



Medical College of Georgia

# Neuroscience Outlook

Department of Neurosurgery Newsletter

Volume 1, Issue 2 - Winter 2005

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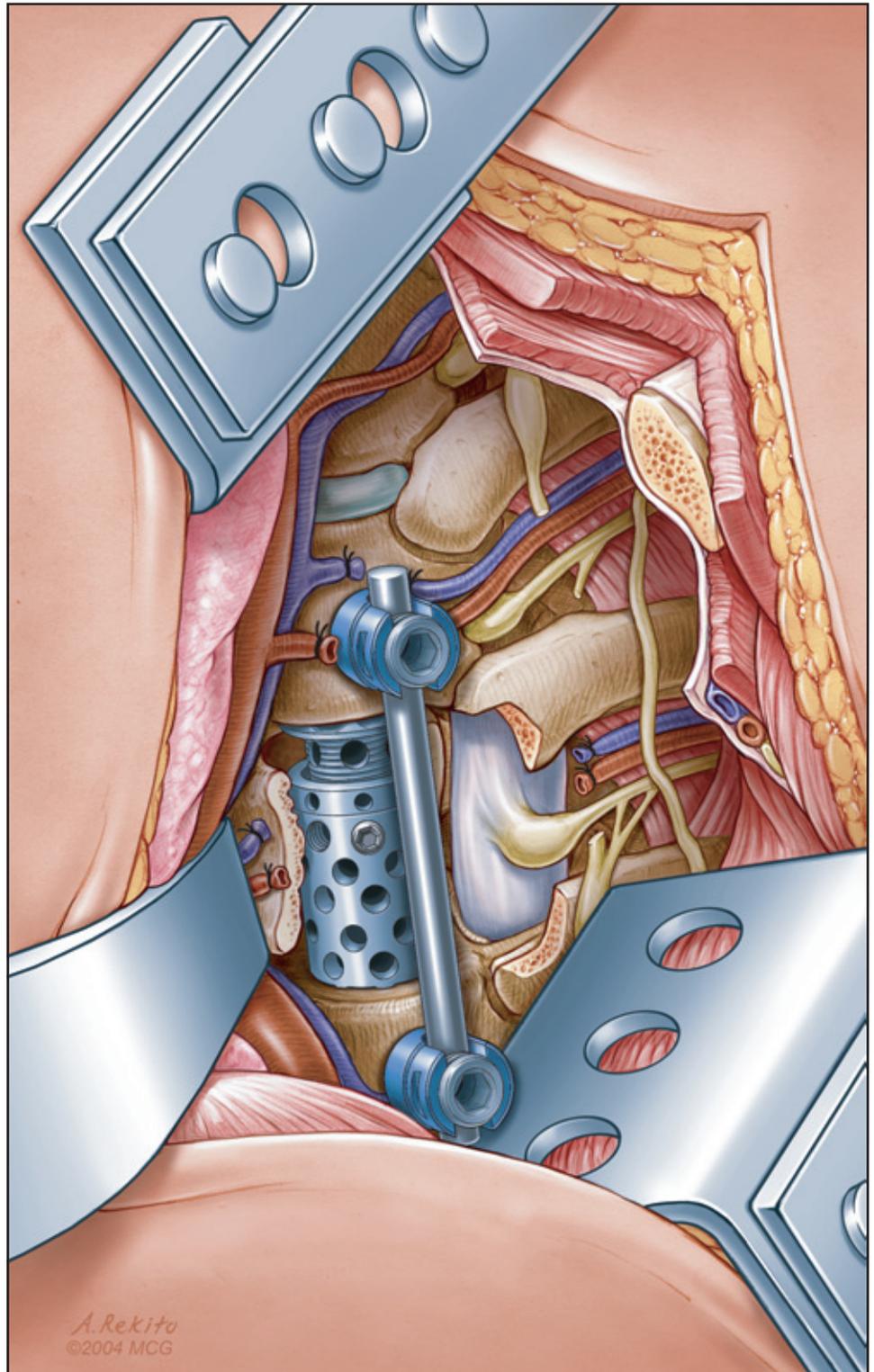
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[www.mcg.edu/som/neurosurgery](http://www.mcg.edu/som/neurosurgery)



**MCG**  
Neuroscience Center

Clinical Spotlight: Multidisciplinary Treatment of Vascular Spinal Tumors

## **Chair's Message**

Welcome to the Winter 2005 edition of The MCG Neuroscience Outlook. We have had a busy and productive six months in the Department of Neurosurgery since our last publication. Although we are absorbing significant cuts in departmental and residency program support from the School of Medicine, we have been fortunate to continue to improve our departmental clinical income by over 20% year to date through the hard work and innovative practice-building of our faculty. This has allowed us to fund the start-up of three new faculty practices this fiscal year.

