EDITOR’S NOTE

Welcome to New Orleans! This CNSQ Fall 2009 issue is dedicated to the CNS Annual Meeting. The theme of this meeting “A Culture of Excellence,” is exemplified throughout this issue. Ali Rezaei, Russell Lonser and Nathan Selden, the Scientific Program Committee, provide a detailed review of modifications and improvements in this year’s program. These changes will provide a better and more focused educational environment.

This issue has been designed to serve as a companion for the meeting. The two scientific sessions highlighted—the highly successful Integrated Medical Learning® (IML) and recently added Consensus Sessions—have been summarized and topics abridged. This provides the audience a detailed scope of the session as well as pertinent background information. For the IML sessions, the audience interacts with panelists discussing clinically applicable controversies and this has been expanded to several areas this year. Ashok Asthay and Bernard Bendok provide an overview in the article Expansion of a Concept and then each subsection is further abridged and highlighted in these articles:

- Cerebrovascular: What is the best management paradigm for Small Hemispheric AVMS? – Erol Veznedaroglu and Bernard Bendok
- Pediatric: Is Dural decompression necessary in the surgical management of Chiari I malformations? – Hugh Garton

The interactive sessions for practitioners have been received well by the CNS membership and the concept has been expanded to economic and political issues in the form of the consensus sessions which is reviewed by Nathan Selden. These specific areas were again summarized:

- The Role of Mid-level Health Care Providers in Modern Neurosurgery Practice – Richard Schlenk and Edward Benzel
- Individual Practice Options for Insurance Plan and Medicare Participation – Joshua Rosenow and Richard Byrne
- Regionalizing Emergency Cerebrovascular Care – Jamie Ulman
- Defining Quality Measure in Neurosurgery – Todd Vitaz and Robert Weil

This CNS meeting benefits from having further collaboration from our international and regional neurological colleagues. The CNS international host nation India and South East Asia (NSI and AASAN) meetings have been integrated. Shekar Kurpad and Jogi Pattisapu provide a detailed overview of India’s contributions to neurosurgery. Regionally, there has been the concurrent coordination of the 2009 Joint Meeting of the Society for Neuro-Oncology and AANS/CNS Section on Tumors. Alfred Quinones-Hinojosa, Hadie Adams, and Michael McDermott in the Tumor Section report discuss “The Community of Neurosurgeons in Latin America.”

In addition to the CNS annual meeting issue, I and the CNSQ staff would like to further thank David Adelson for the great year he provided as President of the CNS. In addition, we would like to welcome the new Editor of Neurosurgery®, Nelson Oyesiku.

Correction

In the article Writing Zenzele: One Neurosurgeon’s Journey into the Literary World, by J. Nozipo Maraire, MD, from the summer issue of the Congress Quarterly. Dr. Maraire’s credentials were inadvertently left out. The CNSQ regrets the error.
CONTENTS

04 Editor’s Note
James S. Harrop

2009 CNS ANNUAL MEETING

2 President’s Message
P. David Adelson

4 2009 CNS Honored Guest – Dr. James T. Rutka
James M. Drake

6 2009 CNS Annual Meeting: A Culture of Excellence
Ali R. Rezai, Nathan R. Selden and Russell R. Lonser

10 Integrated Medical Learning® (IML): Education Through Dynamic, Learner-Centered Interaction
Ashok R. Asthagiri and Bernard R. Bendok

11 IML: Section on Disorders of the Spine and Peripheral Nerves
James S. Harrop and Praveen V. Mummaneni

14 IML: Section on Stereotactic and Functional Neurosurgery
Emad Eskandar

17 IML: Section on Pediatric Neurosurgery
Hugh J.L. Garton and John D. Heiss

20 IML: Section on Cerebrovascular Neurosurgery
Erol Veznedaroglu and Bernard Bendok

22 CNS Consensus Sessions (CS): Putting the Annual Meeting to Work
Nathan R. Selden

23 CS 1: The Role of Mid-level Health Care Providers in Modern Neurosurgery
Richard P. Schlenk and Edward C. Benzel

25 CS 2: Individual Practice Options for Insurance Plan and Medicare Participation
Joshua M. Rosenow and Richard Byrne

27 CS 3: Regionalizing Emergency Cerebrovascular Care
Jamie S. Ullman

29 CS 4: Defining Quality Measures in Neurosurgery
Todd Vitaz

30 Neurosurgery and India
Shekar N. Kurpad and Jogi V. Pattisapu

SECTION NEWS

34 AANS/CNS Section on Tumors Report
Alfredo Quinones-Hinojosa, Hadie Adams and Michael W. McDermott

SPECIAL REPORT

36 In Memoriam: Dr. Setti S. Rengachary
Praveen V. Mummaneni, Raj K. Narayan, Ashwini Sharan, Shekar N. Kurpad and Jogi V. Pattisapu

37 Annual Neurosurgery Charity Softball Tournament
Ricardo J. Komotar

INSIDE THE CNS

38 Selection Process for NEUROSURGERY® Editor-in-Chief
Anthony L. Asher

40 A Biography of Nelson M. Oyesiku, Editor-in-Chief of NEUROSURGERY®
James S. Harrop

41 Membership Committee Report
Russell R. Lonser and Catherine A. Mazzola

42 IT and Web Committees Report
Ganesh Rao, Ashwini D. Sharan and Michael P. Steinmetz

43 Education Committee Report
Jamie S. Ullman and Nathan R. Selden

THE CNSQ BACK PAGE

Images in Neurosurgery
Over the past few months, we have seen heated debate over healthcare reform which has at times resulted in the appearance of a “division” of our country as well as the house of medicine, not only amongst specialties, but also from within. There are as many diverse opinions as there are individuals whether they practice medicine, are part of the allied health workforce, work in hospital administration, help provide health care insurance, or work in the government as well as amongst our patients, young and old. What has always made this country great has been the ability to have spirited debate and discussions regarding often very personal topics, but then come to a reasoned decision of how to move forward. Whether you agree with the politics or not, whether it be national or “local” as within our professional society, the Congress of Neurological Surgeons (CNS), there is always the opportunity to provide an opinion and a voice. One may disagree with the outcome or the decision but there is always the opportunity to make a difference or to make a change, even after the fact. I have heard from many of you who have expressed wide ranging opinions on the different details of the legislation as well as the opinions and decisions of our national organizations that are before us and the country. The leadership of the CNS takes all of your voices seriously and appreciates your sharing your views with us. While you may or may not
presently agree with the decisions made, I would encourage everyone who has the interest to become and stay engaged in the debate, to provide an opinion whether it be to the leadership of our national organizations or to the members of Congress, because your voice indeed counts. Make it heard!

This issue of the Congress Quarterly brings us through another year to our Annual Meeting, this the 59th Annual Meeting of the Congress of Neurological Surgeons (CNS). The Annual Meeting, especially for the CNS, has always been a celebration of our science and knowledge, and from our beginnings, has played a particularly central role in the education of neurosurgeons from here and abroad. As one will see from this meeting, the CNS Annual Meeting truly serves as a central educational opportunity, a forum, for national and international neurosurgery. While there are a plethora of educational opportunities that might be less expensive, more convenient, and less time consuming, the CNS Annual Meeting is a time to come together to hear of the latest in basic, translational, and clinical sciences that have occurred over the past year and an opportunity to get together, face to face, to listen, to discuss, to debate, and hopefully go home with an appreciation of what is and what may be for neurosurgeons in the future. These verbal interactions have in the past and continue to provide the basis of our learning between professionals from here and around the world. For the CNS, it has been a wonderfully creative forum for the organizers, to review what has been done in the past and where we may be going in the future. From the choosing of a theme, partnering with an international neurosurgical society, developing of topics, organizing the plenary sessions, identifying useful practical courses and interesting luncheon seminars, the process of choosing speakers, both scientific and general interest, and then pulling this all together into a final product, is the culmination in over a year's worth of work.

And while much of the framework of the meeting remains the same from the first, much has evolved. For example, the introduction of education science and Integrated Medical Learning (IML) into the meeting in the last few years has provided further in-depth interactive evidence based learning that is part of the evolution of educational culture in today’s environment. The summary of the different IML articles and topics can be reviewed in this issue and are provided to enrich the experience for you at the meeting. As well, the summary articles for the Consensus Sessions are included where indeed, your opinion and voice at the meeting shape the clinical decision making recommendations of our specialty in the future. Be a participant, be a voice, because your experience, your knowledge and your opinion matter.

I would like to conclude by thanking Drs. Nate Selden, Ali Rezai, and Russ Lonser for all their work and effort this year to make this meeting a success. It has been a true pleasure as well to work with and get to know personally, our Honored Guest, Dr. Jim Rutka. He was particularly instrumental in shaping this meeting and is truly in my opinion most deserving of this honor. As well, I would like to thank Drs. Basant Misra and V.K. Khosla and all their colleagues from the Neurological Society of India (NSI) who played such an integral role in the development of this meeting. I would also like to thank, Ms. Laurie Behncke and her staff who tirelessly took our ideas and put the pieces in place. Lastly, I would like to thank all of you for the opportunity to serve as your President this year. It has been a true honor and pleasure, one that I will always cherish and remember.
At the 2009 Annual Meeting of the CNS, we commemorate the achievements of our esteemed colleague, Dr. James T. Rutka. Born in Toronto, and educated at Princeton University and Queen’s University Medical School, Dr. Rutka did an internship at McGill University before entering the University of Toronto Neurosurgery Training Program in 1982. Dr. Rutka’s training included a research fellowship at the Brain Tumor Research Centre, the University of California San Francisco where he obtained his PhD in Experimental Pathology. Upon conclusion of his neurosurgical residency in 1989, Dr. Rutka did a post-doctoral research fellowship in molecular immunology at Juntendo University, Tokyo.

