INTEGRATED MEDICAL LEARNING: EXPANSION OF A CONCEPT

CNSQ IS THE OFFICIAL NEWSMAGAZINE OF THE CONGRESS OF NEUROLOGICAL SURGEONS
This Wednesday afternoon session brings neurosurgical masters together as they demonstrate six microsurgical principals live on our GSS stage! This innovative session—one of the most-anticipated of the entire Annual Meeting—features cadaveric demonstrations using state-of-the-art, 3-Dimensional imaging technology, followed by cutting-edge videos.

**Wednesday, September 24**
2:30 – 5:30 pm

- **Dr. Daniel L. Barrow**
  Surgical Anatomy of the Transsylvian Approach/Microsurgical Clipping of a Complex Middle Cerebral Artery Aneurysm

- **Dr. Albert L. Rhoton, Jr.**
  Surgical Anatomy of the Suprasellar and Anterior Third Ventricular Region/Microsurgical Resection of a Suprasellar Tumor

- **Dr. Juha A. Hernesniemi**
  Surgical Anatomy of the Subtemporal Approach and the Upper Basilar Region/Microsurgical Clipping of a Complex/Wide Neck Basilar Apex Aneurysm

- **Dr. Dennis Spencer**
  Surgical Anatomy of the Mesial Temporal Lobe/Microsurgical Amygdalohippocampectomy

- **Dr. Laligam N. Sekhar**
  Surgical Anatomy of the Petroclival Region/Microsurgical Resection of a Petroclival Meningioma

- **Dr. Evandro de Oliveira**
  Surgical Anatomy of the 4th Ventricular and Pontine Regions/Microsurgical Resection of a Pontine Cavernoma

This session is open to all registered medical attendees.
Dear Colleagues,

This will be my final Editor’s letter for the CNSQ. I will be taking on new responsibilities for the Congress of Neurological Surgeons. This magazine was created over two years ago to replace the previous publication, Neurosurgery News. The concept for the CNSQ was to provide a new publication for neurosurgeons with various backgrounds and interest given the changing world of neurosurgery.

Two years ago, when I wrote my first Editor’s note, I was enthusiastic about the possibilities for the magazine. The initial vision was put together with the strong support of the CNS Past President Richard Ellenbogen and Michael L.J. Apuzzo, Editor of Neurosurgery. Editorial, design, and management support was expertly provided by Jackie Thai, Rod Faccio, Scott Santos, John Tom, Martha Tobin, Christine Moore, and Paula Novash. These individuals and the Editorial Board have done an outstanding job and have worked tirelessly in developing each issue.

Our team had a vision: to put together a publication that would offer a unique perspective on the issues that are shaping neurosurgery today. As I reflect on the developments in our profession during my tenure, I am pleased to say that, with your help, we have succeeded in creating a resource that fosters discussion about the ongoing evolution of our neurosurgical community.

Over these 24 months, we have consistently presented information that is relevant to our members, including topics such as neurosurgical education, research, conflict of interest, socioeconomic issues, and neurosurgical outcomes. With our growing international membership, we have focused on our international colleagues and partners and discussed how neurosurgeons are making a difference by performing procedures in economically deprived areas around the world.

In this current issue, we continue to cover the wide range of content areas related to neurosurgical education. In this context, we feature an innovative CNS educational initiative, Integrated Medical Learning™ (IML). We also highlight our Annual Meeting program and our Consensus sessions and provide reports from several CNS committees. In addition, we become better acquainted with our colleagues in Brazil who will be joining us in Orlando.

Finally, I wish to welcome the incoming Editors James Harrop and Jamie Ullman who have served in the capacity of Associate Editors for the past year. I know you will share your opinions, ideas, and feedback with them as generously as you have with me. I will still contribute to the CNSQ from time to time.

Thank you for a wonderful two years. It has truly been a privilege to serve as Editor of this publication.

Ali R. Rezai, MD

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Learning Science and the Community of Neurosurgery: A Call to Action

Dear Colleagues:

Physicians’ organizations have long recognized that ongoing education is essential to the maintenance of medical knowledge and skills. Over the last few decades, billions of dollars have been expanded in continuing medical education (CME) programs in an effort to develop meaningful and relevant learning experiences for practicing physicians. Nevertheless, public and regulatory oversight bodies have recently challenged medical organizations to improve the quality and safety of patient care and create greater accountability with respect to the design, focus, and results of CME programs. Moreover, there is an increasing consensus that prevailing methods of CME are poorly suited to achieve the basic objectives of changing professional performance and improving patient care. Some have gone so far as to suggest that CME in the health professions is “in disarray.” As a result, postgraduate medical education is now undergoing dramatic restructuring due to a variety of forces, including many from outside the healthcare industry.

Although external influences have given rise to a number of important improvements in healthcare education (including instruction in competencies beyond medical knowledge and patient care skills) these external drivers for change threaten to create a reactionary approach to CME reform that could diminish the effectiveness of physician-led efforts. Additionally, externally mandated reform threatens to divert attention from many of the fundamental challenges healthcare workers face as producers and consumers of knowledge in the modern healthcare environment. The maintenance of a robust and relevant CME system therefore requires that physician educators remain at the forefront of theoretical and practical discussions regarding the scope, design, and intent of CME programs. To do this, leaders in healthcare instruction must develop an understanding of modern learning principles that inform the development of learning methodologies in numerous other disciplines.

Various deficiencies in the current practice of CME can be broadly grouped into issues of cost (individual and institutional), conflict of interest (content objectivity), structure (physical and intellectual proximity to the professional experience), and theory (epistemology). Recent articles in the medical literature, along with many recent press reports, have addressed problems of cost and objectivity, which largely relate to the financing of CME and conflict of interest. Less understood by both the public and physicians, but of equally profound implication for the effectiveness of CME, are existing deficiencies in the structure and epistemological orientation of medical education. Learning experts in various disciplines are increasingly applying elements of modern learning theory to instructional design at all educational levels. Although many of these elements may enhance understanding and knowledge generation, they have largely failed to inform the design of medical education programs, possibly to the detriment of both physicians and patients.

Current changes designed to improve the quality, safety, and accountability of care through improved physician education should proceed in concert with efforts to design learning programs based on a sound understanding of human cognitive architecture and modern disciplinary knowledge. These approaches are likely to be complimentary, and will allow for the development of instructional design that will not only improve care, but also advance the science of care.

Recently, the Congress of Neurological Surgeons has responded to these challenges in healthcare education with the creation of the Learning Sciences Subcommittee of the CNS Education Committee. This multidisciplinary subcommittee includes national experts in educational science and is charged with applying key aspects of learning theory to all areas of our educational portfolio. The specific focus of this group will be to develop flexible, relevant, and accessible educational programs that will include the adaptable knowledge and essential competencies which neurosurgeons require to successfully manage the challenges that lie ahead for our specialty. The work of this committee will be conspicuous throughout the content and design of this year’s remarkable Annual Meeting program, which is profiled in another article in this issue of the CNSQ. In coming months, our members will observe continued evidence of our commitment to informed instructional design in a broad variety of novel educational programs.

Among physicians, neurosurgeons possess a singularly cogent perspective on human functional neuroanatomy and cognitive architecture and are uniquely qualified and strategically positioned to lead a revolution in medical learning. Consistent with our longstanding tradition of innovation and our core mission of education, the CNS has partnered with respected learning theorists from around the country to develop opportunities that will allow neurosurgeons to remain effective instruments for change within medical systems. This commitment to informed instructional design reflects a historic leap forward for our organization, and it is our belief that this unprecedented effort will result in nothing less than the development of completely new paradigms in healthcare education. The development of those new instructional systems and our commitment to the advancement of learning science will unquestionably improve our ability to improve the safety and value of care, and will hopefully allow us to retain our autonomy as clinical decision makers. CNSQ
2008 CNS Annual Meeting:
Creating a Community of Neurosurgery

The 2008 Congress of Neurological Surgeons Annual Meeting will create a Community of Neurosurgery dedicated to learning and the generation of new knowledge about neurosurgical practice, quality, and outcomes. The meeting is specifically designed to meet two of our greatest professional challenges head on.

First, the demand for and availability of outcomes based clinical and practice data is exploding. Staying current with knowledge critical to cutting edge care delivery is increasingly challenging. Putting new information into the context of practical, every day clinical decision making is even more difficult. To meet these challenges, the Annual Meeting is organized around a series of new scientific and learning formats that emphasize interactive, clinical problem solving formats. The agenda of many of these experiences is driven by input gathered from neurosurgeons in web based forums before the meeting itself even begins. Even more importantly, the knowledge, experience, and practice patterns of all meeting participants are captured in digital interactive sessions that expand our scientific understanding of current practice and point the way towards effective clinical care improvement, novel translational science, and outcomes based research.

Secondly, the public is paying increasing attention to the nature of medical education and quality improvement, including scrutinizing more carefully than ever the interests and conflicts that can influence surgical practice. The CNS remains committed to providing the highest standard of scientific educational material to neurosurgeons and to fostering the best possible clinical outcomes for all of our patients. Many of our new educational formats incorporate learner driven identification of the most relevant clinical questions and scientific topics for future consideration. We have encouraged industry sponsors to direct philanthropic funding towards broad support of these new educational formats, which are designed to improve the effectiveness of continuing medical education and which can be applied to any topic or content area. This approach dramatically reduces the risk of conflicts of interest arising during Scientific Program design. We believe that sponsorship of the most compelling and effective educational methods, rather than of specific content, will serve the needs of our patients, our sponsors, our organization, and society in a transformative way.

The 2008 Annual Meeting will serve not only as an educational forum, but also as a workshop. Meeting attendees will participate in the meeting not as an audience, but as knowledge generators and consumers. The work product of many meeting sessions will be formally analyzed and presented in the CNS publications, Neurosurgery, Clinical Neurosurgery, and the CNSQ, in order to broadly disseminate lessons learned and point the way towards quality improvement projects, clinical studies, and translational science projects. All members of the Community of Neurosurgery assembled in Orlando will participate and add to our collective understanding.

Integrated Medical Learning (IML) will be a centerpiece of the educational program in Orlando. IML 2008 will expand into two major learning formats: IML: Clinical Science and IML: Community Learning. Eight IML: Clinical Science sessions, one for each subspecialty section plus one created by the Council of State Neurosurgical Societies, will take place on Tuesday and Wednesday afternoons. These sessions will use the same successful evidence review, expert presentation, and polling methodology employed by the inaugural IML sessions in San Diego at the 2007 Annual Meeting. Because the 2008 sessions are specialty section based, they will provide invaluable and totally novel data about current knowledge and practice amongst active practitioners in challenging areas of clinical care.

IML: Community Learning is a new format that will allow all participants in the General Scientific Sessions to shape the content of expert presentations about cutting edge translational research (on Monday), clinical trials evidence (on Tuesday), and practice-based wisdom (on Wednesday). Participants will have access before the meeting to key literature related to these expert presentations and interactive discussions will take place during and after the sessions using personal digital assistants and the internet. Both IML: Clinical Science and IML: Community Learning will offer the opportunity to earn substantially increased CME awards for participants.

The 2008 Annual Meeting will also apply the same community driven, collaborative and scientific analysis to the most challenging policy issues facing neurosurgery today. Five controversial and compelling topics will be analyzed and discussed in new Consensus Ses-
Staying current with knowledge critical to cutting edge care delivery is increasingly challenging. Putting new information into the context of practical, every day clinical decision making is even more difficult. To meet these challenges, the Annual Meeting is organized around a series of new scientific and learning formats that emphasize interactive, clinical problem solving formats. The agenda of many of these experiences is driven by input gathered from neurosurgeons in web based forums before the meeting itself even begins.

sessions, on Monday, Tuesday, and Wednesday afternoons. Your voice is critical to guiding neurosurgical leaders and providing them the evidence needed to advocate for all neurosurgeons on vital issues such as conflict of interest, residency design and regulation, and emergency care coverage.

Finally, the 2008 Annual Meeting will place great emphasis on the practical, including numerous opportunities for case based learning with master surgeons, such as the return of the highly popular 3-D Cadaveric Dissections program on Wednesday afternoon. The Digital Video Masters program will be the centerpiece of a new, surgical-case oriented Thursday General Scientific Session. Also, you can submit your own cases for review and discussion with specialty experts in a “working” coffee break on Thursday morning.

We would also like to help meeting participants obtain the practical tools that are needed day to day in our practices and professional lives. In Orlando, experts from the Nicholson School of Communication at the University of Central Florida will teach a special course on Monday afternoon covering presentation and PowerPoint skills. Neurosurgical experts will present a two part Practical Course series on Sunday dedicated to understanding the principles of evidence based medicine and applying them to the latest and most important evidence publications. Look for other “toolkit” sessions throughout the meeting.

