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## COINFECTION OF HIV AND VIRAL HEPATITIS

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The article provides an overview of reported data on HIV coinfection and chronic viral hepatitis. The analysis of disease incidence of HIV-infection in the Karaganda region according to the Karaganda regional center data on the prevention and control of AIDS was held. Verification of the diagnosis was carried out on the basis of clinical and anamnestic data, taking into account the epidemiological anamnesis and confirmed the results of enzyme immunoassay with the definition of marker medications of hepatitis B and C in paired sera and polymerase chain reaction with detection of viral DNA and RNA in blood plasma. The major routes of transmission of HIV and viral hepatitis B and C were pointed. The genotypes of viral hepatitis C in HIV-infected patients were determined. The marker diagnosis of viral hepatitis B and C with HIV-infected patients was represented. A comparative analysis of the prevalence of viral hepatitis B and C with HIV-infected patients was held.

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**Keywords:** HIV, chronic viral hepatitis, coinfection, serologic marker medications, genotypes, Karaganda region

The urgency of the problem of HIV and viral parenteral hepatitis largely is determined by common epidemiological, social and economic indicators. The growing importance of viral hepatitis is associated with their wide extension, its variety of clinical forms, a significant frequency of adverse outcomes, large economic damage [1].

According to the World health organization data, there are about 300–400 million people living with viral hepatitis B and more than 170 million people living with hepatitis C, about 35 million people infected with HIV at present time. The number of patients infected with HIV throughout the world is increasing every year [2].

HIV-infection and viral hepatitis are the two most serious and wide-spread viral infections causing significant morbidity rate and mortality. The peculiarities of HIV extension and hepatitis B are conditioned by common ways of carry-over infection. The state of immunodeficiency with HIV-infection contributes to the acceleration of viral hepatitis flow. The occurrence of AIDS progression and fatality conditioned to AIDS-related illnesses is significantly higher in patients co-infected with HIV/HSV or HIV/HCV [3].

It is important to note that the prevalence rate of HIV-infection is increasing in parallel number to morbidity of viral hepatitis with parenteral way of extension. In recent years, the bulk of injecting drug users is involved to the epidemic process of HIV-infection. As with HIV, the leading role in the extension of hepatitis B and C belongs to injecting drug users. However, the importance of sexual transmission continues to increase [4].

It is known that hepatitis C takes the leading role in the structure of chronic morbid affection of liver in developed countries, infecting about 1–2% of the population. Hepatitis C is one of the most frequent causes of chronic liver

diseases, causing heavy damage to the health of people with HIV-infection. Mixed infection with HIV and hepatitis C virus modifies the epidemiology, clinical course, virology and natural history of hepatitis C. Compared with patients infected with only hepatitis C, the patients co-infected with HIV/HCV have higher levels of RNA HCV (which increases the risk of parenteral and vertical virus extension), a higher degree of necrotic and inflammatory changes according to microscopic examination, slow response on treatment, hepatic decompensation of liver functions and hepatic failure and also increasing level mortality [5–7].

Under the co-infected with HIV and hepatitis B we mean the chronic phase HBV-infection. Patients infected with HBV, immunodeficiency virus may contribute to chronic acute hepatitis; reduce the frequency of HBsAg and HBeAg seroconversion or activation of chronic hepatitis, especially patients with the development of severe immunodeficiency. Hepatitis B with HIV-infected patients is more common and more severe. Patients with multi-infection HIV/HSV the necroinflammatory processes in liver tissue are usually less extended. However, active HBV replication increases the risk of cirrhosis, and the faster the end-stage of liver disease comes. Patients co-infected with HIV/HSV hepatocellular carcinoma occurs earlier than in patients without HIV-infection. In addition, when with coinfection HIV/HSV we observe more frequently multifocal damage of liver. When with multi-infection HIV/HSV, especially when a small number of CD4-lymphocytes the risk of death from liver disease is increasing [3, 5].

In Kazakhstan, the epidemiological situation of HIV-infection as a result of planned anti-epidemic measures in recent years is stabilized and is on the concentrated stage. The prevalence of infection among the population does not exceed 0,2%, which is several times

lower than the average in the region of Eastern Europe and Central Asia.

According to the Global competitiveness Index of the World Economic Forum of Kazakhstan according to characteristic of «HIV extension» takes 12<sup>th</sup> place among 144 countries of the world. Annually about 2000 citizens are put HIV diagnoses according to the National Center data for the last three years. The most vulnerable age group of HIV-infected people remains employable population.

HIV cases are reported in all the cities of the Republic of Kazakhstan. The highest rates of HIV-infection were observed in Almaty (235,3), Pavlodar (191,2), Karaganda (171,7), East-Kazakhstan (140,6), Kostanay (125,5) regions.

At the end of 2013 3789 cumulative cases of HIV-infection were registered in Karaganda region. The incidence of HIV-infection in Karaganda region comprises to 171,7 on 100 thousand of population.

**Aim of research:** studying of the prevalence of chronic viral hepatitis B and C with HIV-infected patients in the Karaganda region.

#### Materials and methods of research

Under the supervision were 124 HIV-infected patients who were in the dispensary in GU «Karaganda regional center on the prevention and control of AIDS».

HIV diagnosis was verified by the method of immune blotting. The clinical diagnosis was established on the basis of complex clinical and epidemiological, biochemical, and serological and instrumental research methods. Marker medications of hepatitis were detected with the help of enzyme-linked immunosorbent assay (ELISA). DNA and RNA viruses of hepatitis B, C were identified by method of polymerase chain reaction. Virus genotypes were determined with patients with chronic hepatitis C.

The analysis of the age structure showed that the largest group were patients aged from 29 to 39 years (83 patients), i.e. young people of working age, whose specific gravity was 66,9%. In this case, the majority of patients of Karaganda region with HIV-infection was noted in 1995–2002 y., and today, due to the natural history of HIV-infection, there is a significant increase in the number of patients with this age group. Among the total number of 124 surveyed coinfecting with HIV and chronic viral hepatitis, 79 were men (63,7%), women – 45 (36,3%).

#### Results of research and their discussion

The prevalence analysis of marker medications of viral hepatitis B and C (HBsAg, anti-HBcorIgG, anti-HCV) among 124 HIV-infected patients who were in the dispensary observation in GU «Karaganda regional center on the prevention and control of AIDS» showed that 65 (52,4%) patients with HIV-infection were identified chronic viral hepatitis B and C.

From the total number of 65 examined, 54 patients were infected with HIV by drugs usage, which accounted for 83,1%, in 11 (16,9%) examined the infection occurred

through sexual contact (infected sexual partners, casual sex contacts). Among patients who used drugs were 45 men (83,3%), women – 9 (16,7%). It should be noted that women are infected with HIV through heterosexual intercourse, while men are mainly infected through intravenous drug use. This fact explains the epidemic of drug abuse, swept Kazakhstan in the late 90s, which led to HIV-infection by intravenous administration of psychoactive substances in 70–80% of cases. In this regard, the dominant cause of HIV-infection and concomitant HCV-infection was the use of intravenous drugs.

On the moment of enrollment to research from total number of 65 patients coinfecting with HIV and chronic viral hepatitis the I clinical stage had 24 (36,9%) patients, II clinical stage – 32 (49,2%), III clinical stage – 9 (13,9%). In this case, patients with clinical stage IV were observed.

In the process of examination 65 patients coinfecting with HIV and viral hepatitis had the number of CD4-lymphocytes. Thus, the number of patients with CD4-lymphocytes is less than 350 cells/mcl was 38 (58,5%), from which 12 (31,6%) had the content of CD4-lymphocytes was less than 200 cells/mcl. The proportion of patients with the number of CD4-lymphocytes more than 350 cells/mcl was 27 (41,5%) patients.

The diagnosis of chronic viral hepatitis C was exposed to 45 (69,3%) patients and confirmed the identification of specific serological markers by enzyme immunoassay (the presence of anti-HCV), as well as the detection of HCV RNA by polymerase chain reaction.

Studying patients with chronic hepatitis C patients with HIV-infection were diagnosed by PCR 4 genotype. 31 (50,9%) patients 1b genotype was set, 19 (31,2%) – 3a, 6 (9,8%) – 2a, 2 patients (3,3%) – 1a. In 3 cases, 2 were determined by genotype at the same time – 1b + 2a (1,6%), 1b + 3a (1,6%), 1a+3a (1,6%) (Fig. 1).

Thus, on the territory of Karaganda region patients coinfecting with HIV and chronic hepatitis C genotype 1b and 3a were prevailed.

HBsAg was found among 25 HIV-infected patients, which is 38,5%. Thus 22 from 25 HBsAg-positive patients simultaneously had antibodies to both viral hepatitis C (88%). From 22 anti-HCV positive blood samples were tested 22 on RNA HCV by PCR method, in 17 cases the result was positive. Consequently, 26,1% of the patients had a place chronic hepatitis of mixed etiology B + C. Monoinfection of hepatitis B occurred only in 3 from 25 HBsAg-positive patients, which is 4,6% from all surveyed and 12% from HBsAg-positive (Fig. 2).

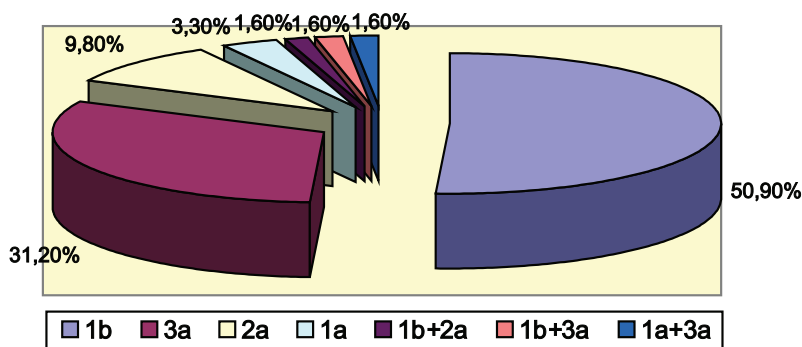


Fig. 1. Variants of genotypes among patients coinfecting with HIV and chronic hepatitis C of Karaganda region

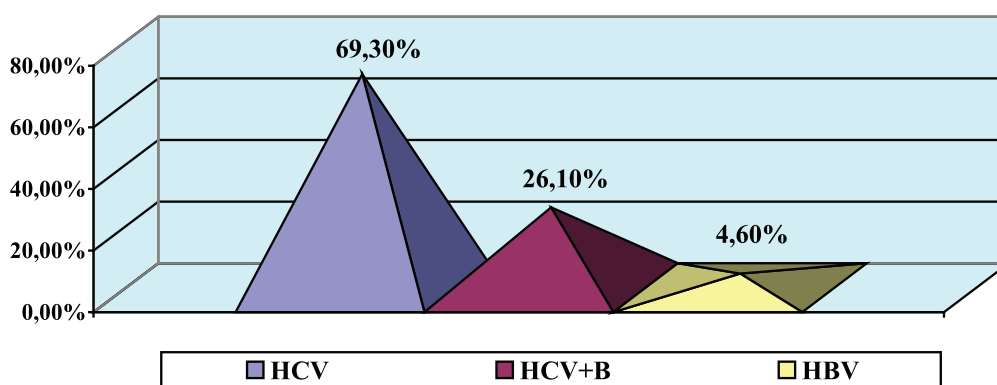


Fig. 2. Distribution of patients coinfecting with HIV and chronic viral hepatitis

Thus, among patients coinfecting with HIV and chronic viral hepatitis the majority in 69,3% of cases the diagnosis of chronic hepatitis C was set, in 26,1% of cases – chronic hepatitis of mixed etiology B+C and only 4,6% of cases – chronic hepatitis B.

**Conclusion**

1. According to anamnestic data it is revealed that on coinfection with HIV and chronic viral hepatitis the leading way was parenteral infection through injection of drugs (83,1%), then by sexual way of infection transmission (16,9%).

2. Patients coinfecting with HIV and chronic hepatitis C had genotypes 1b and 3a dominantly on the territory of Karaganda region.

3. Conducted study showed that among patients infected with HIV, in 52,4% of cases serological markers of viral hepatitis were met. In most cases, chronic hepatitis C – 69,3% and chronic hepatitis of mixed etiology B + C –

26,1% was diagnosed. The rate of infection by only virus B is no more than 4,6%.

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## PATHOGENETIC THERAPY IN DIFFUSE PERITONITIS IN CHILDREN

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The treatment of children with severe purulent-septic complications of abdominal diseases remains one of the most important problem of modern medicine. Abdominal catastrophe leads to extensive disturbances in the organism. Aim of our study is optimization of pathogenetic therapy in the treatment of diffuse peritonitis, various genesis including the use of combined preparations: antihypoxant Reamberin and combined hepatoprotector Remaxol, adequate modern nutritional support and the use of venovenous hemodiafiltration. Investigated 224 children aged 1 to 15 years with diffuse purulent peritonitis. Exploring the statistical key figures of patients in the experimental group and the control group, we found that a faster decrease in the dynamics of intoxication, decrease symptoms of enteral insufficiency were in the group of children with diffuse purulent peritonitis who have received optimized treatment. We consider optimized pathogenetic therapy in the treatment of diffuse peritonitis of various origins is reasonable and very necessary.

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**Keywords:** pathogenetic therapy, peritonitis, children

Despite the significant improvement in surgical methods of treatment in abdominal diseases, the development and introduction of modern antibacterial drugs to surgical practice, the treatment of children with severe purulent-septic complications of abdominal diseases remains one of the most important problem of modern medicine [1, 2, 3, 5, 11, 12, 13].

The mortality rate of diffuse peritonitis remains at 25–30%, and the development of multiple organ dysfunction syndrome is 80–90% [4, 9, 10, 12].

Endogenous intoxication caused by acute abdominal disease develops after intestinal insufficiency syndrome may complicate the post-operative period of up to 30–50% of patients. Abdominal catastrophe leads to the development of local inflammatory response, pain, stimulates hyperactivation of the sympathetic level of motor control intestine and release of cytokines, thereby disrupting the migrating electric complex of the intestine. All this leads to the development of enteroparesis followed by intestinal ischemia. Visceral disturbances caused by the development of diffuse peritonitis, leading to hypoxic enteral insufficiency, manifested by enteroparesis with disturbance of resorptive and barrier function of the small intestine. As a result we can see next wave of pathological mechanisms, with deep disturbances of protein metabolism and water and electrolyte balance, including not only interstitial, but also cell sector. This is followed by translocation of endotoxins from the lumen of the gastrointestinal tract into the abdominal cavity, the portal and systemic circulation. Gastrointestinal tract becomes a source of powerful endogenous bacterial and dismetabolic intoxication [2, 8, 10].

In addition to enteral insufficiency, activation of the processes of lipid peroxidation

with increasing phospholipase A2 and the subsequent suppression of antioxidant defense is very important in the progression of endotoxemia after intra-abdominal catastrophes. All this leads to the destruction of cell membranes, which is manifested homeostasis and metabolic imbalances in the various organs and tissues, including in the liver and intestine. [2, 7]

Diffuse peritonitis is a severe purulent surgical pathology and its treatment consists of three pillars: adequate debridement of the source of infection, modern antibacterial therapy and the appropriate pathogenetic therapy or so-called “impact on the macro-organism” [7, 13].

Aim of our study is optimization of pathogenetic therapy in the treatment of diffuse peritonitis, various genesis including the use of combined preparations: antihypoxant Reamberin and combined hepatoprotector Remaxol, adequate modern nutritional support and the use of venovenous hemodiafiltration.

As a research material we use our experience in treating children with diffuse purulent peritonitis in departments of pediatric surgery.

Investigated 224 children aged 1 to 15 years with diffuse purulent peritonitis (appendicular, perforative, etc.) who were treated in these departments since 2001.

140 children in addition to the standard surgical tactics and modern antibacterial therapy received Reamberin in the pathogenetic therapy, 69 patients in addition to Reamberin received Remaxol. All patients have received nutritional support with specialized preparations from the 1st day after surgery, 32 patients received venovenous hemodiafiltration sessions.

The control group included 84 children with generalized purulent peritonitis, which received the standard pathogenetic therapy: infusion therapy included crystalloid and colloid

fluids (5 and 10% solution of glucose, 0,9% solution of sodium chloride, Voluven, 10% solution of albumin).

As a result of research we have identified a faster decline in the level of white blood cells  $8,9 \cdot 10^9$  and  $9,4 \cdot 10^9$  and leukocytal index of intoxication (up to 2 and 2.1) in the main group, than in the reference group – leukocytosis –  $13,6 \cdot 10^9$  and LII – 3,2 ( $p \leq 0,5$ ).

Analysis of changes ESR (erythrocyte sedimentation rate) and the temperature reaction showed a faster decrease in ESR, as well as a faster normalization of temperature in dynamics in the group of patients with diffuse peritonitis who were treated with Reamberin and Remaxol compared with children who have received the standard therapy (up to 11, 12 and 16 mm/h at 72 hours  $p \leq 0,5$ ), which also indicates the efficacy of pathogenic optimized therapy.

In the statistical study in patients who used an optimized therapy noted faster resolution of symptoms in enteral insufficiency (intestinal paresis) by an average of 1,5 days compared with the control group.

We have identified a statistically significant ( $p \leq 0,5$ ) faster recovery of the total concentration of albumin in children who have received Remaxol in infusion therapy compared with the control group.

Study of the dynamics of transaminases (AST and ALT) showed a statistically significant faster ( $p \leq 0,5$ ) their decline in the application of optimized pathogenetic therapy, especially the use of Remaxol compared with the control group.

Exploring the statistical key figures of patients who received optimized pathogenetic therapy and the control group, we found that a faster decrease in the dynamics of intoxication – leukocytosis, LII, body temperature; much faster decrease symptoms of enteral insufficiency (intestinal paresis) were in the group of children with diffuse purulent peritonitis who have received optimized treatment. In addition revealed faster restoration of the protein-synthetic liver function, and decrease of cytolytic and mesenchymal-inflammatory syndromes, especially when Remaxol was applied.

Thus, we consider optimized pathogenetic therapy, including the use of combined preparations: antihypoxant Reamberin and combined hepatoprotector Remaxol, modern nutritional support, the use of veno-venous diafiltration in the treatment of diffuse peritonitis of various origins is reasonable and very necessary.

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## FORMATION ABILITY TO CONSTRUCTIVELY RESOLVE CONFLICTS IN ADOLESCENTS

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The notion of conflict today is not owned by any one particular field of science or practice. Thus various disciplines endow the concept of conflict in its content: economists often identified conflict with the competition, the psychology of "difficulties", "tension", sociologists replace them the concept of "debate", "opposition", etc. Analysis of the materials of the first national conference of psychological shows that the conflict is called interpersonal difficulties, intrapersonal experiences, crisis, the subject of psychotherapeutic work, collision algorithms for solving educational problems of the child, etc

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**Keywords:** teenager, contradictions, behavior, subject, social evolution, support

Now a lot of conflict that originate from the inability to control their emotional state, low self-esteem, aggression, inflated self-esteem, miscommunication, excessive adherence to principles ... and, unfortunately, this is typical of all teens.

Conflicts are an integral part of the life of any person. Adolescence – the most difficult and complex of all childhood is a period of formation of the person. At the same time, is the most important period since during this period the foundations of morality, attitudes are formed, the relationship to themselves, to people, to society. Furthermore, in this age of stabilized traits. This period can be characterized as a desire for self-improvement.

The ability to build constructive relationships with others and effectively resolve controversial issues is an important indicator of the development of personality. And many of the skills to overcome conflict situations we develop in childhood, when we actively get to know the social world.

Because adolescence child seeks as quickly as possible to become an adult and independent, there is the greatest number of conflicts with their parents. Teenager sometimes prematurely begins to consider himself an adult, requiring appropriate treatment is as an adult, but the teenager is still far in the whole meets adulthood. Therefore, I want to highlight the first factor on the way to solving the conflict – the user's perception of the conflict. From this follows the next factor – the creation of an atmosphere of mutual trust and cooperation. In the study of the Russian University of Psychology and Pedagogy were studied behaviors of adolescents in conflict, aggression as a property of the person, the manifestation of aggression as an act of behavior and tendencies of adolescents in the peer group. The main forms of behavior of adolescents in conflict are avoidance, compromise and competition (in 27% of subjects adolescents revealed a strategy of avoidance, 42% of subjects prone to compromise strategy, 31% of adolescents tend to strategy

rivalry). The findings suggest that adolescents are inclined to the strategies of avoidance and competition, can initiate or participate in conflict situations. Therefore, for a correct solution to the conflict, namely the constructive method for a teenager, it is important to know the answers to these questions:

what can I do to resolve the conflict?

that this can make my partner?

what are our common goals, in the name you want to find a way out of the conflict?

