3. Europäischer Kongress
Fortschritt der Raumfahrtmedizin
für die gesundheitliche
und industrielle Praxis
Berlin, 28.-30. September 2005

3rd European Congress
Achievements in Space Medicine
into Health Care Practice
and Industry
Berlin, September, 28-30, 2005
As a whole, for the intense conditions of the modern world not so much the problem of stress as a problem of frustration, that means the state of anxiety owing to long influence of those or other stressful agents, gains the greatest importance. Owing to essential growth of receipt of the versatile general and special information on the basis of increase in sources of the information and complication of information technologies and their carriers' essential increase in a level of psycho-emotional strain in the persons of intellectual work is marked. This numerous enough group of risks includes people engaged in High-intensity work in spheres of management, business, the organization of management, political activity, etc., whose professional work is linked with necessity of performance of extremely responsible and intensive labour activity in conditions of deficiency of time as well as of insufficiency or surplus of the information.

The unemployment of all proper therapeutic and prophylactic procedures in representatives of this group causes an exhaustion of functional reserves of an organism and development of various diseases. In turn it will cause decrease in quality and labour productivity, increase in probability of appearance of erroneous decisions as well as that is impossible to be avoidable in connection with special importance accepted by representatives of this group social, economic, and political decisions.

The special group of risk is represented by the professionals who go through emergency training or transformation (firemen, etc.), as overloading of training process can exceed safety factor of an organism.

Rapid development of technical, mechanization, and automation of manufacture are an integral part of progress and development of a human society. All this leads to fast and rather significant reduction or even to full disappearance of heavy physical work, long and significant muscular efforts in manufacture and in everyday life.

Restriction of muscular function (hypokinesia) under sharply expressed emotions makes more considerable its vegetative component. In these conditions there is a negative symptomatological influence on a number of systems of an organism and flux of all on cardiovascular systems. Noticeable growth of cardiovascular system disturbances as well as Manifestations, attaining a level of pathologies that affects accordingly medical, economic, psychosocial, and demographic effects is (teleological).

Serious problem of modern public health care became the acquired immunodeficiency syndrome (AIDS) that facilitates development of many chronic infectious-inflammatory diseases, as well as development of autoimmune and neoplastic diseases. The increase in lastnumber of patients suffering from AIDS is caused by conditions of a modern life: prompt growth psychological and information loads, stressful situations, increase in volume and importance of the basic and damaging factors of an environment, especially in greater cities, accumulation of genetic defects in a population.

Successful solution of all existing problems to the medicine of 21-st century appreciably should represent medicine of the healthy person and priority preventive and prophylactic approach to activity. It demands universal creation of medical-social and sanitary-rehabilitation institutions with a view of maintenance of people's healthy way of life, knowledge of those, who are leading role in science and technical, industry, arts, economics, and politics. The modern market economics presupposes increase in rate of personification and individualization social and political behavior of people, their
The Space medicine and health

The Space medicine and health field is a subject of active research, aiming to develop new medical technologies in creation of system of the public health care based on a priority of culture of health and directed on prevention from diseases. For the years separating us from the first flight of the person in space, the astronautics became one of leading branchess that not only allow to carry out effectively large-scale joint scientific and technical projects but also brings the essential contribution to the decision of the global problems affecting interests of all mankind, including in questions of restoration and maintenance of health.

Progress in the piloted outer space exploration reached last years would be impossible without active support of space medicine. For these years some unique methods and the equipment are developed for maintenance of vital activity and working capacity of the cosmonaut in specific extreme conditions of space flight. Created originally for enough narrow and limited scope of employment some of them, herewith, have found the successful application in practice of public health care on the Earth, in particular in the field of diagnostics, therapy, and rehabilitation.

Since the first flight duration of space flights step by step increased, the volume of scientific works spent in space including medical and biological researchers increased. Achievements of space medicine in many respects as result of joint efforts scientists and physicians of many countries cause practical interest in the terrestrial medicine partly more and more.