Perhaps most exciting, the CNS is proud to bring to Orlando some of the most noted proponents of collaborative wisdom and interdisciplinary thought. We will welcome the renowned poet, Maya Angelou, who bridges social and racial divisions, and promotes an optimistic and unified American community through her art. Dr. Muhammad Yunus, who won the 2006 Nobel Prize in Economics for his pioneering work using microcredit to lift individuals and entire communities in the developing world from poverty, will speak. Award winning authors James Surowiecki and Atul Gawande will explore the wisdom of groups, and safety and ethics in medicine and surgery. Ed Viesturs will speak about his leadership of teams that safely scaled all 14 eight thousand meter peaks in the world. Finally, British journalist Wendy Moore will discuss her award winning biography of the “Knife Man,” John Hunter, and the birth of modern surgery.

CNS Honored Guest, Dr. William Chandler, and President, Dr. Anthony L. Asher, will explore profound changes in neurosurgical education during training and practice, describe the regulatory challenges that face our profession, and share their vision for the future.

The 2008 CNS Annual Meeting provides a wonderful opportunity to generate shared knowledge, to create a powerful community of learning, and to hear from some of the most compelling artists and leaders of our time. We also hope this meeting will allow us to redefine the way practicing neurosurgeons learn and adapt to a rapidly changing and challenging clinical care environment. Orlando will mark the foundation of a scientifically based, collaborative society of learners that has life and voice beyond the confines of the meeting itself. The CNS is committed to supporting this community across future meetings and numerous other educational initiatives into the future.
Every aspect of the Congress’s current educational initiatives is based on identifying and filling gaps in our current knowledge and designing educational events that work. The CNS Annual Meeting Committee has pursued a number of strategies to meet this goal.

Many of these educational strategies incorporate a user driven agenda and scientific identification of knowledge gaps as an inherent part of the educational process. Examples include IML: Community Learning and IML: Clinical Science. The CNS has also repeatedly sought the input of members regarding our educational efforts through formal member needs assessments. We have also developed a new, user driven and interactive policy development mechanism, CNS Consensus Sessions, which will take place at the 2008 CNS Annual Meeting.

Last year in San Diego, we used one of the first CNS Consensus Sessions to turn the spotlight on ourselves, asking a group of interested members to help develop educational policy. The CNS Consensus Session, Learners Decide the Future of Neurosurgical Education, took place on Tuesday September 18th, 2007, with approximately fifty participants. Dr. Daniel Resnick, then CNS Education Chair, introduced regulatory challenges posed by new national medical continuing education regulations and Dr. Robert Galbraith presented the latest expert information on adult learning theory. The CNS Annual Meeting Committee leadership then directed an interactive, consensus development workshop, with the aid of real time digital polling.

This session carefully analyzed initial opinions about the most recent major CNS educational initiative, IML, which incorporates interactive learner input, expert opinion, and medical evidence to evaluate current knowledge, opinions, and practice in key and controversial clinical areas. Eighty-eight percent of conferees agreed that IML should be used as a standard educational methodology in future CNS Annual Meetings (a majority “strongly agreed”). Less than a quarter of respondents, however, identified the General Scientific Session as the best portion of the annual meeting to host IML: Clinical Science sessions. A plurality of conferees instead recommended locating IML: Clinical Science in specialty section based afternoon sessions. The CNS Scientific Program Committee also recognized that relatively powerful new knowledge might emerge from analyzing the opinions and practice patterns of specialty neurosurgeons with regards to key controversial questions from their own area of active practice. In response to this analysis, IML: Clinical Science will now be featured in afternoon sessions for every neurosurgical specialty in Orlando this year.

By putting in place an iterative method for educational self-improvement, we believe the CNS can transcend the value of any given educational challenge, paradigm or product.
categories in General sessions, to include (as appropriate to the theme), basic research, clinical, and socioeconomic considerations. Respondents also strongly favored the continued use of digital interaction during General Sessions. In response to these educational priorities, the CNS 2008 Scientific Program Committee has launched a new interactive educational method, IML: Community Learning. Using faculty directed readings and speaker abstracts, learners may develop background knowledge about General Session topics, and then interact with faculty using digital tools both during and after the meeting.

The Consensus Session also addressed the issue of Thursday General Sessions, the last day of our traditional Annual Meeting design. A majority (60%) of conferees favored continuing Thursday sessions, although most favored undertaking significant redesign of their content. At the same time, 80% of respondents felt that case based learning material is useful enough to justify its inclusion in General Sessions. At the 2008 Annual Meeting in Orlando, the Thursday Scientific Session will be entirely case based, incorporating the very popular Digital Video Masters presentations in a General Session, with smaller, specialty specific break out sessions, Cases and Coffee with the Masters, in which attendees can also submit their own cases for group consideration.

The Consensus conferees felt that the objective data resulting from science based IML sessions and policy based Consensus Sessions should be used for a number of important purposes including, in order of popularity, identification of appropriate questions for clinical trial design, publication in the neurosurgical literature, clinical guidelines formulation, and influencing regulatory agencies. In keeping with these priorities, the results of the Education Consensus Session are being reported here, while data from the Consensus Session on The Transition to Retirement: When to Limit or Discontinue Neurosurgical Practice, and all three IML: Clinical Science sessions have been analyzed and submitted for peer review. Many of these data have already been presented to relevant specialty groups and other stakeholders.

Almost all conferees indicated that they would participate in future CNS Consensus Sessions. Five Consensus Sessions are planned for Orlando at the 2008 Annual Meeting, covering policy issues critical to neurosurgery today: conflict of interest, emergency care coverage, residency training design and length, recertification after a practice gap, and negotiating contracts with insurance providers. These efforts are vitally important to realize the CNS Annual Meeting as a practical workshop that serves not only to educate, but also to develop new knowledge and directions for neurosurgery as a specialty.

By putting in place an iterative method for educational self-improvement, we believe the CNS can transcend the value of any given educational challenge, paradigm or product. The goal of our organization is to help each individual neurosurgeon optimize their learning and effectiveness, while assisting neurosurgery in maintaining the highest ideals of patient care and professional excellence. We can only be as strong as your creativity and knowledge allow us to be. Together, we represent a powerful community of learning. CNSQ
It is with sincere appreciation that the Congress of Neurological Surgeons acknowledges the Integra Foundation as a 2008 CNS Neurosurgical Partner.

Due to the tremendous success of last year’s Integrated Medical LearningSM (IML) launch, the CNS is proud to bring IML back to the 2008 CNS Annual Meeting, now in two unique formats.

◆ **IML: Community Learning** returns to the General Scientific Sessions, allowing participants to define content and use interactive technology to directly communicate with experts in neurosurgical science, evidence, and practice. Look for sessions Monday through Wednesday during the GSS.

◆ **IML: Clinical Science** is extended to every subspecialty in sessions focused on key clinical topics, allowing participants to identify answers and generate knowledge using real time digital polling and personal handheld devices. Look for section-specific sessions on Tuesday and Wednesday afternoon.

*IML Sessions at the 2008 CNS Annual Meeting were made possible through an educational grant provided by the Integra Foundation.*
International Partnerships

The active participation of a guest society has become an ongoing feature of the Annual Meeting of the Congress of Neurological Surgeons. In the recent past, our Annual Meetings have involved the Italian Society in San Francisco (2004), the European Association of Neurological Societies in Boston (2005), and both the German Society of Neurosurgery and the German Academy of Neurosurgery participated in our 2006 meeting in Chicago. In 2007, at the Annual Meeting in San Diego, we were delighted to partner with the Japanese Congress of Neurological Surgeons, an organization with whom the CNS has philosophical and spiritual similarities. The involvement of our guest societies has been intimate, consisting of formal participation in the planning and presentation of all elements of the scientific program, as well as the organization of social events and receptions aimed at fostering understanding, collegiality, and discussion of ideas of mutual benefit. To reciprocate, last year the CNS actively participated in the Annual Meeting of the Società Italiana di Neurochirurgia in Rome as well as the Annual Meeting of the European Association of Neurosurgical Societies in Glasgow, Scotland. This year, the CNS and the Croatian Neurosurgical Society are holding a joint meeting in Dubrovnik, Croatia. Over the course of the past few years and into the future, the CNS eagerly anticipates an increased level of participation of guest societies, with interactions beginning well in advance of the meeting to enhance collaboration and to establish long-lasting ties.

In 2008, the Congress of Neurological Surgeons is delighted to have the Brazilian Society of Neurosurgery, (Sociedade Brasileira de Neurocirurgia or SBN), as our international guest society for the Annual Meeting in Orlando. This issue of the CNSQ includes an article co-authored by José Carlos Saleme, MD, the President of the SBN, and Andre Machado, MD, PhD. This article provides a brief overview of Brazil and Brazilian Neurosurgery, a vibrant and well-organized group that will continue to make tremendous contributions to our specialty and organization. CNSQ
Brazil is the largest country in South America and fifth largest country in the world. Its land area covers 3,288,000 square miles, roughly the area of the continental United States. Its population of 191,908,598 is mostly concentrated in urban areas (84%) and has a life expectancy of 70 years. The spoken language is Portuguese. Its population has received immigration from diverse origins including several European, Asian, and African nationalities. The estimated 2007 gross domestic product is $1.1 trillion U.S., the world’s tenth largest. The country has 240,000 physicians, and 7.9% of the GDP is spent on healthcare.

Brazil has a proud history in neurosurgery (Figure 1). Currently, Brazilian neurosurgery is organized by the Brazilian Neurosurgical Society, also known as Sociedade Brasileira de Neurocirurgia (SBN), with 1745 members. In the years following World War II, few surgeons performed neurosurgical procedures at leading academic centers. Founders of Brazilian neurosurgical schools include Jose Ribe Portugal (Rio de Janeiro) and Elyseu Paglioli (Porto Alegre). The SBN was founded in 1957 by eleven pioneering neurosurgeons at a meeting in Brussels, Belgium, who elected Dr. Portugal the Society’s first president. The SBN has grown and consolidated over the decades, expanding to its current large membership in its 50th anniversary. The SBN is now a branch of the Brazilian Medical Association and is responsible for overseeing the quality of training and teaching centers as well as granting the Neurosur-

Neurosurgery in Brazil

José Carlos Saleme, MD
President, Sociedade Brasileira de Neurocirurgia
Andre Machado, MD, PhD
International Guest Society Liaison

The Brazilian Society of Neurosurgery is delighted to be the guest society for the Annual Meeting of the Congress of Neurological Surgeons in Orlando in 2008. Brazil is a vibrant society with a growing economy. In addition to all of the other enterprises that characterize it, Brazil has an energetic neurosurgery effort that has contributed significantly to the field. This article provides a brief overview of Brazil and Brazilian neurosurgery.

Brazil is the largest country in South America and fifth largest country in the world. Its land area covers 3,288,000 square miles, roughly the area of the continental United States. Its population of 191,908,598 is mostly concentrated in urban areas (84%) and has a life expectancy of 70 years. The spoken language is Portuguese. Its population has received immigration from diverse origins including several European, Asian, and African nationalities. The estimated 2007 gross domestic product is $1.1 trillion U.S., the world’s tenth largest. The country has 240,000 physicians, and 7.9% of the GDP is spent on healthcare.

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gery Specialty Title to those passing the board examination.

The formal training of neurosurgeons in Brazil has been established for almost 4 decades. The first organized programs that established the foundations for neurosurgical training were organized in 1970. For the past 10 years, an evaluation process has been in place for graduating residents. Today’s neurosurgical training is composed of five mandatory years. At the end of each of the four initial years, there is a written evaluation which must be passed. The fifth year evaluation is an oral examination. Institutions can be credentialed as training centers when performing more than 300 neurosurgical procedures per year and maintaining a minimal proportion of 10-15% vascular, 20-30% tumor, 20-30% spinal and 20-30% trauma cases. Training centers must have at least 5 full boarded SBN members and are visited periodically by a credentialing committee from the SBN. Today there are 64 training centers in Brazil with 294 residents in training.

In addition to training programs, neurosurgery has been organized along lines similar to that of the country itself. Brazil is divided in 26 states organized in 5 regions and one federal district where the capital, Brasilia, is located (Figures 2 and 3). Each state has a regional society and there are two national headquarters. The permanent headquarters is in Sao Paulo, Brazil’s most populous city. In addition, an administrative headquarters is temporarily organized in the home city of the current president. The SBN has 16 subspecialty departments aimed at developing each field or overseeing specific problems in neurosurgery: cranial base, spine, endovascular, functional and pain, general neurosurgery, neurosurgery for the elderly, neurosurgical implants, peripheral nerves, neurointensive care, oncology, pediatrics, rehabilitation, biological therapies, trauma, vascular, and radiosurgery. There are also permanent commissions for credentialing, development, education, bioethics, and professional practice.

Teaching and continuous medical education are priorities to the SBN. Several regional and subspecialty meetings are organized and credentialed every year, including NeuroTrauma, NeuroVascular, and NeuroSpine. A national meeting is organized every year, with a comprehensive program comprising the major subspecialties. In addition, the SBN also organizes a yearly course in neurosciences and, every two years, the Brazilian Congress for Continuous Education.