We have had a successful start to our Aiken, South Carolina practice. We practice out of the offices of Aiken Neuroscience and have hospital staff privileges at Aiken Regional Medical Centers. Right now, Dion Macomson, M.D. and I are sharing the Aiken clinical practice duties with help in the call coverage by David Floyd, M.D. and Ellen Shaver, M.D. We continue to recruit for new faculty members for a full-time practice in Aiken. In addition, we are very close to establishing an MCG neurosurgery practice at St. Joseph's Hospital in Augusta with only some administrative details to clean up.

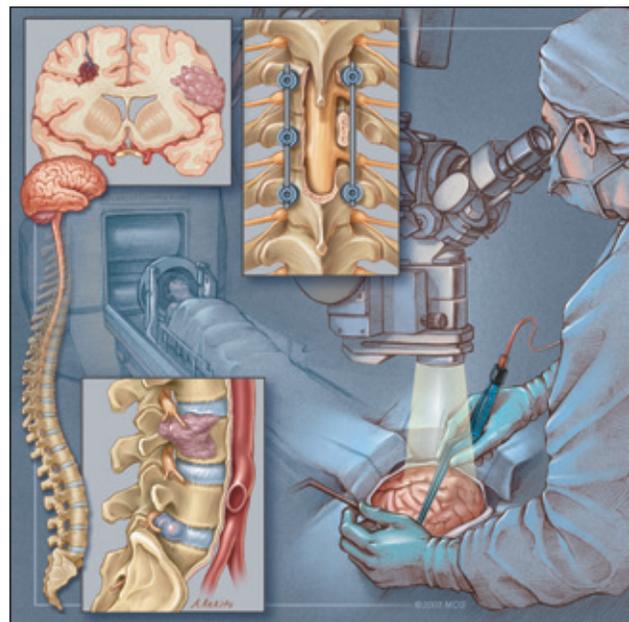
We have started performing actual experiments in the Human Brain Laboratory. The Human Brain Laboratory is designed to provide a rich resource for the study of human epilepsy and to extend findings from the animal models to the human brain. Our initial goal is to conduct research on human brain tissue that has been removed from patients with intractable epilepsy to better understand the pathophysiology of human epilepsy. It is my hope that the Human Brain Laboratory will eventually develop into a core lab for neuroscientists at MCG who desire to work with living human brain tissue. Our early work has already led to a short presentation at the Georgia Neurosurgical Society fall meeting.

We are actively recruiting for new faculty members. We are aggressively pursuing several outstanding candidates for our position in surgical neuro-oncology. The successful candidate will be responsible for building a regionally prominent surgical practice in brain tumors as well as partnering with Alfredo Voloschin, M.D. (medical neuro-oncologist in our department) to develop the MCG Brain Tumor Center as well as clinical and basic research programs in neuro-oncology. We are also recruiting general neurosurgeons to become significant participants in the community-based neurosurgery practices that we are developing.

After a long absence, we will reinstate an annual MCG neurosurgery meeting, which in the past was the alumni reunion. We will change the name and the format to make this an interesting and worthwhile meeting for all, and CME credits will be available for attendees. All MCG neurosurgery alumni and the neurosurgeons in our region will be invited. More on this will follow, but our plans are to have this in March 2005. We are certainly open to any suggestions to make this a great meeting for everyone interested.

Finally, I would like to thank William Mayher III, M.D. for his generous contribution to start our Department of Neurosurgery Research and Education Fund. Billy is well known to most of you. He is a friend and advisor to our department, and we look forward to a continued strong relationship with him.

**Mark Lee, M.D., Ph.D., F.A.C.S.**  
Professor and Chair  
Department of Neurosurgery



## Clinical Spotlight

### Multidisciplinary Treatment of Vascular Spinal Tumors

#### Clinical Features

Although most vertebral tumors represent metastatic foci, there are a large number of tumors that originate within the spine. Aneurysmal bone cysts, giant cell tumors, plasmacytomas, osteoid osteomas, and hemangiomas are all seen in the spine. Spinal hemangiomas are commonly seen on MRI imaging of the spine. Although the vast majority of hemangiomas are asymptomatic and do not require treatment or even follow-up imaging, a tiny percentage of these lesions may produce symptoms and require treatment. We present the case of a hemangioma that eroded through the cortical bone and entered the spinal canal resulting in spinal cord compression and myelopathy.