It is also possible to follow this step by step system to solve the conflict:

The joint decision to withdraw from the conflict. At this stage, it is about choosing the most appropriate way to resolve the situation causing the mutual satisfaction of rivals

Implementation of the planned method of conflict resolution. It is very important opponents, adhering target strategy, not cause hasty word? behavior etc. each other in any doubt about the sincerity of the intentions expressed earlier to resolve the conflict.

Evaluating the effectiveness of the efforts made to resolve the conflict. Based on this issue or deemed to be permitted any conclusion about the need to continue work on it. In the second case described above sequence is repeated times [1, 355–356].

In conclusion I would say that the overcoming of conflicts and the use of constructive methods to the conflict is possible only when the individual approach to the adolescent. It is given his character, preferences and abilities. It is important to know the parents that the ability to engage in constructive conflict resolution kids get at this age. It follows the following principles for the successful formation of the ability to engage in constructive conflict resolution:

conflicts should not be afraid because they are natural;

intervene in the conflict as an adult it is advisable not to remove him as a teenager to assist in the knowledge of himself, his companion, his school team;



before to intervene in the conflict, it is necessary to know its causes, otherwise interference may acquire pedagogically negative;

conflict situations and conflict with the skillful use of control mechanisms can be an effective means of educational influence;

deep expertise needed for the successful management of conflicts among adolescents;

to reduce the level of conflict among adolescents is necessary to conduct psycho events [2, 233–234].

Defining psychological concept of “conflict” F.E. Vasilyuk considers a complex task: “If you ask to find a definition that would not contradict any of the existing views on the conflict, it would sound psychologically absolute meaningless: the conflict – a clash of something with nothing -to. Dva main issues of the conflict theory, that it faces in it and what is the nature of this conflict” [3, 42].

“Psychological Dictionary” defines conflict as “intractable contradiction associated with acute emotional experiences” [4, 161]. When this as it forms stand intrapersonal, interpersonal and the intergroup conflicts.

Difficulties in defining the concept of “conflict” speak presence of different, often conflicting approaches to the study.

Traditionally, the study of conflict evolved within the sociological and psychological problems sciences. We will consider features conflicts with the position of these two approaches.

One of the founders of the theory of conflict is G. Simmel German philosopher, who is credited with the authorship of the term “sociology of conflict” and a priority in its grounds.

G. Simmel believes that conflict is inevitable in a society, and considers it one of his main forms of conflict between the individual and society. Conflict by Simmel not always or necessarily leads to destruction; on the contrary, he can perform the essential functions of conservation social relations and social systems.

Other followers G. Simmel was an American scientist L. Kozler – creator of the theory of positive-functional conflict. P.L. Kozera opinion, recognition of the conflict as an essential characteristic of social relations does not contradict the task of ensuring relativity and stability existing social system.

Social conflict in the tradition of domestic research is usually treated as the aggravation of social contradictions, a collision in which the parties are presented social communities, ethnic groups, classes, public education, etc. Thus, the concept of “social conflict” includes phenomena and processes unfolding at the level of macrostructures.

Thus, under the socialist approach conflict is viewed through the clash of different social classes, communities, nations, states, social groups, etc.

Psychological Conflict Studies tradition differs sustained interest of researchers to the problem of conflict variety theoretically and practical work on the subject. Meaning of the phenomena of conflict in general psychological phenomenology seen in the fact that almost every psychological system one way or another to determine their attitude towards to the conflicts.

According to Freud, the person is in a state the constant internal and external conflict with others and the world in general. “... The conflict in psychoanalysis – the initial form of the collision and constant of the opposite principles drives, ambivalent desires, etc., which express the contradictory nature of man” [5, 181]. That is a conflict of rights is not accidental but essential condition.

Meaning of conflict of phenomenology in general mental life is determined by the fact that, according to Freud, the conflict caused the extra mental unacceptable impulses of the libido and the aggressive impulses of an inner side of the individual [6, 142].

However, the methodological basis of both applied and theoretically approach no conceptual scheme itself as consisting conflict. On discussed and understood as a clash between two antagonistic sildenafil “Above Self” and “It”. “I” stands as permitting displacement of the conflict going on, “Ona trend”, then the consequences of inadequate the worrying permission. Problem psychoanalyst eliminate the negative consequences of the conflict and the withdrawal of the experiences associated with the existence of the conflict.

Unlike Freud and Carl Jung, K. Horney does not believe that the human propensity to conflict biologically it is predetermined. Basically cause conflicts she considers alarm and protect those who line up against nee. Pod influence basic feelings of anxiety person develops compensatory strategies of behavior, which are gradually being fixed in the nature of man, becoming part of his persons, assuming the character needs.

Most fundamentally different from Freud’s position in relation to the conflict is the concept E. Eriksona. He puts forward the idea that every personal and social crisis is oboj with a challenge, leading the individual to personal growth and overcoming life obstacles. Na every stage there own specific, requiring a solution. Successful resolution of the crisis is the key to the further development of a healthy personality and a necessary factor of effective accommodation of further steps [7, 29].

A situational approach to the study of conflict is presented primarily behaviorist tradition. Due to the fact that as an objective subject matter behaviorists considered the behavior,

conflicts of interest was limited mainly externally observable conflict – primarily interpersonal and intergroup.

For domestic psychological science was characterized primarily in the tradition stemming from the psychotherapeutic approach, the adoption of a human subjective evaluation of the situation, its subjective residence as an essential component of a conflict. So V.N. Myasishev notes that experience is arbitrary from the individual experiencing, and to be explained in connection with its features.

Analysis of research on the problem of the conflict leads to the conclusion that to date has not yet happened psychology generally accepted understanding of the conflict. Much of the psychologists consider it as a contradiction, others – as a collision or opposition.

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*Materials of Conferences***ANALYSIS OF PHYSICAL DEVELOPMENT OF BADMINTON PLAYERS AGED 14–16**

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The article studies the young athletes involved in sports badminton. All athletes live in the same region of Arkhangelsk. Complex research of young badminton players aged 14–16 years was conducted in respect of those who train at the sports school. In the course of are defined anthropometric indices of body weight and body length of young athletes. The parameters of the physical qualities of young athletes. Are shown correlation relations indicators of physical qualities, which reflect the influence of one on the other.

The problem of the player selection in professional badminton is very complex. It involves many aspects, among others pedagogical, social, psychological and philosophical phases [1]. The coach's experience and intuition can help to make a choice, but they cannot solve all selection problems, that is proved by the great number of player removing that can reach 90–95% [4, 5].

The indicators used for orientation and selection should have predictive power. That means they should not only fix the current development of the athlete, but also give an opportunity to predict how these parameters may change in the future. They may serve as a signal of the relative level of the athlete development, when this person becomes an adult. The selection of athletes is a complex matter, since it is necessary to predict the next few years of development not of adults, but of growing-up children and adolescents. It is necessary to guess a child's athletic abilities, which have not yet appeared, but can be crucial in an adult athlete [2, 3, 6].

The task of the coach is a selection of children, suitable for playing badminton and able to achieve high results. Identifying children, which are most susceptible to badminton, is possible by making a special testing appropriate to badminton. Test results can help the coach to select the most talented children, and what is also important is to create a program of improving underdeveloped qualities.

Therefore, the question of selection of young athletes in badminton is topical.

The purpose of this research is to identify and evaluate the indicators of athletes' qualification, which are the priority in the selection of young badminton sportsmen.

The follow tasks were set to achieve these **goals**:

1. Assess the physical development of young athletes.

2. Analyze the physical qualifications of badminton players.

Traditional research methods such as analysis of the scientific and methodological literature, assessment of physical development, testing and mathematical statistics were used for solving these problems.

The participants of the study were young men aged 14–16 years involved in a school section of badminton. The athletes' experience at the time of the study was 4,7 years and they had qualification of the first and the second adult category.

The study examined the state of the physical development of young athletes. The obtained results were compared with the tabulated estimates by zones of development. It was revealed that young men of 14–16 years correspond to the fourth development zone according to the length of a body and chest girth, and to the fifth development zone – on body weight. (Table 1).

**Table 1**  
Indicators of physical development of badminton players aged 14–16 years

Physical development	M ± m	Development zone
1. Body length, cm	171,36 ± 1,83	4
2. Body weight, kg	55,82 ± 2,61	5
3. Chest girth, cm	79,73 ± 1,37	4
4. ZhEL, ml	3363,64 ± 127,49	4

Some tests have been identified to assess the physical development of young athletes. They reflect the leading motor skills in the selection to the group of badminton (Table 2).

Correlation method was used to analyze the indicators of physical development. Analysis of the results shows the degree of the interconnection between motor abilities.

Statistical relationships showing the effect of control exercise on each other were established by the study. High negative correlations of the speed abilities (cross country running (3·10 m)) and speed-strength abilities (high jumping,  $r = -0,8$  and long jumping,  $r = -0,7$ ) were showed. High positive correlations observed between cross country running (3·10 m) and running of 30 m ( $r = 0,8$ ). The demonstrated results indicate that only optimally high values of these characteristics implemented in the necessary speed of movement on the court and improving technical and tactical skills allow realizing their full potential in the game of any intensity.

Table 2

Results of testing young badminton players

Motor abilities	Control exercise	M ± m	r	r
Speed	Running 30 m	4,76 ± 0,11		0,8
Coordination	Running 3·10 m	7,37 ± 0,08	-0,7	
Speed-strength	Long jumping, sm	210,36 ± 5,87		0,7
	High jumping, sm	43,73 ± 1,67	-0,8	
Speed-actioned	Tapping test, number of times	29,73 ± 1,41		0,5
Strength	Carpal dynamometry, right arm, kg	29,55 ± 1,63	-0,4	
	Carpal dynamometry, left arm, kg	24,55 ± 1,73		

An average connection between the motor action index speed (tapping test) was determined with the result of running 30 m ( $r = 0,6$ ).

The obtained results are supported by specialists in the field of sports training that are created during adolescence some physiological prerequisites for the development of speed and power abilities. They underlie the growth speed. Adolescence is also associated with the onset of puberty, which is accompanied by increased excitability of the nervous system and its instability, which adversely affects the adaptation to physical stress and recovery process. Therefore, the strictly individual approach is required during the training.

According to the study, **the following conclusions** can be made:

1. Analysis of the indicators of the physical development of young athletes aged 14–16 showed that the level of physical development of children in the study group is relevant to the age groups and refers to the fourth and the fifth development zones. There is a harmonious physical development as well.

2. The determinate high correlation of motor abilities show their significance and possible use as a criterion in the selection of badminton players.

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#### THE QUALITY OF LIFE IN PATIENTS WITH CHRONIC PANCREATITIS

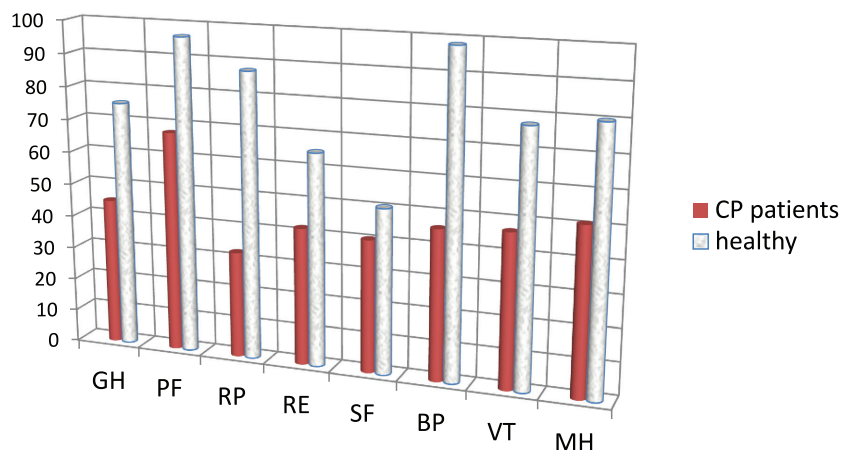
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Chronic pancreatitis (CP) is a socially significant disease due to the high morbidity and frequent primary disability (15% patients). Thus, in the Udmurt Republic was revealed high growth of morbidity for diseases of the pancreas: the overall incidence increased from 460,5 persons per 100 thousand population in 2005 to 835,1 persons per 100 thousand people in 2013. Annual growth in the overall incidence ranged from 7,2 to 18,6%. Thus there is a constant progression of the disease with irreversible changes in pancreatic tissue. Constant keeping diet and long-term use of drugs limit the usual rhythm of life of patients. In recent years, assessment of life quality (LQ), which determines the degree of satisfaction of human needs, is widely used to characterize the severity of the pathological process, its dynamics and the effectiveness of therapeutic interventions. Definition of quality of life is particularly important in chronic diseases that require follow-up therapy for a long time.

The aim of our study was to investigate violations of the features of quality of life in patients with CP.

**Materials and methods of research.** We examined 112 patients with exacerbation of CP at the age of 33–65 years. There were 45 men and 67 women. The diagnosis was verified on the basis of carefully collected medical history, laboratory data and imaging studies (ultrasonography and fibrogastroduodenoscopy). LQ was assessed using the SF-36 test «Health status survey» (Ware J.I., 1994), where 100 points mean complete health, and the test «Gastrointestinal index of life quality» GIOLI. To study the peculiarities of patients nutrition we used special questionnaire. The results were compared with the control group (20 healthy subjects).



The data of health quality in CP patients and healthy (due to th SF-36 questionnaire)

**Results of research and their discussion.** Testing has shown that CP patients suffer predominantly physical component of health (Figure). Thus, there were significantly limited physical functioning (PF) –  $67,5 \pm 8,2$  points and role functioning (RP) –  $32,9 \pm 9,2$  points, that reflect the influence of physical condition to performing exercise and daily activities (in the control group –  $96,3 \pm 2,4$  and  $87,5 \pm 7,5$ , respectively). The general health status (GH) and pain intensity (BP) patients evaluated as  $44,9 \pm 7,4$  points and  $45,9 \pm 11,3$  points, in healthy, these figures were  $75,3 \pm 7,1$  and  $98,3 \pm 2,1$  points ( $p < 0,05$ ). In the psychological component of health social functioning (SF) and role functioning (RE) due to emotional state, tended to decrease. Vital activity (VT) was limited to  $47,0 \pm 10,4$  points, in healthy –  $77,5 \pm 4,2$  points ( $p < 0,05$ ). Mental health (MH) that characterize the presence of anxiety and depression was also significantly reduced compared with the control group:  $51,1 \pm 9,5$  points and  $80,0 \pm 2,1$ , respectively.

According to the questionnaire GIOLI and special questionnaire, with 82,1% of patients with CP due to the disease worsened relationship with family, 58,9% were forced to change their way of life, 64,3% of patients – food. 61,6% of patients experiencing discomfort from inadequate food intake, enjoyment of food received only 57,1% of patients. 45,5% of the examined persons noted sleep disturbance, 43,7% of patients marked poor coping with everyday stress. Due to stress majority of respondents (63,4%) had appetite elevation, in case of positive emotions (when they were satisfied by themselves) 41,9% patients allowed themselves to eat something, 27,7% of patients could drink alcohol.

#### Conclusion

In the period of CP exacerbation physical and psychological components of health suffer, that connected with chronic disease and necessity to

change diet. With help of the SF-36 questionnaire we can detect and quantify changes in LQ for the individual follow-up psychological treatment.

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#### ATTACKS OF CARDIOVASCULAR BOTH NERVOUS ILLNESSES AND THEIR INTERRELATION WITH NANOFUCTUATIONS OF THE MAGNETIC FIELD OF THE EARTH

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The magnetic field of the Earth can be divided conditionally on two parts: constant and variable as they have a various origin. Sources of a constant component of a magnetic field are located in a planet. Sources of a variable component of a magnetic field have an extraterrestrial origin. The variation field is imposed on constant, causing change in time as a whole all magnetic field of the Earth. The geometrical difference between observable size of a magnetic field and its average value for any long time interval (month, year) is called as a vector of magnetic variations of fields. The size of change of a variable component of a field in comparison with a constant component is insignificant. Magnetic variations share on fast and slow (century). Among fast variations distinguish quiet and revolted (geomagnetic pulsations). Geomagnetic pulsations by the physical nature are MGD – waves in magnetospheric plasma which are transformed in electromagnetic waves at the approach to the Earth.

Amplitude of geomagnetic fluctuations it is insignificant it is small: from units to hundreds nanotesla ( $10^{-9}$  T). The range of frequencies of separate types of geomagnetic pulsations is close to the basic biorhythms of the person. Pulsations of a magnetic field of the Earth can be imposed on biorhythms and depending on an imposing phase to render both positive, and negative influences. Now the problem of studying of geospheric and biospheric communications has got still the big importance in connection with piloted flight planned for the nearest decade to Mars, accompanied by an exit for limits magnetosphere of the Earth. In work are presented experimentally and statistical results. The inhabitants of Murom, Vladimir region are chosen as the subject and the object of research. The object of research on the site concerns average geomagnetic widths of an order of 53 degrees. Geomagnetic conditions in this region are fixed by a geomagnetic observatory of Borok in Yaroslavl region. The time interval of supervision – three years (from February, 1985 till December, 1987) – coincides with lifting of solar activity in its 11-year-old cycle. The ends of the time interval adjoin on the one hand, to a minimum of Sun activity (1984), on the other hand – to its maximum, and, to the highest on the intensity for the last almost two centuries (1989). An initial material for research are medical given stations “First aids” in Murom and the geophysical date of the observatories of Borok. Magnetic storms recurrent and flight characters are considered. Feature of a technique of processing consists that the medical data is selected according to each case of a magnetic storm. It is rather important if to consider that circumstance that handwriting of each magnetic storm is individual and unique. The medical data was analyzed in three time intervals: before a magnetic storm, during a magnetic storm and after a magnetic storm. Thin structure of magnetic storms (nanostructure) are geomagnetic pulsations. Among variety of geomagnetic pulsations those which periods are close to the basic biorhythms of the person have been chosen. Frequency of fluctuations of a cardiac muscle of an order of 1 Hz, frequency of pressure fluctuations 0,1 Hz, brain biorhythms have frequencies from 0,2 Hz to 100 Hz. In consideration joined the irregular fluctuations

of low-frequency and high-frequency ranges accompanying all three phases of course of a magnetic substorm, and also regular fluctuations of type Pc1. The magnetic storm in February, 1985 had recurrent character, chromospheric flashes on the Sun was not observed. Emission of plasma of a solar wind occurred from of crown holes. Flight magnetic storms are considered in a counterbalance to a recurrent storm. One of them is registered in the same month not to break seasonal prevalence of the phenomenon, but in 1986. Others are registered in the spring and autumn of 1985 (April-May, November-December). Besides, the long time intervals corresponding to moderate and low geomagnetic activity at which magnetic storms it was not observed (spring of 1986 and winter of 1987) are considered. The analysis of the medical information is executed in each of versions of following cardiovascular illnesses: a chronic ischemic heart trouble, hypertensive illness, a hypertensive crisis, a stenocardia, a heart attack of a myocardium and in each of following nervous illnesses: the vascular dystonia, a bronchial asthma, a neurasthenia, a neurosis, a psychosis, a schizophrenia, a brain stroke. The greatest number of calls of first aid concerning attacks of cardiovascular and nervous illnesses and their lethal outcomes was necessary for the moments of time of a long absence of high-frequency geomagnetic pulsations in a frequency range of biorhythms of the person. As scale of duration of absence of pulsations the six-hour interval necessary for reorganisation of the plasmasphere (namely its borders – plasmopause) which can act in a role of one of natural amplifiers of high-frequency fluctuations is considered. As the recommendation for maintenance of normal conditions of ability to live of crew of the spaceship at an exit from an operative range of a geomagnetic field it is possible to offer artificial influence by variable electromagnetic fields in a range of frequencies close to biorhythms of the person.

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## DIETARY USE OF URAL LICORICE (*GLYCYRRHIZA URALENSIS FISCH*) AS A FOOD ADDITIVE IN STRESS

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The article represents the results of application of the diet containing the Ural licorice root extract in the correction of pathologies of the rats' lung surfactant after their exposure to noise effect. Present study enables us to recommend use of the Ural licorice extract as a food additive for correction of pulmonary status in the conditions of exposure to noise stress.

