
Ekaterina Kochueva, Nick Kochuev [Hrsg.]

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TENETS OF CONCEPT OF MODERN MEDICAL CLINIC - CLINIC OF HEALTH

S.B. Shvarkov¹, V.V. Polyakov², M.G. Potapov³, V.N. Kochuev⁴,
E.V. Kochueva⁵, V.A. Kotolupov⁶

¹ The I.M. Sechenov Moscow medical Academy, Moscow, Russia

² State Scientific Center of Russian Federation – Institute of Bio-Medical Problems, Moscow, Russia

³ OS, The Center of Aerospace Medicine, Moscow, Russia

⁴ Institute of Design and Technological Informatics of the Russian Academy of Science, Moscow, Russia

⁵ Copris GmbH Berlin, Berlin, Germany

⁶ Cotelupov d.o.o, Vipava, Slovenia

Abstract

The goal of protection and improvement of health of normal and essentially healthy people gains priority all over the world and calls for opening a new type of clinic – health clinic «Revital».

Importance of these clinics is defined by the negative impacts on human health and life as such of the following factors:

- extremely rapid scientific and technological advance
- economic downturn
- high psychoemotional stresses on the background of low physical activity
- growing risks of technical and natural catastrophes, and terrorist acts and many others.

Starting from the analysis of the present-day approaches to therapy and prevention of diseases, a fundamentally new system of medical care can be developed that will prioritize the healthy life and dedicated to prevention of a large group of diseases.

Diagnostic and correcting technologies of rehabilitative medicine consist of a rich arsenal of classic and advanced treatment-and-sanitary methods, and some specific and unique technologies including those borrowed from space medicine. Space medicine the subjects of which are strong and essentially healthy people has made a considerable contribution to broadening and extension of our knowledge of health and premorbidity, introduced in the terrestrial health services many novel techniques of diagnostics, prophylaxis, rehabilitation and treatment.

The concept of a health clinic, as it can be conceived from the above, does not exclude but, on the contrary, presumes application of the most successful and advanced procedures of traditional medicine. It means that the clinic can be opened in a rehab clinic after its partial reformation and equipping with the latest medical facilities and procedures.

Introduction

The goal of protection and improvement of healthy and essentially healthy people gains priority all over the world and calls for opening a new type of clinic - health clinic.

Importance of such clinics is defined by the negative impacts on human health and life as such of the following factors:

- extremely rapid scientific and technological progress
- economic downturn
- high psychoemotional stresses on the background of low physical activity
- growing risks of technical and natural catastrophes, danger of acts of terrorism, and many others

Starting from the analysis of the present-day approaches to therapy and prevention from diseases, a fundamentally new system of medical care can be developed that will prioritize the healthy life and directed to prevention from a large group of diseases.

Diagnostic and correcting technologies of restorative medicine include a rich arsenal both traditional and modern medical-improving methods, specific and unique technologies, including from area of space medicine. The space medicine the subject of which are healthy and essentially healthy people has made a considerable contribution to broadening and extension of our knowledge of health and premorbidity introduced a lot of new methods of diagnostics, preventive maintenance, rehabilitation, and treatment in practice of terrestrial medicine.

The concept of a clinic, as it can be conceived from above, does not exclude but, on the contrary, presumes application of the most successful and advanced procedures of traditional medicine. Thus foundation of such a clinic is possible by means of partial reformation and equipping with the latest medical facilities of existent rehab clinic.

Project actuality

Extremely rapid scientific and technical progress in 21 century, not having analogue in all previous history of mankind, assume, in turn, adequate rates of development new knowledge and fast adaptation to new technologies and new conditions of a life.

Great technological successes on the one hand allow to improve people's living standards, to solve many economic, social, medical, and biologic problems, and on the other hand they are sources of adverse influence on a state of health and human life.

Vital activity of an organism should be considered in its unity and interaction with an environment. For the person the concept of an environment includes natural and social factors that can influence directly on his physical and mental health.

Among the main adverse factors defining life conditions there are a deterioration of ecological situation, an urbanization, growth of psycho-emotional strains under an insufficient level of physical activity, influence on mentality of a surplus information, strengthening of risks of occurrence of technogenic failures and natural accidents on a background of a proceeding pollution of a surrounding environment and increase in a degree of its aggression in relation to the person.

Degradation of an environment (extermination of woods, increase in concentration of carbonic gas, a poisoning of ground and reservoirs, raised ionizing radiation in connection with tests of the nuclear weapon and breakdowns at the atomic power- station, etc.) fraught with atmosphere pollution, potable water and the food stuffs deterioration, essential increase in risk of development of various diseases.