#### Case Presentation

The patient is a 44-year-old female who presented with progressive lower extremity sensory loss and weakness associated with midback pain. MRI demonstrated a hemangioma in the T9 vertebral body with epidural and paraspinal extension. Axial imaging shows that the epidural component of the tumor compresses, deforms and deviates the thoracic spinal cord. The patient has had progressive symptoms over a period of months including urinary retention and hyper-reflexia with spontaneous clonus.

#### Treatment

The optimal treatment of this will involve decompression of the tumor with reconstruction of the T9 vertebral body. These lesions can be extremely vascular and massive hemorrhage has been encountered with resection of hemangiomas. To reduce bleeding at surgery, preoperative spinal angiography and embolization was performed. Surgery was performed via a left sided thoracotomy with removal of a segment of the 8th rib, exposing the entire T9 vertebral body and paraspinal tumor. A general surgeon skilled in anterior exposures of the spine performed the thoracotomy. This allowed for direct exposure of the pathology without the need to work at an angle or an unnecessarily large thoracotomy. Fluoroscopy, identification of paraspinal tumor and coils from the embolization procedure enabled confirmation of the correct level. The paraspinal tumor was removed first and was noted to be completely devascularized by the embolization. The T9 vertebral body was then removed including the posterior cortex and posterior longitudinal ligament. The epidural tumor was completely removed allowing visualization of the dura. Although moderate bleeding was encountered, the embolization clearly reduced the blood loss and allowed for a careful and complete decompression of the spinal cord. Reconstruction was performed with a vertical distraction cage (Vertebral Body Replacement Cage). This cage was packed with autograft chips from the removed rib. After insertion, the cage was distracted to ensure a secure fit and was then held in place with bone screws and a rod (XIA-Anterior). When seen at her 3-month follow-up, the patient showed significant improvement of lower extremity strength and bladder control, and was healing well from her thoracotomy.

(Haroon F. Choudhri, M.D. and Jeffrey A. Stone, M.D.)

VBR® Cages are manufactured by Ulrich Medical, Ulm Germany. SpineSource is the exclusive US distributor of the VBR® Cage

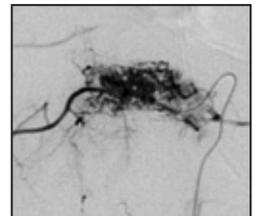
XIA® Pedicle Screws and anterior Spinal System are manufactured and distributed by Stryker Spine, Allendale, NJ



T9 vertebral body hemangioma



Tumor and cord compression



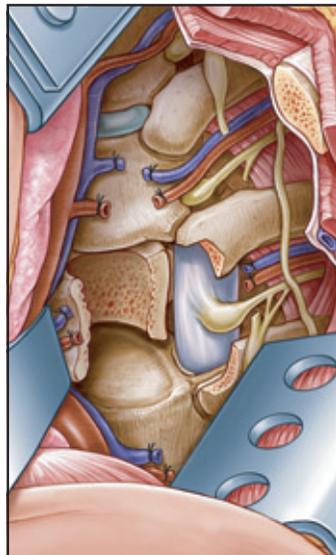
Pre-embolization angiogram



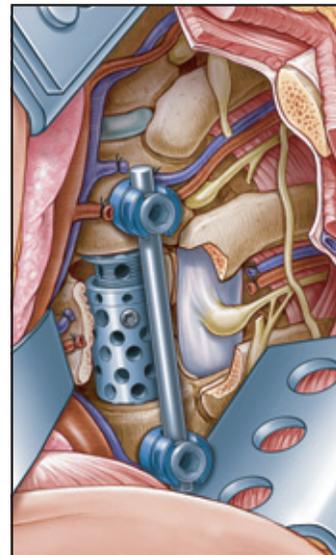
Post-embolization angiogram



T9 vertebral body hemangioma



S/P decompression



S/P reconstruction



AP post-op X-ray

## Clinical Spotlight

### Closed-Loop Stimulation in the Control of Focal Epilepsy

A clinical trial of an implantable device designed to abort seizures was begun at MCG this summer. An abstract of the results to date is shown below.

#### Closed-Loop Stimulation in the Control of Focal Epilepsy

Between June 2004 and December 2004, six closed-loop stimulation systems called the Responsive Neurostimulation Systems (RNS) have been implanted at the Medical College of Georgia as part of a multi-institutional investigative study of the effect of programmed stimulation of epileptic foci in patients with drug resistant focal epilepsy. The RNS consists of a cranially implanted pulse generator, one or two four-contact surface depth electrodes, and a programmer, shown in Figure 1. The RNS pulse generator continuously analyzes the patient's electrocorticograms (ECoGs) and triggers electrical stimulation when ECoG characteristics programmed by the clinician as indicative of electrographic seizures or precursor epileptiform activities are detected. The pulse generator then stores diagnostic information detailing detections and stimulations including multi-channel stored ECoGs.

