacists.

Materials and methods. The method of peer review has been used in study.

Results and discussion. During research, it was determined the needs of employees. The most important in the work of employees is feel the need to esteem (71 %), 8% respondents reported self-actualization, that is the opportunity to be realized, and for 21 % has a value – safety. Thus, the basic concepts of motivation are the needs, behavior and reward. Requirements of the first order linked to the provision of the physical existence of person. These needs are met through the pay system. Results of the study of the wage system showed that 33,3% of respondents consider it unsatisfactory, and 66,7% – normal. The respondents were asked about a possible change of the place of work: 83,3% answered that they are ready to change depending on conditions, and 16,7% immediately fired. Moreover, among the respondents about the possible reasons for dismissal results indicate that 29% are ready to leave because of the wages. According to them, this is the most important factor. 41% believe that the essential reason for dismissal – a relationship that did not work out with the collective, management. Wages for them is less important than the atmosphere in the team, the psychological mood and positive emotions. 9% of pharmacists can leave for personal reasons. 10% experts noticed bad organization of work, and the remaining 11% – other motives. It was suggested to assess the current system of staff punishment. The results showed that 66,6% respondents assessed its effectiveness as a normal, 16,7% considered inefficient and 16,7% – efficient. Moreover, among the suggested punishments staff noted the warning (50%), others (33,3%) and reprimand (16,7%).

Conclusions. Thus, for effective functioning of pharmacies it is necessary to consider the needs and analyze the motivating factors of pharmacists.

THE ROLE OF INTERNET MARKETING AS A PART OF MULTICHANNEL MARKETING COMMUNICATIONS IN PHARMACY

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Market promotion of drugs is an important part of successful business of each pharmaceutical company. The concept of multi-channel marketing allows pharmaceutical companies to use a set of traditional off-line and modern on-line channels of marketing communications to influence their target audiences.

The growing number of Internet users on the whole planet, legislative restrictions of some ways of drugs promotion in many countries and reduction effectiveness of traditional instruments of marketing communications cause an increased interest of pharmaceutical companies in effective communications with target audiences using Internet marketing. The evolution of promotion of pharmaceutical brands led to a deepening the specialization of pharmaceutical marketing and developing the 'digital pharma' direction.

Over the last decade, the world's leading pharmaceutical and biotech companies developed great number of digital tools. Currently the most popular Internet activities of pharmaceutical manufacturers include using a company web-site, using a product website of a certain drug and using web-site about a certain disease or medical problem. These measures allow pharmaceutical companies to present their drugs to different target audiences, to promote corporate values, to actualize medical problem and demonstrate social projects. At the same time, experts note the trend of loss of priority of product web-sites of pharmaceutical companies in their marketing programs, as interest and confidence to these sources of information in the professional community and consumers is not very high.

Nowadays pharmaceutical companies use a large set of on-line channels of marketing communications: search engines, social networks, professional communities, e-mail, blogs, forums, webinars, mobile applications, etc. According to estimates of employees of pharmaceutical and biotechnological companies, in the near future to promote drugs companies will actively implement such modern tools AS mobile marketing, social media, e-medical representative, virtual e-detailing, e-detailing on tablets, web conference and on-line training.

According to experts, the evolution of on-line promotion of pharmaceutical brands is closely associated with the integration of CRM-systems, the development of educational programs for healthcare professionals as well as the formation of social networks for healthcare professionals and patients.

**STUDY OF THE ASSORTMENT
OF VARIOUS PHARMACOTHERAPEUTIC GROUPS SPRAYS
AVAILABLE ON DIFFERENT PHARMACEUTICAL MARKETS**

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Introduction. Currently, sprays are being actively used in practice and replacing aerosols. The range of medicines in the spray drug formulations on the pharmaceutical markets of the Commonwealth of Independent States is still not wide enough, therefore the theme of creating new medicines in spray drug form is quite topical.

Aim. Theoretical substantiation of the creation of medicines from various pharmacotherapeutic groups in a spray drug form on the basis of a comparative analysis of sprays represented in Belarus, Russia, European countries and the USA.

Materials and methods. Literature review; state registers of medicines of Belarus, Russia, European countries (Germany, UK, Norway) and the USA; comparative analysis; marketing research.

Results and discussion. According to the results of pharmaceutical markets research it was revealed that 82 names of sprays were registered in Belarus, 214 in Russia, 221 in Germany, 134 in England, 92 in Norway and 604 in the United States. Table 1 presents results of the comparative analysis of registered sprays included in different pharmacotherapeutic groups.

Table 1. The number of registered sprays included in different pharmacotherapeutic group

| Pharmacotherapeutic group | Belarus | Russia | Germany | UK | Norway | USA |
|---|---------|--------|---------|----|--------|-----|
| Drugs for treating throat diseases | 20 | 32 | 26 | 6 | 3 | 97 |
| Drugs for the treatment of diseases of the nose | 34 | 107 | 78 | 45 | 38 | 196 |
| Drugs for the treatment of skin diseases | 10 | 15 | 37 | 22 | 2 | 192 |
| Drugs for the treatment of ear diseases | 0 | 0 | 0 | 2 | 0 | 0 |
| Cardiovascular group | 4 | 7 | 10 | 3 | 1 | 6 |

| | | | | | | |
|--|----|-----|-----|-----|----|-----|
| Antihistamines | 4 | 12 | 12 | 4 | 9 | 15 |
| Immunomodulators | 3 | 13 | 1 | 0 | 0 | 14 |
| Local anesthetics and dental drugs | 4 | 6 | 13 | 11 | 1 | 37 |
| Hormonal drugs | 0 | 9 | 8 | 13 | 11 | 16 |
| Anti-migraine drugs | 1 | 2 | 5 | 4 | 5 | 10 |
| Insecticides | 1 | 0 | 2 | 0 | 2 | 0 |
| NSAIDs / opioid analgesics | 1 | 3 | 22 | 15 | 14 | 17 |
| Antiviral drugs | 0 | 1 | 2 | 2 | 2 | 1 |
| Drugs for the treatment of alopecia | 0 | 5 | 2 | 0 | 0 | 0 |
| Antiparkinsonian drugs / drugs for the treatment of multiple sclerosis | 0 | 1 | 1 | 2 | 2 | 0 |
| Drugs for the treatment of nicotine addiction | 0 | 1 | 2 | 5 | 2 | 1 |
| Drugs for the treatment of insomnia | 0 | 0 | 0 | 0 | 0 | 2 |
| Total number | 82 | 214 | 221 | 134 | 92 | 604 |

The analysis data show that medicines in a spray drug form are mainly used to treat inflammatory and allergic diseases of the nose, mouth and throat, infectious and fungal skin lesions. That makes about 70% among all sprays. The main active ingredients are decongestants, antihistamines, antiseptics and anesthetics, local antibiotics and antifungal agents.

Conclusions. Currently, foreign countries are working out sprays not only of local action, but also systemic action for the treatment of severe pathologies, such as Parkinson's disease and multiple sclerosis. Antiviral spray-vaccines and sprays for the treatment of insomnia are being created. This makes the prerequisites for searching various combinations of medicinal substances in order to create new medicines in spray drug form and to expand their pharmacotherapeutic range.

CHARACTERISTICS OF PHARMACEUTICAL ORGANIZATIONS MANAGEMENT ON THE EXAMPLE OF GERMAN FIRMS

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Introduction. Successful functioning of pharmaceutical organizations, to a great extent, depends on the quality of management and efficiency of fulfillment of its functions as well as application of approaches and methods of control. The process of evolution of pharmaceutical management in Ukraine is exactly correlated with renovation of conditions of pharmaceutical organizations` functioning. However, present-day managers do not always make use of today`s achievements of scientists and practitioners in the field of management. They often ignore foreign experience of European developed countries. At the same time, both theoretical knowledge and use of practical experience gained by foreign pharmaceutical organizations are necessary for acquirement and retaining the administrative potential in the present-day conditions.

Aim. The aim of this paper is the theoretical substantiation and development of practical recommendations on implementation of foreign managerial experience into Ukrainian pharmaceutical organizations for ensuring its efficiency in the conditions of uncertain environment.

Material and methods. Methodological basis of the research is compiled on: basic trends in the theory of management and marketing; system and complex approaches; logical analysis; works of Ukrainian and foreign scientists in the field of pharmaceutical management. During the past decades, a large-scale implementation of the Quality Management System (QMS) based on constantly developing standards ISO of 9000 series is taking place in every field of world economy. This is conditioned by the fact that QMS is an all-purpose set of instruments which allows achieving maximum efficiency in all aspects of activity of any enterprise or organization and providing instruments for further self-improvement. In many countries, implementation of QMS into pharmaceutical industry, including the sector of medicines retailing (J1C) has acquired a peculiar significance.

Results and discussion. From the point of view of practical implementation of QMS German pharmaceutical organizations may be considered as the example on the European arena: the sphere of responsibility and competences are strictly divided among employees depending on their positions; orders are passed from administration to workers and are obligatory without discussion. The position of a manager in German firms is linked to not only individual abilities, but also depends on the length of work, formal acknowledgement of qualification, and level of

education. It is worth noticing that a German manager with a university diploma gets promotion once in four years on the average. Those who have got the degree of a Doctor have the open way to the highest administrative circles. It should be mentioned that in Germany Doctors of Sciences enjoy considerable respect in the society and gain higher social position than successful businessmen without academic degrees. The process of communication (interrelation among various departments) in German companies is strictly vertical: suggestions of junior subdivisions are carried to administration through direct superiors who pass the information along the hierarchic chain from lower to upper officials. The complex analysis of literary sources has shown that according to the comparative studies the following peculiarities of the German model of management should be paid attention to:

- stimulation of professional training (realization of the management function such as «motivation» and high-quality work with the staff, which allows raising standards of production to the highest level in an organization and linking the company`s and employees` interests);
- aiming at high quality and satisfaction of customers` requirements (competition on the basis of up-to-date experience and concentration on customers` requirements, state policy, and resolutions of government);
- social responsibility in front of employees and society (introduction of discussing employee`s social sphere and the organization`s responsibility before the society into everyday practice);
- managers` loyalty(is formed by motivating managers of all administrative levels for the achievement the organization`s mission and goals);
- adherence to innovations (as a means of reinforcement of competitiveness in the market with the help of introducing innovations);
- efficient labour relations (are formed by using compromises when discussing questions concerning any production or social problem).

Conclusions. As a result of the analysis and systemization of Ukrainian and foreign publications concerning the main trends of pharmaceutical management certain domains have been revealed organizational development of which allows to improve patients` provision with medicines. Theoretical sources of German model of management that form the foundation of managerial systems in German companies, e.g., rational basis of activity, use of strict formal procedures, selection and promotion of employees according to their qualification, remain its strong aspects and a considerable competitive advantage up to the present. Their theoretical analysis and application in managerial practice in pharmaceutical organizations in Ukraine will considerably increase both professional performance and self-evaluation of a manager as well as the market stability of an enterprise.

Section 16.
SOCIO-ECONOMIC RESEARCH
IN PHARMACY

RESEARCH OF THE PHARMACEUTICAL MARKET OF UZBEKISTAN AND PROSPECTS OF ITS DEVELOPMENT

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Introduction. To date pharmaceutical market of Uzbekistan one of most quickly developing among pharmaceutical markets countries he CIS. He is on the third place after Ukraine and Kazakhstan. A pharmaceutical market of Uzbekistan is quickly developing industry of economy of country. In the last few years the rates of height of pharmaceutical market of Uzbekistan increase only, that attracts foreign producers and is interesting for research.

Aim. The purpose of this work is research of the pharmaceutical market of Uzbekistan and prospects of its development.

Methods. The methods of scientific justification, comparative analysis and desk research methods of marketing research are used.

Results and discussion. Investigating the development of the pharmaceutical market in Uzbekistan, it should be noted that its volume over the past 5 years has grown to 500 million US dollars. 80% of this market depends on imported medicines and currently imported medicines are provided by the Uzbek pharmaceutical market from 60% to 95%. Uzbekistan imports medicines from Ukraine, Russia, India, Germany. According to analysts over the past 5 years, the import of drugs has increased every year by 20-22% and is about 620 million dollars. Uzbekistan exports medicines mainly to the CIS countries. Every year, exports also increase, by about 20% per year. At such rates of growth in domestic demand for medicines, the volume of the pharmaceutical market in the coming years may reach \$ 1 billion.

The capacity of the Uzbek market is about \$ 700 million and is characterized by quite high growth rates (up to 10% per year). In Uzbekistan, more than 5,500 medications have been registered. Of these, 500 items (11.1%) are produced in Uzbekistan, over 2,000 preparations (more than 60%) of foreign pharmaceutical companies, 1300 medicines (28.9%) from CIS producers.

The greatest volume of the pharmaceutical market is occupied by antimicrobials, that is, antibiotics, they are more in demand not only in foreign countries, but also in Uzbekistan. Earlier in Uzbekistan, all imported medicines were subject to preferential taxation. But, in 2015, the Cabinet of Ministers of Uzbekistan, according to the decree "On the regulation of imports of finished medicines," put into effect a list of medicines, for which imports are not covered by the VAT exemption.

However, foreign manufacturers dominate the pharmaceutical market. In

Uzbekistan, the products of such companies as Berlin Chemie / Menarine Pharma (Italy), Novartis (Switzerland), Sanofi-Aventis (France) and so on are in demand.

Despite the high growth rates of the pharmaceutical industry in Uzbekistan, further development of this sector is necessary. Among the promising tasks is the development of medicines based on domestic scientific developments and local raw materials. In Uzbekistan, a rich flora: 138 families, 1023 genus and 4,500 plant species (including about 1150 medicinal plants), which makes it possible to produce original medicines and biologically active additives based on local raw materials.

Promising is the development of domestic producers due to the construction of an effective system of promotion and sales. Achieving this goal will be possible through the promotion of products to the market through the participation of medical representatives, as well as through the implementation of an active marketing policy of domestic companies. These companies find it difficult to maintain their positions due to unequal financial opportunities with foreign companies. Therefore, in the future, market shares of local and foreign companies will begin to be redistributed as a result of competition.

In 2016, the Uzbek state pharmaceutical company announced plans to further invest \$ 65 million in 2018 in the development of the local pharmaceutical industry. The company also developed 10 additional projects to increase the production of infusion solutions, dressings and 20 new generics. All these projects are an integral part of the program for the development of the pharmaceutical industry for the medium term.

Conclusions. The pharmaceutical market in Uzbekistan has a reputation as one of the fastest growing markets in the CIS. The largest suppliers of pharmaceutical products to Uzbekistan are Russia, Ukraine, Germany, Poland, France and the United States. In the sphere of export activities, Uzbekistan cooperates with the CIS countries. In recent years, the country has adopted regulations that clearly regulate the scope of activity in terms of import of pharmaceutical products. By the ratio of profits and risks, Uzbekistan is gradually becoming an attractive country for the prospective development of the pharmaceutical business. The proof of this is the state health policy, which is manifested in the increase of funds for the development of health facilities and infrastructure. Due to these factors, the inflow of foreign direct investment into the country should be higher than observed today. However, today the investment climate in Uzbekistan remains very complicated. The main promising areas of development of the pharmaceutical market in Uzbekistan are: increased financial investments in domestic scientific pharmaceutical development; Use of local raw materials in the production of medicines; Active marketing policy of domestic pharmaceutical companies.

URGENT ASPECTS OF PHARMACEUTICAL BUSINESS IN THE REPUBLIC OF KAZAKHSTAN

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Introduction. Now the pharmaceutical market is one of the most highly profitable and fast-growing sectors of world economy.

Aim. Determination of the main aspects of development of pharmaceutical business in the Republic of Kazakhstan.

Materials and methods. It has used statistical, calculated and analytical, comparative, systemic methods.

Results. According to Committee on MNE Republic of Kazakhstan statistics, in 2016 (December, 2016 in comparison with December, 2015) inflation made 8,5%. In January–November, 2016 15,7 thousand tons of drugs were manufactured in Kazakhstan. In comparison with a similar index of 2015 production increased by 68,2%. The share of the antibiotics made on the Kazakhstan pharmpredpriyatiya makes only 13,7% from sold in the country (86,3%– import), and other medical medicines – 41,3% (58,7% – import). In general, citizens of Kazakhstan began to buy less drugs to what decrease of an index of consumption of GLS per capita testifies. The group of automatic telephone exchange J01 – Antibacterial medicines for systemic use (9,7%) remains the most sold and profitable group of medicinal preparations in Kazakhstan still. Them more, than for \$45 million the USA was sold for the first half of the year of the current year through drugstores. Nevertheless, it is 31,2% less, than in the I half-year 2015 when the sales volume of medicines of this group made \$66,2 million the USA. The second position and 5,7% (\$26,6 million the USA) of sales volumes were occupied by medicines for elimination of symptoms of cold and cough (R05). On the third place from shares in 5,4% (\$25,4 million) – antiinflammatory and antirheumatic tools (M01).

Conclusions. Thus, by results of the analysis, the considerable decrease in sales volumes both in natural, and in value terms is noted. Body height of sales volume in tenge is not so considerable and especially it does not cover the losses suffered by the companies working at the market after devaluation. Some opportunities open with introduction of OSMS within which it is planned to expand access to medical care, including, to providing with drugs.

DEVELOPMENT PROSPECTS OF THE PHARMACEUTICAL MARKET OF THE REPUBLIC OF KAZAKHSTAN

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Introduction. The pharmaceutical market is one of the most highly profitable and fast-growing sectors of the world economy. It serves as a criterion of economic and social development of the country and welfare of the population.

Development of the pharmaceutical industry in the state is considered to be an indicator of the high innovativeness of its economy.

An advanced pharmaceutical industry contributes to the sustainable socioeconomic development of the respective country and to the improvement of the quality of life of its people.

Today the pharmaceutical market of Kazakhstan is one of the most dynamic and fastest growing in the world. According to the analysis of the pharmaceutical market in Kazakhstan, exports and imports of products of the pharmaceutical industry, it should be noted that imports far exceed exports. According to experts, the domestic production of drugs provides only 20% of inner demand.

Therefore, in case of deficit of local pharmaceutical production, people have to provide for their needs through imports. This creates relatively conducive conditions for new companies to enter Kazakhstan market.

Aim. The goal of this study is the analysis of the current state condition and development prospects of the pharmaceutical market of Kazakhstan.

Materials and methods. Statistical, calculated and analytical, comparative, system and other analysis methods, and also analysis data of the pharmaceutical market of Kazakhstan were used for this research.

Results and discussion. Conducted studies show that the volume of export had been growing steadily during 2010-2015, and in 2015 the index of pharmaceutical products exports made up to to 27 617 thousand USD.

In 2015, 11 403 tons of medicines and 297.7 tons of other pharmaceutical products were produced, which is one-third more than the amount in 2014, although in monetary terms, in comparison with 2014 year's amount the

production has decreased.

In the conditions of economical crisis the prices of medicines have changed, however, marketresearch shows that demand for them remained the same as before the crisis, as pharmaceuticals belong to the group of essential goods.

During the first half of 2016 the volume of production of antibiotics increased by 30% compared to the same period in 2015.

The growth was influenced by putting into commission of the new joint-stock company "Himfarm" that produces antibiotics in 17 denominations. Annually the company can produce more than 24 million vials of antibiotics, which is capable to provide the population of the Republic of Kazakhstan with affordable domestic drugs.

According to the results of 2016 the general market of medicinal products compared to the same period of the last year decreased by 18% in the total value (United States Dollars). In quantitative terms, on the contrary, there was positive growth of 13%. Ambulatory channel showed decrease of 27% in monetary terms, taking 14% of the total market share, and increased by 63% in terms of quantity as compared to 2015.

According to the forecasts of the company Vi-ORTIS, in 2017 pharmaceutical market of medicines will reach more than 1 billion dollars, and in packages will be 584 million packages.

Conclusions. To sum up, today the pharmaceutical market in Kazakhstan dependents on imported products, the pharmaceutical industry production volumes do not provide the necessary level of national security of the country. According to the results of the analysis, we can conclude the following: there is a huge potential for the development of the pharmaceutical industry as it is one of the most promising domestic markets in the world with available necessary factors for the development of the industry, and the possibilities of increase of competitiveness of production and export increase.

APPLICATION OF STATISTICAL METHODS IN ECONOMICAL RESEARCH

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Introduction. It is difficult to overestimate the importance of statistics for the economy. Any research on the economy will contain plans, estimates and forecasts that are based on sufficient information and specific methods for collecting, grouping and analyzing the relevant aggregates (the sum of the facts). This information can only be found through statistics. In addition, anyone who wants to start research in a particular market in order to be familiar with the factors affecting supply and demand must follow the scientific steps of statistics.

Aim. The aim of the research is to study statistical methods and directions of their application.

Materials and methods: content analysis, method of analysis and synthesis.

Results and discussion. Statistical method which is applied to a study is the right way to secure goal setting to apperceive social and economic phenomena. To date, there is a large number of universal systems for statistical analysis and data processing. These include SPSS, STADIA, Statistica, Statgraphics, etc. But all the data obtained are heterogeneous and due to the use of these software products, errors in the analysis are minimized. In addition, these software products are characterized by a large set of statistical procedures, which include classification trees, discriminant, variance analysis, taxonomy method, cluster method, and multidimensional regression method, etc.

Classification trees are a method that allows you to predict whether the observations or objects belong to a particular class of the categorical dependent variable, depending on the corresponding values of one or more predictor variables. The purpose of constructing classification trees is to predict (or explain) the values of the categorical dependent variable.

Discriminant analysis is a method of predicting some level of a one-way classification based on known values of the responses. It assumes that different classes generate data based on different Gaussian distributions.

Discriminant analysis is used to decide which variables discriminate (discriminate) two or more emerging sets (groups). For example, an educational

researcher may want to investigate which variables the high school graduate refers to in one of three categories: (1) entering college (2) entering vocational school; or (3) refusing further education or training.

Dispersion analysis is a statistical method for detecting the effect of individual factors on the results of an experiment, and for the subsequent planning of similar experiments. Dispersion analysis was originally proposed by R.A. Fisher. Modern applications of dispersion analysis embrace a wide scope of problems in economics, sociology and technology; they are usually treated in terms of the statistical theory of detection of systematic differences between the results of direct measurements carried out under specific varying conditions.

Cluster analysis is used to organize objects, which is a set of multidimensional statistical procedures that allow you to order objects by homogeneous groups.

To determine the dependence of a certain economic indicator on independent variables, an econometric model was created using the regression method.

Conclusions. The statistical study is an important science because it recently managed to apply scientific methods and theories. It mirrors the modern course of statistics as a science and its applications to reach discerning decisions in different fields of economics. Today, it is fair to say the statistical analysis is part of every economical research. Generally, the contemporary economists are mainly dependent on statistical methods to make economic policies.

The use of these methods allowed us to analyze the current state of the economy and substantiate the methods for improving it.

With the accession of Ukraine to the world economic system, the introduction of statistical methods of analysis into all spheres of the socio-economic life of society will be relevant.

**THE CURRENT STATE AND THE DEVELOPMENT
PERSPECTIVES OF PHARMACEUTICAL LABOR MARKET
IN THE REPUBLIC OF KAZAKHSTAN**

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Introduction. The pharmaceutical market is an important sector of the economy of Kazakhstan and is a measure of its economic and social development, human well-being. The year 2016 of for Kazakhstan began as challenging and complicated: an economic environment could be summed up in one phrase – economic crisis. In 2017 the pharmaceutical companies will continue to adhere to the wait-and-see approach, such tactics will continue until the economic situation will be stabilized. During this period, a key role is to be played by the optimization of human resources management as an essential strategic component of the pharmaceutical industry. Pharmaceutical labor market in Kazakhstan has undergone some changes: during the years of 2015-2016 years, the labor market has gained new features: the reduction of staff and the number of vacancies as well as the reduction of company costs for recruitment; strengthening work of HR-services. In this regard, many employers to temporarily suspend the recruitment of new staff, and the others – reconsider the need of the existing staff, which means that they will be much more demanding for those who are given the job. The performance will be important for companies of each specialist pharmacist, therefore, the demands will be made much higher. In the regard, most important qualities which will be needed, for pharmacists are communication, tolerance, loyalty, flexibility, result-orientedness, successful experience and deep expertise which will help pharmaceutical companies to overcome a difficult period for businesses.

Aim. Assessment of development trends of the pharmaceutical labor market.

Materials and methods. The study was conducted in November and December 2016 by the expert survey, which was attended by 100 professionals – pharmacists, pharmaceutical organizations of Astana, Almaty and Shymkent. Statistical, comparative analysis methods were used for this research.

Results and discussion. Traditionally, the pharmaceutical industry's economic situation is on average better than in the market. This is evident from the

responses of respondent's who has spoken about the increase of salaries this year. So the results of our study showed that the majority of employers of the pharmaceutical industry (62%), in 2017 will plan to increase salaries of their employees in any case. Among them 75% are going to raise the salaries of their employees in the range of 4 to 15%.

Compared to the previous year of 2015 the wage expectations of pharmacists have become higher. In case of transition to a new job 95% of respondents expect their salaries to be increased. At the same time only 9% of respondents are counting for a slight increase up to 10 % in wages, the rest are waiting for a more substantial growth. To the question, «How did your salary in 2016 change compared to 2015? » 60% of respondents indicated that their salary was increased than in 2015. The salary did not change for 34% of respondents and decreased among 6%. According to the survey, more than 50% of employers do not plan to recruit new employees. The intention to carry out reduction is being by 6% of employers reported. Great is the percentage of those who will not actively seek new employees.

To the question «Do you plan to change a job?» The majority of employees of pharmaceutical companies said that they value their jobs. The proportion of pharmacists professionals who do not think about changing jobs increased in 2016 compared to 2015 and amounted up to 51% . The question «How do you assess the future of the economy in the next 12 months ?» assessing the country's economic prospects, the pharmacists, and managers look to the future is very optimistically, it was confirmed by 44% .

Conclusions: Thus, it is considered necessary to develop reasonable pharmaceutical personnel management systems, giving special priority to human resources in the field of pharmaceuticals, which will solve the problem of the labor market in pharmacy today.

IMPROVING STAFF MOTIVATION ON PHARMACEUTICAL ENTERPRISES

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Introduction. Motivation is an important attribute of the management. Positive motivation activates human abilities, reveals its potential negative - inhibits expression abilities prevent the achievement of goals. Most acutely the problem affected the trade of pharmaceutical industry, because here there is a high psychological burden on the employee.

Aim. Contemporary Issues and controversies in motivating personnel pharmaceutical company based on study of factors that influence the choice of staff motivation and strengths and weaknesses of the current system of motivation.

Materials and methods. In this research are used the investigation methods of analyses and synthesis, systematization and generalization.

Results and discussion. With the formation of modern mechanism motivation pharmaceutical companies must consider the impact of various factors external and internal environment. To effectively manage resources such as people, need to know the factors that contribute to employee behavior and group dynamics.

The main objective internal factors include self-realization, improving professional skills and training, the atmosphere in the team, career, responsibility and so on. The most influential factor is a subjective internal pay and working conditions.

The external factors that influence the formation mechanism of motivation in pharmaceutical companies are the general economic situation, earnings of employees in related economic activities, economic and social programs of the government.

The peculiarity of pharmaceutical enterprises is connected with combining the functions of drug provision with scientific, industrial, control-analytical, commercial, medical, information, control and support functions. This should take into account the specific features of the pharmaceutical industry, due to the high level of competition.

Conclusions. The use of innovative methods in motivational activities of pharmaceutical companies improves overall performance; employees use innovative approaches in difficult situations; increase staff productivity and loyalty of employees to the company; create a favorable climate in the team; the involvement of the most qualified professionals.

AVAILABILITY OF PHARMACEUTICAL CARE AS A COMPONENT OF SOCIAL PROTECTION SYSTEM IN TUNISIA

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Introduction. General need for social security is recognized as one of human rights by the international community. Today about 75% of the world's population (5.1 billion people) don't have complete social protection, and 40% don't even have basic protection. Availability of medications is an important component of social protection systems. Tunisia is a leader in terms of welfare of all African countries. However, availability of medications does not always correspond international conventions №102 (1952 year) on minimum standards social welfare which has caused actuality of the chosen research theme.

Aim. The aim of the study was an analysis of the availability of drugs in the context of social protection in Tunisia.

Materials and methods. To achieve the objective we used methods of scientific analysis, systematic approach and content analysis.

Results and discussion. Each state provides certain types of social health services, thus theoretically opening available, at least, a limited list of medical services, including medicines. There are two health insurance systems In Tunisia: compulsory and voluntary, which operate independently or in combination. Compulsory health insurance covers more than 90% of the population – the so-called active citizens of Tunisia: officials, employees of state enterprises, the agricultural sector laborers, fishermen, students and children.

Compulsory health insurance provides this category of citizen free medical care by social insurance, that is carried out in public health facilities. In addition, such insurance enables receiving a list of drugs prescribed in the insurance policy by every patient. The average cost for health services in cases of using just public medicine to each citizen of Tunisia are only 20% of the cost of medical services.

There is regular round the clock community pharmacy with fixed prices in every region of the country. Find community pharmacy in any city in Tunisia can sign «PHARMACIE». It is noteworthy that almost every community pharmacy in Tunisia is not just a place where you can buy the necessary medication, but also is a place where easy to get a little advice, if the disease is not serious. The fact is that experts with medical education work in the «PHARMACIE», they could to measure pressure and provide first aid needed.

In general, sanitary and epidemiological situation in the country is

controlled by the state, and therefore considered a favorable. One of the most common diseases in Tunisia are hepatitis A and B – in varying degrees, it get sick about 10% of the population. Also cutaneous leishmaniasis and hepatitis C are widespread.

Today the health care system in Tunisia is actively developing. The state modernizes the existing network of health services and building a new one. There are implementing new technologies, increased qualification of doctors and pharmacist. According to WHO, the total cost of health by state is about 7% of GNP.

Evidences of success in healthcare Tunisia is a few medals won at international level for its efforts in health care, in 1996 received a gold medal "Health for All" and the medal of the World Federation of blood donors in 1997 received gold medal of the seventh conference of the red Cross and red Crescent Societies.

Conclusions. Social protection of Tunisian in availability of medicines is provided two systems of health insurance active in the country: compulsory and voluntary. Compulsory health insurance covers more than 90% of population. The public health system in Tunisia allows us to provide a decent level of service for citizens of their country. The cost for each citizen of Tunisia for health services are only 20% of the cost of medical services that corresponds to one of the main requirements of the Convention №102, namely "... set the framework emergency medical costs not exceeding 40 percent of total family living expenses".

Lack of financial availability and financial protection, of course, closely associated with existing coverage gaps social healthcare system – as legislatively established and realistic. These mechanisms include a wide range of institutional arrangements, including the implementation of government programs, social insurance, private insurance, are common in many African countries, including Tunisia.

Each state provides certain types of social health services, thus theoretically expanding availability to medicines. In terms of international practice basic set of such expansion must meet international Millennium Development Goals (especially in the case of healthcare of mother and child), the requirements for the treatment of certain diseases, such as AIDS or malaria, and the requirements of the Convention N 102.

THE ROLE OF INTELLECTUAL CAPITAL IN INNOVATION ACTIVITY OF PHARMACEUTICAL COMPANY

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Introduction. In the modern context intellectual capital becomes the dominant factor in the competitiveness of pharmaceutical companies in the context of globalization of markets, regionally and internationally increasing competition. Prolonged lack of innovation means stagnation pharmaceutical production, reducing the quality and competitiveness of pharmaceutical products and, therefore, decreasing of economic effect of pharmaceutical market subject. In addition, today it is necessary to change-over the Ukrainian pharmaceutical industry to the innovative development model, which will ensure more effective pharmacological support of population, Public Health Organization by quality and safe domestic drugs.

Aim. The aim is to study the theoretical aspects and development of practical recommendations for the formation of intellectual capital management of pharmaceutical company.

Materials and methods. It has analyzed scientometric databases, database of Ukrainian patent office, database of the State enterprise “The State Expert Center” of the Ministry of Health of Ukraine.

Results and discussion. Analysis of theoretical work shows that traditionally intellectual capital is included human, structural and market capital. It has analyzed intellectual capital management of JSC “Lekhim-Kharkov”. The state of human capital management system indicates the level of inventive activity and cooperation of pharmaceutical companies with universities and research institutes. Analysis of structural capital researches by the following indicators: number of application for an invention in Ukraine, patents and utility models, the cost of keeping a patent valid. The market capital is investigated the number of applications trade mark and received certificates. Analysis of intellectual capital JSC “Lekhim-Kharkov” shows positive trends of human, structural and market capital indicators. As well integral indicator intellectual of capital has showed positive growth trend during the analyzed period.

Conclusions. The research has established that rational management of intellectual capital allows JSC “Lekhim-Kharkov” maintain and enhance the quality and efficiency of its operations, increasing of domestic drugs share in Ukrainian pharmaceutical market that are available to the general public. Thus, it is necessary for JSC “Lekhim-Kharkov” to keep the achieved results and increase innovative capabilities.

PROFESSIONAL ETHICS OF PHARMACIST AS AN ELEMENT OF PHARMACY SOCIAL FUNCTION

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Introduction. A pharmacy is a specialized health care institution whose task is to provide the population, enterprises and organizations with medicines and medical products through retail trade. At the same time one of the main functions of the pharmacy is social, i.e. providing the population with pharmaceutical aid. In this connection, the understanding by a pharmacist of the social significance of one's work is of paramount importance.

Aim. The aim of this work is to study the rules of pharmaceutical ethics in professional activity as an element of the social function of the pharmacy in the pharmacies of Morocco.

To achieve this aim, it was necessary to solve the following tasks: to study the concept and principles of pharmaceutical ethics and deontology; to consider the methods of communication between a pharmacist and a pharmacy visitors; to study ethics of sales in a pharmacy.

The object of research of this work are the rules of pharmaceutical deontology in the professional activities of the pharmacist of Morocco.

The subject of the study is compliance with the rules of pharmaceutical deontology in the professional activities of the pharmacist of Morocco.

Materials and methods. Codes of pharmaceutical ethics served as an object of study. The system-review analysis and bibliographic analysis of professional publications, international documents, legislative and regulatory acts to justify the possibility of introducing the principles of pharmaceutical ethics into the professional activities of Moroccan pharmacists served as research methods.

Results and discussion. The pharmaceutical network in Morocco is the second largest in Africa, right behind South Africa. Local production covers 70% of domestic demand and even 10% of production is exported. In Morocco, there are more than 14,000 pharmacies, which means a pharmacy for every 3,000 citizens.

The main responsibility of the pharmacist is to take care of the welfare of each patient. According to the ethical code of FIP, the pharmacist should be objective; to put the health and well-being of a person above personal or commercial interests (including financial ones); to promote the human right to safe and effective treatment.

Professional ethics considers two aspects: axiological (value) and deontological (must) in dialectical unity. Pharmaceutical ethics is designed to study and substantiate

the social importance of professional activity, requirements to the personality of the pharmacist, to determine from the standpoint of good and evil the nature of actions and relationships of pharmaceutical workers.

Currently, the range of drugs available in pharmacies has expanded significantly, and the doctor does not always have time to get acquainted with information about all incoming new medicines. At the same time, the level of literacy and exacting to one's health in a certain part of the population has increased, and patients belonging to this social stratum and also experiencing a time deficit, because of their strong employment, very often turn directly to the pharmacist, bypassing the doctor. Due to the circumstances, the role of the pharmacist has changed. Now the pharmacist is a key link in the developing system of responsible self-management, which imposes on him a certain, increased responsibility.

The relationship between pharmacy workers and pharmacy visitors is one of the main points of pharmaceutical deontology. The main pharmaceutical law regulating pharmaceutical practice in Morocco is Dahir No. 1-59-367 of February 19, 1960 (partially amended in 1978), which does not provide for the rules of professional ethics of the pharmacist. Therefore, the following requirements of deontology were proposed. When communicating with patients, as well as relatives of patients, the pharmacist must comply with ethical standards, as well as principles with respect to the patient; to instill confidence in the effectiveness of treatment, medicines and recovery of the patient; to be able to communicate with patients and take into account their habits and interests; to sympathize with patients when communicating with them; to be able to share another's grief and raise the mood, as well as overcome the feeling of hopelessness in the patient and his despair; to understand the nonverbal signs of the patient's condition, in particular the facial expression, the tone of the voice of his posture; to be always benevolent and deserve the patient's disposition and trust; do not allow mistakes and inattention to what and how he says in communication with the patient; to avoid hasty actions and ill-considered preparation of the workplace of the pharmacist; to observe medical secrecy and confidentiality of information during the conduct of professional practice; when dispensing medications, the pharmacist must explain in detail the patient how to store the medication properly at home, how and at what time to take it, what is recommended to drink it, and also to warn (with caution not to inspire the patient with fear) about possible side effects of the drug and to explain to the patient what to do if there is a side effect of the drug.

Conclusions. Thus, the rules of pharmaceutical ethics were studied and the principles of deontology in the professional activities of a pharmacist in Moroccan pharmacies were suggested.

EVALUATION OF THE STATE OF THE PHARMACEUTICAL MARKET OF EXPECTORANT DRUGS

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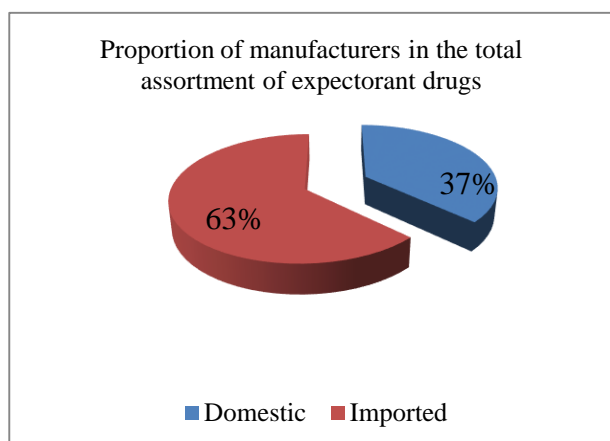
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Introduction. Cough - a symptom that accompanies most respiratory diseases (signaling of respiratory disease). From the physiological point of view, it is a complex reflex protective reaction aimed at removing excess mucus and foreign bodies from the respiratory tract. By its nature, cough is dry (unproductive) and moist (productive). The duration is divided into acute (up to 3 weeks), prolonged (from 3 weeks to 3 months) and chronic (more than 3 months). Considering the fact that cough is just a protective reaction for various diseases, the main goal of therapy is not to eliminate it, but to alleviate its course. Elimination (suppression) is carried out in the case of dry painful cough. In the treatment of wet cough, expectorant and mucolytic agents are used.

Methodology. To achieve this goal, the following methods were used: the analysis of the register of medicines, the information retrieval system "Morion" and the database of medicines in Uzbekistan "Drug audit", which allows to analyze the range of active substances that are part of monopreparations and combined expectorants. A comparative retrospective analysis method was also used. Data processing was carried out with the help of the computer program "MS Excel" in 2010.

Results. According to the state register of medicinal products of the Republic of Uzbekistan for 2012-2016, 43 international non-proprietary or chemical names of funds possessing expectorant or mucolytic effect are registered, both in monocomponent forms of medicines and in combinations. By composition, the preparations can be of plant origin and obtained synthetically.

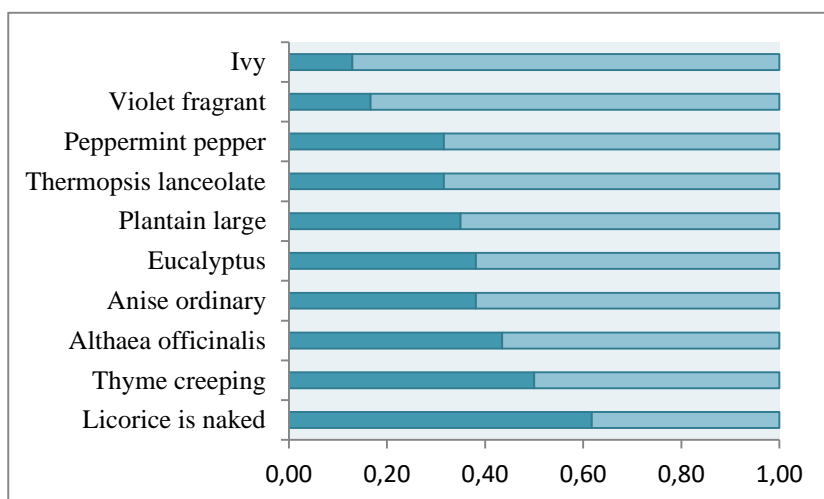


If we talk about producing countries, then a much larger share is occupied by imported medicines. 29 countries offer 80 trade names of drugs. Domestic producers are represented 46 names of drugs.

Among which 37% of domestic and 63% of imported production. Traditionally, a large distribution (preference) in the group of expectorants received preparations of plant origin.

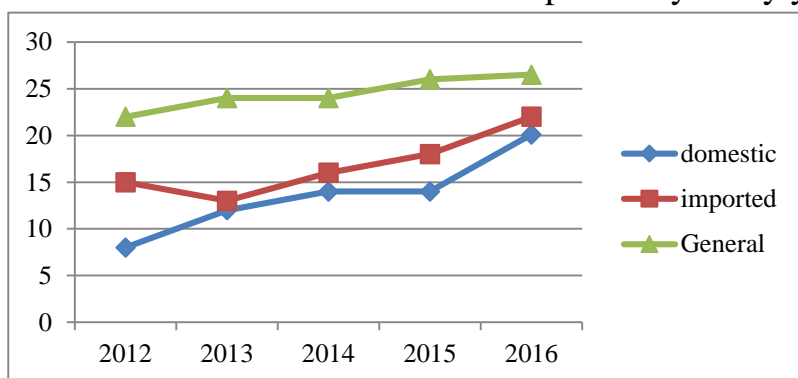
Interest and popularity of phytopreparations are due to the content of biologically active substances, which are more naturally than synthetic drugs, are included in metabolic processes, have good tolerability and significantly fewer side effects. In addition, herbal preparations in addition to expectorant have anti-inflammatory, softening, enveloping effect. Currently, 18 plants are allowed to be used as expectorants in Uzbekistan. The most common drugs are based on licorice naked, thyme creeping, medicinal althea, anise and eucalyptus.

Number of trade names of medicines on the basis of medicinal plants.



According to the state register of medicinal products of the Republic of Uzbekistan for 2012-2016, it has been analyzed dynamics of range of assortments of expectorant drugs. It can be seen on the graph, within this period range of assortments has been increased from 24 to 43

trade name. General assortments expansion year by year periodically.



Let us dwell on such a form of medicines as syrup, which is the most preferable and convenient in children's practice. To date, a large number of expectorants of vegetable origin in the form of syrups are represented on the

market.

Conclusion. Apparently, the assortment of syrups is very diverse, and its main part is represented by foreign producers, in particular, Germany, India, Slovenia. However, not all patients can buy these drugs, primarily because of their cost. In these conditions, it is important to expand the range of available medicines. The obtained data indicate that expectorants are presented in a wide range. The prices vary from low to high depending on the manufacturer, which makes it possible to choose, and also makes the treatment accessible to different segments of the population. The number of domestic preparations on the pharmaceutical market in Uzbekistan is gradually increasing, which is important in the economic aspect.

ANALYSIS OF ECONOMIC AND FINANCIAL ACTIVITY AT THE OPENING OF A PHARMACY INSTITUTION

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Introduction. The analysis of literary, statistical data, standard and legal documents showed that for today in Ukraine availability of the population to the main medicines both physical and economic doesn't conform to national requirements.

Aim. Main objectives of the national medicinal policy are: availability of medicines, their quality and rational application. Therefore the purpose of our researches was: to carry out the analysis of conditions of a microeconomic level of pharmaceutical branch for opening drugstore.

Materials and methods. To implement this goal the following tasks delivery were defined: to analyze and generalize data of literature on the basic principles of the organization of medicines provision in microeconomics system; to carry out the analysis of license conditions of implementation of the economic activity connected with retail sales of medicines in the territory of Ukraine; to carry out a choice of a location of a drugstore and the analysis of possible conditions for goal implementation; to carry out questioning of pharmacists in Kharkov for the purpose of definition of expenses articles which future drugstore in accordance to will have license conditions of pharmaceutical activity in Ukraine; to carry out the analysis of the calculated main indicators of trade and financial activity of future drugstore in order to forecast the point of profitability.

The objects of research were healthcare institutions of Ukraine in Kharkov which provide the population, necessary medicines and products of medical appointment. The subject of research was a process of opening of pharmaceutical enterprise in order to improve the availability of providing the qualitative pharmaceutical help for the population.

One of the criteria which influences on the availability of medicines is the number of inhabitants served by one pharmaceutical establishment. An average figures show flat across Ukraine 2193 persons served by one pharmaceutical institution. Then we continued the calculation of average sales of one pharmaceutical institution during the year which we need for definition of the main indicators of trade and financial activity and definition of a point of profitability became the following stage of our researches. For Ukraine this average value is nearly 1 million 730 thousands UAH a year. Hi order increase in an indicator of commodity sale turnover of the future drugstore we carried out questioning of customers. In the questionnaire a number of questions which defined factors influencing increase in this indicator were set. The analysis of questioning showed that different factors influences on commodity turnover of a drugstore: qualification of the personnel, the drugstore location, the range of the drugstore, the open

presentation for parapharmaceutical goods, opportunity to get primary medical advice and the help (to measure pressure, level of blood sugar, etc.).

Results and discussion. Carrying out questioning of 10 drugstores of Kharkov for the purpose of definition of their primary and monthly articles of expenses was the following stage of our researches. So for one pharmaceutical institution that will work in accordance with general practice on tax accounting with apartment purchase were the expenses 741 thousand 800 UAH. The sum of average monthly expenses on one pharmaceutical institution will make 32 thousand 200 UAH.

The analysis of the profitability was carried out at constant level of trading imposing and the sums of expenses showed that drugstore opening with profitability in 1,3% isn't perspective. Because the net profit will make about 1040 UAH, and primary expenses counted by us make earlier 742,5 thousand UAH. It means that primary expenses will be blocked more than in 58 years. With profitability in 5% in 12 years, from 6-8% respectively in 9,5 and 7 years, but the point of an extremum is the best of all with profitability in 12% will come in 3,5 years.

The following stage of our researches carried out calculations of the same indicators, but for pharmaceutical institutions with the simplified tax system (the 2nd group: to 10 workers with commodity turnover to 1 million UAH). For this group of businessmen average monthly expenses could be from 14 to 32 thousand 300 UAH. In our questioned group they made approximately from 16 thousand to 20 thousand UAH.

The analysis of the calculations of profitability that we have carried out and a profitability point for a pharmaceutical institution which works at a uniform tax showed that the net profit will make nearly 4800 UAH, and primary expenses will decrease to 735 thousand UAH. It means that primary expenses will return in 12 years, and profitability will make 6%-7%.

Conclusions. As a results of research we come to the conclusions:

1. The analysis of number of pharmaceutical institutions and the population in Ukraine showed that 2160 persons are served by one pharmaceutical institution.

2. The results of calculations of average sales of one pharmaceutical institution that it makes 1729,1 thousand UAH In Ukraine a year.

3. The analysis of results of questioning of 10 drugstores of Kharkov showed that average prime expenses counting on one pharmaceutical institution make 624500 UAH. Average monthly expenses counting on one pharmaceutical institution which works in accordance with general tax practice, make 32300 UAH, and on the simplified system from 16 to 20 thousand UAH.

4. The analysis of the calculations of a point of profitability carried out by us showed that with profitability in 12% the point of an extremum will come in 3,5 years, and for pharmaceutical institution which works at a uniform tax and income in day doesn't exceed on the average 5100 UAH primary expenses will be blocked in 12 years, and profitability will make 6%-7%.

ANALYSIS OF FACTORS AFFECTING THE PROVISION OF QUALITY PHARMACEUTICAL CARE FOR POISONING POISONS

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Introduction. Ukraine is one of the largest European states behind the territory, the population and economic potential, and also one of the first accidents in terms of scale and consequences.

Aim. The aim of the work is to analyze the factors that influence the provision of quality pharmaceutical assistance for poisoning with poisonous substances.

Materials and methods. The analysis of literature data showed that poisonous substances are used in the production of household goods, food products and other goods. Therefore, conducting an analysis of domestic and foreign experience in providing assistance to victims in accidents and catastrophes will allow us to improve the pharmaceutical supply of patients with poisonous substances poisoning.

The statistical analysis carried out by us showed that between 2015 and 2016 in hospital departments an average of 603 people with toxic poisoning were hospitalized every year, where carbon monoxide poisoning was almost 50%, food poisoning was 31% and poisoning with household chemicals was almost 19 %.

Since the treatment of poisoning affects both quality of life and mortality, there is a need to assess the reduction in mortality and to assess the change in the quality of life as possible results of the pharmacotherapy.

Due to the fact that poisoning is accompanied by severe psychological stress, pain, fever, the possibility of complications from different organs, we developed a psychometric questionnaire that covers the spheres of physical, psychological and social well-being, as well as the medical sphere.

The questioning was conducted on the basis of the hospital of emergency medical care in Kharkov (sample 1). We also conducted a parallel survey of residents of Kharkov (sample 2). General data on respondents.

Analysis of the general data in sample 1 and 2 showed that the average age of patients was 38 years, the inhabitants of Kharkov - 42 years. Patients with poisonings within 10% - 68%, in the total number of respondents: working - 92%, pensioners - 5%, unemployed - 3%, women - 38%.

In the analysis of the second part of the questionnaire, it was revealed that in case of poisoning for sample 1 the most worried question of the medical sphere was expressed by almost 61% of respondents, the physical sphere - 13.9%, the level of independence - 10%, the psychological sphere - 7.7%, social Relationships - 4.6% and less than 3.1% - the environment.

Results and discussion. In connection with the above, we developed and proposed a calculation of the coefficient of stressogenicity, which reduces or increases the overall quality of life and the effectiveness of poisoning treatment.

When calculating this coefficient, we took into account such indicators in the treatment of poisonings in a patient: the effectiveness of treatment; The total volume of infusion solutions that was introduced; Frequency of administration; The duration of therapy and the average daily volume of infusion solutions.

