



2009 OUTCOMES

UAB Radiosurgery Program
The University of Alabama at Birmingham

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CONTRIBUTING TEAM

PARTICIPATING PHYSICIANS

Michael C. Dobelbower, MD, PhD

John Fiveash, MD

Barton L. Guthrie, MD

DATA COLLECTION SUPPORT

Jordan DeMoss

Teresa Honeycutt

Kimberly Hummel

Mark Bassett

EDITORIAL TEAM

Ivan Brezovich, PhD

John Brinkerhoff

Valeria Pacheco-Rubi

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RADIOSURGERY OUTCOMES

The Radiosurgery Program at UAB is proud to introduce the first of its Outcomes book series designed for a health care provider audience. The outcome book outlines a thorough description of the program and provides valuable data on patient volume outcomes, and quality and outcome measures on selected treatment procedures and disease sites. To get more information about the UAB Radiosurgery Program, visit the following web sites:

Department of Radiation Oncology
www.uabradonc.com

Department of Surgery
<http://main.uab.edu/uasom/2/show.asp?durki=23194>



Kirby I. Bland, MD

Chairman, Department of
Surgery

The University of Alabama at
Birmingham

A MESSAGE FROM **KIRBY I. BLAND, MD**

CHAIRMAN, DEPARTMENT OF SURGERY

We are delighted to introduce our first UAB Radiosurgery Program Booklet. The UAB Radiosurgery Program began in 1992, and since then we've successfully treated thousands of patients and we remain one of the busiest Radiosurgical centers in the world.

Our goal is to offer every patient compassionate, superior care by maximizing the value of our encounter with the patient. The UAB Radiosurgical Program accomplishes this in number of ways. First and foremost is the unique collaborative effort between surgeons and radiation oncologists who are members of UAB's Comprehensive Cancer Center. This unique approach provides every patient with a thoughtful and thorough evaluation of their situation and therapeutic options. Second is the broad array of contemporary radiosurgical technology that is available to optimally carry out the treatment plan. Finally, we follow-up with each patient and focus on outcome such that treatments can be optimized as we understand more about the value of our approach to the spectrum of disorders you'll see in this report.

The results of our attention to patient needs, and maximizing our value to the patient, is evidenced by our growth and consistently high patient satisfaction depicted in this report. We take this as an indication of excellent service to our patients and the community. IT is our mission to continue along this path to improved patient care.

Sincerely,

Kirby I. Bland, MD
UAB Department of Surgery

A MESSAGE FROM
JAMES A. BONNER, MD
CHAIRMAN, DEPARTMENT OF RADIATION ONCOLOGY

This is our first annual UAB Radiosurgery Program Outcomes Booklet. I am hopeful that our 2009 version provides you with some valuable insights into the clinical progress occurring in the fields of stereotactic radiosurgery (SRS) and stereotactic body radiation therapy (SBRT). This Booklet is shared with physicians related to cancer internationally.

Patients who place their trust in our care are our greatest priority. And so it is our mission to combine excellence in clinical care, research, and education toward the pursuit of curing cancer for our patients. As an institution, we have chosen to develop a multidisciplinary approach to the treatment of patients with complicated tumors requiring stereotactic radiation therapy. This program, as part of the UAB Comprehensive Cancer Center, has successfully integrated sub-specialized faculty and staff from both the Department of Radiation Oncology and the Department of Surgery. This structure will lead to further innovations, revolutionizing the diagnosis and treatment of patients with complicated cancer processes. Tumors that were untreatable just a few years ago can now be treated successfully with SRS or SBRT.

Furthermore, our faculty and staff understand that the diagnosis of cancer is a life-altering event for both the patient and their loved ones. Having the most advanced technology available with a highly experienced faculty is not enough. Our team of associates makes a point to understand our patients' specific needs and subsequently provides compassionate care and social support services to ease these trying times.

As you explore this Outcomes Booklet, I hope you find it to be a valuable tool as you learn more about the progress in SRS and SBRT and how it can help you and your patients. For further information, you may contact the Department of Radiation Oncology at (205) 934-5670.

James A. Bonner
Merle M. Salter Professor and Chair
UAB Department of Radiation Oncology



James A. Bonner, MD

Chairman, Department of
Radiation Oncology

The University of Alabama at
Birmingham



Approximately **3,939** patients have been treated including Crainial Radiosurgery and SBRT.

HISTORY

In April 1992, the first patient in Alabama was treated at UAB with stereotactic radiosurgery for a primary brain tumor. Physics team members modified a standard linear accelerator to provide the extra precision required for this exacting procedure. Since radiosurgery was in its early stages and commercial turnkey equipment was not available, many of the instruments and devices were designed and manufactured in the laboratory. The institution-designed equipment provided for sub-millimeter precision, the highest reported at that time. The 1992 multidisciplinary team included neurosurgeons and radiation oncologists.

With the expansion of this modality to AVMs and brain metastases, the number of patients benefiting from radiosurgery increased rapidly to the point that a system dedicated to CNS treatments became necessary. In 1995, a Model B Gamma Knife was added to the UAB

Radiosurgery Program. The first Gamma Knife was replaced in 2004 with a more advanced system that included automatic positioning, the Model C. With over 3,827 patient treatments performed by the end of 2008, the UAB Gamma Knife center is one of the most experienced programs in the nation.