Dr. Rutka assumed his appointment in the Department of Surgery, Division of Neurosurgery in 1990, and has been on the surgical staff at the Hospital for Sick Children in the Division of Pediatric Neurosurgery since that time. His primary research and clinical interests relate to the science and surgery of human brain tumors. His laboratory interests lie in the molecular biology of human brain tumors - specifically in the determination of the mechanisms by which these tumors grow and invade. His recent clinical and research interests have centered on the surgical treatment of epilepsy in children.

Dr. Rutka has over 250 peer-reviewed publications. He is on the editorial boards of the *Journal of Neurosurgery* and *Neurosurgery*®. He is also a Professor of Neurosurgery at the University of Toronto. He was appointed as the first Director of the Arthur and Sonia Labatt Brain Tumor Research Centre at the University of Toronto in 1998. In 1999, Dr. Rutka was appointed Chairman of the Division of Neurosurgery at the University of Toronto, and sits in the Dan Family Chair of Neurosurgery. In 2004, he was honored with the Grass Award from the Society of Neurological Surgeons. In 2005, he received the Farber Award from the AANS/CNS Section on Tumors for longstanding contributions to neuro-oncology research. In 2006, Dr. Rutka was nominated for and became a member of the International Order of Smile. He was also appointed as the President-Elect of the American Association of Neurological Surgeons.

As division head, Jim oversees 35 neurosurgery residents, 29 full time neurosurgeons, and nine neuroscientists. How he manages this in addition to an extremely busy clinical practice, serving as Co-Chair of the Labatt Brain Tumour Centre, supervising his solid peer

> THERE ARE MANY SUCCESSFUL LEADERSHIP STYLES. DR. RUTKA’S IS TO LEAD BY EXAMPLE, MIXED WITH DEEP UNDERSTANDING AND COMPASSION. <
review funded laboratory of four PhD students and three Post-Doctorals, and participating in editorial review boards and leadership positions in organized neurosurgery is somewhat of a mystery. But certainly his indefatigable work ethic, superlative and decisive judgment, and relentless pursuit of excellence are key components.

His University of Toronto residents, in addition to an extensive and comprehensive curriculum filled with visiting professors from around the globe, also enjoy ice hockey matches, golf tournaments, curling and an annual canoe trip which Dr. Rutka leads. Dr. Rutka’s competitive spirit extends to most athletic contests including squash where he usually emerges victorious. He is also an accomplished pianist, restaurant connoisseur and wine collector. In addition to all this, he still finds time for and is devoted to his wonderful family - his wife Mari, a School Board Trustee, and his three children Dan, Hana and Marissa, all embarking on exciting careers in the arts including film and ballet.

There are many successful leadership styles. Dr. Rutka’s is to lead by example, mixed with deep understanding and compassion. He manages “to bring out the best in everyone and make them feel good about themselves” to quote his predecessor Dr. Charles Tator.

Jim is a loyal friend and colleague. The entire Division of Neurosurgery at the University of Toronto is extremely proud of Dr. Rutka’s being the Honored Guest at this year’s Congress of Neurological Surgeons Annual Meeting, but feel that is an appropriate recognition of his remarkable contributions to the field of Neurosurgery.
A CULTURE OF EXCELLENCE

Congress of Neurological Surgeons
2009 ANNUAL MEETING
New Orleans, Louisiana
October 24-29, 2009
The 2009 Congress of Neurological Surgeons (CNS) Annual Meeting will take place in New Orleans, Louisiana, October 24-29. The Annual Meeting theme, “A Culture of Excellence,” exemplifies neurosurgery as a surgical specialty, and as such, this year’s meeting has been based on how neurosurgeons define, pursue and measure excellence in their everyday practice and specialty. This featured theme has been integrated into various aspects of the program as well as the selection of speakers from around the world. Excellence is exemplified by this year’s Honored Guest, Dr. James T. Rutka. We are also excited about hosting this year’s meeting with our neurosurgical colleagues from India and South East Asia (See Box 1), as well as our programmatic coordination with the 2009 Joint Meeting of the Society for Neuro-Oncology and AANS/CNS Section on Tumors that immediately precedes the CNS meeting (See Box 2). The various program elements are discussed below.

**General Scientific Sessions (GSS):**

The 2009 Annual Meeting General Scientific Sessions I through III (Monday through Wednesday mornings) cover a spectrum of topics related to neurosurgical excellence. The GSS sessions will chronologically focus on how to define (Monday), pursue (Tuesday) and measure excellence (Wednesday) in neurosurgery. World-renowned neurosurgeons and prominent speakers will review and discuss a variety of topics including the characteristics of excellence as applied to the various neurosurgical subspecialties, excellence in surgical practice design, evidence-based medicine approaches, program/practice development, health care delivery, as well as excellence in research, training, continued competency and quality assurance. The General Scientific Session IV (Thursday morning) will focus on clinical and surgical management of complex neurosurgical cases in the ever-popular “Digital Masters Video Symposium” and the interactive “Cases and Coffee with the Masters” sessions.

The morning General Scientific Sessions also feature an exciting list of invited speakers. The CNS President, Dr. P. David Adelson, will explore the definition of excellence during his Presidential Address on Monday morning. The CNS Honored Guest, Dr. James T. Rutka, will provide lectures each day examining excellence in neuro-oncology research, clinical neurosurgery and neurosurgery program building. The CNS is delighted and honored to welcome APJ Abdul Kalam, PhD, (former President of India) as the 2009 CNS International Leadership Orator. We are also privileged to have the following outstanding speakers: Walter Isaacson, internationally

---

2009 CONGRESS OF NEUROLOGICAL SURGEONS ANNUAL MEETING
acclaimed author (*Benjamin Franklin: An American Life*, *Einstein: His Life and Universe*, *Kissinger: A Biography*), as the Walter E. Dandy Orator, Governor Bobby Jindal (Louisiana) as the invited Julian T. Hoff Lecturer, Peter Agre, MD, (2003 Nobel Prize in Chemistry and the President of the American Association for the Advancement of Science) as the John Thompson History of Medicine Lecturer, and Terry Orlick, PhD (world-renowned author in the field of focus training) as this year’s CNS Michael L.J. Apuzzo Lecturer on Creativity and Innovation. These distinguished speakers will provide their unique perspectives related to achieving excellence in their respective disciplines.

**CNS Original Science Program:**

**Top Ten Abstracts and the Neurosurgical Forum**

Original science will be highlighted at the 2009 Annual Meeting during the “Top Ten Abstracts” and “Neurosurgical Forum” program on Monday afternoon. This year, we received a record number of abstract submissions. During the “Top Ten Abstracts” sessions, the ten highest-ranked abstracts will be presented by the authors during eight concurrent sessions covering each subspecialty and the CSNS. The “Neurosurgical Forum” program immediately follows the “Top Ten Abstracts” session, and will provide attendees an opportunity to view additional outstanding abstracts and directly discuss the findings with the authors. A new feature at this year’s Neurosurgical Forum is the participation of senior section representatives as discussion facilitators who will tour posters with attendees, participate in discussion, and provide additional insight into the presented research. The senior leadership will also select the best quality presentation for each section in the Forum. The Forum program allows for a unique and relaxed format for information exchange, discussion and dialogue between the presenting authors, senior section leadership and the audience. Refreshments will also be provided at the Forum.

**Consensus Sessions**

The 2009 Annual Meeting will feature four controversial and timely Consensus Sessions on Tuesday and Wednesday afternoons. These Consensus Sessions will focus on policy and socioeconomic topics that are currently impacting all neurosurgeons and include the role of mid-level health care providers in neurosurgery (Tuesday), options for insurance plan participation (Tuesday), regionalization of emergency cerebrovascular care (Wednesday) and defining quality measures in neurosurgery (Wednesday). See pages 22-29 for an overview of these critical issues.

**Special Courses**

Two outstanding Special Courses are also planned for Monday and Tuesday afternoons. Special Course I (Monday) will review the recently assembled guidelines for the treatment of cerebral metastases (Part 1), which will be followed by an examination of the science of neurosurgical practice as it relates to Integrated Medical Learning® (Part 2). Special Course II (Tuesday) will
focus on the management of CNS infection globally. Speakers from around the world with unique expertise in the treatment of central nervous system infections will provide their clinical insights and management strategies.

**Integrated Medical Learning® (IML)**

The 2009 Annual Meeting will host four afternoon IML Clinical Science Sessions. On Tuesday, timely IML questions including “Anterior Temporal Lobectomy versus Selective Amygdalohippocampectomy: Is There an Advantage in Seizure or Neuropsychological Outcome” and “What Is the Best Management Strategy for Single Level Medically Refractory Cervical Radiculopathy?” will be examined. On Wednesday, IML questions including “What Extent of Decompression Is Necessary in the Surgical Management of Chiari I Malformations?” and “Small Hemispheric AVMs: To Treat or Not Treat and Surgery versus Radiosurgery” will be evaluated by attendees. These sessions will provide attendees the opportunity to benefit from cutting-edge interactive educational offerings by the CNS.

**Practical Courses and Luncheon Seminars**

The 2009 Practical Courses (Saturday and Sunday) and Luncheon Seminars (Monday through Wednesday) have been designed to cover a broad range of fundamental, practical and cutting-edge aspects of clinical and academic neurosurgery. The Scientific Program Committee has carefully evaluated and incorporated feedback and evaluations from last year’s participants to develop the 36 Practical Courses on Saturday and Sunday, and 55 Luncheon Seminars, providing comprehensive coverage of various neurosurgical topics. New offerings at this year’s meeting include a 3-D cadaveric spine dissection course, an NIH grant-writing course, an excellence in global neurosurgery course, a pediatric neuro-oncology course and various topic update courses.

**Operative Techniques with the Masters**

The very popular Operative Techniques with the Masters: 3-D Live Cadaveric Demonstration of Surgical Techniques program will return on Wednesday afternoon. This live session from the GSS stage will be presented by world-renowned neurosurgeons demonstrating surgical techniques in different subspecialties with cadaveric demonstrations, state-of-the-art 3-D visualization and videos.

