

## ***Hyperthermia Treatment***

Texas Oncology's radiation oncologists use advanced treatment planning systems and technology tools in the fight against radio-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 can disrupt and destroy a cancer cell's ability to repair DNA damage from radiation within malignant tumors. As the cancer cells try to reproduce, they die, and the cancer tumor shrinks. Normal cells recover without the long-term damage. Hyperthermia therapy uses heat applied directly to the cells to destroy cancer cells or to enhance the effects of more conventional treatments, such as chemotherapy and radiation.

It works by a multitude of mechanisms, for example:

- Disabling 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 alterations in tissue perfusion, allowing radiation and/or chemotherapy to work more effectively

### **Administration of Hyperthermia**

The hyperthermia therapy is administered by the Pyrexar-500, a powerful microwave system that delivers heat energy directly into the cancerous tumor at temperatures between 107-111 degrees Fahrenheit. This treatment has been shown to destroy 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 microwave, 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 where the entire area or region is targeted and treated using microwave or radiofrequency energy that raises the temperature to the area, which may be "seeded" with tumor cells.

The hyperthermia treatment technology has been approved by the U.S. Food and Drug Administration to treat malignant tumors on the surface or just below the surface of the skin. Hyperthermia is used for select cancers of the breast, as well as sarcoma, melanoma, adenocarcinoma, rectal, brain, cervical, bladder, or squamous or basal-cell carcinoma, some of which have recurred after conventional treatments. It is covered by most insurances and Medicare.

*Sources: American Cancer Society and National Cancer Institute*