In process of development of piloted astronautics methods and means and maintenance of cosmonaut and control over a condition of their health were improved, knowledge about opportunities of the person as well as methods of management processes of the adaptation of an organism to space and other severe conditions of an environment were multiplied. On the basis of fundamental and applied researches of space there were working methods and knowledge in many areas of medicine (for example in adaptive and productive physiology, pathology of motor system, functional electrophysiology, neurology and many others).

Features of the methodological approach of space medicine, especially it's clinical branch are:

- The maximal account of reserve resources of an organism
- An individual approach
- Wide application of modern methods of a medical science for the remote control and organization of the prevention and treatment processes
- The quest for a border between adaptive and premonitory changes under influence of extreme effects of an environment and prevention from negative impacts of these factors

It is possible to ascertain the fact that exactly owing to astronautics knowledge of "humanistic" factors is provided for development of special types of the cosmonauts' apparatus, its structure and function, diet on stress, metabolism, cardiovascular and endocrine functions, on the body's sensitivity to stress, etc.

The biological and medical devices developed for piloted space flights have a number of advantages, including light, wearable, safe, simple and easy to control. These devices are competitive in a class of the equipment for the organization of the medical service.

The Tenets of the Concept of Modern Medical Clinic - Clinic of Health

The Tenets of the Concept of Modern Medical Clinic - Clinic of Health rends the emergency help in places of natural disasters, catastrophes, accidents, for medical examination of the population in remote areas in most of the world's countries, and also for examination of sportmen. Here one problem remains: what kind of experience of space medicine can become useful to common medicine:

- Serotonin concentration and activity disturbances are frequently turned up in clinical daily occurrence. The broken sensory signal (visual, vestibular or kinesthetic), a pain or functional disorders in muscular system demand application of complex adequate processes which till now in daily medicine are clearly only partly and in space medicine are investigated long term ago.
- Other clinical points of contact are, for instance, stability (resistance) of hemodynamics, working capacity of the person under influence of the special situations causing overloading (mental stress, oxygen insufficiency, etc.) Today the syndrome of mild blood circulation after prolonged immobilization and development of more optimal measures in intensive medicine represents the primary goal of space medicine.
- The factors limiting functional ability, high physical and mental requirements to work effect work capacity of the person. The control and an estimation of stressful factors, an estimation of their influence apparently is the primary aim of space medicine.
- The importance of application of unique experience of space medicine for the benefit of the person is also use of simple opportunities of a biomedicine that has arisen in essence owing to the decision of a problem of maintaining of piloted flights.

The New ways to the medical treatment organization

Instead of the isolated and highly specialized hospitals, large number of low - standards ambulances, and sanatoriums where initial markers take preference over treatment, clinics of health are integrating medical-reconstructive-rehabilitation combinations containing the positive sides of the arrangement (in the health resort places) with effective rehabilitation therapy on precise algorithm on the basis of operatively diagnostic information and modern technologies of treatment. All this with presence of the highly skilled personnel and the corresponding equipment (including technologies of a know-how) in conditions of comfortable stay, with service do not strong 4.5 (since 3.5) and results of treatment are rather profitable undertaking.

Attraction of such a clinic is provided also with the obligation of application of the modern diagnostic methods estimated level of a health, state of organs, dynamics of restoration, effective and aesthetically pleasant treatment in short terms. An idea of the additional services in medical science about transformation of an accent on diagnostics and treatment from systems and organs to power-information approaches to understanding of occurrence, development of illness and restoration of health lay in a substantiation of the new concept.

Due to common theory of systems, an illness can be defined as set of processes in the complex system accomplished by raised power expenses causing a deficiency of power supply of the processes that necessary for the provision of the achievement of the purpose of its function.

Power expenses are linked with restoration of an optimal way of achievement of the normal functionary of system, a deviation from which around an influence of...
On a following step it is necessary to pass to selection of the various parameters forming an optimum of its psychological condition and standardization of \( \text{a sensory way}\) for every patient. In this case it is necessary to define needs of the human being for his psychological, physiological optimum, for a proper correlation of activity of a cortex and a subconscious, for balance capacity of an organ as bioclastic integrity and to other specially proved and calculated structure of influences of an environment including structure of information field.

Use of innovations of space medicine on diagnostics, prevention and control of stressful conditions is capable to resolve the real help in struggle against some problem of a century - burnout.