**Keywords:** Ural licorice, surfactant lung noise stress, nutritional correction

Ural licorice (licorice root, *Glycyrrhiza uralensis Fisch.*) and licorice-based products have been traditionally used for the treatment of acute and chronic respiratory diseases, such as bronchitis, catarrh, inflammatory pulmonary diseases of different etiology, bronchial asthma etc. Biological activity of extracts produced of licorice root (*Radix Glycyrrhizae*) and their physiological safety are accounted for by their chemical composition with main components including: glycyrrhizic acid which is structurally close to glucocorticoids; flavonoids – liquiriton, liquiritigenin, isouraloside and others; carbohydrates, organic acids, vitamins, amarines and other compounds [1]. The principal therapeutic effect is most likely to be due to corticosteroid-like effect of glycyrrhetic acid which is released in the course of hydrolysis of glycyrrhizic acid. This is the most important pharmacologic property of the plant. Activity of glycyrrhizic acid is similar to 1/8 of that of cortizone. Another significant pharmacological effect is antioxidant action which is provided by flavonoids.

In spite of considerable number of research works dealing with study of licorice up to present time, we did not find any work on the use of licorice or licorice-based products as stress protectors, components of functional food products or food additives.

Today, the action on the organism by various stresses, including emotional ones, is a current and widely discussed problem. One of the principal places within the framework of this problem belongs to the pulmonary pathology initiated by a stress factor. The lungs react to the stress with structural and functional changes at the cellular level. As a rule, pulmonary pathogenesis is connected with impaired functioning of the macrostructure which is essential for operation of the organ – lung surfactant which is the membrane lining the internal surface of air vesicles. Lung surfactant (LS) is mainly composed of lipids and thus prone to lipid peroxidation (LPO) activated by effect of environmental stress factors [2]. The process of lung surfactant

injury can be reduced by dietary use of functional food products and specific biologically active additives on the basis of phytopreparations with stress-protective activity able to reduce LPO and to stabilize lipid status [6].

The aim of this work was to study experimentally the effect produced by noise stress on pulmonary surfactant system and correction of its pathologies by extract of Ural licorice introduced in food ration.

### Materials and methods of research

In order to determine the degree of lung injury in experimental animals as a result of psychoemotional stress we conducted studies on three groups of white rats (Wistar line) with weight  $170 \pm 20$  g. The rats were subjected to acoustic discomfort by noise with intensity 80 dBA at the distance of 5,5 m from the source during 1 hour one time and during 9 days (control group). Experimental groups (the 1<sup>st</sup> and the 2<sup>nd</sup> group) consisted of rats which were intragastrically administered the Ural licorice extract in the dose of 0,1 g/kg of body weight 30 minutes before the noise exposure. Besides, during seven days before the beginning of the experiment the rats of the second experimental group daily received the same dose of licorice root extract with their food ration. The intact group consisted of healthy animals of the relevant age and sex who received the standard food ration.

The extract used was extract of Ural licorice roots (*Glycyrrhiza Uralensis Fisch*) prepared by percolation 1:1 with 40% water-alcohol solution in accordance with requirements of The USSR State Pharmacopoeia (1968).

Chemical and technological parameters and content of macro- and micronutrients were determined for the extract. The results of studies are shown in Tables 1 and 2.

**Table 1**  
Chemical and technological parameters of licorice roots

Name of parameter	Content, %
Moisture content	43 ± 1,0
Ash (total)	8 ± 0,1
Extractive substances:	25 ± 1,0
Glycyrrhizic acid	20 ± 1,0
Flavonoids (total)	2 ± 0,1
Others	Less than 3

**Table 2**  
Content of macro-and micronutrients  
in licorice roots

Name of indicator	Value of indicator
Macronutrients, (mg/g):	
Potassium	14,5
Calcium	11,5
Magnesium	2,4
Micronutrients, (mkg/g):	
Iron	0,7
Manganese	0,15
Copper	0,31
Zinc	0,33
Molybdenum	traces
Cobalt	traces
Chromium	0,08
Aluminum	0,06
Barium	traces
Vanadium	0,02
Selenium	1,0
Nickel	0,26
Strontium	0,09

The rats' LS was separated and examined using techniques described in the earlier works [4]. Among parameters to be determined were LPO secondary products reacting with 2 – thiobarbituric acid (TBA-active products), activity of antioxidant system enzymes – superoxide dismutase and glutathione reductase, total lipid amount in terms of raw lung mass and phospholipids in percentage from total lipids, classes of phospholipids and neutral lipids.

### Results of research and their discussion

The undertaken investigations showed significant changes of principal functionally important parameters of lung surfactants reflecting the conditions of LPO and antioxidant system (Table 3).

The amount of peroxidation products (TBA-active products) in rats' lung surfactants 9 days after the noise exposure increased significantly, and the activity of antioxidant protection reduced: the amount of LPO products increased by 1,2 ( $p < 0,05$ ) times, the activity of superoxide dismutase and glutathione reductase reduced by 1,9–1,6 ( $p < 0,01$ ) times. Intensification of lipid peroxidation with simultaneous inhibition of antioxidant system resulted in disturbance of lipid metabolism which was manifested in decrease of total lipid level, including phospholipids, by 19% ( $p < 0,05$ ). In terms of phospholipidic composition the share of phospholipid precursors increased (phosphatidic acid by twofold and phosphatidylglycerol) by 1,7 times ( $p < 0,05$ ), and the share of oxidized phospholipids (lysophospholipids) increased multiply ( $p < 0,001$ ). In terms of neutral lipid composition, the share of free fatty acids and triglycerides decreased by 11 and 18%, respectively, and the share of cholesterol and cholesterol esters increased by 12 and 19%, respectively ( $p < 0,05$ ) (Table 4). Therefore, it should be noted that the general impact of noise on the rats' body resulted in severe disturbance of the state of their lung surfactants.

**Table 3**  
Values of lipid peroxidation (TBA-active products), antioxidant protection  
(activity of superoxide dismutase and glutathione reductase enzymes), total lipids  
and total phospholipids of LS in intact rats, control rats and rats fed with licorice extract  
(9 days after exposure to noise stress)

	Intact	Control	1 <sup>st</sup> experimental	2 <sup>nd</sup> experimental
TBA-active products (nmol/mg of lungs)	0,49 ± 0,02	0,58 ± 0,03*	0,50 ± 0,02 <sup>#</sup>	0,51 ± 0,03 <sup>#</sup>
Superoxide dismutase (nmol of nicotinamide adenine dinucleotide, reduced form (NADN)/ mg of lung)	0,56 ± 0,02	0,30 ± 0,01*	0,49 ± 0,03 <sup>#</sup>	0,50 ± 0,03 <sup>#</sup>
Glutathione reductase (nmol of NADN)/mg of lung)	0,65 ± 0,01	0,40 ± 0,02*	0,61 ± 0,01 <sup>#</sup>	0,60 ± 0,03 <sup>#</sup>
Total lipids (mg/g of lung mass)	15,2 ± 0,5	14,3 ± 0,8	16,9 ± 1,0*	17,3 ± 1,0 <sup>#</sup>
Total phospholipids (% from total lipids)	76,21 ± 1,22	61,48 ± 1,31*	75,35 ± 2,47 <sup>#</sup>	70,41 ± 6,13

**Note:** \* – changes are significant in respect of intact animals; # – changes are significant in respect of control animals.



Table 4

Levels of lipids (phospholipids and neutral lipids by classes) of lung surfactant in intact rats, control rats and rats fed with licorice extract (9 days after exposure to noise stress)

	Intact	Control	1 <sup>st</sup> experimental	2 <sup>nd</sup> experimental
Classes of phospholipids (in% from total phospholipids):				
Phosphatidylcholine	56,5 ± 2,4	46,3 ± 1,2*	53,1 ± 2,4 <sup>#</sup>	55,3 ± 0,8 <sup>#</sup>
Phosphatidyl-ethanolamine	11,2 ± 0,9	7,0 ± 0,3*	9,2 ± 0,8 <sup>#</sup>	10,1 ± 1,0 <sup>#</sup>
Sphingomyelin	9,6 ± 0,5	7,6 ± 0,6*	9,3 ± 0,7	9,0 ± 0,6
Phosphatidylglycerol	5,1 ± 0,8	8,7 ± 0,9*	5,5 ± 0,7 <sup>#</sup>	4,9 ± 0,3 <sup>#</sup>
Phosphatidylserine	6,9 ± 0,3	3,4 ± 0,2*	7,5 ± 0,6 <sup>#</sup>	6,0 ± 0,5 <sup>#</sup>
Phosphatidylinositol	6,8 ± 0,5	3,4 ± 0,5*	8,0 ± 0,8 <sup>#</sup>	6,7 ± 0,2 <sup>#</sup>
Phosphatidic acid	3,4 ± 0,9	7,4 ± 0,3*	5,2 ± 0,4 <sup>#</sup>	5,3 ± 0,5 <sup>#</sup>
Lysophospholipids	0,5 ± 0,2	16,2 ± 0,6*	2,2 ± 0,3* <sup>#</sup>	2,7 ± 0,4* <sup>#</sup>
Classes of neutral lipids (in% from total neutral lipids):				
Cholesterol	20,7 ± 1,5	24,6 ± 0,7*	21,0 ± 0,2 <sup>#</sup>	20,9 ± 1,0 <sup>#</sup>
Cholesterol esters	21,6 ± 0,9	24,3 ± 0,4*	22,0 ± 0,4 <sup>#</sup>	22,3 ± 0,9 <sup>#</sup>
Free fatty acids	18,6 ± 0,4	16,6 ± 0,6*	18,1 ± 0,4 <sup>#</sup>	18,8 ± 0,7 <sup>#</sup>
Triglycerides	17,6 ± 0,8	14,5 ± 0,4*	17,0 ± 0,3 <sup>#</sup>	17,7 ± 0,6 <sup>#</sup>
Unidentified lipids	21,5 ± 1,2	20,0 ± 0,8	21,9 ± 0,8	20,3 ± ± 1,6

Notes: \* – changes are significant in respect of intact animals; # – changes are significant in respect of control animals.

Application of the Ural licorice extract prior to noise exposure maintained the level of the examined LPO parameters, enzymes' activity and lipid values at the level of intact animals. Only the value of lysophospholipids exceeded the level of the intact animals. However, the total lipids level even increased by 11% as compared to the correspondent value in the intact rats. The application of the Ural licorice extract proved to be efficient as a LPO inhibitor and for maintenance of antioxidant enzymes activity at the level of healthy animals.

Protective effect of licorice extract in relation to lung lipids is most likely to be due to corticosteroid-like impact of glycyrrhetic acid which intensifies secretion of cortisone and prevents its degradation in the liver. The synthesis of lung surfactant lipids is known to intensify under the influence of glucocorticoids by increasing blood concentration of fatty acids and glucose which are the necessary substrates for the synthesis of phospholipids.[5]. Another important stage of restorative processes in the lung surfactant induced by licorice extract is the inhibition of lipid peroxidation reaction by flavonoids forming a part of the extract [3]. This is the reason why the development of adaptation mechanisms aimed at the maintenance of homeostasis of the lung surfactant lipid component in the animals consuming licorice

also takes place under the activation of the antioxidant system.

Thus, the results of the investigations showed the efficiency of the Ural licorice extract application for correcting the damaged lung lipids. This given investigation enables us to recommend the application of the Ural licorice extract as a food additive for correcting the lung condition when the body is exposed to the noise stress.

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*Materials of Conferences*

**NON-FINANCIAL INSTRUMENTS  
OF THE STATE SUPPORT  
OF AN EXPORT POTENTIAL  
OF ENGINEERING ENTERPRISES**

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Non-financial instruments of the state support to develop the export potential of enterprises – are tools that have an impact on the development of enterprises – exporters not directly, but indirectly, through what any other instruments. State should pay particular attention to the tools of non-financial support from the fact that these tools are not contrary to accepted into the WTO ways to support exporters.

The variety of non-financial instruments to support exporters at the state level is shown in Table – performers are listed for each type of instruments, as well as specified methods of interaction with exporters. Among the instruments of government non-financial support for the development of export potential of a tool such as infrastructure development non-financial support of export-oriented enterprises, through which the state provides engineering company, plans to export its products, non-financial support for the organization of export deliveries.

In Krasnoyarsk Region in 1997 was founded JSC “Krasnoyarsk Regional Agency for Small and Medium Business Support”, according to the Civil code of the Russian Federation and the Federal law “About joint-stock companies” and the foundation agreement of June 1, 1997. Krasnoyarsk Region, represented by Agency on management of the state property across Krasnoyarsk Region, is the Only shareholder of JSC Krasnoyarsk Regional Agency for Small and Medium Business Support, possess 100% of share holding in authorized capital.

JSC “Krasnoyarsk Regional Agency for Small and Medium Business Support” conducts the activity since May, 2009.

The main activities of the Agency are:

- financial support within “Micro financing” state program;
- providing guarantees for credit receivers in credit institutions according to the Guarantee program;
- consultation on questions about business methods;
- trainings for businessmen within a course of financial literacy «Begin and improve the business».

For non-financial instruments to support the export potential of machine-building enterprises include activities under the various programs at the regional level.

Non-financial instruments to support exporters

State support	Implementers	Non-financial instruments of the support
The information and consultation of exporters	<ul style="list-style-type: none"> <li>● Trade missions of Russia in foreign countries</li> <li>● Coordination Centers to support export-oriented small and medium-sized enterprises</li> <li>● European Information Correspondent Center</li> </ul>	<ul style="list-style-type: none"> <li>● Identify business missions Ministry of Economic Development</li> <li>● Establishment of an intergovernmental commission on cooperation between the Russian Federation and foreign countries</li> <li>● Conduct summits and councils with foreign partners</li> <li>● Research of foreign markets;</li> <li>● Provision of legal, financial and logistical issues</li> </ul>
Assistance in organizing exhibitions fairs forums	<ul style="list-style-type: none"> <li>● Coordination Centers to support export-oriented small and medium-sized enterprises</li> <li>● Trade missions of Russia in foreign countries</li> <li>● Chamber of Commerce of the Russian Federation</li> <li>● Russian Union of Entrepreneurs</li> <li>● Russian Venture Company</li> </ul>	<ul style="list-style-type: none"> <li>● Preparation and implementation of projects of passports</li> <li>● Support for the exhibition activity</li> <li>● Preparation of information about enterprises of Krasnoyarsk region for potential partners;</li> <li>● Preparation and publication of information about exporters in international databases</li> </ul>
Reducing barriers for exports	<ul style="list-style-type: none"> <li>● Chamber of Commerce of the Russian Federation</li> <li>● Trade missions of Russia in foreign countries</li> <li>● Russian Union of Entrepreneurs</li> </ul>	<ul style="list-style-type: none"> <li>● Improve access to goods and services to foreign markets</li> <li>● Simplification of customs procedures and formalities</li> <li>● Elimination of administrative barriers</li> </ul>

For example, in the Krasnoyarsk region has a program “road map” Support access to foreign markets and “export promotion”.

The program is designed to ensure the promotion of export production enterprises of the region to foreign markets, the formation of the competitive environment, active entrepreneurs, exporters, as well as the formation of the institutional environment for the competitive conditions of enterprises in the global market.

Among the instruments of state support aimed at developing the export potential of engineering, you can select a tool, the granting of tariff preferences to Russian exporters. The system of tariff preferences operates under the general system of preferences of the United Nations. Granting of tariff preferences is a tool aimed at reducing the overall cost exporters of goods to foreign countries.

Russian Federation, in accordance with the classification of the United Nations, included in the list of countries in transition (transitive) model of the economy, so the Russian exporters may qualify for more favorable treatment to import their products, rather than RNB.

Preferential treatment of imports of goods provided by developed countries on a unilateral non-reciprocal order of the Russian Federation and is not contrary to WTO rules and disciplines.

There are Government programs to create and develop economic cooperation, developed with the participation of the intergovernmental commission on trade and economic cooperation with foreign countries. As part of the Commission to establish committees and working groups, which play an important role in the development of bilateral cooperation between Russia and foreign countries, aimed at obtaining mutual interest. Intergovernmental committees are established for effective interaction between business and the state at the international level. The main goal of each program – the creation of favorable conditions for the development of foreign economic relations of the Russian Federation, assistance to Russian entrepreneurs in collaboration with foreign partners.

The European Union and the Russian Federation signed an “Agreement on Partnership and Cooperation”, which is a program of cooperation aimed at the implementation of economic and social transformation. One tool is the organization of industrial cooperation among countries at the international level, contributing to the deepening of industrial cooperation and the formation of a coherent conceptual approaches to industrial policy.

In the Eurasian Union in the framework of this area signed the decision of the Supreme Eurasian Economic Council “On the main directions of coordination of national industrial policy”. This decision is the legal basis for the formation of industrial cooperation in key areas.

Non-financial instruments of government regulation relate to the environment, provision does not

depend on the opinions of business leaders. However, using this tool does not contradict the block with WTO rules, and hence can be used by enterprises without any restrictions. As a rule, non-financial instruments of state support are advisory in nature, the company cannot use them at all.

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#### THE ROLE OF INTERNAL MARKETING IN THE INTERNATIONALIZATION OF HIGHER EDUCATION ORGANIZATION

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In the nearest future high school of Russia will have to solve quite a complicated problem: no less than five Russian universities must qualify for top one hundred of leading universities all over the world according to the rating of QS World University Rankings [1]. A poor level of competitiveness at world market of the most domestic organizations of higher (tertiary) education is mostly defined by discrepancy between the level of graduates and challenges of globalization. Methodical, pedagogic, and other components of higher education often obtain over-national features as a result of spontaneous and unsystematic internationalization.

Modern definition of the idea “globalization” in application to activity of educational organizations implies parallel existence of two types of processes – internal and external (internationalization at home) internationalization [Jade Knight]. External internationalization that is being studied more closely in Russian high school, is usually represented by mobility of students, tutors, projects, educational programmes and services. External internationalization that, according to J. Knight, represents a complex of measures that provide for development of intercultural communication and international understanding skills among students, embraces almost all aspects of educational organizations’ activity, from defining educational plans and programmes to interacting with local cultural societies and various ethnical groups. From our

point of view, preparation for a successful introduction of Russian high school into the world market should start with internal internationalization. Inviting foreign tutors and student to an educational institution with unclear internationalization goals and lack of operational processes and microclimate, adapted to challenges of globalization, can lead (and does!) to degradation of an organization's image and decrease in education quality.

Studying educational services as a commodity defines a necessity to apply marketing principles to process of high school internationalization. The most appropriate model for the area of tertiary education is that of "serving in action" by P. Eiglier and E. Langedard that contains three basic elements – consumers (students), process of providing a service (education), and organization that provides services (educational institution). According to the marketing model "serving in action", an environment that favours for receiving knowledge and competences, implies providing educational services by a qualified and motivated "communicative personnel" that contributes greatly to increase in education quality.

A broad specter of organizational-managing, methodical, educational, upbringing, and scientific nature should be solved within the frames of internal internationalization. Chancellor of Russian university of international friendship in which number of foreigners forms more than 1/3, mentions a list of 29 problems [3], most of which can't be solved without a skillful introduction of marketing concepts into activity of universities. A strategic goal of internal marketing within a university is to create conditions that provide for development of competitive personnel within an institution. In this case methods of all comprehensive motivation and internal personnel training become basic tools. The latter method deserves our special attention. Most of Russian high school tutors haven't had an experience of teaching their subject in a foreign language yet and usually are completely unprepared to carrying out their pedagogic functions in terms of cross-cultural communications in both psychological and methodical sense. At the same time, with-

out trained professor-tutor and training-assisting personnel it is impossible to solve such problems as, for example, realization of educational process within international groups or implementation of modern (including interactive) methods of using global informational systems. Therefore, internationalizing activity of an educational organization of tertiary education must begin with development of new inter-firm standards of professor staff, and the system of inter-firm personnel training. However, placing new requirements before the personnel, university leaders must reveal and improve level of employee's satisfaction with their work at the same time. Definition of an optimal correlation between activity types and motivational potential is possible with toolset of internal marketing, introduction of which usually starts with figuring out subjective opinions, preferences, and settings of employees. It can be achieved through an iterative procedure, result of which is formation of work attributes' positioning map, based upon matrix "significance-realization". Specific features of university tutor's work, emergence of new informational technologies, complexity of organization goals (educational, upbringing, and scientific) require revising all parameters of their activity. Trade union organizations of educational institutions could take responsibility for forming such list according to selective study of opinions among professor and tutor personnel.