The RNS programmer communicates transcutaneously with the implanted pulse generator when initiated by a clinician. The RNS programmer can download diagnostics and stored ECoGs for review. It can be used to analyze stored ECoGs to adjust the detection settings. The RNS programmer includes an electrophysiology study mode that can be used by the clinician to test stimulation settings for tolerability and view real-time ECoGs. It can then be used to program detection and stimulation parameters into the implanted pulse generator. Figure 2 shows an electrographic seizure, which was aborted with pre-programmed, automated high frequency stimulation.

To date, follow-up on the implanted cases has shown no serious adverse events. Preliminary stimulation results are encouraging.

(Joseph R. Smith, M.D., Anthony M. Murro, M.D., Jeffrey Politsky, M.D., Yong D. Park, M.D., Kostas N. Fountas, M.D., Patrick D. Jenkins, P.A., David Greene)

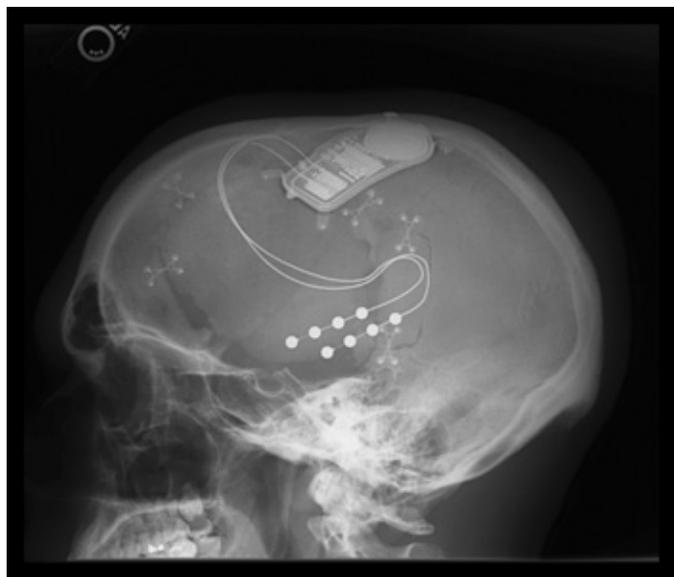


Figure 1. Cranially implanted pulse generator and surface contact electrodes

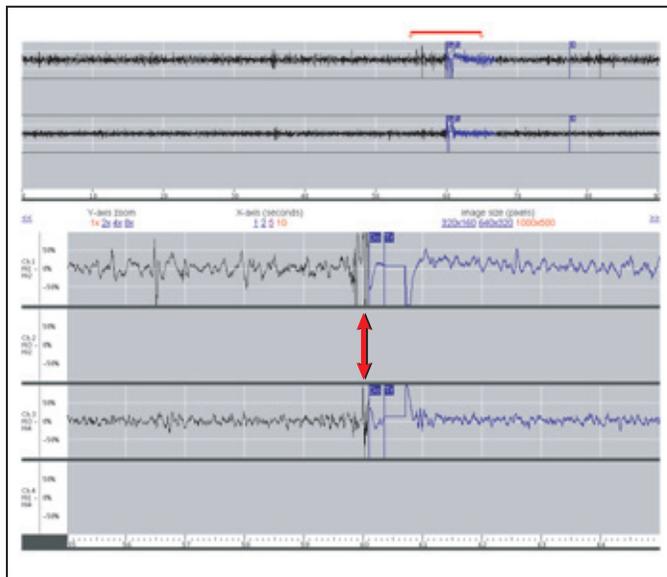
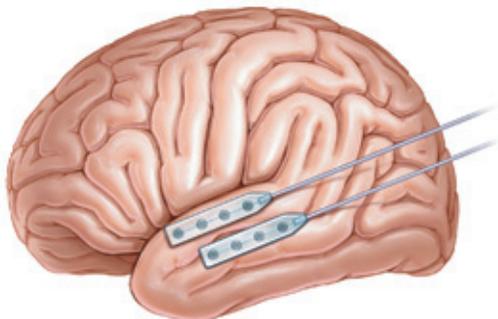


Figure 2. Electrographic seizure (aborted with high frequency stimulation)  
Arrow points to stimulation burst



Joseph Smith, M.D.



Patrick Jenkins, P.A.