The CNS is proud to present the 2009 Annual Meeting. The meeting has been developed by the hard work and the outstanding efforts of the CNS leadership, scientific program committee, the CNS Headquarters and numerous other individuals. We are confident that the speakers, topics and the program will be of broad interest for neurosurgeons, and will highlight and complement the “Culture of Excellence” that is at the foundation of our specialty. We look forward to seeing you in New Orleans!

---

**Box 1 - Joint Meeting with NSI and AASAN.**

The Congress of Neurological Surgeons (CNS) is proud to welcome our 2009 Joint Meeting partners, the Neurological Society of India (NSI) and the American Association of South Asian Neurosurgeons (AASAN). Founded as a professional society in 1951, NSI stands at the apex of the clinical neurosciences in India and has published a leading journal since 1952. The CNS is proud to welcome both the Past and Current Presidents of NSI to the meeting in New Orleans, Dr. Basant K. Misra, and Dr. Virender K. Khosla as well as leading Indian neuroscientist and neurosurgical educator, Professor Prakash Narain Tandon, and scores of NSI members who will attend and participate in the CNS Annual Meeting.

AASAN is an organization of South Asian neurosurgeons based in the United States and promotes scientific and personal ties between these two regions. The AASAN leadership, including current president Dr. Jogi Pattiapu, and many of its over 200 members have been intimately involved in scientific planning for the 2009 CNS Annual Meeting and in generous sponsorship of scholarships for South Asian neurosurgeons to attend and participate in the meeting. The CNS is proud to have contributed an additional $25,000 towards these travel scholarships.

The CNS, AASAN and NSI are all very honored to have the Past-President of India, APJ Abdul Kalam, PhD, who will give the 2009 International Leadership Oration. In addition, AASAN member and member of the CNS Nominations Committee, Dr. Anil Nanda, will introduce Governor Bobby Jindal, of Louisiana, who is invited to deliver the Third Annual Julian T. Hoff Lecture. Extensive special scientific content highlighting neurosurgical issues and science in South Asia will be presented during the meeting, including a Practical Course, ‘NSI and Excellence in Global Neurosurgery’ and a Special Course on ‘Global Disease: Infections’. Finally, the CNS is proud to host the CNS International Reception for our guests from South Asia and around the world at the Audubon Aquarium of the Americas.

---

**Box 2 - Alliance with the Joint Meeting of SNO and the AANS/CNS Section on Tumors.**

The Congress of Neurological Surgeons (CNS) is proud to support the 2009 Joint Meeting of the Society for Neuro-Oncology and the AANS/CNS Section on Tumors, October 22-24, immediately preceding the 2009 CNS Annual Meeting. To enhance the educational potential for SNO attendees to participate in the 2009 CNS Annual Meeting, the 2009 CNS Annual Meeting Scientific Program Committee has developed a number of neuro-oncologic offerings at this year’s CNS Annual Meeting that should be of interest to neurosurgeons and medical professionals specializing in neuro-oncology. Many of the neuro-oncology related courses have been placed within the first three days of the CNS Annual Meeting and persons registering at both meetings can save up to a 25% on combined registration fees. Details for this Joint Meeting, specific program offerings and registration fees can be found on the CNS website at http://www.cns.org/snosot/.
INTEGRATED MEDICAL LEARNING® (IML): EDUCATION THROUGH DYNAMIC, LEARNER-CENTERED INTERACTION

Integrated Medical Learning® (IML) enters its third year of implementation this fall at the Congress of Neurological Surgeons (CNS) Annual Meeting in New Orleans, Louisiana, October 24-29. This educational format incorporates elements of teaching that have been lacking from the traditional didactic approaches utilized at most national meetings. With the aim of enhancing the educational experience for participants and departing from the passive learning process obtained in conventional lecture formats, the IML approach utilizes the premise that session participants will be more engaged and interested in a topic deemed important by learners. This shift has been espoused by educational experts based on a growing body of knowledge in the field of learning theory.

Each session topic is chosen, not based on expert preference but rather by examining survey data from previous IML sessions and the CNS educational activities. In this way, potential session participants identify an educational need. The educational focus of the IML process begins by examining the existing body of knowledge surrounding an issue of burning interest and importance to neurosurgeons. This topic is intended to represent an area of clinical practice in which significant controversy exists or clinical equipoise remains in management.

Once the topic has been chosen, a rigorous process is used to select dynamic experts on that specific topic and thoroughly review pertinent literature. Care is taken to explore the varying viewpoints and to ensure chosen experts and selected readings adequately represent the full spectrum of opinions and practice patterns. A pre-meeting survey is then designed for each session and vetted by the IML working group (moderators, technology moderators, experts for each session) with the aim of better understanding current views and practice patterns of neurosurgical health care professionals with varying backgrounds (geographically, level of training, etc.) as well as identifying potential areas of knowledge gaps, controversy and consensus. The pre-meeting survey thus serves as a rich database, the examination of which allows for the refinement of each IML session before the CNS Annual Meeting to achieve an “audience-directed” learning session.

Along with the generation of the pre-meeting survey, each session’s IML working group selects three to four key peer-reviewed published manuscripts on the chosen topic that highlight varying viewpoints and provide a solid spectrum of knowledge. This ensures that each participant has the opportunity to be fully prepared before ever entering the “classroom.” By providing a fundamental knowledge base and exposing participants to different viewpoints in clinical management, each participant is able to become more engaged in the live, interactive session. With all this preparation, the IML session at the national meeting becomes primed for optimal dynamic exchange rather than passive didactic lectures. To ensure an optimal experience for learners, the session is carefully scripted. Session moderators, technology moderators and experts rehearse multiple times prior to the actual session. IML slidesets are standardized, carefully reviewed and rehearsed for optimal delivery.

Each IML working group has assembled case presentations that highlight potential differences in management of a given clinical scenario. Questions are posed that aim to explore knowledge level and opinions regarding pathophysiology of disease as well as how clinicians manage cases. Audience participation is encouraged and facilitated by handheld devices that allow session participants to answer questions via live-audience polling. Graphic presentations of results are instantly displayed, interpreted and reviewed with the group, allowing neurosurgeons to compare their opinions and knowledge level vis-à-vis their colleagues, while maintaining anonymity. Concurrently, audience questions may be submitted to the experts via a simple web-based platform. Questions are immediately triaged by the back table moderators and delivered electronically to session moderators and experts so that they can be answered efficiently and systematically. Polling questions regarding the chosen topic are posed both before and after experts give didactic lectures. This will assess the impact of the session on opinions and knowledge. At the conclusion of the session, the audience is polled regarding how the IML session may influence their clinical practice and are asked to provide feedback regarding session quality and potential future topics and educational needs.

Four topics have been chosen this year based on feedback from the audience and the CNS members involved in last year’s IML sessions. The following articles will introduce the subject matter for each of the four IML sessions that will be held on Tuesday and Wednesday afternoons during the CNS Annual Meeting. We invite you to get involved today by logging onto the CNS IML web page http://w3.cns.org/meetings/2009/attendees/iml.asp to complete pre-meeting surveys and review the articles prior to the interactive session at this year’s Annual Meeting. Come prepared for a dynamic and fun educational event. In addition to continuing medical education (CME) credits which can be claimed for attending the session, an additional hour of CME credits can be earned by participating in the complete IML process (pre-meeting surveys and literature) for each session.
In neurosurgery practice there is a great deal of heterogeneity in the clinical pathologies we encounter. Patients present with a variety of symptoms. The AANS/CNS Section on Disorders of the Spine and Peripheral Nerves therefore chose the topic of cervical radiculopathy to discuss through the Integrated Medical Learning® (IML) process.

As surgeons we must first correctly identify that the patient is suffering from a cervical radiculopathy and not another diagnosis. Cervical radiculopathies that are unresponsive to medical therapies may require surgical intervention. However, it is unclear which surgical treatment will provide the patients with the least morbidity and the greatest benefit. This is quite a complicated topic and the “correct choice” may depend on the perspective of the individual (i.e., the patient, the surgeon, the hospital, and the patient’s healthcare provider). For surgeons the ultimate goal is to achieve the maximal clinical outcome for the patient. This decision, however, is complicated by whether this benefit will be short- or long-term.

In order to address these questions we have chosen an expert panel to review current treatment modalities. This panel consists of Regis W. Haid, Jr., discussing cervical arthroplasty; John A. Jane, Sr., discussing posterior cervical foraminotomy; and Michael G. Fehlings discussing anterior cervical decompression and fusion. These experts are tasked with reviewing the existing literature concerning these topics and further defining which subpopulations of patients may benefit more from certain treatment modalities.

In order to prepare you, the participant, for these discussions and highlight the available literature, we have chosen four manuscripts as background information.

Cervical Radiculopathy: Pathophysiology, Presentation and Clinical Evaluation. Abbed KM, Coumans JVCE. Neurosurgery 60:S28-34, 2007. This is a review article on the degenerative cascade and pathology in the cervical spine which predisposes patients to cervical radiculopathy. The authors discuss in detail the clinical presentation of acute cervical radiculopathy. They noted that the most common presentation is pain. This article is particularly thorough and reviews the dermatomes and myotomes for the C3-T1 nerve roots. In addition, there is an explanation of several medical conditions which may mimic specific cervical radiculopathy symptoms. For example, a patient who presents with a potential C6 or C7 cervical radiculopathy may in fact have carpal tunnel syndrome. This can be differentiated in that carpal tunnel syndrome patients often have painful nocturnal dysesthesias and hypoesthesias distally over the palmar side of the hand. The authors, in addition, reviewed the attributes of various radiographic
 modalities such as plain films, myelography, computed tomography and magnetic resonance imaging, as well as electrodiagnostic studies.


This is a class III retrospective review of a case series of posterolateral foraminotomies that were performed for cervical radiculopathies in 736 patients over an 18-year period from 1963-1980. The authors reported that 133 (14%) underwent a second operative procedure consisting of a foraminotomy. However, of these procedures, only 24 of the patients (3%) were considered recurrent radiculopathies since their symptoms recurred at a previously operated site.