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 a psycho-emotional strain in the persons of intellectual work is marked. This numerous enough " group of risk " includes some people engaged in high-intensity work in spheres of management, business, the organization of manufacture, 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 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 acceptance of erroneous decisions as well that is frequently absolutely inadmissible 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 strengthened preparation or training (pilots, divers, etc.), as overloading of training process can exceed safety factor of an organism.

Rapid development of technics, 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 sympatricotonic influence on a number of systems of an organism and first of all on cardiovascular systems. Noticeable growth of cardiovascular system disturbances as well as lipid, carbonic, albuminous, and other kinds of metabolism impairment on a background of an intensive pressure of function of the central nervous system arise.

Multiplane medical and social problem all over the world of today that affects accordingly medical, economic, psychosocial, and demographic aspects is osteoporosis.

Serious problem for practical public health care became the acquired immunodeficiency (AID) that facilitates development of many chronic infectious-inflammatory diseases, as well as development of autoimmunity and neoplastic illnesses. The increase in number of patients with the AID is caused by conditions of a modern life: prompt growth psychological and information loadings, stressful situations, increase in volume and the importance of toxic and damaging factors of an environment, especially in greater cities, accumulation of genetic defects in a population.

Successfully to solve all existing problems the medicine of 21-st century appreciably should represent medicine of the healthy person and prioritize preventive and prophylactic direction of activity. It demands universal creation of special medical-sanitary and rehabilitation institutions with a view of maintenance of people's healthy way of life, especially of those, who play a leading role in science and technique, industrial arts, economics, and politics. The modern market economics presumes increase in rate of personification and individualization social and political behavior of people, their

responsibility for own and their relatives well being, but in some cases is accompanied by the certain decrease in a level of social protection of the human being. Achievement of a high degree of working capacity and productivity of workers in modern conditions of social-economic development of a society demands from medicine providing some possibility for the person to control a state of his health, development of means and methods of adequate intervention with the purpose of correction and modification (strengthening) of health.

As far back as 1941 the prominent home scientist-pathologist academician I.V. Davydovsky had stated strange for that time, but in the course of time appeared exclusively deep idea, that " diagnostics of illnesses should start not at the bed of the sick person (it more likely the passed stage of medicine), but in a clinic of the healthy person " meaning quite often long asymptomatic (pre-clinical) period of development of illness when structural changes of organs are continuously increased, but being still completely compensated, do not cause changes of state of health of the person still considered practically healthy.

State of a problem

In modern medicine there is a steady tendency to the multistage approach in treatment and prevention of diseases. It is caused by specific features of development of a society every decade doubling the scientific and technical potential with the advent of essentially new technologies (computers, mobile communication, the Internet, and etc.) essentially changing an image and style of a life of millions people in civilized countries. At the same time psycho-physiological opportunities of the person are limited and depend on age, sex, his profession, and the social status. The chronic emotional stress, acceleration of rhythms of a life, a poor-quality feed and insufficient rest form psychosomatic diseases that according to the WHO (1998) are principal cause of mortality and physical disability. By the 25-40 years practically healthy people under careful examination discover early signs of disadaptation and pathological failures in different systems of an organism. Clinical manifestation of the widespread diseases -ischemic, hypertonic, ulcerative diseases and etc., occurrence of a heart attack and an insult is marked in externally safe and successful young persons becoming a source of tragedy. At those patients who already are ill and are treated in traditional medical institutions, as a rule, a course of disease is lingered become chronic since medicinal therapy in overwhelming majority is symptomatic (manifestations of illness are treated), adaptable resources of an organism are not realized, and former pathological factors (stress, complications of therapy) in district and social group of the patient continue to operate. Multistage of medicine is the compelled measure since there are various problems at each stage. At an out - patient department level - the primary reception, screening, medicamentous therapy, on the hospital stage - diagnostics, modern treatment in the shortest possible time, on sanatorium level - restorative therapy, rehabilitation, rest. Each stage has their features, pluss and minuses, therefore to use the positive moments and to avoid lacks at health services set forth above a category of patients rather difficulty, but is achievable through creation of specialized clinics of health - the large, well equipped hospitals having diagnostic and medical-rehabilitation base.

The Space medicine and health

Let's stop a little bit more in detail on a subject of activity of space medicine, its contribution to development of 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 branches that not only allows 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, nevertheless, 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 biologic researches extended. Achievements of space medicine in many respects as result of joint efforts scientists and physicians of many countries cause practical interest on the terrestrial medicine party more and more.

In process of development of piloted astronautics methods and means of medical maintenance of cosmonauts 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 varying and often 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, physiology of motor system, functional electrostimulation, 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 the health state prognosis
- The quest for a border between adaptive and premorbid 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 "terrestrial" physicians of mechanisms of spatial orientation of the person, the vestibular apparatus, its structure and function, data on biomechanics, a metabolism, cardiovascular and nervous systems have enriched.