## Department News

### Comprehensive Brain Tumor Program Established

Our Neuro-oncology program continues to rapidly evolve. Under the direction of Dr. Alfredo D. Voloschin (medical neuro-oncologist recruited from the Massachusetts General Hospital) we have already established a weekly multi-specialty brain tumor board, adult and pediatric neuro-oncology clinics, a brain tumor support group, clinical trials, molecular targeted therapy and investigator initiated research protocols in collaboration with NIH and UPENN. Our mission is to provide quality clinical management and research to this largely underserved area. Currently, we are actively recruiting a surgical neuro-oncologist.

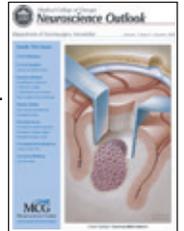
### Microsurgical Anatomy Lab Established

With the generous donation of a surgical microscope by the Zeiss company and the tireless assistance from David Adams, Director of the Anatomical Donation Program, we have established a microsurgical anatomy lab that will be used for research as well as resident education and training.



### Editorial Office Established

This fall, our department contracted Judy Wright, a full-time editor. Judy brings to the department seventeen years of experience as a technical writer and editor in Denver, Colorado. Her background consists of a B.S. in Technical Communication. We are all tremendously pleased to have someone with Judy's expertise in our midst. The editorial office also includes Andy Rekito, M.S., Medical Illustrator, and Cargill H. Alleyne, Jr., M.D., Director.

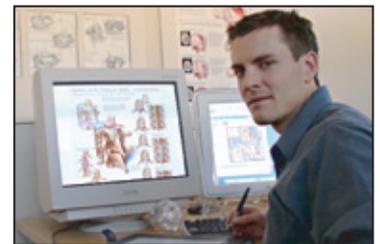


## Faculty Update

### Accomplishments and Recognition

Congratulations to **Andrew Rekito**, Assistant Adjunct Professor and Neuroscience Medical Illustrator, who won top honors at the 59<sup>th</sup> annual meeting of the Association of Medical Illustrators in Cleveland on July 28 - August 1. He won the distinguished Russell Drake award in medical line illustration and a Certificate of Merit Award in medical instructional color illustration.

**Dion Macomson, M.D.** co-authored the latter.



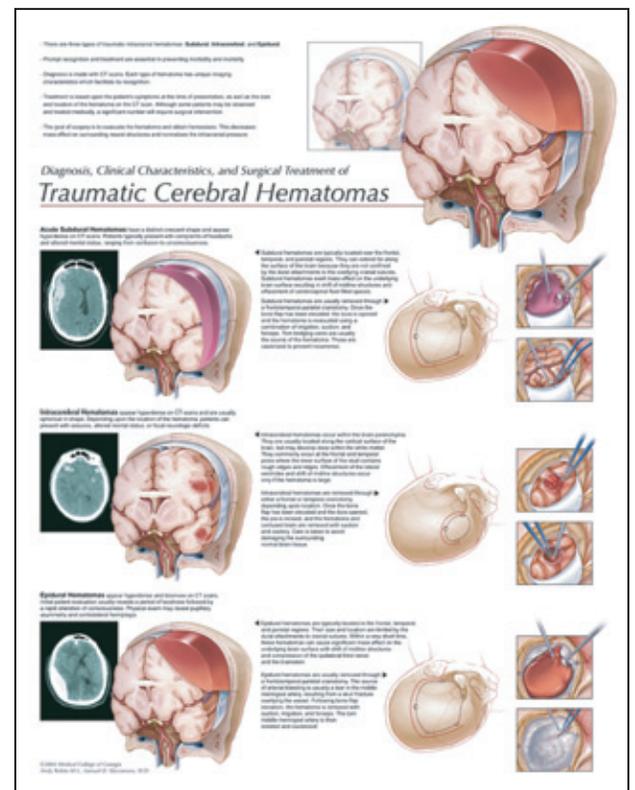
Congratulations to **Haroon Choudhri, M.D.** who recently received certification by the American Board of Neurological Surgery in November 2004.

**Mark Lee, M.D., Ph.D.** was elected chair of the Constitution and Bylaws Committee of the Southern Neurosurgical Society for 2004-2005.

**Cargill H. Alleyne, Jr., M.D.** served as Scientific Program Chair of the Georgia Neurosurgical Society for 2004-2005. The honored guest at the Fall meeting in Atlanta, GA was Dr. Gazi Yasargil.

**Cargill H. Alleyne, Jr., M.D.** and **Jeffrey Stone, M.D.** submitted a patent application (021501-001200US) with the University of Rochester entitled "Devices and Methods for Aneurysm Treatment."