The 2008 SBN National Meeting has been organized by Evandro de Oliveira and will be held in September at Foz do Iguacu (Figure 4). The 2009, 2010, and 2011 meetings are planned for Porto Alegre, Salvador, and Porto de Galinhas, respectively. The SBN invites you to participate and to submit abstracts for oral or poster presentations. The Congress of Neurological Surgeons and the Brazilian Society of Neurosurgery look forward to joining you in Orlando. CNSQ
Audience participation is the second key component of IML. Learning theorists emphasize the importance of creating an interaction between teacher and learner to maintain the attention of the student. Audience participation is achieved through audience question uploading and audience polling. At the 2007 CNS meeting, hand held devices allowed General Scientific Session participants to upload questions throughout the presentations. Unlike the traditional microphone method of audience questions, the use of personal electronic devices to pose the questions allows the CNS to compile questions to be answered later. Thus, all questions can be answered rather than just those of the first individuals at the microphone. This approach also allows questions to be triaged such that the most thought provoking are presented to panels, moderators, and experts, further improving the quality of the session. More importantly, questions can be uploaded in real time during a presentation rather than being saved for the end. The CNS has developed its own sys-
As with other facets of IML, the central goal is to engage the learner in a dynamic process that holds attention. Polling provides added benefits, though. Through audience polling, the CNS can collect information on the demographics and practice patterns of its members. This data collection is one aspect of the “Meeting as Laboratory.” This laboratory can help us to define where consensus exists and, just as importantly, where no consensus exists.

TEM for online audience question uploads. IML sessions at the 2008 CNS meeting will be staffed by backtable volunteers, who will triage questions for moderators. The introduction of universal wireless access at the 2008 CNS meeting will enable use of this platform from laptops or web-enabled PDAs. For those who choose not to bring these devices, desktop computers will be available in lieu of microphones to upload questions.

Audience polling is the second element of participation. A variety of smaller neurosurgical meetings have utilized audience polling. IML 2007 was the first, however, to utilize polling with an audience of over 700 participants. As with other facets of IML, the central goal is to engage the learner in a dynamic process that holds their attention. Polling provides added benefits, though. Through audience polling, the CNS can collect information on the demographics and practice patterns of its members. This data collection is one aspect of the “Meeting as Laboratory.” This laboratory can help us to define where consensus exists and, just as importantly, where no consensus exists. In the former case, consensus can act as a surrogate for prospective data. In the latter case, data supporting a state of clinical equipoise can form powerful motivation for clinical trials, and also establish a critical element of the feasibility of such an effort.

Apart from providing data on opinions and practice patterns, audience polling can track the process of learning. IML combines web-enabled polling within the meeting with the previously mentioned extrameeting surveys. In this way, the process of learning can be assayed before and after a meeting as well as in the early and later stages of the IML presentation. Thanks largely to the efforts of Fred Barker, MD, manuscripts analyzing the data from each of the three IML sessions of the 2007 CNS General Scientific Sessions were submitted in the summer of 2008. These manuscripts document the shifts in audience opinion that occurred during the IML process with respect to treatment of lumbar spondylolisthesis, brain metastases, and the clipping vs. coiling conundrum. In addition to tracking and analyzing the data with respect to these early time points (post-meeting surveys are posted immediately after the meeting and closed within three months), efforts are being made to create methodology and infrastructure to track the longer term impact of IML. The “IML Outcomes” project will initially query volunteers about whether they think that their practice patterns were affected by IML 2007 one year after the sessions. IML 2008 Outcomes will attempt to track these opinions at multiple time points to document changes over the year following the meeting. It is anticipated that national CME awarding institutions, such as the CNS, will soon be asked to provide data on the outcomes of educational initiatives to justify their existence. Early efforts at documenting IML Outcomes lay the groundwork for more intensive data collection to serve this end.

Finally, IML has formalized a number of processes to provide a more systematically high quality educational experience. For example, on the advice of learning theorists who addressed the CNS Executive Committee in January 2008, slide masters were designed for use in IML sessions. Slide masters will provide a background calculated to enhance presentation format with less distraction from the essential content of the presentations, themselves. Also, because the dynamic nature of IML presentations prevents scripting, moderators and experts participate in preparatory meeting rehearsals. In addition to familiarizing moderators and experts with the IML process, rehearsals promote a higher quality, coordinated educational presentation.

This feature of the CNSQ will introduce the subject matter of the various IML: Clinical Science sessions of the 2008 CNS Meeting. IML: Clinical Science will occur on Tuesday and Wednesday afternoons. Each session will be augmented by pre-meeting surveys and readings, audience polling, online audience question uploads, and post-meeting surveys. The General Scientific Session will introduce a new version of IML at the 2008 CNS meeting. IML: Community Learning will utilize pre-meeting access to abstracts and citations pertaining to presentations, and the ability to upload questions prior to the meeting, to ensure that individual lectures remain “audience centered.”

We anticipate the continued refinement of IML in 2009. Efforts are being made to create an online software package that will enable IML sessions to occur entirely outside of the bounds of traditional face to face professional meetings. These efforts will broaden the availability, flexibility, and accessibility of cutting edge neurosurgical education for CNS members, both domestically and abroad. We challenge the members of the CNS to take full advantage of this new process, whose success depends on your participation before, during, after, and eventually beyond, the Annual Meeting. Your enthusiasm and participation will ensure that IML contributes definitively to our specialty and to the quality of care we deliver to our patients. CNSQ
INTEGRATED MEDICAL LEARNING™ (IML) AND THE CNSQ

“The Congress of Neurological Surgeons exists to enhance health and improve lives worldwide through the advancement of education and scientific exchange.”

In recent times, the basic tenets regarding the delivery of education have been critically re-evaluated. Teachers and instructors have sought to maximize the potential of students through various modalities. Interactive teaching environments utilizing multiple sensory mechanisms (vision, hearing, and tactile feeds) have been illustrated to be the most beneficial.

Recognizing these education modalities, the CNS, through the efforts of Drs. Douglas Kondziolka and Anthony L. Asher introduced Integrated Medical Learning™ (IML) in the General Scientific Session of the 2007 Congress of Neurological Surgeons meeting (CNSQ, Winter 2006). IML transformed previously isolated, short-term educational experiences, such as medical meetings, lectures, publications, or teaching modules, into a unified series of dynamic interactions between teachers and students. These learning environments have further met and expanded on the CME requirements of providing positive reinforcement on the main principles in the learning arena.

This issue is dedicated to the IML process and also serves as a further educational aid, (which can simplistically be referred to as the “IML Crib Sheets”), in this new endeavor. The section begins with an overview written by Nicholas Boulis, MD, who has been instrumental in the evolution of this process and highlights the goals, principles and implementation of this process. Additionally, the IML moderator for each subspecialty section has composed an overview and further highlighted the main principles of the articles within their section. I would like to commend and thank these moderators.

Spine Michael Groff and Ehud Mendel
Tumor Alfredo Quiñones-Hinojosa, James Frazier, and Michael Lim
Trauma Roland Torres and Odette Harris
Pediatrics Sarah Gaskill
Pain Julie Pilitsis
Vascular Bernard Bendok and Erol Veznedaroglu
Functional Emad Eskandar and Kathryn Holloway
CSNS Michael Steinmetz

Thank you. We hope you enjoy this issue and utilize it to maximize your learning potential.
At the 2008 annual meeting, the Spine Section will feature an IML session on metastatic spine disease. The topic is increasingly important as patients with cancer are living longer and, as a result, the incidence of spinal metastasis is increasing. In the U.S. more than 20,000 cancer patients per year experience spinal cord or nerve root compression due to their metastatic disease. At any given time, approximately half of patients with cancer will harbor spinal metastasis. Almost one-third will have a neurological symptom on presentation when pain is included as a neurologic symptom.

The management of spinal column metastasis has undergone a rapid evolution due to improvement in both technology and our understanding of the disease. The IML session is intended to bring the membership abreast with the changes that have taken place. Three articles were selected to support the session and they are reviewed here. The first is a randomized study by Patchell et al. that compares the effectiveness of surgery to standard radiation therapy alone for symptomatic spinal column metastasis. The second is a paper from Mark Bilsky’s group defining and evaluating the posterolateral approach for decompression and stabilization. The third, from Peter Gerszten’s group, looks at the combination of vertebroplasty and conformal radiation. This is a less invasive treatment option that capitalizes on recent technological advances.


This is a prospective randomized multicenter study that evaluates the effectiveness of standard radiation therapy compared to surgery followed by radiation therapy for patients with symptomatic spinal column metastasis. All patients had metastatic epidural spinal cord compression as demonstrated on MRI and a tissue proven diagnosis of cancer. It is important to keep in mind that tumors commonly felt to be radiosensitive (such as lymphomas, leukemia, multiple myeloma, and germ-cell tumors) were excluded. To qualify for enrollment patients had to be symptomatic, however, the definition of symptomatic was broad and included pain. One hundred and one patients were enrolled in the study.

The exact surgical procedure performed was also not precise but had to address decompression and stabilization if needed. The radiation treatment was a standard 30 Gy given in 10 fractions. Patients in both arms of the study received dexamethasone immediately and their initial treatment, either surgery or XRT, within 24 hours of randomization.

The primary endpoint was ambulatory status after treatment. Urinary continence, Frankel scores, ASIA motor scores, as well as steroid and narcotics use were also evaluated. A Kaplan-Meier analysis with intention to treat was performed. The ambulatory rate post-treatment was 84% in the surgery group as compared to 57% in the radiation group. This was a statistically significant difference with a p value of 0.001. Surgery patients retained the ability to walk for a median of 122 days compared with the radiation therapy group which had a median of 13 days. Maintenance of continence also showed significant benefit of surgery with a median of 156 days compared to 17 days for the radiation group. All of the other secondary endpoints were improved with surgery as well. The conclusion is that surgery is superior to standard radiation therapy for this group of patients.


The authors suggest that appropriate indications for surgery are high grade spinal cord compression by metastatic lesions that are not very radiosensitive. The goal of surgery is palliation. The operative approach should be dictated by the location of the tumor and patient symptoms. In cases where anterior posterior surgery is contemplated they advocate a posterolateral approach (PTA) instead. The PTA affords an opportunity to provide circumferential decompression and stabilizations while avoiding the morbidity attendant to a second approach. They present a retrospective review of 140 cases managed in this fashion. They emphasize the importance of anterior column reconstruction which was most often performed with methylmethacrylate.

The median survival in this group of
patients was 7.7 months. Overall pain and performance status improved significantly. Of patients with significant pain, 93% of the group, almost all (96%) experienced significant improvement. Median operative time was 5 hours and the median EBL was 1500 mL. The major complication rate was 14% which included wound infection or dehiscence in 3% and a mortality rate within 30 days of 4%. Instrumentation failures were seen in 5% with a median time to failure of 17 months. Of those, half were asymptomatic and half required revision surgery. Instrumentation failure was twice as likely with hooks as with pedicle screw fixation. Eleven percent required reoperation for recurrent disease that was either symptomatic or demonstrated high-grade compression on imaging. As a result of this study, consideration should be given to PTA in situations where anterior and posterior column stabilization as well as circumferential decompression needs to be performed.


The authors report on a prospective cohort of 26 consecutive patients who presented with pathologic compression fractures with little or no canal compromise. The fractures were stabilized using percutaneous PMMA injection (kyphoplasty) and the underlying neoplasm was treated using stereotactic spinal radiosurgery (CyberKnife). The primary cancer was considered radioresistant in 19%. Seven patients had previously undergone conventional external beam radiation such that spinal cord toleration would not allow further conventional XRT. All of the radiation treatments were performed in a single fraction. Follow-up ranged from 7 to 20 months.

As measured on a visual analogue scale, 92% of patients experienced an improvement in back pain. Throughout the follow-up period there were no clinical signs of radiation toxicity to the spinal cord. One patient (4%) experienced progressive kyphotic deformity and the presenting pain never improved. They conclude that kyphoplasty followed by stereotactic radiosurgery is safe and effective.

Summary
Spinal column metastatic lesions are increasing in frequency. These three articles are representative of the new techniques and ideas that are influencing modern management of this disease. We encourage you to participate in the pre-meeting assessment and look forward to seeing you at the IML Spine Session at the annual meeting.
Low-Grade Gliomas (LGGs) are slow-growing tumors, and chemotherapy has not been definitively confirmed in trials to be an efficacious and standard component of treatment for these low-grade neoplasms. A recent retrospective study attempted to evaluate the predictive impact of chromosome 1p/19q deletions on the response and outcome of LGGs treated with up-front temozolomide (TMZ). One hundred forty-nine patients with histologically confirmed LGG (81 biopsy, 68 surgical resection) from a single institution were included in this study, and 36 had 1p/19q loss out of the 86 patients that had material available for genotyping. All patients were treated with TMZ with a median follow-up of 30.4 months. Response to TMZ was evaluated by MRI every 2 to 3 months. 1p/19q deletions were detected by the loss of heterozygosity technique. Response to TMZ was evaluated by MRI every 2 to 3 months. Twenty-two patients had a partial response, 55 had a minor response, 55 had stable disease, and 14 had progressive disease. The median progression-free survival (PFS) was 28 months, and the median time to maximum tumor response was 12 months. Loss of 1p/19q was significantly associated with a higher rate and longer objective response to TMZ. Additionally, longer PFS and overall survival were observed. Concerns regarding this study include its retrospective analysis and the lack of material available for genotyping for all patients in this study. Prospective clinical trials evaluating the efficacy of TMZ in patients with LGG are needed.

