**POSSIBILITIES OF HUMAN’S LONG STAY IN ARGON CONTAINING GASEOUS ENVIRONMENT REDUCING FIRE RISK IN HERMETICALLY SEALED FACILITIES**

A. O. Ivanov, V. A. Petrov, \*M. S. Bocharnikov, E. N. Bezkishkii

Association of developers and producers of monitoring systems, Saint­Petersburg

\*Special Design and Technological Bureau of electrochemistry with experimental plant, Saint­Petersburg, Russia

The aim of the study is feasibility for permissibility of human’s long and constant stay as well as tasks performance in hermetically sealed facility with artificial normobaric argon containing hypoxic gaseous environment (ArHGE), reducing the fire and ignition risk. Methods. The study was conducted with participation of 6 test men aged 20 to 51 year, classified as fit for sailing in submarines. The duration of sealed period was 60 days, during which the test men carried out a work program, consisting of the daily modeling professional activity. Results. It was shown that long­term (for 60 days) constant stay of test men in predetermined ArHGE (argon content 30­35 %, oxygen 13,5­14,5 % carbon dioxide ­ 0.8 %, nitrogen ­ the rest) did not result in unacceptable somatic health functional status and capability distress. Among the negative evidences, only minor subjective reactions, moderate compensatory stress of oxygen transport function, decrease in maximum aerobic performance (up to 17 % of background level) were noticed, that generally allowed the test men to perform the activity tasks without substantial damage to their efficiency and reliability. Conclusion. The obtained data proved feasibility of creation such environment at inhabited hermetically sealed facilities to increase their fire safety.

**Keywords:** fire safety of hermetically sealed facilities, argon containing hypoxic gaseous environment, functional state, working ability

**MEDICAL AND BIOLOGICAL EFFICIENCY OF HEALTH TOURISM AMONG YOUTH**

L. S. Khodasevich, S. M. Romanov, A. V. Polyakova, A. A. Malyshev

Sochi State University, Sochi, Russia

Literature review is devoted to medical and biological efficiency of health tourism of modern youth, who are characterized by deterioration of health indicators due to the high prevalence of bad habits, lack of knowledge and inexperience in matters of disease prevention, lack of interest in the implementation of health measures and low level of physical activity. The authors describe health tourism as one of the most effective and attractive means of health improvement due to high availability to the youth and fitness of a big part of the territory of the Russian Federation for tourist activities. They consider it as the basis of a healthy lifestyle able to affect on its quality and duration, as well as disease prevention. Healthcare effect of sports and health tourism is greatly enhanced by the fact that they are carried out mainly in the green forest countryside or urban parkland. Physical activity in the conditions of the forest or parkland landscapes provides favorable effect of flora, bioclimate, topography and the picturesque landscape terrain, aimed at disadaptation prevention and improving the general non­specific resistance. Health tourism is similar in its healthcare effect to a sanatorium resort climate landscape therapy, being actually its variation. The health improvement process in both cases is a highly active motor activity, which improves mental performance, the level of the functional state of the cardiovascular, respiratory and muscular systems, forms a harmonious constitution. Physical activity in the forest or parkland offers a man a rare opportunity to approach nature, observe and appreciate its beauty.

**Keywords:** youth, healthy lifestyle, health tourism, medical and biological efficiency, climate landscape therapy

**THE ORGANIZATIONAL MODEL OF ADDICTION PREVENTION AMONG MINORS ON THE BASIS OF NETWORK TECHNOLOGIES**

1A. A. Eremeeva, 2A. G. Soloviev, 3I. A. Novikova, 1V. V. Nikulichev

1Arkhangelsk psychoneurological dispensary, Arkhangelsk
2Northern State Medical University, Arkhangelsk
3Northern (Arctic) Federal University named after M. V. Lomonosov, Arkhangelsk, Russia