**Ellen Shaver, M.D.** has recently demonstrated that peptide transduction of a biologically active peptide mimetic of HSP20 (PTD-pHSP20, AZX-100, patent pending) inhibits the development of vasospasm after SAH in a rodent model. She has teamed up with Dr. Colleen Brophy (founder of AzERx, an start-up company focusing on therapeutic engineered proteins). They plan to evaluate AZ-100 in large animal models of SAH and vasospasm and to initiate future human clinical trials.



## Resident Corner

### Accomplishments and Recognition

**John Tuttle, M.D.** won the Council of State Neurological Surgeons Resident Award. John presented his paper, which was co-authored with Bill Hamilton, at the Congress of Neurological Surgeons meeting in October. The presentation was entitled, "Health Care Financing 101: An internet based learning platform for nontraditional resident instruction on the economics of healthcare."

### Residency Program Update

#### RRC approves continued accreditation

In a correspondence dated September 2, 2004, the Residency Review Committee informed us that they had approved continued accreditation of our program based on our site visit last January. The committee requested a progress report by November 15, 2004 to address certain issues, all of which have been addressed.

#### Pilot evaluation system begun

In July 2004, the MCG Department of Neurosurgery was among a group of 19 programs that volunteered and completed the initial phase of the pilot testing of a new evaluation system. The competency assessment tools were devised by Dr. Deborah Benzil and Dr. Edward Benzel and presented at the May 2004 meeting of the Society of Neurological Surgeons. It incorporates the 6 ACGME competencies and a 360-degree evaluation process.

### Contributors to Resident Educational Fund

We thank **KLS Martin** company for its kind donation to the Resident Educational Fund.

We also thank **Neuro-Tec** for their generous donation of surgical instruments and a Zeiss surgical microscope for the Microsurgical Anatomy Lab.



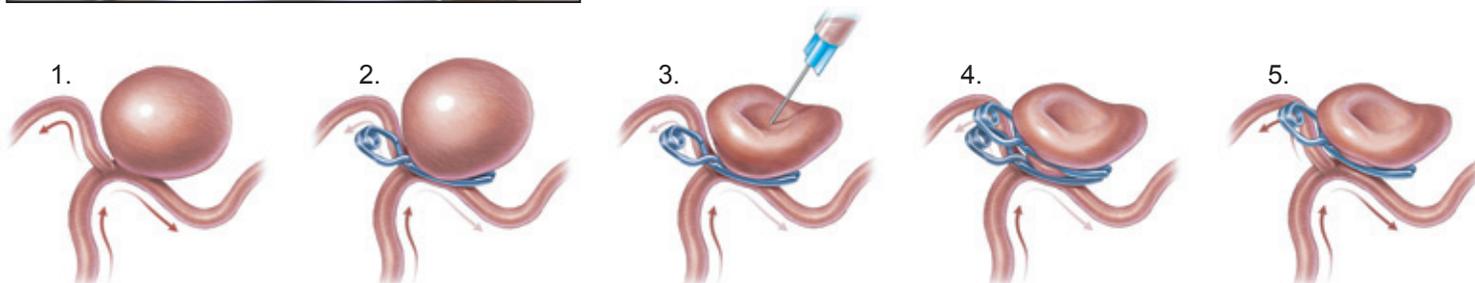
### Initiation of the Neurosurgery Research and Education Fund

**William Mayher, III, M.D.** provided the MCG Department of Neurosurgery with a check of \$25,000.00 to be used for the establishment of a research and education fund. We are deeply grateful for this generous sum from Dr. Mayher.



The following alumnus is also acknowledged for his contributions to the Resident Education Fund at the time of publication:

**Geoffrey Cole, M.D.**



## Presentations and Publications (July-December 2004)

### Presentations:

**Alleyne CH:** Recent advances in the treatment of cerebrovascular disease. Family Practice Grand Rounds. Medical College of Georgia, July 2004

**Kirov SA:** Rapid structural synaptic plasticity on mature hippocampal dendrites. 4th Forum of European Neuroscience, Lisbon, Portugal, July 2004 (Poster)

**Kirov SA:** Serial electron microscopy, confocal microscopy and two-photon microscopy as complementary tools for the study of synapses and dendritic spines in the central nervous system, Microscopy and Microanalysis Meeting, Savannah, Georgia, August 2004.