Recent retrospective trial of 149 patients examined the issue of up-front TMZ for LGG and the impact of chromosome 1p/19q deletions on response and outcome.

All patients received TMZ and the response was evaluated by review of MRIs every 2 to 3 months. 1p/19q deletions were detected by the loss of heterozygosity technique.
• Twenty-two patients had a partial response, 55 had a minor response, 55 had stable disease, and 14 had progressive disease.
• Median progression-free survival (PFS) was 28 months, and the median time to maximum tumor response was 12 months.
• Loss of 1p/19q was significantly associated with a higher rate and longer objective response to TMZ; longer PFS and overall survival were observed.
• Group concluded that LGGs respond to TMZ and 1p/19q predicts a more favorable outcome.
• CONCERNS: Prospective clinical trials are needed to corroborate the authors’ findings.


While radiation for LGG is an accepted treatment, the timing of radiation remains unclear. A recent large prospective randomized trial has attempted to answer this question. The European EORTC 22845 trial was a prospective randomized trial of 304 patients with LGG. One half of the patients were treated with early radiotherapy while the other half were treated with radiotherapy at the time of progression. The trial reported that there was no influence of radiation timing on the overall survival; however, the time to progression of disease was significantly longer in the early radiotherapy group. The group recommended that patients with LGG should be treated with delayed radiation if patients have a good performance status and can be closely monitored. Otherwise, the group recommends the initiation of early studies if the patient has a poor performance status or high intracranial pressure. The study also found that early radiotherapy did not appear to increase the risk of malignant tumor transformation. One other important issue is the quality of life and cognitive status which was not adequately addressed by this study. The cognitive status post radiation still remains an unresolved issue.

Recent prospective randomized trial (EORTC 22845) of 304 patients examined the issue of radiation timing.
• Half were treated with early radiotherapy and the other half were treated with deferred radiotherapy until time of progression.
• Results showed no difference in overall survival; however, time to progression was significantly longer in the early radiotherapy group.
• Group concluded that patients with LGG should be closely monitored and radiotherapy can be deferred if patients have good performance status.
• Early radiotherapy does not appear to increase risk of malignant tumor transformation.
• Early treatments should be initiated in patients with focal deficits, signs of high intracranial pressure, or cognitive deficits.
• This is the only randomized trial addressing the role in timing of radiation.
• CONCERNS: Quality of life was not assessed.


Both stereotactic biopsy and open biopsy provide an opportunity to confirm pathology without the morbidity and mortality risks associated with a large craniotomy. Biopsy has been advocated in the setting of tumors located adjacent or deep to eloquent cortices, which would not be amenable to gross total resection (GTR). Craniotomy and resection have traditionally been reserved for patients with appreciable mass effect from LGG (which results in increased intracranial pressure or neurological deficit) and for those with symptomatic epilepsy that is refractory to antiepileptic therapy. The best treatment policy for LGGs is still unclear. Some physicians advocate early and extensive surgery whereas others tend to postpone treatment until functional deficits are present. This group retrospectively studied prospectively collected data from European Organization for Research and Treatment of Cancer trials (22844 and 22845).
• The association between age and survival: prognosis being worse for older patients.
• Patients with oligodendrogliomas or mixed oligoastrocytic tumors had a more favorable prognosis than patients with pure astrocytoma.
• The presence of neurologic deficits is associated with worse survival.
• In univariate analysis, the presence of epilepsy was associated with longer survival, but the presence of neurologic deficits superseded its prognostic importance in multivariate analysis.
• Smaller tumors (less than 5-6 cm) or tumors not crossing the midline had better prognosis.
• This group found, on univariate analysis, that extensive resection (i.e. >90%) was associated with longer overall survival. However, on multivariate analysis the benefits of extensive resection were marginal at best.
• These factors were used to derive a prognostic scoring system that can be reliably calculated based on the total number of unfavorable prognostic factors present, with increasing scores corresponding to worse prognosis.
  o Low-risk patients with two or fewer risk factors have an expected median survival of more than 7 years.
  o Patients carrying three or more risk factors should be considered high risk and have a significantly shorter median survival time.
• CONCERNS: The failure of prospective trials to identify a benefit on multivariate analysis seriously challenges the role of extensive surgery in the management of low-grade gliomas. However, these studies were not primarily intended to assess the effect of extensive resection, and were, therefore, not designed or powered to reliably evaluate this factor. For example, the extent of resection was gauged on the basis of the “surgeon’s impression,” which is an unreliable assessment.
O
ver the past several decades, med
ical research has shown that after the
moment of impact (primary brain
injury), brain injury continues and evol
ues over the ensuing hours and days. This sec
ondary brain injury contributes significan
ty to mortality and poor functional outcome
after head injury and other acute neurological
 disorders such as stroke. Among the major
 factors causing secondary brain damage are
cerebral ischemia and hypoxia. The injured
brain is most susceptible to hypotension and
hypoxia, which are causes of secondary injury.
Even at the best neurotrauma centers in the
country, devastating secondary events account
for an inpatient mortality rate that continues
at an alarming rate (25-33%). It has been pos
sulated that as many as 90% of patients who
die from Traumatic Brain Injury (TBI) show
some evidence of secondary brain injury.

While Mannitol is the standard against
which other ICP lowering agents are com
pared, one of the most researched areas in
neurotrauma has been the use of hypertonic
saline (HS). This is an osmotic agent that is
already being used therapeutically. Its recent
popularity stems from its usefulness in the
fluid resuscitation of penetrating trauma with
hypovolemic, hypotension. HS is attractive
as a resuscitation fluid because it can help
achieve hemodynamic stabilization, which can
optimize brain perfusion. It has also been sug
gested, based on animal data, that increased
plasma tonicity, after HS administration, also
favors more rapid absorption of CSF

HS refers to any saline solution with a con
centration of sodium chloride (NaCl) higher
than normal saline (0.9%). Commonly used
preparations of HS include 2%, 3%, 5%, 7%,
and 23% NaCl. HS may have an important
role in preventing and treating the effects of
secondary brain injury. It works primarily by
an osmotic effect on the brain because of its
high tonicity and ability to effectively remain
outside the blood-brain barrier. A number of
animal studies have shown that fluid resusci
tation with HS boluses following hemorrhagic
shock prevents the intracranial pressure (ICP)
increase that follows resuscitation with routine
fluids. HS control of ICP, leads to a decrease
in secondary brain injury. There is also some
benefit in restoring cerebral blood flow, which
is felt to be from the local effects of HS on
cerebral microvasculature.

The subject of the Integrated Medical
Learning session for the AANS/CNS Section
on Neurotrauma and Critical Care is Hyperos
molar Therapy. The following clinical arti
cles were chosen for review by participants
prior to the session. Summaries of these arti
cles are provided.

I. Guidelines for the management of severe
traumatic brain injury. II. Hyperosmolar
therapy: Brain Trauma Foundation; Amer
ican Association of Neurological Surgeons;
Congress of Neurological Surgeons; Joint
Section on Neurotrauma and Critical Care,
AANS/CNS; Bratton SL, Chestnut RM, Gha
jar J, McConnell Hammond FF, Harris OA,
Harrtl R, Manley GT, Nemec et A, Newell
DW, Rosenthal G, Schouten J, Shutter L, Tim
mons SD, Ullman JS, Videtta W, Wilberger
JE, Wright DW. J Neurotrauma 24(Suppl 1):
S14-S20, 2007

a. This article provides a review of the cur
rent literature for hyperosmolar therapy in
TBI with the following recommendations
for treatment.

i. Level II: Mannitol is effective in
controlling ICP at 0.25 g/kg to 1
g/kg bolus. Avoidance of arterial
hypotension is important.

ii. Level III: Mannitol usage prior
to ICP monitoring should be
restricted to patients with neuro-
logical deterioration or evidence
of herniation.

b. Note: Hypertonic saline is discussed, but
the literature reviewed was not strong
enough to make formal recommenda
tions regarding its use, concentration,
or method of administration (contin
uous infusion or bolus).

II. Use of Hypertonic saline/Acetate infusion
in treatment of cerebral edema in patients
with head trauma: Experience at a single cen
ter: Qureshi Ai, Suarez, JI, Castro A, Bhard

a. Design: A retrospective chart review of
severe TBI patients admitted to the neuro
critical care unit over a 7 year period
(1990-1997) by a single reviewer.

b. Inclusion criteria - GCS ≤8 at hospital
ization

c. Exclusion criteria - Patients who suf
fered injury to multiple systems were not
admitted to the neurocritical care unit
and were thus excluded from the study.

d. Total number of patients reviewed – 36
patients were included in the treatment
 group, 46 patients were in the control
group.

i. Treatment Group received infusion
of HS initiated within 48 hours of
admission for a mean period of 72
days ± 85 hours. Either 3 or 2% solu
tion was administered.

ii. Control group did not receive HS.

f. Patient allocation to treatment or con
trol group was based on the year of
admission and associated protocol.
Prior to 1993 patients did not receive
HS and thus comprised the control
group. Patients admitted after 1993
were administered HS and comprise the
treatment group.

f. Treatment and control groups were
similar statistically in age and GCS.
Important differences were noted in
mechanisms of injury—Treatment group
had a higher incidence of penetrating
injuries and mass lesions and a higher
utilization of pentobarbital coma.

h. The authors report HS infusion was asso
ciated with higher in-hospital mortality.

h. Note: The methodology is extremely
poor. Although this article is listed in the
evidentiary table of the Guidelines, it is
noted as Class III. The methodology is
fromth with bias. These include selection
bias, and bias introduced with subgroup analysis that depended on adjustment for differences in the 2 groups and combining the 3 and 2% groups. In addition, the size also severely limits the statistical validity and its conclusions, (when evaluating pentobarbital coma, the treatment group included 7 patients, control only 2).

III. **Isovolume hypertonic solutes (sodium chloride or mannitol) in the treatment of refractory posttraumatic intracranial hypertension:**

2ml/kg 7.5% saline is more effective than 2 ml/kg 20% mannitol: Vialet R, Albanese J, Thomachot L, Antonini F, Bourgouin A, Alliez B, Martin C. Crit Care Med 31:1683-1687, 2003

a. Design: A prospective randomized trial/study.

b. Patients were treated using a standard protocol for the management of TBI. If ICPs were refractory to the standard strategies, >25mmHg, they were randomized to osmotherapy.

i. Group I was comprised of patients with 20% mannitol (1160 mOsm/kg/H2O) = 2.3 mOsm/kg of mannitol.

ii. Group II was comprised of patients who received 7.5% HSS (2400 mOsm/kg/H2O) = 4.8 mOsm/kg of saline.

c. The goal was to decrease ICP <25mmHg or to increase CPP to >70 mmHg. Treatment failure was defined as the inability to decrease ICP to <35mmHg or to increase CPP to >70 mmHg with two consecutive infusions of the selected osmotic solution. In that case the treatment protocol was stopped.

d. Twenty consecutive patients were utilized, 10 per group.

e. Mortality and neurologic outcome did not differ between the two groups.

f. The number and duration of ICH episodes were statistically lower in the HSS group than in the mannitol group.

g. The authors note that a higher osmotic load was more effective in reducing refractory intracranial hypertension episodes. Specifically, 2ml/kg of 7.4% saline was more effective than 2ml/kg of 20% mannitol.

h. Osmotic load versus Volume


a. Design: A prospective randomized trial/study.

b. Aims: to compare HS (1.6%) with LR (slightly isotonic) in moderate and severe TBI patients to determine the relative effects on ICP during the resuscitative, operative, and initial intensive care phases of treatment.

c. Thirty-four patients with TBI were included. GCS was ≤13.

i. Eighteen patients were included in the HS group.

ii. Sixteen patients were included in the LR group.

d. Treatment effectively lowered ICP in both groups. There was no statistically significant difference between the groups in ICP.

e. GOS was not different between the groups.

f. Note: HS patients required statistically significantly more interventions than the LR group. (Daily serum sodium, osmolality, and ICP interventions)

g. This is one of two articles included in the Evidentiary Table of the Guidelines document, 2007—Class III. CNSQ

• The stated objective was to determine if a functioning shunt could improve the neuropsychological functioning of young adult patients with spina bifida and presumed arrested hydrocephalus with abnormal intracranial pressure (ICP).

• N= 23 consecutive patients with spina bifida (mean age 22.5 years) and stable ventriculomegaly without significant signs and symptoms of increased ICP underwent continuous extradural ICP monitoring.

• In addition to a complete neurological
examination and neuroimaging studies, all underwent a comprehensive neuropsychological assessment.

- All patients underwent shunt placement and were reassessed 6 months postoperatively. There were no significant surgical complications.
- Every patient demonstrated improvement in all neuropsychological functions.
- Improvements were statistically significant in the following realms:
  - Verbal and visual memory
  - Unilateral motor coordination and speed
  - Tests of attention and mental flexibility
- Ventricular size was significantly reduced in all 23 patients.

