

## **AN HYPOTHESIS REGARDING A KEY ROLE OF ALTERATIONS OF BODY HEAT CONTENT IN THERAPEUTIC EFFECTS OF PHYSICAL THERAPY AGENTS**

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Commonly used physical therapy agents (PTAs) are heat, electricity, light, massage, exercise, water. They have a therapeutic effect (TE) in patients with very different diseases. Why? Because, at least: (1) different diseases can have something common in their pathogenesis; (2) different PTAs can have something common in mechanisms of their influence. What is this common in mechanisms? To exert an influence on the organism, PTAs need to transfer an energy into the body; there are no body's reactions without this energy intake. What kinds of energy are to be transferred by PTAs? Almost always, these are thermal, electromagnetic, and mechanical ones. When absorbed by body tissues, thermal energy simply heats them (either this heating is registered or non-registered by our tools - no matter, in principle; anyway it takes place!). Electromagnetic and mechanical energies, being absorbed by tissues, have there some work to do; it relates to dislocations/shifts/recharges of microstructures. This work is inevitably accompanied with dissipation of a part of the energy as a heat. What is more, all non-dissipated energy will obligatorily be converted, sooner or later, in the most degraded form of energy - thermal one. Thus, any influence of PTAs is leading to a visible or invisible, immediate or delayed alteration of heat content of the body (AHCB). According to the principles of thermal physiology, a perturbing heat must only be taken off the body using appropriate reactions of thermoregulation. Body heat exchange is dependent on even small inside and outside temperature perturbations (especially within thermoneutrality zone), and there is the fact of convergence of temperature signals to integrating neurons that gather an information from large areas of the organism (Ivanov, 1990). How is this related to a TE of PTAs? I have hypothesized the following four stages of a PTAs TE appearance (Korobov, 1999): (1) any PTAs impact is accompanied by a transient AHCB; (2) due to an AHCB, appropriate thermoregulatory responses have been launched; (3) vital functional systems (cardiorespiratory, neural, endocrinological, bioenergetic) become involved in the reaction since the thermoregulatory system uses them to realize its effector activity; (4) as a result of a number of AHCB (i.e. - of thermal adaptation), a beneficial modification (optimization) of activity of the vital systems takes place including processes of salutogenesis. As a possible way of interrelation between a pathogenesis and thermoregulatory alterations, the phenomenon of depressing the thermoregulation using hypoxia (Giaja, 1938) may be instanced. Based on the fact that hypoxia is an attribute of any pathological process, and assuming that thermoregulatory reactions can, on the contrary, exert an effect on hypoxia, we may expect a TE of PTAs thermal stimulatings. In conclusion, it may be hypothesized that a transient AHCB is the primary and prime act of developing a TE of all known PTAs.

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