**Tuttle J, Hamilton W:** Health Care Financing 101: An internet based learning platform for nontraditional resident instruction on the economics of healthcare, Congress of Neurological Surgeons, October 2004

**Alleyne CH:** Anterior circulation aneurysms. Complication avoidance and pitfalls. Congress of Neurological Surgeons luncheon seminar, October 2004

**Alleyne CH:** New ideas on vascular malformations. Moderator, Section on cerebrovascular surgery II, Congress of Neurological Surgeons meeting, October 2004

**Macomson SD, Shaver EG, Harris VA, Winger JN, Brophy CM:** Protein therapy inhibits chronic vasospasm after experimental subarachnoid hemorrhage, Congress of Neurological Surgeons meeting, October 2004

**Kirov SA:** Comparison of synapse number and structure under homeostatic and Hebbian synaptic plasticity. 14th Neuropharmacology Conference. The Cytoskeleton and Synaptic Function, San Diego, California, October 2004 (Poster)

**Lobel DA, Lee MR:** Early release of tethered cord may benefit children with a history of imperforate anus, Congress of Neurological Surgeons meeting, October 2004

**Smith JR:** Neuropace trial, Congress of Neurological Surgeons meeting, October 2004

**Hamilton W:** Hospital Financial Outcomes of Establishing Comprehensive Stroke Programs: MCG Case Study. Active Communications, Inc, The National Conference on Developing and Designing Comprehensive Stroke Programs For Hospitals and Health Systems, Chicago, Illinois, October 2004

**Alleyne CH:** Stroke, its prevention and treatment. Tabernacle Men's Group, Augusta, Georgia, November 2004

**Rahimi S, Lee MR:** Citrobacter brain abscess in an infant: Case report and review of the literature, Georgia Neurosurgical Society meeting, November 2004

**Lee MR, Kirov S:** Functional imaging of human neurons derived from epileptic pediatric brain, Georgia Neurosurgical Society meeting, November 2004

**Tuttle J, Hamilton W:** Healthcare Management 101: An Internet-Based Learning Platform for Continuing Medical Education and Resident Instruction, Georgia Neurosurgical Society meeting, November 2004

**Tao C, Alleyne CH:** Needle decompression of large aneurysms during aneurysm clipping: Technical case reports, Georgia Neurosurgical Society meeting

**Lobel D:** Stem cell therapy: Pearls and pitfalls. Neurosurgery Grand Rounds, Medical University of South Carolina, December 2004

### Publications:

**Smith JR, Sillay K, Winkler P, King D:** Orbitofrontal epilepsy: electroclinical analysis of surgical cases and literature review. *Stereotactic Functional Neurosurgery* 82: 20-25, 2004

Fountas KN, King DW, Meador KJ, Lee GP, **Smith JR:** Epilepsy in cortical dysplasia: Factors affecting outcome. *Stereotactic Functional Neurosurgery* 82:26-30, 2004

**Kirov SA, Harris KM:** Serial electron microscopy and two-photon microscopy as complementary tools for the study of synapses and dendritic spines in the central nervous system. *Microscopy Microanalysis* 10(Suppl 2): 222-223, 2004

Dakwar E, Teja S, **Alleyne CH:** Sciatic neurolymphomatosis. *Neurology* 63: 1751, 2004

**Kirov SA, Goddard CA, Harris KM:** Age-dependence in the homeostatic upregulation of hippocampal dendritic spine number during blocked synaptic transmission. *Neuropharmacology* 47:640-648, 2004

Loring D, Meador K, Lee G, **Smith JR:** Structural versus functional prediction of memory change following anterior temporal lobectomy. *Epilepsy Behavior* 5: 264-268, 2004

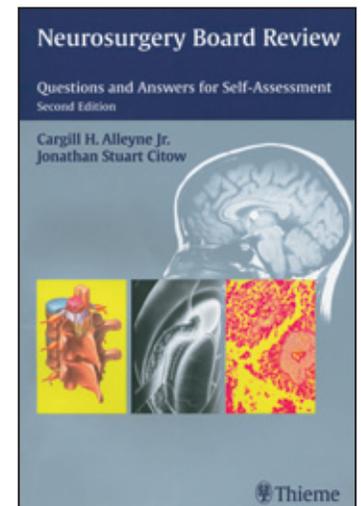
Fountas K, King D, **Jenkins P, Smith JR:** Nonhabitual seizures in patients with implanted subdural electrodes. *Stereotactic Functional Neurosurgery* 82: 165-168, 2004

Fountas K, **Smith JR:** Factors influencing surgical outcome in patients with nonlesional medically refractory epilepsy. *Epilepsia* 45 (suppl 7): 337, 2004 (abstract)

Lee KH, Park Y, Murro A, Politsky J, **Lee MR, Smith JR:** Prognostic implication of secondary hyperperfusion in the temporal lobe contralateral to the seizure focus in patients with temporal lobe epilepsy: subtraction SPECT study. *Epilepsia* 45 (suppl 7): 302, 2004 (abstract)

Liu Z, Park Y, Hessler R, **Lee MR, Lee KL, Smith JR, Murro A, King D:** Temporal lobectomy in children with medically intractable epilepsy: neuropathological, clinical features, and seizure outcome. *Epilepsia* 45 (suppl 7): 272-273, 2004 (abstract)

**Alleyne CH, Citow JS:** Neurosurgery Board Review: Questions and answers for self-assessment. Second edition. New York, Thieme Medical Publishers, Inc., 2004





Department of Neurosurgery  
 Medical College of Georgia  
 1120 15th Street  
 Augusta, GA 30912  
 706. 721. 3071

# Neuroscience Outlook

## Conference Schedule

All grand rounds take place on Friday in the 3 West amphitheater.