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## LEGAL POLICY OF THE UKRAINIAN SOVIET SOCIALIST REPUBLIC IN THE SPHERE OF MEDICINE AND ITS MATERIAL EXPRESSION IN DAYS OF THE GREAT PATRIOTIC WAR

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Legal policy of the Ukrainian Soviet Socialist Republic in the sphere of medicine and its material expression in days of the Great Patriotic War is considered in the article. And also legal, state regulation of medicine against military events in the territory of the USSR is considered.

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**Keywords:** medical law, medical provision, health protection

In 1941–1945 the big part was assigned to a medical provision. The formation of a network of military sanitary establishments was carried out mainly under the direct influence of an operational and strategic situation at the front which had its specifics on different directions of advance of fascist aggressors. So, fascists destroyed military hospitals in Peremyshl, Cowel, Dubno, Lvov, Drohobych in Ukraine in the first two days of the war. On their basis the Head sanitary department planned the creation of medical parts. It should be noted that the military-medical service of the Red Army had no clear ideas of a network of medical institutions on fronts of the acting army, and in our case not only operating, but receding and suffering a defeat. There were cases quite often when the created and the directed medical institutions on the front couldn't develop their activity on a place because of helplessness of doctors who didn't know how to work in the conditions of the war.

In the years of the war the main tasks of health care became: help to wounded and sick soldiers, medical care of home front workers, health protection of children and anti-epidemic actions. The wide network of evacuation hospitals (one-field and multi-field) was created, the system of stage-by-stage delivery of health care by the wounded and patient was issued. During the war all sanatoria were converted in hospitals. The organization of specialized medical care at wounds in a head, a neck, a spine, a breast and a stomach, in a thigh and large joints was improved. The service of blood worked well. Together with the centralized supply of the acting army with tinned blood, its preparations and blood substitutes, regular departments and stations of blood transfusion were created on fronts and in the army; mobile stations of blood transfusion of the People's Commissariat of Health Care of the USSR were formed.

The organization of rendering the first qualified assistance by the wounded in the army and front to backs was complicated by an

acute shortage of bed fund that was connected with the evacuation of hospitals to the deep back in connection with the prompt advance of fascists. That is why 42 Ukrainian hospitals, haven't started to work, were relocated to the east by the USSR.

In the conditions of the war the medical provision needed the highest level of centralization and management, in connection with a contribution of health workers to the victory 72,3% of wounded and 90,6 patients came back to a line. From the very beginning of the war the state policy was focused on a fast organizational reformation of all health system. In most concentrated form it is reflected in decisions of the supreme party and government bodies which were guided on places. The basic value in this regard had the main requirements "Directives of Council of the People's Commissars of the USSR and the Central Committee of All-Union Communist Party (bolsheviks) to the party and Soviet organizations of front areas" of June 29, 1941 about the mobilization of all forces and funds of the people for the defeat of fascist aggressors. The item 2 belonged to workers of health care: "To organize the comprehensive help to the acting army, to provide the organized carrying out of mobilization of spares, to provide the supply of army with all necessary, fast advance of transports with troops and military freights, the broad help the wounded granting under hospitals, schools, establishments".

The performance of this task was complicated by the objective circumstances – a condition of a health service of the Red Army for the beginning of the war and its losses during the first battles. By the beginning of the 1940th there were 13,8 thousands of medical institutions, with the total number of hospital beds to equal 791 thousand in the country. To June 9, 1941, 149 soldiers of hospitals with the general capacity of 35 540 beds appeared as a part of a health service of the Red Army. To June, 1941 the general shortage of experts of a health service of the Red Army made 20 thousands

of people. Besides, the first days were put in jeopardy of destruction both military, and civil health care: “the considerable part of mobilization, material and human resources of health care were in the western areas of the USSR and in the first days of the war it was taken by the coming parts of the opponent”. Each human life is unique, and a death of a person – it is always a tragedy. But in the functional relation “human resources” aren’t equivalent. The dead physician – is not only the dead person. It is the lost possibility to rescue many other people. Fights brought the essential human losses of a health service: more than 80% of all its sanitary losses were the share of ordinary and non-commissioned officer’s structure (the advanced link operating on a front line); more than 85 thousands of physicians were missed or lost during the war. From them were 5 thousands of doctors, 9 thousands of average health workers, 23 thousands of sanitary instructors, 48 thousands of hospital attendants – and hospital attendants-porters. In total 140 000 doctors worked on the eve of the war in the USSR (slightly less than a half – 69 600 people were called to the army from civil medical institutions at the beginning of the war).

In these conditions the implementation of the Directive of Council of People’s Commissars of the USSR and the Central Committee of All-Union Communist Party (bolsheviks) began: “in July, 1941 the additional formation of evacuation hospitals began on 75 000 beds. It made for about 1600 hospitals. Besides, from the beginning of the war till the 1<sup>st</sup> of December, 1941 were created: 291 divisions with medical battalions, 94 shooting brigades with medical and sanitary companies, 38 companies of medical strengthening, 12 hospitals for the treatment of lightly wounded, 37 field evacuation centers, 79 evacuation receivers”. Thus the powerful health service was created, meeting requirements of mass military operations, and providing continuous return wounded varying severity in a line. Evacuation hospitals were formed in the area of PCH, the People’s Commissariat of Defense of the USSR (PCD), some part – through line of the All-Union Central Council of Trade Unions. The departmental “delivery” couldn’t complicate system of the management of evacuation hospitals and had an adverse effect on the medical process. Therefore at the end of September-October, 1941 the evacuation hospitals which were created in the wartime and located in rear regions of the country were transferred under the uniform management of the People’s Commissariat of Health Care of the USSR. Regional departments of health care transferred evacuation hospitals to Councils of War which were in front and army areas.

According to the resolution of the State Committee of Defense (SCD) “About the improvement of medical care of wounded fighters and commanders of the Red Army” of September 22, 1941 for the improvement of medical care of wounded fighters and commanders of the Red Army and streamlining of matter of evacuation the medical care of wounded and sick fighters and commanders in rear regions of the country was assigned to the People’s Commissariat of Health Care of the USSR (in the army and front areas – on the Head military and sanitary department of the Red Army). All evacuation hospitals created in the wartime, located in rear areas were placed under the authority of People’s Commissariat of Health Care (except the constant hospitals PCD). To leave evacuation centers in submission of the Head military and sanitary department of the Red Army. The following tasks were also assigned to the People’s Commissariat of Health Care:

a) the organization of treatment of wounded and sick fighters and commanders of the Red Army in evacuation hospitals of rear regions of the country;

b) the maintenance of staff of these hospitals;

c) the support of evacuation hospitals by all types of medical and sanitary economic property;

d) the management of medical care of the hospitals created on the basis of the sanatoria and All-Union Central Councils of Trade Unions rest houses containing at the expense of means of the All-Union Central Council of Trade Unions, and supply with their medical property on time sheets and norms for evacuation hospitals of the People’s Commissariat of Health Care of the USSR.

It was assigned to the People’s Commissariat of Defense of the USSR (PCD):

a) the support of evacuation hospitals of People’s Commissariat of Health Care of the USSR by food, fodder, money allowance, travel documents of wounded and sick military personnel and an exchange collection of linen on norms and as it should be, established in the Red Army;

b) the organization of evacuation of wounded and patients to rear areas;

c) the distribution of wounded and sick fighters and commanders through the evacuation centers on evacuation hospitals of the People’s Commissariat of Health Care of the USSR. The measures for the increase in the country of medical shots were taken.

In the conditions of the war the level of questions increases and becomes complicated which the public health service of each army has to carry out naturally. On August 11, 1941 the Resolution of the State Defence Committee SDC “About the reorganization of the Sanitary

management of the Red Army in the Main military – sanitary management of the Red Army” is accepted and a new provision “The provision on the Main Military and Sanitary Management (MMSM)” is approved. According to the last it was assigned to MMSM: the guide of evacuation of wounded, the organization of the medical help, the sanitary inspection to anti-epidemic providing army.

In some weeks after the beginning of the war in Ukraine 159 evacuation hospitals on 56000 beds were developed. The chief surgeon of evacuation hospitals of the People’s Commissariat of Health Care of the USSR I.G. RUFANOV directed the activity of medical institutions of the back who in 1942 carried out the specialization of hospitals (distribution on surgical, traumatological, infectious and other profiles) that allowed to treat more competently wounded.

The activity of MMSM provided the realization of accurate planning of a medical support of troops when carrying out strategic operations and control of its performance. It should be noted that such realization was enabled for the first time in the history of domestic military medicine. The efficiency of work of military physicians is decided by the developed system of landmark treatment of wounded and patients on their evacuation to destination. Under the leadership of E.I. SMIRNOV the group of military physicians developed the uniform field military-medical doctrine which the basic beginnings became: the united understanding of the principles of surgical and therapeutic work in field conditions; the existence of uniform views of methods of the prevention and the treatment of defeats and diseases; the continuity in the performance of medical actions at various stages of evacuation; the maintaining of short, accurate medical documentation providing the continuity and sequence in carrying out medical and evacuation actions.

The positive value of this doctrine both in scientific, and in the organizational relation it is difficult to overestimate it acted as uniting, unifying factor for a military health service in the conditions of destabilization.

In the years of World War I V.A. OPEL put forward the principle of landmark treatment of wounded, combining surgical treatment of wounded and their evacuation in uniform process for the first time in the world. This principle was applied and in days of the Great Patriotic War. The amount of sanitary losses of the operating army in the war always determines the volume of work of a health service. The military health service paid the main attention to the organization of immediate carrying out of seriously wounded from a battlefield and their evacuations to the back during the advance of

the enemy across the territory of Ukraine with a speed of 25–35 km per day. Unfortunately, it always worked well because of a shortcoming of hospital attendants and vehicles. L.M. MAYZHEHES stated: “... in the first fights it became clear an insufficient security of carrying out of wounded from a battlefield, the main reason for that was the acute shortage of carriers and inability of hospital attendants to work”.

As it wasn’t always possible to provide carrying out and delivery of wounded in medical aid stations in optimum terms, as a result wounded arrived on the following stages of medical evacuation too late that led to the development of various complications and growth of a lethality. The problem of search, collecting and carrying out of wounded from a battlefield faced the army health service throughout the whole war. The command and the management of a health service repeatedly took cardinal measures for its decision. So, on July 23, 1941 the deputy chief of the General Staff gave on the telegraph the order to chiefs of staffs of armies with the requirement “systematic maintenance” in a complete regular set of hospital attendants and hospital attendants-porters in front battalions and regiments, allocations of people for the aid to hospital attendants-porters. In this regard the Front commander ordered:

1) to complete fully to the staff of division of porters in shooting regiments immediately;

2) to commanders of parts beforehand, to allocate in the order of the senior doctors of parts of auxiliary porters in number of not less than 30 people for a shooting regiment and 16 people on a cavalry regiment before the performance of a march and prior to a fight;

3) it is obligatory to include the organization of carrying out and export of wounded from a battlefield in the general plan of ensuring a march and a fight. The direct responsibility was conferred on commanders of parts, for ensuring carrying out and export of wounded from a battlefield.

For the stimulation of dangerous work of a younger link of a health service the People’s Commissariat of Defense issued the order № 281 of August 23, 1941 “About an order of representation to the government award of military hospital attendants for a good fighting work” (I.V. Stalin signed personally). For the first time the activity of the medical personnel was in the battlefield officially equated to a feat of arms which was rewarded by the medals “For services in battle” and “For courage”, awards of “Red banner” and “A red star”.

The expansion of public beginnings, “national patronage” over wounded was the important direction of the legal policy in the field of health protection of fighters of the Red

Army. The resolution of All-Union Communist Party (bolsheviks) of the Central Committee "About the organization of All-Union committee of the help with service of patients and wounded fighters of the Red Army" of October 6, 1941 created the relevant committee" played an important role in the improvement of work of hospitals. The organization of a wide public aid by a member of health care in service of wounded and sick veterans was assigned on it and also on regional republican committees.

Sanitary losses of the Soviet party made more than 18 million people, including more than 15 million wounded contused and burned, 3 million, sick and more than 90 thousand frost-bitten according to reports of fronts, fleet, separate armies and flotillas. During the Great Patriotic War in medical institutions of all names it is considered the hospitalized more than 22 million people. 72,3% of wounded and 90,6% of sick soldiers and officers, i.e. over 17 million people continued to battle against the enemy were returned by efforts of health workers to a line. During World War II any of the being at war countries couldn't achieve such results. Therefore the organizational measures directed on the strengthening and the improvement of a military health service were justified not only and the quality of an element of the scientific doctrine, were called by the life, need of rescue of people, conducting combat operations and, finally, achievements of the Victory in the Great Patriotic War. Even in the most difficult, first year of war, monthly 100–200 thousand wounded and patients came back to a line. Later, when the situation was stabilized and appeared at the front opportunity more accurately to organize the work of medical institutions, this indicator began to increase steadily.

Summing up the results, it is possible to draw a conclusion that the successful solution of the tasks set by the war in the sphere of health protection of the military personnel and the civilian population, was defined not only heroism of physicians and people, but also thought over by the systematic and consistent legal policy providing the flexible reorganiza-

tion of the state health system, its scientific validity, and also consolidation of efforts of the population on the help to sick and wounded fighters and commanders of the Red Army.

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## EDUCATION OF ECOLOGICAL CULTURE OF SCHOOLCHILDREN ON THE BASIS OF ETHNOPEDAGOGY

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Facilities of folk pedagogics, traditions, ceremonies and customs of people, stable norms and rules of behaviour of children set the ecological maintenance in the wild, assist education for them ecological culture; education of ecological culture of schoolchildren on the basis of ethno pedagogy has an ecological, scientifically-pedagogical, historical, socio-political value.

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**Keywords:** culture, education, ecology, ethno pedagogy, folk pedagogies

An ecological problem has global character. Efforts of one separately taken country or group of countries are insufficient for successful maintenance of natural environment of our planet. International cooperation is here needed and simultaneously the use of regional knowledge of people.

In our days in pedagogical literature there are two near on sense terms: “ethno pedagogy” and “folk pedagogies” In our opinion, folk pedagogies is educator traditions of concrete ethnic group, and ethno pedagogy is the generalized concept meaning the comparative analysis of educator traditions of different people. People are an only and inexhaustible source of spiritual values. He produced original moral since times of immemorial mode of spiritual culture [8].

Today small modern pedagogical researches, sanctified to experience of education of ecological culture students on the basis of ethno pedagogy, small scientifically-reasonable labours, where the basic methodological and theoretical problems of education of ecological culture of students, would get permission.

Education of ecological culture of schoolchildren works of foreign scientists are sanctified to – F.A. Peccei, F. Saint-Marc, E. Tofler, A. Toynbee, Heflinga, so as native scientists – S. Glazachev, A. Zakhlebny, I. Zverev, A. Mironov, N.F. Reimers, I.T. Suravegina.

At the same time, in spite of the permanent interest of researchers further in the problems of ethno pedagogy and ethno-ecological, ethno-cultural processes in Russia, including its regions, are studied not enough.

An aim of our research is education of ecological culture of schoolchildren in the educational-training process of schools on the basis of ethno pedagogy.

### Materials and methods of research

Research methods are a theoretical, pedagogical and ecological analysis of different aspects of the investigated problem; theoretical and practical generalization of research results taking into account basic factors and concrete terms.

### Results of research and their discussion

It turned out in the process of our research, that in case that children reach after nature on the basis for ethno pedagogy and ethnologist, study its variety, then it destroys them on the special relationships and co-operations with a naturally-social environment. In a traditional culture a person is in the conditions of close intercommunication with nature. A student behaves to nature as to the “source of life, condition of development, cognition and poetry”. Nature is presented in consciousness of man as “something unchanging living, playback and granting – as a source of life” [9].

The problem of ecology stops to be the problem of separate cities, countries and becomes global. On this basis, in their researches students lean against works of home and foreign scientists: S.D. Derâbo, V. Âsvina, G. Heflinga, A. Humidification, P. Gantry, F. Sent-Marc and others.

For realization of the advanced study with students a number of certain and neat teachers-experimenters were chosen from Tatar, Chuvash, Russian and other in schools and gymnasias of Kazan and Republic of Tatarstan. The aim of experiment was verification of efficiency of the worked out programs, their informatively-didactic bases of realization in forming of ecological culture of schoolchildren at national and general school.

At development of the methodical providing of experimental researches we tried to take into account the features of the multilevel system of general and national schools in Republic of Tatarstan. All national educational establishments were given the task to provide the students with durable ecological knowledge and to form for them an ecological culture on the basis of experience, knowledge, customs, ceremonies, holidays, traditions of the Tatar people and other ethnos of the region. On the basis of the conception of education of ecological culture of schoolchildren we worked out the following basic *criteria*:

1. A certain ethno pedagogical and scientifically-ecological knowledge.

2. Morally-aesthetic and action-practical attitude of student toward objects and phenomena of nature;

3. Objective and subjective attitudes of student toward ethno pedagogical knowledge, traditions, ceremonies, customs, holidays; to the objects and phenomena of nature and their integrative connections between them.

Teachers-experimenters, on the stage of establishing experiment, conducted group experimental verifications, measured initial, intermediate, eventual results. Authenticity of distinctions in the indexes of reasons and barriers in the conditions of innovative and traditional activity is set on  $t$  – to the criterion of the Student's  $t = \frac{\bar{x} - \mu}{s/\sqrt{n}}$  namely that  $t$  – a criterion

is expressed as a relation to the difference selective middle to the error:  $t = \frac{\bar{x}_1 - \bar{x}_2}{s_d}$  for not equally numeral selections

$$s_d = \sqrt{\frac{\sum (x_i - \bar{x}_1)^2 + \sum (x_i - \bar{x}_2)^2}{n_1 + n_2 - 2} \cdot \frac{n + n_2}{n_1 \cdot n_2}},$$

where  $\bar{x}_1$  is a mean value of measuring in an experimental group,  $\bar{x}_2$  is a mean value of measuring in a control group. If the control group of  $m = 7$ , and in an experimental group –  $7,89$   $|x_1 - x_2| = 0,89$ .

$$\sum (x_i - \bar{x}_1)^2 \approx 49;$$

$$\sum (x_i - \bar{x}_2)^2 \approx 62,3,$$

then

$$s_d = \sqrt{\frac{49 + 62,3}{10 + 15 - 2} \cdot \frac{10 + 15}{10 \cdot 15}} =$$

$$= \sqrt{\frac{111,3}{23}} \cdot 0,17 = 0,91;$$

$$t_{cp} = \frac{0,89}{0,91} = 0,97; t_{cp} < t_{st}$$

on a Table 5 [177, p. 323]  $t_{st} = 2613$  [177, p. 323]. A difference between the averages of experiment and control account was  $2,13 - 0,97 = 1,16$ .

The count of index of meaningfulness we will show on an example (first line of Table 2).

During experimental work teachers-experimenters divided schoolchildren into two groups: experimental and control ones for 10 persons. During the first experiment, they found out the following results in an experimental group:

Number of student	1	2	3	4	5	6	7	8	9	10
Points	7	7	8	8	8	6	9	8	9	8

$$M = \frac{7 + 7 + 8 + 8 + 8 + 6 + 9 + 8 + 9 + 8}{10} =$$

$$= \frac{78}{10} = 7,8.$$

Further, an experiment recurred 9 times. The results of all experiments are reflected in a summarizing Table 1:

**Table 1**

Results of experiments

Nuhcen \ Number expert	1	2	3	4	5	6	7	8	9	10	
1	7	7	8	8	8	6	9	8	9	8	$M_1 = 7,8$
2	8	7	8	8	9	7	8	8	8	6	$M_2 = 7,7$
3	9	8	8	9	8	7	9	7	8	7	$M_3 = 8,0$
4	8	8	8	9	7	8	8	7	8	9	$M_4 = 8,0$
5	8	9	8	8	7	9	8	9	7	8	$M_5 = 8,1$
6	8	8	9	8	7	9	7	8	7	8	$M_6 = 7,9$
7	9	8	8	7	8	8	8	8	8	8	$M_7 = 8,0$
8	8	7	9	9	9	9	7	8	8	8	$M_8 = 8,2$
9	8	9	8	8	8	8	7	9	9	7	$M_9 = 8,1$
10	8	8	9	7	8	7	6	9	9	8	$M_{10} = 7,9$

According to the results of the research there was produced a statistical row of probability distribution:

$X_i$	1	2	3	4	5	6	7	8	9
$n_x$	0	0	0	0	0	3	21	52	24

On a formula

$$M = \sum_{i=1}^9 \frac{n_x}{n} \cdot x_i$$

found the mean value of index:

$$\begin{aligned} M &= \frac{3}{100} \cdot 6 + \frac{21}{100} \cdot 7 + \frac{52}{100} \cdot 8 + \frac{24}{100} \cdot 9 = \\ &= \frac{1}{100} (3 \cdot 6 + 21 \cdot 7 + 52 \cdot 8 + 24 \cdot 9) = \\ &= \frac{1}{100} (18 + 147 + 416 + 216) = \frac{797}{100} = 7,97. \end{aligned}$$

On a formula  $D(x) = \sum (x_i - M)^2 \cdot \frac{n_x}{n}$  a also found dispersion. It appeared equal  $D(x) = 0,0469$ .