In conclusion, “Patients with hydrocephalus and suspected non-functioning shunts or non-shunted ventriculomegaly should always be carefully monitored to identify those who could benefit from shunting. Improved cognitive functions will probably lead to clinical, educational, and social benefits.”

**Arrest and compensation of hydrocephalus:**

- This paper focuses on the decision to shunt or not shunt children with enlarged ventricles without clinical evidence of hydrocephalus. It is a discussion, not a scientific study.
- Arrested hydrocephalus was defined as adequately shunted hydrocephalus.
- Compensated hydrocephalus was defined as ventricular enlargement without increasing head circumference, progressive developmental delay, cognitive deterioration or other progressive neurological deficit.
- The authors acknowledge a number of studies documenting improvement in a child’s intellectual performance following shunting in children with large stable ventricles.
- The question proposed is: What price is reasonable to pay to avoid a shunt and the risk of the shunt versus the cost of compensated hydrocephalus?
  - The cost of compensation is difficult to determine, especially in children under the age of 3, as cognition and development are difficult to assess. Therefore, in the child 3 or younger, with moderate or greater ventriculomegaly one should err on the side of shunting.
  - We do not know the cost of compensation. The risks of a young adult with large ventricles (beyond the potential intellectual issues) include: decompenetration and epidermal and subdural hematomas.
  - If watching a child with ventriculomegaly, vigilance with repetitive evaluation of ventricular size and intellectual performance is critical.
  - “Children beyond 5 years of age with stable ventriculomegaly can be monitored if their intellectual performance is within the normal range and stable... Close follow-up with objective data is essential for all other children with compensated hydrocephalus, as well as for all children with a shunt.”


The goal of this study was to assess the effects of systematic follow-up and shunt revision in asymptomatic shunt failure (ASF). The results of shunt revision for ASF versus symptomatic shunt failure (SSF) were analyzed.

- ASF was defined as shunt failure diagnosed in an asymptomatic patient during routine evaluation.
- N=1564 shunted children monitored for a mean of 10.7 years.
- 1106 (70.7%) patients required at least one shunt revision. SSF in 609 patients, ASF in 505 patients, unspecified in 192 cases.
- When ASF was detected, shunt weaning was considered in patients without ventricular enlargement compared to baseline studies, and if the patient had never had surgery for a SSF.
- Shunt weaning protocol:
  - Shuntogram demonstrating the absence of CSF flow, followed by
  - Ligation of the catheter, and if tolerated (clinically and radiographically) for one month,
  - Removal of the shunt
  - Shunt removal was tolerated in 66 patients (4.2%) in the 305 cases operated on for ASF, the incidence of shunt infections and subsequent shunt revisions occurred significantly less frequently than in the SSF group (609).
  - The event free survival rate after the first shunt revision is significantly (p=0.0023) larger (better) after revision for ASF, than for SSF.
- On fractured shunts the authors state:
  - “Although shunt rupture may remain silent for many years, we consider it primarily a matter of time before symptoms appear”
  - “We think that allowing a child to live with a ruptured shunt cannot be justified.”
  - A disrupted shunt cannot be considered “non-functional” unless proven clinically and radiographically, at which point the shunt should be removed or revised.

- The results of the study demonstrate a low complication rate for surgical treatment of ASF and the authors recommend prophylactic surgical treatment of ASF.
- In conclusion, surgical outcomes following surgery for ASF are better than for SSF. “Cases of ASF are among the few opportunities we have to improve the outlook for this difficult disease.”

The articles are the starting point for what we hope will be an interactive and lively discussion between our 3 experts (Arthur Martin, MD, Corey Raffel, MD, and Hugh Garton, MD) and you, the audience. At the conclusion of the IML we hope that you will have developed a clear concept of the safest, most scientific approach to the management of fractured and outgrown shunts.
The suggested readings for the Pain Section IML Session on Failed Back Surgery Syndrome include two randomized controlled studies. The first study involves a multi-center trial comparing the effectiveness of spinal cord stimulation (SCS) versus conventional medical management (CMM) in patients with failed back surgery syndrome (FBSS). The second study involves a prospective randomized comparison of the effectiveness of SCS versus repeat operation in patients with FBSS at a single institution.


This trial was part of the PROCESS study and enrolled 100 patients with FBSS who had a predominant complaint of neuropathic leg pain at 12 centers. Intent to treat analysis showed that SCS was significantly more efficacious than CMM for treatment of these patients at six months (p<0.001).

1. Methods
   a. Eligible patients had:
      i. Neuropathic radicular pain in an L4, L5, and/or S1 distribution with leg pain exceeding back pain.
      ii. Visual analogue scale score (VAS) of 5 or greater for at least 6 months with a minimum of one anatomically successful surgery for a herniated disc.
      iii. No history of other chronic pain condition or disease process prohibiting SCS placement.
   b. Randomized in a 1:1 ratio to CMM or SCS via random sequences.
   c. The patients were required to wait 6 months before crossover and were followed for one year.
   d. All patients assigned to SCS had a screening trial requiring 80% coverage of painful area.
   e. Outcome measures:
      i. The primary outcome measure was the percentage of patients reaching >50% pain relief using VAS pain diary.
      ii. Secondary outcomes included improvement in:
         1. Leg and back pain.
         2. Health-related quality of life using Short Form 36 (SF36), functional capacity (Oswestry Disability Index).
         4. Level of patient satisfaction.
         5. Incidence of adverse events.

2. Results
   a. Randomization: 52 to SCS and 48 to CMM (the groups were essentially demographically the same):
      i. Of SCS patients, 50 were available at 6 months, 5 then crossed over to CMM; 47 were available at 1 year for the intent to treat analysis.
      ii. Of CMM patients, 44 were available at 6 months, 28 crossed over to CMM; 41 were available at 1 year for intent to treat analysis.
   b. Primary Outcome Measures:
      i. 48% of SCS vs. 9% of CMM achieved primary outcome at 6 months (p<0.001) based on intent to treat analysis.
      ii. 48% of 71 SCS patients and 18% of CMM patients met primary outcome measures at 1 year (p=0.03) based on per treatment analysis.
   c. Secondary Outcome Measures:
      i. At 6 months SCS patients did significantly better in improvement in leg and back pain, function, health-related quality of life and treatment satisfaction.
   d. Complications:
      i. 32% of patients with SCS had a device-related complication with 20 patients of 84 (including screening trials and permanent implants) requiring surgery.
      ii. 35% of the SCS group and 52% of the CMM group had one or more non-device-related events; most commonly a drug AE or development of new condition.

3. Synopsis
   a. In selected patients with FBSS, SCS provides better pain relief and improves health-related quality of life and functional capacity compared to CMM alone.
   b. Strengths:
      i. Largest trial of SCS for management of neuropathic pain.
      ii. Uses standard primary outcome measure for pain studies.
   c. Limitations:
      i. Lack of blinding or independent assessment.
      ii. Crossovers make unbiased evaluation of SCS efficacy difficult after 6 months.


This trial was a single center prospective ran-
domized study which followed 50 patients for a minimum of 3 years. Patients with FBSS who had a predominant complaint of neuropathic leg pain were randomized either to repeat spine operation or SCS.

1. Methods
   a. Eligible patients had:
      i. Surgically remediable nerve root compression with radicular pain equal or greater than low back pain.
      ii. Previous lumbar spine surgery.
      iii. No disabling neurological deficit (foot drop or neurogenic bladder), no significant cauda equina compression and no gross instability.
      iv. No significant narcotic dependency, untreated psychiatric comorbidity, unresolved secondary gain issues, concurrent chronic pain problems.
   b. Patients randomized in a 1:1 ration to CMM or SCS via random sequences.
   c. Reoperation options included decompression with or without fusion with or without instrumentation. Crossover was possible to SCS after 6 months.
   d. All patients with SCS underwent a screening trial.
   e. At six months, a third party assessed outcome. Average follow-up was 3 years.

2. Results
   a. Randomization: 24 to SCS and 26 to reoperation.
      i. Of SCS patients, 17 underwent permanent implant and 5 crossed over to reoperation after SCS trial.
      ii. Of reoperation patients, 14 crossed over to SCS implant.
      iii. The rate of crossover to SCS was significantly higher than the rate of crossover to reoperation (p=0.02).
   b. Outcomes
      i. Patients with > 50% pain relief:
         a. 9 of 19 patients (47%) randomized to SCS and 3 of 25 (12%) patients randomized to reoperation had significant pain relief in intent to treat analysis (p=0.04 assuming worst case analysis).
         b. 0 of 4 patients who crossed over to reoperation had successful pain relief while 6 of 14 (43%) who crossed over to SCS had pain relief (p<0.05).
      ii. Patients randomized to reoperation required more opiates than those randomized to SCS (P<0.025).
   c. Complications:
      i. 4 SCS patients underwent revision surgery.

3. Synopsis
   a. In selected patients with FBSS, SCS provides better pain relief compared with reoperation.
   b. Strengths:
      i. Single center study.
      ii. Uses standard primary outcome measure for pain studies.
      iii. Independent assessment at 6 month follow-up.
   c. Limitations:
      i. High crossover rates limits power of the study.

In summary, these two articles show that in randomized controlled studies, SCS is more effective at providing significant pain relief of radicular leg pain than either conventional medical management or reoperation at 6 months. They suggest that this benefit is still evident at long-term follow-up.
Life threatening brain edema occurs in 1 to 10% of patients with a supratentorial infarct. Prognosis for patients with “malignant” edema from MCA distribution infarction is poor, with 80% mortality reported with best medical management. While craniectomy has been recognized as a life saving procedure for patients with this condition, concern has been raised regarding the possibility of increasing the number of survivors with severe disability. Recently a number of studies have been published which shed light on this important question. For this reason the CNS scientific committee in conjunction with the Cerebrovascular Joint Section has chosen “Hemicraniectomy for Acute Stroke” as the the topic for the cerebrovascular IML Session to be held at the 2008 CNS annual meeting. The planning committee has chosen four articles to serve as part of the curriculum for this session. These 4 articles are summarized below:


In a retrospective multicenter study of 201 patients with acute MCA distribution infarctions, imaging and clinical predictors of fatal brain edema after hemispheric ischemic stroke were analyzed. In this study, 94 patients (47%) died of brain swelling. Multivariable analysis identified the following predictors of fatal brain edema: hypertension, history of heart failure, elevated white blood cell count, >50% MCA hypodensity on early CT, and involvement of additional vascular territories. While fatal herniation from middle cerebral artery distribution infarction can occur in the first 24 hours after symptom onset, this typically occurs between the second and fifth day after infarction. There is value in being able to predict which patients will develop fatal brain edema. Theoretically, this could help identify candidates for prophylactic hemicraniectomy.


To better define the utility of hemicraniectomy for middle cerebral artery infarction, Gupta et al. reviewed their own data and performed a systematic review of the literature. Their detailed analysis supported the long held notion that outcome was age dependent with better outcomes noted in patients less than 50 years of age. At follow-up, 80% of patients over the age of 50 were dead or severely disabled compared with 32% in patients ≤ 50 years of age.


In a pooled analysis of three European randomized trials, Vahedi et al. presented the most convincing data to date that hemicraniectomy for malignant infarction can improve functional outcomes. The three trials analyzed were DECIMAL, DESTINY AND HAMLET. Both DECIMAL and DESTINY were
terminated early because a predefined analysis showed a significant benefit of surgery on mortality. At the time of the pooled analysis HAMLET was still ongoing. DECIMAL and DESTINY were both published subsequent to this pooled analysis. In this pooled analysis, patients aged 18 to 60 and treated within 48 hours were included. Ninety-three patients were analyzed. More patients in the hemicraniectomy group than in the control group had mRS \leq 4 (75% vs 24%) and MRS \leq 3 (43% vs 21%). Of note the outcomes appeared consistent across the three trials. No differences in outcome were noted based on preoperative presence of aphasia. It is important to note that none of the studies addressed hemicraniectomy in patients older than 60.

Hemicraniectomy: A second chance on life for patients with space-occupying MCA infarction: Mayer SA. Stroke 38:2410-2412, 2007. In an editorial, Stephan Mayer commented on the publication of DESTINY and DECIMAL as well as the pooled data analysis by Vahedi et al. described previously. This editorial emphasized that in the pooled analysis of Vahedi et al., this population was associated with a 49% absolute risk reduction in mortality. From a practical standpoint this editorial pointed out that, based on this pooled analysis, for every ten hemicraniectomies performed, 5 patients will escape death. Of these 5 patients one will have mild disability, one will have moderate disability, and three will have moderate to severe disability. The argument was made that side of stroke may no longer be appropriate selection criteria for surgery.

