**CONSTITUTIONAL PECULIARITIES OF VEGETATIVE REGULATION   
OF HEART RATE IN GIRLS FROM WEST SIBERIA**

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To study the constitutional peculiarities of vegetative regulation of cardiac rhythm in 16­17 year girls, their body and leg length, trohanterny index, blood pressure, pulse frequency and temporal indicators of cardiorhythmography were taken. A pathological type of age evolution with a trohanterny index of ≤ 1.85 was manifested at most; 25 % of surveyed persons had a normal (or slightly deviating from the normal) trohanterny index. Among long­legged girls with a low trohanterny index, the predominance of the sympathetic nervous system influence on heart rate occurred more frequent. Here, the regulation activity value was consistent with the level of functional tension (3,5 ±0,55). Among the girls with a medium and high trohanterny index, there was a tendency for a balance of sympathetic and parasympathetic influence on heart rhythm. Using the constitutional approach, we identified the groups of girls prone to hypertension. The persons with extreme values (both low and high) and dominated effects of sympathetic and parasympathetic system on heart rate have a high risk of developing arterial hypertension with age due to the increased peripheral vascular tone and minute volume of blood flow.

**Keywords:** evolution somatotype, trohanterny index, cardiovascular system, heart rate variability, indicator of system regulation activity

**CARDIOHEMODYNAMIC ASSESSMENT OF INDICATORS   
IN CHILDREN OF THE FAR NORTH AND SIBERIA**

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A study of the functional state of the cardiovascular system (CVS) on the basic parameters of cardiac hemodynamic in children of the Far North and Siberia has been carried out. The received data reflect the variety of ways of CVS development in children of different ethnic groups: Nenets, Buryats and Slavs. Bradycardia; reduced resistance of small vessels; implementation of the heart pump function at a high level were typical for children of indigenous people of the North and Siberia (Nenets and Buryats). Cardiac hemodynamic indicators have shown a substantial tension of compensatory remedial reserves, manifested in tachycardia, slow recovery of CVS after physical activity in urban Slavic children. CVS functionality in Slavic people living in the rural areas has been reduced by fall of stroke and minute volume. Reaction assessment of CVS to stress test has shown that recovery opportunities in Nenets children were higher, than in Slavic children. Correlation relationship has been revealed between anthropometrical measures and haemodynamics indicators in rural children. The imbalance between mentioned indicators has been observed in the group of urban children who are exposed to a constant inhalant harmful interference.

**Keywords:** ethnic groups, adolescents, remedial function of the cardiovascular system, the North, Siberia, the rural and urban populationn

**INDICATORS OF THE RESPIRATORY SYSTEM FUNCTIONAL CONDITION   
IN STUDENTS OF THE NORTHERN HIGHER EDUCATION INSTITUTION**

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A spirographic study of 80 students from 1­3 courses of Surgut State Pedagogical University at the age of 18­20 years old, born and residing in the North has been carried out. The aim of the work was to study the peculiarities of the respiratory system of the university students. Measurement of respiratory function was carried out by means of Program Apparatus Complex "Spiro­Spectrum". Results were analyzed by standard methods of mathematical statistics. All surveyed belonged to 1 and 2 health groups. Students with chronic and acute diseases of the respiratory system were excluded from surveyed group. It was found out that needed respiratory minute volume at rest in students­smokers was achieved by increase in respiratory rate and not by respiratory volume which was more energy­consuming. Reduce of maximum expiratory flow from 50 % and 75 % of forced vital capacity (FVC) and forced expiratory flow rate from 25­75 % FVC in students­smokers were reflection of respiratory failure and a high risk of obstructive disorders development. Lower rates of maximum breathing capacity in smokers compared to proper values show decrease in the frontier of external breathing.

**Keywords:** respiratory system, smoking, students, North

**PHYSIOLOGICAL REACTIONS OF CARDIOCIRCULATORY SYSTEM TO LOCAL COOLING OF EXTREMITIES IN YOUNG MALE AND FEMALE, NATIVES**

**OF EUROPEAN NORTH**

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The paper presents the diagnostic results of apparently healthy girls (n=35 per.) and boys (n=35 per), born and permanently residing in the European North. The aim of the study was to detect peculiarities of hemodynamic parameters’ change in reaction to local hand and foot skin cooling. Indices of cardiac function, vascular tone, as well as energy and velocity of blood flow have been studied by means of rheographic device «Rео­Spektr­3». Initial indices and indices straight after cold test (hand dipping into the water with temperature 6 °С) have been registered in surveyed. The same method and temperature were used for foot cooling. It has been stated, that local effect on hand and foot skin thermoreceptors induced statistically significant decrease of heart rate, increase of stroke volume, systolic blood pressure, volumetric blood flow rate, energy flow rate in girls and boys. Besides, the girls had increase in average hemodynamic pressure, linear velocity of blood flow and aortic ventricle capacity. Thus, circulatory response on local cooling to a greater extent typical for girls than boys and in foot cold tests than in hand cold tests.

