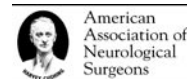


Stereotactic and Functional NEUROSURGERY



Spring 2004

AANS/CNS Section on Stereotactic and Functional Neurosurgery and American Society for Stereotactic and Functional Neurosurgery

Editor: Philip A. Starr, MD

President's Message

G. Rees Cosgrove, MD, FRCSC

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**2004 ASSFN Biennial
Meeting**

There has never been a more exciting time to be involved in stereotactic and functional neurosurgery. With advanced neuroimaging, technological developments and the opportunities in deep brain stimulation and neuromodulation, the prospects for the future are even brighter. Over the past year, the leadership of the American Society of Stereotactic and Functional Neurosurgery (ASSFN) and the AANS/CNS Section on Stereotactic and Functional Neurosurgery have worked hard to live up to these new possibilities by improving membership communication, scientific programs, publications and our own internal organization. It is therefore a great privilege to serve as your ASSFN president during such times of progress and promise.

Under the stewardship of Andres Lozano, MD, our vice-president, and Michael Schulder, MD, our secretary-treasurer, the ASSFN Web site (www.assfn.org) remains the best and most current way for the society to communicate with its members. We plan to increase the utility of the Web site for all our members with updated reimbursement information, listings of fellowships, meeting registration and online abstract submission. Any suggestions for additional content should be directed to Dr. Lozano and Dr. Schulder.

The 2003 ASSFN Quadrennial Meeting was held this past May in New York City at the Plaza Hotel and was simply outstanding. More than 300 participants enjoyed a superb scientific program organized by Dr. Lozano, and the sophisticated NYC scene and social events arranged by Patrick Kelly, MD. The success of this meeting, along with the rapidly accelerating pace of new knowledge in the field, has goaded us into finally holding meetings every two years rather than every four. Our next meeting, to be held in Cleveland, Ohio, Oct. 1-3, 2004, is being organized by Philip Starr, MD, who will direct the scientific program, and Ali Rezai, MD, who is in charge of local

arrangements. This meeting will focus on the role of neuromodulation in the areas of movement disorders, epilepsy, pain and psychiatry. Looking farther into the future, the next biennial meeting of the ASSFN will be held in Boston at the Copley Plaza June 1-4, 2006.

David Roberts, MD, the new editor of *Stereotactic and Functional Neurosurgery*, has worked diligently to revitalize the journal with the goal of making it the source for information in stereotactic and functional neurosurgery. Dr. Roberts' efforts, along with a renewed commitment from Karger, the publisher, already have resulted in a noticeable improvement in quality and consistency. Not only will the journal be published on a regular schedule but it now will appear in full-color format. However, a journal is only as good as the quality of the manuscripts it receives, so I urge you to consider *Stereotactic and Functional Neurosurgery* as a forum for your best work, which can be submitted to Dr. Roberts for review.

Over the past year, the ASSFN has been working with the Executive Office of the American Association of Neurological Surgeons (AANS) to create a new organizational infrastructure for society administration. In the past, dues collections, database management and secretarial functions were performed by Karger in Switzerland. We have felt strongly that the secretarial and administrative functions of the ASSFN would be better managed closer to home. To this end, we have successfully negotiated transferring the secretariat to within the AANS Executive Office with no cost to the society. These are the same services and functions enjoyed by the other AANS/CNS sections, but the ASSFN will be preserved as a distinct and independent society.

Finally, Dr. Rezai, Dr. Henderson and Sam Hassenbusch, MD, along with the leadership of the AANS, were instrumental in convincing the

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Stereotactic and Functional Neurosurgery at the 2004 AANS Annual Meeting

The 72nd Annual Meeting of the American Association of Neurological Surgeons (AANS), themed “Advancing Patient Care Through Technology and Creativity,” will be held May 1-6 at the Orlando Convention Center in Florida. The most up-to-date meeting information is available online at www.AANS.org/education/annual.asp.

Tuesday, May 4, 2004

AANS/CNS Section on Stereotactic and Functional Neurosurgery

Moderators: *G. Rees Cosgrove and Andres Lozano*

This session will serve as a forum for the presentation of topics of stereotactic and functional neurosurgery.