The biological and medical devices developed for piloted space flights have a number of advantages in comparison with "ground" analogues, somehow portability, stability to overloads, impacts, vibrations, temperature drops, and simple handling. These devices are competitive in a class of the equipment for the organization of the medical service

rendering the emergency help in places of natural disasters, catastrophe, accidents, for medical examination of the population in remote areas, for submarine, aviation and sea medicine, and also for examination of sportsmen. Here only some problems where experience of space medicine can become useful to common medicine:

- Sensomotor coordination 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 adaptable processes which till now in daily medicine are clear only partly and in space medicine are investigated long time ago
- Other clinical points of contact are, for example, stability (resistance) of hemodynamics, working capacity of the person under influence of the special situations causing overloading (mental stress, oxygen insufficiency, and etc.). Today the syndrome of weak blood circulation after prolonged immobility 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 affect work capacity of the person. The control and an estimation of stressful factors, an estimation of their influence on autonomus nervous system of the person is very important statement of a question.

The important direction of application of unique experience of space medicine for the blessing of the person is also use of ample opportunities of a telemedicine that has arisen in essence owing to the decision of a problem of maintenance of piloted flights.

The new ways to the medical treatment organization

Instead of the isolated and highly specialized hospitals, large number of low - standards ambulatories, and sanatorium where trivial measures take preference over treatment, clinics of health are integrative medicinal- restorative institutions combining the positive parties 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 string 4-5* (stars), is the perspective and highly profitable undertaking.

Attraction of such a clinic is provided also with the obligation of application of the modern diagnostic methods estimated a level of health, state of organs, dynamics of restoration, effective and aesthetically pleasant treatment in short terms. An idea of the advanced medical science about transference of an accent in 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 accompanied by raised power expenses causing a deficiency of power supply of the processes that necessary for providing of integrity of system and achievement of the purpose of its functioning.

Power expenses are linked with restoration of an optimal way of achievement of the normal functionality of system, a deviation from which aroused through an influence of

factors of an environment or "the internal reasons" (as consequence of sensitive dependence of behavior of system on conditions). The organism represents the complex hierarchical system consisted of many subsystems. In hierarchical system at each level of the organization (circle) processes of transformation of energy and information with characteristic from time to time proceed. Coordination and regulation of processes on each circle and in all organism as a whole is carried out by means of information flood, i.e. specific signals. For transfer of the information various types of signals and their carriers are used. In an organism of the person for this purpose are used basically nervous and humoral systems.

Processes of transfer of the information and transformation of energy in an organism are related; information processes operate processes of transformation of energy, but depend on power supply of information systems. The organism is arranged in such a way that in a norm supports optimal parameters of these processes by means of compensatory reactions. On deviations from the norm in an organism the compensatory processes arise providing adaptation of an organism to new conditions - adaptive reaction of an organism. In case of significant and protracted deviations from norm an adaptation with preservation of the basic characteristics of processes of transformation of energy can appear impossible.

Within the frame of such theoretical notions, the organism is considered not only as set of organs but as multilevel system, regulation of processes in which is carried out on the most delicate levels registration of which was inaccessible by usual methods before. Revealing some shifts through such diagnostics assumes presence of methods of the medical effects correcting these disorders. Presence of such equipment in clinic of health is an obligatory and achievable condition. The specified methods of diagnostics and therapy will be associated in a uniform complex. As a guarantee of efficiency of such therapy successful use in many clinics, including the Europe, separate technologies from planned series of methods with a good medical and public estimation of results serves. Inclusion in programs of work exclusive technologies borrowed from the space branch makes clinic a unique medical institution.

Methodological bases of the healthy person medicine

Traditional way of an estimation of a health state is revealing of diseases, and with reference to a population, measurement of spreading of diseases, frequency of occurrence of new cases of diseases, death rate. The data of an estimation form a basis of current medical practice.

According to the definition of the WHO - health represents "a state of full physical, mental and social well-being, and not just as absence of illness and corporal defects". This definition does not contain criteria of health and means that health represents a limit, asymptom.

To estimate a state of the person in general and quantitatively (it is usual in the research purposes) the digital indexes uniting estimations of a degree of functions disorder, mental, and social functionality are applied.

Pragmatically adjusted experts put forward relative criteria of health, refusing to define absolute health. Since the remote of illness and death is represented, obviously, attractive as external criterion of an optimality (health) of the person life duration and especially healthy life duration are offered. This approach is represented the most perspective.

An estimation of a degree of functional reserves of an organism, i.e. ability to keep stability to influence of various adverse factors, will allow to come nearer to understanding of a person's health level.

This approach represents health or illness as absence or presence of a different degree of defects, as a degree of the adaptation of an organism to an environment, abilities to resist to adverse influence of this environment, its skill to modulate environment. For the first time concept of health as maximal fitness to conditions of environment was brought into scientific turn by G. Spenser.