The complex of special methods of prevention and detection is developed for exception of adverse consequences of influence stressfull and frustration factors, including following directions:

- Special preparation
- Measures for professional activity optimization
- Formation of a positive feedback with a declaration of success in real work
- Control of an asthenic syndrome, removal of a nonspecific anxiety component
- Improvement of heart condition

If the strategic concept of human life includes the thesis about peak efficiency of his personal existence for the benefit to a society, it means, that the person should be healthy and long lived. It means also, that his work should be effective. If person agrees with this concept, dentist should offer him the certain list of recommendations using which he can achieve it.

Mission, the purpose, problems and predetermination of a Clinic

Mission of a Clinic
Maintenance of optimal functioning (a high vital tone, efficiency of activity, an emotional stability, and active longevity, including professional) of an organism of people, first of all those, who have leading positions in sphere of a science and technical, development of technologies, an economic and political life of a society, and also carrying out the professional work in extreme conditions of environment accounting individual conditions of a life and features of a professional work. Complex use of methods and technologies of medical treatment and space medicine on activation of functional reserves of an organism, restoration toward physical, psychological, cognitive abilities, maintenance of a high level of working capacity and good state of health in an combination with the newest medical methods and technologies of diagnostics, correction, prevention and rehabilitation.

The purpose of clinic activity
Possibility of preservation of an optimal state of health, high intellectual and physical working capacity and professional longevity on the basis of use of methods of space medicine on standardization and modification of health.

The primary goals of a Clinic
Reversal of negative natural and professional factors, being principal causes of development of various functional disorders and decrease in working capacity of people.

Maintenance of the rehabilitation treatment concept
In the methodological plan it is possible to allocate diagnostic and corrective technologies. Diagnostic researches include:

- The control of a level of health
- The account of age, sexual, hereditary, social and ecological features of the healthy person
- Maintenance of the control including problems of biological age of persons who are more than 60 years
- Use of the remote control of a state of health
- Clinical and physiological examination and the dynamic medical control
- Various methods of diagnosis for persons whose profession is connected with stay in extreme conditions of an environment (pilots, divers, fans of extreme tourism, etc.)
- Various corrective methods are applied to restoration of reserves of an organism and an high-grade complex of treatment. The most important of them are:
  - Space technologies including methods of low temperature cryotherapy, prevelational therapy, etc.
  - Bioclastic therapy
  - Various kind of massage
  - Homeopathy
  - Reflex therapy
  - Diet therapy
  - Physical therapy
  - Balneotherapy
  - Internal hypoxic training.
  - Psychocorrection
  - Cosmology.

Difference between new type of clinic and existing medical institutions
- Understanding of diseases as power and information disorders of functioning of complex hieratical system of an organism
- Use of the newest medical technologies and achievements of natural sciences, first of all biology, chemistry, and physics allows to apply new methods of the objective control of a condition of an organism and a course of treatment, and also to organize process of treatment by methods of restorative medicine
- An opportunity to organize process of treatment on the basis of already existing medical institutions
- Scientific grounds of created medical-diagnostic complexes and programs of clinic of health is the guarantee of success for many years

The concept of the creation of the health clinic as it comes from the above mentioned, shows the fundamental role of use of effective and progressive methods of traditional medicine. That’s why the creation of such clinic is possible on the base of existing rehabilitation centre via re-profiling and re-equiping with new equipment and methods.

References
The Illness (Morbus) - New Biological Principles - Illness and Pharmacy

Viktor A. Kotolupov

Kotolupov d.o.o., Vipava, Slovenia

We tend the research work in the fields of medicine (diagnostics, medical treatment, pharmacy), agronomy, ecology, sociology, that already in the initial stages of research should be thoroughly examined for correspondence with fundamental knowledge from various branches of science, which would allow to avoid mistakes, especially expensive ones. In order to achieve that, the research work is to be carried out under strict guidance of laws of origin, development and adaptation of certain functions in evolution of living systems and man (scientific achievement of the firm "Kotolupov d.o.o."). Since 1956, this has been the basic scientific guideline of the J. Prešeren Institute of Evolutionary Physiology and Biochemistry of the Russian Academy of Sciences (IPRI - www.ipri.ru) and the "Medical Pharmacy" (H. A. C. M. V. Jakims, 1994).

