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Conclusion. The study made it possible to clarify the list of psychological and psychophysiological methods, the indicators of which can be considered as CS predictorsin operators, which increases the objectivity of its assessment and development forecasting.

RAT BONE TISSUE IN CONDITIONS OF LIMITED MOTOR ACTIVITY

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It's believed that there are two main sources of regulators of mechanical transduction of bone tissue - exogenous gravitational forces and endogenous muscle forces. But, there is no convincing evidence for a leading role in the regulation of bone metabolism of muscle strength. This fact determines the novelty of the proposed study. The aim of the work is to assess changes in the mechanical properties of rat bones with a decrease in the physical component of movements and a decrease in their total number (hypokinesia), and in the other case - the tonic component and muscle load, support (hypodynamia).

Restriction of the motor activity of rats was achieved by placing them in pencil cases. By moving the partition, the volume of the box was changed according to the size of the animal. The hanging method according to Morey-Holton modified by Ilyin and Novikov was used as a model of gravity unloading. All experiments were performed in compliance with bioethical standards.

The bones were weighed, the density was estimated, the geometric parameters were measured, and then the three-point bending tests were carried out.

The results showed that in the case of antiorthostatic suspension and hypokinesia, unidirectional changes occur – loss of strength and stiffness of the femur and humerus and an increase in the ulna and tibia in adult animals. It was also shown that the femurs lost bone mass faster than the lower legs. For the young rats, it was shown that a loss of both strength and stiffness of the bone, also more pronounced in the femur and humerus. The data show that the mechanical properties of bone decrease significantly under hypokinesia.

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MODELING OF BONE ORGANS UNDER THE INFLUENCE OF EXTERNAL FORCE FACTORS

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It is known that bone formation is defined by exogenous gravitational forces and endogenous muscle forces. On another way, the question of the quantity of influence of each factor on bone remodeling is still ongoing. Wherein, the mathematical formulation of Wolf's law is known. The aim of the work is to evaluate in numerical experiments the influence of various force factors on the formation of a bone tissue organ.

The femur was used as a model. The initial geometry was modeled by two cylinders smoothed by spheres, with an evenly distributed material. For the resulting geometry, geometric and anatomical parameters were introduced. Three problems were formulated: pure impact of mass forces, the impact of support forces, and impact of muscle forces. The solution was produced numerically based on the finite element method and projection methods. The general numerical model was subjected to nondimensionalization.

As a result of modeling, a clear shaping of the femur was revealed: the formation of the tubular component of the long bone, strengthening of the material in the area of the Adams arch, the formation of the greater and lesser trochanters. As a result of modeling, the characteristic forms of the femur were revealed depending on the external influence.

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FEASIBILITY STUDY OF HABITAT DESIGN COMMONALITIES FOR MARS TRANSIT AND SURFACE MISSIONS

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This paper discusses the feasibility of developing a Mars surface habitat with capabilities that present certain commonality with in-space transit habitat architectures. The presented study follows mission requirements that are defined in NASA's