They define a recurrence as any ipsilateral radiculopathy at the site of a previously operated space, and differentiated this from an ipsilateral radiculopathy occurring in a virgin space which was a “new problem”. Post-operative evaluation was rated using the ODOM criteria as “excellent or good” defined as complete or nearly complete return to a normal lifestyle, or as “fair,” “poor” and “failure”. The most frequent pre-operative presenting symptom was arm pain and segmental radiculopathy was seen in 99.4% of the patients, while neck pain was found in 79.7%, and a specific motor deficit was seen in 68.0%.

As a result of this operative intervention, relief in arm pain was good-to-excellent in 95.5% and resolution of motor weakness was seen in 97.7%. Furthermore, there was a reported improvement of scapular pain in 97.7% and anterior chest pain in 95.4%. Interestingly, they reported resolution of neck pain in 610 of these patients and reported an overall good-to-excellent relief of neck pain in 88.8%. There were no mortalities as a result of the operative procedure and the complication rate was reported at 1.5% (13 incidences). Of these, 10 (1.2%) were due to wound-site infections and three due to wound dehiscence.

The authors conclude that the operative procedure and the morbidity of only 1.5% were generally good, long-term results with a specific recurrence rate of 3.3%. Further radiculopathy on the ipsilateral side occurred in 5.2% and a further radiculopathy on the contralateral side occurred in 5.6%. The authors concluded that cervical laminoforamintom was the procedure of choice for a simple cervical radicular problem at “one or more levels.”


This manuscript reviewed the incidence, prevalence and radiographic progression of adjacent segment disease (ASD) after an anterior cervical fusion. This is a class III retrospective review of a cohort of 374 consecutive patients who had a total of 409 anterior cervical fusions. The cohort is a heterogenous group of both cervical radiculopathy and myelopathy patients. The authors specifically make the distinction between radiographic changes and clinical complaints following an anterior cervical arthrodesis.

This review was over a 20-year time span (1973-1992) and the final analysis included 383 patients with a total of 418 anterior cervical fusions all performed by the senior author, Henry Bohlman. Nine patients were excluded since they died within six months of the procedure leaving 374 patients in the final analysis. With the index procedures there were 368 one level, 131 two level, 47 three level and two four level procedures. There were 28 patients with two subsequent operative procedures; two with three ACDFs and one with four separate ACDFs. The patients were treated with autograft bone (either iliac crest or fibula) without instrumentation. Data was compiled using Kaplan-Meier survival curves to assess symptomatic ASD calculated annually.

The authors reported that symptomatic ASD developed in 58 of the 409 procedures, or 55 of the 374 patients with an overall prevalence of 14.2%. Reviewing the Kaplan-Meier curve analysis, the annual average incidence was 2.9%. It is interesting when specifically looking at different motion segments that the relative risks of interspace degeneration at the third-fourth and fourth-fifth vertebra levels was 3.2x greater than at the second-third intervertebral disc. These were less than the relative risks for the fifth-sixth and sixth-seventh vertebra at 4.9%. This is most likely due to the increase in motion at the C5-6 and C6-7 motion segments. More interesting, the authors point out that the incidence of ASD following multi-level arthrodesis was significantly lower than following a single-level arthrodesis. Of the 256 multi-level procedures...
arthrodesis, 31 (12%) developed symptomatic ASD compared to 27 (18%) of the 153 single-level procedures (<0.001).


This is a prospective, randomized controlled study (US FDA IDE study) analyzing the effects of an arthroplasty device versus anterior cervical discectomy and fusion with a plate and allograft. Although the original hypothesis was conducted in a template of a class I study, this may be downgraded to a class II study since the reported follow-up was less than 80% of the patient population. In addition, the original study design was through an industry template and developed as a non-inferiority study. A further bias as disclosed by the authors in the manuscript is their financial relationship with the manufacturer.

The authors in this prospective, multi-centered, randomized study compared anterior cervical discectomy and fusion (ACDF) versus cervical arthroplasty with the Prestige ST device. Patients were enrolled in 32 separate sites with 276 patients randomized to the arthroplasty group and 265 patients randomized to the ACDF control group. Reported follow-up was 80% of the arthroplasty patients but 75% of the control group.

Inclusion criteria were patients greater than 18 years of age with single-level symptomatic disc disease between C3-7. Patients were required to have an intractable radiculopathy, myelopathy or both. The neck disability index (NDI) had to be $\geq 30$ with numeric neck pain (VAS) score $\geq 20$. Patients were randomized and had similar demographics including age, weight, gender, percentage with workman’s compensation or litigation and tobacco use with only the percentage of alcohol use being higher in the control group.

The outcome assessments were based on both clinical and radiographic results including the SF-36, neck disability index, neck pain and arm pain numeric rating scales. All radiograph assessments were documented by independent radiologists. Radiographic assessment consisted of A-P, lateral and dynamic X-rays measuring segmental angulation and range of motion. Analysis showed that there was similar mean operative time between groups. Levels of surgery were also similar between groups (most common levels of surgical treatment were C5-6 and C6-7). However, a significantly greater percentage of patients in the control group (ACDF group) wore an external orthosis after surgery.

It was interesting that there was no revision in the arthroplasty group; however, five of the control patients (ACDF group) required revision surgery. A revision surgery was defined as a second operation to modify or adjust the original implant configuration (i.e., change of screw length). Removals, on the other hand, occurred when a surgeon removed one or more components of the original implant and replaced it with a different type of implant (i.e., remove PESTIGE Disc and replace with fusion with a plate). The removal rate was 1.8% in the arthroplasty group and 3.4% in the ACDF group, but this difference was not statistically significant. A supplemental fixation was defined as an additional surgery to place an additional spinal device not approved as part of the protocol (i.e., posterior wiring). There were no supplemental fixations in the arthroplasty group, but there were nine in the ACDF group. A “re-operation” was defined as any surgical procedure at the treated level that does not remove, modify or add any components (i.e., posterior foraminotomy). The arthroplasty group had four cases of reoperation whereas the ACDF group had two cases, but the difference was not statistically significant.

Outcomes were excellent in both groups (NDI, VAS neck and arm pain scores, and SF-36), but neurological success was statistically higher in the arthroplasty group. The arthroplasty group returned to work 16 days sooner than the fusion group. However, there is the further bias that many patients sought inclusion into this study and then randomization in the fusion may have caused a “disappointment” in the study population.

The radiographic outcomes revealed that the Prestige ST device maintained 7 degrees of flexion and extension segmental motion, whereas the ACDF had no motion in flexion or extension. The authors conclude that their data “demonstrates that anterior cervical arthroplasty is at least as safe and effective as ACDF for cervical degenerative disc disease.”

Links to the IML pre-meeting literature are available online at http://w3.cns.org/meetings/2009/attendees/iml.asp.
Temporal lobe epilepsy is one of the more commonly encountered causes of medically refractory seizures. Numerous studies have demonstrated that in appropriately selected cases with medically refractory unilateral disease, surgery can be successful in curing or significantly reducing seizures. Hence in this chronic and disabling disorder neurosurgical intervention plays a critical role. Nonetheless, there is considerable uncertainty regarding the optimal type of procedure that should be performed: anterior temporal lobectomy, selective amygdalohippocampectomy, or other variants and whether different techniques should be used for disease in the dominant or nondominant hemisphere. Empirically, there is a sense among some epilepsy surgeons that larger resections offer better outcomes for seizure control so long as they are not associated with neurological deficits. Conversely, many other surgeons believe that more limited procedures provide comparable benefit in regard to seizure control with less risk of adverse neuropsychological outcomes. This important debate has been ongoing for some time and remains unresolved.

The primary issues are whether one procedure offers better seizure control over the other and whether the neuropsychological outcomes differ significantly between the procedures. In order to address these questions, we have selected a panel of experts and moderators (Experts: G. Rees Cosgrove, Nicholas Barbaro. Moderators: Guy McKhann II, Robert Gross, Emad Eskandar, Jeffrey Elias, and Kathryn Holloway). The papers selected to highlight some of the relevant points are briefly summarized below.


The aim of this study was to compare seizure outcomes at the five-year follow-up in patients with medically refractory unilateral mesial TLE (MTLE) due to hippocampal sclerosis (HS) who were treated using a cortical amygdalohippocampectomy (CorAH) or a selective AH (SelAH). The authors obtained data from 100 adult patients who underwent surgery for MTLE. Fifty patients underwent a CorAH and 50 underwent an SelAH. Overall, at the five-year follow-up, favorable (Engel Classes I and II) seizure outcomes were noted in 82 and 90% of patients who had undergone CorAH and SelAH, respectively. Furthermore, 40% of the patients who had undergone a CorAH and 58% of those who had undergone a SelAH were seizure free (Engel Class Ia). There was no statistically significant difference between the two surgical
approaches in terms of seizure outcome at the five-year followup (p = 0.38). The authors conclude that both CorAH and SelAH can lead to similar favorable seizure control in patients with MTLE/HS. However, the authors suggest that the transcortical approach has the advantage of minimizing or abolishing the impact of dividing venous and arterial adhesions which is tedious, time consuming, and maybe associated with some degree of cerebral swelling.


Eighty randomized patients were included in the analyses. In 41 patients, the transsylvian approach, and in 39 patients, the transcortical approach was performed. All patients received comprehensive neuropsychological testing of verbal and nonverbal memory, attention, and executive functions before and six months or one year after SAH. Seventy-five percent of patients became completely seizure free with no difference depending on the chosen approach. Repeated measures multivariate analysis of variance (MANOVA) showed that cognitive outcomes after both approaches were essentially the same. Interestingly, the only exception was phonemic fluency, which was significantly improved after transcortical but not after transsylvian SAH. The authors conclude that either surgical approach can be chosen independent of cognitive outcome criteria. Improvement in phonemic fluency after transcortical SAH may reflect selective normalization of cognitive function after epilepsy surgery, whereas frontal lobe manipulation might have hindered recovery of this function after transsylvian SAH.