The demands of Institute for definite researches have been additionally scientifically benchmarked.

This scientists in IPRI RAS regard this new knowledge as being of fundamental importance for medicine (higher dimensions - an abiotic, toxicology, processness of sensory system), agriculture, ecology, pedagogy. These new laws comprise limitations of energy, functional limitations, functional independence, memory, ability to store information, ability to change internal, external and functional structures, selection of priority forms of activity, level of reference (adaptability of activity, compensatory-adaptive mechanisms, aggressive and defenseless situations, urge towards aggressive situations and tendency to avoid defenseless situations, tendency to increase the survival coefficient, maintenance of human energy, change of certain forms of activity under concrete changing conditions in order to achieve greater longevity, tendency to diminish losses and to increase fluxes of information and to distribute the bio-organic system to the outside, transformation of definite chemical element into another form, as well as information processing (control of the regulation quality of variables). Let me stress that this knowledge has been able to avoid those lapses.

Multidisciplinary for the methodological approach together with biological principles enables the correct understanding of processes and mechanisms taking place in the body. This approach (the human race) is based on the limitation of biological (the point of view of all sciences) bases for understanding the causes of various illnesses. More details are in basic text.

This knowledge can be used for research in the fields of: genetics, bio-information sciences, cardiovascular diseases, development of new drugs, regional development of new, safe and more efficient medications including pharmacoeconomical approaches, neurology, brain damage of embryos, fighting against cancer, multidisciplinary approaches of functional genomics to understanding of basic biological processes, resistance to antibiotics and other medications, study of brain and tissues that affect nerve system, e.g. (Glial mechanisms of knowledge organization and higher education processes).

A group of respected scientists from the world respected institutions develop a new tendency in pharmacy, a "methodological" pharmacy, giving new fundamental knowledge and understanding of the causes of various illnesses by using the structures of excellent pharmaceutical companies. The main concept of "methodological pharmacy" is the elaboration of their own products based on the understanding of causes of illness, inside the framework of methodical science and in accordance with the fundamental knowledge.

Broadened Definition Inside Spectrum of New Biological Principles (Kotolupov)

According to suggested principles, illness is defined as a process inside the organism which occurs when the organism is acted upon the pathogenic factors (external or internal ones) and is determined by restricted possibilities of performing various functions, among them functions connected with energy supply of this different systems of the organism. This process is defined with principles of origin, development and adaptation of functions during the evolution of living systems and humanized (as stated in introduction).

The state of organism is determined by balance of various exchange processes that can be divided into the processes of energy exchange, plastic exchange and information exchange. The parameters of mentioned processes of organism and undergo variations inside its different parts in accordance with biologic rhythm and also under the influence of external factors. Optimal values of the parameters of exchange processes and their variations in time are genetically determined in advance. Great deviations from these fluctuations and the influence of either external or internal factors lead into the disturbance of homeostasis, which can be considered as illness or the boundary between illness and health.

Long-lasting disturbances of balance appearing in processes of metabolism and aminolysis inside the organism or as inside its respective systems may give evidence of illness. As a possible criterion in this respect, I suggest an analogous coefficient of metabolism (titration). This coefficient determines the sum of the metabolic processes and the bio-organic system from the outside, transformation of definite chemical element into another form, as well as information processing (control of the regulation quality of variables). Let me stress that this knowledge has been able to avoid those lapses.

From the viewpoint of the general theory of systems, the illness can be defined as a combination of the processes of the organism is complicated systems, accompanied by increased expenditure of energy, resulting in the shortage of energy supply needed for support of the whole system and for achieving the purpose of its functioning. The consumption of energy by the organism is affected by redox equilibrium and oscillation of the illness. This is the purpose of the functioning of the system, the deviation from this course has emerged as an consequence of either environmental factors or "technical illness" (because the behavior of systems it highly dependent on the conditions). This kind of definition is correct and useful not only for the illnesses of living organisms, but for example, for the "illnesses of the society", as well.