The paper is concerned with justification of innovative areas of substance dependence disorders prevention, conditioned by the need to improve the system of preventive drug treatment of minors in the Arkhangelsk region in terms of public priority of children's health. The aim of the study was: 1) to reveal the peculiarities of preventive drug treatment provision to minors in the Arkhangelsk region; 2) to identify regional perspective lines of its improvement based on the use of network technologies. The key factors of internal and external context of the Arkhangelsk psychoneurologic dispensary were revealed on the basis of organizational analysis of preventive drug treatment on the territory of the Arkhangelsk region through the matrix of SWOT­analysis. Medico­social adaptation of the SWOT­analysis was presented. This method is traditionally used for business strategies formation, and construction of prospective regional organizational model of substance dependence disorders prevention in children and adolescents, based on network technologies. The basic management decision on the development of the Arkhangelsk psychoneurologic dispensary as a regional organizational and methodological center has been made. It is necessary to create a special division for remote preventive and inter­agency work on the basis of the dispensary. The study results can be applied to improve work efficiency in the field of substance dependence prevention practice.

**Keywords:** substance dependence disorders, prevention, minors, Arkhangelsk region, SWOT­analysis, network technologies

**CHRONOPHYSIOLOGY AND CHRONOPATHOLOGY OF CARDIOVASCULAR SYSTEM (Literature Review)**

O. Yu. Zenina, I. I. Makarova, Yu. P. Ignatova, A. V. Aksenova

Tver State Medical University, Tver, Russia

This review presents modern data on the biorhythms of cardiac activity in healthy individuals and pathological conditions. The article presents the changes in the indices of the cardiovascular system during the day. There are diurnal patterns in changes of heart rate. As in healthy persons and in patients suffering from arterial hypertension bimodality circadian rhythm of blood pressure was revealed. It is emphasized that circadian fluctuations in blood pressure may be associated with the participation of melatonin in the regulation of this indicator of cardiovascular activity. In healthy people circadian fluctuations of intervals duration and the height of ECG waves have been revealed. The people belonging to a certain chronotype influence diurnal variations of indicators of heart rate variability. The results of seasonal fluctuations of indicators of cardiac activity as well as the analysis of the frequency of disease recurrence in different periods of the year, the seasons and during the day are presented. The article describes research data on the effect of natural abiotic stress factors ­ geomagnetic disturbances on chronostructure biorhythms of the heart. The changes in blood pressure and heart rate in the voltage amplification of the magnetic field of the Earth have been covered. The statistical data proving connection between the heliogeomagnetic activity and an increase in the number cardiovascular accidents have been presented. Using the basic regularities of chronobiology allows us to predict the risk of developing various diseases, primarily cardiovascular diseases, which are the main reason of mortality in the world.

**Keywords:** biorhythms, cardiovascular system, desynchronosis

**IMMUNOLOGICAL RESPONSIVENESS OF THE AGED IN THE NORTH**

E. Sergeeva, A. Levanuk

Institute of Environmental Physiology, Federal Center for Integrated Arctic Research,
Russian Academy of Sciences, Arkhangelsk, Russia

The comparative analysis of immunological responsiveness in the elderly and old people and middle­aged persons, born and lived in the north has been carried out. Analyzing levels of various clinical manifestations of immune protection insufficiency depending on the age, one can say that the frequency of registration of chronic inflammatory processes, and also diseases in which pathogenesis hypersensitivity of delayed type and high level autoimmune reactions lie increase with age. It has been revealed that densification of mucin glycoproteins in blood with age increase was connected with necessity of more effective protection of the surface epithelium of the mucous by epitheliocytes activation, nonspecific barrier function and local immunity reactions. The content and the structure of cell­associated mucous tissue are refilled by migration of neutrophils, mid cells / macrophages, natural killer cells. One gets the impression that the levels of phagocytic activity, especially neutrophils depend on microorganisms concentration in the barrier organs and are regulated by functional state of the cells in paracrine community. In cases when response of innate immunity cannot cope with the influence of pathogenic microflora, this community of paracrine cells initiates the development of specific reactions of adaptive immunity. Content increasing of cytokines, cytotoxic lymphocytes, lymphoproliferation are a reflection of those reactions, which are aimed at preservation of homeostasis in conditions of decrease or loss of threshold standards, or resistance increase to the inhibitory effect of homeostatic stimuli.