To evaluate the indicators, the following scoring scale was developed.

The results of the analysis of the questionnaire showed that respondents from sample 1 and 2 for poisoned patients preferred treatment according to scheme "A" in which the infusion therapy was performed in less time (three days). They almost did not care about the volume of solutions, which he introduced for one appointment of a doctor. As we see the stressogenicity in the treatment of poisoning scheme "A" is less than almost 2 points in comparison with the scheme "B".

The next step in the analysis was the calculation of the coefficients of the ratio of total costs and stress.

As a result of calculating the coefficients of the ratio of total costs and stress, it was found that, in comparison with scheme "A" for scheme "B", the stress factor is increased by 20%, while the consumption for treatment of poisonings according to scheme "B" is smaller by 53%, or To 640.59 UAH. Comparing these coefficients in our opinion, the ratio of the total costs should be more important, therefore, the use of the "B" scheme is more economically feasible.

Conclusions. For the group of drug-leaders, liquidity indicators and adequate solvency were calculated. The results obtained indicate the relative availability of drugs of this group and their stability in the market.

The developed and proposed calculation of the coefficient of stressogenicity, which reduces or increases the overall quality of life and the effectiveness of treatment of poisoning SDYAV.

As a result of calculating the coefficients of the ratio of total costs and stressogenicity, it was found that, in comparison with scheme "A" for scheme "B", the stress factor is increased by 20%, while the cost of treatment for poisoning under scheme "B" is less by 53% , Or at 640.59 UAH. Comparing these coefficients, in our opinion, the ratio of total expenditures should be more significant, therefore the use of scheme "B" is more economically feasible.

CHARACTERISTIC OF THE PRESENT INSURANCE MARKET OF THE REPUBLIC OF KAZAKHSTAN

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Introduction: Insurance medicine as a form of nationwide population protection is a specific organizational system of medical care based on the insurance method. Health financing can be provided by the state, enterprises, private individuals. This is a mobile system of commodity-market relations, where a specific medical service acts as a commodity and the buyer is a state, an enterprise, a citizen. Medical insurance at the present stage in a broad sense is a new economic relationship in the market. Their essence lies in the creation of a health and social security system that guarantees free access to qualified medical care for all citizens, regardless of social status and income level.

Aim: To review the insurance sector of the Republic of Kazakhstan.

Materials and methods of research: The analysis of the insurance market of the Republic of Kazakhstan is carried out. The analysis was based on the results of a systematic review of the articles.

Results of discussion: The health insurance system is now being implemented in all countries. At the moment, the need to introduce compulsory social health insurance in the Republic of Kazakhstan is defined by the Institutional Reform Plan "100 concrete steps for further state building", by the Message of the Head of State Nursultan Nazarbayev to the people of Kazakhstan dated January 17, 2014 "Kazakhstan way – 2050: Unified goal, common interests, common future". Kazakhstan has chosen a solidary model of the health insurance system. The chosen model provides for the responsibility of three parties - the state, the employer and the citizen. The state is responsible for its citizens, directly transferring the appropriate contributions, the employer for their employee, and the third party is a citizen who must take care of his health. The Ministry of Health has already adopted the law "On Compulsory Social Insurance" of November 16, 2015, No. 405-V. On July 1, 2016, JSC "Social Health Insurance Fund" was established. The main subjects of the fund's activities are the accumulation of contributions and contributions. The rate of allocations to the fund for employers will increase from 1% from 2018 to 3% in subsequent years. Contributions of employees – 1% since 2019 and 2% - since 2020.

The purpose of introducing this system of medical insurance is the creation of a balanced and stable system of providing guarantees and obligations for the provision of medical care. Creation of conditions for free choice of the patient by a doctor and

medical organization will lead to the development of competition, increase the transparency of the process of providing medical services.

To date, Kazakhstan's insurance sector consists of 33 insurance (reinsurance) organizations, and is represented by 3 insurance groups. Concentration indicators, in particular the Herfindahl-Hirschman index, which are widespread in international practice, show that the insurance sector of Kazakhstan for the period from 2005 to 2015 By volume of received insurance premiums refers to markets with a low level of monopolization. As of January 1, 2016, 5 insurance organizations account for 40.8% of the total assets of the insurance sector and 41.9% of the total insurance portfolio. If in 2005 the share of the 5 largest insurance organizations accounted for about 52.8% of total insurance premiums and 35.8% of insurance payments, in 2010 this share fell to 43.7% for premiums and 37.1% for payments. In the insurance sector, the dominant positions are held by participants in banking conglomerates and financial and industrial groups.

About 90% of the insurance fund is placed in classic financial instruments - deposits and securities. Such a tool as lending that is actively used by insurance companies of European countries in Kazakhstan can only be used by insurance companies that have a license for the "life insurance" class. Its share does not exceed 0.1% of the total investment portfolio. Other instruments include refined precious metals, derivatives and investments in the capital of other legal entities.

In general, health insurance in the Republic of Kazakhstan will be implemented at three levels: two levels of compulsory insurance (basic and supplementary) and one voluntary. A basic package or medical assistance guaranteed by the state will be free for the population (financing from the state budget). These include: first aid, sanitary aviation, medical care for socially significant diseases and preventive vaccinations in emergency cases. An additional insurance package will be provided from the Social Health Insurance Fund. The additional insurance package will include types of assistance that are not included in the basic: outpatient care, inpatient care (with the exception of socially significant diseases), rehabilitation treatment and medical rehabilitation, palliative care and nursing care. Voluntary health insurance. In addition to these two mandatory packages, a medical policy in Kazakhstan can also be obtained by entering into a contract with a private insurance company. However, it will be only a complement to the first two.

Conclusion: The National Insurance Market is one of the stable suppliers of domestic investment resources, which the Kazakhstani economy, especially its real sector, badly needs in order to increase the demand. For successful introduction of compulsory medical insurance, the state needs to develop clear criteria on which it will determine the willingness of the insurer to provide these services. Another factor that could have a positive impact on the compulsory health insurance market is the introduction of tax incentives for companies that provide corporate health insurance.

REGULATORY ASPECTS OF PHARMACEUTICAL PROVISION ORGANIZATION IN DIFFERENT COUNTRIES OF THE WORLD

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Introduction. The pharmaceutical health care sector belongs to economy sectors of different countries, which are mostly regulated at the state level. Such approach is conditioned with a strategic task of almost every country to provide its population with quality, efficiency and accessibility of pharmaceutical care. The important means of state regulation in pharmacy is the organization of drug dispensing under the prescription with the purpose to provide efficient, safe and rational pharmacotherapy of different diseases.

Objective. The aim of research is conduct analysis of modern approaches to regulation of the medications dispensing in different countries of the world and to determine efficient directions of its improvement.

Materials and methods. System analysis, literature search, comparative and structural and logical methods were used. The subject of our study was documents regulating the order of the medications dispensing in different countries of the world.

Principal study material. With the purpose to achieve the objective set, we conducted the analysis of statutory instruments on organization and regulation of the medicinal products dispensing in 26 countries of the world.

According to analysis results, the medications distribution by presentation on prescription and non-prescription medications was established. Alongside with that, in the most countries considered, both prescription and non-prescription medications are divided into separate subcategories. For example, special prescription medications, medications dispensed in pharmacies only, medications dispensed with the mandatory pharmacist's consultation, medications, available for dispensing in a distribution network, etc. In our opinion, such distribution allows minimizing the incorrect administration of the medications and increasing the rationality of drug use, including the economic point of view.

It was defined in further research that in numerous countries the medications availability is not the pharmacists' prerogative. For example, in 16 countries of 26, doctors are allowed to dispense the medications. At the same time, in such countries as Canada, France, Austria, Poland only a pharmacist has a right

to write out a prescription.

The important direction of dispensing regulation on the national level is the medications advertising. The laws of the overwhelming majority of the countries considered regulate the issue of advertisement in pharmacy strictly and definitely. It is strictly prohibited to conduct advertising campaigns of the prescription medications for the final consumer. Advertisement of prescription drugs is allowed, but it is considered as the information tool and is aimed only at health care professionals.

It must be emphasized, that category of medications provision in foreign countries affects also on the organizational system forms of pharmaceutical implementation. In online-pharmacies, which are spread in 80% of countries, assortment is formed only from non-prescription medications. Prescription medications are not allowed to be sold in online-pharmacies. But exceptions are also happened. For example, in Canada provision of prescription medications are allowed in online-pharmacies.

So, results of our research show that it is necessary to provide systematic and comprehensive analysis of pharmaceutical law in different countries of the world to identify the perspective ways of its improvement. That kind of research will allow to implement the most effective forms and methods of pharmaceutical supply considering national health system and pharmacy.

Conclusion. The research of regulatory documents in the sphere of health care and pharmacy allowed us to determine the principal provisions concerning the medications dispensing regulation in different countries of the world.

Different approaches to the definition of subcategories of the medications dispensing within prescription and non-prescription forms were determined. The differentiated approach to prescription subjects, in particular, qualification of persons dispensing the medications and having the right to write out prescriptions, was determined. The medications presentation conditions the possibility or prohibition of the advertisement on the use of different organizational forms in the pharmaceutical provision system.

With regard of the modern status of reforming the national health care and pharmacy the system investigating foreign experience on organization and regulation of pharmaceutical provision is the promising direction of further scientific research.

ANALYSIS OF THE INFLUENCE OF SMOKING ON CARDIOVASCULAR DISEASES

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Introduction. WHO estimates that up to 2030 it is expected that deaths from tobacco will exceed 8 million people. It was found that the highest smoking prevalence in the European Region and 31%, and the lowest in the African Region - 10%. According to WHO, Ukraine is in 17th place among all countries in the consumption of cigarettes.

Aim. The study is an analysis of the impact of smoking on the development of cardiovascular diseases.

Materials and methods. The study used a logical, analytical and marketing methods of analysis.

Results and discussion. In the analysis of smokers in Ukraine among the category of the working age population it was found that smoking characteristic of about 40% of the population. Mortality from cardiovascular diseases increases triggered, for example, in Kharkiv die on average 3373 people a year, or 9 patients daily. According to expert estimates, smoking is responsible for approximately 10% of cardiovascular diseases. For example, after 5 minutes of smoking increases heart rate by 14%, blood vessels constrict, blood pressure rises by about 5%, the accompanying risk of hypertension, mortality which is over 1 million people. The risk of coronary heart disease in both men and women smoking increased 1.5-2 times. It should be noted that coronary heart disease is one of the leading places in the structure by the number of cardiovascular diseases deaths of about 7.4 million, cases in the world. According to the State Statistics Service of Ukraine, it was found that purchase of one pack of cigarettes population consumes about 15% of their monthly income. In other countries this figure is much lower in the Czech Republic 7%, Kazakhstan 12%, in Germany, Italy, Belgium and Sweden 13%. Tobacco dependence – a syndrome that requires further treatment. We have investigated drugs used to prevent and treat nicotine dependence (group N07BA). Thus, the pharmaceutical market of Ukraine registered 19 medicine to treat tobacco dependence. Of these medicine foreign occupying 94.73%. Prices of drugs ranging from 40.00 USD to 990.00 USD depending on the manufacturer.

Conclusions. Summing up the above we believe that the main task of the state should be the prevention of smoking and dependence, and promote a healthy lifestyle.

MARKETING APPROACH IN THE STUDY OF PROFESSIONAL COSMETICS FOR HAIR ON THE UKRAINIAN MARKET

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Introduction. To achieve "market orientation" of the company and create favourable conditions for entrepreneurship and innovation need to use marketing. Market Analysis allows you to collect and analyse information.

Aim. The aim of our work was to study the current trends in professional cosmetics and make recommendations to increase conservation or part in the target market.

Materials and methods. Information materials of the scientific literature, statistical data. Analytical, statistical and marketing research methods are used.

Results and discussion. The modern consumer wants to see in a cosmetic product for hair many properties in one package. Only cleaning properties lack. This situation provokes manufacturers to increase product range and creation of new positions, which include professional products. As of 2016 cosmetic hair care products leading position among all the cosmetics, namely 17% of the market. We see rapid growth in demand and increased supply as a result. Thus, the increase of the market of perfumery and cosmetics is 4% for 12 months. Today, the ukrainian market of perfumery and cosmetic products for hair care can be described as: 60% are imported products. Also the relatively high price compared with domestic, not reduce demand. Ukrainian products occupy 40% of the total market and have a price range below middle. The reason for this is the lack of financing of advertising budget Ukrainian producers and public opinion that the imported product identifies a quality product. Ukrainian companies are different from foreign companies. The first compete in price, and the second - give considerable attention to branding, they develop a marketing policy. Ukrainian market of professional cosmetics for hair care is parted between foreign companies. American professional hair care occupies a significant part of the market Ukraine - 30% and represented by such trademarks as Global Keratin, Brazilian Blowout, Tibolli, Keraorganic, Max Blowout, Joico. Equally market share (30%) is a Brazilian cosmetics, represented by such brands: Agi Max DNA, NutriMax, Cadiveu, Honma Tokyo, Inoar, Korban Prof. Next are manufacturers of Italy, France and Japan - each has 10% market share of professional cosmetics for hair care. In addition, sales of products of Japanese companies is rapidly increasing. The reason is the over saturation European and American agents who have become common. Also Japanese companies have advantages. They invest more money in research and development than advertising. Israel and Spain occupy 5% of the Ukrainian market.

Conclusions. Thus, it is established that the Ukrainian market of cosmetic products for hair care professional destination is 100% occupied by foreign manufacturers. For Ukrainian producers enough prospects on the market.

COMMUNICATION SKILLS ARE THE MAIN COMPETENCES OF A PHARMACEUTIST

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Introduction. Including social significance of pharmacy organizations' working, constant contact with the population and the system of staff management in pharmacy puts the human factor to the fore. Therefore, for the pharmacy environment competition development the pharmacy organizations give the big role to the increasing of communication skills' role and to the significance of communication competence for effective interaction of the pharmacist and a patient.

Aim. To form and to develop communication competence of the future specialists.

Materials and methods. The subjects of the research are pharmacy organizations and the enterprises of Kazakhstan cities: Astana, Almaty, Aktau, Aktobe, Shymkent (around 400 responders). We chose anonymous questionnaire for pharmacy specialists to solve the set tasks. However, to get representative results, according to the irrevocable excerpting formula, proceeding from the general amount of the pharmacists, it was enough to survey only 400 of the responders.

Results and discussion. As a result of the sociological research, it was found out that overwhelming quantity of the responders – pharmacy specialists thinks that the main mission of a pharmacy is to render the pharmaceutical help.

One of the most important parts of research was questionnaire elaboration. We have used highly developed open questionnaire, handy and simple in filling and in analyzing the results. The questionnaire consisted of informational questions, that allowed us to make a social-demographical portrait of the responders, and general questions, allowing us to get an idea directly about the theme of the research. There were 7 questions, divided into two blocks.

The responders according to the gender division: 86,8% – female, 13,2% – male.

The biggest specific gravity came to the age group from 31 to 40 years old (35,8%), that allows us make a conclusion that the workers in the pharmacies are

mature aged and ready for changes.

We were also studying the necessity of extra seminars conducting by pharmacy specialists for students in universities with pharmaceutical major. That's why we have formed a question: "What themes of teaching future pharmacists are the most required in your organization?". The responders answered that they would like to improve their professional competence according to the next subjects: "Pharmacist's communication skills" (30%), "Pharmacology" (42%), "The regulatory aspects" (28%). Due to these facts, the necessity of studying the communication skills of intercourse with the patients is obvious.

The next questions were coming out of the influence of the professional competence of future pharmacists on labor productivity: "How do you think if it's necessary to conduct in-factory seminars in your organization for improving your communication skills?". Most of the responders have answered positively – 91,5% ("Yes, it is").

There always are some invisible mutual relationships between people. In-group relationships are known to be born in an informal structure, and then they move the formal relationships sphere, making the work of a collective not so accurate.

The next question in the questionnaire was "How often do you have conflicts in your collective?", the responders answered "Often" (68,7%). The question "Does the social-psychological climate effect on labor productivity?" was answered "It does" by 88,9% of all the responders, what shows us the necessity of teaching the students methods of solving the problematic situations. That will help to keep the favorable climate inside the collective.

Conclusions. We have suggested them to conduct some seminars, trainings with student-participants, also to include a project of the rules of the consumer serving into the seminar's program, that are supposed to show the way of communicating with a patient. The main aim of the rules is to prepare future specialists to work in pharmacy organizations.

ANALYSIS IMMUNOSUPPRESSANTS COST PARAMETERS USED IN THE TREATMENT OF PSORIASIS

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Introduction. Psoriasis – a chronic systemic immuno-mediated disease, which mainly affects the skin and joints. Psoriasis – one of the most common chronic dermatosis, they suffer to 3% of the world population. In Ukraine this nosology affects about 1.5 million people. Keen interest in this disease is associated not only with an increase in the incidence of psoriasis in recent years, but with increasing frequency of severe forms of dermatitis, which often lead to disability.

About 20% of patients with psoriasis have medium-heavy form or heavy form of disease. In the US, about 1.5 million people suffering from moderately severe forms of psoriasis, approximately 30% of patients with psoriasis develop psoriatic arthritis, which often leads to disability.

The urgency of treatment and timely diagnosis is the worldwide prevalence of psoriasis, the lack of domestic production of drugs in the pharmaceutical market, the high risk of morbidity and increased risk of cardiovascular related diseases.

Aim. The research is an analysis of cost factors immunosuppressants used in the treatment of psoriasis.

Materials and methods. We analyzed standardized clinical protocols of medical care to patients with psoriasis, data of the State Register of Medicinal Products of Ukraine, price lists weekly journal "Apteka". It was applied retrospectively, logical, systematic method of analysis.

Results and discussion. According to the ATC classification system, the drugs used in the pharmacotherapy of psoriasis are a group L04 – immunosuppressants. Analysis of state registration as of December 2016 study drugs found that the domestic pharmaceutical market was attended by 77 trade names of drugs based forms of production, namely - L04AA - 29 trade names of drugs, L04AB – 10 kinds of drugs, L04AC - 11, L04AD - 25 and only 2 L04AX trade names. The analysis by the manufacturing companies in the pharmaceutical market, found that the domestic market for 100% of the drug European companies.

Analysis dosage forms of drugs immunosuppressants, revealed that currently on the market there are six forms of medications used for the treatment of psoriasis: capsules, concentrates, lyophilisates, powders, solutions and tablets. The leaders are solid dosage forms, namely 71%.

Analysis of price index growth between 2012-2016. Revealed that agents of

foreign manufacturers lowest prices index was 0.98 during the 2013/2012. The highest price index was marked in the years 2014/2013 - 1.34. Established that from 2012 to 2014 price index increased immunosuppressants drugs growth by 36.73%.

From 2014 there is a gradual decrease of the indices of growth in prices, it may be associated with the stabilization of the exchange rate on the domestic market. For example the cost of the drug Mifortik, coated tablets intestinal-soluble. 180 mg blister, №120, company Novartis Pharma (Switzerland) in 2012 amounted to 1320.36 UAH, And in 2016 given drugs actually increased in price 3 times, this cost was 4,440.87 UAH. According to the analysis of the market price index foreign drugs in the study period observed significant changes in the dynamics of prices for medicines.

Price indices immunosuppressants domestic production of drugs in the pharmaceutical market was also stable. Thus the maximum rate of price index is 1.30 in the period 2015/2014. While for the years 2016/2015 price index amounted to - 1.04. Drugs immunosuppressants domestic production have been on the market only in 2015. Average performance index of price growth in the period 2012-2015 p. Increased by 44.71%, the drug Lefno, coated tablets 20 mg blister, №30, Kusum Farm of the company (Ukraine). The maximum prices for drugs immunosuppressants domestic production was in the 2014/2015 years, and drugs of foreign origin - in 2013/2014 years.

Currently, a decrease in the price index for drugs for the treatment of psoriasis, it may be associated with an increase in the range of medicines and stabilization of exchange rates on the market.

Conclusions. According to the analysis of state registration immunosuppressants drugs used in the treatment of psoriasis in the domestic market was attended by 77 trade names of drugs based forms of production. Analysis by the manufacturer, established that the domestic marks 100% consists of foreign manufactures. The analysis for dosage forms revealed that leaders are solid dosage forms, such as 71% (capsules, tablets, powders and lyophilisates for injection).

Analysis of index of price growth between 2012-2016 revealed that agents of foreign manufacturers lowest prices index was 0.98 during the 2013/2012. The highest price index was marked in the years 2014/2013 - 1.34. Established that since 2012 to 2014 growth of immunosuppressants drugs price index increased by 36.73%. The maximum prices for drugs immunosuppressants domestic production was in the 2014/2015 years, and drugs of foreign origin - in 2013/2014 years.

Currently, a decrease in the price index for drugs for the treatment of psoriasis, it may be associated with an increase in the range of medicines and stabilization of exchange rates on the market.

**ACTUAL PROBLEMS
OF PHARMACEUTICAL CLUSTERS ORGANIZATION
IN THE REPUBLIC OF KAZAKHSTAN**

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Introduction. It has established that attracting of investment resources in the development of domestic drugs, medical equipment, technologies and tools is possible in the conditions of state support, which in the long run will significantly improve the situation with the medicinal provision of Republic of Kazakhstan (RK) population. The most complete connection of government, science, education and business realize within the framework of cluster forms of organization.

Aim. The aim is to study the theoretical aspects and development of practical recommendations for the formation of pharmaceutical cluster in RK.

Materials and methods. It has analyzed scientometric databases, database of Kazakhstan patent office, database of the State enterprise «National Centre for Drug Expertise, medical devices and medical equipment Ministry of Health and Social development of the Republic of Kazakhstan».

Results and discussion. Analysis of theoretical work shows that the basis for forming a model of a pharmaceutical cluster should be a system of priorities and organizational approaches that should be based on the integrate and concentrate scientific capital and economic potential of medical and pharmaceutical production, a multidisciplinary medical and preventive complex and basic logistics centers; ensuring that the cycle is closed between academic studies clinical trials.

An important feature of pharmaceutical clusters is the active role of the state, which not only should contribute to the formation of such clusters, but must itself be a participant and co-investor of cluster development.

The following programs for the development of the pharmaceutical industry in general and pharmaceutical clusters in particular are presented in Kazakhstan: State program of industrial and innovative development of the Republic of Kazakhstan for 2015-2019; The State Health Development Program of the Republic of Kazakhstan “Densaulyk” for 2016 - 2019; Nation Plan - 100 concrete steps to implement the five institutional reforms of the Head of State Nursultan Nazarbayev (May 2015).

Conclusions. Thus, the formation of pharmaceutical clusters is a real mechanism for introducing domestic innovative drugs, attracting the necessary investment resources in the context of implementing the concept of state support.

PHARMACEUTICAL SUPPORT OF THE TUNIS POPULATION

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Introduction. Organizations in the society are created and function to solve industrial, commercial and social problems, as well as accomplish a certain mission. The implementation of the mission is possible only with the correct structure of the management system.

Aim. The aim of our work was to study the activities of drugstores in Tunisia in terms of managing the achievement of the goals and mission of the organization.

Materials and methods. Information materials of the scientific literature, statistical data. Analytical, statistical and marketing research methods are used.

Results and discussion. A pharmacy, as an object, is a consciously coordinated social education, that is, an artificial union of people, with certain boundaries, functioning on a relatively permanent basis and pursuing its specific goals. The main goal of the pharmacy (its mission) is the uninterrupted supply of medicines and products of the pharmacy range to the population and individual institutions.

As an object, an organization is invariably an element of a social structure with its own functions and methods. Therefore, any organization, including a pharmacy, is able to exert some influence not only on its members, but also on the world as a whole.

Tunisian pharmacies are private, have a standard sign. Ones work daily, except Sunday, from 8³⁰ to 19⁰⁰ (on Saturday to 13⁰⁰) with a mandatory break for the siesta (from 13⁰⁰ to 15⁰⁰). At the door of each pharmacy there is a list of addresses of the nearest pharmacies, including those on duty and all-night chemist's shops. The management of the pharmacy pays great attention to the organization of the convenience of consumers: the premises of the pharmacies are spacious; there are some comfortable chairs in which the visitors are seated are waiting for the order or consultation of the pharmacist. Medicines, even over-the-counter, are placed on the shelves in a way that their customers do not see and therefore cannot make their own choice by themselves. There is no self-service in chemist's shops. Most of the drugs are released to the end user only after consulting a specialist. Approximately 60% of medicines in Tunisia are purchased in private chemist's shops of retail sales, and 40% are supplied to hospitals and clinics.

Tunisian pharmacies do not unite in the retail chain, but at the same time they strictly adhere to the regulations, according to which only the specialist with a higher

pharmaceutical education can be the owner of the pharmacy and her employee. One can open as the owner his allowed only one pharmacy and the distance between them must be at least 200 m. One pharmacy serves at least 5 thousand inhabitants. However if you in order to open your own chemist's shop in Tunisia you need to file a little number of documents. There are application to the Ministry of Health, attaching to it copies of documents on education and a contract for the lease of premises.

Equal conditions are established for wholesale pharmaceutical companies for the supply and sale of goods. The state strictly controls all aspects of the pharmacy business and ensures that all pharmacies work in equal competitive conditions.

The requirements for the pharmacy premises are also regulated: ceiling height should be at least 2.8 m, the trading room is quite spacious (dimensions are not specified), the total area is not less than 50 m². All inscriptions in the drugstore of Tunisia, as a former French colony, should be in two languages: French and Arabic. Necessarily, in a prominent place in the trading hall, a poster is posted about the harm of uncontrolled and excessive use of medicines. The observance of the pharmaceutical order, the serviceability of the measuring and other devices are closely monitored by the State Inspectorate.

The assortment of Tunisian chemist's shops comparatively small and amounts to about 1730 names of Tunisian ones and imported production medicines (mostly French), and at the same time the prices for them are lower than European ones. They dispense medicines for both prescription and prescription, but many prescription ones can be purchased without a prescription after consultation with the pharmacist. There is a list of strictly prescription drugs that are sold only on prescription. Representatives of regulatory bodies also closely monitor the quality of medicines, the level of education and competence of staff. In the course of their work, pharmacy specialists are required to regularly undergo professional development, and the level of their knowledge is periodically checked by a special commission.

A distinctive feature of the work of the Tunisian pharmacies is that they sell orthopedic goods, incl. Inexpensive high-quality footwear of famous European brands. Also in the pharmacies are sold local essential and fatty oils, used for cosmetic, therapeutic or preventive purposes.

Conclusions. Thus, it is established that the management of the activities of chemist's shops in Tunisia is strictly regulated by the state, which ensures high-quality, affordable medicinal assistance to the population, guarantees the further development of the Tunisian ones pharmaceutical industry and facilitate the implementation of the pharmacy's mission.

DIFFERENCES IN THE PHARMACY VISITORS SERVICE PROCESS BETWEEN STATE OWNERSHIP PHARMACY OF FIRST AND FIFTH CATEGORY

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Introduction. Depending on the performed functions, pharmacies in Belarus are divided into five categories. Pharmacy of first category engage in pharmaceutical manufacture of medicines, dispensing narcotic medicines and psychotropic substances, while this pharmaceutical services in pharmacy of fifth category are not provided. It is important to determine the impact of pharmacy category on the pharmacists' labor content. It must be taken into account during future development of pharmacy staff calculating methods.

Aim. The aim of present research is to identify the differences in pharmacists' labor content and time of providing pharmaceutical services for pharmacy visitors between state ownership pharmacies of first and fifth category.

Materials and methods. The indicators characterizing the labor content and time of providing pharmaceutical services for pharmacy visitors, obtained during labor process time-study in pharmacy first and fifth category RUP "Belpharmatsia", was analyzed. The labor content of pharmacists with similar professional and personal characteristics working in pharmacies of first and fifth category during 4 – 7 P.M. 23 February 2016 year was compared. The processing of the results was carried out using the programs Microsoft Excel and Statistica 10.

Results and discussion. It was determined that the types of pharmaceutical services provided to visitors statistically significantly differed between pharmacy of first and fifth category (χ^2 criterion=4.6583, df=2, p=0.0974),– form of payment for purchases (χ^2 criterion=2.7869, df=3, p=0.4257), the number of purchased products (χ^2 criterion=7.0957, df=6, p=0.3121), contingent of pharmacy visitors (χ^2 criterion=4.6583, df=2, p=0.0974) did not differed between researched pharmacies.

In the table 1 presents the types of pharmaceutical services provided to pharmacy visitors by ists.

It was defined that the time of providing pharmaceutical services for pharmacy visitors in pharmacy of first category was higher in comparison with pharmacy of fifth category (t-test for independent groups, t=5.548, df=83, p<0.05, image 1).

Table 1 – The differences between types of pharmaceutical services provided to

pharmacy visitors between pharmacy of first and fifth category

| The type of pharmaceutical services provided to pharmacy visitors | Pharmacy of first category | | Pharmacy of fifth category | |
|---|----------------------------|------------|----------------------------|------------|
| | number of visitors | proportion | number of visitors | Proportion |
| Dispensing medicines without prescription | 14 | 36.84% | 31 | 65.96% |
| Dispensing medicines with preferential or without payment | 2 | 5.26% | 2 | 4.26% |
| Dispensing medicines with preferential or without payment with other types of pharmaceutical services | 6 | 15.79% | 1 | 2.13% |
| Dispensing of medical products | 3 | 7.89% | 3 | 6.38% |
| Dispensing of medical products with other types of pharmaceutical services | 1 | 2.63% | 2 | 4.26% |
| Visitors consultation without dispensing | 0 | 0.00% | 5 | 10.64% |
| Obtaining of paid-up pharmaceutical manufactured medicines | 4 | 10.53% | 0 | 0.00% |
| Dispensing prescription medicines | 7 | 18.42% | 2 | 4.26% |
| Dispensing prescription medicines with other types of pharmaceutical services | 1 | 2.63% | 1 | 2.13% |

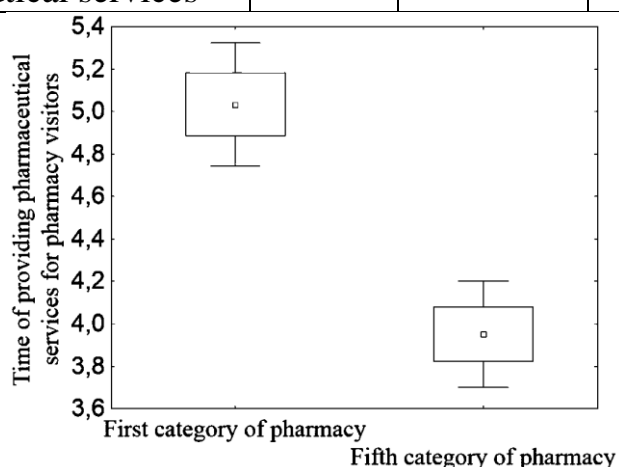


Image 1 — Box-plot of time of providing pharmaceutical services for pharmacy visitors in pharmacy of first and fifth category

Conclusions. It was identified that in the pharmacy of fifth category prevails dispensing medicines without prescription (65.95%), whereas in pharmacy of fifth category it composed 36.84%. More than half of first category of pharmacy visitors (52.63%) dispensed prescription medicines and medical products (including dispensing medicines with preferential and without payment). The analysis showed that time of providing pharmaceutical services for pharmacy visitors was higher in pharmacy of first category. It is necessary to study differences between pharmacies of all categories.

EVALUATION OF INVESTMENT ATTRACTIVENESS OF PROJECTS

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Introduction. The increase of number and cost of projects results in the necessity of introduction of project analysis methods for activity of pharmaceutical enterprises of Ukraine. The necessary condition of successful implementation of projects is an evaluation of their investment attractiveness.

Aim. The purpose of the study is to create an algorithm for integrated evaluation of investment attractiveness of projects in the conditions of pharmaceutical production.

Materials and methods. The base materials of research are literature sources, publications of scientists in the field of project analysis and investment. Methods: analysis, expert method.

Results and discussion. Evaluation of investment attractiveness of projects minimizes the risks associated with investment activities of the pharmaceutical company and is the basis to make an informed investment decision. In a comprehensive assessment of investment attractiveness of projects in the pharmaceutical industry by understanding the installation process by appropriate coefficients importance of each indicator in a group and the group of factors in the overall investment attractiveness of the maximum the requirements and goals of all participants. The ultimate aim of this assessment is to obtain integral indicator by which we can conclude about the level of investment attractiveness of any project.

The proposed algorithm for calculating the integral index of investment attractiveness of projects in the pharmaceutical industry includes the following steps:

1. Preliminary selection factors of investment attractiveness of projects.
2. Assessment of the significance of the factors on the basis of expert opinion.
3. The selection of the most important factors. Evaluation of the weight factors.
4. Calculation of weighted average score for each factor.
5. Calculation of complex parameters for each type of investment attractiveness of the project.
6. Calculation of the integral index of investment attractiveness of the project.

Conclusions. The integrated approach to the evaluation of investment attractiveness of projects allows to do their multidimensional assessment. It is very important for the pharmaceutical industry, whose activities are related to the production and sales of special social significance.

ANALYSIS OF PREFERENCES OF BUYERS OF PARAFARMATSEVTIK OF ANTIHISTAMINIC ACTION

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Introduction. Allergic diseases (AD) are a global problem of modern medicine. According to literature sources, found that after the first symptoms AD the diagnosis to be confirmed and adequate therapy is prescribed for the first year only 25% of patients, 2-4 years is 55%, and more than 5 years – 20%. Therefore, applying parapharmaceuticals antihistamine action at the initial stage of the disease to prevention is of great importance.

Aim. According to a questionnaire survey to analyze the preferences of buyers parapharmaceuticals antihistamine action.

Materials and methods. The paper used content analysis method comparison of the survey.

Results and discussion. During the questionnaire survey were selected 60 questionnaires. Set that most in the survey participated women, ranging in age from 21 to 53 years, with higher and secondary special education. By occupation is mainly office workers and entrepreneurs. With wages from 3000 to 6000 UAN. To the question do You have the right way of life, almost all replied in the negative. All respondents suffer from allergic diseases (rhinitis, bronchial asthma, allergic dermatitis). 65% of respondents do not take pharmaceuticals for prophylactic purpose. The question of how You feel about the parapharmaceuticals 55% of the respondents reported a neutral attitude towards them, 35% positive and 10% negative. To the question, what are parapharmaceuticals for You, 35% answered addition to food, 35% drugs, 10% vitamins and minerals 10 % of the ordinary "chemistry", 10% - do not accept at all, because trust only lekarstvennyimi means. The majority of respondents 65% make pharmaceuticals more than 1 time per year. Give preference to domestic producers during the crisis in the country. The majority 55% of respondents give preference to the recommendations of a dermatologist and cosmetologist, to the opinions of friends listen 25%, advertising on television and drugs in the Internet – gave 25%.

Conclusion. During the questionnaire survey found that shoppers in the most positive attitude to the parapharmaceuticals antihistamine actions, perceive them as an addition to dietary intake, give preference to the appointment of a dermatologist or an allergist prefer to buy at the pharmacy, where they will give advice about prophylactic use of the analyzed products.

FORMATION THE CONCEPT OF SOCIAL PHARMACY AT THE WORLD

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Introduction. Today the pharmacy is defined as an independent social institution with multi-level structure, the main challenge of which is to save and improve the health of the population as a result of rendering highly qualified pharmaceutical care that led to the appearance new scientific and practically-oriented concepts – social pharmacy.

Aim. In view of aforementioned aim of our work was the study of international experience in the formation and development of social pharmacy

Material and methods. To achieve the objective we used methods of scientific analysis, systematic approach and content analysis.

Results and discussion. The first mention of social and behavioral science in pharmacy are observed in some universities in the US and Europe simultaneously. Thus, 1947 – the opening of the first Department of Social Pharmacy in Sofia Medical University (Bulgaria), 1972 –discipline "Social Pharmacy" was introduced in the curriculum for pharmacists in Denmark, and in 1974 the textbook «Pharmacy practice: social and behavioral aspects» was published by authors Albert I. Wertheimer and Mickey C. Smith (USA). It was found that an important and significant step in the formation and development of social pharmacy is the rationale for social and behavioral aspects of pharmaceutical activity in the training of pharmacists in public and state levels. Thus, in 1975 the Commission of pharmacy in the US defined the need for teaching behavioral and social sciences in pharmacy, and in 1986 Naffild Committee on pharmaceutical research decided to include behavioral science to the undergraduate curriculum pharmacists (UK).

The first attempts at defining the concept of social pharmacy was made by Geoffrey Harding and Kevin Taylor in 1993. However during preparations for conference in Malta in 2003 Sørensen EW formed the concept of social pharmacy, which, in our opinion, was one of the main turning points in the way of its formation. The definition by Danish scientists, social pharmacy – hybrid field, allowing use of the theory and methods of many humanistic and social scientific disciplines to study pharmacy practice. That knowledge of humanistic and social disciplines, enabling the pharmacist to operate, participate and be responsible for activities related to medicines on the social level, and rational use of medicines.

Conclusions. So it can be argued that social pharmacy formation begins with a rationale of social and behavioral sciences to educational programs for pharmacists and its inclusion in the curriculum, and also creation of departments and centers of Social Pharmacy, which is a prerequisite for the formation of the concept of social pharmacy and its further implementation in practice and functioning pharmaceutical field.

THE STUDY OF GENERAL STRUCTURE OF SALES IN THE PHARMACY

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The activity of any pharmacy is aimed at getting stable income from the sale of medicines and medical products, expansion of its presence and retaining stable position at the pharmaceutical market. Well-formed assortment that fully meets the needs of different consumer groups provides the organization with stability and profitability even in the most difficult market conditions. Therefore, the optimal pharmaceutical assortment formation is very important for a pharmacy.

The purpose of our work was to study the general sales structure of the pharmacy.

During the research, we used the method of a system analysis.

A pharmacy chosen for the research is located in Lubny (Poltava region) in a very public place and requires a wide range of goods.

Based on the analysis of the sales of goods in this pharmacy in 2016, it was found that the assortment is mainly represented with medicines that make 71% of the total sales in the general structure. The sales of medical products made 10% of the general sales during the 2016 year. Medical devices, personal hygiene items, baby products, cosmetics, mineral water and other products provided 19% of the general sales during the 2016 year (Fig. 1).

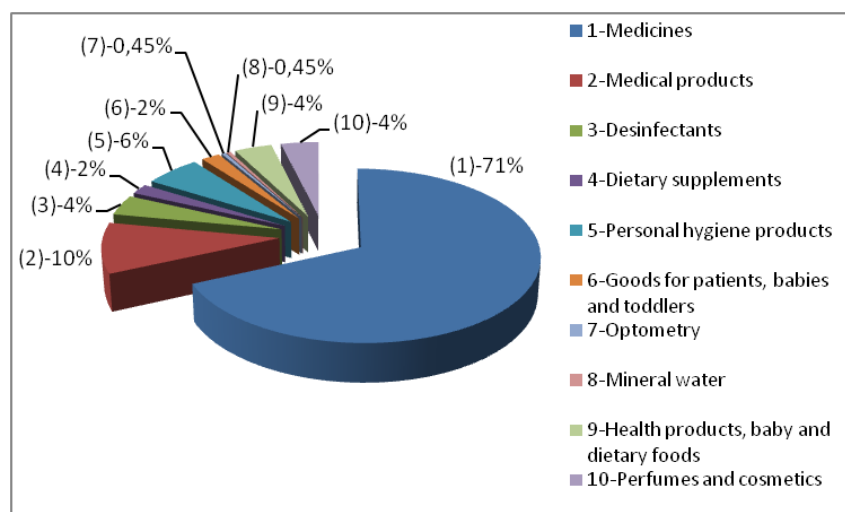


Fig. 1. The general structure of sales in the pharmacy in 2016 (Lubny, Poltava region)

Thus, further research on improving the assortment policy of this pharmacy should take priority medicines as an object of the research with prior definition of leading therapeutic groups.

**STUDYING THE INVESTMENT POTENTIAL
PHARMACEUTICAL INDUSTRY OF KAZAKHSTAN:
MODERN CONDITION AND PROSPECT**

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Introduction. Investment attraction is one of the most important element, which shows economic growth and rise of competitiveness in national economics, it helps for integration in world's industrial processes. Foreign investments can accelerate the development of pharmaceutical enterprise, will be able to raise the quality of human asset, can make more jobs for workers, attract advanced technology and promote their spreading in related industries. That is why we can see the growth of competition for global investments in last two decades. So there is a big task for government to work out and do complex measures of economic politics forwarded to the raise of country's attractiveness for investments.

Aim. Studying the modern condition of attraction for the pharmaceutical industry investments in Republic of Kazakhstan.

Materials and methods. We reviewed the level of attraction for direct investments in the pharmaceutical industry using the positions of the main indicators of fixed capital used for investments. While researching analytical and comparative methods of analyzing and information about the analysis of pharmaceutical market in Kazakhstan were used.

Results and discussion. The pharmaceutical industry is exclusively high-tech. In medical manufacture the results of perennial researches in different branches of science are used. According to statistics agency data during 2003-2016 the investments volume to fixed capital is about 63 009 936 million tenge. Comparing to the previous year investments to fixed capital increased by 1,4% and is now 694 084 tenge. So the total index volume for financing investments sourced by republic 2015 year's budget is 13%, from local budget – 5%, funds of foreign investors–9%, loan funds –23%, proper funds of enterprises and organizations–58%.

The government is making lots of initiatives to influence the development of manufacturing industry and pharmaceutical branch. Within the national industrial-innovative increase program for 2015-2019 there are various business supporting facilities, pharmaceutical industry is also included. Programs such as

“Business road map”(«Дорожная карта бизнеса 2020»), “Еxporter 2020” («Экспортер 2020»), “Occupation”(«Занятость 2020»), “The map of the industrialization 2015-2019”(«Карта индустриализации Казахстана на 2015-2019 гг.»), “Productivity” («Производительность 2020»), etc. are forwarded to the growth of competitiveness of national enterprises by stimulating industrial, outbound, personnel and technologic capabilities of enterprises.

Within the map of industrialization in pharmaceutical branch for 2010-2015 there are 28 projects were launched, investments amount 50,5 billion tenge were involved. During 2016-2019 12 investment projects amount 53,7 billion tenge are planning to be launched.

It is worth to point out considerable changes in global pharmaceutical market. There is a patent collapse lasting for more than a year, also the growth of the price to create drug molecules, the growing fraction of generics in the global market, especially in developed countries, which are chasing decline of health care costs. According to ongoing changes in global pharmaceutical market, to increase competitiveness of national manufacturing products and the growth of its share in Kazakhstan market, native enterprises need to expand the list of manufacturing products accordingly to international GMP standards. And soon move on to manufacture highly remunerative generic drugs, with reorientation from hospital markets to retail markets.

Conclusions. So, while researching Kazakhstan’s investing abilities, we can point out that Kazakhstan is taking preferred place between CIS and other developing countries and also is one of the most competitive country to attract foreign investments. Lots of foreign investors have already noted this fact and they started to invest their resources to Kazakhstan economics. However, as we can see from analysis, some regions of Kazakhstan still need to reveal their investing potential, then foreign investor will be able to invest their resources more actively.

SYSTEMS OF THE AUTOMATION IN RANGE OF PHARMACEUTICAL BUSINESS

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Introduction. Pharmacy is not only health care provider that provides medicines, but also source of business with complex reporting structure, which maintains contact with many suppliers, controls various aspects such specific goods, as medicines.

Now stock-out detection, choice of supplier, the formation of order receipt and product pre-sale preparation, maintenance serial accounting, inventory management, dispensing drugs to consumers can be performed faster and more efficiently through the use of computer programs.

Aim. Determine the needs of pharmacies in medicines. Consider the main types of programs that are currently used in pharmaceutical networks

Methods. Based on the research identified the main goals of pharmacies.

1. Management range. The main goal – to support the pharmacy range, the most profitable in terms of maximizing profits, meeting the demand and attract customers to the pharmacy.
2. Management of inventory. The main goal - maintaining optimal inventory.
3. The organization quality and faster customer service. The main goal - increase sales by speeding up and simplifying the decision-making process between buyer and sales.
4. The customer relationship management. The main goal – to increase sales through effective engagement and retention.
5. The decision of specific tasks related to government regulation of medicines main goal - to provide quality customer service and safe and avoid penalties by regulatory authorities.
6. Minimize financial, organizational and labor costs associated with automation. The main goal – to minimize the cost of automation provided a successful solution of all tasks. Using research Expert 2016 Farm selected basic applications for orders of medicines.

Results. 1) by automating processes from routine work are exempt valuable employees to help solve the personnel problem and removes the need to increase staff.

2) almost all analysts note that pharmacy automation reduces costs and increase turnover, increase sales and profits of companies.

3) turnover increased by 30-40%.

4) expanding the range of drugs.

5) prevent the ingress into circulation quality and counterfeit products through poseriynomu accounting.

**ANALYSIS THE COST OF TREATMENT
FOR GASTRIC ULCER AND DUODENAL ULCER
WITH PROTON PUMP INHIBITORS (PPIS)**

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Introduction. Peptic ulcer disease – a chronic disease characterized by ulcerative lesions on the mucous membrane of the stomach or duodenum and has a polycyclic course. This disease is inherent in seasonal exacerbation and development of complications that can endanger the patient.

The feature of peptic ulcer disease is the involvement in the pathological process in other organs of the digestive system, which requires timely diagnosis for the preparation of medical facilities to patients with peptic ulcer disease, taking into account comorbidities. Peptic ulcer and duodenal ulcer they are often accompanied by severe course and serious complications that can lead to fatal consequences. Mortality from gastric ulcer and duodenal ulcer ranges from 6 to 71 per 100 thousand of people with a stomach ulcer and from 2 to 97th of people with duodenal ulcer.

According to WHO, the incidence of gastric ulcer and duodenal ulcer in the world affects about 5-10% of the population, mostly by women. Duodenal ulcer localization occurs 3-4 times more common than gastric.

According to the State Statistics Center of Ukraine the number of registered patients is approximately 5 million. Each second must be hospitalized, each third losing efficiency again within one year. Not infrequently peptic ulcer disease is the cause of disability.

Most often gastric ulcer and duodenal ulcer appears between 25-40 years, although it may appear more in early age also. There are cases of ulcer disease after the age of 50 years.

Aim. The main Purpose of this research was to analyze the cost of treatment for gastric ulcer and duodenal ulcer with proton pump inhibitors (PPIs).

Materials and methods. The conducting of research were used in such methods as marketing analysis – method to study the domestic pharmaceutical market, historical and retrospective method.

Also it been used the data of State Register in medicines of Ukraine, Unified clinical protocols for treatment of peptic and duodenum ulcer and the price list from weekly journal "Apteka".

Results and discussion. We have analyzed the protocol providing medical and pharmaceutical care to patients with gastric ulcer and duodenal ulcer approved by

the Health ministry of Ukraine since 03.09.2014 №613 “Concerning the approval and implementation of medical and technological documents for standardization of medical care in peptic ulcer for the stomach and duodenum”. According to the protocol of treatment established which is the main drug for INN are: Omeprazole, Lansoprazole, Pantoprazole, Rabeprazole and Esomeprazole.

According to the unified anatomical and chemical and chemical classification system ATC (Anatomical Therapeutic Chemical) the drugs used for the eradication of *Helicobacter pylori* in complex treatment of peptic and duodenum ulcer belong to the group A02 - Drugs for treatment acid disorders - A02BC – inhibitors of proton pump (PPIs).

According to the State Expert Center by the Health ministry of Ukraine "State Register in Medicinal Products of Ukraine" in January 2017 was registered in 126 trading names for inhibitors of proton pump (PPIs). During the analysis by group it's been found that the bulk forming medications solid dosage forms such as tablets. Among the registered drugs foreign pharmaceutical companies drugs are leading (about 90%). Thus the domestic market PPIs, used in the treatment for gastric ulcer and duodenal ulcer indicates full dependence on foreign production.

Analysis the cost expenditures for the treatment of gastric ulcer and duodenal ulcer drugs with PPIs it been established as it's one of the most affordable drugs among this group of medications is Omeprazole. The minimum cost of treatment with Omeprazole-Astrafarm, Astrafarm company (Ukraine, Vishneve) cap. 20 mg blister, №10 is 9,17 UAH., Maximum - 77.01U AH. The drugs that have the highest rates of the cost is Rabeprazole - Rabeprazole-Zdorovye, Zdorovye Group of Companies (Ukraine, Kharkiv) tablet tunicate enteric-soluble 20 mg, №20 .Minimal cost is 40.37 UAH and the maximum coast – 399,11 UAH.

Conclusion. High morbidity and disability of patients is very significant to the economic losses - all of this can attributed to be he issue of ulcer disease among the most important modern medicine and social-oriented. In the analysis of inhibitors of proton pump (PPIs) drugs registration established as a significant dependence of the domestic market from foreign drugs, that points to necessity to implement effective measures of import substitution.

After analyzing the protocol of treatment gastric ulcer and duodenal ulcer, we found that the most affordable drug is Omeprazole, such as Omeprazole-Astrafarm, Astrafarm OOO (Ukraine, Vishneve) cap. 20 mg blister, №10.

ANALYSIS PARAPHARMACEUTICS ANTI-KELOID ACTION

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Introduction. About 10% of the population long for statistical data of special literature from education hypertrophic and the keloidnykh of hems. Tendency to emergence of keloidny scarring it is fixed at patients from 10 to 40 years, as a rule, after the postponed surgical interventions or damages of integuments. Average age of people who complain of education the keloidnykh of hems makes 25,8 years. It is established that any method of treatment of colloidal hems doesn't give a complete guarantee of lack of a recurrence of a keloid. Therefore the question of application of parapharmaceutics of anti-keloidny (PA) action for the purpose of prevention of formation of postoperative hems is of great importance.

Aim. To perform a medicine and PA actions.

Materials and methods. In work the content analysis and a method of comparison are applied.