Recent data as partially described previously supports hemicraniectomy for select patients with ischemic stroke, but many intriguing questions remain regarding patient selection and timing of treatment. Clearly, patients and their families need to be an inherent part of the decision analysis based on the available data. We hope you will join us for this exciting IML session where this topic and the many questions it raises will be explored interactively. CNSQ
The surgical treatment of Parkinson’s disease has undergone dramatic shifts over the past 15 years. The reintroduction of pallidotomy (ablation of a portion of the globus pallidus internus or GPi) in the early 1990s, coupled with an improved understanding of basal ganglia anatomy and physiology led to a tremendous renewal of interest. Pallidotomy became a successful and widely accepted technique but was rapidly, and almost completely, supplanted by deep brain stimulation (DBS) of the subthalamic nucleus (STN). This dramatic shift was prompted by the inherent appeal of a reversible and adjustable treatment, by the potential for performing bilateral surgery, by reports demonstrating motor improvements that were equal to or better than those reported for pallidotomy, and by the associated reduction in dopaminergic medications. Currently, STN DBS is widely considered the standard of care for the treatment of Parkinson’s Disease. In this transition from ablative to stimulation therapy, however, it was not established whether the STN or the GPi constitutes a better overall target for DBS, or whether one target is better in some clinical situations than the other. Based on the known anatomy and physiology, either nucleus can be considered appropriate candidates for DBS therapy.

In an effort to address this important issue, several studies have attempted to compare the two targets in an effort to better define the potential advantages and disadvantages of each. The goal of this IML session is to review the most relevant papers on this topic. In addition, this session will explore whether one target should be routinely selected over another or whether there are some reasons for considering either the GPi or the STN, depending on clinical circumstances. Four papers were selected for review and discussion.

• This is a randomized, blinded, pilot trial comparing pallidal versus subthalamic DBS in Parkinson’s disease.

• This is a multicenter study of bilateral DBS in Parkinson’s disease comparing pallidal versus subthalamic targets with four year follow-up.

• This is a metaanalysis of patient outcomes following deep brain stimulation surgery using either the pallidal or subthalamic target.

• This is a study of neuropsychological outcomes following staged bilateral pallidal or subthalamic nucleus deep brain stimulation for Parkinson’s disease.

These studies demonstrate that the issue is far from settled. However, there are some themes that seem to emerge.
• Both STN and GPi targets are associated with significant improvements in off-medication motor scores.
• Both STN and GPi targets are associated with significant improvements in activities of daily living scores.
• Neither target is consistently associated with improvements in on-medication motor scores.
• The STN target is more consistently associated with a reduction in dopaminergic medications.
• The GPi target may be associated with a lesser incidence or severity of postoperative neuropsychological deficits.

Hence, some of the issues that will be discussed during the session include:
• The quality of available data comparing STN and GPi Targets.
• Possible advantages and disadvantages for each target.
• Possible indications for selecting one target over another.
• Implications for future studies and treatment.
As changes occur in neurosurgical reimbursement, workforce, and business practices, concomitant changes are taking place in neurosurgical groups and practices regarding how physicians are compensated.

Recently the CNS performed a phone survey of 20 community based neurosurgeons on a variety of issues including compensation for neurosurgical services. Based on the results of that survey, the majority of non-university based neurosurgical practices operate on a compensation model that provides a base salary plus a bonus that varies between 15 and 50% of individuals production.

In addition a substantial minority of community based neurosurgical practices now generate a portion of their compensation from ancillary services such as imaging centers, pain management services, or ambulatory surgery centers. Physicians in this survey reported generating between 5 and 30% of their total compensation from these types of ancillary services implementing them either on their own or in partnership with other entities including hospitals.

The vast majority of neurosurgeons also receive part of their compensation for providing coverage of emergency departments. Respondents to our survey reported payments varying between $1000 and $4000 depending on their market conditions, location and acuity of the emergency neurosurgical service being provided.

Combining this data with the current political climate which seems less and less friendly to physicians with regard to compensation for clinical services, it seems timely for neurosurgeons to educate themselves with the latest information on compensation models and partnership formation, and how these issues may affect the recruitment and retention of physicians. To that end, the CSNS in combination with the CNS is holding an IML session featuring these issues at the 2008 CNS Annual Meeting in Orlando, Florida. On Wednesday, September 24, Ken Heckman, an expert in medical economics, will explore neurosurgical compensation models. Sean Grady will then discuss gain sharing and partnering with hospitals. Finally, physician recruiter Angie Farris will tie all of these concepts together and discuss how they influence a group’s ability to recruit and retain partners.

We hope to see you in Orlando for this important education initiative.
Membership Committee Report

The Congress of Neurological Surgeons membership continues to grow steadily. CNS membership now includes a total of 6346 persons in 10 membership categories. Current categories include Active (2988 members), Active International (488 members), International Vista (277 members), Senior (915 members), Resident (1073 members), Affiliate (54 members), Associate (22 members), Inactive (434 members), Transitional (83 members) and Honorary (12 members). Due to the expansion of members in these respective categories, total membership has grown over 21% in the past 5 years (Figure 1).

While steady growth of active members has occurred over the past several years, the most rapid rate of growth in CNS membership has occurred in the international membership categories (International Active and International Vista) (Figure 2). The number of international members has increased by 37% in the past 5 years and 14% in the past year alone. The development of the International Vista membership category (released in January 2007) in conjunction with an ongoing international recruitment effort underlies this recent increase in CNS international members. The International Vista membership is available to neurosurgeons that live and work outside of North America (United States, Mexico and Canada) and underscores the Congress of Neurological Surgeons desire to continue to expand the critical input of neurosurgical colleagues worldwide in its organizational activities.

Benefits of the new International Vista membership category include internet-only access to Neurosurgery, Operative Neurosurgery and the Congress Quarterly, as well as internet access to the new Congress of Neurological Surgeons University of Neurosurgery. In addition to these advantages, International Vista members can register for the CNS annual meeting at a reduced fee and participate in CNS committees. These benefits of membership are available at a reduced fee of $135 per year.

To offer a mechanism for medical students to learn more about neurosurgery and to provide a more comprehensive information resource for students interested in neurosurgery, the Ad Hoc Committee for Medical Students of the CNS have developed a Medical Student membership category. This category of membership is slated to be launched after the 2008 CNS Annual Meeting in Orlando, FL. Medical Student membership will be open to medical students in good standing that are enrolled in an accredited U.S. or Canadian medical school. Benefits of the new Medical Student membership category will likely include internet-only access to Neurosurgery, Operative Neurosurgery and the Congress Quarterly, as well as internet access to the new Congress of Neurological Surgeons University of Neurosurgery. The CNS believes that providing educational opportunities to our youngest potential colleagues will encourage their development and ultimately, the long-term success of our profession.

The CNS remains committed to providing excellence in education and retains a dedication to research and scientific knowledge for its worldwide membership. Based on the tenets of volunteerism and development of neurosurgical leadership for public service, CNS membership continues to grow and thrive worldwide. Additional information and applications for membership can be found online at www.cns.org. Please feel free to contact us at any time with questions or comments at info@1cns.org.
The CNS Education Committee has undergone significant growth and has put forth substantial strategic plans to contribute to neurosurgical education in both the United States and internationally. As part of this development plan, we have restructured the Education Committee into eight subcommittees. It is my pleasure to provide a report of the current status and the goals of the new subcommittees.

CNS Online Educational Tools Subcommittee:
1. The CNS University of Neurosurgery: The CNS University project is undergoing substantial growth and development under the leadership of Dr. Jamie Ullman. The University is currently being structured to include a Dean, Vice Dean, Associate Deans (CME, Research and Education, International Relations, Resident Education, and Medical Student and Undergraduate Affairs) and Departmental Chairs. The departments within the University will encompass the main subspecialties within neurological surgery (cerebrovascular, trauma, tumor, spine, pediatrics, functional/stereotactic, pain, and peripheral nerve). Each department (subspecialty) will contain the following course offerings: course catalog, image database, video theater, podcast station, NeuroWiki, case of the month, CNS University grand rounds, and webinars (live web seminars for CME). There will also be a specific department for non-clinical core competencies.

2. SANS: The Education Committee is coordinating with the SANS Committee (Dr. Jason Sheehan) vis-à-vis the CNS University of Neurosurgery and resident educational programs.

3. NeuroWiki: The Education Committee is coordinating its efforts with Dr. Elad Levy and his editorial group to enhance the NeuroWiki program and make it an integral part of the CNS University of Neurosurgery effort.

Learning Sciences Subcommittee
The Education Committee has established this new subcommittee under the direction of CNS President Dr. Anthony Asher. The role of this subcommittee is to assess current and future educational programs as part of a learning sciences model to be able to coordinate future educational efforts to maximize the benefit to the learner community (neurosurgical community). The CNS is currently in the process of formally incorporating learning scientists as consultants to help these efforts evolve. Initial efforts will focus on IML and the CNS.

CME Subcommittee
This subcommittee, under the leadership of Drs. Michael Wang and James Harrop, is coordinating all CNS CME activities with the headquarters office. Special emphasis for this subcommittee will be placed on the annual meeting, online educational programs, CNS endorsements, and CME for Neurosurgery journal reviews.

Resident Education Subcommittee
This subcommittee has also expanded its activities substantially and is working closely with the CNS Resident and SANS Committees. The subcommittee has coordinated the 3rd Annual CNS 3-D Chief Resident Course that was held in St. Louis, Missouri, August 7-10th, 2008. The 3rd Annual CNS 3-D Chief Resident Course: hands on microsurgical training using 3-D technology, microscopes, and image guidance at every station.
CNS hosted 70 chief/senior residents from U.S. and Canadian programs. This was envisioned as a forum for graduating residents to interact with some of the senior educators in the U.S. Professor Albert Rhoton served as the lead faculty for the course. Drs. Richard Byrne, Aaron Dumont, Christopher Getch, Charles Liu, Russell Lonser, and Christopher Wolfla served as course coordinators. Drs. Ossama Al-Mefty, Nelson Oyesiku, Jon Robertson, and Philip Weinstein served as senior faculty. Drs. Benedicto Baronia, Gerald Grant, and Ashok Asthagiri served as course faculty. The CNS hosted all residents and faculty at the Ritz-Carlton hotel in St. Louis. The course was held at the Saint Louis University Practical Anatomy and Surgical Education Laboratory.

The CNS Education Committee is planning to host a Senior Education Leadership Conference at its annual meeting in Orlando this year. The CNS is inviting educational leaders from the AANS, SNS, and the RRC for a special symposium to discuss future resident educational programs, projects, and initiatives.

International Educational Collaborations Subcommittee
This subcommittee is forming an international education advisory board that will serve as a guide for the CNS Education Committee as the CNS expands its international educational mission. The board will encompass major figures in neurosurgical education representing North America, Central and South America, Europe, Africa, and Asia. The first meeting of the advisory board with the CNS Education Committee is scheduled to take place during the 2008 CNS annual meeting in Orlando. This subcommittee will function in collaboration with the CNS International Committee, chaired by Dr. Charles Liu.

Special Educational Programs Subcommittee
The mission of this subcommittee is to provide specialized educational opportunities to CNS members. The Oral Boards remediation course has been expanded under the direction of Dr. Richard Byrne and its annual program will be held at the CNS annual meeting in Orlando. This subcommittee is also tasked with evaluating the need for a specialized course for Maintenance of Certification preparation; Dr. Holly Gilmer is leading this initiative. This subcommittee also works in close coordination with the CNS Scientific Program Committee to arrange the “Operative Techniques with the Masters: 3-D Demonstration of Surgical Techniques” symposium, which will be held at the CNS annual meeting on Wednesday, September 24th, 2008. Drs. Ganesh Rao, James Liu, and Shaun O’Leary are coordinating this effort.

Member Feedback and Educational Surveys Subcommittee
This subcommittee has completed a survey on the educational value of morbidity and mortality conferences in training programs in the U.S. The subcommittee is in the process of launching a survey regarding the educational value of Grand Rounds conferences in U.S. neurosurgical training programs. Dr. Russell Lonser is heading this project.

Academic and Community Neurosurgical Training and Research Collaborations Subcommittee
This newly formed subcommittee is tasked with forming alliances between academic training programs and large community practices. The potential role for community based neurosurgical practices in providing training for residents and fellows will be explored. Likewise, potential regional and national collaborations in clinical research projects between academic and community practices will be studied.
CNS IT and Website News 2008

The Information and Technology Committee has been working behind the scenes of many exciting CNS projects. As we strive to improve services for CNS members, we remain committed to advancing education, disseminating information, and enhancing online learning opportunities. We are focusing on the following major areas.

**SANS 2.0 (www.sanswired.com)**

Working closely with the SANS committee, we are ready to launch the next iteration of SANS Lifelong Learning. The coming version will be much more user friendly for both contributors and users. In addition to an aesthetic make over, the next version of SANS will include continuous updates, with new questions added at regular intervals. There will also be a link to Neurosurgery, allowing the membership to acquire CME credits with the latest contributions to the neurosurgical literature. Finally, we are working on providing links to the NeuroWiki and the CNS University of Neurosurgery so your learning can be augmented by these online tools.

