

Assessment and correction of the functional state of operators of video display terminals using energy information methods

M.G. Maslova, L.K. Kurtseitov, V.L. Volodarsky (Scientific and Methodological Center of Personnel Policy of the Ministry of Defense of Ukraine, Main Military Clinical Hospital of the Ministry of Defense of Ukraine)

In modern conditions, it is impossible to imagine any sphere of life and activity without information technology (IT). An important place is occupied by the use of IT in the armed forces: collection and storage of information, automated control systems for structural units and technical means, application at various stages of training of military personnel, in scientific research, etc.

The IT system involves people of different professions and of different ages (from 4–5 years old to the elderly). Personal computers are widely used in production, various types of official activities, in everyday life. However, there are more and more reports of negative impact electromagnetic radiation on the human body, especially children. The problems have increased even more in connection with the spread of mobile communications, Wi Fi and other methods of obtaining information or communication [1, 2, 3].

This message will focus on people of widespread activity - on the operators of video display terminals (VDT). The work of operators of various ergatic systems, primarily those equipped with computers, devices for tracking and evaluating various indicators, is usually considered in a complex interconnected system: "man - machine - environment". In this system, every component is important, but the human factor is decisive.

WHO experts consider working with VDT harmful to human health [4]. It is no coincidence that the European Economic Community issued Directive No. 90/270, which prescribes informing the operator of VDT about safety and health measures, as well as ways to eliminate or reduce the risk. However, VDT operators and employers, especially in commercial structures, prefer to work not only on a working day, but also part of the night in order to earn money without thinking about the consequences of such work [5].

The problem of protecting operators from electrostatic and electromagnetic fields, ultraviolet and soft X-rays has been almost completely solved by the introduction of shielding devices into computers and other technological improvements. At the same time, long-term work with VDT of the most modern design still leads to disruption of the functional state of operators, and often to the occurrence of diseases [6, 7].

The study of energy-informational interactions between VDT and humans allowed scientists to make the assumption that the negative impact of VDT on health is due to the torsion component of electromagnetic radiation, which is not shielded by protective devices [8, 9]. According to these scientists, the left torsion field interacts with electromagnetic oscillations of cells, tissues, human organs and, at the informational level, disrupts the processes of coordinating the work of functional systems and preserving

homeostasis. We did not find convincing objective data confirming this hypothesis, but there is no reason to disregard it.

The negative impact of VDT is due to a number of factors, among which the most important are the following [6]:

- radiation from video monitors;
- lighting effects associated with sharp fluctuations (pulsations);
- discomfort from posture, weakness;
- excessive loads.

This is not a complete list of negative factors of working with VDT, only the most significant ones are listed. They cause tension and irritation of the central and autonomic nervous systems, fatigue of the visual analyzer, general fatigue, which leads to a violation of complex elements of professional activity, a decrease in the accuracy of work, and the appearance of errors [2, 10]. Therefore, the issues of psychological and functional reliability of VDT operators play a major role in ensuring the necessary working capacity to perform professional tasks [11,12].

Performance is a complex complex category that depends on a number of factors and can be represented by a formula proposed by the physiologist M.M. Volkov: $UFS = E / (R1 + P2 + P3)$, where UFS - specific functional consistency (performance); E - energy level, depending on the state of the central nervous system, ANS, functional capacity of organs and systems; P1, P2, P3 - environmental factors (electromagnetic oscillations, geopathogenic load, ionizing radiation, other environmental and industrial factors). It is quite obvious that the higher and more stable E, the lower the index of the P factors, the higher the efficiency. In order to preserve the required operability factor of the operator, it is necessary, if possible, to change the environmental factors (first of all, the workplace, the quality of electronic equipment). Need to evaluate

the energy potential of the operator and other indicators of the functional state of the body, monitor these indicators and maintain performance at the optimal level.

In publications devoted to human-machine interaction (VDT) is given a bunch of various tests on evaluation fatigue and performance.

Most often it is a complex that includes questionnaire, condition assessment cardiovascular, nervous system, psychological and motor tests. These methods are objective, but, as a rule, they are cumbersome, require a lot of time and involve different specialists.

For a quantitative and qualitative assessment of the functional state of RCCB operators, energy-informational methods are the most appropriate. The equipment, developed by the IMEDIS Center, allows you to quickly and objectively obtain the necessary information about the functional state of the body of the VDT operators.

Our research team examined 46 VDT operators - officers and civilian specialists of the Ministry of Defense of Ukraine. All of them worked on personal computers throughout the working day, in tight spaces.

Using a questionnaire, the following subjective signs were revealed

violations of the functional state of VDT operators: by the end of the working day, fatigue, irritability was observed in all, visual impairment (blurred letters and numbers) - in 43%, headache - in 15%, fatigue and slight pain in the shoulders and back - in 67% of people ...

At the end of the working day, blood pressure in 7 people remained unchanged, in the rest it was elevated (especially diastolic), the pulse rate in 26 people became more frequent.

Quadrant measurements showed a decrease in the energy level, a significant imbalance of indicators.

Segmental diagnostics showed almost all cerebrovascular disorders, a decrease in energy level after a working day. The vegetative resonance test revealed an increase in the degree of geopathogenic and electromagnetic burdens.

Diagnostics by R. Voll's method was carried out for 20 operators. The greatest deviation of indicators (as a rule, increase and instability) were on the meridians of nervous degeneration, blood circulation on BAP TP 20, VB 20.

With the help of a frame and a magnet in the premises where the operators worked, geopathogenic zones were identified, and the relocation of workplaces from the PC was carried out. Instructions were given on the observance of sanitary and hygienic standards when working with VDT, instructions on how to conduct gymnastics for the eyes and spine. Four officers with severe neurocirculatory disorders received courses in bioresonance therapy and homeopathy. Another 12 officers underwent correction of the existing disorders with the help of individually selected bioresonance homeopathic preparations.

In the long-term period (after a month), repeated studies were carried out in 20 people: in 16 of them, subjective disorders decreased and objective indicators of the state of the body improved according to the data of instrumental research methods. The indicators of the functional state of the remaining four operators did not change. By the way, all of them did not consider it necessary to follow the recommendations for working with VDT.

Our little experience in research work with VDT operators indicates that UFS (according to the formula of M.M. Volkov) can and should be maintained by correcting the functional state of the body (E in the numerator of the formula) by energy-informational methods and organizational measures of influence on the factors P, indicated in denominator of the formula.

Conclusions:

1. The question of the harm to health of long-term work in VDT and constant use of IT.
2. Quantitative and qualitative assessment of the functional state operators of VDT is possible with the help of energy information technologies developed by the center "IMEDIS".
3. Methods for correcting violations of the functional state of operators VDT, the implementation of sanitary and hygienic recommendations will preserve their performance and health.

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M.G. Maslova, L.K. Kurtseitov, V.L. Volodarsky Assessment and correction of the functional state of operators of video display terminals using energy information methods // XVII