Results and discussion. For today in Ukraine the medicine and PA containing identical structure, namely extract of onions and heparin in the structure are implemented at the same time. Difference in the price of the analyzed goods that significantly affects availability for the purpose of prevention of formation of keloids. For today in Ukraine for treatment of hems at children and adults according to automatic telephone exchange classifications belong to dermatological medicines (ATC– D11A X20 code) such medicine as is registered:

- gel Kontraktubeks20 gr, "MERZ PHARMA GmbH & Co. KGaA", Germany - 350 UAH;
- gel of Dermatiks 15 gr, "MEDA Manufacturing GmbH" (MEDA MANUFACKHURING GmbH), Germany – 800 UAH;
- cream Kelofibras's 25 gr, SandozPharmaceut GMBH, Germany – 690 UAH;
- gel Fermentol 40 gr, "High Technologies", Russia-550 UAH.

And such medicine as gel Konrarubets,40 ml, "Cortés", Ukraine, is registered as parapharmaceutics, average price of implementation in drugstores 60 UAH.

Conclusion. It is established that medicines of anti-keloidny action, identical on structure, are in circulation as medicines, and others – as PA. Essential difference consists in the price, the analyzed goods that the keloidnykh of hems affects availability of treatment postoperative. Application of parapharmaceutics of anti-keloidny during an economic crisis in the country for the purpose of prevention of formation of postoperative hems is of great importance.

STUDY MAIN TRENDS OF THE DOMESTIC PHARMACEUTICAL MARKET

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Introduction. The pharmaceutical market - a powerful industrial sector, which is one of the five most profitable sectors of the global economic complex.

Modern pharmaceuticals market is complex, Multifunction and multi-tional with high growth rates of production and sales. The reasons for this growth are the features of the medicines that meet the specific needs of consumers and for which demand is increasing regardless of the economic, political and other factors. The pharmaceutical sector today is one of the most advanced on capital intensity, knowledge-based, sustainable growth, social importance for the global economy.

The pharmaceutical industry occupies an important place in the economy of Ukraine as an important segment of the national market, largely determines national security and defense of the country, is distinguished by high knowledge intensity and developed cooperation.

The aim of this work is the analysis of modern pharmaceutical market of Ukraine for 2012-2016rr. and identifying key problems and prospects of its development.

Materials and methods. We used literature data and information agencies. The study used the method of market analysis and comparative, logical, historical, and others

Results and discussion. The analysis of the pharmaceutical market for 5 years, demonstrated a significant increase in pharmaceutical sales performance of all product categories "pharmacy basket", including drugs (medicines), medical products (VMP *), cosmetics and dietary supplements. By results of 2012 the volume of the pharmaceutical market of Ukraine totaled UAH 31.7 billion. for 1.96 billion packages, but data exceeded 2011 by 16.9% to 4.5% cash and in kind. In dollar terms, the figure was 3.9 billion. USA. The weighted average cost of goods "Pharmaceutical basket" on results of 2012 the average for the pharmacy market grew by 11.9% to 16.2 USD. For all product categories "pharmacy basket" for the last year, noted positive dynamics of retail sales in cash and in kind in comparison to 2011.

However, most pharmaceutical sales growth in all product categories "pharmacy basket" was observed in 2013. Thus, this indicator stood at 35.85 billion. UAH., Exceeding the previous year by 12.7%. The market in monetary terms

continues to grow, but the growth rate slowed down, and last year showed the lowest dynamics of this indicator over the last 6 years. In physical terms, the market volume totaled 1.99 billion packages, down 1.6% compared with 2012 dollar total volume of pharmaceutical sales amounted to 4.39 billion dollars. USA, showing a growth rate of 11.7%.

In 2014 the volume of pharmaceutical sales of all product categories "pharmacy basket" amounted to 40.8 billion USD. and increased in comparison with the previous year by 13.8%. However, this increase mainly achieved by increasing the cost of goods "Pharmaceutical basket" because of the devaluation of the hryvnia, in dollar terms since the market has shown a negative trend at 20% (2.6 billion dollars. USA).

Following the results of 2014 average price of 1 package of goods "Pharmaceutical basket" 23.1 USD. and increased by 28.5% compared to the same period last year. In 2014 also marked reduction in physical sales by 11.4%. The above is due to the continuing fighting in the east of the country, the annexation of the Crimea, the introduction of 7% VAT rate on medicines.

By results of 2015 the total sales of all categories of goods "Pharmaceutical basket" made up 1.5 billion packages and 50.5 billion USD., Which in dollar terms amounts to 2.3 billion dollars. USA. In the hryvnia terms, sales increased by 23.7% compared with 2014. At the same time, in physical terms, a decline of 12.3%. In dollar terms, sales fell by 33.5%. The weighted average cost of 1 package of goods "Pharmaceutical basket" on the basis of 2015 amounted to 32.6 UAH. and increased by 41.1% compared to 2014.

In 2016 Ukrainian pharmaceutical market demonstrated growth. The total volume of pharmaceutical sales of all product categories "pharmacy basket", at the end of 2016 amounted to 60 billion USD., Which in dollar terms amounts to 2.2 billion dollars. USA. for 1.6 billion packages). Importantly market growth both in money (at 21.9%) and in kind (5.7%).

Thus, in 2016 the Ukrainian pharmaceutical market has shown a slight increase in kind from the previous year. The results of the last months of 2016 are encouraging. In dollar terms since mid-2016, there is growth in retail sales of medicines, which is gradually gaining momentum. The growth of the retail sale of medicinal products by December 2016 in UAH terms of 42.5% in volume - 27.9%, in dollar - 27.5% compared to the same period of 2015.

Conclusions. The results of the research can be argued that the domestic pharmaceutical market is a dynamic structure. The nature of its development depends on a large number of factors, the impact of which is the subject of comprehensive research. Research in that direction will be conducted by us in the future.

Section 17.
PHARMACY QUALITY MANAGEMENT

COMPARATIVE ANALYSIS OF THE REGISTRATION DOSSIER STRUCTURE FOR EUROPEAN AND ASIAN COUNTRIES

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Introduction. One of the goals facing drug product (DP) manufacturers in Ukraine is to expand sales markets and enter a new international level. To sell products in foreign countries, it is necessary to first confirm the safety and efficacy of medicines, which is achieved by passing an examination in the regulatory bodies of foreign countries with subsequent receipt of approved registration documents. Pharmaceutical legislation in Ukraine is harmonized with EU legislation, which allows free registration of domestic drugs in European countries. Despite the fact that registration in Asian countries is of considerable interest to drug manufacturers in Ukraine, due to specific pharmaceutical legislation in Asian countries and the lack of an accessible information base, the documents preparation for registration is difficult.

Aim. The aim of the study is to compare the Registration Dossier (RD) structure for European countries and Asian countries, identify common features and differences, which will facilitate the transposition of RDs for registration in Asian countries.

Materials and methods. In the process of the study, the analysis of the Ukraine and the countries of Asia legislative bases in the drug registration system were used. As the result of the analysis, the table of the main differences in the contents of the RD is drawn up, using which it is possible to carry out work on adapting RDs to the requirements of Asian countries.

Results and discussion. The format of RD in Ukraine is CTD (Common Technical Documentation). RD in this format consists of 5 modules: Module 1. Administrative & Prescribing Information, Module 2. Summaries CTD, Module 3. Quality, Module 4. Non-Clinical Reports, Module 5. Clinical Reports. In its turn, the ASEAN Common Technical Documentation format consists of 4 parts: Part I - Administrative Data and Product Information, Part II - Quality Documents, Part III - Non Clinical Documents, Part IV - Clinical Documents.

The list of documents included in the administrative data, as well as the requirements for them are different, reflecting the specifics of drug registration in different countries.

The results of the comparative analysis and the main differences in the structure of the RD for the implementation of medicines abroad are presented in the table.

Comparative table of RD structures CTD-format and ACTD-format.

| Comparison parameters | Ukraine (CTD-format) | Asian countries (ACTD-format) |
|--|---|---|
| Certificate of Pharmaceutical Product (CPP) | Not applicable | Requires a legalized CPP in the embassy of the country in which the drug will be registered |
| Summary and reviews of clinical and preclinical data, general quality report | Applicable | Only need to provide the general quality report |
| Certificates of Suitability to the Monographs of the European Pharmacopoeia (CEP) | Does not required legalized CEP | It is mandatory to have a legalized and authorized CEP in the country of the producer of the active pharmaceutical ingredient |
| Specification and quality analytical methods of FMP(finished medicinal product) | In accordance with the State Pharmacopoeia of Ukraine, the European Pharmacopoeia | In accordance with the European Pharmacopoeia, the United States Pharmacopoeia |
| Certificate of compliance with the standard ISO 15378 “Primary packaging materials for medicinal products” | Not necessarily | Obligatory availability of the certificate of conformity to standard ISO 15378 from the manufacturer of primary packing materials |
| Conditions for carrying out long-term stability tests | Climatic zone II (Subtropical climate with possible high humidity) t° = 25 °C, relative humidity - 60% | For climatic zone IV A (Hot and humid climate) t° = 30 °C, relative humidity - 65% For climatic zone IV B (Hot and very humid climate) t° = 30 °C, relative humidity - 75% |

Conclusions. Thus, a comparison of the RD structure for European countries and Asian countries, the identification of common features and differences, will facilitate and accelerate the transposition of RDs for registration in Asian countries.

ELECTRONIC SEPARATION OF DRUGS IN THE STATUS OF "QUARANTINE" IN THE PHARMACEUTICAL WAREHOUSE

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Introduction. As stated in the operating license conditions regarding implementation of manufacturing medicines, wholesale and retail trading of drugs, importing drugs (except for active pharmaceutical ingredients), electronic separation of drugs in the status of "quarantine" may be provided on the condition of existence conforming product identification, validation of computerized systems (CS) and upon condition that the system provides equivalent safety. In good distribution practice (GDP), are says that only specifically designated person should perform data entry or changes in the system. In case of system, failure or malfunction should be determined procedures.

Validation of computerized system and program support, that guarantees electronic separation of prohibited for sale drugs from authorized store, is considered extremely important concerning the functioning of the system of quality in modern pharmaceutical distribution companies. Based on validation testing, should be provided determined and documented procedures of process control of behaving with quarantine production and proper actions in case of malfunctioning system.

Validation testing CS and further determination of documented procedures with consideration for validation testing appears to be distributor of drugs matter of interest. In this instance, validation should cover all of the aspects related to CS: starting from system choice and its installation to operation under normal and critical conditions. All of the mentioned aspects are always concerned with risk on quality influence of pharmaceutical production. They have to be determined and estimated during validation process.

Aim. Determination methods of electronic separation of drugs in the status of "quarantine" with the help of relevant CS and PS, in distributing activity of pharmaceutical company.

Materials and methods. In the capacity of research database were used normative documents, which standardize CS functioning and its validation (in particular, GMP/GDP regulations), ISO specialized standards, ICH regulations and other information sources. The comparative analysis method, the method of structural and logical modeling expert method were applied during the research.

Results and discussions. There is properly built and documented process controlling model of quarantine production and the program of CS and program support (PS) validation that provides electronic separation of prohibited for sale drugs with due account for undesirable situations. It allows qualified person of pharmaceutical distributor to guarantee prevention of ingress the quarantine production to permitted for sale store with following statuses:

- Pharmaceutical products that didn't pass the incoming inspection of quality by qualified person;

- Drugs that are prohibited in accordance with law;
- Drugs that must be utilized (including rejected products);
- Low-quality drugs or those, which under suspicion of quality violation;
- Adulterated drugs or those, which under suspicion of adulteration;
- Drugs that are recalled from the market;
- Returned drugs;
- Drugs that are imported and do not have permission for selling.

When building a functioning system of electronic separation, should be considered, at least, the following:

- The rights for operations performing on quarantine production with the help of CS must be given only to qualified person. Each qualified person should have the necessary access to system authentication and authorization;

- Any operation performed with the help of CS should retain in PS "audit trail" with a history of events and full name of the person, who performed the operation;

- Pre-compiled database a series of drugs that must be blocked by the system in case of such series remains available in authorized selling stock;

- Block activation a series of drugs by program, whose marketing authorization or shelf life soon expires;

- Any returned pharmaceutical production, which is taken on charges and put into the system, must be automatically blocked, until qualified person makes a decision concerned this production;

- Giving an appropriate status for imported drugs, concerning the stages of the formation of the sales permit.

Conclusions. There is properly built and documented process controlling model of quarantine production and the program of CS, whose validation testing is thoroughly organized. In case of malfunctioning, all of the necessary procedures are determined, which are extremely important for obtaining drugs quality guarantee. Our further researches are focused on developing methodology of validation CS.

THE NECESSARY OF IMPLEMENTING THE STANDARDS OF THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION IN THE RETAIL SEGMENT PHARMACEUTICAL MARKET

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Introduction. Medicines quality assurance is a wide-ranging concept covering all matters that individually or collectively influence the quality of a product.. GPP is the practice of pharmacy that responds to the needs of the people who use the pharmacists' services to provide optimal, evidence-based care. To support this practice it is essential that there be an established national framework of quality standards and guidelines. The basic requirements of ISO 9001 is the basis for the introduction of international standards of good practice, including Good pharmacy practice (Good Pharmaceutical Practice, GPP), which is the final component of the system providing the population with quality medicines and pharmaceutical care. Today, the issue of implementation of quality management systems (QMS) according to standards ISO for the retail segment of the domestic pharmaceutical market remains relevant.

Aim. The aim of our work was to investigate the problems of implementing QMS ISO 9001 model for the activity of pharmacies.

Materials and methods. In carrying out this work used a generalization of scientific literature and theoretical analysis, analysis of materials on the Internet.

Results and discussion. The first step in building a pharmacy QMS is to define processes, their relationships and interactions – that the implementation process approach. Model for QMS ISO 9001 in the pharmacy covers internal processes management; regular training and certification of personnel; processes of interaction with suppliers; verification of purchased product on qualitative and quantitative indicators, the activities of the authorized person; work with clients; provision of adequate infrastructure and material resources; development and traffic control documentation. The next step is the formation of QMS regulation processes - the establishment of certain terms of algorithms and their implementation. Another problematic aspect of the formation of the QMS is to establish an effective system of monitoring and review processes implemented in pharmacies.

Conclusions. Recognizing the need for a quality management system is a strategic decision of the pharmacy guide that can help improve overall its operations and provide a solid foundation for sustainable development initiatives.

LABOR SAFETY MANAGEMENT IN MODERN PHARMACEUTICAL COMPANIES

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Introduction. Today, the majority of pharmaceutical companies in Ukraine is part of international business, therefore the need to use uniform requirements with the international community for the system of occupational safety of workers is relevant. The improvement of the safety management system, the reduction of occupational risks, the introduction of practical experience of the best domestic and foreign companies, meets modern requirements and is one of the most important tasks facing the management of pharmaceutical companies

Aim. Study the conditions for the development and implementation of a labor safety management system for modern pharmaceutical companies.

Materials and methods. The methods of theoretical analysis of the scientific and methodological literature have been used.

Results and discussion. The management of the pharmaceutical companies assumes responsibility for the creation and successful operation of the safety management system. It should be based on a clear distribution of authority and responsibility for security issues between management, officials, specialists and employees. Such distribution is enshrined in the Regulation on the safety management system, with which all employees of the institution should be familiarized. The enterprise should develop and implement the main regulatory documents of the management system. The management of the institution approves the documents and is responsible for their implementation and successful operation. The procedure for exercising control and supervisory activities should be developed.

Its effectiveness will be confirmed by an audit. A new approach to the formation of management systems and the implementation of supervisory activities should be based on the principles of accessibility, openness, publicity.

To maintain safety at the proper level, organizations should envisage the development and implementation of integrated management systems for labor protection, environmental and industrial safety, that is, to solve these problems in a comprehensive manner.

Conclusions. New approach will make it possible to significantly reduce the costs for the development of individual control systems, reduce the number of documents being developed, the types of audits and the costs of conducting them, and also simplify the understanding by specialists and personnel of documentation regulating the procedures for ensuring safety and harmlessness of production activities.

RESEARCHES OF THE INTERNAL AUDIT ORGANISATION AT THE DOMESTIC PHARMACEUTICAL COMPANIES

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Introduction. According to the requirements of GMP for pharmaceutical manufacturing and for distributors to assess the effectiveness and suitability of the pharmaceutical quality system (PQS) must be conducted internal audits (IA) systematically. IA should be used as a tool for searching and analyzing the causes of discrepancies in the work with further correction and and recommendations for improving operations of the company processes. All these data needed for making management decisions.

Aim. In order to analyze the state of IA process at pharmaceutical companies (PC) we have been processed material sources of published information, and conducted a sociological study by a questionnaire of a representatives at domestic PC of production and wholesale trade of medications.

Materials and methods. In the work we have used: system-analytical method, structural and logical modeling, a comparative analysis of peer review, a sociological survey and more. Statistical analysis of the results was performed using the licensed software Microsoft Excel of Microsoft Office 2013.

Results and discussion. Based on analysis of the survey we found that next to the development of large-scale audit practice, there're certain aspects of this process that most PC need to be improved. For example, the survey revealed the problem of auditing methodological support: 44% of respondents expressed the critical need to developed appropriate guidelines, and 43% of respondents agreed with the fact that these recommendations would be useful. Most of the respondents to the question on the reasons of the unsatisfactory efficiency of IA noted a human factor (such as competence of auditors, impartiality and objectivity). Also were mentioned reasons related in the deficiency of hour for planning and conducting audits in reasons that for IA often involved specialists from different business units, which have to leave their main workplace in this short period of time.

Conclusions. We can conclude that the problem with IA efficacy on domestic PC existing and must be solved by reforming the scientifically proven organizational basis for these activity. Therefore, we planned to form a set of proposals for the auditing organization at PC defining scientific and methodological approaches to reglamentation and documentation of the audit process, planning of IA based on risks, implementation of the PDCA methodology to the audit process and other aspects.

ACTUALITY OF STANDARTIZATION THE CLASSIFICATION OF MEDICINE COSMETICS IN UKRAINE

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Introduction. The question of classification medicine cosmetics allows standardizing basic concepts used by the specialist, and is the important stage in mastering of educational disciplines students, in particular, in direction of quality management in pharmacy.

Basic principles of classification of cosmetics regulated by the Law of Ukraine "About medicines" from 04.04.1996, the number 123/96-BP, According to the Law of Ukraine "About Medicines" principles of government control of pharmaceutical products are the same for the medical cosmetics.

Aim. Analysis of the current global cosmetics market showed that the classification of medical cosmetics does not consider their cosmetic properties: requirements to consumer descriptions of form of vacation feature of sensory in dexes of preparation, specific requirements to the packing and others like that. According these trends, the objective of this research was to suggest approaches to classification of medical cosmetics with taking into account of their features of the use.

Materials and methods. The analysis of the domestic and European legislation was conducted in the sphere of the classification of cosmetic products, in particular, that regulates the question of unitization and standardization of basic concepts in perfume-cosmetic industry of Ukraine : the National standard of Ukraine ISO 2472: 2006 "Perfume-cosmetic products. Terms and determinations of concepts", corresponding State standards and technical requirements for the certain type of cosmetics. Also used material of Regulation №1223 / 2009 of the European Parliament and of the Council on cosmetic products (Brussels, 30 November 2009), which regulates the requirements for the classification of cosmetic products, operating in the European Union.

Results of the research. According to ISO 2472: 2006 "Perfume- cosmetic products.Terms and determinations of concepts"cosmetics classify depending on an application and appointment: cosmetics for lips and eyes, for a manicure and pedicure, skin care products, powders, rouges and voice-frequency creams, facilities of care of hair, tooth-pastes and facilities for the hygiene of cavity of mouth, toilet and hygienical wares. The Regulation №1223 / 2009 of the European Parliament and of the Council on cosmetic products provides for classification of cosmetic products depending on an application domain on: facilities on the care of hair ; facilities are on

a supervision upon a skin ; on a supervision upon lips; on a supervision upon the skin of face; on a supervision upon nails; facilities are for the hygiene of cavity of mouth ; facilities are for eyes; facilities that contact with mucous membranes. Also, the European legislator separates cosmetic products that need moving away from cosmetic products do not need moving away from a skin and her derivatives after application.

The marked classifications are not envisage such characterizing signs of cosmetic products, as an orientation of cosmetic action, level penetrations through the cutaneous covering, that is able to influence on efficiency of cosmetic preparation in general.

It was proposed to unify a wide variety of cosmetics classified them depending on the direction and mechanism of cosmetic action. According to this principle, cosmetic products can be divided into cosmetics of the hygienical setting and cosmetics of the decorative setting. In turn, by type of action cosmetic preparations of the hygienical setting can be classified on the preparations, sent to cleaning of the cutaneous integument and preparations to protect the cutaneous integument. Cosmetic preparations of clearing action are intended for cleaning of the cutaneous integument from mechanical contaminations microorganisms, their metabolic products, product of functioning of soft tissue - horny fat, to the secret of greasy and sweat glands, horny scales etc.

In basis of clearing action of cosmetic preparations, according to their classification, can be based on the following mechanisms: mechanical tearing away of horny layer, its destruction as a result of chemical, physical and chemical and/or biochemical influence; depriving of fat as a result of dissolution or solubilization of fatty contaminations e.t.c.

Cosmetic preparations of protective action are direct on warning of negative influence on the cutaneous covering of external factors, such as UV- radiation, chemicals, physical reagents and other. The mechanism of protective action consists in creation on the cutaneous covering mechanical and/or chemical protective barrier.

Cosmetic preparations of protective action, in turn, appropriately to classify depending on nature of irritating external factor and, accordingly, from the type of the formed protective barrier. Cosmetic products that protect the skin from influence of moisture, aggressive chemicals, determine as a water-repellent; from the action of UV rays - as sunscreen, dehydration - as moisturizing; from depriving of fat - as emollient; from negative physical influence - usually as facilities for a massage.

Conclusions: According to results of the research, it is possible to establish that modern cosmetology industry actively develops and draws on innovative accomplishments of medicine, chemistry, pharmacy and needs systematic development of the system of classification of facilities of cosmetic supervision.

PROCEDURE FOR WITHDRAWAL OF MEDICINES FROM PHARMACIES

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Introduction. In accordance with the standard ICO 9001: 2015, quality assurance is the main task of the management and requires the participation and responsibility of the company's personnel at all levels. The correct solution for fulfilling the tasks is the implementation of the rules of GMP and GSP, which take into account all components of the quality system, including risk management, and factors that may affect the quality of the drug during the delivery to the destination.

Aim. An important component of the quality of the drug is an effective quality management system, in which there should be a procedure for recalling medicines from the market.

Materials and methods. The effectiveness of the drug recall procedure from the pharmaceutical market depends on: 1. A clear distribution of powers of the responsible person; 2. A clear and complete description of the sequence of procedures; 3. Complete interaction with regulatory authorities; 4. Interrelationships with suppliers; 5. A clear and regular documentation review procedures.

When the distributor interacts with a pharmaceutical company that deals with the retail sale of medicines, it is a prerequisite to conclude a contract on the basis of individual contract terms.

Results and discussion. The fate of the medicinal product and the reasons for the refunds:

1. Drugs according to the recall of the distributor.
2. Medicament according to the manufacturer's recall.
3. Medicinal product according to the order of the regulatory authority (rejection of the medicinal product - marking, impurities, termination of registration in the territory of Ukraine).
4. Medicinal product according to the order of the regulatory authority (suspicion of falsification according to consumer complaints).
5. When the falsification of a medicinal product is confirmed, this series, according to a written notification from the regulatory authority, withdraws from the pharmaceutical market.
6. When refuting the falsification of a medicinal product, according to a written notification from the regulatory authority.

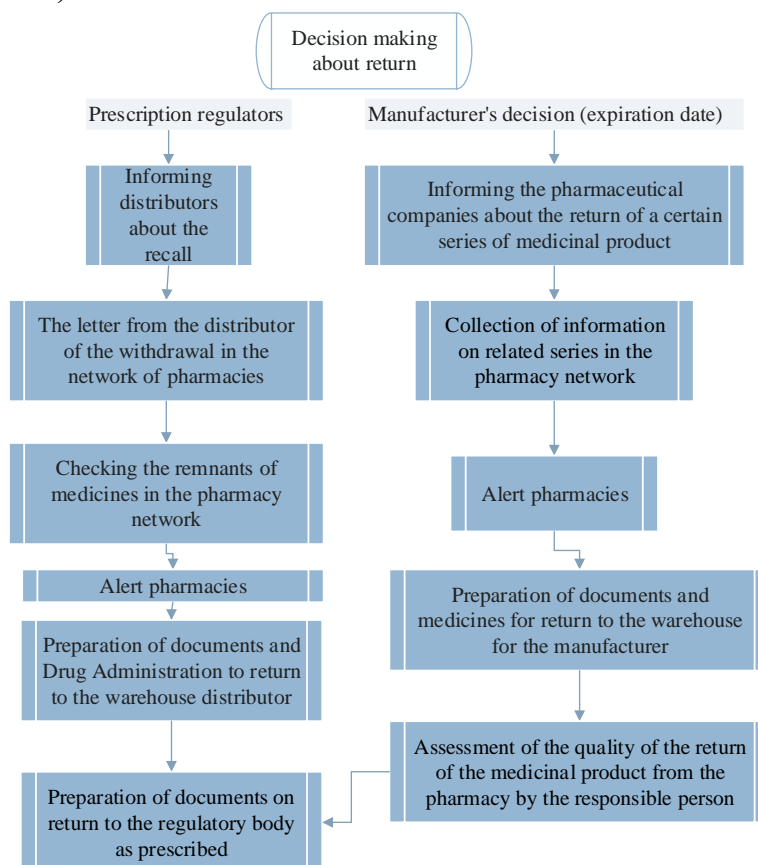
For proper and strict management procedures Review of medicines, appointed by the person in charge of the pharmacy, which is responsible for the review

procedure with the pharmaceutical market. The key procedure is implemented by the process manager in the pharmacy network of the pharmaceutical company.

The drug is subject to return from the pharmacy network in accordance with the terms of the supply agreement with the distributor or manufacturer, and the terms of the contract, regardless of the import or domestic production of the medicinal product. Obligatory is the preparation and signing of documents, the procedure for possible refunds (reviews) is preliminarily announced.

The effectiveness of the recall procedure is possible when displaying all the conditions for the return of the medicinal product to the distributor:

- information about the responsible persons (surname, name and patronymic, telephone);
- document flow during recall;
- methods of communication for urgent interaction;
- method, conditions, terms of repayment;
- obligations to the distributor (ensuring the full interaction of the return of the recalled products).



Conclusions. We have developed a return procedure in the form of a flowchart of return procedures taking into account the areas of responsibility. Formation of the withdrawal procedure will ensure compliance with the requirements of GDP, GSP, GPP, and will be one of the components of the guarantee for the end user.

QUALIFICATION OF STORAGE AREAS AT PHARMACEUTICAL ENTERPRISES

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Introduction. Ensuring quality during storage is an important part of the life cycle of pharmaceutical products. There are several international standards (GMP, GDP, GSP) which states that the pharmaceutical enterprises must undergo validation / qualification.

Aim. The aim of our work was the development of training measures for of storage facilities to ensure the conditions of storage of medicines.

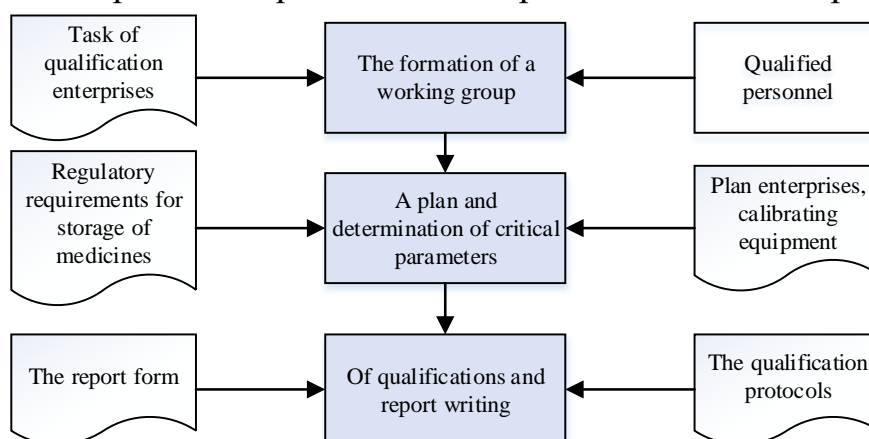
Materials and methods. We used training methods of qualification installation for the work. Work to determine the temperature and humidity were conducted using wireless Datalohheriv.

Results and discussion.

Determine the three stages of validation pharmaceutical enterprises:

- The first step in validation is part of the qualification project. It is performed before construction is to analyze and design documentation.
- Qualification assembly is held for new enterprises or after their reconstruction. At this stage, mainly used methods of visual inspection and comparison with the specification.
- Qualifications operation performed after successful completion of the qualification installation. At this stage, conducted mapping hollow structure using wireless Datalohheriv temperature and humidity.

We have defined pattern of qualification the pharmaceutical enterprises.



Conclusions. We have the place validation / qualification in the system of quality management. Developed and proposed training plan, report and statement of qualifications.

CLINICAL DATA MANAGEMENT FOR PROJECT MANAGER: VENDOR SELECTION AND MANAGEMENT

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Introduction. The expert examination and approval of pharmaceuticals by national regulatory agencies is possible only in case when the clinical trials data presented are of sufficient integrity to ensure confidence in the results and conclusions presented by the sponsor company. Adherence to quality standards and practices, for instance Good Clinical Practice (GCP) is very important for obtaining that confidence.

Aim. This research examines the critical factors that a project manager need to look out for in the area of Clinical Data Management when undertaking a clinical trial project.

Materials and methods. In this work we used international and national regulations and guidelines, and a specifically developed questionnaire with a rating score as the analytical instrument to share the experience from internationally sponsored clinical trials and professional network.

Results and discussion. The purpose of this research is to present accepted practices and to demonstrate how to apply the concepts contained in existing regulations and associated guidance to Clinical Data Management as well as to provide practical suggestions and proven tools recommended by the clinical trials professionals when making decisions upon clinical trial data and its utilization. Commonly Clinical Data Management services are outsourced by the sponsoring companies to catch up with technology innovations and regulatory pressure for quality. Clinical trial projects are resource intensive and costly endeavors, and conducting them requires the establishment of a process in the execution of the project. Clinical Data Management constitutes a major part of the clinical trials conduct, and includes paper and electronic case report form (CRF) design, clinical trials database design and programming, data standards, system implementation, data acquisition, data integration into the clinical trials database, data review, validation, coding and database finalization. Each company involved in clinical trials conduct is obligated to ensure that the individuals performing tasks follow Good Clinical Practice.

Conclusions. Therefore, vendor management was examined, minimal standards and the best practices for the clinical trial project manager were provided constituting the essential theoretical part of our master's thesis.

FEATURES OF MATHEMATICAL MODELING IN THE CREATION OF DRUGS

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Introduction. While producing drugs pharmaceutical companies pay special attention to math modelling. In particular in modern pharmaceutical industry are being taken different math models that describe substances behavior in the organism, us processes and help to plan before clinical researches.

The aim of the research. Conduction of the theoretical analysis of math modelling while creation of drug and to look through the example of math model while creation the drug curing multiple sclerosis.

Materials and methods. The were used some theoretical methods of research for solving the problem (studying and analysis of scientific at literature to define the condition of development and theoretical basis of the research).

Results and discussion. Today the math model is a virtual math construction, that was created on the basis of experimental datum and that has all properties of real object. While creating a medication it is possible to define the right dosage. *Interoperate*, in high dosage any drug is toxic and the possibility of side effects is doubling using low ones it can be unhelpful. So it is necessary to count of dosage where the drug has maximal effect but is not a poison. It gives the opportunity to make the right model. With the help of math modelling is it necessary to count the right amount of drug its behavior and influence of the organism.

Today the drug against multiple sclerosis was registered a hard autoimmune disease while lymphocytes start attack myelin covers of nervous fibers a person looses mobility slowly. This drug has anti-inflammatory analgesic an antipyretic activity and also is used for treatment of autoimmune diseases.

The mechanism of this drug action is the amount of lymphocytes low down. Clinical researches show that drug is effective in doses of 0,5 and 1,25. Scientists and pharmacists have asked themselves: "if it is possible to use half the dose (0.25 mg)". The calculation is simple: the smaller the dose, the less harmful is the drug. But for a clinical trial of one dose will take years, and medicine is vital for patients. Therefore, with properly designed mathematical model, it was proved that this drug is also effective at the dose of 0.25 mg.

Conclusions. Thus, we can safely say that nowadays, mathematical modeling is one of the most promising methods for increasing the efficiency of the process of creating new medicines.

ORGANIZATION OF LOGISTIC ACTIVITY IN THE DESIGN OF NEW MEDICINES

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Introduction. It is important rational planning of development, production and sale of medicine. It is basis of satisfaction of demand with minimum charges, strengthening of co-ordination between subdivisions of enterprise.

The decision of these tasks requires developed logistic, presence of competent logistic management.

Due to the high degree of co-ordination of actions of all participants of logistic process, increase of reliability of deliveries, rationality of distribution of supplies it maybe to promote speed and quality of development of new medicines.

Aim. Organization of logistic activity at development and introduction of new preparations Farmak Joint-Stock Company.

Materials and methods. After the zones of management the logistic of enterprise is divided on:

- external (engages in questions management streams, that go out outside an enterprise, but are in the field of his influence);
- internal (sent to the management stream processes within the limits of enterprise).

After functional areas, the logistic is divided on:

- purchasing (supply) - decides questions that belong to the sphere of providing of enterprise necessary resources;
- productive (productive processes) - embraces a question from a management moving and storage of resources directly in the process of production;
- sale (distributive) - related to the management of commodities a stream from a producer to the consumer;

On maintenance logistic operations distinguish transport, warehouse logistic, logistic of supplies, informative, financial logistic.

Results and discussion. The functions of department of support of new developments are worked out.

1. Providing of communication is with foreign partners.
2. Grant of data about companies to the appropriate departments of Farmak Joint - Stock Company for realization of further works with them.
3. Takes part in development of documentation and procedures that touch works within the limits of competence of department, stowage of annual plans of

development of new preparations and primary working of expediency of development, realization of negotiations, entering into the corresponding contracts, sent to establishment and development of relationships with contractors on foreign markets, strategic analysis and planning: in diagnostics of internal and external environment of company, watching of tendencies world pharmaceutical market and industry, development and determination of strategies of possible collaboration.

Standard operating procedure is worked out in relation to work of department of support of new developments. This procedure contains the order of man-hunting and choice of companies-producers of API, adjuvant, reviewer preparations, chemical raw material, and intermediates for development and introduction of new preparations. Purchase and supply of standards.

Procedure determines the order of man hunting and choice of companies-producers. Order and receipt of commercial parties of API, adjuvant, chemical raw material, and intermediates, order and receipt of API, adjuvant, chemical raw material, and intermediates on the first industrial producing, order and receipt of documentation for registration and re-registering, search of alternative producers.

Protocol of acceptance of standards is worked out, that issued to the laboratories at the transmission of standards. In protocol all information registers on a standard;

Responsible especially in the sector, who gave a standard;

At an acceptance, work begins in relation to delivery, and commercial deliveries.

Protocol of information transfer on a producer gets to the department of purchases after successful labour with a contractor for a year.

Conclusions. Due to development of standard operating procedure in relation to work to the sector of support of new developments next tasks were decided.

Order of man hunting and choice of companies-producers.

Works are on an order and receipt of standards, and to documentation.

Works are on ordering and receipt of raw material.

Works are on an order and receipt of raw material on the first industrial producing.

Relations and zones of responsibility are regulated between subdivisions

Farmak Joint - Stock Company, that eliminates possibility of errors in process.

The packages of documents, that to give the department must to corresponding subdivisions, are concerted.

Time is regulated for consideration of the given documentation / of realization of works.

RESEARCH OF QUALITY MANAGEMENT SYSTEMS STAGES FORMATION AT THE ENTERPRISES OF WHOLESALE TRADE OF MEDICINES

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Introduction. For successful work in the field of medicines and medical products distribution, it is necessary to improve the efficiency of the company's activities. This is necessary for improving the quality of customer service and reduce non-earmarked costs. This requires the implementation and continuous improving of the quality management system (QMS) in accordance with modern principles and requirements of international standards ISO 9000.

Aim. Development of proposals for the design and implementation of QMS based on a typical distribution pharmaceutical company. Tasks: studying of the standard ISO 9001 requirements, Good distribution practices (GDP) requirements and licensing circumstances for the wholesale trade of medicines; definition of general and specific requirements of the ISO 9001 standard and the GDP guidance; development of the project of QMS forming by the example of a distribution company.

Materials and methods. The analysis of the domestic and international requirements conducted in the sphere of the quality management and requirements for quality assurance and quality control in pharmacy: the National standard of Ukraine DSTU ISO 9001:2015 "Quality management systems. Requirements", ICH Q10 methodical recommendation, GDP guidance etc.

Also used material of Technical Committee ISO TC 176, which contain recommendations on the implementation and improvement of QMS.

Results of the research. We have developed a detailed plan for the formation and implementation of the QMS to the stage of certification. Duration of this project - about 9 months. Formation of the QMS, we propose to conduct in stages, with a clear regulation of all stages of the project and with the help of independent auditors and experts. We propose to pay special attention to the development of the QMS process model. We have developed the "Process Tree" contains a list of all processes of the distributor company QMS. Below is a list of QMS processes:

- Manage the organization (A1)
 - Manage finances (A11)
 - Manage QMS (A12)
 - Plan the activities of the company (A121)
 - Carry out self-inspection (A122)

- Conduct a QMS analysis (A123)
 - To develop CD and PD (A124)
- Provide resources (A2)
 - Provide staff (A21)
 - Provide infrastructure (A22)
 - Provide rooms (A221)
 - Provide equipment (A222)
 - Provide communications (A223)
 - Ensure the production environment (A23)
 - Manage the documents and records (A24)
- To buy and sell of products (A3)
 - Interact with consumers (A31)
 - To purchase of a products (A32)
 - Transportation, control and storage of products (A33)
 - Deliver of products to the customer (A34)
 - Carry out returns and reviews (A35)

The QMS process model is rationally designed using the IDEF0 toolkit. In the IDEF0 model it is very easy to see the interconnection of all processes at different levels. Each group of QMS processes can be "decomposed" to the desired scale. "Decomposition" is a more detailed representation of the process for better detail.

The process model is needed to describe the QMS and to develop a rational documentation system.

Developed process model of the QMS allowed:

- visualize the hierarchy, types and number of QMS regulatory documents;
- establish unambiguous responsibilities for each process;
- clearly define the requirements for the results of each QMS process.

Based on the process model, we proposed a list of the main documentation:

- documented procedures of the processes management (A1),
- documented procedures for supporting processes (A2),
- documented procedures for production processes (A3).

We also developed a draft of the Regulation on the leaders of QMS processes ("process owners"), documented procedure "Document management", SOP "Acceptance and input control of purchased products" etc.

Conclusions: completed developments will allow a typical distribution company to implement and certify of the QMS in the most rational way, minimizing project execution time and eliminating the risk of common mistakes. Our developments are taken into account by several distribution companies of Ukraine and Kazakhstan.

VALIDATION OF ANALYTICAL METHOD IN QUALITY CONTROL OF DRUG PRODUCTS ON THE BASIS OF KUSUM PHARM LLC

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Introduction. Analytical method validation – one of the basic requirements of the pharmaceutical industry, because there is still no established conventional system for validation work. The objective of any analytical measurement is to obtain consistent, reliable and accurate data. Validated analytical methods play a major role in achieving this goal. The results from method validation can be used to judge the quality, reliability and consistency of analytical results, which is an integral part of any good analytical practice.

Aim. To develop a method validation procedure as per Pharmacopoeia requirement for pharmaceutical laboratory like Quality control laboratory ‘Kusum Pharm’.

Materials and methods. Precaution during the planning of the validation studies: the standard’s method validation data are adequate and sufficient to meet the laboratory’s method requirements; the laboratory must be able to match the performance data as described in the standard method; the validation of a specific method must be demonstrated through laboratory experiments by routinely analyzing samples; ensure that user’s equipment, the people, the reagents and the environment are qualified to perform the analysis; make proper plan or flow chart for evaluation and validation of standard methods.

Results and discussion. Analytical method validation parameter as per ICH guideline

| Sr. No. | Validation Characteristics | Identification | Testing for Impurities | | Assay |
|---------|----------------------------|----------------|------------------------|-----------|-------------------------|
| | | | Quantitative Tests | Limit Tes | - Dissolution - Content |
| 1 | Accuracy (Recovery) | - | + | - | + |
| 2 | Precision (2 parts) | | | | |
| | Method precision | - | + | - | + |
| | Intermediate precision | - | +(1) | - | +(1) |
| 3 | Specificity (2) | + | + | + | + |
| 4 | Detection of Limit | - | -(3) | + | - |
| 5 | Quantitation Limit | - | + | - | - |
| 6 | Linearity | - | + | - | + |
| 7 | Range | - | + | - | + |

«-» signifies that this characteristic is not normally evaluated;

«+» signifies that this characteristic is normally evaluated.

System suitability (for assay Montelukast Sodium)

| Sr. No | Parameter | Results | Acceptance criteria |
|--------|---|---------|---------------------|
| 1 | RSD | 0.11 | NMT 2.0 |
| 2 | Resolution between Cis - isomer and Montelukast | 1.3 | NLT 1.0 |
| 3 | Signal – to – Noise | 51.63 | NLT 10 |

Based on the validation parameters, it is established that method is able to identify the subjected substance within acceptable parameters for RSD, resolution & S/N.

Mostly results depends on the following basis: chemists, chemicals, instruments, laboratory environment.

Chemist – they are most common cause for results' variation. To eliminate their involvement we can perform Ruggedness with different chemist. ICH says it Intermediate precision. Use of two trained chemists and perform same analysis to get comparative results within 2.0 % of actual results.

Chemicals – they are silent culprit of results' variations. To identify their role in the method, we can perform Robustness. We deliberately use different changes chemical grade and their specification, Solution preparation and their physicochemical properties.

Instruments – they are back bone of any analysis. To ensure their working suitability, we follow repeatability of same sample ICH says it Instrument precision approach. We use two instrument with same capacity, religiously calibrated and reliable for the given method. This gives us awareness of method's response on two instruments.

Laboratory environment: another unpredictable critical factor. To remove this error from our method, we use Ruggedness also part of Intermediate precision. We perform method in different laboratory, different days, different analysts and so on so we can confirm method ability in different labs.

Conclusions. We developed a required established validation documentation such as SOPs, validation protocols and reports, which are very easy to use and can be propose to QC for easy operation. Developed documents clearly show how validation will be conducted analytical methods, they said critical steps and acceptance criteria.

Proposed life cycle help to choose analytical method validation parameters.

Developed a successful SOP No: SOP/QC/031/00 for "Validation of analytical methods" Which can define common requirements, procedures, planning and execution of analytical methods validation as per requirement.

Developed a organized protocol and self explainery report for validation of analytical methods. A practical approach on validation of analytical methods for the laboratory quality control LLC "Kusum Pharm".

ELECTRONIC DOCUMENT MANAGEMENT AS AN ELEMENT OF THE QUALITY MANAGEMENT SYSTEM AT PHARMACEUTICAL ENTERPRISE PJSC "PHARMSTANDART-BIOLIK", UKRAINE

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Introduction. In the conditions of the modern world and total information system development, the use of electronic document management systems is topical. According to the GMP (Good Manufacturing Practices) requirements at pharmaceutical companies in the world and in Ukraine in particular the issue of proper workflow regulated and there is separate standard Good Documentation Practice (GDocP). In 2014, the WHO introduced Guidance on good data and record management practices. This document includes the notion of ALCOA (attributable, legible, contemporaneous, original and accurate). The ALCOA concept includes requirements for the documentation design in clinical studies, but for unifying the workflow, it was use in the pharmaceutical industry. According to the requirements of the DSTU ISO 9001:2015, the organization, regardless of its activities, must document its Quality Management System (QMS) ie., describes in the relevant documents all the processes of the system.

Aim. The purpose of the study is to study the interaction between the Electronic Document Management System (EDM) and the Quality Management System (QMS) of the PJSC “PHARMSTANDART-BIOLIK”.

Materials and methods. For the Ukrainian pharmaceutical companies the EDM is relatively new system and in modern conditions, its integration with the QMS is an urgent issue. On the example of PJSC “PHARMSTANDARD-BIOLIK” these two systems separately from each other and their functioning as the uniform mechanism of management in the conditions of one pharmaceutical enterprise have been considered. In the course of the research, the current state of the EDM and QMS and their interaction were analyze, and an analysis of the functioning of these systems in the business units performed.

Results and discussion. The analysis showed that both systems are configured and active in the enterprise, but the absence of an electronic signature system excludes the full and proper functioning of electronic document management and its integration into the QMS.

Conclusions. Taking into account the above, we suggest introducing a local electronic signature system with a corporate server, validating computer systems and integrating the EDM into the QMS.

APPLICATION OF MATHEMATICAL MODELLING TO FIND NEW APPROACHES TO DRUG DEVELOPMENT

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Introduction. Creating innovative medicines is currently very challenging and risky area of investment. A significant proportion of such projects stops at different phases of clinical trials or does not pass the criteria to regulatory authorities for new drugs. One of the main causes of this negative trend, experts suppose the increase in the number of failures of clinical trials. In this regard, the increasingly debated issue of the productivity crisis in the pharmaceutical industry and search for new approaches to drug development. One of the most promising scientific techniques that can help in solving the problems posed above is mathematical modeling.

Aim. Conduct a theoretical analysis of the application of mathematical modelling to find new approaches to drug development.

Materials and methods. To solve this problem were used methods of theoretical research (the study and analysis of scientific literature to determine the state of development and the theoretical underpinnings of the study).

The results and discussion. As is known, mathematical modeling is one of the most promising research methods that can help to shed light on the search for more predictive biomarkers, clinical parameters and optimal dose, over-designed clinical trials, the use of new technologies for the analysis of their results, and integrate the maximum amount of information when making key decisions. In connection with the development and improvement of the existing software and develop mathematical models become more complex, which allowed to significantly expand the range of their application. Now we use such mathematical modeling as biological, pharmacological and statistical modeling. The use of mathematical modeling allows for the analysis of clinical data on a qualitatively new level and propose the optimal design for clinical trials. We should also mention the contribution of simulation to the register reading to the kids when the results of the simulation times were recorded as the main reasons for making regulatory decisions.

Conclusions. Thus, it is safe to say that mathematical modeling is one of the most promising methods to increase the efficiency of the process of creating new drugs. In fact, today, are developed a number of innovative mathematical methods to improve decision-making at the early stages of the research, thereby reducing the risk of failures of clinical programs within evidence-based phases of the research.

FMEA METOD FOR QUALITY RISK MANAGEMENT IN PHARMACEUTICAL DISTRIBUTION COMPANY

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Introduction. As stated in the operating license conditions regarding implementation of manufacturing medicines, wholesale and retail trading of drugs, importing drugs (except for active pharmaceutical ingredients), risk management for the quality of medicines is an integral and very important component of the pharmaceutical quality system.

In the current national Guidance ST-N MOSE 42-4.2:2011 "Medicines. Risk management for quality", harmonized with the ICH Q9 document, the principles and examples of tools of quality risk management that can be applied to different aspects of quality in the activities of pharmaceutical companies. Based on experience from our own practical experience we have found that the identification and analysis of risks in activities appropriate to apply the FMEA method. An FMEA (Failure Mode and Effect Analysis) is a systematic method of identifying and preventing product and process problems before they occur.

Aim. Determination processes in pharmaceutical companies for the application of the method FMEA

Materials and methods. Was used regulatory documents, ISO specialized standards, ICH regulations and other sources of information. The comparative method of analysis the method of structural-logical modeling, the expert method was applied in the study.

Results and discussions. The FMEA process is widely applicable in a variety of settings beyond the product design and manufacturing processes. It can be used to improve support basic processes:

- the transportation of medicine;
- the acceptance of medicine;
- the storage of medicine;
- information systems;
- human resources.

Conclusions. The urgency of using FMEA method for quality risk management in pharmaceutical companies distributors. Determination the basic processes for risk management of method FMEA.

ORGANIZATION OF THE AUTHORIZED PERSON ACTIVITY AT THE DISTRIBUTION PHARMACEUTICAL COMPANY

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Introduction. In accordance with the national regulations of Ukraine and EU, the Authorized Person (AP) in a pharmaceutical company (PhC) is an employee with a higher pharmaceutical education.

The Authorized Person is responsible for the functioning of the Quality Management System of medicinal products, as well as granting permission for their further implementation.

The rational organization of the AP's activity at the pharmaceutical enterprise is of scientific and practical interest for the reasons that the experience of organizing and regulating their activities at distribution companies in Ukraine and CIS countries is still not enough.

Aim. The purpose of our work is to develop proposals for improving the organization of professional activities of the AP based on a typical distribution pharmaceutical company. The object of research: activities of the authorized person on the example of pharmaceutical distribution company "Venta. Ltd", m. Dnipro, Ukraine (Importer and distributor nationwide. "Venta. Ltd " is occupies a leading position among the top 10 importers of Ukraine: 600 suppliers, 1000 series medications daily, 150 series of direct import of medicines every day).

The Subject of research: methodology of organization and improvement of authorized person activities at the pharmaceutical companies and wholesale sale of medicines.

Materials and methods. The European and Ukrainian legislation in the field of activity of pharmaceutical distributors has been studied and analyzed, in particular the EU Directive on Good Distributive Practices (GDP), the national GDP guidelines (Guidance CT-H MO3Y 42-5.0:2014 Medicines. Good distribution practice), government regulations, orders of the relevant ministries, Licensing conditions for the production and trade of medicines (Постанова КМУ від 30 листопада 2016 р. № 929), Guidance ICH Q10 Pharmaceutical Quality System etc.

Results of the research. Based on the results of our sociological research, we have been identified the main problems associated with the suboptimal organization of the activities of Authorized Persons at large pharmaceutical distribution companies.

Such problems include:

- inconsistencies during the implementation of the incoming quality control of medicines,
- delays in approving suppliers and customers,
- difficulties with signing pharmacovigilance agreements,
- problems with handling claims for quality,
- inadequate results in staff training,
- rather formal approaches to internal audits etc.

