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Modern Models for the Living Organism's Functioning at Normal and Pathological Conditions

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Our large experience of treatment patients in coma - apallic syndrome (AS) and the analysis of restoration of their functions in the rehabilitation process made us interested in the aspect of estimation of reserve potential of the human organism and capacity of self-restoration with numerous and deep damages in the brain, multi-injuries. Our considerations we tried to present in the next models from minimum capability to maximum adaptation.

A minimal model. The human body could be an initial stage for modeling the living system, which is structurally formed, has all organs but not all are functioning. In most cases very this model could be as a standard for modeling any comatose states. Our results have shown that most patients with AS had satisfactory blood, urine tests etc. It says that a living organism was statically preserved, however from dynamic positions it was not able to function adequately. This means that considering the simple model we have a structurally preserved body, but is not capable to function - a body in shock (coma with expressed disbalance in functioning of vitally important organs).

A chaotic model. Now we will complicate the model - a body start functioning as a chaotic system, organs and systems chaotically work in their autonomous background mode. This model reminds an orchestra that keeps training without a bandleader before a concert. Chaos of sounds of different instruments could be heard. Sometimes occasionally they fall together in euphony. The model of initial resuscitation can be considered by the example of an organism which begins to "wake up " from shock.

A model of the control decentralization. The next model is a variant of resuscitation, there is a start for rhythmic work of the heart and breathing, however there are no minimum signs of the brain

functioning, which clinically are shown by changing of phases "sleep-cheerfulness". That is so-called heavy artillery (heart, breathing) started in the automatic mode, however the leading organ - the brain is not able to restore its higher hierarchical function. The model can be associated with the state of apallic syndrome.

Thus, 3 models - coma, resuscitation and apallic syndrome can be in the basis of the process of mathematical modeling, as the most primitive, and the next models of "little" and "large" consciousness, self-service, social and professional adaptation describe more complicated levels of the human organism's functioning.