Consequently, mean quadratic deviation makes:

$$\sigma(x) = \sqrt{D(x)};$$

$$\sigma(x) = \sqrt{0,0469} = 0,23.$$

We designated. Because then the result was written down in a kind (Table 2, line 1). Other middle indexes were produced (see a Table 2).

In measuring used 9 point scale of estimations, and for measuring of barriers used 9 point scale with negative values.

Experimental work consisted of ascertaining and formative experiments with 725 students. The programme contains target, methodological, substantive and procedural components. For scientific and methodical support of experimental work there were held seminars with teachers-experimenters.

In the course of ascertaining the experiment the most important indicators of ecological culture of students were revealed, carrying out and implementation of the teaching system of experiment with the epidemiological patterns and rules for their implementation in accordance with the criteria. Quantitative and qualitative evaluation of experimental work was carried out on the basis of the wide use of mathematical apparatus. Analysis of the quality of learning in each section was held to determine the level of possible retention, by G.F. Lakina [3].

Table 2

Environmental rating and ethno-ecological knowledge in the formation of ecological culture of students in innovation

Scale indicators	Ecological and ethno-ecological knowledge and skills of students	Average ( $m \pm m$ )	Rating
1. The most significant indicators of $m = 7$ and more	Continuous expansion of ecological knowledge bases of folk education of high level needs ethno-ecological knowledge in the knowledge of nature	7,97 $\pm$ 0,23	1
	Participation in the environmental research group in enhancing environmental awareness of the people	7,64 $\pm$ 0,27	2
		7,23 $\pm$ 0,24	3
2. Moderate rate $m = 6$ and more	Active participation in environmental events of the family, based on ethno-ecological knowledge	6,48 $\pm$ 0,23	4
	The ecological path, in order to enhance environmental awareness of the people	6,03 $\pm$ 0,25	5
	Involved in environmental expeditions to enhance environmental awareness of the people of the region	6,01 $\pm$ 0,24	6
3. Unimportant indicators $m = 5$ and more	Students work on a geographical area to obtain geographical and ecological knowledge.	5,84 $\pm$ 0,24	7
	Visits to the reserve in order to increase the ethno-ecological knowledge about the flora and fauna of his native land	5,71 $\pm$ 0,25	8
	Participation in planting trees, on the basis of ethno-pedagogical and ethno-ecological ideas.	5,53 $\pm$ 0,24	9
	Development of traditional ecological knowledge, rituals, customs and traditions	5,42 $\pm$ 0,26	10
	The average for the Group	6,42 $\pm$ 0,24	

As the information in table 3 shows, if the initial experimental work on nature in 2–5 classes, a high level of ecological culture was characteristic for 15 per cent and 31 per cent of traditional innovation group, by its end there were 58 per cent of students characterized the Innovation Group and 34 per cent of the traditional group. In the innovation group it was 3,5 times more than at the beginning of the experiment, and the traditional group changes were minor and occurred mainly at the low and middle levels.

The results of the pilot test are shown in Table 2.

Results of the 6–9 classes in science subjects showed that the level of ecological culture of schoolchildren in innovative and traditional groups before the experiment was generally low. As a result, on a conceptual basis, there were significant changes at all levels, but in the innovation group they were more significant.

The results prove the efficiency and accuracy of our conceptual framework and give grounds to recommend them for introduction into the mass of schools, gymnasiums and high schools not only in our region but throughout Russia.

We have received positive results, confirmation of this is the Table 3.

Thus, the goal of the study is achieved. During the experimental work based on a conceptual framework sufficient teachers developed copyright innovative technologies forming ecological culture of pupils on the basis of non-traditional psycho-pedagogical conditions (environmental simulation games, ecological and psychological training, environmental workshops, etc.). Creative interpretation and use of educational technologies have greatly expanded arsenal of pilot programs.

Thus, those teacher-experimenters who use textbooks and programs website works more productively managed to solve the problem of ecological education and forma-

tion of ecological culture of schoolchildren in the region [10].

During the experimental work in the classroom and extracurricular activities there were widely used ecological knowledge of the Tatar people and other peoples of the region: the songs, paintings, works of art, historical materials, proverbs, riddles, tales, legends, fun, Baits, etc. Munajat, reflecting the nature of his native land, the relationship between man and nature; traditions, customs, rituals and Tatar ethnic groups living together in the edge associated with the nature of ennoblement. Children under the guidance of teachers trained in the critical analysis of the processes taking place in nature and environmental change in it.. With years of experience and living together Tatar peoples of the region, the students learned to perceive the world and nature from the perspective of ecology. All this allowed the students to establish a close relationship with the natural sciences ecological knowledge of the Tatar people and people in the community territory. Under the guidance of teachers students gradually learned the nature, consistently revealed a long chain of relationships of natural components. Complemented by bright ethno pedagogical, ethno ecological knowledge and peoples knowledge about the nature of students gained humane.

Given the negative things in the environmental behaviour of children, teachers have made adjustments to the newly planned observation tours, hiking and nature trails. Varied forms and methods of work, picking up more emotional means to influence their psyche: movies, computer programs, reflecting the landscapes of his native land, Tatar, Russian, Bashkir, Chuvash, Mordovia, Udmurt, Mari and other songs with touching words that convey mood, thought and aspirations of the people, etc.

### Discussion of results

Education of ecological culture among the students revealed in the works of I. Zvereva,

Levels of ecological culture of students in learning science subjects before and after the experiment (in%)

Table 3

Subject	Classes	Number students	Before experiment				Experiment			
			High	Wed	Bottom	Very low	High	Wed	Bottom	Very low
Nature – study (2–5 classes)	Innovative	320	15	13	30	42	58	30	8	4
	Traditio-nal	320	31	28	18	23	34	32	18	16
Natural science subjects (6–9 cl.)	Innovative	405	13	19	29	39	75	12	8	5
	Traditional	405	12	17	31	40	53	25	12	10

I.T. Suraveginoy, A.G. Asmolova, V.S. Transfiguration and other authors of the study: N.S. Blyagoz, A.M. Galeev, M.L. Trigger, G.A. Ivanov, T.V. Kucher, V.M. Minayeva, L.P. Saleeva and others approached the problem from different angles. However, none of them was able to fully disclose the nature and versatile formation of ecological culture based ethno pedagogics students. The authors confined themselves to the actualization of the problem and did not undertake the task of substantiation and disclosure. Deeper and wider the problem was disclosed by B.T. Lihachev. However, he did not give a precise definition of ecological culture based ethno pedagogics students.

Analysis of scientific work and experimental verification of the efficiency of use in the practice of environmental education of students on the basis of culture ethno pedagogics shows that there is no analogy to this study.

In carrying out the experimental work environment education and psychology acted as psychological and pedagogical foundations in implementing the conceptual basis for the formation of ecological culture of schoolchildren. When formation of ecological culture means subjective attitude to nature – it's subjective attitude reflected in their needs, student interacts with objects and phenomena of nature, is a factor leading to behaviors. Based on the criteria, subjective attitude towards nature promotes the formation of ecological culture student, describes the basic parameters: the breadth, intensity, awareness, modality, and the parameters of the second-order emotions, generality, dominance, integrity and conscientiousness. They provide a system of values that foster students' qualities such as social activity, the ability to interpret environmental events surrounding natural and social environment, to make independent decisions ennobling environmental and social protection.

The developed system implementing environmental education of students on the basis of culture ethno pedagogics passed a multi-year research and experimental verification. Subject of study had a complex structure and content; experimental work was carried out in a comprehensive, incremental way. Specificity studies of ecological culture foundations of education of pupils in national and secondary school is their organization in vivo experiments in a real educational process flowing.

Education of ecological culture of children in the experimental work was provided by the introduction of content and ethno regional, ethno ecological material, ethno pedagogical, ethno ecological knowledge. On the lessons there were widely used environmental experience, knowledge, rituals, customs, holidays, traditions and Tatar ethnic groups living together in their native land.

On the basis of research results state that modern pedagogy increasingly removed from the principle nature useful. Only the greening of all subjects on the basis of ethno pedagogics in all educational institutions, schools and institutions of higher education will be a methodological framework for dealing with the issue, and radical renewal of Ecological Culture [11].

In the formation of ecological culture of pupils on the basis of clearly visible ethno pedagogics two lines of ecological relations – man and nature, physiological and psychological ties have an effect on physical and mental health. Their gap entails a disruption of normal biorhythms interaction of physiological and psychological processes, destruction of a single person's aura and nature. Only their revival restores single naturalistic aura, brings inspiration to psyche and physiological systems. Spiritual, moral and aesthetic communication affect the state of mind. Appropriateness, proportionality, harmony and beauty are a source of human moral and aesthetic satisfaction and purification. Both of these communication lines serve as a physical and spiritual, moral and aesthetic improvement, formation of ecological culture of personality.

Thus, pedagogy contributes to the solution of the problem in practice, use of environmental education and training of young generation, developed by different peoples for centuries. Our research in the field of education of ecological culture of the younger generation advocates the new content of the public culture of the XXI century.

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*Materials of Conferences***WAYS OF CONDUCTING INTERACTIVE WHITEBOARD ACTIVITIES AT THE KAZAKH LANGUAGE CLASSES**

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Today there are great tasks before the humanity and its natural phenomena. In the XXI century when everything is developing rapidly it is impossible to follow old ways of teaching. Therefore, the goal of the new advanced technologies is to provide a variety of teaching methods. This is a requirement of time. For implementation of the state president's program of education some work done in the field of language learning. Among the different methods of language learning information and communication technologies are more important. The use of information and communication technology in the classroom is based on the use of computer, e-books, and interactive media and Internet resources. If the computer is the main instrument in this area, currently one of the additional devices, software and hardware complex "Interactive screen" plays an important role in this direction. In Kazakh language learning we can use the interactive whiteboard in the course of the following three modes.

The first is well known "Whiteboard mode". As its name implies, this is to use a simple writing on the screen as with chalk or marker on the simple board. Peculiarities during the lesson one can use different colors for denoting basic concepts of the theme. On the interactive whiteboard we can use several model exercises for the assimilation of the same theme. Here are some of them: For example, the following slide is for mastering the possessive endings. We paint the endings with the help of the pen and when necessary, we will immediately move the paint to another place.

The second mode of interactive whiteboard is Office mode. Pre-prepared materials should be opened in this Office mode. These materials may be the materials of Word text editor or Excel and Power Point presentations. You can create slides and show them on a simple screen. But Interactive whiteboards are more powerful rather than using such a ready-made images. You can work directly with the ready documents and over the same time to change them or add additional information. Such exercises which are prepared in advance increase the efficiency of the use of class time. Each listener comes to the board and with the help of the router connects the words with the same endings and paints them in the same color.

When presenting the classification of pronouns it is good to use ready materials as on this slide. This is the only reason to transfer the attention of the au-

dience, and secondly it is good decision for those who has an excellent visual memory.

The same with any subject, one can collect materials and prepare slides in advance or use them creatively with the help of interactive whiteboard. For example, while presenting lexical-grammatical themes such as medical clinic and chemists, at the hospital, at the bus stop, in the dining room or seasons we can consolidate pictures and carry out different tasks. That is, the appearance of the word information with a view.

The third mode – the interactive mode of the board. Projector and screen shade are the main instruments. Projector is for drawing learner's attention to one object. If there are multiple objects or different data on the screen, we'll highlight one and close the others.

And we cover a part of the screen with a screen shade. In other words, it will be an anonymous data for the learners or the correct answers of the test. During the Kazakh language classes the glossary of the text or the translations of some words and correct variant of endings may be covered. Performing the task, teacher removes the screen shade for the learners to check their answers.

The use of the interactive whiteboard is of great importance in the course of its library fund. Library has a variety of images, pictures, drawings which we can use any of them in the classroom.

Achievements in the use of interactive whiteboards:

- it allows to present materials effectively and gives an opportunity to discuss it with the learners;
- all the learners in class will be involved;
- learners can see materials with a view;
- it helps to save class time. It is not necessary to copy the data, because the tasks performed on the interactive whiteboard screen are saved automatically. Teacher can use them for revision.
- it gives fun for the students who are tired of the traditional form of lessons
- it has more advantages than simple blackboards: rich color and different marking makes it easy to present materials;
- it proves the conception "Said is forgotten, shown is remembered" Saturated colors, a variety of images, video and audio materials support to remember the lesson theme for a long time;
- by preparing lesson materials in advance we save enough time and make changes during the class period.
- learners can act cooperatively, control themselves, perform tests and other ready tasks for self-evaluation;
- it is possible to read the material again going to the next page or back to the previous one. There is no need to turn off the interactive board.

– we can use many materials at the same time: video or audio materials, pictures, texts and internet resources, etc. We can develop all the speech skill of the learners with the help of audio and video materials.  
– using Activote we can conduct testing system.

Today, all schools are equipped with multimedia resource rooms. Each of them is equipped with an interactive whiteboard and electronic books. In this way we have achieved the most advanced levels of state language learning. Today, as a result of the use of information and communication technology, telephone, Internet and interactive whiteboard we are able to teach distantly, to consult distantly. These communicative and information technologies play an important role in Kazakh language learning.

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#### TO THE PROBLEM OF PRACTICAL IMPROVEMENT OF TRAINING PROCESS ON INNOVATIVE MEDICAL TECHNOLOGY

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During the recent five years medical education has been experiencing reformation that is defined by integration between our domestic medical education and European standards. In these terms requirements towards education in medical universities grow steadily. Therefore, during the period of post-graduate training of intern doctors of years 6–7 certain problems stand before department workers: regular study of healthcare requests that respond to modern requirements, increase in motivation among students and tutors in achieving high results of education process. In order to create an efficient training-practical work that nowadays is one of prior problems of modern high school, it is necessary to establish continuous search for training methods, renewal of “old” but useful means and introduction of new innovative directions, oriented for the world standards.

In West-Kazakhstan state medical university of Marat Ospanov there is well-equipped training-clinical center that corresponds to modern requirements. It uses innovative technology of training interns with implementation of dummies, virtual computer simulation, starting training process from fundamental motions to complicated skills [4, 5]. Such form of education leads to remembering of theoretical knowledge, received during classes, and better mastering of practical skills. During multiple trainings within the process of module training within innovative directions interns learn and master a certain sequence of operative interference

that will give intern doctors confidence, required for independent work in surgical rooms, centers of ambulatory hospitals, and hospitals.

Each intern requires an individual approach. Since 2009–2010 until 2014–2015 interns of years 6–7 took their training in consultation centers of different stations, and they will report the received practical skills at objective structured clinical exam.

An efficient method of training with mastering an innovative technology tutors-specialists should be trained at modern level.

Since 1993 surgical departments of hospitals in the city and region districts methods of laparoscopic surgeries have been mastered in practical aspect. The existing educational programme neglects problems of innovative technologies of Laparoscopic cholecystectomy. Regardless of this fact, interns are interested in module education according to innovative technology of consultation centers. Realizing the fact that an expensive laparoscopic apparatus, acquired by a hospital, interns will not practice on people. Therefore, some of them take courses in consultation centers by universities, though they intend to train at simulators. A reliable mastering of the innovative technology implies demonstration of videofilms on laparoscopic cholecystectomy and appendectomy.

Advantages of laparoscopic methods are well known by doctors and patients, number of surgeries increases rapidly [5, 9]. In nearest future a significant part of surgeries of stomach pathology will be carried out through laparoscopy. Many medical institutions, even in regional centers of the country now have the necessary equipment and tools. At the same time a lack of surgeons who can at least assist in laparoscopic surgery arose. Therefore, medical mistakes are still frequent, especially at early stage of work.

Thus, **educating surgeons** who can carry out basic laparoscopic operations on stomach organs with guaranteed high quality, **is the most significant problem of modern surgery** [10]. Laparoscopic intervention place certain high requirements towards a surgeon [12]. A surgeon who plans to master basic skills of surgical laparoscopy, must take an active part in assisting and then carry out laparoscopy independently, have a conscious desire and serious motivation. Regretfully, there are not many surgeons of different specialties who want to develop professionally in this direction [11]. However, there are even fewer practicing laparoscopic surgeons who intend to improve their expertise. Nevertheless, even among those who want to take up laparoscopic surgery it is necessary to introduce additional selection with consideration of type of highest nervous activity and psycho-emotional features of a doctor’s character in order to predict and correct intra-surgical behavior of some surgeons.

There are candidates who are high-qualified general surgeons but due to their special features (choleric temper, unstable type of CNS) [6, 7]

or a negative and initially unfair attitude towards low-traumatic methods of surgery are unable to master laparoscopic methods completely. Besides, a doctor must have the necessary experience of practical treatment, be familiar with traditional technique of surgery, understand and implement this tactic in case of emergency and development of intra-surgical complications.

But, a surgeon who carries out traditional interventions [9] with a rich practical experience cannot transit to laparoscopic surgeries without taking the corresponding training. Mastering innovative technique for carrying out laparoscopic interventions and preparing most of laparoscopic surgeons must proceed according of principles of deontology. It is proved that **simulation methods** [8, 10] bear the greatest efficiency of developing manual skills of laparoscopic surgery. In order to realize them it is also recommended to use virtual computer simulators Lap Mentor, LapVR, and others. However, such training should be considered not only as additional training course with simulators or models, but, first of all, as implementation of certain innovative pedagogic technologies that provide for succession of the system of forming, processing, improving practical skills and preparation for carrying out professional activity at all stages of a doctor's training. Nowadays there are no existing objective criterions that would allow a surgeon to start his independent laparoscopic interventions. As a rule, a young specialist gains access to laparoscopic surgeries according to a subjective evaluation of his tutor, and criterions of this evaluation differ among tutors. At the same time, it is important to secure that a tutor is able to provide this access in accordance with his medical position, in other words, possesses a sufficient administrative resource. In this case full responsibility for actions of a young doctor lies on his teacher that, one the one hand, motivates a tutor to train his student well, and, on the other hand, provokes an excessive caution and slows down access of young specialist to independent laparoscopic work.

Preparing a surgeon for undertaking laparoscopic surgeries is a **continuous and tedious process**. In foreign medicine a surgeon is allowed to perform practical work via laparoscopic method after his graduation. The main complication of such education lays in necessity to obtain a great number of manual skills [8] and tactile sensitivity [13] by a doctor. We should outline that technique of carrying out laparoscopic interventions in various medical specialties of surgical profile has a lot of mutual aspects [1, 3]. It is reasonable to develop a habit to control the flow of surgery according to two-dimensional screen picture with lack of lack of depth perception in terms of the limited view over the area of surgical intervention, learn to move tools in space economically and regulate one's motion accurately in conditions of "lever effect" and masking effect of rubber closure rings of trocars, and also

evaluate resistance and consistency of tissue by vision and tactile perception through an indirect manipulation of a long tool [12]. These skills must be formed and developed at the stage of postgraduate education.

At the same time, there is no possibility to equip profile surgeons with all necessary tools in medical institutions. **Special training centers** are supposed to solve this problem, for example, in consulting center of West-Kazakhstan state medical university, profile departments of medical universities, and scientific centers (national center of surgery of A.N. Syzganov) that have an ability of aimed training in techniques of carrying out laparoscopic surgeries as corresponding goals are set before these institutions. [9,11]. There are several stages of module systems to train doctors with taking certain testing tasks.

Within the first module interns receive the necessary theoretical knowledge, including that on topographic anatomy and operative surgery with usage of digital textbooks and interactive digital guides, anatomic models, tools of 3D visualization (Control Lab). It allows us to improve motivation to educate and approach mastering practical skills consciously.

At the second stage interns master basic skills of laparoscopic surgery at visual simulators. Regrettably, the system of registering simulation task results does not allow to evaluate quality of following all rules and recommendations. Of course, these parameters can be estimated visually with usage of video recording, but such evaluation is unlikely to be objective of technological. Series of five daily courses has been selected as organizational scheme of training module, devoted to mastering practical skills. At the first class interns take a test that allows tutors to evaluate their initial level of expertise. Every move, made by an intern, is registered and analyzed by computer, as a result, the system is able to evaluate over ten parameters of operation quality in terms of the given task (consumed time, quantity, safety, speed, efficiency of motion.), outputting it as a table. It is also possible to analyze video record, discuss a student's actions, reveal mistakes.