In accordance with the regulatory requirements studied and based on studying the experience of domestic distribution company, we concluded that the following functions should be assigned to the duties of the AP:

- ensuring the implementation and operation of the Quality Management System;
- ensuring the proper performance of input and output quality control of medicines;
- licensing activity;
- participation in training and certification of personnel on quality assurance issues;
- complaints management;
- approval of suppliers and customers;
- medicines recall organization etc.

We also developed a draft of the Regulation on the leaders of QMS processes ("process owners"), documented procedure "Document management", SOP "Acceptance and input control of purchased products" etc.

Conclusions. Summarizing the results of the conducted studies, it can be stated that to optimize the work of Authorized Persons at large distribution pharmaceutical companies, it is rational to appoint several authorized persons, in particular those responsible for the:

- functioning of the Pharmaceutical Quality System,
- incoming quality control of medicines and medical products,
- working with complaints,
- pharmacovigilance,
- withdrawal of medicines, etc.

For each of these areas, we have developed a detailed list of functions that can be use in the development of job descriptions and Standard operating procedures (SOP). We have also developed the subject of internal training courses for authorized persons and criteria for a systematic evaluation of their activities.

These criteria can be used for internal certification of Authorized Persons and verification of the effectiveness of training activities.

IMPROVEMENT OF THE QUALITY SYSTEM FOR PROVIDING MEDICINES THROUGH THE INTRODUCTION OF INTERNATIONAL STANDARDS OF GOOD PRACTICES

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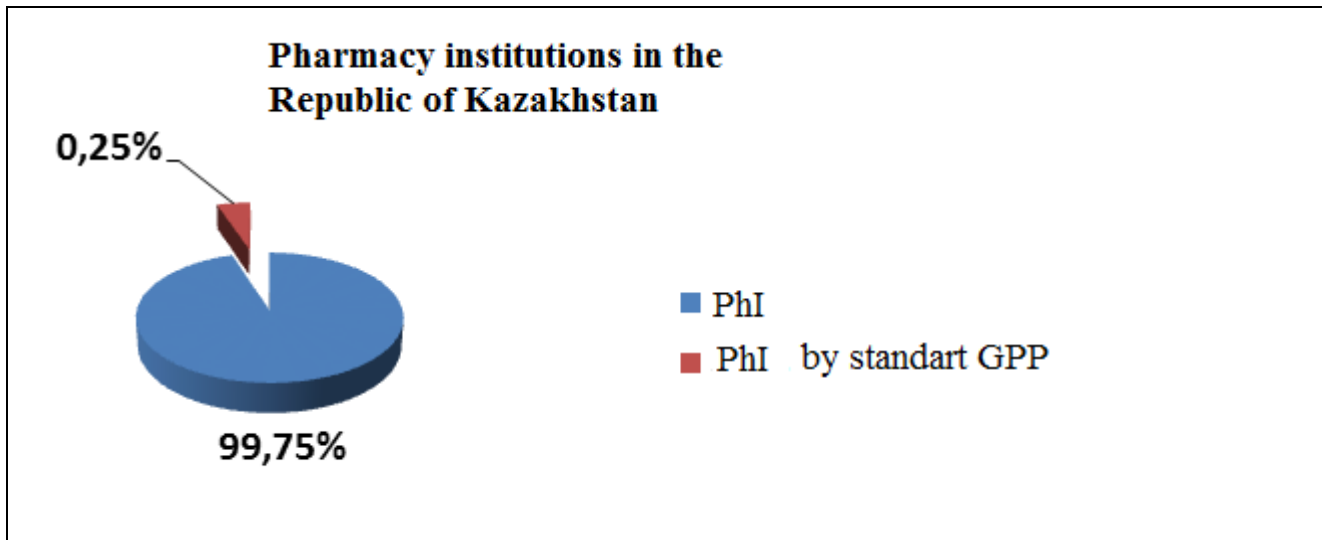
Introduction. Currently, the pharmaceutical market in Kazakhstan is actively growing and developing. In order to ensure high-quality provision of medicines Ministry of health implements standards of good practice GxP drawing on the experience of foreign countries. In the program of the President of the Republic of Kazakhstan from May 20, 2015 year nation-plan specific steps "100-STEP" 82 establishment of the Joint Commission on the quality of medical services in the Ministry of health and social development "marked the main goal-the implementation of advanced health care standards (protocols, training, drugs, quality control and accessibility). This direction and objective enshrined in the" State program for development of health care in the Republic of Kazakhstan «Densaulyk» on 2016-2019 years".

Aim. To consider the stages of introducing standards for Good Pharmacy Practice in Pharmacy Institutions, as a system for ensuring the quality of medicines.

Materials and methods. The methodological basis of the research served the requirements of legislative and normative acts regulating the State system of quality control of medicines of the Republic of Kazakhstan, Ukraine, the countries of Europe and the World.

Results and Discussion. Currently, the pharmacy of the Republic of Kazakhstan have begun to introduce good practice standards GxP This process assumes that. served as the decision of the Ministry of health care Republic of Kazakhstan 1615-2006 (good pharmacy practice. The basic provisions). Until April 2015 year State standard of the Republic of Kazakhstan "good pharmacy practice and wore a recommendatory character and was implemented only those drugstore organizations that participated in the provision of pharmaceutical services under State volume of free medical care. According to the order of May 27, 2015 №392 "On approval of good practices", all pharmacy institutions from January 1, 2018 must necessarily receive a certificate of compliance with GPP, confirming the right of pharmaceutical activities and ensuring the quality of pharmaceutical assistance.

As the majority of pharmacies on the form property arranged as small and medium-sized businesses and large pharmacy chains not so much, but they all understand the need to move to the NEW standards. In the first quarter of 2014, In the Republic of Kazakhstan has 5940 pharmacies, of them 15 retail facilities comply with the requirements of Standard GPP, which is approximately 0.25% of all existing pharmacies (picture 1).



Picture 1. Compliance of pharmacy institutions in Kazakhstan with GPP requirements

One of the key milestones GPP is the development of standard operating procedures. the employees of the pharmacy must clearly understand the goals, objectives and procedure for implementation of the quality system to ensure the social function of pharmaceutical organization.

Conclusions. "Good Pharmacy Practice", along with other "Good Practices" - is modern ideology, the way of modern thinking, the way a pharmacist of the XXI century works, which must be continuously improved. The introduction of GPP standards in pharmacy institutions ensures the implementation of safe, effective and high-quality drugs, prevents marriage and errors, guarantees compliance with the requirements, allows you to identify defects with constant quality control.

MILESTONES OF PROCESS OF HUMAN RESOURCES MENEGETM AT ENTITIES

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Introduction. Human resources management takes pride of place in the entity management system. A sustain improvement of the milestones of all recruitment and selection processes is necessary.

Aim. The purpose of this work is to study the key milestones of the human resources management at the entity.

Materials and methods. In our work we use legal network for organization and regulation for the process of human resources management such as the Labor Protection Act of Ukraine, the Employment Act of Ukraine.

Results and discussion. The milestones of the human resources management are:

- Human resource planning represents the subsystem of the plan system at the entity encompassing completion of the mission to support the entity with an adequate number of manpower of an adequate quality as well as improvement of social relations.
- The selection of the potential employee includes the initial acquaintance with applicants (an interview), collection and processing of the information about them according to the determined system, assessment of the characteristics and composition of the accurate applicant profiles, reconciliation of the actual characteristics of the applicants with the job position requirements.
- Employee adaptation is the process of the fitting of the employee to the content and conditions of the working activities, and to the direct social environment.
- The employee development represents the aggregate of the business activities performed by the human resources department in the aria of the employee training, professional advancement and career development.
- Appraisal of the personnel includes the following activities: preparation of the necessary documents for the appraisees, scheduling of the attestation, determining of the composition of the qualification/attestation committees and their education.
- Conflict management at the entity is the collision of the opposite aims, interests, positions, opinions, outlooks of two or more individuals.

Conclusions. Thus, we studies the milestones of the human resources management process at the entity, which formed the basis of our final work.

AUDIT AS AN EFFECTIVE MANAGEMENT TOOL

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Introduction. Nothing is perfect in the world. Each person strives for maximum achievement of the results. In order to achieve them we need methods that allow not only to optimize the process, but also to identify problems that arise during the activities of enterprises, as well as finding a way to solve them, ways of correction and improvement. An example of this is the audit process.

Aim. The purpose of our work is to review the audit process in the manufacture of medicines.

Materials and methods. To study this process, we use the international regulatory framework: ISO 9001, ISO 19011.

Results and discussion. The production of medicines today is a particularly important process, since the safety and therapeutic effect of medicines depend on the quality of production.

In connection with the unfavorable incidents of pharmaceutical manufacturers in the world, they have been obliged to carry out internal control of not only the product but also the manufacturing process in order to minimize the likelihood of such consequences. As a result, an audit process arose.

Audit is a complex process that consists of three stages:

1. Audit planning.

It starts with drawing up plans and schedules for each individual unit or process.

2. Conducting an audit.

In the second stage, the process and problems that arise in it and the reasons for their occurrence are examined.

3. Conclusion on the results.

The third stage provides recommendations for correcting and eliminating inconsistencies. A report is generated based on the results of the audit. For example, discrepancy: the tablet has an irregular shape. Let's say this is due to the incompetence of the staff. The solution to this problem is the constant monitoring of the tableting process, which will reduce the risk of poor-quality products.

Conclusions. Thus, although the audit requires a lot of time and resources, it makes it possible to identify weaknesses in the process and take preventive and corrective actions. Audit is a promising tool in the field of organization management and quality production in general.

Section 18.

**INFORMATION TECHNOLOGY
IN PHARMACY AND MEDICINE**

THE VIRTUAL LAB WORK ON PHYSICS

“IDENTIFICATION OF NATURE AND CHARACTERISTICS OF GASES USING METHOD OF STANDING WAVES”

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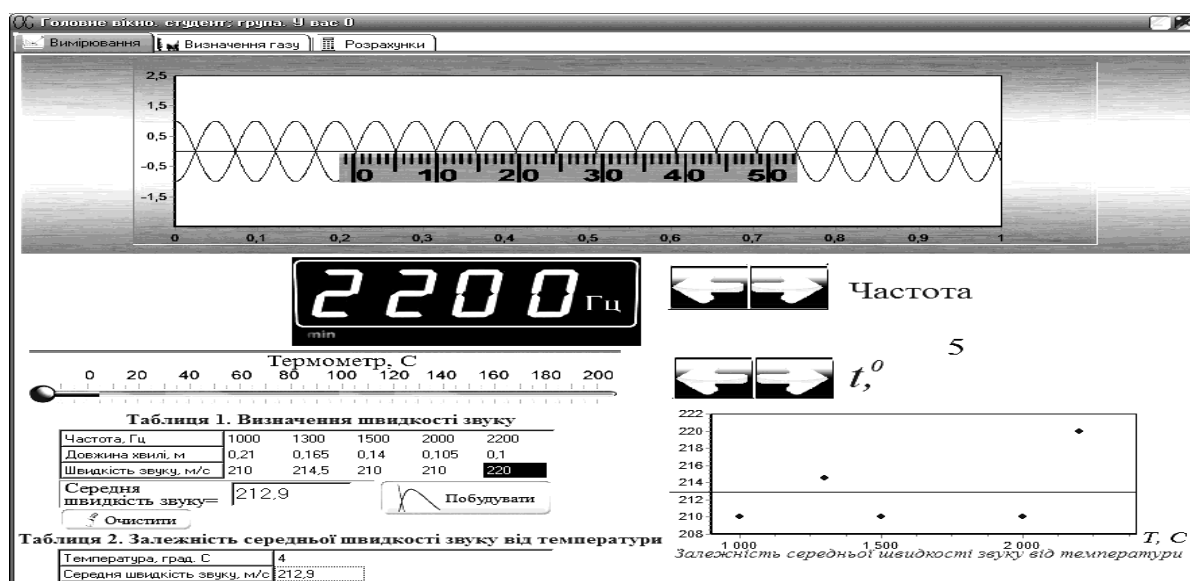
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In fast developing world we can't imagine studying without using of information technologies. Lab work is a way to obtain practical knowledge. Extramural students are not able to carry out practical lab works. Therefore creating of virtual lab works would be a very effective innovation.

The aim of this work is to describe virtual lab works on physics “Identifacation of nature and characteristics of gases using method of standing waves” in units “Mechanical waves” and “Molecular physics”.

This lab work were created in C++Builder. It consists of 3 windows. In the first one you should enter student's name and group. In the second one we can see graphics of incident, reflected, and standing waves. The third window has 3 pages. On the page “Measurement” we can see an image of the wave, scale, dial with wave frequency, and thermometer. We can change temperature and wave frequency. Lower there is a table where we should enter value of physical quantities. While pressing button “Build” the program will build relevant graphics.

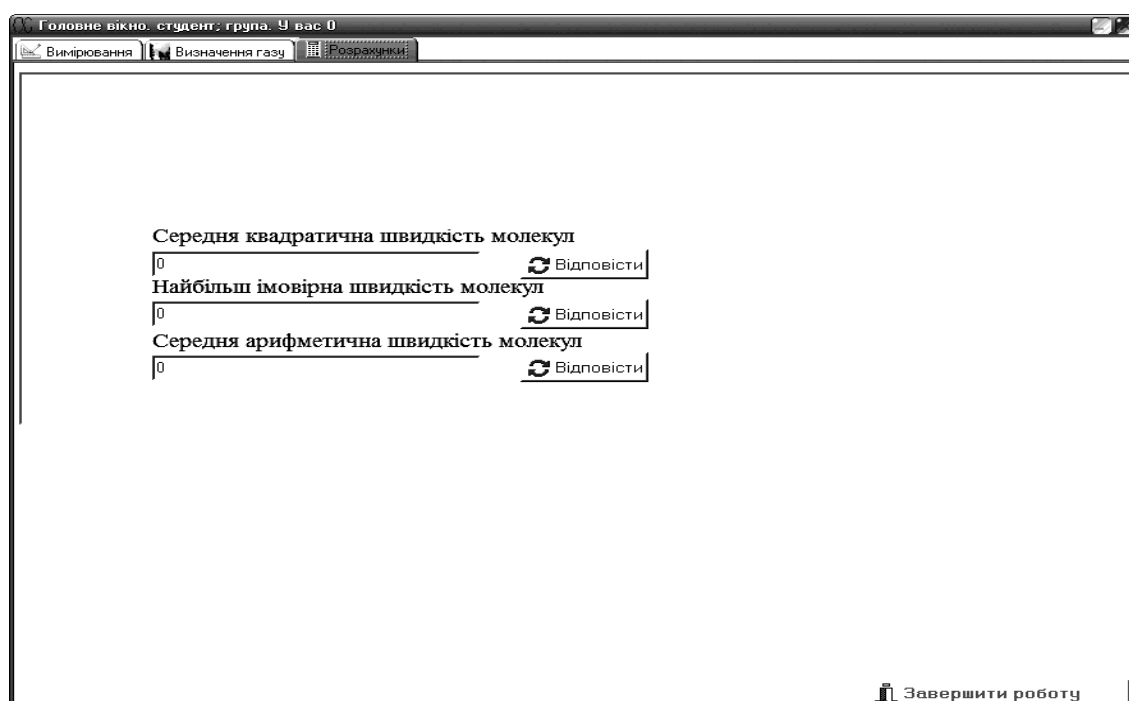


There is a table of dependence of speed on temperature on the page

“Identification of gas”. After filling this table the program will build relevant graphic. In the same time it builds graphics for different real gases. The program will automatically determine if the answer is correct or not.

On the third page we need to calculate such gas characteristics as root mean square speed, the most probable speed, and mean speed of molecules at a temperature 0°C using the proposed formulas.

After filling blank of answers the program will determine the correctness of inputted data.



As a conclusion I can say that in conditions of rapid development of conception of distance studying, such type of lab works becomes very actual. This allows us to learn disciplines without necessary equipment for real experiment. This can help studying to come to a new level.

MATHEMATICAL MODELING OF THERMAL PROCESSES AT HEATING OF SKIN BY LIGHT-EMITTING DIODES

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Introduction. In the research laboratory of laser medicine of Karazin Kharkiv National University the methods of treatment of man are explored with the use of lasers and light-emitting diodes. Devices are created for this purpose. This the complexes from the light-emitting diodes of different color, which can become stronger on the different areas of body of man. Power of radiation of one light-emitting diode is from 10 to 30 mW. At the diameter of radiative aperture 5 mm intensity of radiation is about 50 mW/cm².

It was discovered, that the local heating of skin sometimes is to 50-60° C. Therefore there is the necessity of research of thermal processes which go here.

Aim. Mathematical model of thermal processes in a skin and internal layers of skin at heating by the radiation of light-emitting diodes and lasers in the continuous and pulse .

Materials and methods. A mathematical model allowing to explore the thermal and to estimate the temperature of heating is developed. Equation of heat conductivity is with the sources of heat – radiation of light-emitting diodes, which penetrates on some depth in a body. Taking of heat is taken into account by the stream of blood in vessels under a skin.

Results. At the normal stream of blood the surface of skin is heated on a few degrees. Warmly impenetrates on a few centimetres. Time of establishment of temperature is about 30 minutes. If motion of blood is laboured (for example, at pressure on a skin), the temperature of surface can rise on 15-20° C. The penetration of heat to 15-20 cm is multiplied.

Heating of body is explored at intensity of radiation to 2-3 W/cm², when the strong heating of body is – to charring of fabrics – in the continuous and pulse .

Conclusion. Heating of skin to 50-60° can be at the intensity of radiation about 50 W/cm². At the intensity of radiation 2-3 W/cm² there is the damage of skin.

PHARMACOKINETIC MODEL OF THE EXTENDED ACTIONS OF MEDICAL DRUGS.

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Introduction. The speed and degree of absorption of a drug substance depends on many factors: the route of administration, the individual characteristics of the patient's body, the physiological and pathological state of the gastrointestinal tract, the cardiovascular system, the liver, and the kidneys. In addition, bioavailability has a pronounced effect on biopharmaceutical factors: the dosage form, its composition, and the technology of the preparation.

Aim. Most drugs are administered orally in the form of tablets, capsules. It is for these dosage forms that biopharmaceutical factors are particularly important.

On the bioavailability of the drug may have a pronounced effect of auxiliary substances used to prepare dosage forms and are part of their composition. For example, the disintegration of tablets often depends on the amount and nature of the disintegrates included in their composition. For pressing the tablets and filling the capsules, substances that can adversely affect the dissolution rate of the active compound are used. Dissolution of drugs may be hampered by the low dispersing ability of the filler particles, and surface-active agents or other substances that affect the electrostatic properties of the particles promote their disaggregation. The technology of granulation of powders in pharmaceutical plants also affects the nature of the release of the active substance from the dosage form. An important role for bioavailability of drugs is played by the nature and composition of the coating of tablets and capsules. In this regard, it is interesting to extend the effect of the drug by simultaneous administration of it in two different forms with varying degrees of bioavailability.

Materials and methods. Mathematical methods allow modeling a pharmacokinetics (behavior of medicine in an organism). The main index of a pharmacokinetics — change of concentration of medicine in a blood plasma depending on time. If medicine is taken in the form of tablets, then the corresponding dependence is described by two differential equations. To describe such a process, consider a pharmacokinetic model with a subcamera, through which the drug is administered:

$$\left\{ \begin{array}{l} \frac{dM_1}{dt} = -k_{in1}\alpha M_1 - k_{in2}(1 - \alpha)M_1 \\ \frac{dM}{dt} = k_{in1}\alpha M_1 + k_{in2}(1 - \alpha)M_1 - k_{el}M \end{array} \right. \quad (1)$$

Here M_1, M – the amount of the drug in the subcamera and the main camera that simulates blood and other tissues, k_{in1}, k_{in2} – the absorption constants of the two forms of the drug from the subcamera to the main camera, k_{el} – is the elimination constant of the drug from the main camera, α is the relative fraction of the first drug in the administered dose, t is the time.

Integration of system of differential equations taking into account starting conditions ($M_1(0) = M_0, M(0) = 0$) allows to receive dependence of $M(t)$:

$$M(t) = \frac{\alpha M_0 k_{in1}}{k_{in1} - k_{el}} (e^{-k_{el}t} - e^{-k_{in1}t}) + \frac{(1-\alpha)M_0 k_{in2}}{k_{in2} - k_{el}} (e^{-k_{el}t} - e^{-k_{in2}t}) \quad (2)$$

Results and discussion. Parameters of the received expression are constants of an absorption k_{in1}, k_{in2} , which can be varied technologically, and the constant α determined by a ratio in an initial dose of two different forms of medicine. Let's assume that $k_{in1} < k_{in2}$, then the first item in a right member (2) provides extension of effect of medicine, and the second – regulates the speed of achievement of the necessary concentration of medicine in blood.

Conclusions. The given consideration shows that at enteral simultaneous reception of two different forms of a medicinal preparation, perhaps extensions of effect of medicine when ensuring its high quick action. Naturally, confirmation of such effect requires carrying out the corresponding experiments.

SYSTEMATIZATION OF SIDE EFFECTS OF DRUGS

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Introduction. The number of people who can't tolerate from one to several medicines increases every year. Side effects occur in 18-40% of patients taking the drugs, but serve as a reason for asking for a medical help only at 4-6%. Besides this, the side effects lead to deaths in 8% of patients who located on outpatient treatment and up to 5% of patients who are hospitalized. The reason of the increasing of side reactions often is in the unreasonable and irrational using of medicines, because it is justified only in 13-14% of cases, in 23% it is doubtfully and questionably and in 63-64% it is inappropriate.

Aim. Systematization of side effects of drugs with using etiopathogenic classification of side effects.

Materials and methods. Medicines, statistical methods of processing of information.

Toxic effects. The overdose of medicines causes toxic effects. It, in its turn, has a number of reasons: the conscious using of large doses of medicines; the characteristic of pharmacokinetics of medicines (for example, the increased concentration of medicines in the blood plasma, caused by genetic changes); the existence of accompanying illnesses; the increase of absorption of medicines (for example, taking drugs to "empty" stomach); the discrepancy dose to human weight; interactions of drugs - accumulation (material and functional); the modification of the sensitivity of molecules-targets to different medicines; specific toxicity of drugs.

Side effects , which caused on the pharmacological properties of the drugs are divided into basic (for example, atropine, used to treat bradycardia, causes mouth dryness, dilated pupils, increased intraocular pressure, slowing intestinal motility), and indirect, such as goiter, superinfection, the emergence of resistant strains of pathogens , suppression of immune processes and others.

Allergic reactions. Allergic reactions account from 20 to 70% of all side effects. They, as a rule, don't develop at the first reception of drugs. The classification of Jell and Coombs identifies four main types of reactions: anaphylactic-type (immediate type), cytotoxic-type, immune complex-mediated reaction and delayed or cell-mediated reactions are mediated by special immune cells called the T-cell lymphocytes. In 78-80% of patients, the drug allergy ends in recovery, and in 10-12% of cases it takes a chronic course in the form of topical asthma, recurrent agranulocytosis and drug hepatitis. In 0.005% of cases, a lethal

outcome is possible, the most common cause of which is anaphylactic shock.

Pseudoallergic reactions. Pseudoallergic reactions may have similarities in clinical manifestations with allergic reactions, but their development is not associated with changes in the immune system. The major importance in their pathogenesis is the release histamine, liberin and other mediators of allergy by labrocytes with the deficit of the C₁ component of complement. Pseudoallergic reactions can be caused by muscle relaxants, opioids, iodine-containing radiopaque substances, and others. The severity of pseudoallergic reactions depends on the dose of drugs.

Idiosyncrasy. Idiosyncrasy is a genetic disease which is manifested in defects of enzyme systems and increased sensitivity to a particular drug. For example, the development of methemoglobinemia in patients with methemoglobin reductase deficit at admission of nitrates. With hereditary insufficiency of blood serum cholinesterase, lactation of dithiline is associated to 2-3 hours.

Psychogenic reactions. Psychogenic reactions include drug dependence (mental and physical). Physical dependence always proceeds with the phenomenon of abstinence. It is characteristic, first of all, for drugs that have a narcotic effect.

Iatrogenic effects. Iatrogenic effects are negative reactions provoked by a medical worker. An example can be not only the negligence of the doctor, but also the incorrect performance of medical appointments due to typos and smearing handwriting. Intentionally induced iatrogenesis occurs when some specialists use intimidation for the future condition of the patient so why he will additionally pay for medical services. The term "iatrogenia" was first introduced by the German psychiatrist Oswald Bumke in his work "The Doctor as the cause of mental disorders" in 1925.

Results and conclusions. The frequency of development of side reactions and their severity depends on the individual characteristics of the patient, his sex and age, the severity of the underlying and concomitant diseases, the pharmacodynamics and pharmacokinetic characteristics of the drug, its dose, duration of application, route of administration, and drug interactions.

Systematization of side effects of drugs is an important step for diagnosing and preventing many diseases caused by side effects of these drugs.

THE ROLE OF BIOPHYSICS SCIENCE IN THE DEVELOPMENT OF PHARMACY AND MEDICINE

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Introduction. Biophysics as a science began to form in the XIX century. This is the science of the simplest and most fundamental interactions that underlie biological processes and phenomena. The main tendency of modern biophysics is penetration to the deepest, elementary levels that make up the molecular basis of the structural organization of the living.

The purpose of the investigation is to study the role of biophysics science in the modern pharmaceutical branch and its using in pharmacological, pharmaceutical and medical researches.

Materials and methods. In connection with the birth of the term "Biophysics", two names should be mentioned: Karl Pierson (1857-1936) and Jacques Arsen D'Arsonval (1851-1940). In 1892 Pierson proposed to call branch of science that has as its goal the application of laws of inorganic phenomena, or physics to the development of organic forms "Biophysics". D'Arsonval proposed and substantiated darsonvalization method in 1891. In 1882 (10 years before Pearson's book was published) he organized the department at the Collège de France, which he called the "Department of Biophysics". Its main theme was the study of the effect of alternating currents on bioobjects.

According to the decision of the International Association of General and applied biophysics, the sections of this discipline include: molecular biophysics, biophysics of membrane processes or cell biophysics, biophysics of photobiological processes, biophysics of the sense organs, biophysics of complex systems.

The theoretical construction and biophysics models are based on physical concepts of energy, force, types of interaction, on general concepts of physical and formal kinetics, thermodynamics, information theory. These concepts reflect the nature of the basic interactions and laws of the motion of matter, which, as we know, constitutes the subject of physics - as a fundamental natural science. Biological processes and phenomena are the focus of biophysics as a biological science.

In the early 30-ies of XX century an electron microscope appeared. Radioactive isotopes, an ever-improving spectral technique, X-ray structural analysis became effective tools for biological research. The sphere of application of X-rays and ultraviolet rays is expanding, electromagnetic oscillations are used not only as a means of research, but also as factors of influence on the biological objects. Physical

methods of analysis widely penetrate into biology and, especially physiology, electronic technology, pharmacy, pharmacology. The current stage in the development of biophysics is characterized by the fact that the problem of formulating initial theoretical concepts that reflect the fundamental mechanisms of interaction in biological systems at the molecular level is at the forefront.

Results and discussion. The study of deep biophysical mechanisms in connection with the physiological and biochemical features of the object creates a basis for the practical application of biophysical studies, in particular in pharmacy and medicine.

The solution of these problems is carried out both with the help of theoretical analysis, and with the help of a large set of physical, chemical and biological methods. Among the experimental methods, the leading role is played by X-ray structural analysis of protein crystals, high-resolution NMR spectroscopy of proteins and polypeptides in solution, methods of microsequencing proteins, molecular modelling methods.

Without a thermodynamic approach to the study of biological processes, it is impossible to correctly calculate the food ration for humans. The study of the biological processes rate makes it possible to establish the regularities of a number of biological phenomena: growth, reproduction, metabolism, not only in the normal organism functioning, but with pathological changes-bacterial intoxication, the effects of ionizing radiation, allergies, etc. The study of the cells and tissues permeability in the biophysical aspect allows pharmacologists and toxicologists to determine the patterns of absorption in the body and the elimination of various drugs from the body, etc.

Conclusions. So these days the research in the branches of physical-chemical biology and pharmacy in general and biophysics in particular are the following:

1. Study of the structure and mechanisms of gene expression;
2. Various aspects of cellular biology (including chromosomal-genetic studies, problems of cell differentiation and intercellular interactions);
3. Study of the structure of biopolymers (proteins, nucleic acids, polysaccharides and their complexes with each other and low-molecular ligands).

OPTIMIZATION TECHNOLOGY IN FINANCIAL PLANNING

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Introduction. Financial planning is the basis of the program of development of a modern company. There is a trend of increasing usage of methods of mathematical modeling and optimization for the development of the strategy of the company.

Aim. The use of the model of financial planning based on the model of Carleton W.

Materials and methods. The model is based on the model of the flow of dividends, taking into account the number of shares, amount of dividends and the amount of the share capital.

$$\frac{P_0}{N_0} = \sum_{t=0}^{T-1} \frac{D_t}{N_t (1+k)^t} + \frac{P_T}{N_T (1+k)^T},$$

where P_0, N_0 - the total value of the share capital and the total number of ordinary shares in the start-up period, T – the duration of the forecast period, t – current time, D_t – the amount of dividends paid by the company for the period from the start to the current point in time, N_t - the number of outstanding common shares at the current time. P_T - the aggregate market value of the share capital of the company at the end of the forecast period, N_T - the number of ordinary shares during the forecast period. K – a constant characterizing the cost of equity under conditions of constant risk.

To find the optimal solution uses the classical method of mathematical programming in which the goal function accepted a function

$$\sum_{t=0}^{T-1} \frac{D_t}{N_t (1+k)^t} + \frac{P_T}{N_T (1+k)^T} - \frac{P_0}{N_0} \rightarrow \max$$

This goal function maximizes the present value of the capital stock, which includes future dividends and opportunities for financial growth. The disadvantage of this objective function is its nonlinearity.

For linearization of the goal function, it is proposed to use the method of Lee C. F., which allows to replace the nonlinear function linear function of the form

$$\frac{D_1}{N_0 (1+k)} + \frac{D_2}{N_0 (1+k)^2} - \frac{\Delta E_1}{N_0 (1+k)(1-c)} - \frac{\Delta E_2}{N_0 (1+k)^2 (1-c)} - \frac{\Delta E_3}{N_0 (1+k)^3 (1-c)} + \frac{P_3}{N_0 (1+k)^3} + \frac{D_0}{N_0} - \frac{D_0}{P_0} \rightarrow \max,$$

where D_1, D_2 are the dividends for the first and second periods; $\Delta E_1, \Delta E_2, \Delta E_3$ – new

issue of shares for each of the periods; c – assessment of the part of equity capital that can be lost due to transaction costs; P_3 – total market value of the share capital in the last period.

Results and discussions. This goal function was simplified on the base of two assumptions:

- the total market value of the share capital at the end of the forecast period P_3 is completely predefined by the value of dividends and issues of shares;
- the values of the parameters at the beginning of the forecast period, known and constant.

Thus, the goal function can be reduced to the form

$$\frac{D_1}{N_0(1+k)} + \frac{D_2}{N_0(1+k)^2} - \frac{\Delta E_1}{N_0(1+k)(1-c)} - \frac{\Delta E_2}{N_0(1+k)^2(1-c)} - \frac{\Delta E_3}{N_0(1+k)^3(1-c)} \rightarrow \max$$

As a system of constraints in the optimization problem used the following limitations:

- requirements for the amount of income that can be used for the payment of dividends;
- restrictions on the sources of funds and their use;
- limitations related to the selected financial policy of the company.

The formation of the constraints is taken into account that the restriction of the income on ordinary shares is determined by the limitations of net income and the shares of which may be divided between the shareholders. Thus, these restrictions may take the form $D_i \leq \alpha_i \tilde{D}_i$ $i=1,2$, where D_i is the net income of the company for the i -th current period and α_i – share of net income that can be spent on the payment of dividends. On the other hand, because the dividends unite all cash payments to the shareholders, they cannot be negative and the system constraints must be supplemented with conditions $D_i \geq 0$.

Sources of funds might include raising funds by issuing new shares and bonds. Quantitatively they are measured by the change in the amount of share ownership excluding retained earnings. Usually this value represents funds received from the sale of new ordinary shares. This is also a non-negative value. Therefore, the system constraints must be included conditions $E_i \geq 0$ $i=1,2,3$.

The initial information for forming the constraints and the objective function are the financial statements of the company and prognostic characteristics of the external economic environment.

Conclusions. This model is intended for long-term development planning of the company and forecasting of its operating results. The simulation results can be the basis for making fundamental financial decisions on the amount of dividends, working capital, internal and external financing.

USE OF THE TERAHERTZ WAVES IN BIOLOGY AND MEDICINE

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Introduction. In the last decade the attention of scientists has been turned to the influence study of terahertz (THz) waves on physical and biological objects. Researches show that the biotropic parameters of THz waves allow to create the devices to control medicines aging, the quality of food products, and also to identify fakes and dangerous impurities in these technological processes.

Aim. Investigation of biological effects in the terahertz waves range to use it in the biology and practical medicine.

Materials and methods. Radiophysical methods of bioobjects studying.

Great experimental material indicates that electromagnetic waves of the THz range can influence on all known cell types (nerve, muscle, connective tissue, receptor, etc.). THz waves are high efficiency in the treatment medicine: ophthalmic (amblyopia); cardiovascular (angina pectoris, essential hypertension, myocardial infarction); neurologic (pain syndromes, radicular pain, osteochondrosis), skin (atopic dermatitis), gastroenterological (peptic ulcer, hepatitis), dental (periodontosis, periostitis); oncological. English physicists have learned to use terahertz radiation to determine areas of the skin that affected by cancer. Compared to healthy tissues, such cells contain more water, which absorbs radiation intensively in the frequency range from 100 GHz to 3 THz. If you know the intensity of terahertz radiation reflected by different parts of the skin, the complete map of the affected area can be build.

Studies to identify viruses with the help of terahertz waves are carried out. This is possible because the natural oscillation frequencies of viruses and some conformational motions of biomolecules are in the terahertz frequency range. This effect is planned to be applied to such viruses as bacteriophage M13, measles virus, influenza A.

THz therapy has the following features: non-invasiveness, polytherapeutic effect, antistress effect, immunomodulatory effect, analgesic effect, are well combined with other methods of treatment (chemical, physiotherapeutic, etc.) and has no absolute contraindications.

Therapy hasn't side effects unlike THz medicines. THz radiation has no ionizing effect. Using it, you can build the 3D of structures image, for example, for soft tissues.

A study published in 2010 and conducted by Boian S. Alexandrov created

mathematical models predicting how terahertz radiation would interact with double-stranded DNA, could allow terahertz waves to "unzip double-stranded DNA, creating bubbles in the double strand that could significantly interfere with processes such as gene expression and DNA replication".

THz radiation freely passes through paper, wood, plastic, ceramics, as well as through the upper layers of the skin and human clothes. Terahertz waves are used for transmission of passengers and cargo at airports instead of harmful X-ray waves in a number of European countries. Experts in the environmental monitoring field (determination of harmful impurities in the atmosphere, water, near space, etc.) associate great hopes with the development of THz waves.

The somatic cell of mammals has the 2.39 THz resonant frequency, 0.75-15 THz resonant frequencies are for chromosomes of different gene activity. The calculation shows that the resonance frequencies of the Pulmonary alveolus of the lungs are in the range of 0.3-0.5 THz, and the red blood cells are 0.5-1 THz.

Now work is under way which shows that biotropic parameters of THz waves allow to create devices to control medicines aging of medicines, quality of food products, as well as for identifying counterfeits and hazardous impurities in these technological processes.

Terahertz radiation could let art historians see murals hidden beneath coats of plaster or paint in centuries-old buildings, without harming the artwork.

Thanks to the use of THz waves, one can expect a breakthrough in a number of medical technologies. In the very near future Terahertz devices with harmless electromagnetic radiation will enter the practice of medical diagnostics and will be able to replace X-ray machines.

Conclusions. The systematization of the characteristics and biophysical effects of terahertz waves has been carried out. It shows the prospects for researches continuing of the influence of radio waves in the THz frequency range on living objects for creating new promising directions in medical and pharmaceutical technologies – physiotherapy, diagnostics and ecology, which can be called: terahertz therapy, terahertz diagnostics, and terahertz ecology.

SOME ASPECTS OF THE DESCRIPTION OF THE INTERACTION OF VIRUSES WITH THE HUMAN IMMUNE SYSTEM, BASED ON MARCHUK'S MATHEMATICAL MODEL

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Introduction. Viruses are incredibly volatile nowadays and have an ability to adapt to antibiotics, as well as constantly changing its structure and form new strains. That's why Virology is one of the most important areas of research in modern medicine.

The term "infectious disease" means a mapping relationship, established between biocenosis members, where one of them, thanks to pathogenicity mechanisms, can exist in another, and the last one can oppose this pathogenic action. The immune system is one of the main methods of protection against infection.

As is known, immune system response defines the invasion of genetically foreign material (antigen), including the causative agent (pathogen), also its function is to produce the specific objects such as antibodies and NK cells, which are able to neutralize or destroy antigens. Based on this, infectious disease can be considered as a conflict between the population of pathogens and the immune system. Therefore, a certain mathematical model, which describes the interaction of viruses with the immune system of the human body, has been developed by the known academician Guri I. Marchuk.

Aim. To conduct a theoretical analysis of the application of mathematical model, designed by the renowned academician Marchuk for describing the interactions of viruses with the human immune system.

Materials and methods. In order to solve this problem have been used some theoretical research methods (studying and analyzing the scientific literature to determine the state of development and for theoretical justification of the research).

Results and discussion. At the time $t = t_0$ the initial population of viruses V_0 enters the body. Viruses begin to multiply in the target organ cells, thereby destroying it. Part of the viruses enters the bloodstream, where it interacts with receptors of immunocompetent cells, antibodies, which results in stimulation of the immune system. Plasma cell clones, producing specific to the virus antibodies, appear in the body after time T after stimulation. Antibodies bind viruses, and the outcome of disease depends on the relative kinetics of these processes. If viruses manage to smite organ enough, then the overall health deteriorates and as a result, immune system function also deteriorates. Antibody production falls, and reduces the

likelihood of a favorable outcome.

The model considers the following variables: $V(t)$ —concentration of viruses; $F(t)$ —concentration of antibody (substrates of the immune system that can neutralize viruses: immunoglobulins, receptors of cells); $C(t)$ —concentration of plasma cells — the population of carriers and producers of antibodies; $m(t)$ —the relative characteristics of the affected organ (the mass, the number of affected cells, etc.); β —antigens replication factor, i.e. virus multiplication rate; γ — probability of antibodies to neutralize the antigen. The dynamics of plasma cells affected by the following variables: α – the probability of encountering an antigen-antibody, μ — factor equal to the inverse of life of plasma cells (Index shows the object, for which the variable refers) and etc. The duration of life of antibodies (μ_f) and the rate of antibody production of a plasma cell (ρ) impact on their vital activity. And the organ characterization form such indicators, as μ_m – factor inversely proportional to the time of the collapse of the antibody; σ – the virus constant, different for each disease, etc. This mathematical model is based on a system of nonlinear differential equations:

$$\begin{cases} V'(t) = (\beta - \gamma \cdot F(t)) \cdot V(t), \\ C'(t) = \xi(m)\alpha \cdot V(t - \tau) \cdot F(t - \tau) - \mu_c \cdot (C(t) - C), \\ F'(t) = \rho \cdot C(t) - (\mu_f + \eta \cdot \gamma \cdot V(t)) F(t), \\ m'(t) = \sigma \cdot V(t) - \mu_m \cdot m(t). \end{cases}$$

It should be noted, the first equation describes the change in the number of viruses in the body and the second describes the dynamics of the plasma cells. The third equation is based on the balance of antibody production processes, their interaction with antigens and natural death. Accordingly, the fourth feature is the relative characteristics of the target organ. In addition, the system is supplemented with initial conditions:

$$V(t_0) = V_0; \quad C(t_0) = C_0; \quad F(t_0) = F_0; \quad m(t_0) = m_0$$

Thus the special attention is paid to the influence of human body temperature. Since the temperature rise acts in two ways: on one side – it inhibits viral replication, and on the other - it increases the catalytic power of enzymes, i.e. antibody production is accelerated. That's why you do not need to take any of antipyretic drugs at the time of illness (Of course, if the body temperature is less than 38.5).

Conclusions. Therefore, the Marchuk's mathematical model is one of the main models, which are widely used in immunology, virology, epidemiology and vaccination. After all, it can help to trace the formation of acute and chronic disease processes, clarify the role of temperature effects, to examine the conditions of occurrence of complicated forms of the disease.

MATH MODELING OF INFECTIOUS DISEASE (ACUTE FORM) USING GOOGLE DOCS SPREADSHEETS

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Introduction. Today mathematical modeling is the priority direction in the studies of the new and rapidly developing science of infectious immunology that describes the processes of an organism's defense against antigen invasions. Aspects of an organism's defense against viral and bacterial infections and the reaction of immune system to infection are the main problems in practical immunology. Understanding of regularities in immune response provides the researchers and clinicians new powerful tools for the stimulation of the immune system and for increasing its efficiency in the struggle against antigen invasion. In this connection, the construction of mathematical models of immune response to an antigen irritant is considered as the only right tactics in the cognition of the above regularities.

The **aim** of the work is to develop the simple mathematical model of acute form of infectious disease based on an equilibrium relation for each component that participates in an immune response (antigen, antibody, plasma cell, and degree of damage of an organ subjected to antigen attack); and to realize this mathematical model using Google Docs Spreadsheets.

Materials and methods. The mathematical model of acute form of disease have to represent the main theoretical conceptions on the defense system of organism and the basic immunological models. Really, in designing the simplest model of immune defense we have used the main conception of immunology: an antibody binds an antigen and forms antibody-antigen complexes. In proportion to the quantity of these complexes, plasma cells are formed in an organism in a time (t) which carry out the mass production of antibodies. The quantity of plasma cells forming in response to antigenic stimulation depends on the viability of the affected organ: the more severe is the damage to this organ the less is the quantity of plasma cells because of the deficiency arising that affects the immune defense activity. It is seen that many details are missing in this model; however, all the essential components of the immune defense mechanism are taken into account.

Therefore, the basic acting factors of an infectious disease are concentration of pathogenic multiplying antigens; concentration of antibodies; concentration of plasma cells; relative characteristic of affected organ.

Results and discussion. Fig. 1 shows the diagram of the simple model's solutions, which we interpret as the course of the acute form of disease with recovery

in the case of a normal immune system. This diagram represents that for a given rate of virus multiplication, the higher is the dose of infection, the faster the maximum value of antigen quantity is achieved, and the faster this process stops.



Fig. 1. Dynamics of antigen concentration in case of acute form of disease

One can see that the acute form of disease is characterized by a rapid (over several days) increase of antigen quantity in an organism up to the values exceeding the infection dose by several orders, and by rapid elimination of antigens. This character of the disease's course is conditioned by rapid multiplication of antigens which results in rapid accumulation of antigens in an organism, and by strong and effective immune response that leads to production of antibodies in quantities sufficient for the elimination of antigens. The second is the consequence of the first in the case when an affected organ has a weak influence on the immune system's reactivity, i.e., in the case of weak pathogenic antigen.

The above results enable us to make a conclusion: in order to prevent the transition of the acute form into the heavier form, one should try to lower the antigen pathogenicity.

The simple mathematical model of acute form of infectious disease, of course, is approximate and requires further detailed elaboration. However, even in this form it allows one to include in the system various essential factors of infectious disease dynamics.

Conclusions. Realization of simple mathematical model of acute form of infectious disease with the help of Google Sheets allows computing the main parameters of disease and representing them graphically. This model is useful for exploration of general picture of a disease course and for explanation of some results of observations. Some theoretical results may be used in searching for effective methods of treatment.

NMR SPECTROSCOPY

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Introduction. NMR(nuclear magnetic resonance) S is a relatively new physical method of research, which has ample opportunities in the analysis of an increasing number of medicines. There are ambiguities and inaccuracies in assigning a number of signals in the NMR spectra of medicines.

Purpose. Identification of the drug according to NMR spectrum

Materials and methods. NMR-resonance absorption or emission of electromagnetic energy by a substance containing nuclei with nonzero spin in an external magnetic field at a frequency ν (called the NMR frequency) due to the reorientation of the magnetic moments of the nuclei.

1921 - passing through a constant magnetic field beam of hydrogen molecules were able to measure small magnetic moment of the largest of its core. From that time Nobel Prize was given in 1952 by F. Bloch and E.M. Purcell for his discovery of NMR; in 1991 - Nobel Prize was given R. Ernst, in 2002 - was given to K. Vyutrih and later in 2003 in Physiology or Medicine was given P. Lauterbur and P. Mansfield "for fruitful discoveries concerning the use of magnetic resonance for visualization of different structures (NMR tomography)".

NMR- nuclear magnetic resonance . NMR method is based on the interaction of the external magnetic field with nucleus which have magnetic moments (spins non-zero).

In modern NMR spectrometers spectrum recorded with pulses. This spectrum recording method allows to significantly reduce the level of noise and perform experiments much faster.

Positive sides: high resolution, ability to conduct quantitative account of the resonating nuclei, the parameters characterizing the phenomenon in handy for researchers and consumers form.

Conclusions. The NMR is used in many aspects of people life.

Medicine: NMR introscopy; NMR tomography; oncology

Structural analysis: determination of chemical shifts; molecular structure analysis

Other uses: identification reader metal transponders; the manipulation of quantum information (quantum computer).

DOES WATER MEMORY EXIST? DEAD WATER AND WATER OF LIFE

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Introduction. It is known that development of homeopathic treatment is high enough now. According to recent studies in France, 40% population uses homeopathic medicines prescribed by 39% of physicians; in England - 42% of specialists direct patients to homeopaths, and 80% of graduates of medical colleges would like to get education in homeopathy. With the acknowledgment of homeopathy at the state level in Ukraine homeopathic treatment began to develop more intensively, including homeopathic pharmacy. For example, near 20 years complex homeopathic medicines by Heel are presented in Ukraine. During this time the whole generation of patients who have positive experience of application Heel has managed to be created and assemble the home first-aid kit on the basis of these medicines. Homeopathy is a kind of alternative medicine, involving the using of highly diluted drugs and based on his doctrine of similar cures similar (*similia similibus curentur*), a claim that a substance that causes the symptoms of a disease in healthy people would cure similar symptoms in sick people. Many scientists believe that homeopathic remedies are not effective in treating any diseases; large-scale studies have shown that homeopathy is no more effective than placebo, indicating that any positive effects following treatment are due only to the placebo effect and normal recovery from the disease.

Purpose. To conduct theoretical studies and systematization of the most important views on the water memory effect and define such concepts as live and dead water. To analyze the statement about homeopathy, based on the water memory, as pseudoscience.

Materials and methods. In most of works, in which the researchers studied the structure of ordinary water, it was used the method of water purification from all impurities, eliminating the influence of all impurities, methods of refractometer analysis, proton magnetic resonance, high-performance liquid chromatography, methods of freezing various water sources. It was pointed out that the group of Zenin created a device that is sensitive to changes in the structure of water. In particular, it was written that the liquid property is affected by a person's thought. The main sources of information on the water molecular structure in these studies were data from neutron, X-ray diffraction and Raman spectroscopy.

Results and discussion. Structured water is water in which molecules are able to form clusters. The information about the interactions that have taken place or takes

place with a given water sample is encoded in these structures. Many researchers attribute the possibility of information transfer to the water fractals. In addition, water is able to store and transfer information important for the human body. Water at the molecular level has a "memory" of the substance once dissolved in it, and retains the solution properties of the original concentration. This is the basis of the homeopathic effect. The scientific community is divided into two sides: some do not accept the concept of water memory, others agree.

The French biologist Jean Benveniste in his studies in the field of homeopathy, discovered that "water has at the same time a physical "memory" that allows it, even after a significant dilution of the substance dissolved in it, far below the physical availability of the corresponding molecules, still perceive these molecules biologically". Emoto tries to prove that water is able to absorb, store and transmit human thoughts, emotions and any external information - music, prayers, conversations, events. Zenin believes that water is a hierarchy of regular volumetric structures based on a crystal-like "quantum of water". Water has the ability to infinitely structuring under the influence of information. The structured water state is a sensitive sensor of various fields, especially it is necessary to single out its response to the change in the electromagnetic vacuum state. Other laboratory researches with seeds of wheat showed that water is capable to remember the fields generated by alive objects.

Ivanitsky in his experiments has no reason to assert that there is a molecular information matrix in the water that could serve as a long-term memory. Hypotheses that water has a memory are not confirmed in the experiment.

The "dead" water and the one of life were firstly obtained by Kratov. These liquids are produced by electrolysis of ordinary water, acid water is called "dead", and alkaline (concentrated around the negative cathode) is one of life. Water of life is antioxidant, an immunomodulator, a source of vital energy. Dead water is an antiseptic, has anti-inflammatory, antiallergenic, antiedematous properties.

The key moment of scientific disclosing of life-making and the curative mechanism of water consists in studying its catalytic role in the chemical and biochemical processes which constitute the basis of a life.

Conclusions. Despite wide homeopathic medicines using, the experimental proofs of water memory existence which are available today, insufficiently for its existence admitting by the scientific community. So nowadays we can't recognize a homeopathy as a science.

Existence of dead water and the one of life is proved experimentally. These forms of water are widely applied in medicine.

The proofing of water memory existence can open us a new class of power informational technologies which can become breakthrough in agricultural production, the food industry, health care and other branches of the national economy.

ELECTRONIC GLOSSARY ON THE MORPHOLOGY OF PLANTS: TYPES AND KINDS OF FRUIT.

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Introduction. In today's world, facilities of computer technologies led to the appearance of new methods and forms of education and their fast adoption into educational process. Computer training allows students to master the course material quicker. It also improves the quality of student's learning. The material is presented in a highly structured and understandable form and can easily be memorized.

