



FEATURES OF ADAPTATION TO PHYSICAL ACTIVITY OF VEGETATIVE AND REGULATORY SYSTEMS OF THE BODY

Kadyrjonova Feruza Nematjonovna

Clinical resident of the Department of Occupational Health, Fergana Medical
Institute of Public Health

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Physical exercise is a powerful means of maintaining a high level of all functional parameters of the body. Movement is the most physiological attribute of life. Muscular activity causes tension in all functional systems, accompanied by hypoxia, which trains the mechanisms of regulation, improves recovery processes, and improves adaptation to adverse environmental conditions. The influence of muscle activity is so great that under its long-term influence the activity of the genetic apparatus and protein biosynthesis change, aging slows down and many diseases are prevented; the body becomes less susceptible to harmful factors. These provisions are well known, although they are difficult to implement. Here are the statements on this occasion only two widely known people. The Roman poet Quintus Horace wrote in his famous "Monument" even before our era: "If you do not run while you are healthy, you will have to run when you are sick." And the French writer Alfred Musset, in his novel Confessions of a Son of the Century, published in 1836, points out: "Physical exercise can replace many drugs, but no medicine in the world can replace physical exercise."

What is the role of physical exercise for people of mature and old age from a physiological standpoint? Under the influence of moderate regular physical activity, the mechanisms of regulation of various organs and systems are improved, and the functions of the body are more economical. The latter is manifested in a decrease in heart rate and blood pressure, an increase in myocardial diastole, an increase in the oxygen utilization rate and a decrease in the oxygen cost of work. The use of physical exercises improves the blood supply to various tissues, especially skeletal muscles, which reduces hypoxic phenomena.

The development of positive emotions and increased stability of the hypothalamic-pituitary system provide an anti-stress effect. For a longer time, the decline in physical qualities slows down and mental and physical performance is maintained. All this contributes to the development of active longevity, prevention of diseases, aging and prolongation of people's lives. Adaptation of vegetative systems in people of mature and old age has quite



pronounced features. Thus, the development of myogenic leukocytosis, erythrocytosis and thrombocytosis is less pronounced and the lymphocytic reaction is especially weakly manifested. In the streets of this age, the destruction of blood cells is increased, and their restoration is delayed for a longer period.

In people who regularly perform physical activity, there is a more economical activity of the cardiovascular system, and for a long time its main functional constants remain at the optimal level. In particular, they have more stable indicators of heart rate, there is no significant increase in blood pressure, the contractile force of the myocardium, its metabolism, excitability and conductivity are preserved. These individuals do not have a significant decrease in stroke and minute volumes of blood flow, its speed and volume of circulating blood. In people who do not exercise regularly, even minor loads cause a sharp tachycardia, increased blood pressure, a decrease in stroke volume and general blood flow, and sometimes cardiovascular insufficiency may develop. At the same time, the maximum heart rate achieved during work in people of mature and old age is noticeably reduced.

Indicators of the functions of external respiration with regular exercise remain quite high in the elderly. This is manifested by the preservation of their proper depth of breathing and pulmonary ventilation, VC, MOD and maximum ventilation of the lungs. Streets that are not regularly engaged in physical activity are accompanied by severe shortness of breath, insufficient ventilation of the lungs and a decrease in blood oxygenation. The functions of the digestive and excretory systems of people leading an active lifestyle remain fairly stable. In particular, the secretory and motor functions of the gastrointestinal tract are preserved for a long time, filtration and reabsorption in the kidneys are quite stable, there are no pronounced edema, which are most often the result of cardiovascular or renal failure. Small physical activity is accompanied by a deterioration in the functions of the digestive and excretory organs.

Maximum heart rate in adulthood and old age

In old age, all types of harmful substances (protein, carbohydrate, carbohydrate and energy) are reduced. The main indicator of this is the increased content of cholesterol in the blood, lipoproteins and lactic acid (even when loads are detected). Regular moderate physical activity increases the level of a significant reduction in cholesterol and lipoprotein levels, reducing the possibility of developing atherosclerosis. At the same time, physical activity, even of moderate power, but caused occasionally, is accompanied by excessive accumulation of





fats and a decrease in blood sugar levels, an improvement in pH towards acidosis, an increase in under-oxidized products in the blood and urine (creatinine, urea, uric acid, etc.) . Even moderate work in people over 40 is found mainly due to anaerobic glycolysis, which is mainly related to oxygen content. The functions of the body's regulatory systems (endocrine glands and central nervous system) also decrease with age. After 40-45 years, the functions of the pituitary, adrenal glands and pancreas worsen, after 50 years - the functions of the thyroid and gonads. Moderate regular physical activity delays the decline in the functions of these glands; significant loads, as well as the performance of exercises by persons not adapted to them, inhibit the activity of the endocrine glands. The parameters of the central nervous system and higher nervous activity are the most stable and less susceptible to age-related involutional processes.

Improving physical culture activates the functions of the central nervous system and GNA, hard physical work depresses them. Naturally, age-related changes in the functions of the central nervous system and the endocrine system worsen the nervous and humoral regulation of all autonomic systems of the body.

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