Special Symposium

2:45–3:45 PM

Title: Radiosurgery for Functional Disorders

Moderators: **Douglas S. Kondziolka and Michael Schulder**

Speakers: *Douglas S. Kondziolka, Georg Noren, Nicholas M. Barbaro*

Scientific Session

3:45–5:30 PM

Philip C. Gildenberg Award Recipient

3:45–3:55 PM

824. High Frequency Stimulation Blocks Thalamic Oscillations in Vitro: Potential Mechanism of Action of Deep Brain Stimulation Used in Tremor and Epilepsy

Authors: *Kendall Lee, Uhnoh Kim, David W. Roberts*

3:55–4:05 PM

825. A Brain-Machine Interface: Ensembles of Human Subcortical Neurons Can Provide Signals for Neuroprosthetic Control

Authors: *Parag G. Patil, Miguel A. L. Nicolelis, Dennis A. Turner*

4:05–4:15 PM

826. Off-Target Measurements in Deep Brain Stimulation: How Much Off-Target and Why?

Authors: *Ravish V. Patwardham, Eric J. Behnke, Scott Krabl, Antonio A. F. De Salles*

4:15–4:25 PM

827. Direct Visualization of Subthalamic Nucleus With Stereotactic 3 Tesla Magnetic Resonance Imaging

Authors: *Konstantin V. Slavin, Christian Wess, Keith R. Thulborn*

4:25–4:35 PM

828. Stereotactic Radiosurgery and Radiotherapy Using the Radiosurgical Classification of Cavernous Sinus and Parasellar Meningiomas

Authors: *Rodrigo C. Torres, Leonardo Frighetto, Brian Goss, Alessandra Pedrosa, Tooraj Gravari, Lisa Tseng, Michael Selch, Antonio A. F. De Salles*

4:35–4:45 PM

829. Outcomes Following Radiosurgery for Glioblastoma Multiforme as Part of the Multi-Modality Approach

Authors: *Douglas S. Kondziolka, Hidemasa Nagai, Ajay Niranjani, John Flickinger, L. Dade Lunsford*

4:45–4:55 PM

830. Bilateral Gamma Knife Radiosurgery for Treatment of Movement Disorders

Authors: *Ronald Young, Sandra Vermuelen, Vivek Mehta, Robert Meier, Francisco Li*

4:55–5:05 PM

831. Neurosurgical Gene-Based Alternative to Deep Brain Stimulation and Botulinum Toxin

Authors: *Nicholas M. Boulis, Qinsan Teng, James K. Liu, Diana Tanase, Mary Garrity-Moses*

5:05–5:15 PM

832. Does Stimulation Mapping Under-Represent Language Cortex? Anterior Temporal Speech Neurons Distant From Essential Language Sites

Authors: *Timothy H. Lucas, Julie A. Schoenfeld-McNeil, George A. Ojemann*

5:15–5:25 PM

833. Psychophysiology and EEG Analysis of the Yips During Golf Putting—A Tool for Achieving Peak Performance

Authors: *Robert E. Wharen Jr., Deb Crews, Aynsley Smith, Charles Adler*

The Stereotactic and Functional Section's business meeting immediately follows the section's scientific session.

Wednesday, May 5, 2004

Stereotactic and Functional Poster Viewing

2:00–2:45 PM

President's Message *continued from front page*

Centers for Medicare and Medicaid Services (CMS) to increase reimbursement for movement disorders surgery. As all members of the society realized, the assessment of work-related relative value units for deep brain stimulation with microelectrode recordings was grossly undervalued given the time and expertise required to perform the procedure. The responsible representation to the CMS provided by both the AANS and the ASSFN was critical to the success of this proposal.

Much has happened in the past year and much more is on the horizon. It has been a privilege to work with so many dedicated and committed individuals in the ASSFN, and I am looking forward to the year ahead and an even brighter future for the society.

Save the Dates!

2006 ASSFN Meeting

June 1-4, 2006

Boston, Mass.

Neurosurgery Billing and Coding Update for 2004

Philip Starr, MD; Kathleen Dunham, Medtronic Inc.

Several new Current Procedural Terminology codes for deep brain stimulator implantation became effective January 2004. All codes relevant to the surgical procedure are defined in the table along with the relative value units (RVU) assigned. The major change is that codes for deep brain stimulation (DBS) have been split into two groups: one pair that explicitly includes microelectrode recording (MER) (codes 61867 and 61868) and another pair for DBS without MER (codes 61863 and 61864).