Aim. To create an easy-to-use electronic glossary on morphology of plants (section: types and kinds of fruit) on the basis of the Excel program, using the latest computer «cloud» technologies, for native students of the pharmaceutical faculty (specialty 1-79 01 08 «Pharmacy») and students of the Overseas Students Training Faculty of VSMU, because it includes terms and definitions in Russian and English. This glossary will be necessary for students in the study of such subjects as Pharmaceutical botany, Medicinal Plants of Belarus, Pharmacognosy and Pharmaceutical ecology.

Materials and methods of research. A list of herbarium plants for taking tests on practical skills on pharmaceutical botany (section "Plant systematics") is used as basis for the creation of the data bank in Excel program. The photos used in our glossary are author's. Definitions of terms relating to the section "Types and kinds of fruit" are taken from the textbook "Botany" Yakovlev G.P., Chelombitko V.A., 1990.

Results and discussion. The data bank is created in the Excel program. It systematically lists 130 species of plants in the main table, where the names of taxa (order, family, genus and species) are given in Russian and Latin languages in separate columns (Picture 1). To view photos of the fruit, special hyperlinks are created after opening which the respective images appear. To clarify the terms used for the description of various types and kinds of fruit in the table special hyperlinks are created, after opening which the information about the term appears. To open a hyperlink in the Excel table, just click on the information that interests you (the word, combination of words or image). This will open the Word document, which contains detailed information on the term that interests you, as well as a link to the literature source. It should be noted that each Word document also contains cross-hyperlinks, which makes the information complete and clear. Such "transitions" can be done as many times as you need, until you get the required information.

| ейство | Порядок | | Морфологическая классификация | | Морфогенетическая классификация | |
|-----------------|-------------|----------------|-------------------------------|--------------------|---------------------------------|-------------------|
| латинское | русское | латинское | русское | английское | русское | английское |
| Cupressaceae | Кипарисовые | Cupressales | | | | |
| Berberidaceae | Лютиковые | Ranunculales | Ягода | Berry | Ценокарпный | Syncarpous |
| Ranunculaceae | Лютиковые | Ranunculales | Многолисточка | Aggregate follicle | Апокарпный | Aparcous |
| Ranunculaceae | Лютиковые | Ranunculales | Многоорешек | Aggregate nutlet | Апокарпный | Aparcous |
| Ranunculaceae | Лютиковые | Ranunculales | Однолисточка | Single follicle | Монокарпный | Monocarpous |
| Papaveraceae | Маковые | Papaverales | Коробочка | Capsule | Ценокарпный | Syncarpous |
| Papaveraceae | Маковые | Papaverales | Коробочка | Capsule | Ценокарпный | Syncarpous |
| Papaveraceae | Маковые | Papaverales | Коробочка | Capsule | Ценокарпный | Syncarpous |
| Paeoniaceae | Пионовые | Paeoniales | Многолисточка | Aggregate follicle | Апокарпный | Aparcous |
| Caryophyllaceae | Гвоздичные | Caryophyllales | Коробочка | Capsule | Ценокарпный | Syncarpous |
| Polygonaceae | Гречишные | Polygonales | Орех | Nut | Псевдомонокарп | Pseudomonocarpous |
| Polygonaceae | Гречишные | Polygonales | Орех | Nut | Псевдомонокарп | Pseudomonocarpous |
| Polygonaceae | Гречишные | Polygonales | Орех | Nut | Псевдомонокарп | Pseudomonocarpous |
| Polygonaceae | Гречишные | Polygonales | Орех | Nut | Псевдомонокарп | Pseudomonocarpous |
| Polygonaceae | Гречишные | Polygonales | Орех | Nut | Псевдомонокарп | Pseudomonocarpous |
| Polygonaceae | Гречишные | Polygonales | Орех | Nut | Псевдомонокарп | Pseudomonocarpous |

Picture 1. The part of Exel data bank

The glossary is quite simple to use. To set the type and kind of fruit and the required medicinal plant, for example, cornflower, it is necessary to find in the list the name of the species (*Centaurea cyanus* L.). Then go to the same line in the column "Type of fruit". To find out what type of a fruit it is, you should click on the link "achene". This opens a new Word document. It contains a definition of this term and the image of the fruit, as well as the literature source of the information.

On the other hand, if necessary, you can select any species which have fruit achene by a filter: *Arnica montana* L., *Helichrysumarenarium* L., *Centaureacyanus* L., *Inulahelenium* L., *Rhaponticumcarthamoides*, *Tussilagofarfara* L., *Calendula officinalis*, *Taraxacumofficinale*Wigg., *Tanacetumvulgare* L., *Artemisia absinthium* L., *Matricariachamomilla* L., *Gnaphaliumuliginosum* L., *Achilleamillefolium* L., *Bidenstripartita* L., etc.

Conclusions. The presented electronic glossary on morphology of plants (section: types and kinds of fruit), based on Excel data bank, is a part of the e-Learning and Methodological Complex for Educational Botanical and Pharmacognosical Practice. It is the most easy to use. Information material is available anytime, anywhere and from any personal electronic device, because the system requirements of the glossary are close to the minimum for comfortable work. In the near future our glossary can turn to an addition to the mobile application in Android system, called «Guide for identification plants of Belarus», which is currently being developed at the Department of Pharmacognosy of the Vitebsk State Medical University.

THE MODELING OF FINANCIAL ACTIVITIES OF PHARMACEUTICAL COMPANIES

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Introduction. For effective management of the company is necessary to develop strategy of its development. For this can be used mechanism of financial planning. The basis of the modern approach to financial planning is the modelling of possible scenarios of business development. Currently developed models for financial planning use different mathematical apparatus: the solution of systems of algebraic equations, methods of mathematical programming, regression analysis, and econometric approach. These models differ in the level of complexity, feasibility simulations, forecasting and optimization. Depending on the choice of model of financial planning the result can be a forecast of the overall financial balance of the company or its components.

Aim. The use of methods of mathematical simulation for forecasting of the development of company in the medium term.

Materials and methods. This paper considers the modification of the mathematical model of Warren-Shelton for financial planning, which designed for simulation of results of financial activity of the company depending on changes in sales volume, of profits, the ratio of equity capital, loans and financial needs. The model consists from twenty of algebraic equations that describe the investment, financial, industrial and dividend the company's activities. The equations of the model are divided into subgroups, corresponding to data on sales, investments, financing and profitability.

Subgroup 1. The equations describing the volume of sales and income excluding interest and taxes.

$$sl_t = sl_{t-1}(1 + gsl_t); \quad eb_t = reb_t \cdot sl_t,$$

where sl - sales, gsl – sales growth, eb – income before interest and taxes, reb – operating income as a percentage of sales, the index t is the estimated time period.

Subgroup 2. The equations describing the total demand for assets.

$$ca_t = rca_t \cdot sl_t; \quad fa_t = rfa_t \cdot sl_t; \quad a_t = ca_t + fa_t,$$

where ca – current assets, rca – fixed assets. a - total assets, rca and rfa – current and fixed assets as a percentage of sales, respectively.

Subgroup 3. The equations describing the funding requirements.

$$cl_t = rcl_t \cdot sl_t; \quad nf_t = (a_t - cl_t) - (l_{t-1} - l_t) - s_{t-1} - r_{t-1} - b_t(1 - T_t)(eb_t - i_{t-1}(l_{t-1} - lr_t));$$

$$nf_t + b_t(1-T_t)(i_t^0 + U_t^i) \cdot nl_t = nl_t + ns_t; \quad l_t = l_{t-1} - lr_t + nl_t; \quad s_t = s_{t-1} + ns_t;$$

$$r_t = r_{t-1} + b_t(1-T_t)(eb_t - i_t \cdot l_t - U_t^i \cdot nl_t); \quad i_t = i_{t-1} \left(\frac{l_{t-1} - lr_t}{l_t} \right) + i_t^0 \cdot \frac{nl_t}{l_t}; \quad k_t = \frac{l_t}{s_t + r_t},$$

where cl – accounts payable, nf - necessity of funds, nl – receipts from debtors, ns – proceeds from new shares, l - total debt, s - cost of shares, r - retained profit, i – the interest rate on the debt, rcl – payments as a percentage of sales, lr – expenses for repayment of debt, b - the coefficient of reinvestment, T – average tax rate, i_t^0 – expected interest rate on new debt, U_t^i – cost of placing the debt, k - ratio of debt to owner funds.

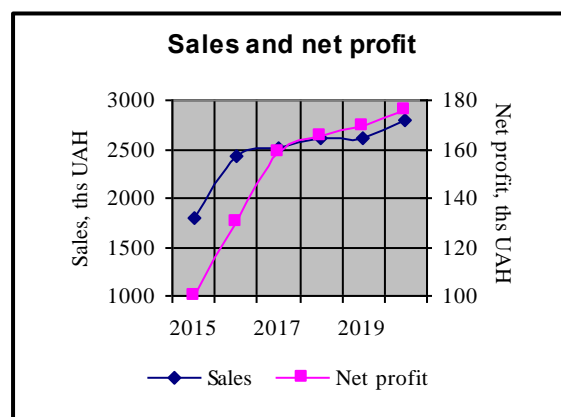
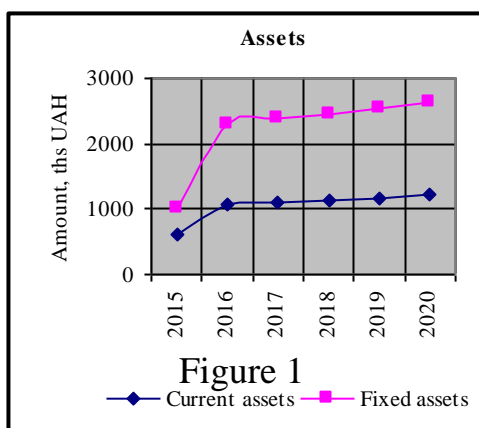
Subgroup 4. The calculation of the specific (per share) indicators.

$$eaf_t = (1-T_t)(eb_t - i_t \cdot l_t - U_t^i \cdot nl_t); \quad cmd_t = (1-b_t) \cdot eaf_t; \quad num_t = num_{t-1} + \frac{ns_t}{1-U_t^s \cdot P_t}; \quad P_t = m_t \cdot \frac{eaf_t}{num_t};$$

$$dps_t = \frac{cmd_t}{num_t},$$

where eaf – profits from which to pay dividends, cmd – dividend amount, num – number of shares outstanding, P - share prices, eps – profit per share, dps – dividend per share, U_t^s – expenses on placing of shares, m - ratio of shares price to the profit.

Results and discussions. The model used for the forecast of the overall financial balance, and determining the ratio of income and expenses of the pharmaceutical company. In the calculation of the overall balance includes the forecast of changes of current and fixed assets, amounts, dividends and profits from shares, debt and profit of the company. In determining trends in the changes of revenues and costs of the company were calculated the volume of sales, all types of income and expenditure. The forecast of revenues and expenditures of the company was calculated on period of 5 years, as the base years adopted 2015 year. The calculations are performed using the software MathCad and MS Excel. Sample results of calculations are presented in figures 1-2.



Conclusions. The use of this model will allow managers to analyse various scenarios of enterprise development, and to make informed decisions when designing its financial policy.

THE FUZZY LOGIC ESTIMATION OF CREDIT RISK

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Introduction. Management decisions in the sphere of market economy practical problems taken in conditions of uncertainty regarding the future and are accompanied by risk. Risk is the possibility emergence of circumstances that prevent getting the expected results from the implementation of supplying goals. If the uncertainty is unavoidable quality of the market environment, the risk - is a numerical description of the possibility of losses. Used accounting methods and risk assessment, as a rule, too much personal and is bordered on the premises, resulting in an incorrect assessment of project risks. So, in the economy probabilistic analysis and minimax approaches replace by methods of fuzzy logic. Benefits of fuzzy logic consist in the possibility to operate the direct data on the spread of parameters. That is, in fuzzy-plural calculation all possible scenarios of the development of events fall. Currently fuzzy modeling is one of the most promising areas of applied research in the field of management and decision-making. Fuzzy logic as a model of people thought processes built into the systems of artificial intellect and automated tools to support decision-making. For the decision of fuzzy logic tasks the special programs are created. The license software (Fuzzy Logic Toolbox, Fuzzy TECH, CubiCalc) are requiring the special preparation of user. The software package FuziCalc, uniting the mathematical apparatus of fuzzy logic with spreadsheets is presented particular interest. FuziCalc has a friendly interface, analogical an interface of Excel, acquaintance to the users. Its feature is possibility of description of fuzzy object in a cell, noting the object as «fuz-zy» and building function of distributing in the special window. In connection with inaccessibility of this commercial package in educational process are presented actually analysis the possibility of work with fuzzy data in freeware spreadsheets.

The goal of work is design the fuzzy logic model for calculation numerous value of credit risk in the environment of OpenOffice.org Calc.

Fuzzy logic model the task about credit risk. The data about credit history are presented in this table.

| № | Risk | Credit history | Income |
|---|--------|----------------|--------------------------------|
| 1 | High | | from 0 until 40 000grn |
| 2 | Middle | Bad | over 75 000grn |
| 3 | Middle | Good | from 40 000grn until 75 000grn |
| 4 | Low | Good | over 75 000grn |
| 5 | High | Bad | from 40 000grn until 75 000grn |

Fuzzy logic linguistic variables are: HISTORY (Adequate, Inadequate),

INCOME (Low, Average, High), RISK (Negligible, Moderate, Unacceptable).

The next cognitive opinions correspond to the data of above table.

If INCOME is High and HISTORY is Adequate, then RISK is Negligible.

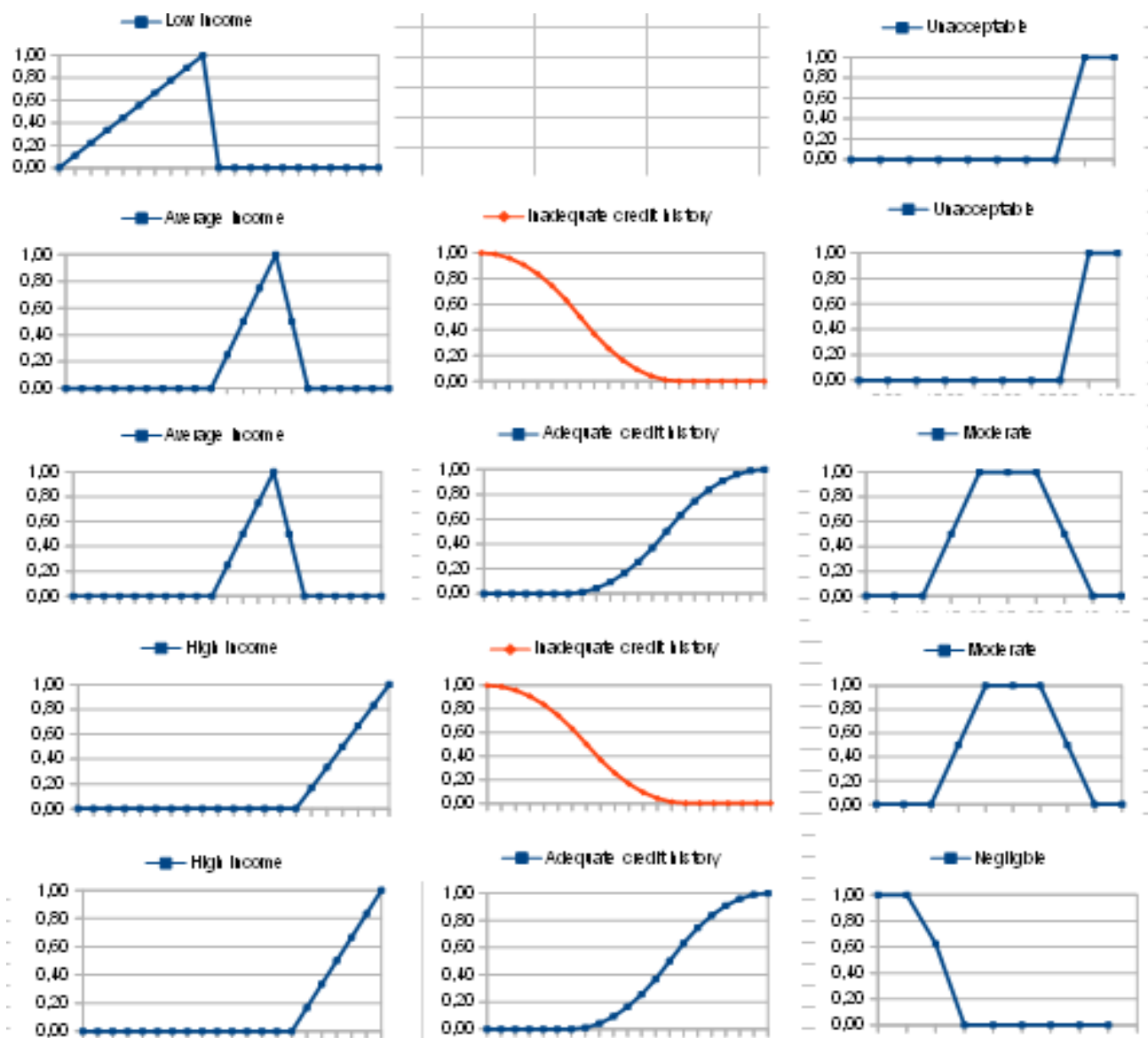
If INCOME is High and HISTORY is Inadequate, then RISK is Moderate.

If INCOME is Average and HISTORY is Adequate, then RISK is Moderate.

If INCOME is Average and HISTORY is Inadequate, then RISK is Unacceptable.

If INCOME is Low then RISK is Unacceptable.

This base of cognitive opinions with linguistic variables functions of belonging is realized in the environment of OpenOffice.orgCalc.



Conclusions. The created fuzzy logic model for evaluation of credit risk on the base of credit history and income gives calculative value of credit risk after defuzzification of fuzzy set by the Mamdany method.

HIERARCHICAL MODILING.

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Introduction. Very often management problems have several solutions. Often, choosing one solution from the set of possible ones, the person making the decision is guided only by intuitive ideas. As a result of this decision-making is of an uncertain nature.

The relevance and practical importance. The Hierarchy Analysis Method is used to make decisions in a variety of situations. Allows you to intelligently and rationally structure a complex decision-making problem in the form of a hierarchy, compare and quantify alternative solutions.

Aim. Buying an e-shop from two proposed options A and B.

Materials and methods. MAI is a procedure for the hierarchical representation of elements that determine the essence of the problem. MAI stages:

1. Statement of the problem.
2. Building a hierarchy.
3. The construction of a set of matrices of paired comparisons for each of the lower levels - one matrix for each element of the layer adjoining from above.

The task is to select a DI shop from two proposed options A and B (in the presence of more options, the problem is easily reduced to their pairwise comparison).

At the top level of the hierarchy is the goal - the purchase of an electronic store. At the second level, the criteria specifying the purpose for which systems can be compared (the criteria proposed below are considered as examples) are:

1. Cost.
2. Terms of purchase.
3. Accompanying the developers.
4. User interface.
5. Provided functions.

The matrix of pairwise comparisons for the second level of the problem of buying an electronic store

| | Cost | Terms of purchase | Accompanying developers | User interface | Functions provided |
|-------------------------|------|-------------------|-------------------------|----------------|--------------------|
| Cost | 1 | 4 | 7 | 9 | 2 |
| Terms of purchase | 1/4 | 1 | 3 | 8 | 1/2 |
| Accompanying developers | 1/7 | 1/3 | 1 | 3 | 1/4 |
| User interface | 1/9 | 1/8 | 1/3 | 1 | 1/5 |
| Functions provided | 1/2 | 2 | 4 | 5 | 1 |

Matrices of pairwise comparisons for the third level of the problem of buying an electronic store

| Cos | A | Б | Terms of purchase | A | Б |
|-------------------------|---|-----|-------------------|---|-----|
| A | 1 | 1/7 | A | 1 | 1/2 |
| Б | 7 | 1 | Б | 2 | 1 |
| Accompanying developers | A | Б | User interface | A | Б |
| A | 1 | 1/5 | A | 1 | 1/3 |
| Б | 5 | 1 | Б | 3 | 1 |
| Functions provided | A | Б | | | |
| A | 1 | 1/6 | | | |
| Б | 6 | 1 | | | |

Global Priorities for A and B Stores

| Store evaluation parameter | $ L_i $ | $ L_{iA} $ | $ L_{iB} $ |
|----------------------------|-----------|--------------|--------------|
| Cos | 0,48 | 0,88 | 0,13 |
| Terms of purchase | 0,17 | 0,33 | 0,67 |
| Accompanying developers | 0,07 | 0,17 | 0,83 |
| User interface | 0,03 | 0,25 | 0,75 |
| Functions provided | 0,25 | 0,14 | 0,86 |
| Generalized priority G | | 0,53 | 0,47 |

Thus, we get that buying a store A is somewhat preferable to buying a store B.

Conclusions. Similar calculations can be easily carried out for any other set of comparison criteria for electronic stores and for an arbitrary set of compared objects. For calculations, the mathematical functions of MS Excel were used.

COMPUTER PROCESSING OF ANNUAL RINGS ON WOOD

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Introduction. The analysis of the annual tree rings is one of the methods for determining the climate (temperature, precipitation) in the past years and predictions in the future. Modern computer technology and mathematical tools make it easier to analyze and obtain more accurate results for the past, as well as future years.

Aim. Determine the dependence of the thickness of the annual tree rings, on temperature and precipitation, using mathematical tools, identification the cycles in the development of trees are the aim of the work. Also make a forecast for the development of the tree in the future.

Materials and methods. Photos of a tree cut with a digital camera were made. With the help of the computer program Graph2Digit v0.7.1b, data on the width of the annual rings of the first object of investigation were obtained. In the programs Scilab 5.5.2 and Mathcad 15, graphs of the ring thickness versus time were plotted, a spectral analysis of the obtained data was carried out using the Fourier transform. The results of the conversions carried out in two computer programs coincided. Based on the results, the time cycles in the development of the trees were determined. These data are compared with data on the thickness of annual rings. A forecast is made for the thickness of annual rings. The graphs of the dependence of the thickness of annual rings of the second object of the study, on the time of its growth, are constructed. A comparison is made between the thickness of annual rings, the amount of precipitation and temperature, over a period of time.

Results and discussion. The representation in the form of a Fourier series made it possible to determine the time cycles in the growth of a tree. We were able to make a forecast of the thickness of annual rings, and to determine its comparative accuracy, as well as compare the annual rings, temperature and precipitation thickness, drawing conclusions about the relationships between them.

Conclusions. With the help of analysis of annual tree rings, one can judge climate changes at a certain time interval and determine the periodicity in the growth of a particular tree. You can make a prediction about the growth of the tree in the future. Mathematical modeling has shown that, such a forecast can be made for several years, but not more. The applied research methods can give accurate results, and within the limits of the specificity to bring appreciable advantage in various spheres of activity

METHODS OF STATISTICAL ANALYSIS IN PHARMACEUTICAL RESEARCH

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Introduction. The wide application of statistical methods of analysis and statistical data models is due to the dynamic development of the scientific and technical directions of pharmacy. Important areas based on statistical analysis include: tasks of identification and input control of medicinal raw materials; Methods for testing the quality of medicines; Methods of establishing the patterns and technology of manufacturing medicines; Studying the compatibility of dosage forms; Process of validation of analytical instruments and techniques.

Purpose of the study. To consider the possibility of using statistical methods and models in pharmaceutical research, taking into account modern validation requirements.

Conclusions. Statistical methods of monitoring and processing of measurement results, have sufficient capabilities and a high level of reliability. Methods of validation in pharmaceutical research is the process of experimental confirmation that the quality control technique provides the necessary and sufficient information about the object under investigation and is suitable for solving specific problems. For the validation of methods, statistical methods based on correlation, regression analyzes are used. In the course of experimental studies, statistical values that describe a sample of observations are estimated and measure both the mean value of the distribution of observations and the variance of observations around a given mean.

The use of statistical methods in the validation process of laboratory analytical equipment and methods of quality control of medicines will allow to detect and significantly reduce systematic mistakes, establish a limit for detection and quantitative determination of the analyze.

DIFFERENTIAL EQUATIONS MODELING PROCESSES IN MEDICINE AND PHARMACY

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Introduction. The main feature of the simulation is that this method of indirect knowledge through Objects deputies. The model serves as a kind of instrument of knowledge which the researcher puts between itself and the object with which it is exploring interest.

Aim. Describe the process modeling in medicine and pharmacy differential equations.

By studying the complex processes that occur in nature, the human body or in the course of scientific experiments, we can't always take into account all available factors, some of which are more important, and some can be ignored.

The object of study medicine - is a living organism that is a very complex system.

Materials and methods. To analyze the literature and discover the essence of modeling differential equations. Used theoretical methods such as analysis of the literature, systematization and actualization of the topic.

There are four types of models used:

1. Biological substantive models used to study general biological patterns, effects of various drugs, treatments. This type models include laboratory animals, simulated organs, cell culture.

2. Physical models - are physical systems or devices that are similar to the behavior of a subject that is modeled. They are implemented in a mechanical device or electrical circuit.

For example, the process of blood flow in large vessels can simulate electrical circuits of capacitors and resistances. It also includes technical devices that replace organs and systems of a living organism. This apparatus of artificial respiration that model lung.

3. Cybernetic model - a different device, often electronic, through which information processes are modeled in vivo. Among the most common one processes information - a control (eg, hand movement, body, etc.).

4. Mathematical model - a system of formulas, functions, equations that

describe these or other features of the object, phenomenon or process being studied. The law of gravity, Ohm's law and others. - All mathematical models of real physical phenomena. When studying dynamic processes, the mathematical model is often a system of differential equations (ie equations that contain derivatives) because only derivatives reflect changing values in the experimental system that interests us.

The value of the method is that - first, mathematical modeling allows to investigate the behavior of biological systems in such circumstances that are difficult to reproduce experimentally in the clinic, with no apparent material costs; in - the second, reduced the study; in - Third, the mathematical model facilitates solving problems with the treatment of disease.

Results and discussion. Need to use the modeling method depends on what many objects (or problems relating to these facilities) directly or impossible to investigate whether the study requires a lot of time and money. The process involves modeling: the subject (researcher), research object model, mediating the relationship knowing subject and the object known. Simulation method finds application in many sciences.

The method of modeling in pharmacy is the tool that allows the more deep and complex relationship between theory and experience. In the last century experimental method in medicine began to stumble upon some difficulty, and found that all studies revealed a number impossible without simulation.

On the basis of mathematical modeling as a means of research and data processing capabilities using the computer future doctors and pharmacists are introduced in the study courses of medical and biological physics, higher mathematics, medical informatics, information technology in medicine. To describe deterministic variable time events most frequently used differential equations. As an example, pharmaceutical and pharmacokinetic modeling process is using homogeneous linear differential equations.

Conclusion. So today mathematical methods widely used in medicine and pharmacy, and promotes knowledge in the field of medicine, the emergence of new highly efficient methods of diagnosis and treatment, the establishment of medical equipment.

Section 19.
COMMODITY RESEARCH

THE USE OF RADIO-FREQUENCY IDENTIFICATION FOR MEDICINES MARKING

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Introduction. Recently, radio-frequency identification technology has been successfully used in various branches. This technology gives more opportunities compared to traditional marking systems. Advantages of radio-frequency labels include: safety, environment-resistance, large reading distance, data-rewriting ability and also the ability of drugs protection from counterfeiting as each label contains a unique code that cannot be faked, changed or deleted.

Aim. To analyze the use of radio-frequency identification for marking of pharmaceutical packages.

Materials and methods. Logical, analytical, marketing method as for the use of radio-frequency identification method in pharmacy.

Results and discussion. RFID-labels in pharmaceutical production help for prompt data obtaining at all stages of production, starting with substances and excipients arrival to the warehouse and ending with shipping of packed medicine.

RFID-systems provide the ability of control at each stage of work from arrival of production to warehouse, its allocation, storage, advancement of data processing due to exclusion of manual input and associated personnel mistakes, records and reports composing and keeping.

Radio-frequency identification of medicines provides unique opportunities for creation of united system of commodity turnover recording and control for departments, with complete transparency of all processes: arrival of medicines to departments; transfer of products to salesroom, immediate satisfaction of a client's demand due to products' positioning in the salesroom, cash transactions and so on.

RFID-labels allow preventing distribution and sales of counterfeit medicines, in attempt to remove the chip is destroyed; life time of the label is not less than 10 years, it is very resistant to mechanical and other impacts; the label can be placed inside the package guaranteeing the impossibility of its substitution with another label without package opening; the label requires no external power supply as for data transfer it uses the scanner field power.

Conclusion: Application of radio-frequency labels on packages of medicines will allow tracing the legal chain of supply from initial stage to the last one and also effectively and safely protect the medicine from counterfeiting.

COMMODITY RESEARCH ASPECTS OF LOTIONS

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Introduction. French women in the Middle Ages already widely used lotions for face cleaning. The first lotion was diluted grape. Vine the origin of this word has Roman roots, *lotio* — washing up, ablution, but the name - lotion, came up with French.

Lotion – cosmetic and hygienic remedy for skin care, hair care, nail care and for aromatization that is alcoholic-aqueous solution or liquid emulsion (suspension) from biologically active substances and useful additives, perfumes and colorants (or without it).

Aim. The aim of this thesis is commodity researching of assortment, destination and consumer properties of lotions in the local markets.

Materials and methods. Information based on researching standard documents, internet resources and own conclusions.

There are many types of lotions. Foremost, lotions can be classified depending on the target area use. For example, there are lotions for the face, body, hands, hair and nails, as well as sunscreen, deodorant, before and after shaving, etc.

Lotions for face care can be classified: by purpose (for cleaning (makeup removing), for hydration (after using milk or other cleansing products), and used for soften skin); by composition (spirituous, aquatic, alkaline, acid, isotonic antibacterial). Composition of remedy determines by the type of skin, for which it possible to use.

Lotion is the basic hygienic means. The most popular are lotions, which include natural solutions that have a healing and cleansing effect.

Lotions for hair care used from dandruff to restore the natural balance of the skin. They are showed antiseptic, antifungal activity.

Sunscreen lotions provide skin protection against sunburn, contribute to a smooth and beautiful tan.

Spirituous lotions disinfects, cleans, dries wounds and pimples, but can irritate and dry the skin, that's why use it only for oily skin, and no more frequently than once in two day.

Weak concentration alkaline lotions also used for oily skin (with blackheads, purulent inflammation).

Nowadays the Ukrainian market is a fairly wide range of this type of product. Consider the range of the most popular among consumers: «Fortress Therapy Pro

«Loss Prevention»» (Fortress Ukraine), Nourishing Body Lotion «Citrus» (Ultima, Ukraine), «Aloe» (Forever, USA), face care lotion «Acnacid» (Elfa, Ukraine), «Nivea For Men» - after shaving lotion, soothing for sensitive skin (Beiersdorf, Germany), body care lotion «Embrace tenderness. Coconut milk and jasmine petals» Dove (Unilever, Great Britain / Netherlands), body care lotion «Lotus and Bamboo» (Mary Kay, USA), «Belosalic» (Belupo, Croatia), «Bifon» (Dermapharm AG, Germany), «Diprosalic» (Schering-Plough Labo, Belgium), «Sinedec» (Laboratoire Silderma SARL, Switzerland), after shaving lotion «ARKO Cool» (Evyap, Turkey), after shaving lotion «Gillette Fusion Phenom» (Gillette (Shanghai) Limited, China) etc.

These remedies must meet the following requirements: will be made in accordance with the requirements of standard formulations, by technical requirements for specific products and by technological regulations (instructions) in compliance with standard documents, acting on the territory of the State that adopts these standards; content of toxic elements and microbiological, toxicological and clinical and laboratory indicators of cosmetic products shall not exceed the established norms; Appearance - homogeneous single-phase or multi-phase liquid without extraneous inclusions; color and odor characteristic of a specific product name; ethyl content 8,1 – 75 % ; pH value 3,0-8,5.

Lotions package should ensure the preservation of their quality throughout shelf life. They are packaged in primary (bottles) and secondary (a pack) packing. Allowed to pack them in bags with a capacity of up to 10 ml of materials permitted in the established normative document. Allowed other types of consumer packaging for lotions agreed with the customer, that ensure the safety of goods during transportation, storage and use.

These types of commodities are transported by all the models of transport in closed vehicles, universal containers in accordance with the transit rules, that operates in this mode of transport.

These products are stored at a temperature not less than +5 °C and not more than +25 °C, in covered warehouses, in the manufacturer's packaging. It is not allowed to store lotions under the direct sunlight or near heating appliances.

As a result of the researching we analyzed range, classification, general requirements, packaging and storage of cosmetic lotions, which allows a very high score for this type of application and the breadth of functionality of the goods from the consumer's point of view.

Conclusions. According to the destination lotions can perform different functions and can be used on different types of skin. Lotions used to deliver medicines to the skin, whereby, have wide applying, that allow extend the consumer properties of goods and make lotions more meaningful for consumers. Therefore, the possibility of further expansion in the production of this type of product is topical.

FEATURES OF TWO-DIMENSIONAL ENCODING

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Introduction. Today barcode cannot give a consumer really important information: composition of the product, allergens, specific origin place. These can be found on other parts of package, but more and more customers seek to obtain such information through Internet or mobile phone camera. The need to encode more information on smaller area has led to development, standardization and application of two-dimensional (2D) barcodes. The most widespread are Datamatrix, Data Glyph, Aztec, QR Code et al.

Aim. Study of QR-code application on package of medicines and other products.

Materials and methods: have been analyzed modern types of packages with QR code marking. In the study, we have used systemic and logical methods of analysis.

Results and discussion. QR code — is a 2D barcode, in which the following maximum number of characters is placed, namely: digits - 7089 symbols, numbers and letters (including Cyrillic alphabet) - 4296 symbols. According the DIRECTIVE 2011/62/EU OF EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 amending Directive 2001/83/EC on the Community, automated system for tracking drugs in circulation is aimed at preventing counterfeit medicines entering the legal network, and implies a unique identifier labeling of prescription drugs. Thus, in order to identify counterfeit medicines, it is planned to apply a QR code to each package, which includes a unique package identifier - a randomly generated sequence of numbers (random inconsistent numbers are used to prevent forgery). QR code will help to track the circulation of medicines through the chain of a foreign manufacturer - a distributor - a pharmacy and a domestic manufacturer - a distributor - a pharmacy. According to GS1 recommendations, this code should include four standard components: the manufacturer's product code (for example, GTIN or NDC), batch number (series), expiration date and unique serial number (unique packing identifier). The application of a two-dimensional bar code is recommended by the European Federation of Pharmaceutical Industries (EFPIA), its use was tested in a pilot project in Sweden, which allows placing only one code on the packaging instead of two or more.

Conclusions. It should be noted that on the packaging of medicines, including ones of Ukrainian production, QR code has been applied for several years, but without an identifier. Usually, in such cases, advertised information about the manufacturer, the product itself is encoded.

MARKING OF NEEDLES FOR INTRADERMAL INJECTIONS

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Introduction. The success of mesotherapy procedure depends primarily on the quality of the applied tools. The arsenal of mesotherapeutical needles is rather limited and they have a number of features.

The aim of our study was to examine the range of needles for intradermal injections represented in the market of Ukraine, their labelling and packaging.

Materials and methods. In the market of cosmetic tools are presented needles of foreign production (Spain, Germany, Italy, Korea, China), the most popular of them are such brands as TM BohMark, KDM, Meso-Relle and others.

Needles for intradermal injections (Labelle needle) are super-sharp, with a length of cut smaller than in conventional needles. For the cut sharpening laser polishing is applied, due to this the needle is not puncturing, but a sort of "broadens" the tissue, allowing painless injection exercise. At this injection effort is minimized, tissue trauma is absent, and the procedure is easier to bear. Luer connector provides secure attachment of the needle. Sterilization of needles is carried out by ethylene oxide.

The plastic base of the needle usually has a particular colour that complies with international coding system in accordance with ISO 6009. Needles of foreign origin are necessarily marked on the system «Gauge» (letter G) to determine nominal external diameter, and the size is indicated in inches. For example, a needle 30G 0.3 × 13mm - yellow with a diameter of 0.3 mm and a length of 13 mm.

Results and discussion. In mesotherapy are used needles of small diameter: 0.26 mm (32G); 0.3 mm (30G) and 0.4 mm (27G). The length of the needles may be 4 mm, 6 mm and 12-13 mm. The smaller the diameter of the needle, the more comfortable the procedure will be for the client, which is not true for doctor. Through the thin needles, such as 0.26 mm, it is difficult to inject viscous solutions (hyaluronic acid).

There is a need, to either dilute the drug, or use a larger diameter needle. The same problems can arise at tissue infiltration with large amounts of drugs. As for the length of the needle, much depends on the practical skills of mesotherapy specialist. 12-13 mm Needle can perform all techniques, while short needles - only techniques, limited by depth of needle penetration. In addition, hypodermal technique is performed only with 12-13 mm needle.

Packaging of disposable needles must provide their integrity and sterility. Each needle is packed into a primary consumer packaging, which should be partially transparent for determining the colour of its base. Secondary packaging - cardboard box, which has a similar labelling and contains 100 needles.

Marking of needles must meet the requirements of the Ministry of Health of Ukraine, as to sterile forms. The packaging must include the conditional denotation of the needle, the word "aseptically" serial number indicating the month and year of expiration.

Symbols that must be present on the package:

conditional denotation of the needle (for example, 30G 0.3×13mm) – calibrated code by the «Gauge» scale (G), the value should correspond colour encoding;



«production date» - the symbol will be aligned with the date expressed as four digits of the year and two digits for the month;



«sterility» - for medical devices that are fully sterilized. It may also contain information that specifies the method of sterilization;



"warning! Read the accompanying documents "- can also be synonymous with the symbol "Attention, see instructions for use ";



«Re-use is forbidden»;



"Use before" – the symbol is accompanied by the date that consists of four digits of year two digits of month and, if necessary, two digits of day. The date must be printed next to the symbol or under it, or right of it;



"Batch code" - this symbol is accompanied by manufacturer's batch code that should be combined with symbol;



"warning! Read the accompanying documents "- can also be synonymous with the symbol "Attention, see instructions for use ";



- certifies that the product meets the basic requirements of EU directives and harmonized EU standards.

Conclusions. Thus, knowledge of the marking of injection needles might help a beautician to properly choose a tool for mesotherapy procedure depending on its purpose. And also, verify the needle compliance with the current document and protect themselves from frauds and counterfeits.

STUDY OF CONSUMER ASPECTS AT CHOICE OF INSULIN PUMPS

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Introduction. Today society of not only our country but the whole world faces the problem of treatment of such disease as diabetes mellitus. According to WHO statistics every minute in the world dies more than 5 people and every year this number grows. And that is why for several decades are being developed new technologies and preparations, improving existing instruments to maintain the condition of a patient suffering from diabetes. One of the modern instruments is insulin pump (IP).

Aim. The study of consumer aspects of IPs.

Materials and methods. Modern range of IPs was analyzed. In our study, we have used a systematic and logical analysis methods.

Results and discussion. IP is an electromechanical device for subcutaneous administration of insulin is a compact automated individual dispenser. In its structure, it is a complex device that includes: a pump for the supply of insulin, as well as a computer with a control system; replacement tank for insulin (cartridge, inside the pump); a replaceable infusion set including a cannula for subcutaneous administration and a system of tubes for connecting the reservoir to the cannula; batteries. When choosing a PI for a modern consumer, it is very important to pay attention to the following aspects: a minimum dose of insulin (basal) in one hour; step of insulin delivery; the number of basal intervals and the minimum duration of the basal interval (defined in minutes); types of boluses (the presence of different modes of insulin administration for food intake); number of basal insulin profiles (indicates how many programmed basal insulin variants the pump can store in memory); system of informing about the errors that occur; memory; system of constant monitoring (allows to measure blood sugar level in real time and display the received data on the screen of the monitor as a graphic curve); a warning signal about too high and too low levels of glycemia; remote control (allows controlling the device without getting it from the usual location); automatic keylock (allows protecting the device from accidental clicks); the menu of the device (presence of the native language); connectivity with a personal computer; volume of the reservoir (reports the amount of insulin contained in the pump).

Conclusions: Proceeding from all above-stated, it is possible to tell with confidence, that for today, there is a wide spectrum of consumer aspects by which consumers at a choice of IP should be guided.

TOOTHBRUSHES AS A PERSONAL HYGIENE TOOL

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Introduction. Toothbrush is the main tool to remove dental plaque from teeth and gums surface. This oral cavity hygiene device should be chosen individually, considering features of teeth and gums of every man.

Aim. Determination of various parameters of toothbrushes influencing hygiene quality and health of oral cavity.

Materials and methods. Objects of the study were toothbrushes and their parameters at choice.

Results and discussion. Toothbrush consists of a head with bristles, handle and a connective neck. The bristle was traditionally made of natural materials (porcine hair). The natural one, due to certain drawbacks was limiting and shortening the abilities to develop more advanced toothbrushes. That is why since 1938 the bristle is made of synthetic materials (nylon).

Bristles of toothbrushes might be of different thickness (which mostly determines their hardness), flexibility and with variously treated ends. The optimum height of bristles is 10-12mm. By the degree of hardness there are 5 grades: very hard, hard, medium, soft, very soft. In many modern brushes bristles of various hardness are combined: thus, central, harder bristles are intended to effectively clean chewing surfaces of teeth (often they are shorter), and peripheral, softer (and often longer) bristles less traumatically clean gums. Often bristles of various hardness are differently colored. The ends of artificial bristles of modern toothbrushes are rounded, that increases their polishing ability and prevents injury of periodontal tissue and oral mucosa. The end might also be sharpened and obtuse. Sharpened ends are better to clean teeth and interdental space. Obtuse ones, in turn, massage gums well.

An important parameter choosing a toothbrush is its head. For optimum cleaning performance it should 2-3 teeth. Usually width of a toothbrush head is 7,5-11mm for adults and 7-9mm for children. Very often on the back side of the head there is a special rubber brush for tongue cleaning that results in more detailed oral cavity care.

Conclusions. For correct choice of a toothbrush individual features of each man's oral cavity should be considered. The best decision before the choice should be dentist's consult because inappropriate choice of a toothbrush might lead to trauma and diseases of oral cavity.

STUDY OF VACUUM BLOOD COLLECTION SYSTEMS

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Introduction. The last years clinical practice has been introduced with a large amount of modern technologies. In this regard significantly has grown the role of laboratory tests in diagnostics and treatment effectiveness of various diseases. Doctor's critical decisions on patient care are often grounded on laboratory data. With this in mind, a priority task of contemporary clinical practice is provision of high quality and reliability of laboratory tests' results.

Aim. To carry out the study of vacuum systems for blood collection represented in the market of Ukraine. To analyze the structure of these systems and the principle of operation.

Materials and methods. Objects of the study were vacuum systems for blood collection, registered in the State Register of medical devices and medicinal products.

Results and discussion. Officially in the State Register of medical devices and medicinal products there is one complex system for blood collection registered (SC Sanguis Counting Kontrollblutherstellungs- und Vertriebs GmbH, Germany). Also in the Register there are parts such as needles, vacuum tubes and tourniquets. Needles for blood collection are represented by 3 samples, manufactured at 2 enterprises: in Great Britain (Becton Dickinson and Company, UK) and China (Weihai Hongyu Medical Devices Co., Ltd, P.R. China). Also in the Register there are 2 types of vacuum tubes produced by 2 enterprises: in Slovenia (Laboratorijska tehnika Burnik d.o.o., Slovenia) and China (Weihai Hongyu Medical Devices Co., Ltd, P.R. China). Vacuum system for blood collection consists of three parts: vacuum tube, holder, needle.

The vacuum system operation principle is as follows, under the action of vacuum blood is sucked directly from the vein through the needle to the test tube and immediately mixed with chemical agent. Precisely dosed vacuum volume provides exact ratio blood/reagent in the test-tube. They meet international standard ISO 6710-2011 for vacuum tubes for blood collection. Standard needle for blood collection is produced in various sizes that can be determined by the cap color (diameter 0,9mm – yellow, 0,8mm – green, 0,7mm – black). The system is produced ready to use and requires no preliminary preparation and reagents dosing.

Conclusions. Thus, we can conclude that vacuum systems are a convenient way to take blood samples that significantly accelerates and facilitates analysis process and also helps saving on secondary plastic test-tubes due to direct use of the system as a primary test-tube.

STUDYING THE ASSORTMENT AND PROCEDURE OF COMMERCIAL ANALYSIS OF GLUCOMETERS

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Introduction. Currently a disease like diabetes mellitus becomes more common and even "younger". Diabetes is a chronic disease that occurs as a result of impaired insulin production by the pancreas, or in the event that, if the body is not able to effectively use the produced insulin, and this leads to an increase in the level of glucose in the blood. There are two types of diabetes: the first type occurs because of the lack of insulin production, the second arises – because of inefficient use of this hormone by the body.

Regardless of the type, this disease has a negative effect on many organs and systems, causes considerable discomfort, caused by the need to constantly monitor blood glucose levels. In order to simplify this procedure, and for the possibility of self-monitoring, glucometers are used.

Aim. We decided to analyze the assortment of devices for measuring glucose in the blood, as well as their physical, technical, technological and cost indicators.

Materials and methods. When doing research, we used empirical and experimental-theoretical methods, in particular – we used observation, comparison, measurement, study of literature, generalization, analysis of published data on reviews and analysis of questionnaires for consumers of glucometers, description, classification.

Results and discussion. Glucometer is a device for measuring blood glucose level. According to the principle of action, glucometers are divided into photometric and electrochemical.

Photometric glucometers are calibrated for whole capillary blood, they determine the glucose content by changing the shade of the reagent that arises from the reaction of glucose with the special substances deposited on the test strip. They are devices of the "first generation". But at the moment their technology is considered obsolete.

Electrochemical glucometers measure glucose levels by measuring current, which appears during the interaction of blood with special substances deposited on the test strip.

These devices are more progressive and they allow to exclude the influence of external factors on the result. To date, there are many models of glucometers, ranging

from the simplest, basic, and ending with multifunctional devices with various auxiliary capabilities.

The kit for level measurement includes the following elements: Glucometer, semi-automatic scarifiers, test strips, batteries. Additional functions of modern devices can include: alarm-clock, built-in memory with the preservation of the results of past measurements, communication with the PC, alignment with the tonometer, and with voice function.

Choosing a glucometer for the elderly, the main emphasis should be made on the type of calibration to which they are already accustomed.

During numerous clinical studies and meetings of medical experts it was proved that the determination of the level of glucose by plasma is the most accurate. That is why this kind of calibration is the basis of most of the laboratory equipment, and is considered the main reference point for choosing a home glucometer.

The most common are glucometers manufactured by Bayer, One Touch, Omelon, Elta. Implemented in Ukrainian pharmacies glucometers are in the price range from 266.00 UAH. (Sensolite NOVA PLUS, CFT, Hungary), up to 1320.00 UAH. (Accu-Chek Performa Nano, Germany).

At acceptance of the given kind of the goods the order of carrying out of the commodity analysis of devices for measurement of a glucose in blood is carried out in some stages.

The first stage is the design and correspondence of the accompanying documents.

The second stage – analyze the appearance of the package and the absence of visible damage to it.

The third stage is to check the completeness of the devices for measuring glucose in the blood.

The fourth stage is an organoleptic analysis of glucometers and verification of the health and functional properties of the device.

The fifth stage is the preparation of a written permission for the implementation of devices for measuring glucose levels.

The sixth stage is distribution to storage locations and implementation.

Conclusions. In this way, glucometer is an indispensable electronic device for personal use by people, who suffer from diabetes, as well as those who want to control the level of sugar in their blood for prevention.

As a result of the conducted studies, we studied the principle of operation and configuration of devices for measuring blood glucose level.

We analyzed the assortment and cost of glucometers with a set of various functions, and also we determined the stages of carrying out commodity analysis when accepting this type of goods.

DEVICES FOR MICROCLIMATE REGULATING AND CONTROLLING

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Introduction. The development of new technical means for control and regulation of the air in the room caused by necessity to improve and maintain the normal state of human health. Nowadays main factors of ensuring clean air are based on using air conditioning and ventilation devices.

Aim. The assortment analysis, classification of microclimate controlling and regulating instruments, which could be found on the domestic market.

Materials and methods. Information methods, based on the study of normative documents, materials, web-resources and my own conclusions.

Results and discussion. It is necessary to quantify each of the room parameters in order to determine whether the air environment of the room conforms the established norms. The temperature is measured by conventional mercury or alcohol thermometers. Thermography (automatic recording devices) are used for a continuous temperature recording. Air temperature is measured at several locations of the working area at different time of a day. Humidity is determined by hygrometers and hygrograph. Industry produces a sorption hygrometer, type GS-210, which measures the relative humidity within 15-100%. For measuring air velocity is used the wing-type and pan-type anemometers, and for the determination of low air velocities - thermoanemometers and catathermometer. Ionization is used for an air purification. There are a number of ways of air ionization. Depending on the implemented method of air ionization this devices (ionizers) are classified into the following groups: plasma, ultraviolet, thermal, corona, radium, water. An air ionizers help to maintain health, prevent infectious diseases, allergies and create a comfortable atmosphere. Humidifiers are also used to improve the peoples' health and well-being. Humidifiers - are devices that maintain a comfortable level of humidity in the room. There are different types of humidifiers: traditional (cold steam, hot steam), ultrasound, cleaner-moisturizers. According to the State Register of medical equipment and medical products, there are respiratory humidifiers mixtures manufacturers registered in Ukraine: Fisher & Paykel Healthcare Limited, New Zealand; humidifiers medical products VADI Medical Technology (Taiwan).

Conclusions. In this way, by analyzing the range of moisturizers, we can conclude that, unfortunately, domestic producers almost do not exist. Although this is very profitable and promising area of development and production of devices for improving living conditions and human activity.

METHODS OF MEDICINES' PACKAGES PROTECTION FROM COUNTERFEITING

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Introduction. According to the World Health Organization experts today the share of counterfeit medicines in the total volume of the global pharmaceutical market is about 10%. One of the global and important problems of Pharmacy is the fight against counterfeiting of medicines, which is a risk to human health and undermines confidence in the legal pharmaceutical manufacturers and national health authorities. Thus, the protection of drugs packages is important in pharmaceutical anti-counterfeiting.