The aim of this study was to compare seizure and memory outcome in patients with medically refractory mesial temporal lobe epilepsy due to hippocampal sclerosis (MTLE/HS) treated using an anterior temporal lobectomy (ATL) or a selective amygdalohippocampectomy (SA). Surgical outcome data were prospectively collected for two to 11 years in 161 consecutive patients with MTLE/HS. Eighty patients underwent an ATL and 81 an SA. Seizure control achieved with each technique was compared using the Engel classification scheme.

Postoperative memory testing was performed in 86 patients (53%). At the last follow up, 72% of the patients who had undergone an ATL (mean follow up 6.7 years) and 71% of those who had undergone an SA (mean follow up 4.5 years) were seizure free (Engel Class IA). Estimated survival in patients in Engel Classes I, IA, and I and II combined did not differ between the two surgical techniques. Preoperatively, 58% of the patients had verbal memory scores one standard deviation (SD) below the normal mean. One third of the patients with preoperative scores in the normal
range worsened after surgery, although this outcome was not related to the surgical technique. In contrast, one third of those whose preoperative scores were less than -1 SD experienced improvement after surgery. Nine (18%) of the 50 patients whose left side had been surgically treated improved their verbal memory scores by more than one SD. Seven (78%) of these nine underwent an SA (p = 0.05). The authors conclude that both ATL and SA can lead to similar favorable seizure control in patients with MTLE/HS. Preliminary data suggest that postoperative verbal memory scores may improve in patients with preexisting verbal memory deficits who undergo selective resection of a sclerotic hippocampus in the dominant temporal lobe.

The aim of this study was to compare the seizure outcome of two different types of epilepsy surgery, selective amygdalohippocampectomy (AHE) and anterior temporal lobectomy (ATLE) in patients with temporal lobe epilepsy. The authors included 114 patients who had mesial temporal lobe epilepsy and hippocampal sclerosis or gliosis on histology. Patients had ATLE if the non-dominant hemisphere was affected or if the whole temporal lobe was atrophic. Patients had AHE if the dominant hemisphere was affected. Standardized seizure outcome at one year following surgery was used. Overall 40% of the 114 patients who had temporal lobe epilepsy surgery were seizure-free at one year (Engel’s class Ia). A good outcome (Engel’s classes I and II) was significantly more frequent in ATLE than in AHE (66% and 44%, respectively, P < 0.05). The authors conclude that ATLE had a better seizure outcome than AHE.
How extensive a decompression is necessary for patients with symptomatic Chiari I malformation? Should one perform bony decompression only or should a dural patch graft be placed to increase the chance of favorable outcome? Should tonsillar coagulation be included? Are there intraoperative adjuncts that can assist in making this decision? Several recent publications have suggested that patients may experience less postoperative discomfort and have a shorter length of stay if a less invasive decompression is performed. However, whether these short-term benefits come at a cost of less favorable long-term outcomes than more invasive decompression is less clear. This unsettled therapeutic landscape prompted the 2009 CNS IML session, “What extent of decompression is necessary in the surgical management of Chiari I malformations?” which will take place on Wednesday, October 28, 2009 at 2:30 PM.

The organizers have selected four articles for you to review before the IML session that will form a background for the discussions. Each article is summarized below.


This study represents a large pediatric series of Chiari I malformations treated operatively by a single surgeon. The study objective was to present the long-term outcome after surgical treatment.

**Methods:** Retrospective review of a case series of 130 pediatric patients, 93% of whom were undergoing initial surgical treatment and 7% re-exploration. Tonsillar coagulation was performed in re-exploration patients. Headache & neck pain (38%) and scoliosis (18%) were the most common presenting complaints. Tonsillar descent to or inferior to C1 was seen in 80% of patients and 58% had a syrinx. Patients underwent a posterior fossa decompression, C1
laminectomy and duroplasty (in all but one case) at a North American Center. Twenty-six of the first 30 patients in the series had placement of a 4th ventricular to subarachnoid stent. Patients were followed for a mean of 4.2 years.

**Results:**

- 83% of patients had relief of presenting symptoms.
- Compared to subsequent patients who did not have stents placed, stented patients had a poorer rate of symptom resolution (p<0.05).
- The mean length of stay was 2.7 days.
- Postoperative complications occurred in 32 patients who underwent bone decompression and duroplasty. Specific symptoms and signs were not tabulated but appeared to be typical for pts with CM I.

Based on the review of their experience and of the medical literature, the authors advocate treatment of Chiari I malformation with midline bony removal and intradural exploration.

**Summary:** This case series provides an estimate of the rate of response with durotomy. However, apart from the comparison of stent vs. symptom response, the study is not internally comparative.

Study compares bone decompression vs. decompression and duroplasty in a single institution review.

**Methods:** Retrospective review of case series with nested comparison of 11 patients undergoing decompression limited to bone removal vs. 32 patients who underwent bone decompression and duroplasty. Mean follow is not provided but ranged from nine months to eight years. Authors report relative outcomes for symptoms, syringomyelia and posterior fossa volume as measured by MRI. Twenty-one of the decompression and duroplasty patients were adults, the remaining 11 were children. Syringomyelia was present in seven out of 11 patients undergoing bone-only decompression and 11 out of 21 patients undergoing duroplasty. Specific symptoms and signs were not tabulated but appear to be typical for pts with CM I.

**Results:**

- Symptomatic improvement occurred in 73% with bone decompression alone versus 87% of pts that had bony decompression and duroplasty. Syringomyelia improved radiographically in 50% of the bony decompression vs. 100% of the decompression & duroplasty patients.
- Complications requiring additional treatment were similar in the two groups (one of eleven versus three of 32). No permanent morbidity occurred in either group.
- Two patients required reoperation in the bone-only group for treatment failure.
- Mean length of stay is not provided.
- Six of 11 patients undergoing bone-only decompression had pre and postoperative MRI-based measurements of the newly created CSF space posterior to the tonsils. The three patients with a measurable new space all improved in both symptoms and syringomyelia, while three others with no improvement in posterior fossa CSF space saw no improvement in symptoms or syringomyelia.

**Summary:** The authors conclude that although duroplasty was more effective for resolution of syringomyelia and slightly better for symptom relief, there clearly existed a subset of patients who improved with bone-only decompression. The retrospective methodology limits the strength of the conclusions. While increased posterior fossa CSF volume correlated with improved outcome, comparison was limited by small number of patients.


Study reports results for Chiari decompression without duroplasty.

**Methods:** Retrospective review of single institution consecutive case series of 26 children.

- Preoperative symptoms, signs, imaging, surgical procedure and clinical results were tabulated. Postoperative follow-up was available for a mean of 4.7 years. Twenty-six pts had isolated CM I. Occipital/nuchal pain (57%), Vertigo (27%), and weakness & hyper-reflexia (20%) were the most common clinical features. Four pts had 3-5mm tonsillar decent, 14 had 5-10mm decent, while 8 had >10mm decent. Eleven of 26 (42%) had syringomyelia.
- Children underwent osseous decompression at a European Center.
- In 11 cases, “dural delamination” was performed, with scoring of the outer bands of dura, without actual durotomy.

**Results:**

- Twenty-five out of 26 patients had improvement in their preoperative symptoms. Of 11 pts with a preoperative syrinx, six became smaller, four remained unchanged.
and one worsened leading to a reoperation and duroplasty.
• The performance of dural delamination did not affect the treatment outcome.
• The length of hospital stay was 5.2 days.

The authors survey the medical literature and report that similar improvement rates of 80-95% are seen with osseous decompression alone and with osseous decompression & duroplasty.

Summary: Case series and literature review describing high symptomatic response rate without duroplasty. Symptomatic improvement rate exceeded radiographic resolution of syringomyelia.


Study describes the results of using intraoperative ultrasound to determine whether duroplasty should be performed in conjunction with a bony decompression.

Methods: Retrospective review of case series with nested comparison of duroplasty vs. decompression alone, stratified by baseline degree of tonsillar herniation. Single institution North American center review of 256 children, with 140 undergoing duroplasty and 116 only a bony decompression. Postoperative follow up was a mean of 2.4 years. Intraoperative ultrasound was used to select treatment modality, either bony decompression only or decompression and duroplasty. Duroplasty was performed when dorsal and ventral CSF spaces were present on ultrasonic imaging and tonsillar pistoning was absent. Headaches (75%) and brainstem/cranial nerve dysfunction (27%) were the most common symptoms. Fifteen percent of pts had tonsillar herniation rostral to C1, 76% from C1 to C2 and 9% had ectopia to below the C2 lamina. Twenty-seven percent had syringomyelia. The distribution of tonsillar location was similar between the groups (15%, 75%, 9% for duroplasty), (17%, 78%, 9% for bone only).

Results:
• Complications were rare (2%) and did not differ between the treatment groups, nor did mean length of stay (four days).
• For patients with tonsillar herniation rostral to C1, duroplasty and bone only decompression produced similar results with about 25% of pts experiencing treatment failure at the mean follow up interval of 29 months.
• For patients with tonsillar herniation below C1, bone only decompression produced a statistically higher rate of symptom recurrence (25 vs. 20 % for C1-C2 tonsillar location, 52 vs. 20% for caudal to C2 location).
• Reoperation rates were similar in both groups (7-8%).
• The authors do not report specific results with respect to syrinx resolution, nor overall results for the duroplasty vs. bone only cohorts without respect to tonsillar decent.

The authors concluded that ultrasound was useful in mild tonsillar herniation but not more caudal tonsillar herniation. Similarly, they concluded that for tonsillar herniation caudal to C1, bony decompression alone was associated with higher treatment failures.

Summary/Comment: Study methodology does not allow firm conclusions about the utility of ultrasound in Chiari I with tonsillar herniation to C1, because all pts with ultrasounds showing small CSF pathways and dynamic tonsillar pulsation underwent duroplasty while all other patients underwent bony decompression alone and did not undergo the alternative treatment of duroplasty. Although results raise concern about bone-only decompression, the retrospective, non-random allocation of the patients to the treatment groups limits the strength of the conclusions.