Thanks to persistent work on the part of Robert Florin, MD, and Jaimie Henderson, MD, with the Centers for Medicare and Medicaid Services (CMS), the RVUs for MER-guided DBS have increased substantially. For example, in 2003 a bilateral DBS implantation with MER (without pulse generator placement) would have been coded as 61862 (stereotactic DBS) at 19.34 work-related RVUs, along with the bilateral modifier -50, providing an additional 9.67 RVUs, for a total of 29 work-related RVUs. (Some surgeons who did microelectrode recording also billed 95961, the code for intraoperative neurophysiological monitoring, but this only added 2.19 RVUs, when it was paid at all). Using the new codes 61867 and 61868, the total of work-related RVUs is 39.3, an increase of 35 percent.

In 2004 the dollar value per RVU (conversion factor) was increased slightly over the 2003 value, from \$36.99 to \$37.33. When factoring in the additional RVUs for practice expense and malpractice insurance, the total expected Medicare reimbursement for bilateral DBS (leads only) is now \$2,353, a 19 percent increase over last year's reimbursement.

Although the neurosurgeon no longer can bill separately for neurophysiological monitoring (codes 95961 and 95962), a neurologist assisting with the monitoring still can bill for these codes, and the work-related RVUs for these codes have doubled. Regarding hospital reimbursement, a favorable development is that

Current Procedural Terminology Codes for Deep Brain Stimulation <i>As of January 2004. An asterisk (*) designates new codes.</i>		
CPT Code	Definition	RVU (work component only)
61867*	Twist drill, burr hole, craniotomy or craniectomy with stereotactic implantation neurostimulator electrode array in subcortical site (eg, thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal grey) <i>with use of intraoperative microelectrode recording; first array</i>	31.34
61868*	Twist drill, burr hole, craniotomy or craniectomy with stereotactic implantation neurostimulator electrode array in subcortical site (e.g., thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal grey) <i>with use of intraoperative microelectrode recording; each additional array</i>	7.92
61863*	Twist drill, burr hole, craniotomy or craniectomy with stereotactic implantation neurostimulator electrode array in subcortical site (e.g., thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal grey) <i>without use of intraoperative microelectrode recording; first array</i>	19.00
61864*	Twist drill, burr hole, craniotomy or craniectomy with stereotactic implantation neurostimulator electrode array in subcortical site (e.g., thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal grey) <i>without use of intraoperative microelectrode recording; each additional array</i>	4.50
61885	Incision and subcutaneous placement of cranial neurostimulator pulse generator or receiver, direct or inductive coupling, with connection to a single electrode array	5.85
61886*	Incision and subcutaneous placement of cranial neurostimulator pulse generator or receiver, direct or inductive coupling, with connection to two electrode arrays	8.00

placement of bilateral pulse generators in an outpatient setting now will reimburse twice as much as placement of a single pulse generator, making it less likely that the hospital will lose money on this component. Unfortunately, at this time placement of a dual channel pulse generator (such as the Medtronic Kinetra) in the hospital outpatient setting will not provide the hospital more reimbursement than for one single channel generator (such as the Medtronic Soletra), despite the greater expense of the Kinetra.

Highlights of the 2003 ASSFN Meeting in New York

Jason M. Schwab, MD and Gordon H. Baltuch, MD, PhD

The breadth and quality of the scientific program for ASSFN 2003 underscored the resurgence of functional and stereotactic neurosurgery. A small sampling of the program is highlighted here.

Deep Brain Stimulation. Emad Eskandar, MD, from the Massachusetts General Hospital presented practice data showing a significant shift toward DBS and away from lesional procedures in the United States, and better results occurring at the busier centers. With the increase in the number of DBS procedures performed, there has been a focus on the nuances and complications associated with these procedures. DBS is finding new applications. More groups are placing DBS electrodes into the globus pallidus pars interna for dystonia. Stimulation of the dentate nucleus was reported as a means of treating spasticity. Preliminary data was reported from a trial of

stimulation of the anterior limb of the internal capsule for obsessive-compulsive disorder. The Velascos from Mexico City described DBS of the centromedian nucleus of the thalamus for Lennox-Gastaut syndrome and bilateral hippocampal DBS for patients found to have complex partial seizures arising from both hippocampi.