It is represented interesting to apply such approach to an estimation of health of people who are not having clinically outlined diseases and visible functional defects. The methodological approach developed by medicine of the healthy person, assumes that the concept "health" does not mean only absence any diseases and defects, and means ability of the person not simply to carry out a certain average level of working tasks, but, first of all, to resist to various additional loadings, pressure and to keep general well-being and high working capacity by all means. Any individual features of reaction of an organism are not included. The main thing - readiness of an organism to resist effectively to the bad (stressful, extreme) effects, and presence of physiological reserves.

Thus health of the person can be defined as a condition of optimal adaptation (shown in particular a high level of working capacity) his organism to a life conditions (environment) and specificity of professional work.

Features of the new methodological approach, developed by medicine of the healthy person, are:

- The maximal account of reserve opportunities of an organism
- An individual approach to an estimation of a health level, individual standardization
- Wide application of modern methods in medical science for diagnostics, prognosis, control, and correction of health (including methods of self-diagnostics and self-control)
- The quest for a border between adaptive and premorbid changes under negative factors of an environment, the account of biological effects and prevention from bad effects of these factors.

Researches in management by functions of an organism of the person in extreme conditions for maintenance of a high level of working capacity in condition of obligatory preservation of an optimal state of health have generated qualitative shifts in approaches and methodology of medicine.

The account of individual standardized parameters of the person provides increase in longevity, including professional, increase in efficiency of activity of people, improvement in their state of health and minimization of probability of those or other disorders and diseases.

The balanced, adequate feeding takes an important part in harmonious development (formation of the optimum physical and mental status of an organism) and maintenance of a normal level of health. Besides, it is one of the major conditions of maintenance of stability of an organism to action of adverse ecological factors of an environment.

The important element is standardization of volume and intensity of physical exertions, computation and a substantiation of optimal values for every individual on each of stages of his life and activity.

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On a following step it is necessary to pass to selection of the various parameters forming an optimum of his psychological condition and standardization of "a sensory way" for every person.

In fact, it is necessary to define needs of the human being for his physiological, psychological optimum, for a proper correlation of activity of a cortex and a subcortex, for optimal functioning of an organism as biosocial integrity and to offer specially proved and calculated structure of influences of an environment including structure of information flood.

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

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

- Special preparation
- Measures for professional activity optimization,
- Formation of a positive feedback with a declaration of success in realizing work,
- Control of an asthenic syndrome, removal of a nonspecific anxiety component, including application of pharmacological agents.

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

Mission, the purpose, problems and predestination of a Clinic

Mission of a Clinic

Maintenance of optimal functioning (a high vital tonus, efficiency of activity, an emotional saturation, and active longevity, including professional) of an organism of people, first of all those, who take leading positions in sphere of a science and technics, 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 modern terrestrial and space medicine on activation of functional reserves of an organism, restoration lowered physical, psychological, cognitive abilities, maintenance of a high level of working capacity and good state of health in a combination with the newest medicinal 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 stabilization and modification of health.

The primary goals of a Clinic

- Revealing of negative natural and professional factors, being principal causes of development of various functional disorders and decrease in working capacity of people.

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- Studying of preconditions and the mechanisms responsible for decrease in a work capacity level, deterioration of state of health, and development of diseases in experts of a various types of the activity, engaged in high-intensity intellectual work or working in extreme conditions of environment.
- Allocation of "groups of risk", exposed a high degree of exhaustion, decrease in the work capacity, the raised risk of occurrence of diseases owing to a high degree of intellectual intensity of work, influence extreme conditions of environment.
- An expert estimation of functions of an organism of the person including his individual standards and features.
- Revealing of the initial, compensated forms of disorders of a state of health and working capacity. Definition of a degree and clinical importance of the revealed shifts including features of a professional work and a life style.
- Performance of necessary volume sanitary medicophysiological and psychophysiological measures directed on maintenance of health and activation of adaptive mechanisms, hindering development of diseases in conditions of usual vital activity and extreme situations.
- Preparation of the individual, scientifically proved treatment and prophylactic recommendations on the further vital activity of the examined persons promoting maintenance of their health and working capacity.
- Realization of dynamic monitoring of a state of health and a level of working capacity of the observed persons with the purpose of duly correction of their condition in case of need.
- Development, approbation and introduction of the newest methods, technologies, equipments, and agents promoting preventive maintenance, treatment, rehabilitation of the person, increase in productivity of his activity and maintenance of professional longevity.

Predestination of a Clinic

Clinic is orientated towards rendering medical aid to patients with a various level of health:

- The persons considering essentially healthy but having separate sickly manifestation of a disease (asthenia, insomnia, and etc.).
- Patients, presumably with functional disorders of organs and systems and decrease in adaptive resources of an organism (algesthesia syndromes, faints, AP drops) demanding an exact diagnosis.
- Patients with a neurologic and somatic pathology in a stage not demanding highly specialized methods of treatment (operation) whose condition allows to administer regenerative and rehabilitation therapy and to use modern technologies of clinic of health.

