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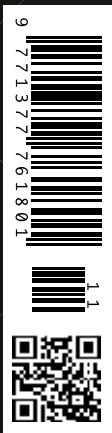
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Hyperthermia. An amplifier for radiation therapy

Hyperthermia can further enhance the therapeutic outcomes of radiation and chemotherapy, while keeping side effects at a minimum. A treatment method with many advantages.



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What is hyperthermia?

Hyperthermia is the intentional overheating for therapeutic purposes, either throughout the body or in individual organs. The method of directly and precisely targeting individual body regions with hyperthermia systems is referred to as regional hyperthermia. The interventional aim of hyperthermia is to increase the temperature in the deep-seated areas of the relevant body region to be treated.

Celsius42 has particular expertise in the development of regional deep hyperthermia systems. Two noninvasive electrodes heat up a tumour region to over 40°C in order to boost and intensify the efficacy of chemotherapy or radiation.

When is hyperthermia primarily used?

The technology is currently used in oncology because cancer cells are more heat-sensitive than healthy cells. Hyperthermia can increase the efficacy of radiation and chemotherapy with low side effects.

The applied heat promotes the oxygenation and blood circulation in the therapeutic area. This effect makes cancer cells more sensitive to radiation. The more oxygen accumulates, the greater the efficacy of radiation in destroying or minimising cancer cells. Hyperthermia therapy enables the surrounding healthy tissue to regenerate faster. In many cases, that offers the option to individually vary a patient's radiation doses without additional side effects.

Hyperthermia also promotes the uptake of cytostatic drugs and their metabolism in the cell in chemotherapies. These effects for radiation and chemotherapy have been clinically proven in numerous studies. Moreover, hyperthermia boosts and activates the immune system, modelled after fever as a natural defence mechanism of the human body. In this way, the body and

hyperthermia join forces in the fight against the disease.

Is hyperthermia an equal partner in the arsenal of medical treatment options?

We are well on our way. Over the past 20 years, global studies have shown that combined therapies that include hyperthermia guarantee significantly better outcomes in terms of tumour control and survival rates. However, the excellent documentation of hyperthermia's benefits is not yet reflected in day-to-day medical practice. Doctors don't yet consider hyperthermia as a natural therapy complement.



Innovative technology. Maximum therapeutic success.

How can this reluctance be explained?

Paradoxical as it may sound, it may be associated with the truly simple and comprehensible plausibility of hyperthermia. When it comes to cancer

treatment, we are used to thinking in complex procedures with multiple side effects. In contrast, hyperthermia is natural, low in side effects, and effective. We have to relearn this combination when it comes to life-threatening illnesses such as cancer. Gentle approaches can indeed produce maximum success.

Physicians are increasingly reporting positive experiences with hyperthermia. Meanwhile, patients are stepping up the pressure by requesting concomitant hyperthermia treatment. All of this results in greater lobbying for hyperthermia—a lobby for healing and success.

What are the risks associated with hyperthermia?

Hyperthermia scores exceedingly high in risk-benefit analysis. The principle is based on the body's own intelligent processes and is so gentle that there are hardly any side effects.

“ GENTLE AND EFFECTIVE.
HYPERTHERMIA AS AN AMPLIFIER
FOR CHEMOTHERAPY
AND RADIATION ”

Risks are present when hyperthermia is not applied properly. That makes training, experience reports and publicity especially important. Hyperthermia should not be used too soon after surgery and the treatment areas must be kept free of sweat to avoid burn injuries.

Limitations also exist in certain body areas such as the abdomen, where temperature is difficult to measure, or in morbidly obese patients.

Are there other application areas of hyperthermia in addition to oncology?

Chronic inflammation processes are an application area where hyperthermia offers promising solutions. Such processes weaken the immune system and can trigger carcinogenic processes over the course of decades. We also have first positive studies on the treatment of fatigue and acute depression as well as neuropathic pain.

Which developments do you expect?

In my mind, this is primarily a question of structured and publicised effectiveness control. The more study outcomes and research results demonstrate



The patient. Always the centre of attention.

how valuable and effective hyperthermia can be in the fight against cancer, chronic inflammation and depression, the broader its reach will become.

One decisive impulse would be the recognition of hyperthermia by all health insurance providers. The first positive steps in this regard have already been reported in countries such as Switzerland.

What are the future prospects for hyperthermia?

Hyperthermia must become accessible to all patients with the corresponding diagnoses. That means acceptance by hospitals and health insurance providers. Broader use will generate funds, which in turn will benefit hyperthermia research and the associated technological innovation.

Physicians and patients should be able to benefit from this gentle and effective technology. A technology that has been proven in studies to increase the efficacy of radiation therapy by a factor of 1.2 to 5, as in radio-modification.

I am certain that hyperthermia will prove itself in clinical practice over the coming years and will become an established method – as a strong partner in the fight against cancer. ■

Further information:
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