

## History of hyperthermia and electro-medicine

**Prof. Dr. Seung Cheol Kim<sup>1</sup>, Prof. Dr. Woong Ju<sup>1</sup>, Prof. Dr. Andras Szasz<sup>2,3</sup>**

*(1) Department of Obstetrics & Gyneocology, College of Medicine Ewha Womans University, Mok-Dong Hospital, Seoul Korea (South)*

*(2) Department of Biotechnics, Faculty of Engineering, St. Istvan University, Budapest, Hungary*

*(3) Oncotherm Group, Germany*

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Introduction: Hyperthermia was one of the very first treatments in human medicine, having 5 thousand years history. Of course it had a sacral meaning at the beginning, and Hippocrates was convinced about its overall efficacy, telling when hyperthermia (fire) does not help, than the disease has to be declared as incurable. Our objective is to follow the development of the heat-therapies by selection important moment from its history.

Discussion: Heat was applied to locally affected parts of the body and to its entirety by means of hot water, steam, sand, and mud baths. Natural hot air caverns connected with volcanic sources. The first known oncotherapy by heat was made by an Egyptian priest/physician Imhotep in the 5<sup>th</sup> century BC. He had infected tumors before surgically removing them, which was in fact the very first immune approach as well.

By the development of the medical knowledge, more and more heat applications were applied in practice. Hippocrates told later: "Give me the power to produce fever and I will cure all diseases". His followers in the line were Aurelius Cornelius Clesus and Rufus of Ephesus, who believed on the curative effect of fever. The progress was continuing in the middle ages, when the ablation techniques (burn out the tumor) and hot-bathes were in practice, while step-by step the temperature measurement was worked out. The first clinical thermometer was introduced only late: Sir Clifford Allbutt did it in 1868. This was the start of the modern history of heat-therapies, which was characterized with such famous names like Virchow, Busch, Warren, Coley and the Nobel-laureate Wagner-Jauregg. The technical revolution of the heat therapies was when the modern microwave heating was developed, and applied in medicine. This temperature based focused deep heating became one of the line (focused loco-regional heating), while the other was the whole body heating with various methods. In local heating the paradigm is to reach the appropriate temperature locally. The main representatives of this techniques are the Brucker (French) BSD-Medical (USA), Thermotron (Japan), Alba (Italian).

Other line of the development was parallel: the electromagnetic treatments in cure of cancer. The first famous name was D'Arsonval. His method had fantastic popularity at the turn of the 19<sup>th</sup>-20<sup>th</sup> centuries. Numerous devices were developed and applied widely, but the expected breakthrough result was missing. Entirely new line was started with Professors Rudolf Pekar, Bjorn Nordenstrom and Xin You Ling. They used the galvanic electric current to treat cancer. Their method had delivered remarkable results.

Based on the best knowledge of the heat- and electro-therapies, combine them with the most modern fractal physiology Oncotherm was established in 1988. This had opened a new paradigm in the field. Instead of the necrosis, the immuno-specific answers were forced supporting the natural protective and defending mechanisms of the human body. A large number of various devices were developed, and presently working worldwide.

Conclusion: Oncothermia is a direct follower of the ancient heat-therapies combined with the modern bioelectromagnetic and fractal physiologic knowledge. This new paradigm is feasible to reach new heights in the historic war against cancer.