Further progress in linac technology and image guidance made it possible to extend stereotactic radiosurgery to areas beyond the brain. In 1999, UAB placed the Nomos-Peacock system into operation and initiated its Stereotactic Body Radiation Therapy (SBRT) program. This device was the first FDA cleared Intensity Modulated Radiation Therapy (IMRT) device available; UAB was the first program to treat a patient with IMRT in Alabama and thirty-second to treat with this device in the world. In 2001, a system based on a multileaf collimator (MLC) with sliding window technology replaced the Nomos-

¹ Brezovich, Ivan, Prem Pareek, Eugene Plott, and Richard Jennelle. "Quality Assurance System to Correct for Errors Arising from Couch Rotation in LINAC-Based Stereotactic Radiosurgery." *Int. J. Radiation Oncology Biol. Phys.* Vol. 38 (1997): 883-890.

SYSTEM TO CORRECT FOR ERRORS DURING ROTATION IN LINAC-BASED STEREOTACTIC RADIOSURGERY

DR. J. S. JENNELLE, M.D., W. EUGENE PLOTT, PH.D. AND
UNIVERSITY OF ALABAMA AT BIRMINGHAM, BIRMINGHAM, AL

Development of a quality assurance (QA) system that would provide
for stereotactic radiosurgery (LBSR).
Our QA system is a novel device (Alignment Tool) for expedient
excursions (wobble) during rotation. The Alignment Tool replaces
that is used with the field light of the accelerator to indicate
patient treatment and analyzed together with
used to place

Peacock system substantially shortening treatment delivery time. This program allowed UAB faculty to treat tumors located near critical organs such as the spinal cord, heart, and gastrointestinal tract.

Installation of the fourteenth TomoTherapy unit in the world, in 2004, was another first in Alabama by UAB. The TomoTherapy unit was the first clinically viable CT-based image guidance platform for radiation therapy. The ability to image a tumor immediately before the application of the therapy beam, targeting precision was greatly enhanced increasing the physician's ability to treat complicated tumors with radiation.

Building on its longstanding experience with Radiosurgery and Stereotactic Body Radiation Therapy, UAB became the first institution in the US to treat patients with the newly developed Volumetric Arc Therapy (VMAT,

RapidArc-Varian Medical Systems) in May 2008. The system provides for high-quality CT images with greatly shortened treatment times reducing the possibility of patient movement between imaging and radiation delivery. UAB physicists were instrumental in the final research stages of development and testing of RapidArc before FDA approval.

Currently, UAB offers a variety of advanced technologies for frame-based or frameless Radiosurgery and Stereotactic Body Radiation Therapy for tumors located anywhere in the body. The Treatment plans are designed and evaluated by a multidisciplinary team of radiation oncologists, neurosurgeons, and physicists with decades of experience in radiosurgery. The radiosurgery team at UAB continues to evaluate, pursue and develop the most advanced technology available for cancer treatment in the world.

STEREOTACTIC RADIOSURGERY

UAB has a unique approach to the determination of the optimal plan for each individual patient. A team of subspecialists from multiple disciplines, radiation oncology, surgery, medical oncology, GYN oncology, radiology, and pathology, evaluate multiple parameters related to an individual patients' cancer and derive a treatment plan based on the most current literature. If radiosurgery is indicated, the patient will be referred to the UAB Radiosurgery Program. Relying on their 15 years of experience treating patients with complicated tumors, the physicians will design a patient specific plan and implement it with the most advanced technology available.

The Radiosurgery Program at UAB is a recognized national leader in providing quality comprehensive care and using state-of-the-art technology. Starting in 1992 with a linear accelerator, the program improved treatment delivery with the addition of the Leksell Gamma Knife. Soon thereafter, the program expanded its treatment procedures by introducing Stereotactic Body Radiation Therapy. SBRT enabled physicians to treat spinal and lung tumors with high precision. But, not only technological leadership on treatment therapies contributes to the program's success, UAB Radiosurgery has an extensive and highly qualified group of neurosurgeons and radiation oncologists with many years of experience in this field that specialize in more than one disease site.

Cranial radiosurgery at UAB offers patients with certain disorders a safe, effective alternative to conventional neurosurgery. The program offers cranial radiosurgery on the Leksell Gamma Knife unit at UAB Highlands. The highly advanced technology allows UAB specialists to treat Arteriovenous Malformations (AVMs), benign and malignant brain tumors, some vascular malformations, and other functional brain disorders without an incision and without damaging healthy tissue.

UAB Radiosurgery offers SBRT on the TomoTherapy unit at The Kirklin Clinic at Acton Road and also on the Varian iX linear accelerator with RapidArc at the Wallace Tumor Institute. This highly advanced radiation therapy allows physicians to deliver high-energy x-ray beams precisely to the tumor targets throughout the body. Physicians can treat with higher doses of radiation with and reduce the toxicity, fewer side effects and shorter treatment times as compared to other treatment modalities. Lung treatments are a most common SBRT treatment site, but spine, liver, and other sites can also be treated using SBRT.

UAB offers cranial radiosurgery and SBRT as part of its comprehensive cancer program recognized for its excellent care, innovative research, expert specialists and advanced technology.

OUTCOME MEASURES FOR PATIENTS TREATED

QUALITY & OUTCOME MEASURES

STEREOTACTIC RADIOSURGERY AT UAB

OUTCOME MEASURES FOR PATIENTS TREATED