**Keywords:** immunity, anti­genes, aging, North

**CHANGE OF PATIENTS’ QUALITY OF LIFE AFTER HIP REPLACEMENT
AT THE FIRST STAGE OF REHABILITATION**

N. А. Goryannaya, N. I. Ishekova, V. V. Popov, Е. G. Bondarenko

Northern State Medical University, Arkhangelsk

The research has been done to analyze changes of patients’ quality of life at the first stage of rehabilitation after hip replacement. 140 patients undergone total hip replacement were surveyed (73 female and 67 male, average age (57,0 ± 9,0) years old) . The patients were divided into two groups: I group ­ 52 persons at the age under 55 years old (average age (48,0 ± 4,0) years old); II group ­ 88 persons at the age of 56 and older (average age (62,0 ± 6,0) years old). Pain intensity according to VAS scale, joint range of motions, limb length, muscle strength were detected as well as indices of quality of life by means of SF­36. The research was done before operation and in 10 days after operation. It has been stated that at the first stage of rehabilitation all the patients had abatement. Life quality improvement according to VT scale, social functioning, mental health and psychological health component was observed in patients of the I group. Life quality deterioration according to VT scale and social functioning was detected in the II group.

**Keywords:** hip replacement, pain intensity, quality of life

**IImmunological passport of SICKLY INHABITANTS
OF THE Industrial region**

A. M. Zemskov, \*V. M. Zemskov, V. A. Zemskova, N. P. Mamchik, A. V. Khaperskov

Voronezh State N. N. Burdenko Medical University, Voronezh

\*A. V. Vishnevsky Institute of Surgery, Moscow, Russia

The immune system is a critical target of environmental factors’ change, which in its turn influence the human organism functioning. In the early stage of immune deficiency typical immunological lesion forms, which marks not yet appeared diseases and has a significant diagnostic and prognostic value. While analyzing the results of laboratory immunological examination using 1­2 level tests (more than 5 000 sickly inhabitants of industrial region have been surveyed) signal parameters of immunological disorders have been found out and generalized in typical formulas. On its basis it is possible to choose and assign patients targeted immune correctors. Following the results the positive clinical and laboratory effect of complex treatment has been shown and key targets in the immune system for the influence of specialized drugs have been specified. Created software with a list of specialized drugs for multilevel detection of immunologically compromised persons has allowed feeding into the computer digital part of immunogram and patient’s diagnosis and from the perspective of patient’s indications and contra indications to put on effective modulators for patient’s correct and appropriate treatment. Preparatory, unified, specified, predictive and personalized levels have been worked out for detection and treatment of immunologically compromised persons.

**Key words:** immune deficiency, disorders’ formula, targets’ formula

**POPULATION­BASED MEDICAL BIRTH REGISTRIES AS TOOLS FOR BIRTH DEFECTS SURVEILLANCE AND INVESTIGATION OF THEIR RISK FACTORS**

1,2 V. A. Postoev, 1,3A. M. Grjibovski, 2J. Ø. Odland

1Northern State Medical University, Arkhangelsk, Russia

2UiT – The Arctic University of Norway, Tromso, Norway

3Norwegian Institute of Public Health, Oslo, Norway

It is known that medical birth registries are valuable sources of information on birth defects. They are widely used for their monitoring and control. Currently, the medical birth registries which are established in Murmansk County allow to study the birth prevalence of birth defects and trends in prevalence since 1973, including the period of socio­economic transformations and changes in medical practice caused by introduction of prenatal screening. The aim of this study was to demonstrate the effectiveness of using existing medical birth registries in Murmansk County for the surveillance of birth defects and detecting their risk factors. We found, that medical birth registries in Murmansk County can be successfully used for monitoring and control of the prevalence of birth defects as well as for epidemiological investigations because of full coverage of population and prospective collection of data on both an outcome and a prenatal condition.

**Keywords:** medical birth registry, congenital malformations, prevalence, the Murmansk County Birth registry, the Kola Birth registry

REVIEW OF MONOGRAPH ”FROM POMORYE TO PRIMORYE: SOCIAL, HEALTH AND ECOLOGICAL PROBLEMS OF THE POPULATION“

**N. V. Zaitseva**