THE UAB COMPREHENSIVE CANCER CENTER

To refer a patient to the UAB Radiosurgery Program or schedule appointments, contact UAB MIST at 1.800.822.6478.

For more information about the UAB Radiosurgery Program, visit uabmedicine.org/radiosurgery or uab.edu/radonc.
A Message From the Chairs

The 2011 UAB Radiosurgery Program Outcomes booklet continues our effort to provide our friends and colleagues with an informative picture of how we are handling our mission to provide care to the citizens of Alabama and the region. In UAB’s culture of collaboration, the Department of Radiation Oncology and the Department of Surgery developed the UAB Radiosurgery Program. This special approach to patient care provides every patient requiring stereotactic radiation surgery with a reasoned and thorough evaluation of their situation, resulting in a recommended treatment plan. Treatment outcomes are completed as patients are treated and followed. The goal is to optimize treatments and add to the body of knowledge of the field.

As this inter specialty relationship has flourished, the program has maintained growth and the outstanding score in patient satisfaction you will see in this report.

As an update, we are pleased to report that the linear accelerator based radiosurgery program moved into a new building, the Hazelrig-Salter Radiation Oncology Center, in March 2010, providing our patients and their families with a more comfortable, attractive setting. Included in the new space is one of the first TrueBeam radiation devices in the world. TrueBeam is living up to its promise of delivering precise radiosurgical treatments in significantly less time than previously possible with other machines. For our patients, reduced treatment time means more accurate delivery and increased comfort. The improvement in delivery accuracy reduces the potential for collateral damage to nearby healthy tissue.

This type of continually updated technology, a faculty with more than 253 total years of experience in radiosurgery, and a clinical team that understands and supports our patients’ individual needs all combine to pursue our goal of eventually curing cancer.

We invite your questions and comments. If you wish to learn more about the progress of our program, you may contact the Department of Radiation Oncology at 205.934.5670.

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Thoracic Radiosurgery

Lung cancer is a disease that is too well known by too many people. Only 100 years ago, lung cancer was considered a rare and uncommon entity [1]. Medical literature at that time regarding lung cancer was limited to small studies and individual reports of an uncommon disease [2-5]. Now, scarcely three generations later, it is a leading cause of death and morbidity in the United States, with approximately 196,000 cases diagnosed each year. Of those, 158,000 will die from their disease.

Surgical resection of lung cancer has long been considered the standard of care when attempting to cure patients when the disease is diagnosed early and in a well-localized fashion. Unfortunately, many patients present with advanced disease that is not amenable to operative resection. Other patients, who otherwise would have resectable disease, are not candidates for surgery because of comorbidities such as heart disease. For patients who are unable to undergo surgical resection, high-dose radiation that is delivered daily for several weeks has been used in an effort to cure. This approach has produced less than satisfying results [6, 7]. Now, with the advent of thoracic radiosurgery, outcomes that are more comparable to surgery are possible [8].

Radiosurgery is not a new technology. It has been used for many years to treat cancers in the central nervous system [9]; however, its use in the lung has been

Thoracic radiosurgery is an exciting and promising new therapy for patients with medically inoperable early-stage lung cancer. The ultimate role that thoracic radiosurgery will have in the treatment of lung cancer is yet to be defined. Large clinical trials evaluating its efficacy are exploring new indications for this treatment, and the long-term effects remain unknown. What is clear is that thoracic radiosurgery does offer a chance for cure in patients who previously would have had limited treatment options.

Last year, the UAB Department of Radiation Oncology was among the first institutions in the world to deploy a TrueBeam™ system for image-guided radiotherapy and radiosurgery. Designed to treat a moving target with unprecedented speed and accuracy, TrueBeam incorporates numerous technical innovations that dynamically synchronize imaging, patient positioning, motion management, and treatment delivery during a radiotherapy or radiosurgery procedure.

One important feature of the TrueBeam system is its high-intensity mode, which makes it possible to deliver doses up to four times faster than can be accomplished with other radiosurgery machines, significantly shortening treatment times. Cutting down treatment time by a factor of two to four makes a big difference to patients and can enhance treatment accuracy by leaving less time for tumor motion during dose delivery. Using the TrueBeam system, a standard intensity-modulated treatment that would typically take 10 minutes can be completed in less than two minutes. Simple RapidArc treatments, which used to be done in 2 minutes, can now be completed in 1 minute.

UAB clinicians have used the TrueBeam system to deliver fast, highly precise treatment for tumors of the brain, spine, lung, liver, prostate, and pancreas. The system is extremely flexible, allowing for selection of an optimal treatment approach in each case, from intensity-modulated radiotherapy (IMRT) to stereotactic radiosurgery (SRS), from stereotactic body radiotherapy (SBRT) to volumetric arc (RapidArc®) therapy. In addition, a new gated RapidArc capability allows it to be used with tumors that are subject to respiratory motion, such as many tumors of the lung or liver.