<b>Jan. 07</b>	8:00-9:00 ☐ Oncology	<b>Feb. 04</b>	8:00-9:00 ☐ Oncology	<b>Mar. 04</b>	8:00-9:00 ☐ Oncology
	10:00-11:00 Anatomy		10:00-11:00 Anatomy		10:00-11:00 Neuropathology
	11:00-12:00 Journal Club		11:00-12:00 Neuropathology		11:00-12:00 Anatomy
	12:00-1:00 ☐ Case Conference		12:00-1:00 ☐ Case Conference		12:00-1:00 ☐ Case Conference
<b>Jan. 14</b>	8:00-9:00 ☐ Oncology	<b>Feb. 11</b>	8:00-9:00 ☐ Oncology	<b>Mar. 11</b>	8:00-9:00 ☐ Oncology
	10:00-11:00 Neuropathology		10:00-11:00 Anatomy		10:00-11:00 Anatomy
	11:00-12:00 Anatomy		11:00-12:00 Journal Club		11:00-12:00 Journal Club
	12:00-1:00 Case Conference		12:00-1:00 Case Conference		12:00-1:00 Case Conference
<b>Jan. 21</b>	8:00-9:00 ☐ Oncology	<b>Feb. 18</b>	8:00-9:00 ☐ Oncology	<b>Mar. 18</b>	8:00-9:00 ☐ Oncology
	10:00-11:00 Radiology Review		10:00-11:00 Anatomy		10:00-11:00 Radiology Review
	11:00-12:00 Anatomy		11:00-12:00 Grand Rounds		11:00-12:00 Anatomy
	12:00-1:00 ☐ Case Conference		☐ CNS Infections-John Tuttle, MD		12:00-1:00 ☐ Case Conference
<b>Jan. 28</b>	8:00-9:00 Oncology		12:00-1:00 ☐ M&M	<b>Mar. 25</b>	8:00-9:00 Oncology
	9:00-10:00 Anatomy	<b>Feb. 25</b>	8:00-9:00 Oncology		9:00-10:00 Anatomy
	10:00-11:00 Grand Rounds		9:00-10:00 Anatomy		10:00-11:00 Grand Rounds
	☐ Functional MRI-Jay Pillai, MD		10:00-12:00 Anatomy Lab		TBA-Darlene Lobel, MD
	11:00-1:00 M&M		12:00-1:00 Case Conference		11:00-1:00 M&M

## Upcoming Meetings (January-June 2005)

### AANS/CNS Cerebrovascular Section and American Society of Interventional and Therapeutic Neuroradiology

2/1 - 4, New Orleans, LA

### Southern Neurological Society

3/2 - 6, Key West, FL

### AANS/CNS Section on Disorders of the Spine & Peripheral Nerves

3/9 - 12, Phoenix, AZ

### American Association of Neurological Surgeons

4/16 - 21, New Orleans, LA

### Society of Neurological Surgeons

5/21 - 24, Palo Alto, CA

### Georgia Neurosurgical Society

5/27 - 29, Sea Island, GA

## Credits

Editor:

**Judy Wright**

Illustration and design:

**Andy Rekito, M.S.**

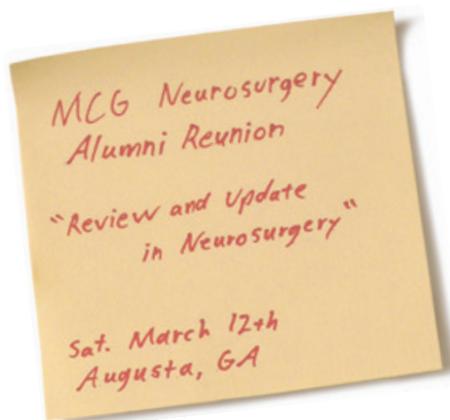
Editor-in-chief:

**Cargill H. Alleyne, Jr., M.D.**

Contributors:

**Mark Lee, M.D., Ph.D., Haroon Choudhri, M.D.,**

**Joseph R. Smith, M.D., Cargill H. Alleyne, Jr., M.D.**



# MCG

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