Aim. Analysis of special materials and paints use on the packages of drugs in order to protect them from tampering.

Materials and methods. Logical and analytical techniques for the analysis of methods of protection of medicines packages.

Results and discussion. The use of special materials for the manufacture of packages and labels is quite an effective way of fighting counterfeit medicines.

To protect against counterfeiting, as one of methods is used partial or complete coloring of paper in the mass or on the surface. Such paper is characterized by poor color stability to wet processing, so for fixing the paints use special substances, such as dicyandiamide with formaldehyde. To improve the stability of color during coloring of paper in the mass and on the surface, are used diazo and triazo dyes based fixers. Special inclusions in the label material may be found either on the surface or inside, under surface layers. The most widely used are such inclusions as protective fiber strands (fibers and strips of various lengths and colors may be visible under normal or special lighting, for example, UV light); metallised threads and strips; microparticles (multicolor particles of various sizes may exhibit different properties at certain conditions); radiation particles (to material are included microscopic doses of rare earth elements, which possess weak radiation - harmless to humans, but very easily detected by special detectors). To improve products protection level use paints that change color under radiation, invisible fluorescent, microencapsulated, metallised, reactive to chemical agents. Materials applied using special equipment include magnetic, thermochromic sensitive, UV, IR-paints.

Conclusion. The use of special materials and paints for packages of medicines is one of effective ways to protect medicines from counterfeiting and a barrier on the way of counterfeits distribution.

MODERN LABELS IN THE PHARMACEUTICAL INDUSTRY

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Introduction. To date, the pharmaceutical industry produces a huge number of dosage forms. Therefore, the labels for each type of packaging, for each type of product, must be different. One of the topical directions is the production of labels from modern materials that reduce the risk of their fading and darkening, are resistant to sunlight, chemical reactions and temperature differences. To pharmaceutical labels put forward such requirements: absolute readability of the text, the presence of the name of the drug, its composition, the date of manufacture and the serial number, the name of the manufacturer, storage conditions, the method of use, the expiration date, the availability and reading of barcodes.

Aim. The aim of our work was to investigate types of labels and kind of materials which can be used for label production.

Materials and methods. Analysis of regulatory acts and literature regarding labels. Pharmacy labels must withstand the treatment with hot air, steam, while not melting and not peeling off, and the paint on the labels should not fade. It is absolutely impermissible to interact the material from which the label is made, with the packaging material and with the preparation itself. Therefore, it is very important to choose the right type of film and keep the finished medicines.

Results and discussion. In pharmacy production, self-adhesive labels are often used. Their main advantages are simplicity and convenience. They are used both for ready-made dosage forms, and for ointments, powders, various vitamins and food additives. Thermal labels are also used. However, they have a shorter period of operation, they do not withstand the change in temperature conditions, so they are used for labeling syrups and tablets. Today, the market demand for warranty labels and stickers. They consist of two layers, one of which is destroyed when trying to peel or damage. This makes it possible to protect products from dishonest opening, to provide warranty marking, to reduce the costs of the service center to check the opening, to avoid theft during operation.

Conclusions. Thus, based on the foregoing, it should be noted the variety of labels for pharmaceutical products. There are also new types: a multilayered label - to put a lot of information on the product; Transparent holographic stickers; High-temperature labels; Seal labels. All this makes it possible to identify falsified products, to prevent the opening of a package or product. Modern labels can be used by people with disabilities (printing labels with Braille).

STUDYING THE CONSUMER ASPECTS OF CONTACT LENSES.

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Introduction. At present, the sphere of optical vision correction is an object of scientific interest of many specialists around the world, means of correction are being improved, new professional educational programs for specialists are being developed. The range of vision correction devices provides for different kinds of contact lenses. Contact lenses must meet stringent requirements, since they are in direct contact with the cornea, their presence in the eyes should not cause discomfort, should be painless and safe. The most popular is correction of vision with the help of soft contact lenses.

Aim. To study the range and parameters, the comparative characteristics of different kinds of contact lenses, the definition consumer aspects of this type product.

Materials and methods. In carrying out research we used the following research methods: observation, analysis of scientific publications, classification.

Results and discussion. Contact lenses are small, stiff or soft lenses that have a cup-like shape, placed on the eye and having certain optical properties. Contact lenses are classified according to various criteria, in particular: by material, by frequency of change, mode of wearing, design, degree of transparency, moisture content, etc. According to the material of manufacture contact lenses are divided into hard and soft. Soft lenses classified according to the degree of hydrophilicity: with a low degree (<50%) of the moisture content, and also with a high degree (>50%) of the moisture content in them. The main characteristics of the material are the water content, which affects the elasticity of the lens, as well as its oxygen permeability. In the production of soft lenses, innovative technologies and the latest modern technical and scientific achievements are used. «Johnson&Johnson» has developed a technology for obtaining the most smooth surface. «CIBA Vision» produces one-day contact lenses using triple humidification technology. Innovative «Bausch&Lomb» technology minimizes spherical aberrations in the lenses of any optical power. From the correctly defined parameters of curvature and the optical power of the lens itself and the material from which the lens is made, its elasticity or elasticity depends on the clarity of vision, the comfort of fitting the lens in the eye. The soft lens market dominates for vision correction: on average, they are worn by about 90% of patients, and only about 10% of patients use hard contact lenses.

Conclusion. During the analysis of the range of contact lenses, various parameters were studied: material, composition, ability to influence the visual organ, safety, consumer aspects of this type of product.

Section 20.
SOCIAL SCIENCE

GLOBAL CITIZENSHIP – STATUS OF CONTEMPORARY

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Actuality. “If you know languages – you know the world” – an old Tajik proverb relevant in the modern global world. Knowledge of foreign languages enables a person to learn more about real life and culture of other peoples. Language studying isn't easy and long task that needs great effort and allows you to understand better the world.

Aim. To define a “global citizenship” and its practical implementation in life of modern students.

Methods. Reflection.

Results. My homeland is a small mountain village of Hochachildier near the town of Gissar in Tajikistan. All my childhood I spent in the mountains in my native village, where I studied at school. After graduation I decided to become a pharmacist-technologist, but this specialty is not taught in Tajikistan. This specialty is at the universities of Russia, Kazakhstan and Ukraine. My choice was the National University of Pharmacy in Kharkov, Ukraine. I decided to study in Ukraine, because it is situated in the center of Europe and gives an opportunity to get closer to European culture and traditions.

I faced a new problem – the university studies are in Ukrainian, although the city of Kharkov is Russian-speaking. I was forced to learn another language – Ukrainian, it helps me not only to learn, but also to communicate with other students, to travel to other cities of Ukraine – Lviv, Ternopil, Poltava, Kiev for student scientific conferences. Without the knowledge of the language it is impossible to know culture, traditions of the country where you study and live in. Studying for a technologist in pharmacy, I realized that without the knowledge of English I will not be able to achieve much in my future profession. I think that study of English will give me even more opportunities to achieve my goals and implement my plans. So I started studies at the additional English language course “Green forest”. For the third year I have been studying English in parallel with my studies. Knowledge of several languages gives the opportunity to develop, better understand yourself and the world around you. I am very glad that today young people have the opportunity to participate in such accessible programs as student exchange, sports and cultural events. Such way of development gives effective results. Students learn, develop and influence the world around us and improve it. This is one of the reasons for the emergence of local and international conflicts. I believe that one of the ways to

reduce this tension is tolerant and inquisitive attitude to each other's languages. Each new language learned by man is the way to a new cooperation.

At the university I met a concept of "global citizenship" and thought about it meaning for me personally. I realized that global citizenship is not related to a particular nation, color of skin, religion, country and represents an understanding that we are all inhabitants of Earth and therefore have an equal responsibility for life in our world. I understand the value of global citizenship – a person who takes responsibility for other people, for their healthy lifestyle, respect for human rights and solution to the difficulties that we meet in our world.

Global citizenship is an ability to act to improve the world around you – in your own university, city, country. At the same time to understand that these actions can affect the situation in a global scale. I decided to try on the notion of global citizenship, in order to be useful for people all over the world, to get a lot of new knowledge in the profession of a pharmaceutical technologist, to learn how to make new medicines that can save people's lives in all countries.

Unfortunately, the level of development of medicine and pharmacy in many countries, including my country isn't high enough. In Tajikistan there is virtually no production of drugs, all drugs are imported from abroad, so it is very expensive and poor people can't often buy it. Therefore my global aim is organization of mass production of drugs in Tajikistan, to use my new knowledge that I got as a result of communicating with people in other countries, the introduction of new advanced technologies in pharmaceutical industry in my country, the improvement of the quality of drugs, reducing their value, and improving the lives of my compatriots, adoption of a healthy lifestyle. One of the main problems of today are heart disease, so I'm working on developing a new medicine based on herbs of hawthorn, lemon balm, hops, motherwort for the treatment of cardiac diseases.

Conclusions. Unfortunately, there are a lot of poor and sick people in modern world who need help. In order to facilitate their life, to help to improve health and to increase life expectancy, to ensure stability, happiness and development of each family, every people, to make the world better, in my opinion, it is necessary to be well-oriented in modern society, to be able to communicate with people from different countries, and it needs a good knowledge of foreign languages.

NARCISSISM AS A FEATURE OF THE XXI CENTURY CULTURE

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Narcissism syndrome is a disorder associated with inadequate self-esteem of a person prone to egocentric sense of self. People with narcissistic traits usually show a commitment to excellence, don't control their ambitions, strive for physical attractiveness, power, and wealth. The most obvious reason for this is that modern society create unrealistic image standards by which people try to evaluate themselves.

The aim of our work is to study narcissism as psychological and socio-cultural phenomenon. Main objectives are to identify the main causes, symptoms and manifestations of narcissism as a personal or social life characteristic.

These days, for people is normal and acceptable to "show" themselves and their lives online. Permanent ascertaining in one's own worth could threaten the the individual with the loss of social communication skills and, as a result, self-destruction.

Narcissess interest in others little and do not see anyone but themselves. But sometimes such kind of concentration can have a positive personal impact. People who are concentrated on their own personality are usually successful in their self-creative activity, ambitious and enjoy overcoming the obstacles.

Social networks, in turn, allow people to build narcissistic defense around their fragile and vulnerable self. Using social networks people can filter out information about themselves, showing only desirable aspects of their life. They are easy to find common language with people, make friends because of great openness, prone to introspection. Narcissism is also a manifestation of sports. A positive side of narcissism is the fact that no other person can so thoroughly study physiology, biochemistry, sports medicine and training theory in order to "build" his/her body.

Historically, this phenomenon has ancient roots. In Patagonia there is a so called "Cave of the hands". On the walls you can see the silhouettes of the hands, that had a ritual meaning. The researchers argue that there was a process of initiation, transition to adulthood. But one can suppose that people left the memory of themselves in a sort of a rock art "selfie".

Today's reflection in the mirror of human subjectivity show us the products of civilization evolution. Perhaps, we should consider contemporary narcissism as a new anthropocentrism but not as a disease of the mankind. First of all, we can assume that narcissism works as a defense mechanism required by new era of global communication.

ART AS A TOOL OF AUTHORITIES

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Introduction: can art change a person?

It seems to be a simple question. “Yes, of course!” - Many people would say in what you can be sure of not making a survey. However, even if such a survey is conducted, the answer will again be almost unambiguous. Art never loses its relevance, as well as a study of its methods and ways of influencing a person. Art of a totalitarian society is one of the least studied aspects of totalitarianism.

We should not consider a totalitarian art as a sign of art of the 20th century. Totalitarian was an art of ancient civilizations: Egypt, Babylon, Assyria, etc. In the 20th century it was art of Russia, Germany, China, Italy, Spain, Portugal and other European countries. The term “totalitarian” (entirely, completely) was introduced by Mussolini, who maintained that “everything in the state, nothing but the state, nothing against the state”.

Aim: To reveal the negative aspects of the influence of art (on the example of totalitarian regimes of the USSR and Germany in the early 20th century), to determine the art of totalitarian regimes.

Methods of research is based on hermeneutics as a science about a theory of interpretation and understanding of texts.

Results: The art of the period of totalitarianism in different countries, with different cultural roots is surprisingly monotonous and similar. The domestic genre develops either scenes of a happy life, or rolls down to moralizing and edification. Totalitarian ideologists have always sought to dominate the masses. And it was the masses, because people were not thought of as individuals, but as elements of a mechanism, elements of a system called a totalitarian state. This is reflected in the culture. Preparing people for heroic accomplishments in the name of a bright future, in the name of defending their state and its leadership has become the task of education, and the chanting of this heroism is the task of culture and art. “We must educate the heroes”, said Mussolini, “the credo of fascism is heroism, just like the creed of the bourgeoisie is selfishness”.

Art required a return. The slogan “Who doesn’t work – doesn’t eat” was fulfilled. Lev Trotsky advised to replace this slogan with a new one: “Who doesn’t obey – doesn’t eat”.

A totalitarian ideology always fights against the ideology of dissenters, fights for a brighter future. It is reflected in the culture. The slogans of the USSR: “Against the separation from Modernity!”, “Against a romantic confusion”, “For communism!”. These appeals and instructions met Soviet people everywhere: at work, on the street, at a meeting, in public places.

Therefore, all works were created by realistic, simple, accessible methods for the ordinary citizen. Paintings were mostly landscapes, scenes from the life of workers or portraits of leaders; music was simple, without complex compositions, rhythmic, cheerful; in the literature there were heroic plots.

Conclusions: A totalitarian society creates its own, special, independent and self-sufficient culture, oriented toward the “internal” consumer who aims to maintain the ideological stability of society and state. In culture of a totalitarian state one ideology and world outlook prevails.

As a rule these are utopian theories that realize the eternal dream of people about a more perfect and happy social order, based on the idea of achieving fundamental harmony between people.

Totalitarian regime uses a mythologized version of such kind of ideology as the only possible worldview that turns into a kind of state religion. This monopoly on ideology permeates all spheres of life, culture in particular.

Art is not only a powerful engine of human progress, but also the most powerful tool of destruction if its goals and methods are aimed at developing the negative properties of human nature.

People are easily exposed to the influence of art, which has been proven in practice, therefore, to art, as a tool of management, it is necessary to treat with utmost care and choose the components of art that make up human life.

PRINCE YAREMA VYSHNEVETSKY: HISTORIC INSIGHT

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Introduction. Probably, few Ukrainian historical figures may be compared to paradoxical personality of Prince Yarema Vyshnevetsky. Despite numerous studies of this historical figure by various historians (both Polish and Ukrainian), some aspects of his biography still remain unclear. Research literature almost turned blind eye to his colonization efforts associated with development of the territory Lubenshchyna. We also know practically nothing about Yarema's relations with Polish King Vladislav and Bohdan Khmelnytsky. National historiography typically focuses on his adoption of Catholicism and it is hardly ever mentioned just how much support he granted to the Orthodox Church. It is those paradoxical phases in Yarema Vishnevetsky's activities, "white spots" of his biography, and common stereotypes that used to make and still make him a subject of major controversy in the works of historians and the public eye.

Aim. Unbiased assessment of Prince Yarema Vyshnevetsky based on the study of documentary sources and factual evidence. Expanding existing hypotheses about his origins, find out details about his education, exploring his economic activities, his hardships and his uncompromising position during the National Liberation War.

Materials and methods: systematic, historic, cognitive methods, heuristic search, historical and typological comparisons.

Conclusions. Recently, there is a tendency in Ukraine of reevaluating a personality of Yarema Vyshnevetsky. It is high time to stop assessing him as a hero or anti-hero based on narrow national vision of the past. Vyshnevetsky belongs to a few individuals who were able to influence the course of historical events. History would have been very different without him. Therefore, the activities of this individual (with all his strength and weaknesses) deserves a comprehensive study.

KANTIAN UNDERSTANDING OF FREEDOM AND ITS MODERN PROSPECTS

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Comprehension of freedom, on Immanuel Kant, is as contradictory as its essence. Coming from the terms of time, the talking about freedom is complicated, because there always is the preceding state in the sequence of events. Life of society and human existence are processes of endless changes, making realize their initial link is impossible.

However, the freedom named by Kant as "transcendental", so is universally-human, requires from an individual the autonomous effort. It shows up as self-determinism of man designing his own causal row of life. Such a self-determinism appears a self-creation: within the framework of person's behavior, individual relies on a moral law and turns his own freedom into a reason and a motive to the action. It, in turn, transforms an autonomy into self-equality, creates an individual as personality.

Ability to heed to the call of duty and to carry out binding regulations is a beginning of freedom. "Inlightening requires freedom only, ... namely freedom in all cases publicly to use own reason". This relation is logically convertible: freedom to offer your own persuasions publicly is equivalent to Inlightening that is needed for freedom, because it is the guarantor of understanding the essence of independence. Inlightening, on Kant, is the exceptional and individual phenomenon. A philosopher considers that Inlightening includes a sort of obligatory labour, it is a task necessary to implementation.

Freedom in Inlightening is endured, because its basement is a self-overcoming of an empiric individual. Speaking out his ideas and shared his mind publicly, an individual undertakes a social responsibility. The ideas of the talking enlightened human don't carry a new informative value qualitatively. The form of idea, devoid of individuality, converts it into universal form, attainable for all. Then a personal autonomy allows to create social freedom. "*Reason must be free in the public use, and inferior in the private use*". So I. Kant goes across from a question about possibility of freedom to the question about its measure.

In XX century the Kantian understanding of freedom was transformed, specified and deprived of its abstractly-rational ground. In relation to Kantian philosophy as its development, completion and opposing point of view, it is possible to mention existential interpretation of problem offered by Jean-Paul Sartre.

According to Sartre, freedom is a fundamental life principle. Therefore, any conversation about the measure of freedom is helpless: "man is always and wholly free – or is not». A choice, on Sartre, is empirically conditioned. It is an existential decision in a crucial determining situation. As a human experiences such situations certainly, he doesn't have a possibility not to choose. Therefore, a choice can't be substituted by calculation, – a human is "convicted" to be autonomous, and his freedom is absurd: circumstances determine sense of our actions, but do not give us any explanations.

While for Kant ambivalence of freedom is determined by the relation of free willing and duty, Sartre formulates the "paradox of freedom" in a new way. Freedom exists only in a situation, and a situation exists only through person's freedom. Every attempt to repeat a successful situation decision conduces to the loss of freedom because of automatism of action. Moreover, Sartre considers, every new choice is a choice "from the ground up", eliding all the preceding experience. A Kantian choice is similarly begun with a "zero" empiric mark. However, for the German classic, emancipation from empiric motivation does not deny the presence of more steady basis for the act - rationally substantiated morality. On Sartre's opinion, while we do not act, we do not know, what we actually are. Only behavior tells a human about his veritable internals. The "real freedom begins on the other side of despair", i.e., far from the verge of understanding.

A human in the choice inevitably runs into a social call. «Not what was made out of me is important but what I made out of what was made out of me». A human making his/her choice is lonely and isolated in the situation of taking decision; every situation is unique similarly as well as a decision. «A man is created by a climate and soil, race and class, language, history of collective part of that he makes, heredity, individual circumstances of the childhood, purchased habits and large and small events of his life», - all the enumerated is taken into account in a role of obstacles or "terminators" of freedom. Moreover: the obstacles as they are make our freedom obvious. To be free does not involve getting everything you want. It is rather an ability to possess exactly what is desirable: here a human "comes from himself". So it is possible to deduce the only philosophical definition of freedom as an autonomy of choice.

PHILOSOPHICAL INTERPRETATION OF NOISE PHENOMENON

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A noise is our natural environment and also an integral part of modern culture. It is usually defined as a sort of audial aggression, an extreme sound possessing destructive power. In fact, noise is not an upbuilding of additional sounds on the main tone, it is an independent musical category that destroys the “clean” sound by forming frequent gaps, which, in turn, represent a new structurally complex composition.

The relevance of the topic is based on the questions that arise today: are there any positive aspects in the listening to the noise and the noise-making? Is it possible to observe this phenomenon as a special reverberation of human life and creativity? What kind of information can we attain through different ontological or cultural “noises”?

In the modern culture, noise is an echo of previously inaudible motives that are related to ambiguous social phenomena. From metaphysical point of view, both generating and discerning the noises is a way to participate in the fullness of existence, because the world sounds polyphonically. For a man, being surrounded by noises includes being connected with all the other human beings in the total interaction.

The aim of our work is to disclose cultural and psychological meanings inherent to the certain type of musical noise, namely, the noise in the metallic sound of rock music by means of philosophical approach.

Traditionally, heavy metal sound is regarded as a factor of powerful psychological impact upon minds and behavior of its listeners. The experts from Westminster University, London, suppose that all the fans of heavy music possess similar character traits. During the experiment, 414 people were passing the tests in order to determine their character traits. It turned out people who like heavy music are often have low self-esteem. According to psychologists, heavy metal songs has an effect of catharsis and help people to cope with negative emotions and increase their self-esteem. This research can help parents to understand their children better. This, in turn, is able to show that rebellious children and conservative parents can have much more in common than it seems at the first sight.

"Music beyond harmony" is by no means just a "teenage riot". It is a sort of experimentation and an example of existential transgression to the edge of human possibilities. Facing noise experience, an individual understands that the world not always sounds melodically, sometimes it screams. That's why creative persons often “make noise”, announcing “the death of harmony” and trying to create new language of self-expression.

KISS AND HEALTH

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Actuality. There is no person in our society who has never made a kiss in his life. Kiss plays a great role in our life. For their purpose, kisses have a different orientation. A kiss can be parental, friendly, related, but a special role play kisses of lovers. The kisses of lovers affect our health.

Purpose. To study the properties of the kiss: both positive and negative.

Methods. Methods of the experimental-theoretical level: experiment, analysis, induction, deduction, as well as observation and generalization.

Results. There are many versions about the origin of the kiss. One of them connects the emergence of a kiss with people who lived in the Stone Age. The neighbor's skin was a source of salt appears when sweating. People kissed when they needed salt. Another absolutely unromantic version of the emergence of such a romantic gesture is the following: each person needs sebum, a moisturizer that is secreted, including lips. To satisfy their need people kiss each other. As a result, it turns out that the kiss didn't appear at all as a means to be closer to a loved one, but only for the sake of ordinary human needs. Anthropologists believe that kissing people can be compared to sniffing of dogs. Kissing someone you get information about this person. It was believed that with the breath, a person can open his soul and heart. The kiss was considered as a symbolic wedding and the unity of souls. Previously, the kiss was a sign of trust. By letting another person come to him so close, people showed that they are not afraid of him, that they trust him completely.

Some researchers consider the kiss to be congenital. For example, Sigmund Freud was convinced that the kiss is the instinct of man, the thrust of a newborn to the mother's breast. In 1960 the British zoologist and ethnologist Desmond Morris suggested that kiss arose from the habit of female primates to chew food for babies, and then to put it in the mouth, having compressed the tube of the lips. Over time mother kisses evolved into romantic kisses. Kisses are correlated with a person's health. During "prolonged" kisses, the person's pulse speeds up to 110 beats per minute. It leads to better circulation, pumping an extra liter of blood. Lungs begin to work in a strengthened mode: 60 breaths per minute instead of the usual 20. Such "ventilation" is the best prevention of pulmonary diseases. Holding the breath at a kiss can have a very beneficial effect on the body, like the breathing techniques of yogis. During a kiss the formation of saliva is stimulated which

perfectly protects teeth from caries due to the content of calcium and phosphorus in it. In addition those who often kiss are less prone to periodontal disease. The best treatment for gum disease is their massage. A passionate kiss causes tension of more than 30 facial muscles. The skin is smoothed, becomes more elastic and is better supplied with blood. The analgesic effect of the kiss is connected to the hormone endorphin. More passionate kiss produces more endorphin. For one kiss the body produces a soothing dose of hormones, which exceeds the minimum dose of morphine. When kissing there is an adrenaline rush that provides us with joyful activity and “attacks” the stress hormone cortisol. And only three kisses per day provide an extremely romantic and peaceful mood for a whole day. Approximately 80% of bacteria that are contained in saliva are absolutely the same for all people, but about 20% are very individual. When they are in the mouth of another person, they give the immune system an impulse for the process of antibody formation. In medical practice this process is called cross immunotherapy.

Express analysis for genetic compatibility. And it is not an exaggeration! While you are kissing, the brain instantly conducts a chemical analysis of saliva and decides your genetic compatibility. So don't be too long with the first kiss. It is better to understand immediately whether you match one another. In general, the kiss causes a significant increase in the pulse (up to 110-120 beats per minute for men and up to 180 for women). It leads to an improvement in blood circulation, pumping an additional liter of blood. The cells thus receive additional oxygen, and the vital tone increases. During the kiss the process of separating some extremely harmful chemical compounds slows down, which has a very positive effect on the whole body work. Who often kisses is less suffer from diseases of the blood, stomach and gall bladder. With the help of a long kiss, you can get rid of hiccups. Holding the breath at a kiss can have a very beneficial effect on the body, like the breathing techniques of yogis.

However, one shouldn't forget that kisses are also carriers of many infections: colds – ARVI, tonsillitis, acute respiratory infections, influenza and herpes, stomatitis, gastrointestinal diseases, tuberculosis, viral infections, such as hepatitis C, HIV.

Conclusions. Now there are a lot of studies that negatively relate to kisses as harm to health. Anyway kisses have more healing properties than side effects.

ALCHEMISTS' CONTRIBUTION TO THE DEVELOPMENT OF PHARMACY

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Introduction. Alchemy is a peculiar culture phenomenon, especially widespread in the West Europe in the period of Middle Ages. Alchemy period in the chemistry history and pharmacy covers twenty centuries (IV–XVI ages) and takes origin from places where Latin formed and developed. The primary alchemists' goal was transformation ("transmutation") of basic metals to noble metals, using image substance - "Stone of Wisdom". In the process of their activity alchemists have disclosed first elements of chemical knowledge. Without even knowing, they have found a lot of helpful substances which down the ages were put in the service of humanity.

Aim. The purpose of this work is to try, based on researches in the field of the history of alchemy, to characterize the territorial frameworks in the context of the historical epochs in which alchemy originated and developed, with consideration of the prevailing alchemical philosophy and world view, as well as the contribution of well-known alchemist scientists with the purpose of a more complete explanation of the main directions of the development of pharmacy in general. However, the main accent in this work has been placed, nevertheless, on a historic period of Europe.

Materials and methods. In the course of writing the work different methods were used, particularly: research and analysis of literature, generalization, comparison, induction and deduction methods.

The material for the study was the work of researchers in the history of chemistry and the ways of its development, most of which contain a description of the alchemical period and represent a wide range of alchemical processes, detailing and exploring all kinds and forms of alchemical vessels, signs and much more. At the same time, it is extremely rare to find a generalization of materials within the framework of the direct contribution of alchemy to the pharmacy, which in fact became the main direction of this study.

Results and discussion. To understand the essence of the influence on the pharmacy of its alchemical period, it is necessary to be deeper into a history that goes back to ancient antiquity.

Alchemy prospered only in the countries, where carried out the regularly and stable exchange of goods and money, how it was in the Hellenistic or Islamic

States and later, in Renaissance era, in Europe.

On the ground of the facts, presented in the work, it can be concluded that, without knowing the substance of effects and processes, alchemists of all historical eras carried out a great experimental work. They set as their main goal the transformation of cheap metals into gold, often aiming their efforts at obtaining a universal leaven that would help transform one substances into another.

Alchemists were well educated people, who know different languages. They revealed sulphuric, benzoic, nitric acids, corrosive sublimate and a number of another substances. As a result of their experiments, they developed and improved such processes as: precipitation, filtering, crystallization, constructed appliances for receipt of distilled water, alcohol, essential oil and turpentine. With the object of getting more concentrated distillation products of spirits, alchemists applied thrice-repeated and fivefold distillations.

All of this promoted development of the chemical and drug production, as well as had a great effect on development of a lot of sciences. However, a lot of alchemists' misconceptions for some time directed pharmacy to the wrong way. The idea of panaceas and elixirs of immortality did not leave experimentalists for a long time, that allowed them constantly to search and develop.

Later, on the ground of enormous factual material, that was collected by alchemists, formed a recent trend in the medical and chemical field, that gave birth to the modern pharmacy, known formally as iatrochemistry and medical chemistry. In general, rational courses in alchemy - iatrochemistry and technical chemistry – have achieved quite significant experimental successes and provided a base for scientific chemistry, the formation of which began in the middle of the XVII century. Alchemical traditions were preserved in the science for a long time. Nowadays, this field is presented in the form of union of alternative medicine with phytotherapy.

Conclusions. All alchemical period is characterized by the development of practical and craft chemistry. In each of its fields one can see the rudiments of positive knowledge. Without scientific evidence of the processes taking place in nature, the alchemists strived to penetrate into its secrets by countless experiments and thus paved the way for the formation of pharmacy and medicine. To carry out all this knowledge through the ages helped the Latin language, which has its own unique history and, ironically, became the main element in the word formation of the modern world.

PARADOXES AS A TOOL OF SELF-DISCOVERY

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Introduction. Paradox is a situation (statement or conclusion) that can exist in reality, but has no logical explanation. By analyzing paradox formulations and finding some concrete examples, one can approach the understanding of many aspects of the uniqueness of the human personality.

Aim. To select all the existing kinds of paradoxes. To give formulation of three various paradoxes and to analyze them. To give the examples reflecting modern realities and confirming the truthfulness embedded in the formulations of the paradoxes of meaning. To make a conclusion.

Materials and methods. The content of the term “paradox” is disclosed. All varieties of paradoxes are systematized. Three paradoxes belonging to different species are taken. The chosen paradoxes most successfully reveal the multifacetedness of a human person, with a careful analysis of their formulations, and also meet a person on a daily basis, which emphasizes their importance in life’s realities. Paradox-ship of Theseus. This paradox belongs to a class of paradoxes-definitions. Its formulation is such as: if each element of the ship was replaced at least once, can we consider the ship as the old ship? On the one hand, let the ship remain unchanged, but on the other hand, will it function in the same way? Example: In the 1980ies many publicists analyzed the causes of the collapse of the command and administrative system of the Soviet Union. The most popular explanation was this: First, representatives of this system were not afraid of responsibility, their energy was very strong and creativity “was off scale”. With each successive generation, the functionaries of this system “milled”. Chiefs selected helpful workers who were afraid of personal responsibility. So gradually the command-administrative system degenerated. Why did it happen? The functionality of the human system of relations depends on a huge number of factors and it is necessary to take into account at least the most important of them, producing personnel rotation. The paradox of Hegel. This paradox refers to paradoxes of self-affinity. One of his formulations is this: “History teaches a person that a person doesn’t learn anything from history”. This formulation is based on a mechanism of “confusion of meanings” and the use of tautological ringing of words. Consequently, the conclusion about a paradox of the phrase follows from its inaccurate understanding. Based on the

imagery of the expression “history teaches” and by including subjects to which they are attached, it is possible to alter the original tautological formulation. It turns out: “Historical facts show it to researchers, descendants (“us”) that people who influence the course of history, make historic decisions (“people”), repeat the mistaken decisions of the past”. In such an exact paraphrase we can speak about a true logical meaning of these statements, since they are confirmed by facts. The paradox of a person’s choice, which belongs to a class of the same paradoxes. A larger choice may lead to a worse decision or in general a refusal to make a decision. Theoretically, this is due to information overload as well as “rational ignorance”. However, this paradox has an opposite side. Sometimes mental abilities of a person facing a responsible choice are exacerbated and he makes the right decision. Obviously, this is due to the uniqueness of an individual which proves the validity of paradoxes as an instrument of self-knowledge.

Results and discussion. The systematization of paradoxes has distinguished their connections with various aspects of life. Disclosure of the meaning of the wording of paradoxes and the reduction of examples, made it possible to compare the content contained in the formulations with reality and made it possible to draw conclusions about the significance of paradoxes in the knowledge of the intricacies of the uniqueness of the human personality.

Conclusions. Using the analysis of the above paradoxes we can look at a particular problem under completely different angles. Each paradox opens new facets of the human personality and allows to understand its features better. Considering the hidden and superficial meaning of their formulations we improve our thinking abilities. Connection of paradox and many aspects of modern life leave no doubt about their exceptional benefits. Paradoxes can be called as an excellent tool for self-knowledge.

HISTORY OF ORTHODOX CHURCH IN UHLIA VILLAGE

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Introduction. Major archaeological studies indicate that the population of Transcarpathia, where Uhlya village is situated, has always been closely connected to Eastern Slavic tribes and constituted one of the branches of East Slavic community.

Historical sources tell us that in the second half of 1st millennium AD Transcarpathian area was populated by white Croats, who united along with other Eastern Slavic tribes into a single community during 9th and 10th centuries and adopted a name – Rus.

During the second half of the 11th and 13th centuries, the Hungarian Kingdom used the decline of Kievan Rus as a pretext for occupation of Transcarpathian lands. However, local people firmly adhered to the Orthodox, which was a sign of national identity.

Aim: to study the history of creation and development of the Orthodox Church in Uhlya village on the basis of documentary and archaeological evidence that have remained to this day.

Materials and methods: systematic, historic, cognitive methods, heuristic search, historical and typological comparisons.

Results and discussion. Parish Orthodox church in Uhlya was first mentioned in 1438. This village was also home to one of the first Orthodox monasteries, which according to chronicles was visited by Slavic educators Cyril and Methodius. In the 16th century, Uhlya Orthodox monastery was visited by ambassadors of the Russian Tsar Ivan the Terrible. Upon entering of the Church Union into force, Uhlya village became a fortress of orthodoxy.

Conclusions. This study proved that Uhlya has always been and still is a center of the Orthodox in Transcarpathia. Residents of Uhlya (like all Transcarpathian Rus) have firmly professed Orthodox for centuries and retained their nationality, although their development took place in conditions of foreign economic and spiritual oppression.

Section 21.
PHILOLOGY

HEALTH PROVERBS IN RUSSIAN, FRENCH AND ARABIC LANGUAGES

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Health is the greatest value of any human: it is dearer than all riches, after him it is necessary to watch and save from young years. Health and correct feed it is impossible to divide in life. Leo Tolstoy said yet: «Manual labour is improved by a health and encourages intellection». Greek philosopher Socrat had added: «We live not for that, that am, and eat in an order to live». Without application of correct steps for the maintenance of health illnesses, which treat oneself more difficult, than saved, come to the people

A proverb is a small form of verbal folk poetic creation, there is short-story, ritmizovannoe saying, expressing folk wisdom, generalized idea, conclusion, allegory, having edifying sense

We will consider proverbs about a health in the Russian, French and Arabic languages, part on the followings 5 groups on semantic values: are resources of nature for a health; are factors of health; it is a health as riches; it is illness as enemy, factors of illness; are medications for a health. More than 70 Russian proverbs were studied with the indicated values. In the French and Arabic languages it is possible to find the enough complete or partial proper by him analogues. From present analogues will mark the

In a group «Resources of nature for a health» to the Russian floorboard «A sun, air and water, help us always / our best friends» correspond Arabic: «House a sun is included in which, a doctor cannot visit»; «It is better to breathe crisp air, what to drink medications». In a group «Factors of health» is there the Russian-French absolute analogue «In a healthy body healthy spirit» – «Une me saine dans un corps sain». In a group «Health as riches» the absolute Russian-French analogues: «Здоровье дороже богатства» – «Santé passe richesse».

Is a «health dearer than riches» – «Sant passe richesse». By partial analogues on sense «health – these all» are Russian-French-Arabic: Did lose a «money – lost nothing, lost time – lost much, lost a health – lost» everything – «Quand la sant? va, tout va» – «who has a health, there is a hope, and who has a hope – there is all». To the partial analogues it is necessary to take also proverbs «Healthy will be and money will extract» (light brown.); «Printemps de la vie ne revient jamais » (fr.);

Thus, Russians, the French and Arabic proverbs call to save a health as irreplaceable value, teach the general moral norms of everybody, regardless of his social origin and religion.

**A COMPARABLE ANALYSIS
OF PHRASEOLOGICAL EXPRESSIONS IS
IN THE RUSSIAN AND TURKMENIAN LANGUAGES**

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The oldest cultural and economic ties between Turkmenistan and Russia led to the compulsory study of the Russian language in Turkmen schools. This fact contributed to the interpenetration of languages. There was a borrowing of proverbs, utterances and other stable expressions.

The aim of this work is an phraseological expressions in the Russian and Uzbek languages analysis, having semantic likeness.

The comparable one was used as **a method of research**.

Different proverbs and sayings were analyzed. For example: *will not pour out by water* - are very close friends – iki bedende bir ruha menzär – *one soul is in two bodies*; *a bad head does not give the feet of rest* – a foolish man does a superfluous work – akmak kelle aýaklary gününe goýanok – *the reckless head of leg abandons in the sunshine*; *after a shower on Thursday* – an event will happen not very soon– eşegiň guýrugy ýere ýetende – when the tail of donkey of earth will get; dry spoon a mouth tears to pieces – if will not endow somebody, will indispose in the benefit – *gury sözden palaw bolmaz* - *from dry words a pilau will not be prepared etc.*

As a result of analysis there was made a **conclusion**, that most phraseological units in two languages have sufficient distinction in a structure and form, that is related to the features of religion, culture, climatic terms, animal kingdom, national kitchen and other.

In bilingual conditions a lexical tier is indeed tested by strong foreign influence: words migrate freely, the different types of counter-drawing are widely widespread.

DIFFERENT WAYS OF LEARNING ENGLISH

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Introduction. Why are people interested in learning English at University and independently ? Nowadays English plays important role among young generation. It is the most spread language all over the world. Every single year the percentage of students increases who are interested in learning English.

Aim. To indicate all ways of learning English.

Results and discussions. When student learns English at University he faces one obstacle. How to learn to speak English in an oral way ? What must be done? If learning of English happens in technical institution of higher education one obstacle arises itself unexpectedly it is a little number of classes of English a week. Only one lesson a week. It is not enough because learning of English requires much more lessons of English a week. This obstacle affects a student. Student searches for other possibilities of learning English:

1. To learn English independently. It is good possibility. But it depends on spare time of student. As far as we know every single student doesn't have a spare time at all. A) Attendance of classes from morning till afternoon, B) Returning home. He is tired after classes but he can find spare time in a such state: To listen to music on TV set in subtitles, to study grammar, to read a story and make up a question to every sentence, to make up sentence to every question, to do grammar exercises in a written form. It can be done every single day without stops for thirty minutes and especially on Saturdays and Sundays where student can find a spare time of learning English independently.

2. To find someone from abroad – it means foreign student. There are a lot of students in our country. If even student doesn't know English very well and if he knows English grammar a little it will help student enlarge speaking skills step by step. Foreign student will help him. The more student sees person from other country the quicker he speaks English orally. Speaking to foreign student won't cost student anything. It will happen paylessly because some students from other country can speak Russian, the rest of them cannot speak Russian at all. It will be easy for them to speak English to our students without using Russian.

3. To learn English abroad will affect student heavily. He will not look for spare days to meet somebody from other country he will see foreign people constantly because he will live in the family. For several months of his stay in other country, our student will improve his speaking skills and he will achieve his objective of speaking English orally in a quickest way. So this way of learning English is the best way for student to do but he will have to pay money for this achievement and he will succeed in doing it without complications.

Conclusions. Every single way of learning English is good. It affects student very much. He is able to learn English. He will get over obstacles (English) because it is his purpose. Everything depends on him.

**IBN MERIT – SINS IN PHARMACY:
STUDYING RUSSIAN ORIGINAL SOURCES**

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In middle ages on East the questions of particular and general pharmacology of medications were studied by the prominent scientist of Ibn-Sina antiquity (Avizenna), in the studies of which operate, three governed: 1) rule of choice of medications on his quality; 2) rule of choice of medications on his amount; 3) rule of distributing of time of reception of medications.

In the second book of « medical science canon » he describes the questions of general pharmacology in detail, scientifically more than 50 varieties of pharmacological action of simple medications ground a display, examines ten of varieties of pharmacological effects, related to the combined setting two or more medicinal preparations. Pharmacological, pharmaceutical and pharmacotherapeutic descriptions 811 medications vegetable, animal and mineral origin

An action and force of simple medications are researched scientifically by a test and comparison. Position of Avizenna that is been «tested better untested» topically in our days advertising and setting of new, pharmacological insufficiently known synthetic medicinal preparations. He teaches that medicine must be free of influence of physical, chemical, and other factors, changing its activity

Also tested by medicine illness must be outage, I.e. without complications. It is necessary to test medicine on two opposite illnesses, because it sometimes helps from one of illnesses by the creature, and from other - side. Position of Avizenna that it is not necessary to «use constantly the same medicine for treatment of the same patient», testifies to that a scientist knew about getting of organism used to medications, about the sinergistical and potential types of co-operation

The fifth book of « Medical science canon » contains two chapters. First chapter «About complete medications, plugged in a pharmacopoeia» consists of 12 independent reasons, characterizing composition and methods of preparation applied to X v. of 654 difficult medications. A chapter is second «Test of medicine for every separate disease» consists of 8 reasons and is composed as a reference book «Symptoms and their treatment». In all 716 recipes of difficult medications, including Wiens and syrups, are described in a fifth book

Thus, a study and scientific analysis of pharmacological legacy of Ibn-Siny in the Russian original sources exposes the secrets of ten of medications and this centuries-old and richest experience puts on service modern humanity.

NEW IMPACT OF THE ENGLISH LANGUAGE ON EDUCATIONAL SYSTEM IN THE CONTEXT OF GLOBALIZATION

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Introduction. During the last century, basic formal education has become an ideal the world over. According to the American Academy of Arts and Sciences, higher proportions of people than ever before are completing primary, secondary, or postsecondary education (Joel E. Cohen, Martin B. Malin, 2009). The study indicates that the emergence of English as a global language is having considerable impact on policies and practices in all countries. Scholars say that about one-fourth of the world's population can communicate to some degree in English.

Globalization is used to explain the recent integration of domestic economies, industries, cultures and government policies around the world. This integration has occurred through increases in the technological capabilities and efficiency of world trade, communication and transportation. Primarily, globalization refers to the economic integration of the global markets, but it is also used to describe the socio-cultural integration that has been brought on by the rise of the Internet [2]. The term can also refer to the transnational circulation of ideas, languages, and popular culture.

The present article **aim** is to show the importance of the English language, as the key for international understanding and world regulation, under the phenomena called globalization.

The **method** used for the production of this study was the thorough examination of articles, e-books and websites linked to the issue.

Results and discussion. English has consolidated its dominance as the language of the Internet, where 80 percent of the world's electronically stored information is in English, according to David Graddol, a linguist and researcher.

Beyond the criteria of native language, and priority foreign language, it is difficult to quantify the proportional use of English versus other languages in everyday life. Nevertheless, applied linguists have provided some data. In academic contexts, Swales (1987) estimated that more than 50% of the millions of academic papers published each year are written in English, and the percentage was growing year by year. English is currently the undisputed language of science and technology, and scientific journals in many countries are now switching from the vernacular to English. In specific disciplines, English appears to be the universal language of communication.

There may be more native speakers of Chinese, Spanish or Hindi, but it is

English they speak when they talk across cultures, and English they teach their children to help them become citizens of an increasingly intertwined world.

At telephone call centers around the world, the emblem of a globalized workplace, the language spoken is, naturally, English. On the radio, pop music carries the sounds of English to almost every corner of the earth.

English and globalization have spread hand in hand through the world, Warschauer said. "Having a global language has assisted globalization, and globalization has consolidated the global language," he said. That process started with the dominance of two successive English-speaking empires, British and American, and continues today with the new virtual empire of the Internet.

Also, the overall number of international migrants has increased in the last few years from the estimated 152 million in 1990 to 173 million in 2000 and to 244 million in the present. The percentage of migrants in the global population increased from 2.9% in 1990 to 3.3% in 2015 (United Nations, Population Division, Department of Economic and Social Affairs (UN DESA), Trends in International Migrants Stock, 2015). The English language is the nowadays tool for not only international organization and communication but also for communication in country.

Education for the global era is education for lifelong cognitive and behavioral engagement with the world.

Conclusions. English is a key component of economic competitiveness at both the individual and national levels. Higher English proficiency correlates with higher incomes, better quality of life, more dynamic business environments, greater connectivity, and more innovation (EF English Proficiency Index, 2016).

Fluency in more than one language and culture is no longer an option - it is becoming a prerequisite for career advancement.

By the most common estimates, 400 million people speak English as a first language, another 300 million to 500 million as a fluent second language, and perhaps 750 million as a foreign language.

The world's top universities are shifting into English, but the move is not without its difficulties, for faculty and students.

Reforming education to be more in tune with the new global reality will require focused energy, creativity, political will, and a commitment of resources on the local, national, and international levels.

Education for globalization should aim to educate the whole child for the whole world.

The world needs people who are culturally sophisticated and prepared to work in an international environment.

LATIN IN ENGLISH MEDICAL TERMINOLOGY

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Today there are no people whose mother tongue is Latin, but the majority of physicians, pharmacists, biologists and other specialists continue to use Latin actively in their profession. From generation to generation medical students around the world study Latin. The long-standing practice of this language unites physicians around the world, it contributes to the unification of the medical literature and education in general. The discipline "The Latin Language and Medical Terminology" is already taught in the course of any medical university. Indeed, *In via est in medicina via sine lingua Latina* – There is no way into medicine without the Latin language.

The peculiarity of this language is that one word can convey meaning more than one word at a time, while in other languages it would have to be denoted by different words, for example: amblyopia, ae, f - amblyopia without objective pathological findings in the eye, keratitis, tidis f - inflammation of the cornea, etc.

Latin plays an important part in pharmacology. Translating into Latin different drug names is a common practice for any specialist. The Knowledge of Latin enables physicians from different countries to understand each other without difficulty. This is the only way you can navigate the vast majority of drugs.

The total number of individual compounds made therefrom and combined dosage forms of drugs used in modern medicine is up to many thousands. This inevitably led to a very confusing drug names. The abundance of existing and ever-increasing number of new drugs is not only difficult to memorize but they can lead to inaccuracies in the selection of the necessary medicines. It is now challenging to understand the jungle of drugs and their names. This leads to the difficulties that arise in the pharmacy drug trade over the last decades, so it becomes obvious how important is to understand medical and biological nature of the drug using only the drug names.

Hence knowing the Latin language has always been considered the foundation of European education,

Much water has flown under the bridge since ancient times but Latin continues to be a basic language of medicine. By the way, it has one of the richest terminology system, which contains more than 500 thousand words. It will be impossible to learn all the names but the knowledge of Latin can help to understand the majority of medical terminology.

TO THE QUESTION OF ORIGIN OF LATIN EXPRESSIONS

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Introduction. Ancient Latin expressions have a great value. Ancient expressions have played an important role in the history of many nations. They have become an integral part in the development of thinking abilities both of individuals and countries in general. Sayings and proverbs bring up in people the desire for self-improvement, which is an important aspect of everybody's live. It is important to state that such expressions were often used by fraternities, colleges and societies of the Middle Ages.

Aim. The aim of the research is to study popular Latin expressions and their origin. Popular expressions are linguistic phenomena, since by their nature they are complex subjects, which in their various manifestations can have different features. The research of popular Latin expressions helps us to understand what the author had in mind and what thoughts inspired him to create this idiom.

Materials and methods. More than fifty popular Latin expressions were researched and divided into five groups according to their origin. The names of these groups are: quotations from the works of ancient authors, statements of public and political persons, sayings of ancient men of wisdom, philosophers and scientists, the Bible, phrases that have lost their author, but are found in many texts. After comparing the content of the groups it became clear that, due to their origin, Latin popular expressions have different way of development and usage.

Results and discussion. Any existing expression is an expression of author's intention. It is well-known that an idea is the prototype of the future expression, where the origins of the main elements of the content can be found. The impulse to create expression may become feelings, emotions, or even insignificant facts of reality. The goal of expression is the creation of the thought with the help of which a person can understand the words.

Conclusions. Latin sayings and proverbs are widely used nowadays. Some expressions are well known in the world today. "Contra spem spero!" used by Lesya Ukrainka unlikely to be ever forgotten by Ukrainian nation. "O tempora, o mores!" by Cicero, always forces us to pay attention to the corruption of power and motivates to fight with it and such expression as "Ubi panis, ibi patria" helps to understand that "From East to West home is the best".

NEOLOGISMS IN MEDICAL TERMOLOGY

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Living language is a dynamic existence. It is constantly developing its internal and external resources. And of course it abandons old forms and creates new ones and its content, improving its expressive means and devices through their structural or simplification or complication.

Changes in language take place at different levels – morphemic, phonetic, lexical, syntactic, etc. But lexical changes are the most noticeable. It is obvious that new unknown word, neologism, always attracts attention.

Neologism is a new word or an old word with new meaning. New ideas and variations on the feelings come from the media. Several years ago, three hundred new words, allegedly recorded in four consecutive number of French language weekly express. It was stated that each language acquires three thousand new words a year.

Language innovations also concern medical terminology. Neologisms are defined as newly coined lexical units that take on new meaning.

There are two types of neologisms: stylistic neologisms and lexical neologisms. We use stylistic neologisms to express some conceptions or definitions with the new word (a known word, but with different meaning). For example, "heart failure".

Lexical neologisms are completely different. They are used to identify new conceptions or definitions, but the words can be both new and old. For example, "pilot study" – means experimental research, "red hypertension" – means benign arterial hypertension, "rodent cancer" – means hair matrix carcinoma etc.

There are advantages and disadvantages of neologisms in all languages, especially in medical terminology, but it is essential to point that they are inescapable in the face of rapid advances in knowledge, equipment and information dissemination to and through diverse cultures and languages. In their assimilation we should be considerate in discarding familiar terms that have served time.

BINOMIALS

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Introduction. Binomial nomenclature is a formal system of naming species of living things by giving each a name composed of two parts, both of which use Latin grammatical forms, although they can be based on words from other languages. Such a name is called a binomial name (which may be shortened to just "binomial"). The first part of the name identifies the genus to which the species belongs; the second part identifies the species within the genus.

Aim. The primary aim of the research is to classify binomials in English. Addressing this question with binomials is especially interesting, as these constructions have been most extensively studied in previous research and it is thus possible to directly compare the results to previous findings.

