



NEW TECHNOLOGY PINPOINTS TUMORS, SPARES HEALTHY TISSUE

UVA's Department of Radiation Oncology has a new tool in its armamentarium. Tomotherapy, or "slice therapy," takes its name from tomography or cross-sectional imaging. The tomotherapy system at UVA, one of the first in the nation, brings together intensity-modulated radiotherapy (IMRT) with CT capabilities for localizing the patient's tumor immediately before each treatment.

This increased accuracy in anatomical targeting combined with highly conformal radiation delivery spares healthy tissue surrounding the tumor from high doses of radiation. Tomotherapy can be applied to several different types of cancer.

During tomotherapy, radiotherapy is delivered via a linear accelerator that rotates on a ring gantry around the patient, while the patient lies on a table that moves continuously through the ring. UVA's Helical Tomotherapy system utilizes a 6 MV linear accelerator to produce high-energy photons to destroy cancer cells and a 6 mm multi-leaf collimator that provides exceptional beam modulation for extremely conformal or targeted radiation treatments. Conformal radiation

means that the high-dose radiation wraps around the tumor volume with fewer side effects to patients.

"Tomotherapy is state-of-the-art IMRT combined with the advantage of daily targeting of the tumor via a CT scan," says Maria Kelly, M.D., chair of the Department of Radiation Oncology. "UVA has an established IMRT program that builds on a tradition of state-of-the-art technology to treat malignancies," Kelly says. "Tomotherapy is just the latest treatment device to become part of our continuing tradition of cutting-edge therapy for cancer. We quickly move new technology into clinical use so that patients benefit." (See sidebar on tradition of excellence.)

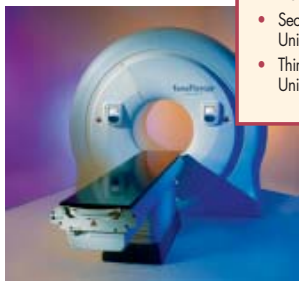
UVA's Helical Tomotherapy unit has a wide range of clinical utilization. It is capable of producing a 5mm-by-6mm radiation beam that could be used for radiosurgery of sub-



UVA's Tradition of Excellence in Radiation Oncology

- Second gamma knife in the United States
- One of the first CT simulators in the United States
- First in Virginia with a linear accelerator
- Second multi-leaf collimator in the United States
- First in Virginia with B-mode acquisition and targeting (BAT)
- Third stereotactic linear accelerator in the United States
- Continuous Quality Program since the 1980s

Maria Kelly, M.D., chair of the UVA Department of Radiation Oncology, has overseen many new additions to the tools used to treat cancer patients. Pictured on left, the addition of a tomotherapy system, one of the first in the nation, marks a new chapter in highly accurate delivery of radiotherapy.



Tomotherapy Shapes Beams to Fit Dimensions of Tumors



Image courtesy of Chester Ramsey Ph.D., Thompson Cancer Center, Knoxville, TN

Tomotherapy plan for prostate cancer showing high radiation doses (red shading) can be confined to the target prostate while sparing the rectum, which receives much smaller doses (blue shading) and prevents rectal side effects and complications.

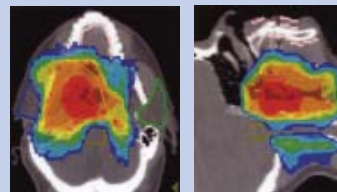


Image courtesy of Tomotherapy Inc.

For carcinoma of the tonsil, tomotherapy is a good tool for sparing the parotid glands and ensuring that the dose to the spine, brainstem, sub-mandibular gland and oral cavity/lip are well below tolerance.

timer tumors as well as a 5 cm fan beam that could be used for total body irradiation targeting the bone marrow prior to bone marrow transplant. Kelly says she expects the tomotherapy technology would someday be used for treatment of tumors adjacent to the lungs, bowels, eyes, salivary glands and kidneys, which are all very sensitive to radiation injury.

"This system holds hope for treating lung cancer patients with less toxicity than currently exists," Kelly notes.

The UVA Department of Radiation Oncology is a Helical Tomotherapy Clinical Center of Excellence and will be an important member of an international research consortium that will examine the clinical benefits of helical tomotherapy. This means that patients at UVA will rapidly benefit from the clinical

experiences derived from many of the top academic centers in North America.

Kelly stresses that overall UVA offers many effective, state-of-the-art treatment options for cancer, in particular prostate cancer. Radiation treatments for prostate cancer include 3-dimensional radiation, IMRT, CT simulation with image fusion for planning, B-mode acquisition and targeting, and brachytherapy. UVA also offers prostate patients the da Vinci Surgical System, a robotic system that employs tiny instruments; nerve-sparing prostatectomy; and cryotherapy.

For more information about tomotherapy and other radiation oncology treatments at UVA, please call Maria Kelly, M.D., chair of the Department of Radiation Oncology, at 434-982-0777 or email mk2f@virginia.edu.

HEART MATTERS

UVA Heart and Vascular Center Named in 100 Top Hospitals

The University of Virginia cardiology and heart surgery program has been selected as one of the 100 Top Hospitals in the Cardiovascular Benchmarks for Success Study by Solucient.

Each year, Solucient, a national health care database company, recognizes 100 hospitals across the nation for their performance in treating patients with cardiovascular disease.

"Being recognized as one of the top 30 teaching hospitals in the country for delivering high-quality and efficient care to heart patients is a tribute to the hard work and dedication of a team of physicians, nurses, technicians and support staff," says George A. Beller, M.D., chief of the UVA Division of Cardiovascular Medicine.

Beller, along with Irving Kron, M.D., chair of UVA's Department of Surgery and chief of its Division of Thoracic and Cardiovascular Surgery, and the departments' staff members all contribute to improving the lives of heart patients by conducting groundbreaking research, partnering with regional physicians and hospitals to give highly skilled care and finding better ways to train tomorrow's health care leaders.