The list of the basic groups of diseases, effective therapy of which will be provided:

- Consequences of an insult, discirculatory encephalopathy
- Consequences of a craniocerebral trauma and slight spinal trauma
- Disease of nerves (polyneuropathy).
- An osteochondrosis of a backbone and algesthesia syndromes through it
- Headaches (a migraine, headaches through overstrain, cluster, etc.).
- Consequences of the neurosurgery operations demanding rehabilitation
- Functional disturbances of nervous system (crises, faints, asthenia, and etc)
- Reumatic pain syndromes

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- Treatment of a bronchial asthma (without corticosteroid therapy)
- Arterial hypotension, hypertension, fatness, insomnia, sleepy apnea.

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
- Special methods of diagnostics 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 a high-grade complex of treatment. The most important of them are:

- Space technologies including methods of low temperature cryotherapy, gravitational therapy, etc.
- Bioresonant therapy
- Various kinds of massage
- Homeopathy
- Reflex therapy
- Diet therapy
- Physiotherapy
- Halotherapy
- Interval hypoxic training.
- Psychocorrection
- Cosmetology

Difference between new type of clinic and existing medical institutions

- Understanding of diseases as power and information disorders of functioning of complex hierarchical 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, doesn't exclude but assumes the 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-equipping with new equipment and methods.

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This can be seen as the most efficient solution.

The clinic could be situated in the proper climatic resort zone close to specialized medical institutions having developed infrastructure so that the patients could spend their free time. The presence of good transport communication is also important.

Authors of the report will be thankful to everybody for all remarks and offers for making the concept more precise and full of specific medical technologies. In this connection medics from revitalization and rehabilitation medicine are welcome for cooperation. At the same time the authors are looking forward to having the concept implemented by active rehabilitation clinics and investors.

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THE ILLNESS (MORBUS) NEW BIOLOGICAL PRINCIPLES – ILLNESS AND PHARMACY

Viktor A. Kotolupov

Kotolupov d.o.o., Vipava, Slovenia

We tender 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 I.M Sechenov Institute of Evolutionary Physiology and Biochemistry of the Russian Academy of Sciences (IEPB RAS, www.iephb.ru <http://www.spbrc.nw.ru/russian/org/iephb.htm>). The demands of Institute for definite researches have been additionally scientifically broadened by our company.

The scientists in IEPB RAS regard this new knowledge as being of fundamental importance for medicine (diagnostics, pharmacology, toxicology, prostheses of sensory systems), agriculture, ecology, pedagogy. These new laws comprise limitations of energy, functional limitations, functional interdependence, memory (ability to store information), ability to change internal, external and functional structures, selection of priority forms of activity, expedience (rationality) of activity, compensatory-adaptive reactions, agreeable and disagreeable sensations, urge towards agreeable sensations and tendency to avoid disagreeable sensations, tendency to increase the survival coefficient, maintenance of homeostasis, 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 generated inside the bio-system and coming from the outside, transformation of definite chemical element into another form, as well as information processing (improvement of the regulation quality of the vital activities). Let me stress that no living being has been able to avoid those laws.

Scientific, multidisciplinary and methodical approach together with biological principles enables the correct understanding of processes and mechanisms taking place inside the bio-systems and human organism, it provides theoretically faultless (from the point of view of all sciences) basis for understanding the causes of various illnesses (more details in basic text).

This knowledge can be used for research in the fields of: genomics, bio-information science, cardiovascular diseases, development of new diagnoses, rational development of new, safe and more efficient medicaments including pharma-economical approaches, neurology, brain damage of embryo, fighting against cancer, multidisciplinary approaches of functional genomics to understanding of basic biological processes, resistance to

antibiotics and other medicaments, study of brain and illnesses that affect nerve system, e.g. (brain mechanisms of knowledge organization and higher psychical function of man).

A group of respected scientists from the world respected institutions develop a new tendency in pharmacy, a "methodical pharmacy", giving consideration to new fundamental knowledge and understanding of the causes of various illnesses by using the structures of existent pharmaceutical companies. The main concept of "methodical 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 Biologic 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 several functions, among them functions connected with energy supply of the 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 humankind (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 processes, plastic exchange and information exchange. The parameters of mentioned processes in a way depend upon the state 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 those values under 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 catabolism and anabolism inside the organism as whole or inside its separate systems may give evidence of illness. As a possible criterion in this respect, I suggest an analogous coefficient of exploitation of metabolism, that is, the ratio of average capacity of anabolism processes to average capacity of catabolism processes. If the value of coefficient should be less than one, the situation can be considered as illness.