Lesioning Procedures. Ablation of the subthalamic nucleus was discussed as an alternative to DBS of that target. Two groups reported their results for bilateral anterior capsulotomy for obsessive-compulsive disorder. Dr. Cosgrove's group reported its long-term results from cingulotomy. There were multiple reports on stereotactic radiosurgery for brain metastases from different primary tumors and pain disorders associated with cranial nerve dysfunction. Peter

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Radiosurgery for Epilepsy: An Update

Nicholas Barbaro, MD

In recent years there has been a growing interest in the use of radiosurgery in the treatment of epilepsy. Although the gamma knife instrument was originally invented by a functional neurosurgeon, Lars Leksell, MD, it has been used mainly to treat neoplasms and vascular malformations. Radiation therapy in general, and radiosurgery in particular has been shown to result in reduction or elimination of seizures in those lesions. An example of a mass lesion associated with epilepsy is the hypothalamic hamartoma. Recent data, mainly from Europe, suggests that radiosurgery is very effective in treating seizures associated with hypothalamic hamartomas. Many U.S. centers have begun to treat these lesions using the gamma knife and other radiosurgical instruments (Linac or CyberKnife). Preliminary information suggests that the morbidity from such treatments is extremely low, but long-term results with seizure outcome are not available.

The same European centers that have been interested in hypothalamic hamartomas have begun to investigate the use of radiosurgery for treatment of temporal lobe epilepsy. Preliminary evidence suggests that, following a latent period of between 10 and 14 months, there are significant radiological changes in the treated temporal lobe along with reduction or elimination of complex partial seizures. An interesting phenomenon that has been reported is a dramatic increase in auras at the same time as complex partial seizures stop. Based on these preliminary findings, a consortium of investigators in the United States has been awarded funding from the National Institutes of Health to study the role of gamma knife radiosurgery in the treatment of patients with temporal lobe epilepsy. Subjects are selected from those being considered for more traditional open surgical approaches and are randomized into two groups: high and low dose (20 Gy and 24 Gy, respectively). To date, 19 patients have been treated, but only five have been followed for more than one year. Of those five, four have been free of seizures for at least three months (seizure counts are collected at three-month intervals).


One patient required an urgent operation to treat significant brain edema, and that patient has done well with no new neurological deficits. Participating centers for this study are the University of California at San Francisco, University of Illinois, University of Pittsburgh, University of Virginia, University of Southern California, University of Washington, and Columbia University. The consortium plans to follow the current study with a larger, multicenter trial designed to measure the efficacy and morbidity of this technique.

Many issues remain to be answered, including whether it is necessary to destroy neurons in order to affect a treatment for epilepsy. Data from animal studies suggest that there is a "sub-necrotic" dose that can reduce neuronal excitability without resulting in the death of neurons. Groups at the University of Virginia and University of Pittsburgh have been involved in these studies. Unfortunately, data from human studies do not yet support such a notion. Should it be possible to treat brain regions without removing their function, radiosurgical treatment could be applied to areas of the brain where direct surgical attack is not advisable,

such is within motor or speech areas. The treatment of seizures associated with developmental anomalies such as focal cortical dysplasia is another area for future clinical research.

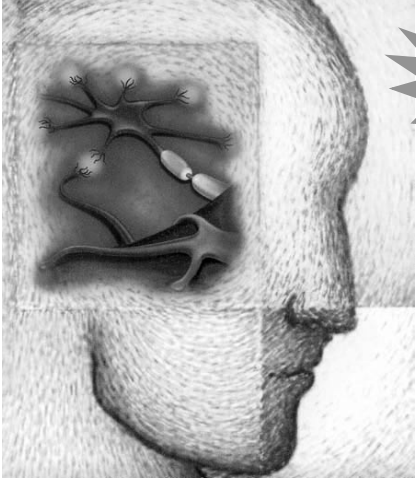
Selected References

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- Regis J, et al. Gamma Knife Surgery for Mesial Temporal Lobe Epilepsy. *Journal of Neurosurgery*, 2000 Dec;93 Suppl 3:141-6.
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American Society for Stereotactic and Functional Neurosurgery
presents

NEUROMODULATION 2004



Abstract Deadline: May 1, 2004

ASSFN President:
G. Rees Cosgrove, MD

Meeting Chairman:
Ali R. Rezai, MD

Scientific Chairman:
Philip Starr, MD, PhD

DEFINING THE FUTURE

October 1-3, 2004 • Cleveland, OH

TOPICS

- Movement Disorders
- Psychiatric Disorders
- Chronic Pain
- Epilepsy
- Emerging Applications

Visit: www.clevelandclinicmeded.com/courses/assfn-neuromodulation2004.htm

ASSFN Mission Statement

The mission of the American Society of Stereotactic and Functional Neurosurgery is to foster the use of stereotactic and functional neurological methods for the treatment of diseases of the nervous system and to advance stereotactic and functional neurosurgery and related sciences to improve patient care, to support meaningful basic and clinical research, to provide leadership in undergraduate and graduate education and continuing education, and to provide administrative facilities necessary to meet these goals.