**CNS NeuroWiki (wiki.cns.org)**

NeuroWiki continues to gain entries and is being reviewed by editors representing each of the sections (e.g. Vascular, Tumor, Peripheral Nerve, etc.) Public viewing of articles will soon be available without a log-in (although adding new articles and editing existing ones will require a log-in, similar to Wikipedia). With continuous compiling and updating, NeuroWiki is poised to be the most concentrated repository of neurosurgical knowledge on the World Wide Web. At the time of this publication, there is a substantial amount of articles.

**CNS University of Neurosurgery (univ.cns.org)**

The IT committee is working with the University of Neurosurgery committee to help continue to develop this product. This is an ambitious effort that is poised to become the definitive source of online neurosurgical education. Various courses are being developed by section representatives. These will be linked with other CNS products including SANS and NeuroWiki. Please continue checking the site for updates.

**CNS Web (www.cNS.org)**

The CNS website is undergoing a major redesign. The next version will be streamlined and provide members easy access to the various products being developed by the CNS. We expect to have the new website ready to launch in the next several months. We are striving to consolidate passwords and improve navigation and accessibility to all CNS products.

**CNS Annual Meeting**

We are striving to continue the educational benefit of the CNS Annual meeting well after the meeting ends. Members may already revisit lectures delivered during the General Scientific Sessions at The University of Neurosurgery “Lecture Hall” (http://www.cns.org/university/lecturehall/). The digital posters can also be accessed after the meeting, allowing for an ongoing interaction between members online. Visit the site at posters.cns.org.

The Electronic Questions Messaging System has been tested and will be ready for use in Orlando. This will allow meeting attendees to submit questions to presenters in real time from their own handheld devices. This new and exciting meeting innovation, part of the larger IML initiative, will allow for almost immediate feedback for members attending the meeting.

**Membership Database**

As an improvement for the membership, the online membership database will soon consolidate information currently stored in disparate locations, such as committee membership, CME, meeting attendance, address, demographic information, a directory of all CNS members, and a calendar of events. These new features will help us provide superior service to our membership.

The IT committee continues enhancing services to our membership. Please keep checking www.cns.org for the latest improvements and additions.
CNS Publications Committee

W e of the CNS Publications Committee take it upon ourselves to communicate new developments in neurosurgery and other medical applications of the neurosciences. As this body of information is mushrooming, the task is becoming ever more challenging but it is also filled with novel and exciting opportunities. Thanks to the World Wide Web relevant developments can be disseminated with phenomenal speed. In parallel to exciting developments in clinical practices, new technology is revolutionizing our ability to transmit these developments to our global audience. In the following paragraphs, I summarize the novel venues by which our organization’s members can access the latest developments.

In conjunction with the Executive Committee’s support, the Publications Committee has established an electronic archive. This resource enables CNS members to see videos of lectures with their accompanying PowerPoint presentations. Using this technology, interested members can experience lectures as if they were present in person. Using the website http://www.cns.org/university/lecturehall/, CNS members can electronically access the lecture at any time after the meeting. The innovative IML sessions are available through this weblink as well. This innovation will be particularly beneficial to international CNS members who are unable to attend the annual meeting. We plan to make this material available in perpetuity, enabling interested members to review proceedings of past annual meetings. This electronic resource will surely prove useful to neurosurgical residents wishing to hear expert reviews of critical topics. Clearly, meeting attendants will be able to refresh the topic of the lecture and take more specific notes by viewing the information again.

Efforts to improve the academic quality and didactic value of Clinical Neurosurgery, a CNS publication, are developing. Starting with the proceedings of our 2007 meeting in San Diego, all articles have been peer-reviewed. In conjunction with the Publications Committee, Dr. Gerald Grant, Editor of Clinical Neurosurgery, and with the invaluable assistance and guidance of Dr. Michael L.J. Apuzzo, editor of Neurosurgery, Clinical Neurosurgery has been transformed and rejuvenated. You will find the new format more practical as well as aesthetically engaging. Beginning this September, a copy of Clinical Neurosurgery will be mailed together with the issue of Neurosurgery which covers the CNS annual meeting. Additionally, Clinical Neurosurgery articles will be available online side by side with its corresponding lecture to CNS members of the Congress.

Under the sponsorship of the Publications Committee, Dr. Ann Ritter is developing an online Pediatric Neurosurgery Handbook. This electronic resource will help residents as well as other neurosurgeons stay abreast of recent clinical advances in the treatment of acute and chronic insults to the pediatric brain. Dr. Ritter is starting by constructing an online manual, though she intends to expand its technical range so that it can be downloaded onto a PDA (personal digital assistant). This resource will have direct links to NeuroWiki and Wikipedia. Following this prototype, equivalent online handbooks addressing other neurosurgical subspecialties will be assembled. We aim to release this product by the end of the calendar year.

The Publications Committee is also proud of its flagship publication Neurosurgery. This journal, now in its 30th year, is currently under the stewardship of Dr. Michael L.J. Apuzzo. With an impact factor of 3.007 (up from 2.7 a year earlier), it ranks 15th among 139 surgical journals. This score reflects the high quality of its peer-reviewed manuscripts and the diligence of the editorial staff. The Human Cerebrum series, in particular, promises to be of great use to readers within the neurosurgical community.

The CNS now publishes the Congress Quarterly (CNSQ), an improved version of our newsletter. Its editor, Dr. Ali R. Rezai, has done a superb job at revitalizing the publication. As is the case with the CNS’s more formal publications, all articles in the CNSQ are available online at the website http://www.cns.org/publications/q/index.asp. This has been an exciting and productive year for the Publications Committee. There is an abundance of new knowledge and—thanks to the internet, and the efforts of a multitude of CNS member volunteers—we are witnessing a transformation in the manner and ability to disseminate timely important information. We look forward to an exciting year ahead to bring new and practical resources to our CNS members.

In conjunction with the Executive Committee’s support, the Publications Committee has established an electronic archive. This resource enables CNS members to see videos of lectures with their accompanying PowerPoint presentations. Using this technology, interested members can experience lectures as if they were present in person. Using the website http://www.cns.org/university/lecturehall/, CNS members can electronically access the lecture at any time after the meeting.
Join us in Orlando, Florida for the 2008 CNS Annual Meeting, as we explore our theme: The Community of Neurosurgery: Wisdom from Shared Experience.

The Congress of Neurological Surgeons exists to enhance health and improve lives worldwide through the advancement of education and scientific exchange. The Neurosurgical Forum is the epitome of our mission. This interactive assembly features a collection of the most compelling, groundbreaking science in each neurosurgical subspecialty, all within one concentrated area of the convention center, so you can move easily from one presentation to the next and interact with presenters in a variety of subspecialty areas.

The Select Abstract Session allows attendees to listen to poster presentations live, talk through techniques with the author, and ask questions about the abstract that interests them most.

More details online at www.cns.org! Preliminary program now available.
The Committees of the Council of State Neurological Societies—The Medico-Legal Committee

Ann R. Stroink, MD
Bloomington, IL
Mick Perez-Cruet, MD
Southfield, MI
Alan Scarrow, MD
Chair, CNS Bylaws Committee

For over thirty years, state and regional neurosurgical organizations have been meeting regularly to address socioeconomic issues that affect the practice and delivery of neurosurgical care to their patients. These conclaves organized and developed into the present day organization known as the Council of State Neurological Surgeons (CSNS). This assembly consists of elected neurosurgeons, each representing a constituency of fifty neurosurgeons, allowing for full representation of “grass roots neurosurgery,” and creating a strong voice that influences policies and decision making in socioeconomic issues. The CSNS is further enriched by delegates to this organization assigned by the parent organizations, namely the CNS and AANS. Young physicians also play a significant role as residents are regularly elected to membership.

The CSNS meets twice a year for two days, just prior to the national CNS and AANS meetings. It is during this time that the standing committees (Communication & Education, Medical Practices, Medico-Legal, Neurotrauma, Reimbursement, Workforce, Young Physicians) and the ad-hoc committees (Website, Fellowship, Mentoring Program, Editorial/Publication, Leadership Development, Membership Expansion) meet to review resolutions that can and will affect socioeconomic issues and work on projects that will further identify, enlighten, and persuade neurosurgeons to remain ever vigilant about the socioeconomic forces that remain pervasive in their everyday practice. It is the responsibility of the members of CSNS to decide which committee they shall serve on. Selection of committee assignments can be based on the needs of the constituents or the organization that each member represents.

Dr. Alan Scarrow heads the Medico-Legal Committee of the CSNS. Dr. Mick Perez-Cruet (Chairperson, Publication Committee) serves as the interviewer, providing questions that orchestrate the highlights and initiatives of the members of this committee that deal with some of the most controversial legal issues facing neurosurgery today.

Perez-Cruet: Define the purpose and function of the Medico-Legal Committee? How do members operate, cooperate and contribute? Do you have a mission statement?

Scarrow: The purpose of the CSNS Medico-Legal committee is to research, report, and educate CSNS and AANS/CNS members on medico-legal issues affecting neurosurgical practice, including professional liability, informed consent, Medicare fraud and abuse regulation and enforcement, CPT coding/E&M documentation rules, antitrust laws, and other pertinent law or regulation. Our committee is largely comprised of delegates and appointees who share a common interest in those issues. Between semiannual meetings when we are working on various projects, the committee members communicate via phone,
The purpose of the CSNS Medico-Legal committee is to research, report, and educate CSNS and AANS/CNS members on medico-legal issues affecting neurosurgical practice, including professional liability, informed consent, Medicare fraud and abuse regulation and enforcement, CPT coding/E&M documentation rules, antitrust laws, and other pertinent law or regulation.

Perez-Cruet: What issues/topics has the committee addressed recently? And, where can the reader learn more about the committee’s involvement?

Scarrow: Our committee has completed several projects and submitted a number of resolutions to the CSNS over the past few years. Perhaps the largest project was generating the non-clinical core competency questions for the Self Assessment in Neurological Surgery (SANS) module published by the CNS. Several of our committee members, in addition to members of other CSNS committees, submitted more than 100 questions for SANS. These “non-clinical” competencies are mandated as part of the CME requirements for neurosurgeons (as well as for all physicians) and will also be a part of the Maintenance of Certification (MOC) exam. In addition several members recently completed an article on the legal issues associated with ownership of an ancillary service facility such as a surgery center or imaging facility. This was published in the AANS Bulletin as part of a series of articles on ancillary service facilities ownership by neurosurgeons. This article grew out of a resolution submitted by our committee and passed by the CSNS that created a “wiki” portion of the CSNS web site that allows individuals to write, post, and edit articles of interest for neurosurgeons. Other CSNS committees are also completing similar projects on topics such as recruitment of new partners to a practice and compensation models within neurosurgical practice. Finally our committee has submitted a number of resolutions to the CSNS on topics such as scope of practice guidelines for nurse practitioners and physician assistants, and the creation of a medical malpractice database for neurosurgeons. Our committee has also been involved in educating our members on the potential for legal actions against physician rating services using suspect methodology such as HealthGrades.com.

Perez-Cruet: What is your background and what best defines your reasons for chairing such an active committee?

Scarrow: As a neurosurgeon and attorney I am obviously drawn to medico-legal issues affecting our profession. During my residency, I spent one year on Capitol Hill working as a staffer for Sen. Arlen Specter as part of the AANS/CNS Charles Plante Public Policy fellowship. I also began working with the CSNS during my residency and as a resident delegate on the medico-legal committee shortly after that. For someone like me with interests in legal, social, and political issues affecting neurosurgery, the CSNS is a natural fit. Within this organization, I have the privilege to work with other neurosurgeons who have similar interests and ambitions within those issues. More importantly I think that all of us in the CSNS feel that the non-clinical issues that neurosurgeons face have a profound effect on our profession and that active participation by neurosurgeons is the best way to assure our future growth. On a personal level, being involved in the CSNS has also been a great opportunity to hear about problems and opportunities in neurosurgical practices in other parts of the country. In some cases my own practice has been able to prevent problems before they arose based on the experience of my CSNS colleagues and in others we have put solutions into place by essentially copying the ideas I have gleaned from others.

Perez-Cruet: What projects are you currently working on? Does the committee have a list of goals or desired achievements? And, how do you motivate your committee members to actively engage in your work products?

Scarrow: Our committee is focused on giving its members the opportunity to come up with ideas for work products related to medico-legal issues, network with other CSNS appointees and delegates interested in similar issues, and to help provide the resources to carry out those projects. For example, Cathy Mazola became very interested in developing a more uniform definition and diagnostic tests for brain death that could be used by neurosurgeons in establishing policy at their local hospitals. Her interest had some obvious overlap with our committee and so several of our members worked with her to research current state statutes on brain death criteria. I think this is a good example of how the CSNS can help to channel our members knowledge, curiosity and intellect into developing worthwhile work products that will benefit practicing neurosurgeons.

Perez-Cruet: What compelled you to serve as chair on this committee? What makes this committee interesting for you in overseeing its activities?