From the viewpoint of the general theory of systems, the illness can be defined as a combination of the processes inside the complicated system, accompanied by increased expenditure of energy, resulting in the shortage of energy supply for the processes needed for support of the whole system and for achieving the purpose of its functioning. The consumption of energy is connected with restoration of the optimal way of attaining the purpose of the functioning of the system; the deviation from this course has emerged as a consequence of either environmental factors or because of »internal causes«, (because the behavior of systems is highly dependent on the conditions). This kind of a definition is correct and useful not only for the illnesses of living organisms, but for example, for the »illnesses of the society« as well.

Organism is a complicated hierarchical system, consisted of many hierarchically subordinate systems. In the hierarchical system, the processes of transferring the

energy and the information are taking place on every level of organization (type); every singular process has its own specific course of duration. The harmonization and regulation of the processes on every level and in the whole organism as well, is enabled with the help of informational fluxes, that is, specific signals. In order to transfer the information several types of signals and their carriers are used. In human body, mostly nervous and hormonal systems carry out this function.

The processes of information transfers and energy transformations inside the organism are connected: informational processes manage the processes of the energy transformation, but they alone depend on the energy supply of informational systems. The structure of organism is such that it preserves the optimal parameters of the processes in the normal condition by means of compensatory reactions. When the deviation from standard in the organism occurs it is resulted in compensatory processes enabling the organism to adapt to new conditions – adaptability reaction of the organism. When the deviation from standard is lasting and of larger scale, the adaptation together with maintaining the main characteristics of the processes may not be possible.

The illness is always connected to homeostasis disturbance, when the changes of some condition parameters of the system exceed allowed values. The changes of condition parameters have boundaries. The boundaries depend on the kind of organism, its history of evolution, are changeable and depend upon concrete conditions of internal and external environment (age, sex, way of life, time of a day, season, etc.). Each type of organism (species) has its own characteristic values of parameters of physiological state and boundary changes. Therefore it can be stated, each species has its own specific homeostasis. Even more, in the framework of species at different grade, those values vary from subject to subject. That means the values are also individually specific. This way, the genus and individual particularities of illness are defined.

Change of condition parameters of complicated system, which is due to internal causes or under the influence of environment factors, within the definite boundaries, does not affect its functioning essentially. Those boundaries can be expressed as diapason of comfort. Inside those boundaries there is no shortage of stores needed for enabling all important functions of system.

There are periodical changes of homeostasis, connected to particularities typical for development of organism, organism's biologic rhythm, way of life, natural phenomena, etc. Suchlike differences of homeostasis are acquisitions of evolution of an individual organism and cannot be considered as anomalous. For this reason, the homeostasis has to be researched within all interactions of organism's under-systems and the organism with the environment during the definite period of time.

Adaptation possibilities of organism tend to have natural oscillation; in some cases can be lowered to the degree/level which is typical for illness. Excessive tiredness is an example of this case.

When condition parameters change significantly, the supply and its exploitation become limited. Incurable changes inside the organism may occur, the system becomes ruined. Diapason of change of an optional parameter can be compared to the standard/norm of reaction. Reaction of the system to the changes of definite number of condition parameters is not that simple combination of reactions as the system reaction to the change of one single parameter. The influence of acting parameters can be reciprocally strengthened or weakened.

Restricted powers of organism can be the result of either the deficit of energy, material or information, or the result of failure in structure of singular parts of organism or in structure of the organism on the whole. In this situation, the adaptation processes begin to develop inside the organism, when compensation for changes developed in the organism is not possible, the state of illness begins to develop. This newly developed state is accompanied by the new division of hierarchy stages and store accessibility i.e. energy and information at every stage.

Disturbances of homeostasis are also possible on the occasion of disturbed system of its regulation (protection) which makes appearance in the form of the organism reactions like: pain, fear, laziness, tiredness, vomiting, diarrhea, incapability to receive and process the information etc., which all aim at restriction of possible forms of organism activities.

Illness can be developed as a consequence of a state, when organism enables the implementation of functions of high priority by reducing others with lesser priority (cardiovascular diseases, gynecologic diseases, multiple sclerosis, depression, etc.). Not only the running short of energy store but also the reduced energy supply of the organism systems can cause the illness as a result of disorder in assimilation function.

In all cases, the selection of prior forms of organism's action is determined by environmental conditions, the state of organism and processes taking part in it. The symptoms of illness help to identify which functions at this instant are of priority for the organism and vice versa, defining the functions of priority in this particular situation help with the understanding of essence of illness. The system of priority functions, the development of suitable compensatory mechanisms and reactions have emerged in the course of evolution of species and are determined by pragmatism. The correct understanding of the symptoms and causes of illness is possible only on the basis of knowledge of those natural characteristics of organism in concrete conditions of environment.