"Intelligent" automation further speeds treatments with an up to fivefold reduction in the number of steps needed for imaging, positioning, and treating patients. A nine-field IMRT treatment that would have required 52 separate steps or mouse-clicks using earlier generations of technology can now be completed in less than ten steps in under two minutes. A nine-field SBRT treatment that would have required 49 steps or mouse-clicks using earlier generations of technology can now be completed in less than six steps in less than two minutes. A nine-field SRS treatment that would have required 46 steps or mouse-clicks using earlier generations of technology can now be completed in less than five steps in less than two minutes.

One such patient is a 67-year-old man with a lung cancer recurrence in his native pancreas. For many years, the patient had undergone a variety of treatments for his cancer, including surgery and chemotherapy. In recent years, his cancer had spread to his pancreas, and the only treatment seemed to be a highly involved surgical procedure that was unlikely to be successful. The patient had heard of thoracic radiosurgery as a potential option, and he was referred to UAB to see if he was a candidate.

The team recommended thoracic radiosurgery and the patient agreed to proceed. He underwent a series of treatments using the TrueBeam system, which allowed for fast, highly precise delivery of radiation to his tumor. The patient tolerated the treatments remarkably well, and his tumor responded favorably to the treatment.

Thoracic radiosurgery is a fast-growing field, and the UAB team is at the forefront of its development. The results are promising, and the potential is exciting. As the field continues to evolve, we look forward to seeing what the future holds for thoracic radiosurgery and its role in the treatment of lung cancer and other thoracic malignancies.
As a result, UAB radiation therapists can focus more of their attention on the patient and on the progress of the treatment.

The precision of a TrueBeam system is measured in increments of less than a millimeter. This accuracy is made possible by the system’s sophisticated architecture, which establishes a new level of synchronization between imaging, patient positioning, motion management, beam shaping, and dose delivery technologies. Accuracy checks are performed every 10 milliseconds throughout the treatment. More than 100,000 data points are monitored continually as a treatment progresses, ensuring that the system maintains a true isocenter, or focal point of treatment.

The TrueBeam imager, which is used to localize a tumor just prior to treatment, can generate 3-D anatomical images in 60 percent less time, with a 25 percent reduction in X-ray dose to the patient, when compared with earlier generations of technology.

We are excited about this powerful and fully integrated high-end system and regard it as a significant step forward in our ongoing commitment to providing patients with access to the best of available contemporary radiosurgical technology.
Quality and Outcome Measure

**CRANIAL RADIOSURGERY PROCEDURES**

The Leksell Gamma Knife is a highly advanced technology that delivers 201 tightly focused cobalt radiation beams to one point in the brain. The radiation beams and doses are so precise they affect only the targeted tissue and relatively spare the surrounding healthy tissue.

**SBRT PROCEDURES**

Stereotactic Body Radiation Therapy (SBRT) uses a high dose of radiation shaped to conform to the patient’s tumor. It delivers radiation to the intended target and avoids healthy tissue. Small tumors are accurately identified and located with precise coordinates.

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2011 Radiosurgery Noteworthy Publications


Prendergast BM, Popple RA, Spencer SA, Minnich DJ, Dobelbower MC. Flattening filter-free mode improves clinical efficiency for pulmonary and hepatic SBRT in American College of Radiation Oncology Annual Meeting. San Diego, Feb 2011.


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2010 Radiosurgery publication mistake: The following publication is not from our Dr. Sharon Spencer-UAB.

Faculty Presentations

MICHAELE DOBELOEVER, MD, PhD
Thoracic Radiosurgery, How we got here (and what we think we know)
8th Annual Simon Kramer Institute Oncologic Symposium, Simon Kramer Institute of Therapeutic Oncology, New Philadelphia, PA
Audience: Physicians with practices related to oncology
May 22, 2010

JOHN B. FIVEASH, MD
Initial Clinical Experience with TrueBeam
ASTRO Convention, UCSD, San Diego, CA
October 30, 2010

Eclipse/TrueBeam Clinical Demonstration
University of Florida Radiosurgery Course, Orlando, FL
December 10, 2010

Advancing Technology for Therapeutic Gain (Clinical Forums CME)
Denver, CO
January 26, 2011

CHRISTOPHER D. WILLEY, MD, PhD
SBRT and Clinical Applications in Radiation Therapy
Eastern Shore Oncology Conference, Salisbury, MD
November 12, 2009

4D IGRT – Certain Phase of Respiration
American Association of Medical Dosimetrists Region IV Dosimetry Conference, Burlington, VT
October 24, 2009

Varian Clinical Solutions Forum, Old Greenwich, CT
March 12, 2009

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