Scarrow: I really like to see our organization doing things—producing work products that have value. In the past some have perceived the CSNS as a sort of “wailing wall” of neurosurgery that seemed capable of complaining but withered at the challenge of doing anything about those complaints. With all of the talent present in the CSNS, I thought that presented an opportunity for our organization. When I was able to chair the medico-legal committee, I wanted to stay focused on not only fielding problems from our membership, but taking the next step to do something about them.
Perez-Cruet: If I were a CSNS member wanting to participate on this committee, how would I go about it? Are there any requirements or special characteristics or talents you are seeking in your committee members?

Scarrow: Our committee is always happy to have new members that have an interest in medico-legal issues and are ready to work. There is very little glory or accolades for this type of work and as a volunteer organization we thrive only to the extent that our members are motivated to participate, however for those people that are interested in the political and legal issues affecting neurosurgery, it is the best outlet that I know of. Individuals interested in working on our committee may contact me at Alan.Scarrow@mercy.net.

Perez-Cruet: How is this committee of interest to all neurosurgeons and how do members benefit from the work products of this committee?

Scarrow: I think any practicing neurosurgeon has a good idea of how various medico-legal issues affect their professional lives. Liability, EMTALA, fraud and abuse, CPT coding, antitrust, certificate of need (CON), and Stark laws are just a few examples and ones that all of us have to deal with commonly. Educating neurosurgeons about those issues, gathering research and data on them, and putting together policy positions based on that work for use by the Washington Committee are examples of how our work can have a broad impact on our profession.

Perez-Cruet: Does this committee generate or plan to generate educational activities that neurosurgeons can participate in and possibly obtain CME credit for?

Scarrow: All neurosurgeons participating in MOC will be required to educate themselves and demonstrate some proficiency in “non-clinical” areas including medico-legal topics such as fraud and abuse, EMTALA, Stark, and informed consent. CME credit can be obtained by enrolling in the SANS course sponsored by the CNS which contains the questions generated by members of the medico-legal committee and the rest of the CSNS.

Perez-Cruet: How does the “non-involved neurosurgeon” get a “say” in the function of this committee?

Scarrow: Perhaps one of the best things about the CSNS is that it is open to any neurosurgeon or neurosurgery resident that has an interest in socioeconomics, politics or law. While the voting membership is restricted to appointees and delegates, the working membership of the organization is not restricted. Our committee is there to help structure and develop the ideas of neurosurgeons. At a very base level, the opportunity for like-minded individuals to share their ideas and network can become a very powerful force.
Section Update

The AANS/CNS Joint Section on Disorders of the Spine and Peripheral Nerves is a strong and vibrant force within organized neurosurgery. Section members are active in all facets of organized neurosurgery including our parent organizations (AANS and CNS), the CSNS, and the Washington Committee. Ongoing collaborative projects with allied societies (NASS, SRS, etc.) provide opportunities for multidisciplinary review of policies and practices that are indispensable for effective and responsible advocacy.

This year, at our 25th annual meeting, we celebrate our “silver anniversary.” This event provides an opportunity to look back on where we came from and to prognosticate where we can go. A specific project related to the silver anniversary celebration is a video history of the section with taped interviews with every past chairman of the section describing the particular challenges and opportunities that they faced during their tenure. This year’s meeting will feature the historically outstanding scientific sessions featuring cutting edge surgical techniques and evolving concepts and the always popular “Cahill Controversies” session. The meeting will also reflect other modern realities of spinal surgery and will include substantial discussions of the section’s advocacy activities and position statements regarding conflict of interest, payment decisions, clinical practice guidelines, and the incorporation of new technologies into spinal care. All neurosurgeons interested in spinal surgery are invited to attend the largest spine specific surgical meeting in North America in Phoenix, AZ, March 2009.
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Silver Anniversary
This year marks the 25th anniversary of the Section. We thought we would take the opportunity to remind both current and potential members what we are doing for them and their practices.

The Section on Disorders of the Spine and Peripheral Nerves was founded at the suggestion of Albert L. Rhoton, MD to Charles Drake, MD, then President of the AANS. The section was developed to foster the use of neurosurgical methods for the treatment of disorders of peripheral nerves, and the spinal column and its associated neural elements. Some of the goals of the section include advancing spinal neurosurgery and related sciences, improving patient care, supporting meaningful basic and clinical research, providing leadership in undergraduate and graduate continuing education, and promoting administrative facilities necessary to achieve these goals.

The section is continuously striving to be one of the leading resources for all spine and peripheral nerve surgeons. To this end, we are exploring the options of creating a new membership category for interested orthopedic surgeons. This would increase our ability to be the meeting ground for all spine and peripheral nerve surgeons.

• Education is fundamental to the Section. Through our annual meeting, the CNS and AANS annual meetings and websites, our members have access to the latest cutting edge research and technological advancements available. Moreover, the section offers numerous educational offerings such as practical courses and breakfast and luncheon seminars on a variety of topics and surgical techniques. This considerable CME offering is available to all members.

• The Section is actively involved with the ABNS and SANS in developing and implementing education that is invaluable for maintenance of certification (MOC).

• Advocacy: Spine and peripheral nerve surgery is widely practiced by the majority of neurosurgeons. Through our advocacy effort and direct work with the Washington Committee, the Section has strived to keep our membership up to date on issues relative to spinal and peripheral nerve surgery. Members of the Section liaison with the Washington and Coding and Reimbursement Committees to ensure optimal reimbursement for the procedures we perform.

• Position Statements: New research and technology is rapidly thrust upon us. The Section is proud to present position statements on these that may become controversial or in the public’s eye. These statements are easily found on the homepage of our website as well as through our e-blast effort.

• A recent position statement addressed Hypothermia and Human Spinal Cord Injury: Position Statement and Evidence Based Recommendations.

• Guideline development: The Section has been continuously and actively involved in guideline development. The Section has also served as an educational resource for others developing guidelines. Examples of recent guidelines:
  • Future projects: Guidelines for the management of cervical myelopathy

• Research: The Section is actively involved in research on disorders of the spine and peripheral nerves, and supports this research as well. The Section offers 4 fellowships, 3 research grants, as well as two resident-specific awards. There are exciting new awards in outcomes research as well as clinical trial design and fellowships. These awards also enable you to network with leaders in the field to help develop or take research proposals to the next level. Information for these awards as well as applications can be found on our website.

• Clinical trials—the Section website serves as a clearinghouse for clinical trials. Our members have open access to these trials through one easy clinic on our site.

• Networking and Getting Involved—The Section welcomes new members who perform spine or peripheral nerve surgery as part of their practice.

Benefits:
• Formal acknowledgement of your special interest in spine or peripheral nerve surgery
• Enhanced credibility with spine and peripheral nerve patients and in medico-legal activities
• Reduced registration costs at the Section’s annual meeting where cutting-edge research and developments are presented and discussed by leaders in the field
• Access to colleagues with similar interests—spine and peripheral nerve surgeons

The Spine and Peripheral Nerve Section wants to represent you and surgeons who practice spine and peripheral nerve surgery like you.

Applying is simple: a short application and details on membership requirements are available by going to www.spinesection.org. CNSQ
Neurosurgeons from 16 of the nation’s top medical institutions battled it out June 7th in Central Park at the 5th Annual Neurosurgery Charity Softball Tournament (www.Columbia-KidsNeuro.org). The event was hosted by Columbia University and benefited pediatric brain tumor research. This year’s competing teams included the Departments of Neurosurgery from Columbia, Emory, Harvard, Duke, Yale, Thomas Jefferson, Cornell, NYU, the University of Pennsylvania, Albert Einstein, Mt. Sinai, Pittsburgh, Utah, Northwestern, and Dartmouth. Harvard claimed their first championship by defeating Emory 4-2 in the Finals. Utah put on a strong showing to finish in third place.

Organized by Ricardo Komotar, a resident at Columbia University, the Annual Neurosurgery Charity Softball Tournament has rapidly evolved into a national competition. The first two championships were claimed by Columbia University in 2004 and 2005, while the University of Pennsylvania repeated their title runs in 2006 and 2007. The championship trophy, named “The J. Lawrence Pool Memorial Trophy” in honor of the former Columbia chairman, will be housed at Brigham and Women’s Hospital for the upcoming year.

For the fifth consecutive year, George M. Steinbrenner, III and the New York Yankees have sponsored the tournament. This year, Brandon Jacobs of the Superbowl Champion New York Giants and Jeremy Schaap of ESPN threw out the honorary first pitches, while rock star Julian Casablancas of “The Strokes” made a guest appearance. Supported by Mayor Michael Bloomberg, this date has been declared “Neurosurgery Charity Softball Tournament Day” in the City of New York. The planning has already begun for the games to continue next year in June 2009 at the 6th Annual Neurosurgery Charity Softball Tournament, with the potential for an expanded field to include 24 teams from across the country.

Columbia University neurosurgeons, along with Brandon Jacobs of the New York Giants and Jeremy Schaap of ESPN, holding a check for the amount raised since the tournament’s inception in 2004.

Playing to Win Against Pediatric Brain Tumors

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MEMBERSHIP NEWS

CNS Membership Applications

**April 2008**
Manish Aghi  
Ali Akhaddar  
Hooman Azmi  
Orhan Barlas  
Sadok Ben Amor  
Carl Bevering, III  
Deidre Buckley  
Geert Buyse  
Ali Bydon  
Satnam Chhabra  
Carlos Codas  
Cengiz Cokluk  
Georgy Daneri  
John Davis  
Amir Dehdashti  
Rodrigo Diaz  
Erin Dunbar  
Sudesh Ebenezer  
Daniel Fasset  
Adriano Fernandes  
Amanda Frakes  
Alfredo Fuentes Davila  
Ashok Hande  
Jorge Jaramillo-de la Torre  
Ryan Jewell  
Christopher Koebbe  
Yu-Hung Kuo  
Herman Christopher Lawson  
Dean Lin  
 Christer Lindquist  
Darlene Lobel  
Mitchell Maltenfort  
Thomas Manning  
Thomas Mattingly  
Francisco Mery Munoz  
 Yzabel Michaud  
Thomas Moriarty  
Wagner Munemori Mariushi  
Balamurugan Nadar  
Malini Narayanan  
Christopher Neumann  
Misa Nishikawa  
Juan Ortega - Barnett  
Sun Paek  
 Susan Pannullo  
Michael Petr  
Kevin Petrecca  
Julie Pilitsis  
Warren Roberts  
Marcy Rogers  
Amets Sagarrribay  
Bello Shehu  
Jun Shin  
Prakash Singh  
Michael Louis Smith  
Jesse Stagg  
Michael Stanley  
Sandeep Teja  
Leonide Toussaint, III  
Johannes Van Loon  
Pablo Vasconez  
Frederick Vincent  
Luis Vintimilla  
Bradley Wallace  
Ziv Williams

**July 2008**
Osvaldo Abibe  
Juan Adorno  
Charene Alderman  
Francisco Andrade  
Ashok Asthagiri  
Jesse Babitz  
Eric Ballantyne  
Efstratios Boviatss  
Samuel Brows  
Michael Bruneau  
Antonio Carlos Caires  
Joao Dominos Carneiro Leao  
Antonio Cavalcante  
Carlos Cavalcanti  
Luiz Cetl  
Pratyush Chaudhuri  
Marcelo Chioato  
Chun-Sung Cho  
Peggy Cotton  
John Cowan  
R. Andrew Danks  
Kleber Duarte  
Samer Elhabaa  
Johnathan Engh  
John Fahrbach  
Luiz Fernando Favorito  
Carlos Freitas  
Yee-Chiung Gan  
Nitin Garg  
Jonathan Gilhooly  
Jorge Gonzalez-Cruz  
Jorge Gonzalez-Martinez  
Pankaj Gore  
Jan Gouda  
Jennifer Guptill  
Sally Haischer  
Philip Hake  
Todd Harshbarger  
Roberto Herrera  
Alicia Hill  
Yoshitaka Hirano  
Patrick Hsieh  
Muhammad Jamil  
S. Taylor Jarrell  
Luc Jasmin  
Arthur Jenkins  
Sarah Jost  
Michael Jost  
Nevra King  
Hiroyuki Kinouchi  
Robert Klaes  
Joshua Kouri  
Michael Labbe  
Fabricio Lamis  
Twyila Lay  
Jean Christophe Leveque  
Roger Lichtenbaum  
Adam Lipson  
Hubiel Lopez  
Clovis Maciel  
Daniel Medina  
Joshua Medow  
Jacqueline Meekins  
Alexandre Miranda  
Shaye Moskowitz  
Bryan Oh  
Joseph Ong  
Felix Pahl  
Carlos Pardo

Ravish Patwardhan  
Frederik Pennings  
Nicholas Post  
Stephen Price  
Luis Reis  
Richard Rhiew  
Pamela Ritter  
Sharon Rivas  
Eric Roger  
Scott Rutherford  
Dennis Saar  
Marcio Santos  
Anthony Sin  
Sumit Sinha  
Lee Tessler  
Ryan Trombly  
William Vandergrift  
Virginia Vining  
Chun-Po Yen  
Bruce Zablow
See You at the 2009 CNS Annual Meeting!

A CULTURE OF EXCELLENCE

Congress of Neurological Surgeons

2009 ANNUAL MEETING

New Orleans, Louisiana

October 24-29, 2009