Biomedical System for Emotional Stress Evaluation

Sergiy Zlepko, Veronika Sierhieieva, Oleksandr Azarkhov, Vitaliy Makogon

Abstract – **In this paper the biomedical system for emotional stress evaluation is exposed, it's general structure is also given.**
Keywords – **Biomedical System, Emotional Stress, Psycho-Physiological investigation.**

I. INTRODUCTION

Evaluation of stress level is important in different spheres of medicine and psychology, but hardware for these functions is practically absent. The new original system for stress estimation is developed in the given work.

II. DESCRIPTION OF SYSTEM

The biomedical system for the evaluation of parameters of emotional stress can be represented as aggregate of a few associate and interactive constituents (Fig. 1).

Psychological component of system – is the testing program complex for sensing of stress stability and social adaptation; nervous system state; differential diagnostics of depressive states; personality type determination and individual psychological qualities of patients.

Basic physiological component of system includes sensors of: photo-plethysmogram (PPG), skin-galvanic reaction (SGR), electro-miogram (EMG), microprocessor 1, interface, blocks of forming stimulation impulses of SGR and EMG, PC.

For the PPG registration the transmission sensor is used.

After the registration and corresponding processing of PPG in microprocessor 1 and PC, physician gets some indexes that characterize emotional stress parameters: stress index, time and amplitude indexes of stress stability, indexes developing speed of anxiety and shock reaction, etc.

SGR registration is proceeding with standard electrodes by skin conductivity measuring on direct current [1] with subsequent separation to tonic and phasic components.

EMG registration is proceeding in standard derivations using classical method, that allows to get and evaluate reaction of nervous and muscle system, and emotional stress influence by such indexes as: ЛЧН, ЛЧР, muscle power, H- and M-recalls, and their correlation [2].

III. CONCLUSION

In this paper the general structure of designed biomedical system for emotional stress evaluation that can be used in clinical and sanatoriums establishment.
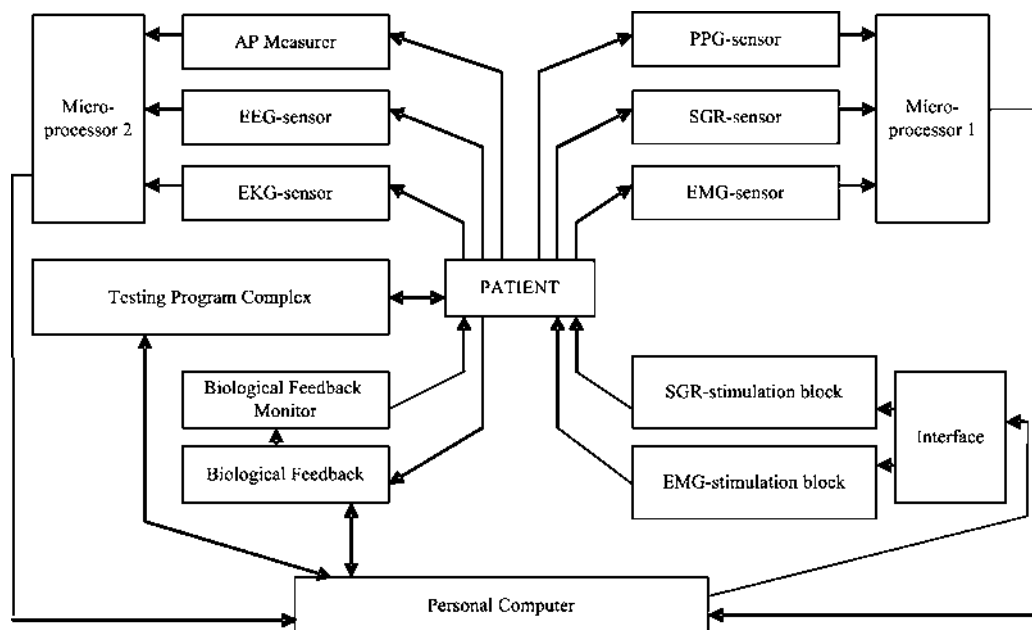

Fig.1 Flow diagram of the biomedical system for stress parameters evaluation

Sergiy Zlepko, Veronika Sierhieieva, Vitaliy Makogon – Vinnytsya National Technical University, Khmelnytske Shose, 95, Vinnytsya, 21021, UKRAINE, E-mail: smzlepko@ukr.net
Oleksandr Azarkhov – Private Sanatorium "Metalurh", Prymorskyy boulevard, 17, Mariupol, 87500, UKRAINE,
E-mail: azarhov55@mail.ru

REFERENCES

[1] M. M. Filippov, "Functional diagnostics", *NTUU "KPI"* Kyiv, Ukraine, 2000, 230 p.
[2] I. N. Burilich, N. A. Korenevskiy, and I. M. Shtotland, "Complex diagnostics of functional states using psychological and physiological experiments data", in *Harold of New Medical Technologies*, Vol. X, No. 3, 2003, pp. 44–48.