At the final stage of this module each intern or young doctor take all exercises in "examinational" regime with registration of results. A great number of parameters, registered by the simulator, complicate work of the tutor who has to classify and analyze a great volume of information. A necessity to evaluate quality of this training module results and form "standard of qualification" defines creation of integral system of parameter calculation. A value, formed by the system, must be objective, clear, and consider maximum number of parameters, regulated by the simulator.

According to the formulated requirements, the basic idea, put into the foundation of developing integral evaluation system, is defined by the following: a perfect result is finishing all exercises without time costs, using tools, but with maximum efficiency in all tasks. The basic principle of results calculation is distribution of parameters according to their significance, efficiency, necessity, and safety.



The smallest significance has been referred to the time of finishing an exercise, further the following parameters go: number of motions with tools, distance of motions with tools, economy of motions, efficiency of trials in taking exercise, and unfinished tasks.

The suggested algorithm of forming evaluation makes the system of its generation more versatile and interesting, thus stimulating an intern to maintain various, even incompatible requirements. It encourages a student to search for a compromise and select an optimal way of solving an objective, trying to minimize number of penalties for each fixed parameter of fulfillment. Besides, while comparing the registered parameters in analysis, we managed to develop a method of indirect evaluation of quality of elements that are not included into the list of those, registered by the simulator, for example, patient's safety during coagulation.

In order to simplify calculations, an automatic computer system has been developed, it is represented by a base in Excel format that contains the developed module system. At the same time, an average result for finishing each exercise is calculated and total final mark is defined. Presence of such database of results, exposed to statistical procession and evaluation by experts, will allow us to create a system of access towards various stages of training in laparoscopic surgery.

At the foundation of integral basic module evaluation a tutor makes a decision on the future training programme. In case of unsatisfactory marks, an intern is recommended to take another course in the finished module. Some interns who are interested in education, require additional training time to master basic manual skills. In case the results are good or excellent, transition towards following stages is recommended.

Module training of general surgeons allows them to master implementation of cholecystectomy and appendectomy. At the same time, it is reasonable to use simulators with tactile feedback that can make training more comfortable from its initial stages and lead to a faster stabilization of qualitative parameters. It is also necessary to consider the fact that expression of tactile sensitivity depends on the nature of set objective and sufficiency of an intern's zeal in process of education [12]. Placing a stitch or setting a knot refers to complex surgical manipulations that require an accurate orientation on intern's behalf. Mastering technique of placing a stitch is reasonable to take to exercises with simulators [13] and even home. First of all, an intern should master placing surgical and self-fitting knots.

Development of various manual skills is possible and should be taken to practice, that includes technique of introducing trocars and stages of laparoscopic surgeries with implementation of electrocoagulation, stitching facilities, alloying tools, and also implementation of different types of stitching and fixing knots.

In order to master a technique of carrying out laparoscopic surgeries, one needs to:

1. Take test of topographic anatomy and operative surgery.
2. Pass basic training course at virtual simulators.
3. Train at mechanical simulators.
4. Take advanced training course at virtual simulators.

Only after these stages are passed, it is reasonable to continue an intern's or young doctor's training in surgical room in terms of surgical department with tutor, whose work should be observed and assisted with provision of necessary comments, and then under his observation and assistance. To complete training in laparoscopic interventions and realize educational programme adequately, it is necessary that a tutor possesses a sufficient experience in laparoscopic cholecystectomy and appendectomy as well as in traditional methods.

**These conclusions** are also confirmed by results of certain researches [7, 8, 9]. During the process of questioning interns it has been registered that a number of interns improved their indicators in laparoscopy after practical training:

- 78,0% of interns obtain a skill to maintain horizontal level of image at videoscreen while working with laparoscope after practical courses;
- 82,7% can steadily fix an object in the middle of the screen with laparoscope;
- 71,7% provide a surgeon with comfortable working conditions by assisting him;
- 66,9% can achieve their target quickly with the tool;
- 54,3% don't make unnecessary motions;
- 78,7% fix an object with the tool firmly;
- 56,7% can tract tissue safely;
- 32,3% are potentially prepared to take up separate stages of laparoscopic interventions.

**Conclusion:** during an independent training in laparoscopy interventions one should follow certain organizational and tactical aspects:

- It is necessary that surgeons, who desire to master and improve laparoscopic method of surgical interventions accumulate experience of carrying out traditional surgeries that will allow them to estimate a situation quickly and make adequate decisions without delaying conversion of access, and manage possible complications independently during and after a surgery.

One should remember that laparoscopic surgery is not a separate specialty, but a method of undertaking operative aid. Therefore, it is important that a surgeon, involved into laparoscopy, carries out traditional surgeries as well.

- At early stages of carrying out laparoscopic surgeries it is useful to watch video record or surgical interventions after operation in order to analyze the process in detail and study mistakes as well as evaluate the work objectively, it is also beneficial to attract more experienced surgeons to this procedure. All endoscopic interventions through video

recording should be studied in cases when certain technical complications emerge or the process oscillates from the standard flow, post-surgical complications develop.

• It is necessary to take courses and trainings of thematic improvement in order to improve qualification, participate in various surgical forums, read specialized literature regularly. Nowadays the necessity and reasonability of continuous improvement of expertise among surgeons of laparoscopic profile is proved by the very flow of surgery development, and this direction cannot be doubted.

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#### IMPROVEMENT OF METHODOLOGICAL PREPARATION OF THE INFORMATICS TEACHER BY A TRAINING TECHNIQUE TO A SUBJECT ON AN INNOVATIVE BASIS

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The use of innovative technologies in education has brought many changes in the pedagogical activity of school teachers. These changes affected the purpose and objectives, content, structure, methods of teaching the subject of computer science related to the applied direction of informatics as a science. The role and place of science in education changed, i.e. known methods used in teaching computer science, acquired general scientific sense, and methods used in the forming of knowledge, competencies and skills, focused on general intellectual development.

Studies in the theory and methods of training informatics teachers, have identified the following problems:

- 1) incomplete perfection methodological system according to a new model based on innovative teaching methods associated with the development of modern science and technology;
- 2) inconsistency of the theory and practice of modern information innovative technology to modern informational and software provision;
- 3) insufficiency of psychological, pedagogical and methodological subjects, training the use of innovative technologies in the educational process

Science of teaching informatics covers all stages of information education. This requires a continuous search in the direction of formation of information competence in improving teacher training. Problems of teaching methods with a focus on the individual, differentiated learning, individual learning, specialized education and others became urgent tasks of methodical science. When profile training teachers faced a number of difficulties in organizing and holding of elective courses on various branches of computer science. It was noted that their methodical preparation is insufficient during conducting elective courses. In connection with this occupation by methods of training informatics became the main work of the teacher. This fact shows the importance of armament of teacher by methodological knowledge on the basis of innovation, improving his methodical preparation.

Modern teacher must know the methodological, psychological, pedagogical, subjective and methodological components of teaching informatics, the methodology of scientific research, the theory of teaching and ways of its implementation in practice, be able to justify the innovation model, to apply

at all levels of education informational and communication tools to the teaching techniques used in the present time, to develop innovative methods and tools for learning.

All of the above requires special study methodology training to computer science. The practical significance of this complex problem is increased by the decision of the research in terms of innovation ideas.

Scientific novelty of the Project lies in the fact that, in research on teaching computer science for the first time the problem of the study of the methodological training of teachers on the basis of innovation raises.

Methodical and methodological training teacher begins with an examination of textbooks and manuals on methods of teaching science. However, textbooks and manuals on teaching computer science, devoted to elective courses on the basis of innovation, are not enough. In elective courses in profile training informatics subject and object of a methodical science have not been disclosed, research methods are described superficially, information about hypothesizing, formulating and solving methodological problems, carrying out experimental work, etc. is not enough.

Many scientists, teachers conducted a study on the use of informatization in computer science education. The scientist-pedagogue U. Pervin [1] developed and proposed now a popular system of effective learning algorithmization and programming through an original tool for the development of students' cognitive initiative – computer artists. Under the leadership of V.S. Lednyov [2], A.A. Kuznetsov [3] basic provisions and principles of content selection continuous course of the school of computer science have been formulated. In the works of A.A. Kuznetsov [4] applied general and vocational aspects of computer science teaching in educational institutions of higher learning are investigated. Test control system based on the use of computer technology is described in the works of Avanesov [5], V.P. Bepal'ko [6] and other researchers. Currently, under conditions of informatization of education training of future informatics teachers, training teachers to use information technology in the educational process are discussed in the writings of M. Zhaldak [7]. Researches of scientists and educators M.P. Lapchik [8], S.K. Kariiev [9], M.V. Shvetski [10] are devoted to traditional methodical preparation of science teachers for multi-level system of education.

In Kazakhstan, a number of studies on the learning of pedagogical possibilities of informational and communicational technologies in education was performed. For example, the concept of modular technology and functional design of electronic textbooks and multimedia tutorials were developed G.K. Nurgalieva [11]; design of methodical electronic systems for primary school

teachers; analysis of the impact of information technology on the research activities of the future teachers; formation of professional competence of teachers in the use of electronic textbooks in the learning process, methods of teaching computer science, pedagogical informatics K.Z. Khal'ykova [12], and others works.

Researches of russian scientist, pedagogue I.V. Robert [13] aimed at the realization of psychological and pedagogical goals of training and upbringing in the field of education. They considered the direction of information industry of pedagogy, ensuring optimal use of the methodology, technology and implementation practices of modern information and communication technologies.

The analysis of the works of the above-mentioned domestic scientists and educators as well as scientists from near and far abroad have shown that there are problems to be solved, one of them is to improve the methodological training of teacher on the basis of innovation. It has been observed that the problem of improving the methodological preparation of teachers for the teaching of computer science discipline of innovation-based are still not fully formed in systematic manner.

In this regard, in our country, scientific and pedagogical, methodological, regulatory, technical and technological prerequisites for the development of education in improving the methodological training teacher on teaching discipline is required to show, to assess the content of education; to develop optimal innovative models for the learning process; to apply by innovative models at all levels of education; to develop traditional learning technology on the basis of innovation, to develop methodological training system development of the intellectual potential of the students and the formation of skills self learning.

Also in the formation of electronic, virtual laboratories and demonstration programming environments need to be developed; to use data base, electronic libraries on the Internet; to use pedagogical software in the information network; to create automation tools, control and monitoring system; to improve methodological training teacher in the organization and implementation of a global work towards the control of the intellectual potential of students in the systemic form.

Noble influence the results of the research work on enriching the content of the subject methods of teaching computer science through improved teacher training methodology on teaching discipline, improving teacher training methodology is indisputable.

Methodical and methodological preparation of teacher related to the content of computer science, teaching methods, teaching aids. However, elective courses on the basis of innovative textbooks and manuals on teaching computer science are not enough. In elective courses in profile training science subject and object of a methodical science

have not been disclosed, research methods are described superficially, information about hypothesizing, formulating and solving methodological problems, carrying out experimental work is not enough.

In this regard, in the case of the transition to a multi-level system of training teachers of computer science it is necessary to form their methodological, psychological, pedagogical, subjective and methodological competences, aimed at innovation. Methodological competence of the teacher will provide motivational and value the participation of students in training. Psycho-pedagogical competence of teacher is characterized by a professional orientation of students' learning activity, increasing their cognitive interests in the direction of humanity and benevolence. Subject component of teacher competence is characterized by a system of theoretical education students and preparing them to practice. Methodological component competence provides specialized scientific, psychological and pedagogical knowledge and skills of teachers and the ability to apply them in preparation for their professional activities.

Positive impact of research results to improve the quality of textbooks and electronic textbooks, video lectures and tutorials, virtual laboratories,

multimedia, electronic reference books, electronic dictionaries, etc., didactic tools and learning environments on teaching computer science is no doubt.

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## THE ROLE OF SOCIAL AND PSYCHOLOGICAL FACTORS IN THE FORMATION OF OCCUPATIONAL STRESS AMONG TEACHING STAFF OF KAZNMU NAMED BY S.D.ASFENDIYAROV

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The article explains the actuality of the chosen topic by authors, which is due to increasing demands from society to the teaching profession, in turn this profession has enormous social importance. Capacity for empathy is recognized as one of important qualities of a teacher, but the practical role of emotions in professional activities is estimated contradictory. Attention is drawn to the fact that teachers are not ready to emotional overload, purposefully they are not form his relevant knowledge and skills which are needed to overcome the emotional difficulties of the profession.

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**Keywords:** burnout syndrome, socio-psychological factors, occupational stress, faculty, psycho-emotional state

Current state of Kazakhstan education system is characterized by an active introduction of innovative technologies in the educational process. In terms of active modernization of pedagogical activity ever higher demands are made not only to teacher's professional knowledge and skills, but also to the level of his personal self-development, his psychological and emotional stability.

The teaching profession, of course, has a great social significance, as a teacher in institute of higher education does not transfer simply professional experience; he also shapes the future specialist as a person and a professional. Therefore psycho-emotional state of a teacher, his health are very important aspect of the professional activity, these factors determine his performance, quality of teaching, quality of relationships with all subjects of pedagogical activities. Feeling-into (empathy), emotional involvement in the educational process is recognized as one of the most important teacher properties; however, not always enough attention is brought to this aspect of the training. This leads to the fact that many teachers are not psychologically prepared for the emotional overload, which makes by the profession.

As far back as 70 years of the twentieth century researchers noticed a fairly common condition of emotional exhaustion by persons engaged in the various aspects of communicative activity (teachers, doctors, social workers, psychologists, managers) [1].

Typically, these experts at a certain stage suddenly were beginning to lose interest to their activities, formally relate to duties, conflicting with colleagues on unimportant issues. Later they usually developed somatic diseases and neurotic disorders. The observed changes were found as cause of long-term exposure by occupational stress. Consequently, the term "burnout" was appeared, which in the Rus-

sian psychological literature was translated as "burn" or "burning" [2].

There is a single point of view on the essence and structure of professional burnout. According to current research, the mental burnout is a state of physical, emotional, mental exhaustion, which are manifested in the professions with emotional aspects. Professional burnout syndrome includes three main components: emotional exhaustion, depersonalization and reduction of professional achievements [3].

Emotional exhaustion is felt as emotional stress, emptiness, exhaustion of emotional resources. A person can not be engaged to work as previously, feels subdued, dullness of emotions, and emotional breakdowns are possible.

Depersonalization is a development of negative, callous attitude towards irritants. There is increasing impersonality and formality of contacts. Negative attitudes that are latent may begin to manifest as the inner restrained irritation, which can start to appear as tantrums or conflict situations.

Reduction of personal achievements are reflected in reduced feelings of competence at their work, in a discontent by themselves, reducing the value of their activities, in a negative self-perception in a professional aspects. The emergence of the sense of guilt for their own negative manifestations or feelings, reducing of professional and personal self-esteem, appearance of feelings of failure, indifference to work.

Educational activity – one of the most deforming human personality activities and teachers – are most susceptible to emotional burnout [4]. Now the society is declared image of a successful person, this image of a confident man, independent and decisive, reached career. Therefore so many people try to correspond to this image to be in demand in the society. But more resources are needed to maintain a proper image of a modern teacher.

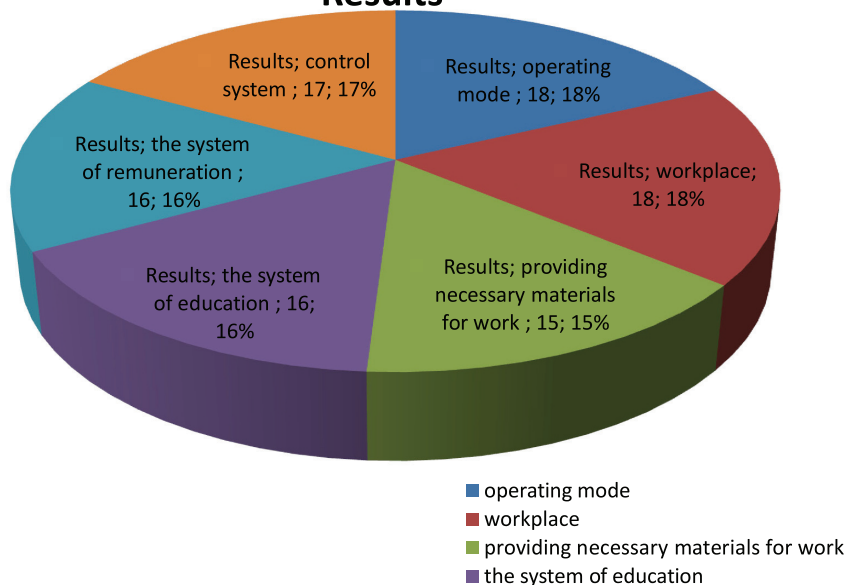
We grouped factors, which are causing burnout, into two large blocks by selecting the organizational factors and individual characteristics of the professionals. In modern conditions the activity of teacher of medical schools literally are saturated with factors causing burnout. It should again be emphasized that the incessant inclusion the teaching staff of KazNMU named by S.D. Asfendiyarov in the innovation processes is the distinctive feature of modern professional life, which is especially expressed in the transition to the new forms of social and economic activity at this development stage of Kazakhstan society. These fundamental organizational changes in many cases give rise to a mismatch between teachers' characteristics of a new work situation and their habitual activities, which in turn determines the occurrence of pronounced stress conditions. New labour situation developing in KazNMU as in educational organization requires additional efforts from the staff to adapt to changing organizational environment that may have done with increasing the professionalism and success of work, and the disorganization of activity and the deterioration of health of workers. In the event of the teachers negative manifestations of occupational stress become too pronounced, the effectiveness of organizational change in general can significantly decrease. Among the many factors causing burnout, we can note a large number of social contacts per work day, extremely high responsibility, underestimation of professional contribution and importance of the leadership and colleagues, necessity to be in the good "form" all the time.

In this regard, it is particularly important to identify on specific researches which factors of work situation plays a crucial role in the emergence of professional burnout at different stages of organizational changes, what determines their dynamics and as well as how it affects on the functional status of the persons working in the organization.

We conducted a study to determine the most significant organizational and personal factors that cause emotional burnout among teachers. The first phase of the study was concerned with identification of the most important organizational factors that cause burnout among faculty. The study was conducted at Kazakh National Medical University, teachers from 36 (42%) departments and staff from 3 sections participated in the study, overall 435 people were involved, 89 forms were spoiled. Professional burnout syndrome is closely related with long working hours, that are not evaluated properly, the content which is difficult to measure, requiring exceptional productivity or appropriate training, also to the fact that the governance does not comply with the content of the work. Therefore, in the questionnaires attention was drawn to the satisfaction of the work conditions. The results were following:

- a) satisfied by operating mode – 18%;
- b) by workplace – 18%;
- c) by providing necessary materials for work – 15%;
- d) by the system of education – 16%;
- e) by the system of remuneration – 16%;
- f) by the control system – 17%.

## Results



Thus, we can conclude that 92% of respondents carry increased workloads, do overtime work, i.e. working hours are lengthened. In our study, 84% of the respondents were dissatisfied by the system of remuneration, 83% – by the control system, this directly leads to burnout syndrome, as a crucial role in the prevention of professional burnout syndrome is played by social support from colleagues, the university administration. For stimulation of teaching staff the correlation of remuneration with their own labours input and labour of his colleagues is more important than the absolute amount of remuneration, that is referred to as equity.

Also, we have identified the work factors that motivated teachers of KazNMU named by S.D. Asfendiyarov, they are located as follows:

1. The staff, friendly relations with colleagues – 23,8%.
2. Confidence in the future – 23,5.
3. Self-realization – 19,4%.
4. The financial incentives: high salary, benefits package – 12,5%.
5. Good working conditions – 10,3%.
6. Career prospects – 6,3%.
7. Professional development – 1,9%.
8. Interest to work – 1,3%.
9. Excitement, competitiveness – 1,0%.

Learning motivation of teachers performance has allowed us to identify three main factors, which affect on their emotional sphere: staff, friendly relations with colleagues; confidence in the future; self-realization. And it proves once again that the teaching activities are more exposed by emotional burnout.

#### Summary

In the course of studying of influence of socio-psychological factors on the formation of professional stress among teaching staff in KazNMU named by S.D. Asfendiyarov was identified organizational factors, conditions and organization of work, relationship with immediate supervisor, providing necessary materials; motives that are prevailed among teachers. Not satisfaction which leads to the lowering of efficiency and the development of occupational stress.