Materials and methods. More than 300 binomials have been studied, compared and classified. The following methods of linguistic investigations have been used: distributional analysis, transformational analysis, component analysis, contextual method, and statistical method.

Results and discussion. The phrase, which is a binomial, consists of words having something in common with each other. Words that make binomial in English can be synonyms or antonyms. They are linked by phonetic features — have similar sound or rhyme. Their connecting element can be grammatical aspect and reduplication (repetition of the same word). Binomials can be classified as follows:

Binomial, grouped on the basis of sound patterns. E.g.: Wine and dine — to entertain, feed, water; Part and parcel — an integral part of something; Prim and proper — prim, prim; Rant and rave - rant and rave, to arrange high-profile stage; Born and bred - born and raised elsewhere; Rough and ready - in haste, hasty, harsh; Rack and ruin - complete ruin; Tried and true - tested, tested; Feast or famine - the thick, it is empty; Life and limb - life and health.

Binomial, consisting of inaccurate synonyms. E.g.: Peace and quiet — peace and quiet; First and foremost — first of all, first of all; Pick and choose — to be picky, finicky; Heart and soul — with every fiber of the soul selflessly; Leaps and bounds - very quickly; at breakneck speed; rapidly; by leaps and bounds; Null and void - lost legal force, invalid; Plain and simple - plain and simple; Rest and recreation - recreation and entertainment; Cease and desist - stop action!(command); Clean and tidy - clean and tidy.

Binomial, consisting of antonyms. E.g.: East to west — in one direction; Days

and nights — around the clock continuously; Win or lose — win or lose; Life or death — a matter of life and death, the crucial question; Rank and file - the rank and file representatives (trade), ordinary members of the organization; Give and take - a compromise, exchange pleasantries, opinions, jokes; High and low - everywhere, all sectors of society; Hill and dale - the mountains and the valley .

Binomial, consisting of function words (grammar / grammatical words). E.g.: Up and down — the ups and downs everywhere; Here and there — sometimes, in some places; Down and out — robbed poor, helpless; Back and forth - back and forth; Out and about - in a good shape, recover from illness; On and off - from time to time, sometimes sporadically; All in all - ultimately a whole eventually; To and fro - up and down, to and fro; In and out - up and down, back and forth, with varying success.

Binomial, in which the words are not connected and (or do nothing connected). E.g.: Back to front — inside out, backwards; Take it or leave it — yes or no; at your discretion; as you please; All or nothing — or nothing, all or nothing; Slowly but surely - slowly but surely; the quieter you go, the further you'll get; Sink or swim - it was not, come what may; More or less - more or less, approximately, to one degree or another; Tit for tat - tooth for a tooth, an eye, a quid pro quo; Helter skelter - negligence, lightheadedness, turmoil; Sooner or later - in the end, sooner or later; Floor to ceiling - floor to ceiling; Never ever - never, in life.

Binomial with repetitive words. E.g.: Again and again — repeatedly, over and over again; Little by little — little by little, slowly, slowly; Horror of horrors! — Quiet horror! Measure for measure — an eye for an eye, a tooth for a tooth; Time after time - again, more than once, all the time; Live and let live - he live and not a hindrance; Wall to wall - covering the entire floor; Bit by bit - step by step, slowly, slowly, slowly; Day in, day out - every day, monotonously; Neck and neck - head to head, almost level.

Conclusion. Using binomials correctly can make your English sound more fluent and make it easier for people to understand you. If you get the words in the pair in the wrong order, people will still understand what you are saying, but it may sound strange to them.

TRAIN YOUR MIND AND HAVE A HEALTHY LIFE

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Introduction. What do we know about bilingualism? A bilingual person is someone who speaks two languages. A person who speaks more than two languages, actively (through either speaking, writing, or signing) or passively (through listening, reading, or perceiving) is called 'multilingual'. The term 'bilingualism' can be used for both situations); just as exercise changes our body physically and chemically, as surely the mental load changing it. In spite of all advantages that second language gives us it is the process that occurs inside our bodies. More specifically, the terms *bilingual* and *trilingual* are used to describe comparable situations in which two or three languages are involved.

Aim. To show how the learning of foreign language effects to our body.

Language creates our first connection to the world. Immigrate to a new country is the cause of bilingualism in children and speak their native language at home. While the children speak language of the country at school, they have not spoken their native language, but parents should remember the significant benefits that their children will get in the future. Bilingualism is not the cause of language delay or language impairment. In fact, one language might have negative consequences on the child's language acquisition. Reverting to one language in the family will not improve the disorder. However, maintaining a well-structured bilingual setting in the family is crucial in helping the child in its development.

Materials and methods. Let us first go through a tour of neurological science nerve cells consist of a body (soma) and the axon. It transmits information from one cell to another, so if we look at the picture in the section of the brain we will find that the outer part of the brain is grey and interior is white. It is grey from the fact that the nerve cells of the somas are assembled there, and white part is the interweaving of axons, which is wrapped in myelin a substance that allows current to go with fast speed.

What are the myelin and a foreign language? It is a constant struggle in man between two languages and he always must suppress the desire to speak another language.

How does the brain manage this additional workload? One way to cope is increase the amount of myelin, an additional amount of myelin leads to faster and more qualitative information transfer.

Now get out a little into psychology. Can the language turn effect of your

thinking? Psychological research suggests that people who speak two languages, their emotional, results of the situation and perception of the world were subjective less. It makes their decisions more rational and objective. In another study, the researcher Ramirez-Esparza asked bilingual that establish their characters in both English and Spanish using a poll in both languages. Ramirez-Esparza said: "The language a powerful tool, they make you see yourself differently".

The research has investigated that bilinguals use their languages to express emotions mostly in adults. Memories encoded in the native language are typically richer in terms of emotional significance than memories encoded in the second language.

That is why the second language is typically acquired in more emotionally neutral setting than the first language. Delaying the onset of Alzheimer, sick people have bilingual signs of diseases such as Alzheimer's or Dementia five years later than others have. It does not mean that the disease will come to them later but by the cognitive point of view, they have much higher lag with straps. At that time, their release will be much longer when they feel the violation.

It was studied after the accident in India that the plasticity of the brain after injury is much higher than in the bilingual. Their cognitive function is faster in twice than who know one language. "The idea is if you have a lot of mental exercise, your brain will be the coach and can compensate better."

Results and discussion.

- 1) Bilinguals of two spoken languages have more white and grey matter than monolinguals.
- 2) Improve brain activity and problem-solving abilities.
- 3) Protect person from the forgetfulness and memory loss.
- 4) Foreign language leads to a reduction of heuristic biases in making the decision.
- 5) The foreign language effect is not due only to a reduction of emotional resonance.
- 6) Bilingual patients had been diagnosed 4.3 years later and had reported the onset of symptoms 5.1 years later than the monolingual patients had.

Conclusions. In conclusion, I believe that all people should have access to bilingual education. This type of education is one, which truly benefit all individuals as both current and future members of our multicultural society, and in sum, there are no overall disadvantages to bilingualism.

ENGLISH DIALECTS

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Introduction. The relevance of our research is determined by the increasing interest of people all over the world to the English language, the penetration of this language into all the spheres of activity, people's aspiration to understand the English language better and to learn its history.

Aim. The aim of our scientific work is to study the distinctions of the English language pronunciations and the formation of the English dialects.

Materials and methods. The materials of our research are English textbooks and the textbooks devoted to the history of the English language. The descriptive method of research was used.

Results and discussion.

Each language is unique in its own way. One of the uniqueness signs is a variety of pronunciation that is called a dialect. The dialect is a local manner of speaking which shows not only the history of the language, but also the history of entire nation, and even history of the formation of the state itself.

In the English language there are two main dialects: British (royal) and American which in turn consist of a great number of other dialects. They sometimes differ in so many ways that two English-speaking people cannot understand each other. In the manner of speaking of some certain inhabited territories the slangs, expressions, specific pronunciation of some words are formed (for example, the word "alcohol" in the American dialect and "spirit" in the British). In addition, the pronunciation changes according to the place where the person who is speaking from. Having a conversation in English, he or she can pronounce some words in his or her own way and, communicating with this person, other people can involuntarily catch this pronunciation.

Conclusions. The study of dialects of a language leads to the development of person's thinking, and to the improvement of understanding people of different cultures. Knowing dialects, a person will be able to learn the roots of his interlocutor and easily find a common language with him. Languages reflect people's identity. So, very often knowledge of different dialects can give us much useful information about the ways of life of people we are talking to, to notice some peculiarities of their culture, expressed by the dialect they are using in their conversation.

LINGUISTIC CHARACTERISTICS OF THE REALITIES AND PECULIARITIES OF THEIR TRANSLATION

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Introduction. Translation plays an important role in the cultural development of mankind. Thanks to translation people of one country get acquainted with the life of other people through artworks. Therefore, the task of the translator is to convey the exact content of the original work preserving its national identity by means of another language. Our research becomes current because the question of the nature, types of realities and ways of their translation is not yet fully investigated at present. However, the role of words realities in the process of cross-cultural communication is quite important. The identification of national-marked vocabulary and phraseology and of those units, the semantic content of which is difficult to convey by means of another language, broadens and enriches the existing knowledge about the language and reality of the country of the studied language.

The main **aim** of the study is to identify the words signifying the national-specific realities as well as to study the peculiarities of their transmission by means of the studied language.

Materials and methods: In this work, a study of specific elements of the national and cultural content of the text was conducted. Specific linguistic means of their expression (that is national-cultural realities) were analyzed. The methods of their transmission by the means of the language they are translated to were shown on the base of novels and stories from the book "The American romantic prose" (the original and its translation into Russian language).

The results of our research work can be formulated as follows:

The text as a unit of communication conveys certain information, which may reflect facts and features of the national culture. This part of the text content along with relevant linguistic means form the national and cultural aspect of the text.

There are some national specific elements in this aspect that play a special role in the interlingual and cross-cultural communication, including translation. The complete transfer of such national specific elements leads eventually to an adequate translation.

Adequacy is a relative concept and depends on the purpose which is put to the translator. It's more appropriate to consider the notion of adequacy from the point of functional-pragmatic concept.

Attempts to preserve the national peculiarity of the original work in many cases

lead to the formation of different gaps. Various schools of modern linguistics consider these gaps as national-specific elements of the culture which are appropriately reflected in the language of the native speakers. These elements are either not fully understood or misunderstood by the representatives of another culture and language during the communication process.

As specific elements of the national and cultural aspect of the text which cause the greatest difficulties in the translation process, act the realities of the national culture. The realities should be regarded as words denoting objects or phenomena connected with the history, culture, economy and lifestyle of the country of the source language that differ completely or partially from the lexical concepts of words of the translated language.

In addition, we detected a number of translation techniques that can be applied in the work with the realities. On the base of professor's G.D. Tomakhin investigation we identified the following methods which were used in practice: 1) transliteration/transcription; 2) tracing; 3) description or an explanatory translation; 4) an approximate (rough) translation; 5) the transformation (contextual) translation.

Transcription and *transliteration* are most often used in cases when we are talking about proper names, names of state institutions, educational institutions, etc. The main disadvantage of this method is that it leads to the appearance of unusual and obscure words in the translation.

Tracing is widely used to translate realities into another language. Tracing can be widely spread in the language, but still it can be an exoticism, because the concept it denotes is alien for the culture of the translated language.

Descriptive or *explanatory translation* has the advantage that it eliminates incomplete understanding which can appear while using transliteration (transcription) and tracing. But its disadvantage is that reality isn't the same as the structure unit of another language. The decisive factor in the choice between the descriptive conversion of foreign realities and their transliteration should be the factor of the connotations preservation. This is important in the description of the specific to a given country referent. The use of transliteration is used to preserve the local color.

Approximate translation is created by selecting the nearest in meaning units of language of the interpreter for non-equivalent units of a foreign language.

The essence of *transformational translation* is to transfer the realities by using lexical transformations including such translation methods as concretization, generalization, etc.

Conclusions: Because of the fact that realities are background units, it's necessary for the translator, first of all, to be a broad-minded person in order to give adequate information to the recipient in the process of translation.

PHRASEOLOGICAL UNITS IN UZBEK AND RUSSIAN LANGUAGES

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Introduction. In Uzbek tales phraseological units found themselves, which are usual and peculiar for Uzbek nation. Good hand at words bahshi (tellers) enrich dastans (fairy-tales) with work and bravery. The research showed that every school representative had their own ways and traditions of singing. Particularly, the clever poet and presentable person in it Kurgoncha Erhash Zhumanbulbul left us great literature inheritance. So, in this article we decided to talk about using phraseological units singed by poets Erhash and Phosil, because their amount of songs, original methods and lyrical style is quite different from others.

Aim. Every phrase in one language has lots of unique properties. Learning of such properties in Uzbek phraseology has its own history. Certainly, researches of famous Uzbek phraseologists have important influence and sense in Uzbek linguistic. Anyway, in our opinion it's appropriate to analyze dialectic phraseological units, which can be found in Uzbek dastans, because it would enrich lexis and phraseological resources of Uzbek language.

Materials and methods. Dastans we analyzed were recorded by kipchak dialect representors. Actually these dastans were moving from one regions to others, so there are some words and phrases which are not usual for kipchak dialect. The language of dialect phraseological units, it's structure and semantic is variety.

Results and discussion. Firstly, these are dialect-phraseological units which refer to national traditions. For example "Bular shirxo'ra bo'lib, nicoh yurmaydiagan bo'lib qoldi" (They became fosterers and marriage disappeared). In this phrase two dialect phraseological units are combined. Fosterer here is for two children nursed by one women and such children are consider to be siblings. For another thing, Sharia forbid the marriage between relatives and that's why in dialect there is a phrase "marriage disappeared". Secondly, phraseological units which touch on different parts of human's life. For example "Ko'z yoshing oqar Jayxun" (Your tears are like Zhajhun) which stands for meaning "to cry, to shed floods of tears". Thirdly, phraseological units which descript character and behavior of animals. "Tulkini ingratgan toziday" (Like a greyhound which forced a fox to groan). Fourthly, phraseological units which refer to different natural phenomena. That are some idioms like "with a nose of a day" – the time of sunset, "everything was covered by fog" – there was thick sheet of dust.

Conclusions. To sum up, phraseological units in Uzbek traditional dastans are used in different ways, for example in description of national color, actions and traditions of concrete location under the influence of extra-linguistic factors.

MODERN RUSSIAN SPEECH ETIQUETTE

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Introduction. All people have their own speech etiquette. It's interesting that we not only talk differently, but also differently keep silent. Exactly, when some people prefer to say something, others are silent.

Aim. The aim of the research is the analysis of modern Russian speech etiquette and description of some widely using Russian idioms.

Materials and methods. The main research methods are: the method of component analysis, the method of functional-parametric descriptions and the cognitive method.

Results and discussion. Comparing people of Russian culture with other people is extremely interesting but very difficult, first of all, because Russian speech etiquette has changed over past years so much that we can speak about two different speech etiquettes: old and new. There is well-known cultural myth about people who live in Ukraine that generally they aren't too friendly, they don't smile and rarely greet each other. For example, if two strangers met in the stairwell of an apartment house or in one elevator, then Europeans and Americans would be greeted but Russians don't. Moreover, we can say that the greeting in the elevator or in a park is undesirable for Russian culture medium because it implies further communication which can be aggressive. In the modern science, politeness is studying as mitigating of possible or actual aggression. Thus, when estimating strategies of polite behavior in such situations, the European strategy could be described as "we (you and I) – aren't strangers, so I am not dangerous for you" and Russian strategy – as "you aren't exist for me, so I am not dangerous for you". Russian greeting "Доброй ночи!" appeared together with night TV air. At first it was greeting of journalists to viewers. Nowadays, "good night!" sometimes is used as a greeting when somebody calls too late. In fact, such greeting is contradicted to many language standards. In European languages the similar formula (good night, Gute Nacht and bonne nuit) is used when farewell, unlike to daily greetings (English: good morning, good evening; German: Guten Morgen, Guten Tag, Guten Abend; French: bonjour, bonsoir). This expression corresponds to the usual Russian farewell "Спокойной ночи!"

Conclusions. Opposed to European Etiquette Russian doesn't require greetings from strangers in a number of situations, when further communication isn't expected or in a brief formal communication between an employee and a client. Here it is important to note that Russians aren't less polite than Europeans, but their etiquette was arranged differently.

WHY ARE TATTOOS IN LATIN SO POPULAR NOWADAYS?

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Introduction. Latin has been a dead language for more than a millennium. However, in many parts of the world, its existence is known not only to specialists, but also to ordinary people. In fact, many people still use Latin today without realizing it. A curious phenomenon of contemporary life is that Latin is making a comeback. During the latest decades, tattoos have become a mainstream part of society. According to surveys, 36 percent of Americans and 25 percent of Europeans aged 18-25 have at least one tattoo. And Latin is a very popular choice for a tattoo word phrase.

Aim. We aimed to find out how Latin became a part of modern youth culture, took the lead in the poll of 'The 10 Coolest Dead Languages', and is keeping gaining popularity.

Materials and methods. The material of the study is inscriptions in Latin language tattooed on the young people from Europe and North America. In the study, such methods as descriptive, comparative, comparative ones, induction, analysis, and synthesis were used.

Results and discussion. We have followed the main steps in history of tattoos and determined the main reasons of their taking over the youth society. We have studied special sites for Latin lovers, conducted a social survey among among students of the NUPh and visitors of the above-mentioned sites from around the world. We have found out what tattoos are the most popular among young people in the US and Europe (including Ukraine).

Conclusions. Latin language is one of the greatest and popular languages in the world that were spoken long time ago. With its popularity, Latin left to us many popular quotes that became pledge of success for many of people. Few languages can describe the many aspects of life in as great a way as Latin. Coupled with its brevity, quotes in Latin have deep meaning and tattooed show person's inner world in all its glory. Tattoo quotes in Latin have become something like public proverb by which one can say all that he/she has in his/her heart by one word or phrase. So nowadays, they have become a very popular tattoo trend.

LATIN TERMINOLOGY IN AROMOLOGY

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Introduction. Studying of the Latin language plays an important role in training of future specialists in medicine and pharmacy. Doctors, pharmacists and medical workers from all over the world study and use Latin. They use national languages in professional communication, but dominance is still owned by greek and latin terminology, words and phrases which are common since ancient times. That is why, we must give special importance to the study of Latin which is necessary in practice of pharmacists. One of the branches of alternative medicine is aromatherapy, in which essential oils are used as active substances. Oils have a wide range of pharmacological activity and contain in medical and cosmetic products. Proper use of oils is possible only with knowledge about their latin names and names of sources of obtaining of medicinal plant raw material (MPM).

Up to now not enough works have been devoted to systematization of latin terminology in aromology. Therefore, generalization of information about latin names of essential oils and medicinal plants is relevant.

Aim of research. The aim of our work is collection, analysis and systematization of information about latin terminology in aromology.

Materials and methods. Analysis and processing of literary sources.

Results and conclusion. According to the results of analysis, information about the names of medicinal plants and essential oils and their application in aromology and pharmacy is generalized.

According to the result of processing of more than 10 sources collection and analysis of information about 63 medicinal plants, which are the source of obtaining of essential oils were conducted and their ukrainian and latin botanical names were shown.

Collection and analysis of information about essential oils which are used in aromology and pharmacy and properties of these oils were carried out and their latin names were given.

The use of latin terminology in aromology is necessary , not only because it is generally accepted, but also because latin names of plants and essential oils and used around the world for accessibility of information.

The names of the majority of drugs that were used for the analysis, do not include the names of essential oils or plants that the drugs contain.

In **conclusion**, the use of latin terminology is important in aromology, as well as in other fields of medicine and pharmacy.

**WORDS AND PHRASES USED WHILE ANTISMOKE CODING
AND CLINICAL-PHARMACOLOGICAL ASPECTS
OF APPLICATION THE DRUGS
FOR NICOTINE-DEPENDENCE TREATMENT**

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Introduction: My work is devoted to verbal and medicinal means of treatment nicotine-addicted people. Nearly 50 % of long-term cigarette smokers die prematurely from the adverse effects of smoking, including cancer, cardiovascular disease, lung disease or other illness. In my opinion this risk can be reduced by smoking cessation. This question is considered to be very relevant nowadays. I will conduct the research and try to help people with such problem. Scientists develop new kinds of medicine, techniques and means for encoding. Pharmacotherapy's for nicotine dependence include nicotine replacement medications in the form of gum, transdermal patch, nasal spray. Combination therapies, long-term medication may further improve outcome with approved medications.

The aim: The aim of my work is to show people who have such problem that everything is possible. I want to consider this issue from the point of view of women, who is growing in the world of nicotine, where both men and women are smoking and it is harmful not only for their health but for all people around.

Materials and Methods: The work was composed by the evaluations of people of age 20-70 years old. All had nicotine dependence of different degree with the terms of disease no less than 4 years.

Results and discussion: During our study, we found several phrases and drugs that were tested and made a good result. The phrases such as "I feel myself more easily and free." "Peasant freshness poured into the lungs." "The type of cigarettes causes nausea and dizziness." And here are some examples of the drugs: nicotine patch, nicotine gum, nicotine nasal spray.

Conclusion: In conclusion, I would like to say that this is a very hot topic. We should stop poisoning our health, our children's health and the environment. Moreover, we must have great strength of will and desire to start treatment and to quit smoking. But, in my opinion life itself is a very interesting and valuable thing, and you should not spoil it with smoking and many such things. It is much better not to start than to try all the ways to quit.

BORROWING FROM ARABIC IN LEXICAL IN RUSSIAN LANGUAGE SYSTEM

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Introduction. While studying the historical development of the language lexical system especially distinctly there are an openness and dynamism of vocabulary observed. From the one side, old words depart to the second plan or disappear quite, and from the other – there appears the addition to dictionary composition, also due to the borrowing. It enriches expressive language facilities.

Aim. The purpose of this research is the determination of the Arabic into Russian vocabulary borrowing ways, and also division of Arabism into thematic groups.

Materials and methods. Arabism's functioning in Russian served as a research material. Research methods are description, comparison, analysis.

Results and discussion. Unlike the fully mastered borrowing, the so-called foreign words save such tracks of the foreign origin as voice, orthographic, grammatical and semantic features that is alien to the native words.

Ways of borrowing can be both verbal (by ear) and book, writing (on letters). The row of researchers considers the starting point of the Russian-Arabic language contacts in XI - the XII century, when the Old Russian merchants set durable trade contacts with Arabic one, and pilgrims from Kyiv Russ began actively to visit Christian sacred objects in Palestine, being under control the Muslim rulers of Middle East.

All Arabism can be divided into plenty of thematic groups : the vegetable and animal world; natural and climatic phenomena; social position of man; names of clothing and materials from that they are made; scientific terminology; religious vocabulary; food and drinks; names related to activity of man; names of political and economic sphere; jewels; building and their part; literature and language; military subjects; emotions and source of their appearance; measure of mass and monetary items; musical instruments; qualities of man.

Conclusions. In conclusion we can say: this research demonstrates the perspective of further Arabic borrowing in Russian studying both from the point of view of their formal mastering and from the point of view of their included in the lexical system of Russian.

LATIN AND GREEK ORIGIN WORDS IN ENGLISH PHARMACEUTICAL TERMINOLOGY

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Introduction: In the process of learning Latin and professionally-oriented English language in terms of medical school, students have the opportunity to observe a pronounced transfer of knowledge Latin to English. From 50 to 80% of the vocabulary studied in the course English for students of pharmacy specialties consists of words of Greek and Latin origin. According to several studies, the scientific text of pharmaceutical nature in English with an average of 60% English, 30% Latin and 10% international terms and words.

Aim: to identify and classify lexical units of the English language, borrowed from the Latin, on the basis of full or partial audio-visual matching.

Materials and methods: in writing this article we analyzed various sources: We studied all lexical items and divided into seven groups:

1. The names of medicinal forms:

анг. suppository – лат. suppositorium – рус. свеча (суппозиторий);

англ. infusion – лат. infusum – рус. настой;

англ. tincture – лат. tincture – рус. настойка;

2. The names of medicinal plants:

анг. ephedra – лат. Ephedra – рус. хвойник;

анг. schizandra – лат. Schizandra – рус. лимонник;

анг. ginseng – лат. Ginseng – рус. женьшень;

анг. juniper – лат. Juniperus – рус. можжевельник;

3. The names of chemical elements:

анг. carbon – лат. Carboneum – рус. свеча (суппозиторий);

англ. sulfur – лат. Sulphur – рус. сера;

англ. arsenic – лат. Arsenicum – рус. мышьяк и др.;

4. The acids names:

анг. formic acid – лат. Acidum formicicum – рус. муравьиная кислота

англ. succinic acid – лат. Acidum succinicum – рус. янтарная кислота;

англ. oxalic acid – лат. Acidum oxalicum – рус. щавелевая кислота и др.;

5. Latin verbs:

анг. divide – лат. dividere – рус. разделять;

англ. add – лат. addere – рус. добавлять;

англ. prepare – лат. praeparare – русс. готовить и др.;

6. The names of the organs and parts of the body:

англ. abdomen – лат. abdomen – рус. брюшная полость;

англ. cranium – лат. cranium – рус. череп;

англ. vertebra – лат. vertebra – рус. позвоночник;

англ. larynx – лат. larynx – рус. гортань;

7. Other terms:

англ. enzyme – лат. enzyme – рус. фермент;

англ. gland – лат. glandula – рус. железа;

англ. cell – лат. cella – рус. клетка;

In addition to being the root that creates a word, Greek words can also be found in the prefixes and suffixes used in daily language. Here is a short list:

Prefixes

a-, an- (without) – atypical – приставка отрицание;

anti-, ant- (opposite) – anticlimax, antacid – приставка против;

hyper- (excessive) – hyperactive, hypersensitive – приставка сверх, выше нормы;

mono- (one, single) – monologue, monosyllable – один;

neo- (new, recent) – neonatal, neoclassical – новый;

pan- (all) – pandemic, panorama – весь;

Suffixes

-ism (the act, state or theory of something) – racism, optimism, Buddhism

-ize (to make into something) – Americanize, legalize, computerize

-graph (something written or drawn) – phonograph, photograph, seismograph

-logy (the study of something) – biology, geology, zoology

-oid (the shape or form of something) – humanoid, trapezoid

-phobe, -phobia (fear or terror of something) – agoraphobia, claustrophobia

-phone (something that receives or emits sound) – telephone, gramophone

Results and discussion: such comparison creates the condition for a clearer understanding of the new material and, as a rule, increases the interest in studying phenomena, contributing consequently to better preserve.

Conclusions: drawing attention to the similarity of the sound coloration of the corresponding foreign words and Latin languages is a factor that positively affects vocabulary memorization. Despite some blockage of English vocabulary words borrowed from other languages, the English language as a whole has not suffered from a large influence of foreign elements. On the contrary, its vocabulary is rich, because it learned foreign-language elements, having absorbed all the valuable and necessary, rejecting in the course of further development all random.

HOW DID THE CHEMICAL ELEMENTS GET THEIR NAMES?

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Introduction: the origin of the names of the chemical elements in Latin terminology is very interesting. The etymological analysis of the names of chemical elements contributes to a more conscious mastery of chemical concepts.

The aim: to find out the origin of the names of the chemical elements.

Materials and methods: study and analysis of literature on the topic.

The analysis of science literature showed that the etymology of the origin of names of chemical elements is determined by the following facts: properties of simple substances formed chemical elements, myths of the ancient Greeks, geographical origins, and astronomical information, the names of great scientists.

For many centuries people have been searching for new chemical elements. Hundreds of dedicated and fanatical lovers of science chemists from different countries have made a concerted attempt to find a yet unknown building blocks of the universe.

Mendeleev wrote Elements of Chemistry in 1868. He ranked the nearly 60 known chemical elements according to a periodic law, linking relative atomic weights of the elements to their properties. Mendeleev's Periodic Table rapidly became the basis for understanding elements and their compounds. Undoubtedly, every schoolchild was fascinated by its first acquaintance with the "Mendeleev's garden" and the periodicity of the properties of the elements: simplicity, coherence, rhythm, inevitability. Although the existence of a chemical industry as well as the expanding chemical knowledge and new theories at the time, the unifying and generally accepted concepts were missing.

When you study Latin you can find many chemical terms that are understandable only to specialists. Some of these names invented recently, others are ancient history. All chemical elements can be divided into the following subgroups:

1) those that relate to the "elements-staff"; such as, Lawrence (in honor of the American physicist E. O. Lawrence (1901-1958)), Materiel (after the Austrian physicist and radiochemical L. Meitner (1878-1968)), Nobelium (in honor of the Swedish inventor Alfred Nobel (1833-1896)), Cyborgy (in honor of the American chemist G. T. Seaborg (b.1912)), Einsteinini (in honor of the American physicist A. Einstein (1879-1955)).

2) associated with the mythological names; for example, vanadium (from

Vanadis Scandinavian goddess of beauty), Niobium (from the Greek. Niobe – Niobe), Promethium (from the Greek. Prometheus is the hero who stole fire from the gods), Tantalum (from the Greek. Tantalos – the Tantalus, the Lydian king, father of Niobe), Titanium (after the Titans, sons of the goddess Gaia).

3) belong to geographic location; for example, Americium (from the English. America), Gallium (lat. Gallia – France), Hafnium (from the Latin. Hafnia, Copenhagen), Germanium (from the Latin. Germania – Germany), Holmium (from the Latin. Holmia Stockholm).

4) the Corresponding compounds, nitrogen (lat. the name is from the Greek. nitron genes – forming nitrate), Aluminum (from the Latin. alumen – alum), Beryllium (from the Greek. beryllos, a mineral used).

5) the properties of the elements: Hydrogen (lat. the name is from the Greek. hydro genes – generating water), Iron (lat. name from Greek-Latin. fers to be solid), Oxygen (lat. the name is from the Greek. oxy genes – generating acid (incorrect assumption A. Lavoisier)), krypton (from the Greek. krypton – hidden), Xenon (from the Greek. xenos – stranger), Lanthanum (from the Greek. lanthanien – hide), Neodymium (from the Greek. neos didymos new twin), Neon (from the Greek neos – new), Protactinium (from the Greek. protos – first), radium and radon (from the Greek. rados – ray), Mercury (lat. name from hydragyrum, liquid silver), Silver (lat. name from argentum – light, white), Antimony (from the Greek. anti monos – not only, according to another version the tool against the monks), Tellurium (from the Greek. tellus the earth), Technetium (from the Greek. technikos – artificial), Fluorine (from the Latin. fluere – to flow, from the Greek. ftorios - destructive).

6) .Corresponding compounds: Nitrogen (lat. the name is from the Greek. nitron genes – forming nitrate), Aluminum (from the Latin. alumen – alum), Beryllium (from the Greek. beryllos, a mineral beryl), Boron (from Arabic. buraq is the name Boers), Cadmium (from lat. cadmia zinc ore), Potassium (from Arabic. gili – potash), Calcium (from lat. calx – lime), Manganese (from lat. magnet – magnet), Molybdenum (from the Greek. molybdos – lead), Sodium (from the Hebrew neter – boiling substance), Samarium (for the mineral samarskite), Carbon (lat. the name carbo – coal).

Conclusions: With the development of science and research methods is a change to the principles of category elements. It should be noted that such an expansion of the signs naming it the objective need caused by an active opening of a large number of items. Many of the elements required to not only his discovery, but also called spectral analysis. The discovery of some of the elements became possible with the advent of such research methods as electrolysis. The work on the etymology of terms and names and allows you to establish and develop interdisciplinary connections of chemistry with not only history, culture but also with Russian, English, German and other languages.

IMPORTANT ABILITY OF USING SCIENTIFIC TERMINOLOGY IN ENGLISH

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Introduction. The modern era of foreign languages is characterized by significant growth in terms of different areas of science, and their active penetration into the spoken language. It becomes urgent problems studying the functioning of the terms in the scientific and technical translation with the rapid development of scientific and technical information.

Aim. To observe usual forms of scientific terms in English.

The main aim of learning foreign languages is student`s achievements in practical knowledge in a foreign language at the university. It allows to read the original literature in their specialty, to extract from it necessary scientific and technical information, to get skills in translating, annotating, and abstracting it, as well as taking part in the oral communication. In order to deal with all these activities, students should master the basic grammatical minimum.

Results and discussions. Carefully defined terminology enables people in a particular industry to communicate clearly. A common understanding of terms allows people to communicate ideas more rapidly with less need for lengthy explanations. This requires a common understanding of important terms.

A large majority of documents today are designed for specialist communication. They are written in specialist language, 30-80% of which is composed of terminology. In other words, terminology is the main vehicle by which facts, opinions and other "higher" units of knowledge are represented and conveyed. Sound terminology work reduces ambiguity and increases clarity - in other words, the quality of specialist communication depends to a large extent on the quality of the terminology employed, and terminology can be a safety and a quality factor.

In the process of working with scientific texts, students are faced with a large number of scientific terminologies. Terms are words those represent emerging concepts associated with the development of science. It is important to remember that terms are ambiguous, translation of the term depends on the specialty and area of use it. Due to the multivalence of terms, it happens some difficulties in their translation. From all of the terms used in scientific literature, especially stand out the terms of Latin and Greek origin. These terms are borrowed. Many of the Latin and Greek loans belong to the so-called international vocabulary; they can be repeated in the languages of many nations, united by the common features of the cultural and social

development. Such terms are easy to translate because their sound and graphic similarities with the Russian language, for example: atom (eng.), das Atom (ger.), атом (rus.); radio (eng.), das Radio (ger.), радио (rus.).

However, a term is not always borrowed from Latin or Greek, can be easily translated. There are a number of words that have preserved the original method of forming the plural that is unusual for English or German. It should be noted that it is often possible to meet usual English plural for words such as antenna - antennas, formula - formulas, stratum - stratum.

Special attention in the translation of scientific terms requires so-called "false friends" of interpreter, lexical units that have the same internal form, but cause false association in connection with the presence of other meanings. For example, the English word "resin", is not Russian word "rubber"; word "data" is often mistakenly translated as "date". The German die Radioastronomie – radio astronomy, but das Radioelement – isn't radioelement, but a radioactive element.

A large number of the profile vocabulary is used in pharmacy. It happens historically, because in this medical profile are always used only the Greek-Latin terminology. It is known that the medical education in European universities in the Middle Ages was conducted only in Latin. Later teaching at the other faculties was conducted in national languages in different countries. However, in this field of science, such as pharmacy is still studying Latin terminology.

Future professionals in the field of pharmacy should orientate in medical terminology, is a widely borrowed from Latin. For these purpose students of our university pass Latin course.

In English, there is also a group of lexical units, which are very often used in professional medical English. These words indicate the parts of the human body, organs, terms relating to patient and nursing care. Their formation, spelling and pronunciation do not have anything to do with Greco-Latin terminology.

Conclusions. In order to work with any terms in a scientific text in a foreign language, to be successful you should:

- To know a certain minimum of general scientific terms;
- To own terminology, characteristics for this or that sphere of activity (specialty);
- To remember the ambiguity of words in English and German;
- To know the methods of forming the plural of some words Latin and Greek origin;
- To avoid false associations with their own language.

Possession of professional terminology in a foreign language makes the future specialist competitive, motivated, and better prepared for the implementation of professional activity, as in a native and in a foreign language. At this point, it is important to pay enough attention to this aspect during the studying process.

THE ROLE OF BORROWINGS IN THE ENGLISH LANGUAGE

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Introduction: Borrowing from the Russian language is not especially numerous in the English language. This is due to the fact that the relations between the Russian and English peoples was established very late, only in the XVI century, and also had been very limited. In the second half of the XVI century in connection with the development of capitalism in England and the expansion of Maritime trade, there arises the interest to the Moscow state. Organized by the London Moscow trading company aimed to establish and develop trade with Moscow. In Moscow were sent to ambassadors and representatives of trading companies.

The aim: to find out the role of borrowings in the English language.

Materials and methods: study and analysis of literature on the topic.

In the extant memoirs and descriptions of the Moscow state made by the British, found a number of Russian words reflect the characteristics of Russian life and government. Among the words borrowed during the XVI century should be called words: Rouble – рубль; Cossack - казак; Tsar – царь (король) and other words. During the XVII-XVIII centuries in the English language entered the following words: astrakhan - каракуль fur occurring on behalf of the city of Astrakhan; copeck - копейка; ukase - указ; samovar - самовар; steppe - степь, verst - верста; vodka – водка. The emergence of the world's first socialist state - the USSR, the development of socialist production, culture and morality - all these factors served as the basis for the emergence of a number of new words and expressions that became widespread not only in our country but also abroad. A number of Russian words in the post-revolutionary era penetrated into the English language. Among them we call words associated with the new state system: Soviet - Совет; bolshevik - большевик; bolshivism - БОЛЬШЕВИЗМ; komsomol – комсомол, then received second value комсомолец. New forms of socialist agriculture were reflected in the words of kolkhoz - колхоз, sovkhos - совхоз.

Conclusions: All languages have some words in their vocabulary that are of foreign origin, and so does the English language. People of different cultures have always interacted with each other, and there has always been an exchange of lexis due to this interaction. Loanwords enrich a language, since the vocabulary gets larger and each word therefore acquires a more specific and subtle meaning and this should be kept in mind before one simply criticizes and dismisses borrowings.

THE MOST COMMON MEDICAL IDIOMS IN ENGLISH

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Introduction. Just to start we have to say what idioms are. According to the Wikipedia: “An idiom (Latin: *idiomī*, "special property", from Greek: *ἰδίωμα* – *idiōma*, "special feature, special phrasing, a peculiarity", f. Greek: *ἴδιος* – *idios*, "one's own") is a phrase or a fixed expression that has a figurative, or sometimes literal, meaning. Categorized as formulaic language, an idiom's figurative meaning is different from the literal meaning. There are thousands of idioms, occurring frequently in all languages. It is estimated that there are at least twenty-five thousand idiomatic expressions in the English language.”

Aim. To provide the review of the educational materials in order to analyze the most common medical or health idioms in English.

Materials and methods. The analysis of educational materials and modern phraseological dictionaries in the target field.

Results and discussion. There are thousands of idioms in English and they are essential to get the message across. If you aim to sound like native speakers, you have to be aware of idioms and their usage. There are plenty of different dictionaries which can represent lots of different idioms with a wide range of topics and ideas. Among them there are The Cambridge International Dictionary and Cambridge Dictionary of American idioms, which we have used for our research.

Concerning the fact that people often complain about their health, the medical or health idioms are of great importance. So we have chosen top ten the most common English medical idioms.

1) **To be in bad shape** – бути у поганій формі:

My friend thinks that he is in bad shape that is why he has started going to gym.

Мій друг думає, що він знаходиться в поганому стані, тому він почав ходити в тренажерний зал.

2) **bag of bones** – дуже худий:

I am afraid of her. She really looks like bag of bones.

Я боюся її. Вона дійсно виглядає як мішок з кістками.

3) **Blind as a bat** – сліпий, як кажан:

Without her glasses, the old woman is as blind as a bat.

Без її окулярів, старенька сліпа, як кажан.

4) **frog in one's throat** – ком у горлі:

I had a frog in my throat, when the teacher asked me to speak out.

У мене був ком у горлі, коли вчитель попросив мене виступити.

5) **on the mend** – почуватися краще:

This patient was sick, but now he is on the mend!

Цей пацієнт був хворий, але зараз він йде на поправку!

6) **new lease of life** – смак до життя:

After a terrible car accident he felt a lease of life.

Після страшної автомобільної аварії він відчув смак до життя.

7) **recharge one's batteries** - набратися сил:

The patient needs to recharge his batteries.

Пацієнт повинен набратися сил.

8) **just what the doctor ordered** – те, що доктор прописав:

He was studying days and nights, the holiday at the resort was just what the doctor ordered.

Він навчався днями і ночами, тому відпочинок на курорті був саме тим тільки, що доктор прописав.

9) **spare part surgery** – трансплантаційна хірургія:

The spare part surgery has become more topical in Ukraine.

Трансплантаційна хірургія стала більш актуальною в Україні.

10) **pull through** – вижити\ пережити :

This man underwent a heart surgery, but he pulled through.

Ця людина перенесла операцію на серці, але вона вижла.

Conclusions. We believe that the English language is a language with a vast idiomatic base, which makes its learning and usage very exciting and intriguing. So grasping the use of its idiomatic expressions is an essential part of learning, practicing and using the language. We suppose, idioms reflect the accumulated human experiences and life lessons from generations. In fact, idioms are the best way to express what we want to say, especially in a more sophisticated and colorful, and also using idioms we can save our time while expressing our points of view. There is why we have come to a conclusion that idioms are essential and we should pay more attention to their usage.

**TEACHING MEDICAL
AND PHARMACEUTICAL TERMINOLOGY
USING GREEK AND LATIN ELEMENTS**

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Introduction. It is known that one of the main objectives of teaching any foreign language in a higher education institution, not specializing in foreign languages, for example in our medical and pharmaceutical institute, is to teach students to read special literature connected with their specialties in the original. However, taking into account the shortage of academic hours and high requirements given to students, this process becomes rather difficult.

Aim. The aim of our scientific work is to find out the role of Greek and Latin term elements in the process of teaching students to read special scientific literature in the original.

Materials and methods. The materials of our study include special scientific literature connected with Greek and Latin terminology, theory of teaching foreign languages, especially Latin, in higher educational institutions. The descriptive method is used in our work.

Results and discussion. For easy reading of foreign-language literature in the original, pharmaceutical students (medical students) have to master the corresponding terminology. It is known that the English medical and pharmaceutical terminology was formed from Latin and Greek term elements. Term elements are root and word-formation elements (prefixes and suffixes) having stable meaning in terminology. For example, the term element "-card -" means "heart"; "-tens -" – "pressure"; "-cran -" – "skull"; "-vas -" – "vessel"; "-pathy" – "disease"; "-itis" – "a disease of inflammatory character"; "hyper -" – "above the norm"; "dys -" – "abnormal, insufficient"; "eu -" – "good, easy, quality improvement"; "-tomy" – "cutting", "excision", etc.

It is also known that the majority of Greek-Latin term elements are frequent. Frequency is understood as the total number of morpheme uses (of a root, a prefix and a suffix) in a separate source or set of sources. The more formations this or that morpheme gives, the more productive it is. The use of a term element in a language submits to certain regularities that is there are less "accidental" combinations of this or that suffix with the productive stem. Some term elements take part in the formation of tens of terms that is why the knowledge of them can

promote the disclosure of meaning of unknown words while reading special texts in English.

For example, the suffix - "scopy" means "examination". Using some simple language operations, students will be able to define the meaning of more than ten lexical units: endoscopy – examination of internal cavities of a body; arthroscopy – a minimum surgical manipulation which is carried out for diagnostics and/or treatment of damages of an internal part of a joint; bioscopy – a research of a pre-natal organism; bronchoscopy – a method of airways examination; cystoscopy – a survey of an internal surface of a bladder; fetoscopy – a fetus examination; gastroscopy – a stomach cavity examination method; laryngoscopy – the examination of a throat; ophthalmoscopy – the examination of the internal surface (bottom) of an eyeball; otoscopy – the examination of an acoustical pass and an eardrum; retinoscopy – eye retina examination; rhinoscopy – diagnostic method of a nose cavity examination; spectroscopy – a section of physics studying ranges of electromagnetic radiation; uroscopy – an urine examination, the analysis of urine etc.

Let's have a look at a number of the terms formed by the means of the term element "intra -": intraarterial; intracellular; intracranial; intravascular; intramuscular; intravenous; intradermal; intraocular; intracerebral etc. We see that the prefix "intra -" unites all the words in one group as the terms given above have similar "inside" meaning.

Conclusions. A modern specialist of a medical and pharmaceutical specialty should acquire a considerable vocabulary of Greek-Latin term elements to read scientific articles, drug annotations, the descriptions of diseases, popular scientific literature, etc. Knowledge of Greek-Latin term elements facilitates the process of reading special literature in English.

ENGLISH PRESS HEADLINES TRANSLATION PECULIARITIES

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Introduction: an important role in the cultural and political life of the country plays the press, which helps a person to get his bearings in the present-day life. Opening the newspaper, the man first of all observes the headlines and defines the main point of the article. It is known to everyone who reads newspapers that the language of the headlines differs much from the ordinary language. This in turn may cause difficulties in their translation into Russian.

The aim of our research work is to identify linguistic features of English newspaper headlines, as well as to determine peculiarities of their translation.

In our work, we used the following **research methods** - theoretical methods (analysis of the available scientific literature on this topic; comparison of data from the scientific literature and data obtained from the analysis of selected newspaper headlines; classification of linguistic features of English newspaper headlines on the basis of studied scientific literature and on the basis of the analysis of selected newspaper headlines data) and empirical methods (work with sources - chosen at random the headlines of such publications as: THE TIMES, THE INDEPENDENT, THE NEW YORK TIMES, THE WASHINGTON POST).

Results and discussions: the analysis of the existing material showed that the headlines are not just a set of lexical and grammatical means taken from the common language. It is a system in which all the elements are in a certain relationship to each other and are interdependent. The main purpose of the headlines in the English newspapers is to announce the main content of the article in succinct format, while the rest of the text depicts the reader the whole situation with all the details. This is the reason of grammatical peculiarities of the headlines language and can cause difficulties in their translation.

Conclusions: for an adequate translation of the English headlines it is necessary to know the features of the translation transformations, because there are differences between the structure of English and Russian headline. The knowledge of such transformations will allow conveying the exact meaning and the originality of the headline. It is necessary to know the vocabulary of newspaper genre, to be able to find and distinguish all the grammatical features of headlines, to understand and to identify a stylistic link between the elements of the headline and the headline itself with the text.

BENCHMARKING OF A RANGE OF DRUGS IN THE PHARMACY: THE INFLUENCE OF LANGUAGE PROCESSING AND VISUAL IMAGE IN FORMING OF CONSUMER DEMAND AND SALES PERFORMANCE

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Introduction. The study of the influence of various factors (visualization, positioning, language processing, etc.) on the buyer's choice of medicines – an area of research in pharmaceutical management and marketing. A comprehensive study of the influence of these factors on the choice of buyers when they buy Dolobene, Diklak gel, Voltaren emulgel, Fastum gel and Deep Relief on the basis of the survey done for the first time.

Aim. We have the following objectives in our work: to explore advertising and television films for the presence of atypical language means ("raisins") in comparison with another advertising product of the competitive space, to explore the effectiveness of advertising texts, slogans and visual images of pharmaceuticals, to confirm the theory of our research regarding the analysis of the effectiveness of advertising on the example 5 products and brands of the group of non steroid anti-inflammatory means in gel form with the help of questionnaires.

Materials and methods. The advertising texts, slogans and visualization in advertising of pharmaceutical drugs, the subject — correlation of well-chosen linguistic means in advertising texts and the popularity among consumers of such drugs, as Dolobene, Diklak gel, Voltaren emulgel, Fastum gel and Deep Relief. The survey involved 60 respondents. In the study, such methods as descriptive, comparative, comparative ones, induction, analysis, and synthesis were used.

Results and discussion. The study of the interrelation between the used linguistic means, visual images and consumer choices of the medicines (prefer nominative sentence that referred to as the medicines, is used metaphorization, the imperative form of verbs (order to purchase it this way), apply word-magnets "fast", "reliable", and numerals, designed to attract the consumer's attention, to emphasize the exclusivity of the vehicle. Visual design contains red, yellow, orange colours, image of the patient's body. In the survey it was established the target audience: sick people are mostly elderly and athletes that can withstand daily training load.

Conclusions. Well-chosen linguistic means of the advertising message is an integral part of the popularity of medicines.

DEFECTIVE VERBS IN RUSSIAN

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Russian is considered difficult to learn. Knowing the complete system of conjugation of Russian verbs helps an international students to quickly and easily conjugate verbs, and also use it in context. However, students have many difficulties along the way. One of the difficulties is Russian Defective Verbs.

The aim of our study is to describe and systematize a group of Russian defective verbs and the difficulty of using these words for foreign students.

The method of scientific description was used as the lead in the work, including methods of direct observation, continuous sampling, system analysis and synthesis, classification and systematization. The study was carried out on the material of the manuals Kurinina G. P. "Learn Russian verbs: Dictionary-reference book for foreigners" (2000), Belyakova N. N. "How is the Russian verb constructed? Features of morphogenesis, stress "(2006), Budai V. G. " Algorithm of the inflection of Russian verbs. Present (simple future) time "(2012).

Defective Verbs are verbs with incomplete conjugation that do not have separate personal forms due to phonetic or semantic reasons. In some sources, the missing verbs are also called Incomplete paradigms or Insufficient verbs. For example, it is impossible to form the first person singular forms from verbs *победить, убедить, дерзить, дудеть, ерундить, окраситься, шкодить*, etc. There are no forms of the 1st, 2nd and 3rd person singular among Russian verbs *сбежаться, толпиться*. There are no forms of the 1st and 2nd person verbs *нестись, ржаветь*. There is no form of imperative for verbs *ехать, видеть, хотеть, мочь, жаждать*. The absence of individual personal forms can be motivated: the traditional notion of the cacophony of pronunciation, the lexical meaning of the verb. We divided the verbs found by us into three groups, depending on the type of missing grammatical forms. We found cases of using the missing forms of Russian defective verbs in examples from fiction, movies and cartoons. We have assembled an audio library of some examples.

Mistakes in the use of Russian verbs by foreign students, in most cases, are associated with defective verbs and with possible mixing of the use of parallel forms. We can say that the question of insufficient verbs remains relevant in our days. The fact that there are different views on the existence of the first person singular forms in the present and simple future of the time attests to this. Obviously, these forms of the verb will eventually become normative. It is possible that some other inadequate verbs will follow the same evolutionary path. Consequently, we can talk about the desire to reduce the number of insufficient verbs in the Russian language.

PECULIARITIES OF TRANSLATION OF SCIENTIFIC AND TECHNICAL TEXTS

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Introduction: the study of scientific and technical translation is an important and urgent task aimed at achieving adequate translations, contributing to the solution of many applied tasks and accelerating the exchange of information in the field of the latest achievements of science and technology.