These articles provide background and details to support what promises to be a lively exchange of ideas between three recognized experts in the care of patients with Chiari I malformation: Jerry Oakes, MD, Neil Feldstein, MD and Ulrich Batzdorf, MD, and you, the audience members. At the conclusion of the session, participants should have a clear idea of what the literature and our experts support with respect to the extent of decompression for Chiari I malformations, as well as the limitations of the currently available experimental evidence addressing this question. <

Links to the IML pre-meeting literature are available online at http://w3.cns.org/meetings/2009/attendees/iml.asp.
small hemispheric arteriovenous malformations (AVM) remain a challenge to treat for the neurosurgeon. Long-term studies in patients with unruptured AVMs have yielded contradictory results. In patients who are deemed suitable for treatment, the best modality is also controversial. Open craniotomy, radiosurgery and endovascular embolization are all utilized alone or in combination. However, to date no studies have demonstrated the most effective treatment or combination of treatments. To help elaborate on this important topic, the CNS Scientific Program Committee and the Cerebrovascular Joint Section have chosen “Small Hemispheric AVMs: To Treat or Not Treat and Surgery vs. Radiosurgery” as the topic for the 2009 IML Cerebrovascular Session at the Annual Meeting in New Orleans, October 24-29. The format of this year’s topic will be that of lively debate based on current literature. The panelists will each be presenting an argument based on their current practice. To help the participants have a better understanding of the topic and provide more robust audience participation, the Committee has chosen four articles as part of the curriculum. They are summarized below:


In this study 238 unselected, consecutive patients with untreated arteriovenous malformations (AVMs) admitted at a single center over a 63-year period were followed for occurrence of rupture. This study is the longest follow-up of AVM patients ever published. Patients with at least one month of follow-up were included, with a mean follow-up of 13.5 years (range one month – 53.1 years). The average annual risk of hemorrhage was found to be 2.4%. The risk was highest during the first five years of diagnosis, decreasing thereafter. Risk factors of rupture using univariate analysis were found to be young age, previous rupture, deep and infratentorial location and exclusively deep venous drainage. Assessing true risk factors is essential in helping define which patients should be subjected to treatment to better define the risk-benefit ratio. This landmark paper is currently the largest to help elucidate this issue.

Unruptured Brain Arteriovenous Malformations Should Be Treated Conservatively: No.
In this article, the author argues the failure of any reliable data that accurately depict the true natural history and morbidity of unruptured
arteriovenous malformations. As described in our first article, this is paramount to appropriate recommendation of observation or treatment. It is argued that current data suggest a more ominous natural history in certain sub-sets of patients. Using data from the Columbia AVM Databank, the author relays that for the average age of the patients studied (34 years old), the cumulative risk of hemorrhage from an asymptomatic AVM is 44%. In the same study, the 30-day rate of moderate to severe disability (mRankin score 3-5) was 33%. In younger patients with certain risk factors, conservative observation may pose a greater risk than treatment. Factors including previous rupture, deep venous drainage, infratentorial location and young age seem to warrant a more aggressive approach than observation alone.

Unruptured Brain Arteriovenous Malformations Should Be Treated Conservatively: Yes.
The authors in this article pose a counter-argument to the treatment of unruptured arteriovenous malformations. The assumption is made that historical data of rupture rates was made in the pre-CT era. In the current MRI era, AVMs are diagnosed much more frequently. In the New York Islands AVM Study it was found that unruptured AVMs exceeded those of ruptured by almost twice as often. The argument is also made that the morbidity of treatment including “less invasive” routes, such as embolization and radiosurgery, carry significant risks. Again quoting the Columbia AVM Database, the initiation of any invasive treatment strategy was associated with a greater than three-fold increased risk of AVM hemorrhage. Interventional treatment was also associated with an increased risk of clinical impairment as assessed by a Rankin score of >2. These observational data raise serious questions about the presumed clinical benefit of treatment for unruptured AVMs.

To illustrate the treatment paradigm for a newly diagnosed AVM in a 51-year-old female who presents with a new onset seizure, Dr. Friedlander discusses the options based on current literature. The point of incorporating anatomic risk factors, age of patient and presenting symptoms into decision analysis is made. Angiographic diagnosis is important to understand the anatomic risk factors. In light of the fact that data are currently lacking on the best approach for treatment and what modality of treatment is most beneficial, a multidisciplinary team is essential. The current ongoing trial, A Randomized Trial of Unruptured Brain Arteriovenous Malformations (ARUBA), is comparing observation of unruptured AVMs to that of treatment. The outcome of this important trial may help answer some of the as yet unanswered questions regarding treatment stratification for this population of patients. The risks and benefits of each treatment modality are also discussed in regards to outcomes for patients with unruptured AVMs.

Definitive data for the management and treatment of small unruptured arteriovenous malformations is currently lacking. Understanding the natural history of AVMs is paramount to educating patients and their families about the associated risks and benefits of observation or treatment. The associated morbidity of available treatments including surgery, endovascular embolization and radiosurgery also need to be clearly defined and need to be lower than the natural history. This year’s IML session will be a lively debate based on current literature with expert panelists. The incorporation of pre-meeting survey data will also allow discussion and live interaction of current practice for unruptured AVMs.

> IN PATIENTS WHO ARE DEEMED SUITABLE FOR TREATMENT, THE BEST MODALITY IS ALSO CONTROVERSIAL... TO DATE NO STUDIES HAVE DEMONSTRATED THE MOST EFFECTIVE TREATMENT OR COMBINATION OF TREATMENTS. <

Links to the IML pre-meeting literature are available online at http://w3.cns.org/meetings/2009/attendees/iml.asp.
Practicing neurosurgery has never been more challenging. Our community of professionals faces stark and complex choices about practice economics, policy, the regulatory landscape and ethics. Because of pressure to increase their volume of clinical work, neurosurgeons ironically have less time than ever to analyze, contemplate and collectively decide on the important issues of the day. Similarly, the time spent away from clinical practice at professional meetings is both precious and scarce.

In response to these considerations, the Congress of Neurological Surgeons introduced the CNS Consensus Sessions at the 2007 Annual Meeting in San Diego, California. Consensus Sessions provide practicing neurosurgeons with carefully designed and prepared opportunities to learn about, analyze and discuss pressing issues facing our specialty. Unlike traditional, passive educational forums, however, Consensus Sessions also enable the interactive collection of individual and consensus data in an effort to formulate policy.

The format of Consensus Sessions is simple, but potentially powerful. First, faculty and invited experts define and explain key relevant background topics for a gathering of active neurosurgeons interested in the chosen topic. Neurosurgical leaders and stakeholders then present a series of potential policy directions and solutions. Discussion ensues amongst all participants, who together move towards consensus. The results of each session are objectively measured using digital polling and then analyzed for dissemination and support of real policy development.

Our initial experience with this methodology at the 2007 and 2008 Annual Meetings has been extremely positive. A pilot session in 2007 explored the issue of the aging neurosurgeon and retirement, a quality and safety issue that has been taken up actively in recent years by a number of other surgical specialties. The session markedly changed the opinion of participants from broad defense of the ‘status quo’ to a solid consensus favoring locally regulated oversight of aging surgeons (in press, NEUROSURGERY®). A second pilot session explored the optimum design of annual neurosurgical meetings in a modern educational context. The results of that session were published in the Congress Quarterly.

Subsequent CNS Consensus Sessions have focused on managing conflicts of interest, emergency care coverage, residency training design, recertification after disability or restricted practice and negotiating with insurance companies.

The topics of the 2009 CNS Consensus Sessions are the role of midlevel providers in neurosurgical practice, regionalization of specialty care, defining quality measures in neurosurgery, and options for insurance plan participation. The following articles outline the key issues to be discussed and some of the policy decisions facing organized neurosurgery and individual practices that will be addressed in these sessions.

By joining your colleagues and participating in these sessions, you have an opportunity not just to learn about these important policy areas, but also to influence the direction of policy formulation and contribute your perspective to the debate. We hope that increasing numbers of our colleagues will take the opportunity to attend Consensus Sessions at the upcoming Annual Meeting.
The upcoming workshop titled “The Role of the Mid-level Health Care Providers in Modern Neurosurgery Practice” will provide a better understanding of the roles of the Physician Assistant and Advanced Practice Nurse (APN; includes Nurse Practitioner and Clinical Nurse Specialist), often referred to as mid-level providers, within the neurosurgical community. We will look at a variety of information from cited studies, highlighting the ability of physician assistants and nurse practitioners to provide quality care as well as concerns raised in regards to liability from incorporation of mid-level providers into the neurosurgical practice. Our focus will be on how to better understand the impact a mid-level provider can have in various clinic and hospital settings and identify which models of utilization are most successful.

The nurse practitioner (NP) and physician assistant (PA) training programs were initiated in response to a perceived shortage of physicians, often in medically underserved communities. NPs and PAs were originally considered to be alternative health care personnel who would function under the supervision of physicians, extending the ability of the physician to provide service to a greater number of patients. However, the role of the mid-level provider has been expanded to include the care of hospitalized patients. The mid-level profession continues to evolve in response to regional shortages of physicians, efforts to reduce health care costs, decreasing funding for graduate medical education, and resident work hour limitations.

With the implementation of restricted work hour guidelines set by the Accreditation Council for Graduate Medical Education, neurosurgical resident education in academic centers has been significantly challenged to adapt to meet duty hours compliance while providing the same level of patient care. In the AANS bulletin (2003) neurosurgeons questionnaire, employing ‘physician extenders’ (PAs and APNs) was cited by virtually all the respondents, but not without questions regarding utilization and scope of practice.

The face of medicine has forever changed to now include both multidisciplinary as well as interdisciplinary teams. The emphasis on these practice teams is to improve the availability and quality of health care. However, these services raise concerns over the mid-level provider and physician practice relationship. Regulations vary from state to state and within the mid-level professions the scope of practice can vary. Health insurance plans may or may not reimburse for mid-level providers, and ultimate responsibility may vary depending on practice setting and state laws. Tasks delegated to the mid-level provider must be within the scope of practice of the supervising physician and the physician is to afford supervision (whether on or off-site) to ensure that the mid-level provider practices to the high level of medical standards.
expected. Physicians should be knowledgeable in all these areas to improve practice outcome.