The role of illness is not only providing signals about disorders in the functioning of any system, but also cooperation in redistribution of priorities. By dispensing with compensatory mechanisms, the pain reduces less important activities of organism, thus enabling the implementation of its priority functions in this situation, for example: regeneration or reparation of the injured part of the organism. However, in some other situations with similar injuries of organism the pain can be reduced or even cannot be sensed which is connected with the priorities of different forms of activity determined in the course of psychical activity of a person. The activity of an organism practically all the time aims at ensuring the maximum possibility of survival under concrete conditions at a definite moment. This is the main criterion for determining the priorities of other functions of organism, which alone cannot be the cause for some illnesses.

Disturbances of information transfers, especially when under the influence of medical preparations, can lead to changed scale of prior organism activities. In this case, organism will make use of its store without need, for practically useless forms of activity in the definite moment. Subjectively, this is seen as improved condition of a diseased organism. However, when priority organism functions are not provided for, the state of patient suddenly changes for worse and future complications in the course of illness occur.

An inevitable consequence of interaction between organism and environment is a non-specific neuro-hormonal reaction of organism, oriented to overcome the functioning

of factors destroying homeostasis. This state is called stress. Clinical stress is shown as an adaptation syndrome.

In some definite situations the stress results in mobilization of organism defensive powers (eustress) together with self-recovery from many somatic diseases (ulcer, allergy, coronary disease, asthma, etc.). However, this requires enough energy stores. In case of excessively intense stress or inadequate reaction of organism to the factors of internal or 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 the systems of information transfer, reception and generation. Sometimes distress is noticed also at low intensive activities.

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 again, the organism consequently passes through those four conditions again. Such recurrence of the conditions corresponds to passage of the organism from adaptation stage to another.

At each adaptation 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 response to activity of external and internal environment.

Usually, organism passes from one adaptation stage to another autonomously according to the situation and accessibility of the energy store. Those passages depend upon interaction of the processes of transferring and processing the information and of transformation the energy in different organs and tissues.

During the illness organism passes to adaptation stage with energy consumption exceeding its abilities. Because of this, in a while organism slides to a lower decompensation stage and can be shifted into the stage of stress. In this case the course of illness becomes complicated.

The illnesses are classified according to the factors, which cause them, or according to which organs or tissues of organism are damaged by this illness. Besides illnesses caused by activities of pathogenic factors, there are illnesses dependant upon failure of genetic information, for example Down, Turner, Klinefelter syndrome, etc. We also know the group of genetic illnesses not connected with damages of exons but are connected with damages of introns, meaning with the group of genes which do not carry information about the structure of some albumins. Huntington chorea is one of those illnesses and there are also others.

We can range among the pathological illnesses also the inborn hyper-function of any optional organism system, for example central nervous system (of brain). With children there are many cases of mature development of any unique abilities/capacities by depriving, hindering other activities of organism, which may lead to anomalous conditions (even of brain).

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

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 changes are of course seen not only in 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 illness. Usually, generalized illnesses have serious progress, unfavourable outcome.

According to the nature of progress, illnesses are divided into chronic diseases, acute diseases and those, which are no longer acute. The development of adaptation reactions takes time. So, when influences are sharp and powerful, organism fails to react in time and this may lead to death.

In many cases illnesses begin imperceptibly and no with no symptoms shown for longer period of time. First symptoms may appear when the shortage of stores becomes evident, compensatory possibilities of organism are used up. One of those cases is arteriosclerosis, when changes of vascular system keep intensifying in the course of many years or even decades with no significant changes of the organism condition.

This way, the morphological changes of organs are non-obligatorily accompanied with clinical symptoms. First clinical appearances considered for the beginning of illness can truly be the evidence of an old, antiquated pathological process on the stage, when organism has no more stores needed for fighting for recovery.

Considering this, it is important to have chance to define, in time, the moment of "destroyed balance", i.e. internal changes of the complicated system which are not yet evident, do not show any visible signs. In fact this is now possible by use of new methods of non-linear dynamics and situation analysis.

The course of illness, its symptoms can be significantly degenerated under dependence of environmental particularities at definite moment. It is generally known that the course of many illnesses in the past was different from nowadays one. In addition to that, because of biologic rhythms of different periodicity and also because of periodic changes of environmental conditions, reactions of organism in different time are different to equally powerful influences. This is referred to pathogenic factors as well as to medical preparations – taking the same preparation in different phases of biologic rhythms can lead to different results.

The appearance of first symptoms of illness equals to its passing to the state of prodrome. It is followed by the state with expressed clinic symptoms, changes of the structure and functions of organs and tissues- manifestation of illness. The illness concludes with recovery (convalescence), death or passing into chronic disease.