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*Materials of Conferences***TO THE ISSUE OF TIERED FUNCTIONAL ORGANIZATION OF PERSONALITY**<sup>1</sup>Gorbacheva M.V., <sup>1</sup>Kuznetsova T.G.,<sup>2</sup>Burkova S.A., <sup>3</sup>Bulgakova O.S.<sup>1</sup>*Pavlov Research Institute RAS, St. Petersburg;*<sup>2</sup>*The Herzen State Pedagogical University of Russia, St. Petersburg;*<sup>3</sup>*Scientific-practical center «Psychosomatic normalization», North-Western State Medical University named after I.I. Mechnikov, St. Petersburg, e-mail: bulgak\_os@mail.ru*

The relevance of this study is related to the question of the study of personality as an indivisible integrity, in which there are different levels of its organization: eg, physiological, psychological and social.

The methods have been chosen in the consideration of the relationship of some parameters in selected personality levels and then correlation analysis was conducted. Examination was carried out three times: in the background, under the conditions of choosing (correct guess) and under the positive acute stress. The following results were obtained:

1) the heart rate features in connection with the results of the test “speed arithmetic account”: in the initial evaluation it reflects the emotional stress of the new situation and a surprise assignment; in the re-presentation – a significant decline, reflecting the tension is likely associated with the process of counting, but anyway, this figure is almost two times higher than in the background;

2) the heart rate features in connection with the results of the test of “alexithymia”: the first presentation is accompanied by some emotional stress, but in the re-presentation is reduced by half;

3) the functional state of the individual in the background is calm, when testing “speed arithmetic account” it is deteriorating, with repeated testing is optimized;

4) we found a significant improvement in functional status in primary and re-testing of “alexithymia”, “emotional intelligence”, “subjective time”;

5) when doing the Jan Strelau test on the background of increasing tension index functional condition improves;

6) in the background there is a high heart rate variability when doing all tests except Jan Strelau test.

It should be noted that in the two minute choice, which was implemented as a result of positive acute stress, differences in the proposed parameters was invalid.

Thus, the study of the relationship in various levels of organization of personality is a deal of great interest, since it gives the opportunity to deepen knowledge of personality organization and its specific response to stress.

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## FEATURES OF A SELF-ASSESSMENT OF CHILDREN WITH IMPAIRED LOCOMOTOR SYSTEM

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In this time of self-esteem of people with opportunities ogrannichennymi attracted attention of many researchers. The reason for this is the fact that these children are growing up in many cases can not fully live and work in society. Because children with disabilities have low self esteem and depend on the opinions of those around them. But very importantly, the children rated themselves sogranichennymi capabilities adequately and feel worthy member of society. This article discusses the formation and characteristics of self-esteem in children with disorders of the musculoskeletal system.

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**Keywords:** self-esteem, impaired locomotor system, cerebral palsy, children

The concept «impaired locomotor system» includes the breakage of motion springing up from different reasons and spectacles. In case of visible illness and damage of impaired locomotor system of child's early years parent's all attention should oriented on developing and repairing of broken motion. The argument is because though some parents become aware of different of psychical and language features, they do not hasten to consult with special teachers, speech therapists, psychologists. Other considers that child's psychical and language development will advance in the process of movement and recovery. As third ones believe that any disease would change child's psyche and behavior. It tells us that most of them do not know about special (recovery) study and fostering systems for children with impaired locomotor system. Relying on psychological-pedagogical and speech therapy work for children with pathology in several decades there has been planned primary direction and way of theory which is being used broadly. Russian scientists L.A. Danilova, M.V. Ippolitova, E.M. Mastiykova, E.F. Arhipova, so do others support the idea of special study and fostering of children with cerebral palsy from the first month of life. Through principal aims, they proved the productivity of work taking care from early childhood, and pre-school age [1].

In our country, the increasing amount of children with mental defects, made health, education and social protection branches to pay their attention. Nowadays the social view have changed towards children with mental defects, they are considered as members of society. The life is hard to make decision without self-esteem. Self-esteem is self evaluation of level of qualities he obtains. It turns to the aspect of self-estimation. Self-esteem is the result of discussion, comparing, thinking and assorting.

It is unconditional that teachers evaluation affects of developing self-esteem in children with impaired locomotor system. It brings

children to the division of excellent, bad and regular students. In the first stage of getting education progress work identifies child's social status. A mark and B mark students' self-esteem is considerably high in comparison with bad mark students' who have doubts about their abilities [2].

Elementary school is the first stage for school life. Taking these steps a child opens up inner learner position. Study takes the main place for him. In this stage child develop theoretical thinking and acquire new skills. The progress at school takes a part in developing personality, children with cerebral palsy disease beyond their age have unstable up and down intellectual, bold and happiness emotional scale. It distracts in developing child's personality [3].

Cerebral palsy children from boarding school have difficulties in behavior and incompetency in adjusting to sociality. But in spite of high level of self trouble, their self-esteem will become adequate as they get older, because of psychological-pedagogical work made to the children with cerebral palsy disease.

There have not been noticed any self-esteem difference and anxiety between children having cerebral palsy disease with the form of spastic diplegia and normal children [4].

Children with impaired locomotor system are incompetent to evaluate their attitude. The evaluation process and teachers good rapport with children are not the only reason for the development of self-esteem in elementary school children with impaired locomotor system. In general family upbringing also plays the fundamental role in extending self-esteem.

The birth of mentally retarded children takes family to the psychological change. Family of children with impaired locomotor system from the beginning have hard times. When child's action does not live up to parent's expectations, it is reason for fading solicitude toward the child. The child comparing his

defects with other regular children ends up with deterioration of his self-esteem, question like «why I was born this way» would concern him [5].

Changes in self-esteem and concern makes children with cerebral palsy different. Biological factor affects to the personal development of brain palsy children. Profitable social psychological-pedagogical correcting work affects on child's adjustment to sociality. The composure of brain's competent capabilities, appear to be psychological-pedagogical correction and adjustment.

Nowadays social improvement of society demands personal improvement so does capability. The principal factor of personality development is self-esteem. The task to shape teenagers self-esteem is considerate as the main dilemma in building his personality [6].

Holding interest to the teenagers eager to present good skills can upper his self-esteem. Teenagers with low self-esteem can have psychological troubles, difficulties in communicating with fellows and, low report card.

Such indicators vanish any believe to get high education, build a rapport with fellows and to take a good rank in society. If a learner does not acquire reading principles in time he will not be able to continue his study. That's why it is important to support learner's ambition to study and do not let to lose his authority among others. The guideline is to pay attention on distinctive features of self-esteem among teenage learners [7].

The adolescent is the one of the complicated period in mankind's life. Expect reforming psychological concept again, it will have been obtained new skills, viewpoint, so does the increase of general guide to inner sociological acclimatization. The period of adolescent feasibly would meet by low studying progress, degrading ability to work causing anxiety, imprudent behavior what turn to stage of division of "I" and "world".

For the children with impaired locomotor system on formation of self-esteem the appearance plays the main role. The more opportunity we provide the more concentration they ex-

tent. The teenager's ego would appear in early years. In this period they begin to observe their inner world. The period adolescence come up with self-consciousness and strive to be independent. After wards they proceed to self-determination what will make them competent to organize their life plan [8].

In adolescence cycle there will appear new concept with developed self-esteem divided by what I think and what others think. children with impaired locomotor system in elementary school do not have low self-esteem as they lack to notice their physical defects. The appearance does not play an important role for them. The school, other children and parents warmth are enough for them [9].

Though in teenage period they get older and start to notice own physical defects by comparing with others. Appearance, physical feature and clothes would play vital role now.

Paying attention to the demands having been said earlier would ensure us in growth of psychological, physical health stability.

If every teacher would have taken into mind to help establishing self-esteem among children with defects support them in self-determination and to help to evaluate their potentiality, capability, it would bring to high level of child's development. Nowadays we should contribute in encouraging children with defects.

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## CHILDREN, SPOILT THAT VEHICLE OF PROP-ACTION, FEATURES ADAPTATION OF POTENTIALLY-PSYCHOLOGICAL

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The article deals with adaptation and socialization of children with musculoskeletal system. Developmental delay in turn affects the poor communication with peers and eventually worsens the situation in their society. In children with impaired motor areas regardless of their origin is often violated adequate perception of the world, there has been aggressive behavior and hyperemotivity. In addition, the negative impact on children, restricted movements, improper home education, in which children become even more unmanageable, with increased attention from parents to their injury, or vice versa, the children there are various systems on this basis. Adaptation of children with disorders of the musculoskeletal system to life in modern society is complicated not only by the fact that limited their ability to perform other actions available in the labor process, teaching, learning, but also personal attendant strains and other psychological problems. Many of these children are difficulties in communication, manifested, for example, in the form of verbal and physical aggression, inability to make contact, common mistakes in interpreting the intentions and actions of another – adult or peer, etc. Socialization of children with musculoskeletal regarded mainstream sociology disability foreign and domestic researchers also quite fruitful. In the scientific literature presented as generalizing the theory of disability (Abberley, Albrecht G.L., Barnes C., Barton L., Susman J., Corkek M., Shakespeare T., L. Treloar, Marin B., Prinz C., T. Zhulkovska, E.R. Yarskaya-Smirnov) and some aspects of the analysis of livelihoods and rehabilitation of children with disabilities.

**Keywords:** violation of the musculoskeletal system, cerebral palsy, children with disabilities, socialization and adaptation of children with disorders of the musculoskeletal system

On in our time pore in our the country conceivable limit increase number of children, storage is sensible, knowledge and to the question this industries social of defence to pay attention requires. Look my of societies “limit child conceivable a year considered” changing, became better turned on time one the member my societies to look them. Possibility children, that examined leader in limit children ran on time, cerebral in the state of paralysis is psychological and features development of phixiologicalon basis labours of B.P. Puzanov, E.S. Kalizhnyuk, V.V. Lebedenskyit was described [1].

One prop-action vehicle is spoilt children cerebral a paralysis – psychological develops motion according to very difficult category teaches and brings up motion vehicle wounds oneself direction in accordance gets organized. Prop-action vehicle is spoilt children intellectual and psychical development feature and physiological melody corresponding surrounds man talks relation very sensible and any weak to the changes observant. Such the children very impressionable, it is possible easily to offend them, lost it балалардакез-келген formed to the state unpleasant look. Viz., defect edge of motion unites social by relations coming, that your the viburnum influences general to development of psyche, is sober.

Especially is from life coevals of her early childhood life of children, spoilt that vehicle of Prop-action, beginning just right. Children motion defects, psychomotor and possibilities conversation doing presence of attempts, that was directed increasing remaining behind destroys defects associate parents, looks [2]. Possibility runs around limit these the children

-different permanent to the patients specialists: orthopaedist, nevrapotolog, internist, speech therapist and etc specialists. Them in system kind medicinal therapy and, physiotherapy means for treatment, accept. Children accept frequent means for treatment it is constrained much in the state, time for a long time lies in hospitals. It tears caress of parents viburnum. That time, when parents came, at children them my the winter, agitation, that a conscience was conceived hundredth to the result of means for treatment associate, looks tracks of dissatisfaction. Children patient cured leaves possibility parents complete viburnum health press pays attention, talks idea children talks affectionate two plan tremble. On sometimes, parents what do not ask for children that, comes, exact what they do, needed be, decides. Here, beginning from it time your the viburnum formed on time of personality spoilt. At first error in family influences children are formed in pathological the state education. If we are, will lean to the result research, to the children what said, edge meets solicitude 80%. Wish of presence this Parents try to carry out, exchange act of this to it [3].

On sometimes, possibility comes in limit family of children – is strong factor, changes that look domestic the state. These the states bring psychological the state mother to change. Your conducts head well-known pores crisis of parents the state personality.

Emotional uniting uncontact: this of mother the state on a pore: unassisted, fear. It pore difficult parents not on strained on a shoe tree to understand information, that was taken. To the State, there was that in that, considers guiltily, it test becomes stronger, dissatisfaction,

that said, high. Acts and, brought that sense of guilt them to the patient of children, bring comfortable sorrow in sorrow error. That sense of capriciousness said to the children, edge brings in solicitude [4].

To deny, inverting is a pore: associate, that constancy in family and well-known level one the hope to keep, it is necessary to the circumstance, at that were functions of inverting. Associate That inverting smothers emotional, method, that was directed to lose worry, is. Viz. not to Acknowledge, in difficult phase denial viburnum of parents to check from to conduct refuses. It specifies reaction of defensive for parents. Looking they a doubt on competence of doctor, attributing to the specialists except for verification intends. On it pore "coping-behavior" develops: beginning from medical establishment, closes pass to different to the towitch-doctors. "Such magic equipped search" real the state to accept distorting, children come in the world strained on a shoe tree to adaptation parents an obstacle compels to come [5].

To Grieve, sense of that malice is, isolated to bring maybe. Children the state gets better not, your the viburnum brings "social to the middle not can to adapt" long phrustration to be on a share on psychical and physical approach for parents. It pore depression for parents to measure deeply characterizes [6].

Emotional unites, adapts, children sick is acknowledges: real question power directs only looks, pays attention, patient children education occupies allows. Examining useful, correct travelling for children of parents on it pore, different decision searches. Parents valuing on pore association self children, loving begin emotional. Your limit viburnum understands Mother possibility the state arrival in the world, to acknowledge needed be. Real look, children said that defect for parents, formed begins. That pays attention from sorrow children become interested beginning, to try appeal surrounding an environment relation needed. Confidence, that said along parents, to fall down, worry on high level brings in psychological health breakage of parents [7].

Psychological basic criteria health to surrounding to the environment adapt, strained on a shoe tree level worry and adequate relation, that said, known. If so be, necessity limit children educator self social to the middle by adjustment of possibility by parents is conceived. For parents strained on a shoe tree to be psychological health, to the children them on connection, that said, carries out large role. Therefore viburnum, spoilt that vehicle of prop-action, conducted with parents educator psychological works it is necessary [8].

Stands psychologist in it the state in first ditch role. To the act of mother duty of Psy-

chologist – to promote confidence, that said, it act can explain necessity to carry out. Though quite first pedagogical acts without result take place, to the psychologist necessary to render support to the mother in any the state. Offers methods of this work of psychologist with parents for her: to the parents to specify methods work with children; lessons, that was led by a psychologist, compendium; to carry out with children tasks of house; to read literatures, that was offered by a psychologist; creative idea, can carry out; to correct psychological health parents, to develop social adaptability, to promote confidence, leads training, that was dedicated to reduce level of worry, works [9].

Named fact is taken into account the state, prop-action vehicle is spoilt children psixocorrection work program social-psixological adaptation develops is envisaged, psychological training kind propagates hardens, them parents and directs is correct.

Children brings up motion years feature takes into account sits, a decision accepts coulisse, – providing, labour, discipline culture, collective works takes as level drives in is necessary. Such the education of children needs understand mutually well and to look them right by a look to the future importance education superiority. Invalid, children, in family to bring up meets against two kind one – first my black. One the kind them fully provides detailed, material side children parents "limit", viz., deeply measuring glancing but to the world fur coat of this spiritual to the necessity gives not [10]. Quite a viburnum punishes sometimes. Children in family of this go down on depression as an interior, to love of mothers, to love shooting – not deservingly talk think. Them heartfelt the state – a melody got down, mistrust a benefit. On development of language what will come from it, cognizableness activity on is formed, on education different defects were on a share, falling down, level of knowledge to stop.

Two viburnum one the state to solicitude coulisse, such the parents edge held too emptily "guilt at child" sense it, caresses. Statement of came Ramble tries to carry out. Children, that grew in such the middle, comes modest. The being unreliably, grows thinly. Are side of what social develop, such the children different to difficulties.

Possibility, limit child in nowadays time, to form takes very basic place Special development of pedagogic question influence. It question on to decide social localization of office workers special. Social teacher is an office worker of establishment what special(to correct) form, he all the representatives(teacher, psychologist, doctor, social office workers, right to protect office workers of organs, labour collective and parents) of institutes and

personalities, at that and other declared oneself interest, on dense connection. Social basic aim act of teacher in special(to correct) establishments is below: to do positive the state development(body, socially, spiritually and development of reason) personality of children; on social adaptation children complex to give help; in vital space a viburnum protects; finishing graduating students are professionally directed I to the following to adaptation of life gives help from boarding-school [11].

Prop-action vehicle is spoilt children an educator parents head goes down not hurts diminishes aim a government 6 children one social office worker gives children and them parents for large help. These office workers district labour, scope and people comes from department social of defiance work. Filled up Therefore possibility your limit viburnum my society in line forming of to feel on time of member localization, takes that social office worker, is special.

Social possibility of office worker limit to the parents of children correctly to develop them and on aim education below suggestions give: getting it right feature of children, to accept; to the children economy patience love to show itself; to the children to worry inwardly unpleasant constantly shooting-right there were mothers, to try not to compel to notice; works associate to the way of life of house on possibility to carry out together with children; touch children are coevals on frequent connection done influence; children connection dowry constantly supports surrounding an environment flow to show itself, connection not tears to check; beret of help, with special by specialists to be on dense connection very important be, constantly taking into account to sit it is necessary to the children [12].

Prop-action vehicle is spoilt children psychological-pedagogical straightens up, children fate medical remedies responsible tutor, doctor, social office worker unites parents dense connection work carries out only, they societies filled up member one time travelling is opened.

Prop-action vehicle is spoilt children teaches and basic duty row brings up children personality forms fully, the cognizableness attempt development, me societies even in a right member one time middle is added be.

Certainly, questions, that lead work found not, though on today's a day limit child possibility, flow decision, sufficiently. Lines anticipating That is carried out works for experience exchanging exposure needed.

Saws social pedagogical tendency prop-action vehicle is spoilt children first moment a help gives for this is family, I lives sits middle investigate, discusses takes, me a viburnum lives social middle mixes, drives in, socialization question active compel to participate pos-

sibility give birth. This of the last name correctly uniting in only the state social tendency of pedagogics, able to resist different social to the obstacles, to form, cultural, industrious physical person maybe be. These the qualities to allow to touch to master limit psychology of children deeply, conversant for conceivable needed along children [13].

On socially to drive in, works of what special correct, defects on to bring up to win united for name that, to unite it is necessary and her as early begin on so social adaptations effective.

This is a level I aspiration values teacher's, parents of reader and, connections between by companions to the state for restore very important [14].

That together, possibility limit stages child this values me aims strained on a shoe tree approach formed, the future me quick in the uptake, cultural, form and world view high is, motherland's matched citizen is large of course there is.

Future generation, there is that possibility of especially limit child, uncontact travelling did not get,correct development personality of they on approach to examine system extremely important.

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## TECHNOLOGY OF 3D PRINTING: DEVELOPMENT PERSPECTIVES IN KAZAKHSTAN

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Everyone uses services of traditional typography: some need to correct an essay, others – to publish a book, create advertising banner, etc. But what if a usual print could be used to print, for example, a chocolate cake? It became possible due to emergence of 3D printing technology, and facilities, used to create three-dimensional objects are called 3D printers. Their abilities are truly unlimited: from creating hand tools and printing human skeleton to construction of full-scale houses with rooms and stair cases! Some experts predict a bright future for this technology, but others – only development within the limits of low-volume output. Let us study this miracle technology from within and see how it can benefit our state.

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**Keywords:** 3D printers, typography, three-dimensional objects

The very definition of 3D printer sounds as follows: it is a facility that uses method of layer-based creation of a physical object according to digital 3d model. In foreign literature these facilities of this type are also called fabbers, and the process of three-dimensional printing – rapid prototyping.

3D printing can be realized through different methods with implementation of different materials, but all of them are based upon the method of layered creation (growing) of a solid object. However, the widest spread was obtained by technology of fused deposition modeling, developed by S. Scott Crump, its popularity is defined by a relatively low cost of printers themselves and expendables. And the first printer of the described technology was produced in 1991. Since then the technology has been developing rapidly and became available for household usage, new operational systems support 3D printers.

During recent years interest towards them has been growing in geometrical progression, and not only among enthusiasts or narrow specialists: companies, involved into producing or projecting various products, use 3D printers actively, and governments of the most developed countries invest into creation of 3D printing development centers that are aimed to cut costs of producing technological goods, or plan to do it in nearest future. It is not all: as universities realize that the nearest future holds a demand for specialists in this area, education plans of training in basics of 3D-modeling and printing are being developed and introduced in educational institutions with state budget financing [5].