Taking all the regulatory information into account, having a mid-level provider on staff can provide multiple benefits as they are capable of expanding practices in all neurosurgical settings. PAs and APNs are cost-effective, able to provide many of the same services of the physician and bill for these ‘same services’. Their availability will allow physicians and residents to focus on more complex patient issues as well as research projects. Finally, if the practice productivity allows, the mid-level can improve patient access, which is a highlighted benefit leading to patient satisfaction and improved productivity.

Studies have shown that mid-level providers can provide quality care at an affordable price, yet some practices were having difficulty reproducing these results. Significant reasons for under-utilization are that the physician, the practice, and many times the mid-level themselves were not aware or not up to speed. Physicians did not know how much confidence to place in this provider, and the degree of utilization has been shown to be directly related to the confidence level of the physician supervisor. Physicians willing to make the commitment to orient, educate, and integrate mid-levels into their practice will find this interdisciplinary approach very successful and a viable solution to the inevitable changes we face in today’s neurosurgical culture.

In conclusion, effective utilization of a mid-level provider can provide the neurosurgeon with more time to provide higher quality of care. The additional fees they are able to bill for their services will cover the compensation and benefits paid to a PA and NP. With committed training and careful implementation, the ANP or PA should be well accepted by patients and should enhance the productivity of most practices.
As the health care climate evolves, neurosurgeons may wish to evaluate their level of participation in private and governmental health insurance plans. Participation status in various plans can have a significant effect on patient flow, practice collections and billing practices. While the CNS does not specifically endorse any of the following participation options, this article is intended to review some of the choices available to neurosurgeons.

There are basically three Medicare contractual options for physicians: participating (PAR), nonparticipating (non-PAR), and private contracting. This status may be changed periodically. Physicians who wish to change their status from PAR to non-PAR or vice versa may do so annually. Once made, the decision is generally binding until the next annual contracting cycle except where the physician’s practice situation has changed significantly, involving relocation to a different geographic area or a different group practice, for example. To become a private contractor, physicians must give 30 days notice before the first day of the quarter the contract takes effect. Those considering a change in status should first determine if they are bound by any contractual arrangements with hospitals, health plans or other entities that require them to be PAR physicians. In addition, some states have enacted laws that prohibit physicians from balance billing their patients.

As a PAR physician, neurosurgeons sign a participating (PAR) agreement with the Centers for Medicare and Medicaid Services (CMS) and accept Medicare’s allowed charge as payment in full for all of their Medicare patients. Medicare pays 80% of this charge and the patient is responsible for a 20% copayment. The patient or the patient’s secondary insurer is still responsible for the 20% copayment but the physician cannot bill the patient for amounts in excess of the Medicare allowance (“balance billing”). As incentives for neurosurgeons to participate, CMS pays PAR physicians 5% more than it pays non-PAR physicians. Also, PAR physicians have access to faster CMS claims processing and toll-free claims processing phone numbers. PAR status does not require neurosurgeons to accept every Medicare patient who seeks treatment from them.

As a non-PAR physician, a neurosurgeon may make assignment decisions on a case-by-case basis and bill patients for more than the Medicare allowance for unassigned claims. For assigned claims, Medicare pays non-PAR neurosurgeons 95% of Medicare approved amounts for PAR physicians. If the claim is unassigned, the neurosurgeon may charge Medicare up to 115% of the Medicare approved amount (115% x 95% of the PAR rate = 109.25% of the PAR rate). The claim is submitted to the Medicare carrier but the payment goes to the patient, making the physician responsible for collecting...
the CMS payment and any supplemental insurance or patient responsibility amount. The AMA has determined that non-PAR physicians would need to collect the full limiting charge amount roughly 35% of the time they provided a given service in order for the revenues from the service to equal those received by PAR physicians for the same service.

Lastly, neurosurgeons may decide to opt-out of Medicare entirely and become a private contractor. Under this provision, the neurosurgeon bills the patient directly and may not bill Medicare or Medigap insurance plans. Once physicians have opted out of Medicare, they cannot submit claims to Medicare for any of their patients for a two-year period. Moreover, unlike non-PAR status, assignment decisions may not be made on a case-by-case basis. Neurosurgeons may choose to opt-out by filing an affidavit which contains specific provisions. If this is done at least 30 days before the start of the next calendar quarter, the opt-out status begins with that quarter. Physicians have 90 days to revoke the affidavit. Once this is done, the neurosurgeon bills the patient directly and may not bill Medicare or Medigap insurance plans. Emergency and urgent services may be provided to these patients under the terms of this private contract provided that the contract was signed before the onset of the emergent/urgent condition. In addition, physicians who have opted out may provide emergent/urgent services to Medicare beneficiaries with whom the physician does not already have a private contract. The physician may bill Medicare and will collect no more than the Medicare limiting charge.

Neurosurgeons may also choose whether to participate in a myriad of private health insurance plan panels. In doing so, the neurosurgeon signs a contract with the insurer agreeing to accept a negotiated rate for services as payment in full (sometimes including a patient copayment). This rate may be expressed as a multiplier of Medicare rates (such as 1.5x Medicare). Patients’ in-network copayments are usually only a very small percentage of the surgeon’s fee, which gives patients a significant incentive to stay in network. It also may help drive business to the neurosurgeon as a participating physician. The surgeon bills the insurance company for the services and the patient for the copayment.

If the neurosurgeon chooses not to participate in a network, patients with this coverage may still be treated in many circumstances if the plan allows out-of-network benefits. Physicians may bill according to their fee schedule. In many cases the insurer will pay according to a set schedule of allowed charges. The patient is responsible for any applicable deductible and coinsurance, plus any charges over the allowance for covered services. Physicians have the choice of either submitting the claim to the insurance company for the patient or having the patient pay for the services up-front and submit the claim themselves for reimbursement.

The methodology that insurance companies use to determine the allowed charges have recently come under fire. Many insurers base their out-of-network physician payments on a database of charges owned by Ingenix, a subunit of UnitedHealth Group. In January, UnitedHealth agreed to pay $350 million to customers and medical providers to settle a class-action lawsuit claiming it systematically under-valued payments for out-of-network medical services going back to 1994. This resulted in lower payments from UnitedHealth and other insurers to providers and left patients responsible for a larger portion of the bill. Aetna has also agreed to pay $20 million to settle similar claims regarding its use of the Ingenix data. Wellpoint and Cigna have also settled similar lawsuits. <
Regionalization of Neurotrauma Care has been proposed as an answer to the shortage of neurosurgeons providing emergency coverage. There is also ample evidence that transferring patients to Level 1 trauma centers, that is, those who treat the highest volume of severe trauma patients, enhances outcome. Thus, can the same argument can be applied to regionalizing cerebrovascular care?

This workshop, entitled, “Regionalizing Emergency Cerebrovascular Care,” endeavors to address this important question. Berman, et al. analyzed admissions and discharges of patients with aneurysmal subarachnoid hemorrhage and unruptured aneurysms in New York State and found that outcomes were better in those centers who treat a higher number of such patients and had endovascular capability.

Furthermore, effects of regionalization have been seen after the Brain Attack Coalition offered guidelines for designating stroke centers. Since then, time to thrombolytic treatment has been shown to be improved when patients are treated in such centers, especially those with specialized stroke teams, organized emergency services, clinical pathways, and rapid radiographic analysis. However, one key to stroke center designation is neurosurgical availability. Although neurosurgeons are not required on site, there must be policies in place to rapidly transfer patients to neurosurgical care should they develop intracerebral hemorrhage through infarct conversion or as a result of thrombolytic therapy. With the installation of transfer policies and teleradiology, even smaller centers can fulfill stroke center designation requirements thereby broadening stroke
patients’ access to quality stroke care and, thus, diffusing the regionalization concept.

In the last decade, there have been increased technological advancements and availability of endovascular therapy for cerebrovascular conditions both through the disciplines of Neurosurgery and Radiology. Endovascular treatment of aneurysms is more prevalent than ever, sparking debates about whether it is best to consider coiling as first-line treatment for both ruptured and unruptured aneurysms. In this Consensus Session the endovascular revolution is juxtaposed to a presentation about what is left for the operating vascular neurosurgeon to operate upon. Certainly, if there is a greater move towards primary endovascular treatment, neurosurgeons will be faced with more complex operative cases, strengthening the need for regionalizing care to the more specialized, high-volume centers. Audience members will have an opportunity to weigh in on these issues through interactive audience polling. Through this process, a consensus for or against regionalization of cerebrovascular care will hopefully be reached.

References:

Over the past two decades there has been a significant trend towards establishing outcome and quality measures to improve healthcare delivery. These efforts have progressed from simple single physician or institution initiatives aimed towards tracking outcomes, and have improved quality of care by reducing complications and lengths of stay, thus improving financial efficiency. As these systems have evolved there is a growing movement towards incorporating many of these systems into a broad umbrella encompassing all aspects of medicine. As the costs of healthcare delivery in this country have skyrocketed governmental agencies have seen this as a way of decreasing expenditures and “protecting patients.” This is most evident in the recent “pay for performance” initiatives as well as CMS’s “never events” in which hospital and physician payments are directly linked to patient outcomes.

The issue at hand in neurosurgery is the vast complexity and heterogeneity of our patient populations. In addition, the critical and non-predictable nature of many of the disease processes which we treat make global protocol driven systems inefficient and impractical. However, at the same time there is definitely a need for a more globalized quality outcome system in which regional trends are identified and tracked in order to provide feedback to the surgeons so that any problems or variances can be explored and corrected if needed.