**Keywords:** local cooling, hand, foot, young male, young female, central hemodynamics

**THE REACTION OF THE HEART AND SYSTEMIC HEMODYNAMICS**

**IN PHYSICAL STRESS IN HUMANS DURING ADAPTATION TO COLD**

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The article presents the results of research structural and functional response of the heart and systemic hemodynamics to measured physical load during adaptation of man to cold. Method of echocardiography in contrast the temperature of the seasons before and after the load on the body of men of working age, people of Northern European measured morphometric parameters of the heart, heart rate, hemodynamics in the pulmonary artery and in the aorta. During the study of the heart recorded blood pressure manometer. It is noticed that the person after clinoorthostatic active changes of body position chronotropic function of the heart, the systemic and intracardial hemocirculation had no seasonal differences. It was established that irrespective of the thermal regime of the external environment the body’s response to short­term physical activity was associated with increased systolic blood pressure, increase heart rate, decrease of the systolic size of the left ventricle, enlargement of the cavity of the left atrium diameter and pulmonary artery. Thus there was an increase in the speed transorting blood flow with an increase in stroke volume and heart minute volume of blood circulation. Along with these changes in winter, relative to summer, found a greater increase in systemic hemodynamics, a lower increase of blood flow velocity in pulmonary artery and heart rate. The results suggest that in humans in the winter when to cold adaptation­induced short­term physical load stress the cardiovascular system is accompanied by a large than in summer, increased systolic blood pressure, less improvement of hemodynamics parameters in the pulmonary artery and chronotropic function of the heart.

**Keywords:** hemodynamics in the pulmonary artery, cardiovascular system, sample Caudina, human adaptation to cold

**THE USE OF INTERNATIONAL REFERENCE CRITERIA FOR ANTHROPOMETRIC INDICES FOR FIRST­GRADERS IN SOUTHERN KAZAKHSTAN**

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The aim of study was to evaluate the prevalence of disorders of physical development in children in the South Kazakhstan region by using international criteria. The study included 1498 children between the ages of 6.5 and 7.5 years. Estimated prevalence of stunting, lack of weight gain, overweight and obesity with obesity and isolation was performed using standard techniques above 2007 and WHO­CDC­2000.

The prevalence of stunting, underweight, overweight/obesity and obesity was 3.4 (95 % CI 2,6­4,4) %, 6.5 (95 % CI 5,3­7,8) %, 15.9 (95 % CI 14,1­17,8) % and 3.1 (95% CI 2,3­4,1) % using the WHO­2007 criteria, respectively.

The prevalence of stunting, underweight, overweight/obesity and obesity was 3.5 (95 % CI 2,7­4,6) %, 8.9 (95 % CI 7,6­10,5) %, 13.4 (95 % CI 11,8­15,2) % and 0.9 (95 % CI 0.6­1.5) % using the CDC­2000 criteria, respectively.

We found that the prevalence of underweight in urban children is almost twice as high than among rural children irrespectively of gender.

**Keywords:** physical development of children, stunting, underweight, overweight, obesity, WHO­2007, CDC­2000

**THE USE OF INFRARED THERMOGRAPHY IN MODERN MEDICINE   
(Literature Review)**

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The article provides a systematic review on the recent applications of the infrared thermography in medicine reported by Russian and foreign researchers. Advances in IRT technology and equipment, resulted in significant improvement of thermo­images quality and opened new opportunities for the practical application. Application possibilities of infrared thermography in diagnostics and treatment of diseases in different branches of medicine including traumatology and orthopedics, sport medicine, therapy and endocrinology, neurology, neonatology, diagnosis of vessels disorders and oncology are demonstrated in the article. The description of advantages (such as noninvasiveness, safety, relatively low cost and the ability to reveal pathologies on early stages) and disadvantages (insufficiently automated diagnostic type, subjective interpretation of data) of this method have been made. Perspectives of its development (creation of mathematical algorithms for automatic processing of thermo­ images) and its introduction in to clinical practice have been analyzed. The use of consistent autoprograms for the thermographic images analysis allows to avoiding subjective interpretation of thermogram data. Nowadays, automatic methods of analysis are actively developed and put into practice, in particular, achievements in development of automatic image recognition algorithms allowed to solve problems of thermal images, automate cancer diagnostics.