The Chinese government realized the potential of these facilities a while ago and stamps various configurations with attractive prices. One can shop different internet-sites for a compact domestic printer for an average of 1000 USD. If earlier only plastic was avail-

able for material, today the variety of materials can strike our mind. How do you like artificial blood vessels, printed in 2010. NASA is planning to send 3D printer to ISS in order to create the necessary tools right in the place of usage, Chinese companies test the technology of house construction. In only 24 hours a whole dwelling complex can be “printed” from quickly-congealing concrete, workers will only need to carry out internal finishing! At the same time, houses of this type are ecological and less material-consuming.

3D printer has a great significance in engineering. At the stage of modeling construction of a part or the whole construction can be altered. In engineering such approach can decrease costs of developing and producing new products dramatically.

Medical workers have learned to print “patches” for human skin. A special gel, made of donor cells, serves as a material for them. According to scientists, even the most regular office printer can produce leather if it is modernized for the purpose. In 2011 scientists managed to reproduce a lively human kidney. It took 3D printer (bioprinter) only 3 hours [6].

Last fall Canadian constructor invented Peachy Printer that costs only 100 USD and uses light-sensitive rubber (resin) that coagulates under the impact of laser, as material [7]. For example, printing a toy cube requires 20 minutes of its operation. And that is not it: this facility can serve as 3d scanner. Technically it can create a copy of any small object. Considering the low cost and availability of it, we can state that a wide spread lies before this invention.

Enthusiasts from all over the world have created an open project RepRap that allows printers to create their own components. At the moment the technology allow to reproduce 50% of spare parts,

however, it is not the limit, and the project will develop [8].

We can imagine the significance this technology has for educational purposes. Our Russian colleagues established mass production of 3D printers for school students and youth on the 5th of April 2014 at the plant “Voronezhselmash” [9]. Fantasy of students regarding possible shape and design of 3D printer turned out to be truly unlimited: models of wood, cardboard, metal, plasticine, “Lego” parts have been presented for the competition. We can name achievements for a long time, but let us concentrate on Kazakhstan realities and outline advantages and negative points as well as obstacles that lay on the way of progress.

Only several firms provide services of 3D printing in Kazakhstan, and only sells the equipment officially! Of course, nothing is said on this technology in government, and domestic mass media doesn't pay much attention to this topic. We can frequently hear businessmen saying that the republic's legislation falls behind innovations and new ideas. Of course, all this can be said in regard to technical regulation. It is a common situation when investors have a prepared business plan, all necessary legal documents, equipment, and personnel, but there is no law to regulate such activity or the very structure of government has changed, and they have to collect all necessary documents again.

Mastering the technology would allow the state to realize new and undergoing programmes quickly and in high quality. For example, accelerate realization of programmes “**Available dwelling-2020**” and “**100 schools, 100 hospitals**”. Besides, in the latter case it would provide not only the working area, but also *tools and donor organs*.

In modern terms of global and vigorous competition, the defining condition of not “eating dust of the leaders” is for the state, its legislation, and population to be prepared for perception and introduction of new technologies. For example, the problem of author's rights and firearms production can become urgent: on operating plastic pistol can be produced (ref. Defense Distributed), and the authorities will be unable to prevent it due to the specific situation. USA have already introduced a law that forbids production of firearms on 3D printers, obviously, we need to act the same. Everything is simple with the author's rights. One should compromise with a producer of author's product. In any different case we shall face a spontaneous production of cop-

ies and defective goods just like China did, and not only of firearms.

*A heavy burden lays in solving this problem lays upon technical regulation.* It is necessary to deal with new materials and substances and, therefore, safety and ecological friendliness of the created products become the most significant aspects. We should approach this problem gradually and carefully. The first step in this direction has already been made. International organizations of standardization such as ISO, ASTM, SME, and DIN work together to develop standards for technologies and materials, used in this sector [1]. This collaboration will allow us to accelerate development of the technology. Standard ISO/ASTM 52915:2013 “Standard of technical requirements towards format of files of additive production. Version 1.1” describes the existing and future requests of production and technology of three-dimensional printing. As industrial file format for transiting information from a computer (designing applications) to a printing facility STL format is recommended to use. This format contains only information on an object surface, but doesn't contain any data on color, size, or taste, etc. Organizations invite specialist in production industry and design from all over the world to discuss and comment the printing process. It is possible that the existing technical regulations will undergo changes, we shouldn't outline emergence of additional paragraphs in old, or even issue of *new standards on “rapid prototyping” (Rapid Prototyping Standards)*. All these measures will lead to creation of new research centers and testing laboratories. The quicker we master this sector in Kazakhstan, the quicker we shall outplay our neighbors and, possibly, will be also to provide consulting services to other countries.

For the first time in Kazakhstan, 3D Print Conference with participation of our domestic and foreign, mostly Russian subjects of jewelry, photo, engineering 3D industry, took place on the 16th of April 2014 in Almaty. Among speakers there was a professor from “Nazarbayev university” where the pedagogue gives a brief introduction course on 3D printing technology [4]. However, as we can see, it is not enough. Action is needed today. **Trends of new technologies in the world define the inevitability of quick and energetic introduction of new subject and specialties into state education.** For example, International IT university in Almaty should open a faculty of training in developing applications and construction sets in the sector of three-dimensional printing, moreover,

the university has the experience of robot construction. It is reasonable to introduce *new courses on technical regulation of the sector of rapid prototyping and material study* to specialties “Standardization, certification, and metrology” of Kazakhstan economic university of T. Ryskulov. And the process should continue among universities of juridical, customs, tax, and economic profile. According to example of Russian Federation, we should construct a plant of producing personal 3D printers for demonstrative and practical education of students. These measures will allow us to develop design thinking and creative approach among students and thus enrich patent portfolio of the republic. The most active and creative citizens should be rewarded with grants and medals. **Kazakhstan can become the first country to rapidly develop technical and regulative base in this sector!** No doubt, these measures will allow our graduates

to be competitive at the international labour market. Such specialists will be able to create a demanded and innovative domestic product, thus accelerating introduction of Kazakhstan into the world’s thirty most developed countries.

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*Materials of Conferences***USE NUTRIENT MEDIUM MADE  
OF ENZYMATIC HYDROLYSATES  
OF SUBSTANDARD OF CHICKEN EGGS  
FOR THE CULTIVATION  
THE PRODUCTION STRAIN  
FOR ENTERPRISE**

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During the last decade volume of bird eggs production among all categories of Kazakhstan enterprises has increased almost two times from 1,3 billion units in 1997 to 3,8 billion units in 2013.

Leadership in output volume belongs to Almatinskaya region. Producers in this region, as well as those in Kostanayskaya, Eastern-Kazakhstan, North-Kazakhstan, and South-Kazakhstan regions produce about 66% of total amount of all eggs, produced in Kazakhstan. According to forecasts of the Kazakhstan Union of poultrymen, by 2015 output of eggs should reach 4 billion units [1].

At the same time, according to statistic data, due to degradation of technological or other costs of production, up to 8–12% of the produced eggs turn out of condition, of them 4–6% are used in non-food production, and the remaining 3–6%, due to their short-term storage period, are not fit for use even for forage purposes. Therefore, the indicated products are often utilized by poultry enterprises, and it is not economically-efficient. Plans, defined by the concept of developing poultry, also imply broadening assortment of poultry products through a deep processing and complete use of the output with minimization of waste and non-conditioned products, especially via utilization method. Besides, it is well-known that during bioproduction of prevention medications against virus diseases of human, animals, and birds (bird disease of Marek, La-Sot, etc.) up to 30% of eggs are put out of selection, they are also used as low-quality product, and often up to 50% of them are utilized.

Though eggs are rich in complete proteins, it would be incorrect to consider this product to be valuable only in human ratio. As apart from proteins, fats, and carbohydrates, eggs are rich in various mineral substances and vitamins in balanced correlations, they are a product that can satisfy different needs in nutrients and can be used in biotechnology, where implementation of protein-dense products is required. The foundation for it is the fact that nutritional value of eggs is quite high. According to a number of researchers, 100 g of chicken egg mass contain 6570 kJ [2]. At the same

time, many of valuable egg nutrients are located in water solution and conditioned for consumption and digestion that of course bears certain significance and scientific interest of their use in diet and biotechnological developments, especially in the area of microbiology and cultivating cells in external environment, growing intracellular anti-genes (viruses, rickettsias, etc.) and creation of high-sensitive diagnostic, preventive, and treating preparations in medicine and veterinary [3]. Besides, during the process of processing, egg shell can be used in combined forage industry as mineral additions, especially in the sector of poultry and cattle production [3]. The described direction proves to be the most purposeful in terms of decrease in amount of non-compensated loss of unconditioned eggs, purposed for utilization and increase in economic efficiency of egg production on the whole, developing the sector of poultry and bioproduction in the republic.

In modern conditions development of cattle production, including veterinary and also animal's biotechnology in Kazakhstan is impossible without diagnostics, prevention, and treatment various infective diseases of bacterial etiology. At the same time all projects in biotechnological science and practice are impossible to carry out without facilitation of complete, economically-profitable microbiological nutritional mediums.

The following environments are usually used for these purposes in Republic Kazakhstan: meat – peptone broth (MPB), meat – peptone agar (MPA) and nutritional mediums, prepared at their basis that are produced at foundation of high-quality cattle muscle hydrolyzates. Commercial value of 1 kg of imported dry environments MPB and MPA (production of Russia) equals over 35000 tenge. According to statistical data, annual demand for the indicated mediums for research and bioproduction purposes forms 90000–100000 litres in the republic.

At the same time, production of the defined nutritional mediums consumes a great amount of high-quality cattle meat that could be used for diet additions in the republic [4].

In Republic of Kazakhstan and countries of CIS nutritional mediums, based on egg hydrolyzates, received from non-conditioned eggs, are being developed for the first time. At the same time, the world practice, particularly USA, produces nutritional mediums at the basis of qualitative quail and chicken eggs, but the technology of their production is unknown [5, 6].

To carry out researches, we have prepared two series of fermented hydrolyzates of egg whites for nutritional medium of non-conditioned chicken eggs.

The received fermented hydrolyzates of non-conditioned chicken eggs (FHNCE) have a typical egg smell, color from bright-yellow to brown, clear or with a slight opalescence, and, according to appearance, equal to control environment meat – peptone broth (MPB). At the same time, for FHNCE, received from white-yolk fraction for nutritional medium, pH equaled 8,20, content of total nitrogen mass – 0,67%, and mass value of ammine nitrogen – 0,56%, for hydrolyzates, received from white fraction pH equaled 8,1, content of total nitrogen – 0,60%, and mass value of ammine nitrogen – 0,51%.

In order to study biological characteristics (possibility to grow microorganism cultures), the described fermented hydrolyzates (base of nutritional medium) is initially solved with distilled water to achieve content of ammine nitrogen 90–150 mg% (if content of  $N_{am}$  in the initial base of nutritional medium equals 550–570 mg%, 400–450 ml of distilled water is added to 100 ml of nutritional medium base). 0,5% of sodium chloride was introduced to the solved nutritional medium, and concentration of hydrogen ions was increased up to  $7,6 \pm 0,2$  units of pH. The received nutritional medium – broth of FHNCE was sterilized in autoclave under 1atm for 15 minutes. In order to receive a dense nutritional medium, 2% of agar was added to the broth before sterilization. Standardized meat-peptone broth (MPB) was used as control medium.

The received broth of FHNCE was used to cultivate biotechnological industrial cultures:

*Bacillus. subtilis ATCC 6633 and Lactobacillus acidophilus 4 S1.*

The sawing material was introduced to liquid nutritional broth of FHNCE in amount 0,1%. Cultivation took place under an optimal growth temperature ( $37 \pm 2^\circ\text{C}$  or different) for 24–28 hours, depending on growth characteristics of the tested microorganism cultures.

Parameters of microorganism growth kinetic were define according to the type of growth in liquid environments and calculated according to concentration of alive microbes, defined by the method of sawing standard serial solutions of bacterial suspensions into a dense dry nutritional medium (Table 1).

As the research results in table 1 show, nutritional mediums, prepared on basis of FHNCE 1 and 2 are the most biologically-complete for cultivating industrial cultures *Bacillus subtilis ATCC 6633 and Lactobacillus acidophilus 4S1*. Title of cells for these cultures reaches indexes  $10^5$ – $10^7$  CFU/ml. Character of the tested cultures' growth in liquid broths FHNCE and in agarized environment was typical for this type of microorganisms.

After preliminary laboratory tests of the produced series of nutritional mediums of fermented hydrolyzates of non-conditioned egg whites for testing microbiological indexes via growing bioindustrial strains, the received environments were transited to bioenterprise Scientific-industrial enterprise "Antigen". The results of research are presented in Table 2.

**Table 1**

Characteristics of microorganism growth in liquid nutritional broth FHNCE at the basis of different variants of fermented hydrolyzates of non-conditioned chicken eggs

Number	Bacterial culture	Nutritional medium		
		FHNCE 1 (white-yolk fraction)	FHNCE 2 (white fraction)	MPB (control)
1	<i>Bacillus. subtilis ATCC 6633</i>	$1 \cdot 10^7$	$4 \cdot 10^5$	$1 \cdot 10^5$
2	<i>Lactobacillus acidophilus 4 S1</i>	$1 \cdot 10^6$	$1 \cdot 10^5$	$1 \cdot 10^5$

**Table 2**

Results of studying indexes of CFU for growing biotechnological strains of microorganisms, used in producing biopreparations in Scientific-industrial enterprise "Antigen" on nutritional mediums of fermented hydrolyzates of non-conditioned chicken eggs

Medium type of FHNCE	<i>Brucella abortus 19</i>	<i>Listeria monocitogenes</i>	<i>Escherichia coli antakon</i>	<i>Bacillus anthracis</i>
Environment 1 (of whites and yolks)	$5 \cdot 10^{13}$	$6 \cdot 10^{13}$	$25 \cdot 10^{13}$	$8 \cdot 10^{13}$
Environment 2 (of whites)	$4 \cdot 10^{13}$	$5,5 \cdot 10^{13}$	$23 \cdot 10^{13}$	$8,1 \cdot 10^{13}$
MPB (control)	$8 \cdot 10^{13}$	$6,5 \cdot 10^{13}$	$9,2 \cdot 10^{13}$	$9,8 \cdot 10^{13}$

The data, presented in Table 2, shows us that, according to microbiological indexes, defined via growing bioindustrial strains in scientific-industrial enterprise “Antigen”, the produced series of nutritional mediums of fermented hydrolyzates of whites from non-conditioned chicken eggs provide for accumulation of microorganisms as much as the control environment, received from MPB. Therefore, we can state that nutritional mediums of fermented hydrolyzates of non-conditioned chicken eggs are completely fit for bioproduction purposes, according to their microbiological indexes.

Thus, according to the studied physical-chemical indexes (pH, color, clarity, contents of total nitrogen, mass value of ammine nitrogen) and biological characteristics, defined via growing biotechnological strains of microorganisms in scientific-industrial enterprise “Antigen”, we can conclude that fermented hydrolyzates of non-conditioned chicken eggs can serve as a complete nutritional basis for nutritional mediums, designed to cultivate bioindustrial cultures of microorganisms.

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## Materials of Conferences

**THE COMPLEX COMPOUNDS  
COMPOSITION AND PROPERTIES  
DETERMINATION ON THE BASIS  
OF HUMIC COMPOUNDS  
AND TRANSITION METALS SALTS**

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Kazakhstan is entered into the world's top decade powers – the real leaders in the coal reserves, behind China, the USA, Russia, Australia, India, South Africa, Germany, and the Ukraine. So, the total geological reserves are estimated at 150,0 bln. tons, 37% of them are presented by the brown coals. According to its characteristics and calorific and thermal properties, the brown coal is inferior to the black coal; it has the high ash content, and the great content of the volatile substances, thereby, the lignite is inclined to the spontaneous combustion. The direct combustion of the brown coal is resulted in the environmental pollution by the nitrogen and sulphur oxides, and also by other harmful substances. So, in the world practice, by the new technologies, the lignite coals are processed to be produced the combustible gases, the liquid fuel, the fertilizers, and also the other products for the various branches of industry and agriculture [1]. For all this, it is quite possible to be obtained more, than 170 names of the chemical products. The significant link in the complex processing of the brown coal is to be obtained the humic compounds. The humic compounds are possessed the large spectrum of the biological activities; they are

environmentally friendly clean and safe to be used, they are performed the functions of the natural detoxicants and adaptogens [2, 3].

In this regard, the complexing properties research of the humic substances with the transit and heavy metals is presented of the great interest. So, the regularities of the various factors influence on the interaction processes in the complex heterogeneous systems «the sodium humate – ferric sulfate (III)» and «the sodium humate – cobalt nitrate» have already been studied. The experimental data have already been shown, that the temperature rise up to 80°C and the process time up to 120 min, the humic substances yield is being increased up to 54,65% and 54,55%, respectively, for the iron sulfate and cobalt nitrate, and the amount of the bound iron with the humic acids and the cobalt, respectively, is being increased up to 20,23 g-eq. and 15,76 g-eq.

It, moreover, has been established, that the increase in the rate of the iron sulfate (III) and the cobalt nitrate (II) from 0,4 up to 2,0 g. is enhanced the amount of the bound iron with the humic substances and the cobalt, wherein, the yield of the humic substances is being reduced. So, the inverse dependence of the indicated parameters on the ratio S:L has already been revealed. Thus, at the interaction of the iron sulfate (III) for 60 min with 1% sodium humate solution at the temperature 60°C, the increase in the ratio S:L from 1:10 up to 1:100 is resulted in the yield rise of the humic substances from 47,91 up to 54,70%, and the amount of the iron bound with the humate is being decreased from 22,49 down to 17,04%. Under the same conditions, at the cobalt nitrate (II) using, the yield of the humic substance is being increased from 40,89 up to 54,49%, and the amount of the bound with the humic substances cobalt is being decreased from 18,29 g-eq. down 15,67 g-eq.

The Content of the Samples Functional Groups, Having Obtained at the Different Normal Salts

The rate of salts, g	The content of acidic group, mg-eq/g		
	COOH	OH <sub>phen</sub>	COOH + OH <sub>phen</sub>
The iron sulfate			
0,4	0,5531	1,5595	1,9730
0,6	0,5374	1,4585	1,9731
0,8	0,5146	1,4200	1,9733
1,0	0,3873	1,4210	1,9741
1,5	0,3782	1,3492	1,9778
2,0	0,3306	1,3374	1,9784
The cobalt nitrate			
0,4	0,6193	1,5409	2,1602
0,6	0,6148	1,5102	2,1250
0,8	0,6122	1,4996	2,1118
1,0	0,4572	1,3386	1,7958
1,5	0,4563	1,3323	1,7886
2,0	0,4275	1,3280	1,7555

The functional analysis of the received samples has been shown (e.g. see the Table), that the carboxyl groups are more bounded with the iron, than with the cobalt, and the largest substitution of the phenolic hydroxyl groups for the metals are observed in the samples, having obtained at the cobalt nitrate using.

For example, at the interaction of the ferrous sulfite with the sodium humate, the number of the bounded with iron the carboxyl and phenolic groups is being increased up to 0,5448 and 0,6492 mg-eq. per 100 g of the organic mass, and at the interaction with the cobalt nitrate (II), respectively, up to 0,4479 mg-eq/g and up to 0,6586 mg-eq/g. However, in general, the complete substitution of the carboxyl and phenolic iron and cobalt hydroxyls does not occur. This is indicated, that other functional groups are practically involved in the complex formation reactions.

The reducing pH, and also the complexing formation ability of the iron and cobalt, as well as the large number presence of the functional groups in the humates is allowed to be suggested the complex compounds formations of the iron and cobalt with the humic substances. The IKS data are confirmed the formation of the complex compounds of the iron and cobalt with the humic substances, so the absorption bands in the region 998, 954, 866, 775, 620–615 and 477–473  $\text{cm}^{-1}$  are assigned to the valent stretching vibrations of the carboxyls in the complexes. It has been established by the DTA

method, that the introduction of the iron and cobalt into the humic substances structure is shifted the thermal effects in the higher temperature region. This is indicated on the formation of the thermally more stable compounds.

Thus, in the course of the carried out works, it has been set the different dependence of the yield of the humic substances and the number bounded with the humic acids of the iron and cobalt from time, temperature, ratios S:L, and salts norms. The formation of the complex compounds of the humic substances with the iron and cobalt has been revealed by the chemically and chemical – physically methods, their composition and properties have also been studied.

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