

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 cancer 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.

It works by a multitude of mechanisms, for example:

- Disabling the intracellular DNA repair enzymes that allow the cancer to survive radiation damage
- Causing the cells to release heat shock proteins, thus stimulating the immune system's fight against the cancer
- More favorable disruptions in tissue blood flow, allowing 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. In the case of 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 large tissue areas, such as a body cavity, an organ, or a limb, where the entire area or region is targeted and treated using microwave or radiofrequency energy that 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, or squamous and basal cell carcinomas, some of which 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

Texas Oncology is an independent private practice with more than 500 physicians and 210 locations across the state. Meeting the oncology needs of Texans for more than 35 years, the practice includes Texas Center for Proton Therapy, Texas Breast Specialists, Texas Oncology Surgical Specialists, Texas Urology Specialists, and Texas Center for Interventional Surgery. As a lead participant in US Oncology Research, Texas Oncology played a role in the development of more than 100 FDA-approved therapies. For more information, visit www.TexasOncology.com.

Sources: American Cancer Society, National Cancer Institute, and Texas Oncology Physicians



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Updated: 10/27/21