

## DESYNCHRONOSIS AND MEASURES TO PREVENT IT

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### Abstract:

A person's well-being and a high level of working capacity depend on the synchronization of the body's vital activity, i.e. the ability of the central nervous system to ensure the interaction of various periodic functions of the body and on the coincidence in time of the rhythm of the organism with the rhythm of the environment. Thus, it has been established that the rhythm of heart contractions and the rhythm of breathing in a healthy person have a ratio of 4:1. Moreover, changes in this ratio are evidenced by about the violation of certain connections in the body and allow us to conclude about possible disorders of its functions and even the appearance of health disorders.

**Keywords:** psychohygiene, biorhythm, state of health, desynchronization.

### Introduction

Biorhythms (from the Greek "bios" and "rytmos" - life and coherence) are periodic changes in the intensity of the course of physiological and mental processes over a certain period of time. Biorhythms are inherent in all living things on Earth and are a prerequisite for ensuring normal life in unison with the basic rhythms of nature, due to the rotation of the Earth around the Sun and the Stars, and the associated change in seasons, day and night, the influence of the phases of the Moon, sea tides, etc.

Disturbances and changes in biological rhythms, which significantly affect the psycho-physiological functions and psycho-emotional sphere of a person, are primarily due to the social conditions of modern life and the factors of urbanization (work in different shifts at work, travel and long-distance flights associated with the change of time zones, etc.). These disorders can cause significant psycho-emotional stress, neuroses and even pronounced disturbances on the part of the criteria of mental health.

Scientific research has convincingly proven that a number of pathological conditions arise as a consequence of a violation of biological rhythms. Such conditions are called desynchronoses. They can appear in the process of education, the work process, in the course of performing other types of human activities, as well as in the process of developing a significant number of diseases. For example, in cardiovascular diseases, as a manifestation of desynchronization, it is necessary to note the appearance of arrhythmic pulse loss, in pneumonia, bronchial asthma, infectious diseases - a change in the rhythm of breathing, in diseases of the gastrointestinal tract - a change in the rhythm of intestinal motility, etc. The activity of intracellular enzymes in patients with coronary heart disease (CHD) at night is also significantly lower than during the day. In myocardial infarction, the circadian rhythms of electrolyte metabolism are disrupted: the concentration of

sodium increases and, accordingly, the concentration of potassium in erythrocytes decreases at night, as well as the rhythms of lipid metabolism are disrupted, the contractile function of the myocardium is inhibited, especially in the evening hours. In patients with cirrhosis of the liver, the amplitude of the daily rhythm of steroid hormone excretion is significantly lower than in healthy patients, disturbances in the rhythms of bioenergetic processes are recorded, etc. Significant desynchronoses are observed in endocrine diseases: daily changes in blood glucose concentration in diabetes, excretion of 17-hydroxycorticosteroids, catecholamines and electrolytes in pancreatitis, significant metabolic rhythm disorders in diseases of the hypothalamic-pituitary and diencephalic Systems. In patients with manic-depressive psychosis, the onset of the manic phase is accompanied by desynchronization of the biorhythms of the "rest-activity" cycle. In the event of stressful situations caused by the influence of extreme environmental factors, the rhythms of the hypothalamic-pituitary-adrenal system are disrupted.

On the basis of the study of desynchronoses and the causes of their occurrence, a separate field of medical science was formed - chronomedicine (and, accordingly, its separate sections, namely: chronotherapy, chronopharmacology, chronohygiene), which is based on the development of optimal schemes for the distribution of therapeutic, pharmacodynamic, preventive measures and means over time. Thus, for persons who work in different shifts, the most effective modes of performing professional activities have been developed, the time has been determined and the optimal duration of periods of rest, sleep and meals has been established. For pilots who cross several time zones - the duration and mode of post-flight rest. Programs have been developed for the professional selection of persons most suitable for flight work in different shifts and the screening of persons unsuitable for such work, which take into account biorhythmological features.

It should be emphasized that not all people have the same daily working capacity. Some, the so-called "larks", work vigorously in the morning; others, "owls," in the evening. For example, Leo Tolstoy, Anton Chekhov and Eduard Hemingway worked early in the morning. "Owls", on the contrary, fall asleep late, wake up in the morning by force, they are characterized by the greatest ability to work in the afternoon, and some - late in the evening or even at night. In particular, O. de Balzac and D.I. Mendeleev worked at night. Each person needs to know his or her individual rhythm of ability to work. By establishing periods of maximum increase in working capacity, it is possible to set them aside for the most difficult and responsible tasks, and use the periods of decline in working capacity to perform less important work.

When organizing professional activities and recreation, it is necessary to take into account the individual properties of the biological rhythms of each person. The organization of the work regime in production during the second and third (night) work shifts, especially among representatives of professions that require increased responsibility or are characterized by a high degree of monotony, must be coordinated with the individual

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characteristics of biological rhythms in such a way that intensive loads fall on natural increases in working capacity.

In all types of shift activities, it is important for each person to develop an individual rhythm of internal shift work, increasing the pace of work during periods of high working capacity and arranging micropauses when a feeling of fatigue arises.

To prevent desynchronosis and increase working capacity, it is necessary to organize daytime sleep. It is recommended to organize your daytime rest in such a way that it is close to a night's sleep in terms of its conditions. Silence, absence of extraneous stimuli, darkening, etc., allow a person to recover much faster and adapt to a temporary change in the rhythm of life. Thus, sleeping during the day in conditions that mimic night allows the body to adapt relatively quickly to unaccustomed patterns. One of the conditions for ensuring high working capacity during night shift work is the organization of mandatory hot meals, which not only compensate for the energy expenditure of the body, but also plays the role of an effective time sensor. It is noted that a long period of work in the night shift is easier to endure than a short one, in which a person does not have time to adapt to a change in the mode of work and rest.

The phenomena of desynchronosis are also observed in cosmonauts during their stay in low-Earth orbit. Unusual working conditions in outer space require maximum energy, attention and strength from them at any time of the day. However, this is difficult to achieve when you consider that while in outer space, they meet the sunrise up to 20 times over the course of 24 hours. To prevent desynchronosis, a whole system of measures is provided aimed at preserving the usual "earthly" 24-hour rhythms. For this purpose, special films, radio and television sessions of communication with the Earth, etc., are used, which allows cosmonauts to maintain a high working capacity throughout the flight. A significant restructuring of biological rhythms is necessary already when flying through 4-5 "time" zones. According to the French authors, 78% of people who belong to aviation personnel who fly long distances have disorders of the desynchronosis type. In this regard, the British airline "British Airways" has developed a kind of norm for its pilots - in 28 days, the pilot is allowed to cross no more than 40 "time" zones in any direction.

There are several rules that make it easier for a person to adapt to a change in the time zone. If the time zone change occurs for a limited time, it is advisable to maintain a close to normal work and rest schedule. If, on the other hand, work is to be performed in a new place that requires maximum effort, it is necessary to gradually change the work and rest schedule in advance, adapting it to the new time zone.

### **Conclusions:**

Thus, having knowledge about biological rhythms, the doctor, and according to his recommendations, the patient himself, can plan certain therapeutic and preventive measures, the implementation of which will prevent the occurrence of manifestations of desynchronosis.

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