During the course of illness, the development of pathologic processes may deviate from typical ones. When this leads to deterioration of the condition, we talk about complicated course of illness or complications.

When the outcome of illness is favourable, clinical symptoms disappear before all the parameters of organism condition return to normalcy, among them also the structure of damaged organs and tissues. In this "out of symptoms" period of illness, the recovery of damaged structures and systems of organism is going on, so it is important, without regard to well feeling of the patient, to protect his organism from additional stress. Premature interruption of treatment on this stage can lead to passing the illness into the chronic state.

Characteristic of chronic disease is the repetition of intervals of decline (remission) and reappearance of disease (recidivism). 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 recidivisms have the same course as the illness itself.

We can distinguish the pause between the recidivisms from entire recovery by continuation of pathologic processes and their compensation by dispensing with adaptation reactions of organism. Because of this, the changes in the organism systems gradually pile up and at the end the stage of decompensation occurs.

After recovery, recidivous phenomena, like changes in the structure of organs and tissues, may remain in organism for a longer period of time or forever. Those lesions of organs and tissues, different from lesions of illnesses, do not progress so they are regarded as a pathologic state not as an illness. In many cases they are not shown in health condition.

In many cases it is easier to prevent from emerging the illness, as it is to recover from the illness. Prophylaxis of illnesses is occupied with the ways of preventing from illness. Because acting prophylactic measures are not yet developed for all types of illnesses, an early diagnostics can be more effective than prophylaxis (for example in some cases of cancer).

Pathology is the science occupying with studying the illnesses. Its duties are to define the causes of illness (aetiology), explaining the mechanisms of its development (pathogenesis), structural changes connected with illness (morphologic changes), and as a consequence, functional changes. The system of conceptions of human illnesses is named nosology; it presents individual illnesses with nosologic forms. The idea of nosologic form is to understand the dynamic nature. By collecting the knowledge and with the development of conceptions of illnesses some forms may fall apart and may shape self-dependent nosologic units, also new forms may appear.

It is impossible to understand illness without precise description of its symptoms showing themselves 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 aetiology 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. Whether or not the medicaments are used for the treatment, there must be obligatory objective control of condition parameters of the organism in both cases. Today, widely used methods of control are the ones that control the minor number of parameters, for example urine and blood tests, electro- and cardiogram, brain waves, NMR spectroscopy, thermography, etc. Using the achievements of natural sciences (especially biology, chemistry and physics) in medical researches enables the development of new methods of objective control of organism condition parameters, treatment and searching for new medicine preparations.

During space flight, astronauts may experience unfavourable changes of psychophysical state, including different illnesses, correction of which is impossible to be made by means of medicaments. Under such conditions, solely non-pharmaceutical methods in improving the state of organism are advantageous and useful.

SCIENTIFIC METHODOLOGICAL BASES OF AN ESTIMATION AND FORECASTING OF INTENSITY OF CAMERA WORK WITH THE PURPOSE OF SERVICEABILITY INCREASE AND DECREASE OF AN ACCIDENT RATE

N. Smaulov, K. Sadikov

The Karaganda state university E.A. Buketov namely, Karaganda, Kazakhstan

The wide introduction of a computerization in modern enterprises has a some features of the physiological contents in work, as a social, organizational and hygienic character. Use a difficult computer facilities do not replace work of the man, and only significantly change its character. The densities of the difficult forms of intellectual activity at all stages in modern enterprises is increased. All this factors causes growth of productions intensity and increase of a nervous – emotional tension, which results in additional mobilization of internal resources and can have the adverse deferred consequences for health [1].

The necessity of amplification of attention to the practically healthy man is obvious, study of physiological mechanisms of human organism stability to negative consequences of emotional overloads [2], revealing of those occupational factors, which create psychic emotional hypertension of the people, and development of criteria for their estimation and forecasting of a nervous emotional of the operators' organism tension.

Other essential lack during study the difficult polyfactorial phenomena is the inexact characteristic of complex "doze" received by the operator during work period, since it consists not only of the factors industrial influences and parameters of productivity, but also lot hard calculated factors (technological, personal psychological, social, household etc.). In this cause the mathematical dependences descriptions received with this methodological basis is not full correspond to the validity. For more objective approach for the decision of this problem use not only modern mathematical device is necessary, but also certain approach allowing methodically to exclude of the hard calculated factors from the analysis [3].

Basis of the mathematical description reception of the occupational harmful factors influence to the physiological parameters of the operators were the supervision received directly in conditions of the working enterprise with use of a principle of unguided (passive) experiment included one-moment registration of hygienic parameters and physiological parameters of the operators, that allows methodically to exclude from a complex estimation the not taken into account factors [3]. On the basis of the received data the further account of correlation and regress equations with the standard programs used linear, exponent, polynomial (3 degrees) and statistic determined