Organisms is a complicated hierarchical system, consists of many hierarchically subordinate systems. In the hierarchical system, the processes of transferring the...
Viktor A. Khotkovsky

Characteristic of chronic disease is the repetition of intervals of damage (remission) and reapparance of disease (recurrence). Such a course has connection in fact that the cause of illness has not been abolished and with temporal shortage of some resources. The defensive powers of organism are not enough to block the illness entirely, all residents have the same course as the illness itself.

We can distinguish the pulse between the intervals from the illness by continuation of pathologic processes and their compensation by dispersing with adaptation reactions of organism. Because of this, the illness in the organism systems gradually pile up and at the end the stage of degeneration occurs.

Pathology is the science occupying with studying the illness. Its duties are to define the cause of the illness, the processes as emerging changes of life processes (functions), and also without a definition of its cause. At the same time, in medicine there are known cases of successful treatment even when pathology of illness was not established. This is in connection with great historical experiences and medicine knowledge in many years.

Defining the cause of illness and the nature of the processes in the organism which either accompany or cause the illness, serves as the base for selection the effective treatment of such illness. When the medications are used for the treatment, there must be obligatory objective control of condition parameters of the organism in both cases. Today, widely used methods or control are the ones that control the minor number of parameters, for example urine and blood tests, electro- and cardogram, brain waves, MRI spectroscopy, thermography, etc. Using the achievements of natural sciences (especially biology, chemistry, and physics) in medical research enables the development of new methods of objective control of organism condition parameters, temperature, and chemical composition for new medicine preparations.

During space flight, astronauts may experience unfavorable changes of physiological condition, differing including different illnesses, connected of which is impossible to be made by means of medications. Under such conditions, solely non-pharmacological methods in improving the state of organism are advantageous and useful.

To be clinical, which is connected with adaptation reactions of organism that prevent from disturbances of homeostasis.

According to the nature of homeostasis, the illness may affect mainly separate organs and tissues. The characteristic reaction of organism to the damaged systems of organism, the degree of an illness is usually connected with the degree of inclusion of the whole organism into the process of homeostasis. Usually, the pathological reaction to the factors of illness has influence on the systems of internal and external environment, the distress is developed, illness changes for worse and new affections appear. This may be connected with insufficient energy supplies and also with the disturbances inside of the systems of information transfer, reception and generation. Sometimes distress is noticed also in less intensive affections.

Reaction of organism to external influences is of discrete character. There are four main conditions of organism when the power of external influence is changed: training, weak activation, strong activation, stress (distress). When the power of influence is increased, the organism reacts consequently as through these four conditions again. Such recurrence of the conditions corresponds to passage of the organism from adaptation stage to another.

At each admission stage, the reaction of training develops under the influence of relatively weak impulse for definite stage, the reactions of calm and increased activation under the influence of an average impulse for definite stage and stress under the influence of relatively strong impulse.

The adaptation stages indirectly characterize energy potential of organism. The energy potential is needed to realize the reaction to activity of external and internal environment.

Usually, organism passes from one adaptation stage to another automatically according to the conditions of external and internal environment.

During the illness organism passes to adaptation stage with energy consumption exceeding at a time. Because of this, it is while organism slips to an lower decapmentation stage and can be shifted into the stage of stress. In this case the course of illness becomes complicated.

The illness is classified according to the factors, which cause them, or according to which organs or tissues of organism are damaged by this illness. Because illnesses caused by activities of pathogenic factors, there are illnesses dependent upon failure of genitic information, for example唐, Turner, Klinefelter syndrome, etc. We also know the group of genetic illnesses and not connected with damages of organs but cows connected with damage of genomes, meeting with the group of genes which do not carry information about the structure of some genomes. Huntington disease is one of those illnesses and there are also others.

We can distinguish the pathological illnesses also the inborn hyper-function of any optional organism system, for example central nervous system (of brain). With children these are cases of(mal-)development of illness. Any unique abilities/disabilities in prevailing, hindering other activities of organism, which may lead to anomalous conditions (brain illness).

Usually it is difficult to define the starting moment of an illness or even impossible in general. Sometimes the illness in progress illness in longer course of time does not show...