

Hyperthermia Treatment

Texas Oncology's radiation oncologists use advanced treatment planning systems and technology tools in the fight against radiation-resistant and recurrent cancer. One of the more specialized tools available is called hyperthermia treatment, which attacks tumors with the additive effects of precisely delivered therapeutic heat.

Heat and Cancer Cells

Researchers have found that elevated temperatures within malignant tumors can disrupt and destroy a cancer cell's ability to repair DNA damage from radiation. As the cancer cells try to reproduce, they die, and the tumor shrinks. Normal cells recover without long-term damage. Hyperthermia therapy uses heat applied directly to the cells to destroy cancer cells or make them more sensitive to enhance the effects of more conventional treatments, such as chemotherapy and radiation.

Hyperthermia works by a multitude of mechanisms, including:

- Disabling the intracellular DNA repair enzymes that allow the cancer to withstand radiation damage.
- Causing the cells to release heat shock proteins, thus stimulating the immune system to fight the cancer.
- Causing more favorable disruptions in tissue blood flow to allow radiation and/or chemotherapy to work more effectively.

Administration of Hyperthermia

Hyperthermia therapy is administered by the Pyrexar-500, a powerful microwave system that delivers heat energy directly into the cancerous tumor at temperatures between 104-113 degrees Fahrenheit. This treatment destroys malignant tumor cells while minimizing damage to the surrounding healthy tissue. When used as part of a combined treatment regimen, hyperthermia improves the effectiveness of other cancer treatments, such as radiation and chemotherapy.

Treatment Methods

Hyperthermia therapy can be delivered locally or regionally.

- **Local hyperthermia:** Heat is applied to a small area or directly to a tumor through microwaves, radiofrequency, and ultrasound. For external treatment, applicators are placed on, or inside, the patient in the appropriate target area and the tumor is heated through the energy source. For tumors located deep inside the body, such as the prostate, heat is delivered to the tumors through probes placed in the specified area.
- **Regional hyperthermia:** Heat is applied to a large area, such as a body cavity, organ, or limb, which is targeted and treated using microwave or radiofrequency energy. This raises the temperature in the area, which may be "seeded" with tumor cells.

Hyperthermia treatment technology has been approved by the U.S. Food and Drug Administration to treat malignant tumors on the surface of the body (superficial) or deep in the body (interstitial). Hyperthermia is used for cancers of the skin such as melanoma and squamous and basal cell carcinomas, which may have recurred after conventional treatment. In addition, it is used for select cancers of the rectum, prostate, and cervix. It is covered by most insurances and Medicare.

About Texas Oncology

With more than 550 physicians and 300 locations, Texas Oncology is an independent private practice, a member of The US Oncology Network, that sees more than 71,000 new cancer patients each year. Founded in 1986, Texas Oncology provides comprehensive, multidisciplinary care, and includes Texas Breast Specialists, Texas Center for Proton Therapy, Texas Colon & Rectal Specialists, Texas Imaging & Infusion Center, Texas Oncology Surgical Specialists and Texas Urology Specialists. Texas Oncology's robust community-based clinical trials and research program has contributed to the development of more than 100 FDA-approved cancer therapies. Learn more at [TexasOncology.com](https://www.texasoncology.com).

Sources: American Cancer Society, National Cancer Institute, National Center for Biotechnology Information, and Pyrexar Medical



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