

# UMMC A LEADER IN OFFERING THERMAL THERAPY

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With numerous historical anecdotes indicating that thermal therapy — incorporating heat into cancer-zapping treatments — was used by ancient Egyptians, it's a fact that the University of Maryland helped steer the therapy in the modern age and continues to guide the way in adopting new technologies in the field.

Zeljko Vujaskovic, M.D., Ph.D., a professor of radiation oncology at the University of Maryland School of Medicine, who leads Thermal Oncology Services at the University of Maryland Marlene and Stewart Greenebaum Cancer Center (UMGCC),

is an internationally recognized leader in the field of thermal therapy (or hyperthermia) cancer treatment. But he looks to the legacy created by UMGCC's J. Eugene Robinson, a pioneer of hyperthermia research from the 1960s until his death in 1983 and a strong proponent of combined radiation and hyperthermia for cancer therapy.

After a decade-long hiatus in offering thermal therapy, UMGCC again picked up the torch last year, treating dozens of patients with a variety of malignancies. Currently, it's the only center in the Baltimore/Washington, D.C., region to offer this type of treatment.

"It has been known for decades that just elevating the temperature of a tumor in cancer patients has beneficial effects in terms of making the tumor more vulnerable to radiation and chemotherapy," explains Dr. Vujaskovic, who served as past president of the Society for Thermal Medicine. "If you heat the tumor in combination with other treatments, you observe a better response. Heating tumors actually inhibits the ability of cancer cells to repair their own DNA, and that's what makes them more sensitive."

## MANY BENEFITS, FEW DOWNSIDES

Heating tumors to temperatures just slightly higher than the human body — somewhere between 104° and 113° F — provokes other beneficial reactions in cancer cells, he says. Higher temperatures increase blood flow to tumors, an important point since blood carries not only oxygen, but also drugs — improving drug delivery.

"Tumor tissue usually has a very low oxygen concentration, which makes

DR. VUJASKOVIC'S clinical and research work focuses on understanding the mechanisms associated with radiation normal tissue injury, identifying potential biomarkers predicting individual patient risk for injury, and developing novel therapeutic interventions/strategies to prevent, mitigate or treat radiation injury.



it resistant to chemotherapy and radiation," Dr. Vujaskovic says. "We can reverse that with heat, making it more sensitive."

Additionally, heat stimulates anti-cancer immune responses in the body, including the prevalence of natural "tumor killer" cells that "present the tumor to our immune surveillance system in the body to start fighting that tumor," he explains.

"Our immune system is suppressed by chemotherapy, but heat stimulates an immune response. So these are all beneficial effects in general."

Along with its many benefits, thermal therapy also has few, if any, downsides, Dr. Vujaskovic says. Heat is non-toxic, and the most prevalent side effect is slight skin blistering, which occurs in about 10% of patients.

## EXTERNAL TECHNIQUE TREATS VISIBLE CANCERS

The most common thermal therapy technique performed at UMGCC is known as external thermal therapy, or ETT, which is recommended for visible, superficial or palpable tumors

## KEY POINTS:

- Heating tumors during cancer treatment used in ancient Egyptian times
- UMGCC's J. Eugene Robinson helped pioneer modern thermal therapies from 1960s through 1980s
- UMGCC only center in region offering these treatments
- External thermal therapy used on superficial, palpable cancers
- Interstitial thermal therapy used on internal tumors in abdomen



“Right now, ETT and ITT are used predominantly for patients with locally advanced disease who are not surgical candidates, or those with a recurrence of their tumor,” he says. “It’s essentially for patients who have pretty much exhausted their treatment options and are now coming to desperate situations. A lot of physicians would say, ‘There’s nothing we can do.’ But we can help those patients.”

### THERMAL THERAPY EXPANDED

Dr. Vujaskovic recently expanded the use of thermal therapy at UMGCC to a patient without cancer whose severe warts — fueled by immunosuppressing steroids taken to control another condition — threatened the amputation of her thumbs. The success of the treatment may prompt other non-malignant applications of thermal therapies.

“This lady couldn’t grab anything with her hands, and she went to another institution where she was treated with radiation as a last resort,” he recalls. “Within one month, the warts came back with a vengeance, growing like cauliflower on her fingers and thumbs.

“We decided to use radiation combined with ETT,” he adds, “and now, six months after treatment, she’s completely clear of warts on her arms and thumbs. The heat may have done something to make the radiation work better, killing the virus more effectively.”

From start to finish, thermal therapy patients referred by community providers will be met and assisted by a dedicated concierge team member during their visit to ensure a positive experience and successful reconnection back to their provider. +

such as breast cancer that has recurred on the chest wall, head and neck cancers, melanomas or sarcomas. This method uses applicators placed over tumors on the body’s surface, heating them with microwave energy in one-hour sessions performed two or three times during the weeks the patient receives radiation therapy.

Dr. Vujaskovic notes that ETT is particularly useful for recurrent breast tumors on the chest wall, which may be emotionally challenging to patients because these lesions are often oozing, open wounds. About 30% of patients with locally advanced breast cancer such as this also have metastatic disease in other parts of their bodies, he says.

“They constantly see in the mirror this cancer eating their skin,” he says. “The psychological impact can be devastating for women.”

In addition to safety, ETT offers these breast cancer patients proven benefit. Clinical research comparing radiation only to the use of thermal therapy plus radiation shows that thermal therapy

increases complete control of chest wall lesions from 25% to 60%.

“It’s a durable response, too,” he says. “Their quality of life is improved, they feel something is working, and you give them hope. Some live 10 or more years after this treatment.”

### INTERSTITIAL THERAPY PROBES DEEPER

Less common but still valuable is a technique known as interstitial thermal therapy, or ITT, which delivers heat directly to tumors inside the body that are difficult to treat with ETT. Using up to 24 small microwave antennas placed into tumors, along with sensors to measure temperature and control treatment, ITT is typically combined with various types of radiation for recurrent cancers inside the abdomen.

While European research has examined the use of ITT as first-line therapy — delivered before cancers have spread or recurred — in the United States, the technique is typically used after other treatments have failed, Dr. Vujaskovic says. But that doesn’t diminish the value of thermal therapies here.



For more information or to arrange a consultation, please call **410-328-6080**.