Further, the society will provide a forum for the review of the basic form and function of the human nervous system toward the improvement of stereotactic and/or functional neurosurgical procedures that alleviate human disease and suffering through diagnosis or treatment of the function of the nervous system and to establish minimum standards for the performance of stereotactic surgery.

Highlights *continued from page 3*

Gerszten, MD, from the University of Pittsburgh also reported on using a CyberKnife system to deliver radiosurgery to the spine using implanted fiducials and real-time image guidance.

Epilepsy. Werner Doyle, MD, from New York University reported his large series of 1,428 resective surgeries for seizures, as well as his experience with vagal nerve stimulation. Nicholas Barbaro, MD, from the University of California at San Francisco gave a progress report on the gamma knife trial for mesial temporal lobe epilepsy. Hayashi and colleagues from the Marseille Timone Hospital reported on their experience with 23 patients using a similar protocol.

Awards. In recognition of their long history of contributions to the field and unflagging support of the ASSFN, Philip L. Goldenberg, MD, one of our pioneers and elder statesmen, and the scientific publisher Thomas Karger were honored with awards for distinguished service. Clement Hamani, MD, from the University of Toronto won the fellow award for his work showing that anterior thalamic lesions in rodents can prevent pilocarpine-induced seizures. Devin Binder, MD, from the University of California at San Francisco won the resident award for his work on hemorrhagic complications of microelectrode-guided DBS implantation.

Membership Application



American
Association of
Neurological
Surgeons



Name _____

Office Address _____

Phone _____ Fax _____ Email _____

Residency Training: _____ Years: _____

Medical School: _____

AANS Member: Yes No

CNS Member: Yes No

Interests in Stereotactic and Functional Neurosurgery: (please circle)

Movement Disorders

Pain

Tumors

Imaging

Epilepsy

Computers

Radiosurgery

Basic Science

Annual membership dues for full members are \$325.00 U.S. per year, which includes:

- membership in the AANS/CNS Section on Stereotactic and Functional Neurosurgery;
- membership in the American Society for Stereotactic and Functional Neurosurgery;
- membership in the World Society for Stereotactic and Functional Neurosurgery;
- a subscription (including shipping) to the journal, *Stereotactic and Functional Neurosurgery*; and
- reduced meeting fees.

Annual membership dues for resident members are a \$25.00 U.S. one time fee, which includes:

- all of the above except a subscription to the journal, *Stereotactic and Functional Neurosurgery*.

Mail your completed application and your current curriculum vitae to:

Michael Schulder, MD, Secretary-Treasurer, ASSFN
New Jersey Medical School
90 Bergen Street, Suite 8100, Newark, NJ 07103
schulder@umdnj.edu

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Web site: www.assfn.org

2004 ASSFN Biennial Meeting October 1-3

The 2004 biennial meeting of the American Society of Stereotactic and Functional Neurosurgery (ASSFN) will be held in Cleveland Oct. 1-3 at the new InterContinental Hotel and MBNA Conference Center on the Cleveland Clinic main campus. "Neuromodulation 2004: Defining the Future" is solely dedicated to the rapidly growing area of neuromodulation. Specific areas of focus include neuromodulation for movement disorders, chronic pain, psychiatric disorders, epilepsy, and other indications. Sessions will include presentations from internationally acclaimed faculty as well as oral and poster presentations selected from submitted abstracts. A unique feature of the meeting will be the utilization of an automated audience response system, providing instantaneous feedback to specific questions, maximizing the interactions between the audience, panel, and speakers. For meeting and registration information or to submit an abstract, go to www.clevelandclinicmeded.com/summit/neuromodulation/index.htm.

Future meetings are scheduled for June 1-4, 2006, in Boston, and for 2008, dates and location yet to be determined.