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VIBROACOUSTIC ENTRAINMENT OF ENDOGENOUS BIOLOGICAL RHYTHMS AN EFFECTIVE STRESS REDUCING METHOD FOR PILOTS AND ASTRONAUTS

Heinen, A., Heinen, A.*

A. Heinen, Friedrichshafen, Germany

*Theoretical Physics University of Constance, Constance, Germany

Medicine in space always has to concentrate on the factor ‘stress’. Stress mostly is defined by the kind of stressors – noise, vibrations, zero gravity, extreme acceleration, which excludes the most relevant factor – the individuality of human organism. Only in organism there is made the decision - in an utmost individual way, whether stimuli, their quantity, intensity, duration, in addition to the actual psychological and physiological status force the rhythmic and functional systems to stress reactions.

The development of intelligent ambient systems is made to reduce stress releasing factors by resuming tasks of machine operators to relieve predictable situations of stress, but cannot prevent perfectly. Too many parameters are not to fix. The human reaction to stimuli depends on his actual complex general condition, which is influenced by processes on the rhythmic, as well as on the functional and psychological levels. This includes his inbred constitutional status, his dominant type of personality - including his normal acting archaic reflexes and his tendency in extreme situations, his personal history, his experiences and unconscious patterns of behaviour, his actual status of health, fitness, mental condition.

To solve the problem of ‘individuality of stress reaction’ one has to collect data concerning the actual stress status of the individual in an easy-handling, quick way in order to react instantly by adequate action of rebalancing.

The level of biological rhythm system is the most sensible level to organize adaptation to environmental and internal stimuli. A special method of voice analysis allows to give insight to this lively system and to refer an actual and individual way of balancing, if necessary. The graph of voice opens the view to the biological rhythm system and enables the detection of striking (areas of) frequencies / rhythms, which demonstrate a disturbance in the natural sequence of stress reaction.

On the basis of investigations and the knowledge of chronobiology, stress and sleep research and chronomedicine we found out, that the entrainment of basic rest rhythms, a. o. of sympathetic and parasympathetic nervous system, of BRAC (Basic-Rest-Activity-Cycle) via body and ear is highly qualified to practice an immediately starting rebalancing of the biological rhythm system and the coupled functional and emotional status. Specially developed software modulates basic rest rhythm’s frequencies to a harmonic and rhythmic sounding and vibrating stimulus. The organism reminds the rest rhythm and absorbs it in a quick and gentle way via body and ear. There has been developed some special equipment of transducers to guarantee highest standard and quality for approximate natural stimulation. These elements are to integrate into seats, beds and mats or to put directly to the body, to aching areas, for example.

An investigation with 10 nurses, who worked under considerable strain in a hospital’s intensive care unit, showed the instant effect of rebalancing via biological rest-rhythmic

sounds. The most disturbing rhythm, detected by the individual voice analysis, was applied for 15 minutes.

Contact

Annegret Heinen
IFG Individuelle Förderung Gesundheit
Zuernstr. 5/1
D - 88048 Friedrichshafen
Germany

Tel: +49-7541-584971
Fax: +49-7541-584972
e-mail: ahainen@ah-ifg.de

*Dr. med. Arno Heinen
Theoretical Physics University of Constance, Constance, Germany
Universitätsstrasse 10

D-78457 Konstanz
Germany

Tel: +49-7541-584971
Fax: +49-7541-584972
e-mail: Arno.Heinen@uni-konstanz.de