The aim: to study peculiarities of translation of scientific and technical texts from English into Russian language

Materials and methods: study and analysis of literature on the topic.

In order to properly understand the scientific and technical text, you need to know this subject and related English terminology. Translation using a dictionary unfamiliar unambiguous terms such as: oxygen, ionosphere, is not difficult. This is not the case when one English term is more Russian, for example, switch – выключатель, переключатель, коммутатор. In this case, a conscious choice of analogue may be dictated by a good knowledge of the subject.

Take this sentence: "Most of the modern radio-transmitters can communicate both telegraph and telephone signals". The translator who is not familiar with radio would translate " Большинство современных радиопередатчиков могут посылать как телеграфные, так и телефонные сигналы." Competently translate as: " Большинство современных радиопередатчиков могут работать как в телеграфном, так и в телефонном режиме."

There are some stylistic and grammatical features of the English text, alien to the style of scientific and technical literature. The English text is dominated by personal forms of the verb, whereas the Russian scientific style characteristic of impersonal or indefinite-personal momentum, for example, "We know the primary coil in the ordinary transformer to have more turns than the secondary one" - " Известно, что первичная обмотка обычного трансформатора имеет больше витков, чем вторичная ".

Conclusions: the main features of scientific and technical style are strict clarity, clear definitions, and concise form. When translating English text, the translator should fully and accurately convey the author's idea.

LEARNING RUSSIAN PHRASEOLOGY BY FOREIGN STUDENTS

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The article are devoted to learning Russian phraseology by foreign students in multinational students' audience. The subject matter of studies connected with foreign language students' national culture in language teaching methods of Russian as a foreign one (RAFL) is actual for the time being. In modern language teaching methods and student teaching it is conventional that the most important means of the educational process optimization is nationally-oriented teaching. It is the main methodical installation on the basis of which the principles of consciousness, systemacity, functionality and communicative orientation are realized, adequate forms and methods of training are defined.

Comparative learning of languages has the philological nature: acquaintance with the culture of a native speakers' country is carried out in the process of learning language units with national and cultural elements in semantics. By comparison of languages national and cultural distinctions are observed practically at all levels, but they are especially bright at lexical and phraseological levels. For this reason lexicology and phraseology act as a direct object of comparative linguoculturology.

The main object in the analysis of phraseological systems of two languages is a phraseological image, as the peculiarities of figurative thinking are more reflected in the structure of set phrases. In phraseological units national identity of the language receives the brightest and direct manifestation as they are correlated directly with extra language reality. Revealing of national and cultural specifics of the phraseological units' semantics of one language can be carried out only in comparison with the phraseological unit of the student's native language, and allocation of common features of two languages promotes fast understanding of the national and cultural component's semantics.

The aim of the research led to the formulation and solution of the following tasks: 1) to determine the main differences of national-specific phraseological units in multinational groups of students; 2) to reveal the main difficulties while comparing Russian, English and French phraseological pictures of the world.

Further work on this issue provides an in-depth study of finding out typical mistakes in the use of Russian phraseological units by foreign students-philologists in order to make the process of teaching more effective.

Section 22.

**PSYCHO-PEDAGOGICAL BASES
OF FUTURE SPECIALIST FORMATION
IN MODERN HIGHER EDUCATIONAL
ESTABLISHMENTS**

PECULIARITIES OF MEDICAL EDUCATION IN GERMANY

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Introduction. At present in the system of higher education in Ukraine, including the health system, there is an active reform and entry into the world education system, the experience of educational systems in other countries is very important. The fact that the German medical education is one of the most prestigious in Europe is well-known. Thus, the system of training future doctors in Germany has long been proven its efficiency and competitiveness, therefore the study of its features in order to follow their implementation in Ukrainian medical education, will be very useful.

Aim. The aim of our research is to reveal features of training future doctors at German universities.

Materials and methods. We used the methods of theoretical analysis and synthesis of information resources and documents.

Result and discussion. The preparation of the future physicians in Germany is carried out at universities. Up to this date, 35 public and 4 private universities have a medical faculty. Depending on the university, education may start in the winter semester, the summer semester or both of them. In total, the state universities provide more than 9000 places for the winter semester and 1500 in summer. Despite the high number of available places the competition is very high – 4.8. The prerequisites for entry are not only the successful completion of the school, many universities also require a specialized test "TMS", an active voluntary activities, as well as the number of semesters, which the applicant had to wait for university entry. Despite this high schools are not closed institutions and continue to recruit foreign students.

Education at the medical faculty is divided into three main stages:

1. **Preclinical:** During a period of four semesters, students learn the basic disciplines such as biology, chemistry, physics, anatomy, physiology, medical sociology and psychology, terminology, etc. At the end of this phase the student must know the structure and function of the human body. This stage also includes a 90-day practice and first aid course.

2. **Clinical:** This phase lasts six semesters, during which students study the pathology and treatment.

An important part before a year practice is a period of four-month practice, the so-called "Famulatur". Practice runs for one month in an institution for outpatients, two months in the hospital and one month in any of the medical institutions of the student's choice.

3. Practical year: Within one year, the students have practice, which in turn is divided into three phases for 16 weeks: internal medicine, surgery and general medicine or a clinical specialty of choice. During this phase, students actively participate in clinical conferences.

Throughout the year, the student has 30 days off, which include holidays and also missing due to illness. It is recommended to use this opportunity at the end of the year to thoroughly prepare for the exam.

Medical examination consists of 3 parts: the first part takes place after the successful completion of the pre-clinical stage and consists of written and oral parts; the second part after the clinical stage and consists of written part only and the third part after the passage of the annual practice, students will take an oral and practical exam.

In total, the program of training of physicians can take up to six years, but most students are not finished with their program and have to take an extra semester. After the successful completion, students receive a medical degree, but learning does not end there. The first stage – the doctor-intern – lasts for 18 months. During the next 4-5 years students work as a physician assistant. After that the doctor is granted the right to pass the exam on the specialty. Only by passing the examination, the physician obtains a license and the right to private practice or as a senior doctor.

Conclusions. The training of future physicians at German universities has a number of distinguishing features, and among them is a large amount of practical training of medical students, aimed at the formation of clinical thinking and professional skills. It is important that at the end of the studies the student gets a general medical education and specialization – after working as an assistant.

ACHIEVEMENT MOTIVATION IN THE EDUCATIONAL PROCESS

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Introduction. Among modern psychological and pedagogical problems of development of higher education the tasks of improving the learning activity of students are of great importance. One of these tasks is formation and support of the academic and cognitive motivation as a driving force for learning. Thus, the question of academic motivation is, in fact, the question of the quality of the learning activity.

Aim. The aim of our work is to reveal the nature of achievement motivation and describe its impact on the efficiency of the educational activity of students.

Materials and methods. The methods of theoretical analysis of the scientific and methodological literature were used.

Results and discussion. One of the variations of motivation of the human activity is achievement motivation related to the need of an individual to achieve success and avoid failures, as well as to strive for success in various types of activities. In modern psychology achievement motivation is defined as a functional system of the integrated affective and cognitive processes regulating the process of activities in the achievement situation continuously during its implementation. A human has two different motives related to the activities aimed at achieving success. The first motive is the actual motive of success achievement, while the second one is the motive of failure avoidance. It is the behavior of the study subjects that can determine what position a particular student has. Students motivated to succeed strive to achieve the best results in all their activities. They mobilize all their resources and focus their attention on achieving the goal set. They have a strong faith in success, its expectations; they expect to get approval for their actions, and their work gives them positive emotions. Students motivated for avoiding failures do not have confidence in their own abilities, afraid of criticism, and do not believe in the possibility to achieve success. Therefore, they usually associate the educational activity with the negative emotions and experiences. They do not get pleasure from their work and are bored with it; as a result this position leads them to failure not only in the academic progress, but in life as well.

Conclusions. Therefore, achievement motivation is always positive and more conducive to the personality development in contrast to the motive to avoid failure. Since the motives are formed in the process of the learning activity, the expedient and reasonable organization of the educational process in general is necessary.

SPECIFICS OF THE USE OF INTERACTIVE TEACHING METHODS AT THE PREPARATION OF THE FUTURE MEDICAL LABORATORY ASSISTANTS

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Introduction. The public need for proactive, authoritative, comprehensively educated specialists, capable of further development and self-education, spiritual and professional development, realizes the social order for the introduction of interactive learning, as it allows you to move away from the standards of thinking, the stereotype of actions, and contributes to the formation of character.

Scientific research shows that the process of training future medical laboratory assistants should model their future professional activity as best as possible. The readiness of future specialists for active duty arises from the acquisition of necessary theoretical knowledge, practical skills, and a positive emotional attitude (motivation).

Aim. Theoretically justify the introduction of interactive teaching methods in the preparation of future medical laboratory assistants.

Materials and methods. It is proved that the interactive method of teaching is an ordered image of active subject-subject interaction between all participants of the educational process aimed at achieving the goals and objectives of education, which contributes to the accumulation of social experience among participants. Scientists focus on the possibilities of using situational exercises in the teaching practice. During their resolution, the student needs to put himself in the place of a specialist and make his own decision, in spite of certain circumstances. One of the varieties of interactive teaching methods are trainings with their unique abilities to motivate, stimulate, create success situations, provide personal and professional growth, form and develop the necessary qualities of future medical laboratory assistants.

Results. Interactive teaching methods play an important role in modern vocational education. Their advantage is that students acquire all levels of knowledge (knowledge, understanding, application, analysis, evaluation). The number of students in a group who consciously assimilate the educational material increases. Students take an active position in mastering knowledge. There is a cognitive interest in obtaining them.

Conclusion. Thus, as a result of theoretical research we found out the nature and feasibility of different interactive teaching methods (methods of collective-group learning, methods of cooperative learning, situational modeling techniques), determined specifics of their implementation, and methods of their execution.

GROUP INTERACTION AS THE FORM OF ACTIVATING STUDENTS' COGNITIVE ATIVITY

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Introduction. Changes taking place in modern society demand modern specialists of health protection to adapt quickly to new conditions, to find optimal decisions of difficult problems, to show flexibility, creativity, not to be taken aback in the indefinite situations, to be capable to get on well with people. So recently the idea of using the group method of learning has become actual in the classes in the higher educational institutions.

The aim of the exploration is learning the effectivity of using group interaction as the form of activating students' cognitive ativity.

Materials and methods – theoretical : analysis of scientific literature to define the amount of works in the topic of exploration.

Results and discussion. Students who study medical and pharmaceutical specialities must be able to gain new knowledge using modern International technologies, put aims and form tasks connected with realising professional functions, find and make managing decisions, be methodologically and psychologically ready for changes of kind and manner of their professional activity. Thus group work and group interaction is one of effective forms to activte students' learning and cognitive process. During group interaction students develop cognitive skills, memory, activate gained experience and knowledge, inrease the responsibility for the result of the work, improve the skills of coherent knowledge presentation.

Methodologically correct work in groups gives the opportunity to practice skills of cooperation, personal communication, broadens students' development, develops skills of discussing and solving problems, educates responsibility for individual doings and common results. In group the personality is put in the condition which leads her to selfexamining and introinspection.

One can depict the following methods to organise group interaction: method of self check, method of common tasks, searching the best solvation, discussion. Group work can be used, when it is difficult to solve the problem individually. Group activity takes a special place among different forms of educational cooperation. It promotes productive interaction of students, development of ability to see and estimate a position of another, to form the point of view and ability to defend it.

Conclusion. Group interaction represents great potential opportunities for development of identity and creates conditions for operation of psychological mechanisms which develop a motivational and strong-willed component of informative activity of students.

JOGGING AND MENTAL HEALTH

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Introduction. Health is the first and most important human need that determines his ability to work and ensure harmonious development of personality. Active long life is an important component of the human factor. Health is the state of physical, mental and social well-being and not just absence disease or infirmity. Mental health is an integral part and an essential component of health. Strengthening mental health includes steps to create living conditions and environments that support mental health and allow people to keep a healthy lifestyle.

Optimal motor mode is the most important condition for a healthy lifestyle. Its basis is on the systematic physical exercise and sports. Jogging is the most simple, effective and affordable means to the preservation and promotion of health.

Particularly important role of jogging is in overcoming stress and frustration. The positive influence of running isn't only on physiological, but on psychological processes also.

Aim. Identification dynamics of the human mental state under the influence of jogging.

Materials and methods. We used analysis and generalization of scientific-methodic literature, pedagogic testing and monitoring.

Results and discussion. Studies were conducted on department of physical training NUPh. Student that involved to jogging, after training felt cheerful, good mood, no anxiety, were internally balanced and calm.

Indicators of mental well-being, sense of power and energy are more evident after a series of classes jogging. Such feelings as anxious expectation, fear, bad temper, depression are less harassed students. After the jogging they had a sense of freedom, vitality and coherence in the actions. They were cheerful, and after rest mental and physical performance were raised.

There are emotional stability and appropriate response to various situations that enhance resistance to stressful influences.

Conclusions. As a result of studies we established:

1. Mental health is an integral part and an essential component of health.
2. Positive dynamics of the mental state of people under the influence jogging.
3. Regular jogging makes dominate indicators of mental well-being, a sense of strength and power over performance anxiety, depression, bad mood
4. Regular jogging leads to vitality, improve mental and physical performance.

RESEARCH OF SOCIAL-PSYCHOLOGICAL CLIMATE IN STUDENT GROUP

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Introduction. Positive socio-psychological climate of the student group is one of the main conditions for successful student training and effective intra-group interaction. Therefore, timely diagnosis and correction of the climate of the group is very important.

Aim. The purpose of the research is to conduct a psychodiagnostic study of the socio-psychological climate in the student group.

Materials and methods. We used the methodology of J. Moreno "Sociometry" and the test questionnaire "Perception of the Individual by the Group". The study was conducted in the academic group of 2nd year students of the specialty "Pharmacy".

Result and discussion. The method of sociometry allows us to determine the sociometric status of each student, which shows the position of the subject in the sphere of informal interpersonal relations in the group. It turned out that 37.5% of students had a positive status in the group, 12.5% - zero and 50% of students received a negative status. The overall group indicators were as follows: the group's positive expansiveness was 0.25, the group's negative expansivity was 0.5, and the group's unity was 0.12. Such results allow us to draw a conclusion about the low cohesion and rather high conflict of this academic group. According to the test results, 56% of students have a "individualistic" type of group perception, i.e. They belong to the group neutrally, deviating from joint forms of activity and limiting contacts in communication. "Pragmatic" type of perception is typical for 31% of students. They evaluate the group from the point of view of the benefits and give preference to those classmates who can help or are the most competent. 13% of students have a "collectivistic" type of group perception, in which students have a value attitude to the group, an interest in the success of each member of the group and the desire to contribute His contribution to the life of the team.

Conclusions. The obtained results indicate that the positive social and psychological climate in the group of students participating in the study was not formed. Participation of students in teambuilding trainings, group work during classes, group out-of-class activities can act as conditions conducive to enhancing the cohesion of this student body.

FORMATION OF EDUCATIONAL MOTIVATION OF STUDENTS FOR FUTURE LABORATORY-BASED PHYSICIAN TO STUDY PROFESSIONALLY-ORIENTED DISCIPLINES

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Introduction. The content and meaning of the problems of educational motivation of students is inextricably linked with the objectives of improving the social and working activity of each individual in the interest of social progress. Formation of a sustainable motivation of educational activity for future laboratory-based physician to study professionally-oriented disciplines is a necessary part of professional development in higher education, education comprehensively and harmoniously developed personality. Formation of motivation of students learning can be called one of the central problems of modern high school, due to updating content of training, the task of forming future professionals the ability to independently acquire knowledge and exercise self-control.

Aim. Theoretically substantiate and verify experimentally psychological and pedagogical techniques and methods of forming the educational motivation of students for future laboratory-based physician to study professionally-oriented disciplines.

Materials and methods. To achieve the goal set of methods applied psychological and educational research: theoretical, scientific analysis of psychopedagogical and philosophical literature to identify various views on the problem under study; empirical - questionnaires, tests, discussion aimed at studying the motivation of teaching and learning of students, motivation and professional training activities; experiment, comparative analysis; methods of mathematical statistics. The work was conducted at the National University of Pharmacy and covered 50 respondents who study 3 course, specialty "Laboratory diagnosis"

Results and discussion. The experiment was conducted in three stages: ascertaining, forming and controlling. On ascertaining stage were chosen monitoring tools defined experimental and control groups, subjects, conducted ascertaining studies the levels of educational motivation of students. At the a forming stage was implemented in the educational process of psychological and pedagogical techniques as educational and business games, educational discussions, debates, excursions, analysis of professional situations, watching educational films, compiling tasks and questions concerning the studied theory, independent work with the textbook,

additional literature and more.

Techniques and methods of forming learning motivation while learning discipline "Microbiology, Virology and Immunology of microbiological diagnostics"

| Methods | Techniques |
|----------------------------------|---|
| Emotional stimulation | <ul style="list-style-type: none"> • View an educational film "Milestones of Immunology" • Study excursion to hospital diagnostic laboratory • Binary lecture on "bacterial respiratory infections (Mycobacterium tuberculosis, diphtheria, whooping cough)" and others. |
| Interest in the learning process | <ul style="list-style-type: none"> • Business game "My profession – laboratory-based physician" • Training discussion on "Influenza viruses man" • Using a laptop, tablet computer, multimedia projector and more. • Independent work with the textbook on the topic of "Human microbiota. Eubiotics." • Independent work with additional literature: <ol style="list-style-type: none"> 1) M. Yakobysyak. Immunology. - A new book, 2004. 2) immunological products. Directory. - K. : Morion, 2001 • Preparation of questions to the theme "paramyxovirus" |

During the control stage of the experiment, we have defined efficiency of psycho-pedagogical techniques and methods, their impact on the motivation of training for future laboratory-based physician to study professionally-oriented disciplines. The results showed that after a set of measures, significantly increased the level of teaching and learning motivation of students in the study of professionally oriented disciplines.

Conclusions. It was established that the formation of educational motivation in future laboratory-based physician to study professionally-oriented disciplines is in the process of teaching and learning and can be significantly improved conditions for introduction in the teaching and learning activities of students methods and techniques of training motives.

CORRECTION OF PRE-START EMOTIONAL STATES OF ATHLETES

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Introduction. In modern sports, one of the main problems is the problem of the athlete's psychological pre-start status. In the conditions of modern sports of higher achievements athletes basically have approximately the same level of physical, technical and tactical preparedness therefore importance of mental readiness for competition increases.

Aim. Definition forms and means of correction at pre-start status in athletes.

Materials and methods. We used analysis and generalization of scientific-methodic literature, pedagogic testing and monitoring.

Results and discussion. Competitive activity requires the athlete to maximize the mobilization of physical and psychological resources of the body. All the activities of the athlete are aimed at achieving maximum readiness for performance at the competitions. For achievement the highest results, it is necessary to make fuller use of the hidden reserves inherent in the personality of the athlete. Working at the limit of their abilities creates situations in that the athlete needs to regulate his emotional state. If the regulation is weak, then unfavorable psychological conditions arise, that reduce the effectiveness of competitive activity, which, as a result, leads to a decrease in effectiveness or a loss. There is a correlation between the effectiveness and reliability of the athlete's competitive activity from his psychological state, which precedes or accompanies it. The problem of entering to the optimal pre-start condition is extremely important for modern sport. This is because one of the main reasons preventing an athlete from fully realizing his potential is the inability to cope with unfavorable pre-start conditions. The most regulating effect is provided by a properly conducted warm-up. In the case of pre-start fever, it is necessary to warm up at a low rate. In apathy, on the contrary, warm-up is carried out at a rapid pace to increase excitability in the nervous and muscular systems.

Conclusions. There are three types of pre-start status of the athlete: combat readiness, pre-start fever and pre-start apathy. Combat readiness is the optimal state of readiness for competitions. The emergence of unfavorable psychological conditions, caused by particularly complex conditions of competitive activity, makes it necessary to develop means for their prevention and psychological correction, which contributes to an optimal reduction, directly, to the beginning of the competition. Individual selection and using means of correction to the pre-start condition help to increase the effectiveness of the competitive activity athletes.

MODERN TRENDS IN TEACHING ANALYTICAL CHEMISTRY

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Introduction. Training of competent professionals in the specialty "Pharmacy" starts with disciplines required for the cycle of natural sciences. Among other subjects it includes such normative academic discipline as "Analytical chemistry".

Aim. To optimize the educational process at the Department of Analytical Chemistry of the NUPh for the specialty "Pharmacy" taking into account the modern trends in teaching analytical chemistry.

Materials and methods. The work was conducted in studying the curricula in "Analytical chemistry" of the leading European universities, which train specialists in the specialty "Pharmacy". In particular, teaching of analytical chemistry was analyzed in 4 universities of Germany in Tübingen, Marburg, Dusseldorf, Heidelberg, and in 5 universities of Poland in Warsaw, Poznan, Lublin, Wrocław and Jagiellonian University (Krakow).

Results. Analysis of the curricula showed a great similarity in teaching of analytical chemistry in the universities mentioned. Modern approaches consider new trends in education associated with improvement of the content of disciplines and introduction of new learning technologies. Therefore, when developing the syllabi the possibility of varying the content of the course was used within the standard program in the amount of 15%. The time for in-class study of qualitative chemical analysis was reduced, and the course of physical-chemical methods of analysis with the new trends of quality control of medicines was extended according to the SPhU. With the purpose of the modern assessment of the quality of analysis concerning the course of analytical chemistry the basic concepts of chemical metrology in qualitative and quantitative analysis were introduced according to the SPhU and the European Pharmacopoeia. The use of videos of practical work in the educational process was also introduced. They provide a deeper individualization of learning, as well as create the conditions for self-study of the learning material and effective implementation of modern methodical and didactic approaches.

Conclusions. The innovations proposed allow improving the success in learning by the students and preparing for the licensing examination "KROK-1". Introduction of these trends coincide with implementation of the Law of Ukraine "On higher education" No.1556-VII dated 01.07.2014 and meet the requirements of QMS.

ROLE OF THE DISCUSSION METHODS IN THE FORMATION OF EXPERT'S PROFESSIONAL COMPETENCE

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Introduction. Today, in a global reformation of Ukrainian society and the country's integration into the European and global scientific educational space, requirements increased to university students training as future specialists that are competitive in the labor market. Modern health care worker should have deep scientific and professional knowledges, be active creative personality, be capable to self-development, self-acknowledge and self-education for the efficient performance of his own professional activity that shows in the ability to act and make decisions in unconventional professional situations, solve complex problems question.

The **aim** is learning the efficiency of controversial techniques in formation of expert's professional competence.

Materials and methods - theoretical: analysis of scientific literature to determine the state of elaboration the problem.

Results and discussion. The preparation of competent pharmacy experts is very important. Professional experience of future pharmacists is based on subject-subject relations, that importance is communicative competences and qualities, the ability to listen and understand others, to sympathize, to control own emotions. Discussion group methods are a group of active learning methods, which are gaining in importance, as they are based on the dominant dialogical communication. The main task of the teacher is developing for the student's independent critical thinking, initiative, and ability to reasonably defend and communicate to others their opinion. Application of the discussion in the course of practical seminars contributes to motivating the students to solve the discussed problem tasks, enhance interpersonal processes in educational and creative activities, formation of skills exchange statements in the group, coordination of different positions and on this basis, selecting a common approach to solving the problem. Effective methods are controversial conduct "round tables", "conference" discussions in the "talk show" debate. Discussions gets particular importance in the study of topics that contain contradictions and divergence of views.

Conclusions. Advantage of discussions methods is that an active, interested, emotional discussion leads to meaningful learning of new knowledge and can make person think, change or review own settings. Thus, the including discussions as an active learning method during practical exercises provides a high level of learning, promotes professional and personal qualities of future specialists in the pharmaceutical and medical industry.

IMPLEMENTATION OF INFORMATIONAL AND COMMUNICATION TECHNOLOGIES IN PROFESSIONAL TRAINING OF NURSES

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Introduction. Nowadays, the computerization of all spheres of human activities is a global problem of the modern world. Progress in genetics, pharmacology, molecular biology, and computer technology caused a rapid development of medicine. Because of the achievements, new diagnostic and therapeutic approaches, using of which requires training of highly qualified specialists, have appeared. That is why the implementation of informational technologies in the educational process of higher medical educational institutions is a necessary step and an important component of the training of nurses for their professional activities.

Aim. To prove the expediency of implementation of informational and communication technologies in the process of preparing future nurses with the purpose of increasing the level of mastering students' knowledge, abilities and skills.

Materials and methods. At the present stage of the Internet technologies development there are many types and forms of ICT. Often cloud technologies, web quests, mind maps, virtual electronic boards, teachers' personal websites and blogs, social networks are applied in the educational process; blended learning and inverted classes are implemented.

To create a truly open educational environment, technologies which would allow you to operate remotely all the necessary data are required. Such services are provided by the technologies based on cloud computing. These technologies allow constant easy and quick access from any desktop computer, laptop, tablet or smartphone to networks, servers, databases, applications, and services.

Blogs in social networks provide an opportunity for conversation, knowledge and experience sharing, mutual assessment. This eliminates a psychological barrier between a teacher and a student that may happen in communication during traditional classroom lesson. Unfortunately, in Ukraine the practice of using social networking for educational purposes by medical students is not widespread.

A virtual board allows you to organize the cooperative activity of students working online simultaneously. A virtual electronic board has its unique e-mail address, so to involve the students a teacher just sends them an invitation via e-mail. The didactic potential of virtual electronic board is large enough: any number of users

can be drawn to work; the registration is done automatically when there is Google, Facebook, or Twitter account; a chat module can be used for communication; the system records users' online activity so that the teacher can assess the contribution of each student in the creation of the final product.

Web quest is a complex problem task to solve which the information resources of the Internet are used. During the preparation of the task, a teacher chooses the sites and provides a list of useful links. A student's function is to find and select the material he considers to be necessary for the final project. Depending on the purpose it is possible to allocate 2 types of web quests: 1) the acquirement and strengthen of knowledge and skills. At the end of the web quest, students master a large amount of new information and are able to perform tasks both of reproductive character and by analogy. 2) Deepening and improving knowledge and skills. As a result of the web quest a student is able to analyze and transform new information, use this knowledge in unfamiliar situations.

A mind map is a diagram that visualizes certain information when it is processed by a man; this is the way of imaging the overall system thinking with the help of structural and logical schemes of radial organization. The essence of mind mapping is to link the individual elements by associative connections. This map enables you to watch almost every concept through the prism of its interconnections, and during the process of its creating not only your own view regarding relationships of key concepts with others are reproduced, but also the logical sequence of search and orienting activities is realized, i.e. not only knowledge is better acquired, but also the ways of getting it are mastered.

Results and discussion. The introduction of mind maps, web quests, video testing, and virtual electronic board is quite effective in the training of nurses. Using of various forms of information and communication technologies allows to develop students' logical thinking skills, creative approach to solving problems, stimulates the search for innovative solutions to solve problems, dramatically increases the level of students' interest and motivation to study new material; search activity in the process of assignments contributes to much better assimilation and retention of knowledge. Assuming a systematic practical use, ICTs allow making additions in the methods of conducting classes and extracurricular activities; animate the emotional sphere of educational activities, open up new possibilities for a teacher's professional and creative development.

Conclusion. Thus, scrutinized forms and types of informational and communication technologies allow optimizing the educational process, taking into account peculiarities of training of nurses, creating a learning environment as realistic as possible, which gives the possibility to train highly qualified specialists of the health system.

FOREIGN LANGUAGE IN THE CONTEXT OF GLOBALIZATION IN MODERN UKRAINIAN EDUCATIONAL SYSTEM

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Introduction. There is a well-known expression: “how many languages you know so many times you are a man”. And I completely agree with that. But it is complicated to disagree that English is the most widespread and important.

Aim. English plays a great role in our life. It is officially known international language so it is necessary to know it if you want to make a success in study, self-development and prospective career.

Materials and methods. Last year our President declared the English language as the “state language – the language of international communication in order to facilitate its study to expand citizens' access to the world's economic, social, educational and cultural opportunities offering knowledge and use of English”. It will give Ukrainian people to ensure the integration of Ukraine into the European political, economic, scientific and educational spaces, having support to the Go Global Program. This Program will define the study of English as a priority of development strategy in educational system.

Results and discussion. It means all people including students or researchers should use English confidently, especially in the fields of science and technology to get benefits while using internet, on-line lessons, and communicating with leading scientists, etc. Furthermore, today pharmacy, in general, and pharmaceutical science, especially are directed to European and American markets. Almost all scientific researchers are connected with pharmacopeia. That’s why we need to have deep knowledge in English in order to communicate with foreign partners perfectly.

Conclusion. We can observe new ways of reforming of our educational system starting from school age up the post graduated curses, including the obsolete methods, procedures, approaches , etc. The main point in it lies in the weak level of knowledge of the English language. When the whole world goes ahead, developing itself, making great researches, we are trying to overcome all difficulties in our educational system. In our country, there are many wise people and professionals in different branches, in order to be famous in the world.

Nowadays, children at schools, students at universities and researchers of different areas are having all the possibilities to get current information, to use modern ways of learning. Therefore, English is the most important issue to discuss, study and develop.

**INTERACTIVE METHODS
IN TEACHING ECONOMIC DISCIPLINES
AT MEDICAL AND PHARMACEUTICAL UNIVERSITIES**

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Introduction. At the present stage of reforms of educational system in Ukraine targeting to European standards, medical and pharmaceutical universities are oriented to rise the quality of education and extend professional training of future specialists. The modernization of education and public demand for competent employee of medical and pharmaceutical sphere, including economic issues, requires innovative methods and approaches in education which would encourage students to be creative-minded, to self-study and acquiring new knowledge and necessary information for further using in practice.

The aim of the study. The actual purpose of using interactive methods in teaching economic disciplines in the medical and pharmaceutical universities is developing students' professional skills and abilities to self-analyzing, understanding and finding ways to solve complex economic problems in the area of healthcare, formation of fundamental background for further work with settling professional issues after graduation.

Materials and methods. The implementing of interactive learning at lessons of basics of economic theory is one of the most important areas of preparing students at medical and pharmaceutical universities, where the teacher has an opportunity to show not only his/her competence and erudition, but he/she can also engage students with new forms of educational activity.

For this individual, pair and group work is organized; case-technology, tasks concerning project-making, "brainstorming" are used; trainings, role-playing and games that simulate a professional situation also take place during the trainings.

The work with documents and other sources of information is also necessary part of studying.

Interactive methods are used at class in the basics of economics at every stage of education: primary, basic, terminal and for monitoring academic progress of students.

Thus, lectures are read using method of interview, the students created a "financial Dictionary", worked with a large amount of educational material by the At the seminars the occurred issues were settled by discussion, "brainstorming" expression of views by the method of "microphone", students

created and presented projects on the history of the origin of the hryvnia and business plan of a beauty salon. There was organized and held intellectual quiz "Famous Ukrainians printed on hryvnas", where such methods as interactive, group work, solving problems by "brainstorming", presentation of mini-projects are used.

During the organization of work on projects the students used different activities: cognitive, aesthetic, transforming, communicative. The method of, making the project won the positive attitude among the students. Together with other interactive methods it ensured the apperceiving of theoretical positions and learning to use practically the material of the discipline.

"Brainstorming" is an effective method of stimulating cognitive activity, formation of creative abilities of students in small and large groups, forming the ability to express their opinion, listen to opponents, defend their own point of view. It ensured the freedom of expression of any ideas.

The positive psychological microclimate dominated at the classes, the students made away with the fear of expressing incorrect assumptions, trustful relations between teacher and students were established.

The obtained results. The combination of traditional and interactive teaching methods at class on the basics of economic theory gave an opportunity to intensify the process of obtaining knowledge, encouraged formation of new points of view among the students, formed professional skills, including in the area of economic and management issues, facilitated modeling new experience, "enrichment" with new competencies.

Interactive training contributed to the development of flexible, critical, thinking predictive of future thinking of medical and pharmaceutical specialists and their skills in solving new problems of modern medical practice.

Conclusions. Not in vain interactive education is gaining more and more supporters; it makes the educational process more motivated, productive, emotionally saturated, personal-developed and therefore more qualitative.

The results of the study showed the necessity of medical and pharmaceutical universities of interactive forms and methods of teaching at the classes in economic subjects, because it affects positively on training of highly qualified specialists of medical and pharmaceutical industry.

**FORMATION OF READINESS
FOR THE PROFESSIONAL ACTIVITY OF FUTURE PHARMACISTS
IN THE STUDY OF ANALYTICAL CHEMISTRY**

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Introduction. The main task of high school is to prepare competitive specialists who are ready to efficiently and responsibly carry out professional activities.

Aim. The goal of our research is to identify the pedagogical conditions of formation readiness of students for future professional work in the study of the Pharmaceutical Analytical Chemistry.

Materials and methods. The methods of theoretical analysis of the scientific and methodological literature have been used.

Result and discussion. Readiness for future pharmacists for professional activity, formed in the study of analytical chemistry, it is an integrative concept and includes the presence of students of basic chemical and analytical knowledge, understanding them as a professional-significant, ability to use this knowledge in the study of relevant disciplines and solving professional problems, possession of complex skills – chemical-experimental, computational, graphic, etc.

In addition, the study analytical chemistry students develop such components such as: ready to professional work in team, self-education and self-development skills.

Formation of readiness for professional activity at the future pharmacists in the study of analytical chemistry provided a complex of pedagogical conditions. The main ones are: the optimal ratio in the pedagogical process of traditional and innovative teaching methods; inclusion of elements of professional activity in the system of educational tasks; the use of various forms of classroom and extracurricular activities that contribute to the disclosure of the student's potential and develop independently; monitoring of educational achievements of students and the process of forming its readiness for professional work.

Conclusions. Ready for the future professional activities of a pharmacist is impossible without complex chemical analytical competencies, which depends on the formation the certain pedagogical conditions.

MODELING AND OPTIMIZATION OF THE EDUCATIONAL PROCESS WITHIN THE ONLINE TECHNOLOGIES

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Introduction. Independent work of students (IWS) is a key component of the educational process that helps to improve the efficiency of the education. The disadvantages of IWS are lack of contact with the teacher, organization and control of the knowledge gained. Modern technologies allow to eliminate the existing shortcomings through the use of electronic materials, creating video lectures and online testing. Developing a new approach to knowledge control and visualization of educational material are key organizing factors of the training activities to provide the feedback from the students, which determines their value, efficiency and perspectiveness. This problem was understood clearly in high school in the past 10-15 years. Universities are creating their own integrated electronic information and education systems (EIES), deploying distance learning systems, developing electronic modules in order to improve the quality and effectiveness of the education.

Educational process at the clinical departments differs from the theoretical departments, requiring a fundamentally new approach to preparation for practical classes from fifth and sixth-year students. There has been a tendency to reduce both lectures and practical training hours, which can lead to loss of quality of education. At the same time the workload on IWS increases, which requires optimizing the learning process. In this case, blended learning system comes to help us.

Blended learning (BL) is a learning process, based on the integration of classroom and out-class learning activities using and complementing the technologies of traditional and electronic learning. The basic idea of the BL is the reduction of classroom studies through the moving the part of training in the electronic environment.

Nowadays, such giants of education as Hopkins University, where medical students also study, provide the BL system.

Aim. The purpose of the study is theoretical substantiation of the problem of using electronic and distance learning, review of methods of optimization and modeling of the learning process by integrating educational material online via the Internet.

Materials and methods: logical and theoretical analysis of philosophical,

psychological, pedagogical and methodological literature; study of teaching experience; analysis of curriculums, programs, textbooks of internal medicine.

Results and discussion. On the basis of Kharkiv National Medical University, the use of electronic learning system – “Repository” is actively promoted. It includes not only expanded scientific articles, but also teaching tools and materials developed by theoretical and clinical departments to improve the IWS and shows scientific activity of employees and students.

The clearest example of distance e-learning on the world stage is an educational resource Coursera, which combines many curriculums from many universities and allow taking courses from various disciplines, including medical. The student can receive a certificate of completion of the course in a particular discipline after creating independent works and passing the module. Our foreign colleagues not only introduce this system among students, but also use it as part of training of specialists.

In the medical field has such a platform resource Medscape, which conducts seminars and provides video training materials for education of health professionals of different specializations. If doctor gets the total number of credits he receives confirmation of the completion of the refresher course after participating seminars with passing the test module.

Conclusions: BL is for Ukrainian education not yet fully developed and realized, being considered in the world the most qualitative and promising model of the organization of the educational process that will optimize the learning process by integrating the educational material online.

Thus, mixed education can be seen as an alternative to classical pedagogical education.

ADAPTATION FEATURES OF 1ST YEAR STUDENTS

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Introduction. Adaptation of a student to new learning conditions is the key to the development of a future professional. First-year students experience a range of problems associated with the lack of psychological readiness for training at a higher educational institution, breakdown of the previous attitudes, skills, habits, values as well as with the inability to perform independent psychological regulation of their activities and behavior.

Aim. The purpose of the research is to describe the features of the first-year students' adaptation to studying at a higher educational institution.

Materials and methods. The methods of theoretical analysis of academic literature have been used.

Result and discussion. Adaptation of students to training at a higher educational institution is an intense, dynamic and complex process which enables the individual to acquire lasting skills to meet the requirements for training and education at a higher educational institution on the basis of appropriate adaptive responses. Often, this process can take from 1 to 6 months. Researchers distinguish three forms of adaptation to training at a higher educational institution. Formal adaptation concerns cognitive and informational human adaptability to the higher educational institution structure. Social adaptation is a process which allows for establishing contacts in a team. Didactic adaptation consists in preparing students for new forms of learning at a higher educational institution.

The adaptation period of a freshman is characterized by certain specific features due to the fact that the student is experiencing a crisis related to the period of transition from childhood to adulthood. The main signs of disrupted adaptation in a freshman include lack of independence, reduced self-esteem, social anxiety, lack of confidence in communication, shyness, feeling of passivity and uncertainty.

Conclusions. Successful adaptation of the first-year students to the training at a higher educational institution requires creating the necessary pedagogical and psychological conditions within the educational process.

THE INTRODUCTION OF GROUP ACTIVITY TECHNOLOGIES IN THE EDUCATIONAL PROCESS OF MEDICAL COLLEGE

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Introduction. The level of modern medical science and practice requires new approaches to training highly qualified medical personnel. Improving the quality, effectiveness, student learning depends on skilful selection and use a variety of the most appropriate subject and situation techniques and technology education, and revitalization of the subject-the whole educational process. Modern learning environment students need different implementation of innovative learning technologies, including technology group activities, which develop students' critical and clinical thinking, form the creative experience and innovation, improve competences taught to work proactively, stimulate the development of both student and teacher.

Aim. The aim is to study theoretical introduction of technology group activities in the educational process of medical college.

Materials and methods. To address the goal of scientific research methods were used: analysis of psychological and educational literature, diagnostic methods (questionnaires, tests, interviews, conversation), the method of observation.

The obtained results. The theoretical analysis of scientific papers revealed that technology is defined as a group of organized educational process of students, united by a common educational purpose. The method of group learning is the mutual learning that provides that each student is a teacher at the same time in relation to other group members, helping them learn the knowledge and skills they possess the most successful, that helps equalize the overall level of learning. Mutual learning can take place in individual, pair, group and collective forms. Implementation of the technology group activities in the educational process of medical college, including the teaching of discipline «Microbiology», showed that its use has provided growth of educational progress: average success rate in the control group increased by only 0,2 points, while the pilot – in 0,7 points.

With the systemic and systematic recourse teacher to group learning, combined with elements of developmental, personality-oriented, problem-based, project and interactive training provided cognitive and communicative activity of students, their professional development and are working substantive and organizational-activity skills, emerging life competencies, personality traits.

Conclusions. The study found that the introduction of technology group activities positively affect the interest of students to subjects, improved performance, increased activity of students during practical training, is confirmed by the results of pedagogical supervision.

THE USE OF MULTIMEDIA TECHNOLOGY IN TEACHING

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Introduction. Now, in teaching practice entered a new phase of computerization of various disciplines, caused by the development of multimedia technologies. In interactive mode, graphics, animation, photos, video, audio, text, create integrated information environment in which the user finds new opportunities, able to act as a valuable tool to enhance teaching and learning of students.

Aim. The aim is to use theoretical foundation features a multimedia presentation in the educational process of higher education.

Materials and methods. To address the goal of scientific research methods were used: analysis of psychological and educational literature, diagnostic methods (questionnaires, tests, interviews, conversation), the method of observation.

The obtained results. As you know, the man in the study of a particular material, saves 20% video, 30% of the audio information. Combination different ways of perception of information in media activity then storing performance increases to 80%. However, it should be noted that visibility – this is not a property of devices and systems as they become «visible» as a result of synergies and speech teacher demonstration device. The word is a specific way of visibility, which determines the ratio of teacher to a specific event or phenomenon, it animates the educational process, and no hardware is not able to influence the minds of listeners compared with the living word of the teacher. This lecture visualization lets you combine these substantial leverage enhance teaching and learning of students.

Using presentations has many errors methodically through improper use of materials, inability creative approach to designing slides. It is therefore not achieved the main goal of a multimedia presentation in the classroom in the educational process – the awakening interest and stimulate students to cognitive activity. Subject to certain requirements and recommendations using lectures, presentations helps: appeal teacher emphasis on logic supply educational material that will positively impact on the level of students' knowledge; ensuring optimal emotional learning environment, create favorable conditions for remembering new material; increasing lectures and more.

Conclusions. The use of modern information technologies, in particular multimedia presentation allows the teacher, firstly, change and enrich the content of education, secondly, enhance teaching and learning activities of students in the classroom. Thus, the use of presentation requires a sizeable improvement, but still leading role of the teacher – main actors lectures, which only skillfully use modern computer technology subsidiary.

OPTIMIZATION PHYSICAL TRAINING OF VOLLEYBALL PLAYERS

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Introduction. The evolutions of training methods for the game of volleyball until recently have been associated mostly with increasing the amount of training and competitive pressures. This path requires from athletes not only physical effort but finding new ways to mobilize the functional reserves of the body. It is clear that this process can't be endless. Therefore, an optimization problem of training of volleyball players becomes more relevant.

Aim. To analyse the methodology of the learning process of general physical training in the preparatory period training of volleyball players.

Materials and methods. We used analysis and generalization of scientific-methodic literature, pedagogic testing and monitoring.

Results and discussion. Modern volleyball is an athletic game that is characterized by high physical activity of athletes that achieved due to the efficiency of volleyball players. The efficiency of a volleyball player characterized by his ability to reliably and stably perform techniques; endure a significant amount of competitive activity. The choice of training methods aimed at improving efficiency of volleyball players, based on knowledge of the requirements of a modern game that are offered to the motor and functional training of athletes. To properly teach the athlete we should know whom to train, and then - how to train. Based on knowledge of the game, we can build appropriate method of trainings.

Most tactical combinations are based on quick movements that are requiring from athletes a high level of speed and speed endurance. The Effective implementation of the jumping games depends on well-developed jumping, hopping endurance and hopping agility. Blows, falling, performance techniques in unsupported position are impossible without special agility and flexibility.

Modern training plans should include control of the athletes' achievement and evaluate his potential abilities. Based on the assessment of the current status of volleyball players it is possible to build and efficient training process not only physical, but also with technical and tactical training aspects.

Conclusions. Research requirements of modern volleyball for physical training of volleyball players showed that modern volleyball players are performing as anthropometric data (average height close to 2 meters) as indicators of physical fitness. Optimization physical training of volleyball players should be based on the basis of the requirements of modern volleyball.

IMPROVING THE METHODOLOGY OF TEACHING THE ACADEMIC DISCIPLINE OF "FIRST AID"

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Introduction. The provision of high-quality training of future specialists at the National Pharmaceutical University makes it necessary to improve the methods of teaching the academic disciplines.

Aim. The goal is to improve the methodology of teaching the discipline "First (pre-doctor) aid" for students of the "Pharmacy" specialty.

Materials and methods. We used methods of analyzing scientific papers and practical experience of teaching future health professionals.

Result and discussion. The academic discipline "First (pre-doctor) aid " among the students of the "Pharmacy" specialty provides: the formation of knowledge, skills for providing emergency medical care to the injured and sick in case of accidents and urgent conditions; knowledge and skills to provide emergency care for wounds and bleeding, burns and frostbite, luxation and fractures of bones, brain injury, thorax damage, etc.

The method of improving lectures in the discipline provides the introduction, along with traditional lectures of the information-explanatory type and visualization lectures, into the educational process of problematic, binary, interactive lectures. Such lectures require preliminary preparation of the teacher and provide opportunities for the teacher to activate mentally cognitive activities of students, strengthen the motivation for learning and involve them in an active discussion.

Practical training uses visual and practical teaching methods. Among the visual methods of teaching, the method most often used shows what constitutes a set of techniques, actions and means which create a visual image of an object by students that is studied and formed a concrete idea about it. Two kinds of display are used: illustrations and demonstrations. Using the method of illustrating with the use of posters, visual products of medical purpose, formed students` knowledge about equipment, which is necessary for the provision of medical care, as well as for the care of patients. During the demonstration, students get acquainted with the algorithm for providing first aid under various emergency conditions. The demonstration takes place through video and directly carried by lecturer on the mock.

Conclusions. Improved methods of teaching during the practical training is essential scientific and educational value, contributes to the formation skills needed for the future activity of specialists.

MULTIMEDIA A NECESSARY ELEMENT IN THE WORK OF THE TEACHER

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Introduction. XXI century – the age of high computer technology. Changing the teacher's role in information culture – it needs to be a coordinator of information flow. Therefore, the teacher must possess modern methods and new educational technology to communicate in one language with the younger generation. The use of information technology allows to develop the ability of students to navigate the information flows surrounding world; to learn practical ways of working with information; to develop skills that enable to exchange information with the help of modern technical means.

Aim. Prove the feasibility of using multimedia technology as a condition for intensifying the process of learning.

Materials and methods. Today's students are visual-figurative thinking, therefore it is very important to build their learning, using as many quality illustrative material, involving in the process a new perception not only vision but also hearing, emotions, imagination. Multimedia support allows to move from explanatory and illustrated way of learning to activity in which the student becomes an active participant in learning activities. This is what contributes to the conscious assimilation of knowledge. When didactically the right approach, the computer activates the students' attention, increases their motivation, develops cognitive processes, thinking, develops imagination and fantasy. Using rich graphics, audio, and interactive capabilities of the computer creates a favorable emotional background in the classroom, contributing to the development of the student.

Results and discussion. Technology develop individual features as individual work at a computer creates comfort conditions in the performance of tasks under the program. Every student works with optimal load and not feel the influence of others, expanding the opportunities of obtaining educational information. The result is cognitive development of the student. With the help of computer technologies, the teacher can introduce students to the basic properties of information, to teach them the techniques of organization and planning of learning activities when solving tasks, to give an idea of modern information technologies and contemporary information society.

Conclusions. Thus, the introduction of new information technologies in educational process allows to use educational games and student needs for educational processes and development of individual skills.

PECULIARITIES OF HIGHER SCHOOL TEACHERS' VALUE AND SEMANTIC SPHERE

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Introduction. There is the formation of emotions and feelings, the selection of information during communication and interaction, and social relations are or aren't established on the basis of personality's value and semantic sphere.

The topicality of the study is caused by the fact that the final formation and consolidation of value orientations happens at the student (youth) age. A teacher must demonstrate the best side of man, his morality, and rules of etiquette as it directly affects the formation of a future specialist's personality, the moral education of students. Therefore, the aim of this article is the study and analysis of the peculiarities of higher school teachers' value and semantic sphere.

Materials and methods. 78 teachers of Kharkov higher educational institutions have been involved in our study. To study value and semantic sphere Sh. Schwartz questionnaire of value has been used, it gives the opportunity to discover and explore universal human values.

Results and discussion. The results of our study allow us to draw the following conclusions:

1) a characteristic feature of higher school teachers' value and semantic sphere, which is evident in the behavior aspect, is a desire for "goodness". Commitment to the values of "hedonism" and "stimulation" can be also noticed;

2) a characteristic feature of higher school teachers' value and semantic sphere, which is manifested at the normative level, is the desire for "security". A large commitment to the values of "kindness" and "independence" can be also noticed.

3) in general, we can say that the level of normative ideals and individual priorities are in close correlation, except the values of "universalism", "hedonism" and "security".

Conclusion. In the process of formation of teachers' value orientations, individual psychological factors, all of which are characterized by all personality characteristics of the person, can be identified on the one hand, and social psychological and pedagogical ones, which include man's environment and the situation in which he is involved, on the other hand.

PERSONALIZATION PHYSICAL TRAINING VOLLEYBALL PLAYERS

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Introduction. Future of sports and volleyball in particular, is in the individualization of training process. Volleyball also has a unique feature to combine in a team both tall attackers and small fast libero. Of course, the construction of the training process greatly complicated by the need study individual approach to each player of a team, however, it is a basic requirement of modern sport. Individual approach is necessary not only to players of different roles, but the players playing the same functions.

Aim. Development individual programs training process of volleyball players.

Materials and methods. We used analysis and generalization of scientific-methodic literature, pedagogic testing and monitoring.

Results and discussion. Theoretical analysis of the literature showed that the factors of determination athletic performance in volleyball are the basis of methodical approaches to the individualization of training process. They are divided into three types: individualization of physical, psychological, technical and tactical training. At the same time, none of the authors mentioned specific methods where is possible combination of all three factors for individual training volleyball players. There is a need to develop an algorithm training process individualization volleyball players, where are combining all types of training, and, therefore, all methodological approaches to personalization.

Based on the theoretical concept individualization of training process in sports games, we have created an algorithm for determining individual fitness complex structure, which showed its effectiveness to improve volleyball players' skills. On the basis of this algorithm consists of complex individual characteristics of fitness for particular players.

This algorithm consists of the following stages:

- Testing of athletes that includes a set of tests at least 10;
- Determination of the overall structure of preparedness of athletes;
- Analysing the performance testing;
- Defining individual factor values;
- On the basis of individual values factor and analysis the performance testing compilation of individual characteristics.

Conclusions. Thus, researching has shown high efficiency of individual training methods of volleyball players.

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