**Keywords:** infrared thermography (IRT), functional diagnostics, monitoring of treatment

**CHARACTER OF ELEMENT STATUS IN EXPECTANT MOTHERS   
WITH FETUS SOMATOMEGALY**

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Element composition of hair of 102 expectant mothers, gave birth to a term 38­40 weeks has been studied. The main group included 52 women with fetus somatomegaly ­ (weight of a newborn is 4000 g and more), middle age ­ 29,6±8,4 The control group included 50 women with fetus normosomiya (weight of a newborn is from 2800 to 3999g ), middle age ­ 26,9±9,1 years. Bio­elements content, participating in carbohydrate and lipids metabolism namely Mg, Cr and Zn has been measured in the hair of expectant mothers using methods АЭС­PIC, МС­PIC.

Statistically lower indices of Mg (p = 0,005) Cr (p = 0,010) and Zn (p = 0,004) concentration have been detected in expectant mothers with fetus somatomegaly in comparison with expectant mothers with fetus normosomiya. The expectant mothers with fetus somatomegaly more often had deviation from the physiologically optimal values of Mg, Cr and Zn concentration and deficiency of different degree of intensity as compared to the control group.

Consequently, imbalance of macro and microelements of the organism can serve as one of starting mechanisms of pathological disorders, responsible for metabolic imbalance and diseases associated with it, in particular fetus somatomegaly in expectant mothers. Timely correction of macro and microelements imbalance can be considered as one of preventive variants of big fetation and along with other well­known methods of body weight optimization of expectant mothers become a preventive method of obstetric pathology development in mother and diseases associated with surplus body weight in a child.

**Keywords:** expectant mothers, fetus somatomegaly, magnesium, chrome, zinc

**MODEN TRENDS OF RESEARCH OF PROFESSIOGENESIS PROBLEM ON THE MODEL OF MEDICAL SPECIALTIES**

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Recent changes in Russian society, due to economic instability and the growing influence of Western culture lead to a change in perceptions of the profession and the content of the professional role. This impact is particularly noticeable in professions of socionomic type, where the intensity of personal interactions is significant. The paper provides an overview of modern research on the problem of professional development of medical specialists. The studies were conducted in the interdisciplinary field of medical, sociological, psychological, economic science, which allowed the authors to explicate such socially important phenomena as leadership in the medical profession, the phenomenon deprofessionalization in medicine and its causes, the professional deformation of doctors, expanding the repertory of occupational roles of non­treatment experts, trends in the development of medical sciences and reproduction of scientific potential in medicine and others. In general, the Russian research in its methodology is based on the classical concepts of the profession and keep the continental (European) approach to the concepts of professions and professionalism, keeping professional identity, career path, professional training and competence as the subject of research. The literature review led to the conclusion that in spite of multiplicity sociological studies in the field of individual professionalisation in medicine have quantum nature and affect the individual moments of the doctor’s professionalization in modern realities, reflecting the continuity of the process of professionalization and socialization in the general, individual life concept.

**Keywords:** the professional development, professional group, health care professionals, medical science, professional deformation of doctors, the deprofessionalization

**ARKHANGELSK COUNTY BIRTH REGISTRY AS AN INPORTANT SOURCE   
OF INFORMATION FOR RESEARCH AND HEALTHCARE**

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The article presents a short review of already established birth registries worldwide and their value for public health and perinatal medicine. Implementation of Arkhangelsk County Birth Registry (ACBR) is presented in detail. Paper registration form contains information on maternal pre­pregnancy and pregnancy health status, reproductive history, data on folic acid and multivitamin intake as well as alcohol consumption and tobacco smoking before and during pregnancy. Pregnancy outcomes with data on babies’ anthropometry and Apgar score are also recorded. For sick liveborn infants, diagnosis and provided treatment are specified. Practical issues of ACBR implementation including the process of transferring data from registration paper forms to computer database are described. From January 1, 2012 to December 31, 2014, 43 327 births were recorded in the ACBR. It comprises 99.6 % of all stillborn and liveborn infants with gestational age 22 and more weeks born in Arkhangelsk County in 2012­2014. Four hundred ninety four births (1.1 %) are multiple. In 2013 and 2014, quality controls demonstrated that 97.3% records in computer database are identical to data in paper registration forms. Ethical and legal issues are discussed. All records in the ACBR are depersonalized. Some practical issues as well as future perspectives of the ACBR for cohort and cross­sectional studies in a field of perinatal epidemiology are also discussed.

**Key words:** birth registry, Northwestern Russia