The objective of this Consensus session is to explore these issues and determine in which direction we as neurosurgeons wish to proceed. The format of the session will follow those of previous consensus sessions. A brief introduction will be followed by a list of polling in which the audience will be asked to register their input and opinions prior to the delivery of the subject matter. Following this, Daniel Resnick will deliver an overview of the subject matter: Quality Measures in Medicine: Past, Present, and Future. Following Dr. Resnick’s overview, three brief position statements will be delivered:

David McKalip: Quality Measures Should be General and Bridge Across Neurosurgery

Charles Branch, Jr.: Quality Measures Should be Subspecialty Specific and I Suggest Using a Standardized Clinical Outcome Metric for Spine Surgery

Mark Linskey: Quality Measures Should be Subspecialty Specific, or Have a Sufficient Subspecialty Evidence Base to Insure External Quality

Finally, the audience will once again be asked to answer the same questions followed by a brief wrap-up session.
A. History of Medicine and Surgery in India

India is a nation of over one billion individuals—one-sixth of the world’s population—which boasts a continuous history dating over 5,000 years. Among various cultural and scientific contributions, medical advancements have a long-standing presence in India. Dating back to 500 BCE, the earliest treatises in medicine and surgery were first written during the early monarchies which geographically integrated the Indian subcontinent.

Among the most prominent of the early Indian physicians and surgeons were Charaka and Sushruta. The earliest surviving excavated written material which contains the works of Sushruta is the Bower Manuscript—dating to the 4th century CE, almost a millennium after the original work. The medical works of both Sushruta and Charaka were translated into Arabic around 750 CE and made their way to Europe via intermediaries.

Sushruta (Circa 500 BCE) is considered the father of modern surgery in some circles. His treatise, the “Sushrutha Samhita” spanning five books with 120 chapters contains a compendium of techniques that range in application to a myriad of surgical conditions. Sushruta stated that attainment of surgical skill follows the study of anatomy. He described a variety of blunt and sharp instruments, discussed the utility of double-armed axle instruments (early forceps) and added that a surgeon, by his own experience and intelligence, may invent and add new instruments to facilitate surgical procedures. He pointed out that the hand is the most important instrument, without which the operation of other instruments ceases! He described bandages and practice techniques to apply them. Sushruta pointed out that hemorrhage can be arrested by stitches, application of styptics and cauterisation with chemicals or heat. Sushruta described six types of surgical procedures: excision, incision, scraping, probing, blood-letting and suturing. To obtain proficiency and acquiring skill and speed in these different types of surgical manipulations, Sushruta devised various experimental paradigms for learning each procedure. Sushruta also described the basic principles of plastic surgery. He described in detail skin release procedures for covering small defects, rotation flaps as well as pedicle flaps.

The ethics of surgical practice were not lost on Sushrutha. He warned that improper intervention with surgery due either to ignorance of the progress of the disease-process, greed for

“_A physician who fails to enter the body of a patient with the lamp of knowledge and understanding can never treat diseases. He should first study all the factors, including environment, which influence a patient’s disease, and then prescribe treatment. It is more important to prevent the occurrence of disease than to seek a cure._”

— _Charaka_ 300 BC
money or lack of judgment, lead only to complications. A conscientious surgeon, on the other hand, considers his patient as a whole.

Charaka (Circa 400 BCE) is widely acknowledged to be the father of “Ayurveda” or “The Science of Life.” He studied the anatomy of the human body and suggested that the structure of the body was imparted by the bony components and that the center of the body was the heart. He also described the importance of a thorough understanding of metabolism and its dysfunction as essential for a good physician.

B. History of Neurosurgery in India

Neurological Society of India

While medicine and surgery have had a long and illustrious history in India, Neurosurgery is a more recent addition. The beginnings of a national neurological program in India can be traced back to 1951, incidentally at the same time as the CNS. In that year, four men created India’s first ever neurological society. Drs. Jacob Chandy, B. Ramamurthi, S.T. Narasimhan and Baldev Singh brought the neurosciences and allied disciplines to the forefront and under one umbrella under the banner of the Neurological Society of India. Today, NSI is the apex organization representing Indian neuroscientists, offering the benefit of diverse and focused interests.

By March 1952, when the society had its first meeting in Hyderabad, it had 30 members, who decided to publish a journal dedicated to the neurosciences, Neurology India. Initially, the NSI held its annual meetings with the Association of Physicians of India, which included sub-sections of cardiologists, pediatricians, chest physicians, etc. Since 1964, the Society started having independent annual meetings, and in 1977, the neurophysiology / EEG sub-section was created. NSI subsequently added the Association of Neurological Nurses as a section of the Society. The Neurosurgical and Neurology sub-sections of NSI are affiliated to the World Federation of Neurosurgical and Neurological Societies respectively.

To honor the founding neurosurgeons, the Society instituted the Dr. Jacob Chandy Oration in 1969, and a few years later, the Dr. B. Ramamurthi Oration. A third oration named after Dr. R.G. Ginde (who was a pioneer in the establishment of the neurosurgical department at KEM Hospital, Mumbai) was initiated in 1990.

Founding Visionaries:
B. Ramamurthi (Balasubramaniam Ramamurthi) was a globally-renowned neurosurgeon, author, editor and a pioneer in neurosurgery. He is often recognized as the father of modern neurosurgery in India. In 1960, Dr. Ramamurthi became a pioneer performing Stereotactic surgery procedures in India. He was one of the founders of the Neurological Society of India (NSI). In the early 1970s, Dr. Ramamurthi built the Institute of Neurology, in Madras modeled after the Montreal Neurological Institute in Canada, with all branches of neurosciences under one roof. He was appointed as the President of the World Federation of Neurosurgeons in 1987 and also served as the former President of the National Board of Medical Examinations in India. Amongst the many neurosurgical units developed under his guidance, the National Brain Research Center (currently headed by Professor P. N. Tandon), serves as an apex body for the coordination of brain research in the country.

Jacob Chandy, a founding member of NSI, completed neurosurgical training in Canada and the United States and returned to India to the Christian Medical College, Vellore in 1949 to begin the first independent Department of Neurosurgery in India with 12 beds. He started the first Residency Program in Neurosurgery in India at CMC Vellore in 1954 and graduated the first physician to have completed all of his neurosurgical training on Indian soil (Dr. KV Mathai).

C. Educational System for Neurosurgery in India

Neurosurgical education in India differs considerably from the United States as does the preliminary training in medical school. Medical school training is approximately 4.5 years, followed by a year of a rotating internship through different primary specialties. After completion of the 5.5 years of training for the MBBS degree, competitive exams determine admission to various post-graduate residencies, including neurosurgery. Only the top 1-2% of trainees are successfully placed in the approximately 110 positions a year.

Neurosurgical training toward an M.Ch. in Neurological Surgery is obtained in one of two ways; completing a three-year general surgical residency, followed by a two- to three-year super-specialization training in neurological surgery at one of the prominent institutions in the country; or direct entry into a five- to six-year neurosurgical program after completion of
basic medical education. Training covers the theoretical aspects of neurosurgery and a practical approach to clinical neurology and familiarity with bedside, diagnostic and operative procedures. A dissertation on a neurosurgical specialty subject is a mandatory requirement for graduation from a training program.

In order to maintain high standards, the University of Madras enacted a regulation insisting that each candidate appearing for the examination leading to M.Ch., in Neurosurgery performs an actual operation under the responsibility and supervision of the Professor of Neurosurgery at the Institution. This pattern has since been adopted at other neurosurgery centers in India. After successful completion of training and passing of qualifying examinations, the Diplomat of National Board (D.N.B.) is awarded by the National Board of Examination, New Delhi.

D. Prominent Educational Institutions for Neurosurgical Learning

There are several institutions in the country large enough and sufficiently funded to offer specialized neurosurgical training of international standards. Listed in no particular order, these institutions include the All India Institute of Medical Sciences (AIIMS) in New Delhi, the King Edward Memorial Hospital (KEM) in Mumbai, Post-Graduate Institute (PGIMER) in Chandigarh, the Sanjay Gandhi Post Graduate Institute (SGPGI) in Lucknow, National Institute of Mental Health and Neurosciences (NIMHANS) in Bangalore, Christian Medical College (CMC) in Vellore, and the Sri Chitra Tirunal Institute (SCITMS) in Trivandrum in Southern India. Other prominent institutions include GB Pant Hospital (New Delhi), SMS Medical College (Jaipur), Bombay Hospitals (Mumbai), VHS Medical Center (Chennai), Madras Medical College (Chennai), Nizam Institute of Medical Sciences (Hyderabad) and Banjir Institute of Neurosciences and Psychiatry (Kolkata).

The All India Institute of Medical Sciences (AIIMS): was created within a decade of India’s independence (1956) as an institution of higher medical learning and was a dream of the first Prime Minister of India, Jawaharlal Nehru. With support from his health minister the Colombo Plan was launched, enabling the formation of the All India Institute of Medical Sciences. The founding objectives included bringing together the medical educational facilities of the highest order for training in all branches of health and to obtain world-class self-sufficiency in postgraduate medical education. AIIMS is an autonomous institution whose mission of teaching (undergraduate and post-graduate medical education) is on par with the best medical institutions of the world [much like the Indian Institutes of Technology (IIT’s)].

This institute has expanded considerably since its inception with comprehensive facilities for teaching, research and patient care. Teaching and research are conducted in 42 disciplines, and in the field of medical research, AIIMS is one of the leading institutions in India with more than 600 research publications annually. More recently, AIIMS has established two outreach hospitals; one a comprehensive rural healthcare center in a suburb of New Delhi, and a second specialized trauma center approximately one mile from the original campus.

Under the leadership of Dr. P. N. Tandon and Dr. A.K. Banerji, AIIMS Neurosurgery has flourished to yield a large group of leading neurosurgeons in India. One of the more prominent AIIMS trainees, Dr. Basant Misra, the past President of the NSI, currently practices at the Hinduja Hospital in Mumbai and has been the driving force from the subcontinent in organizing the CNS/NSI Joint Meeting in New Orleans. Dr. Misra has been consistently involved in collaborations with American neurosurgeons for over 10 years and continues to be a major source of inspiration for future collaborative efforts.

The Department of Neurosurgery at AIIMS is currently headed by Dr. B. S. Sharma.

National Institute of Mental Health and Neuro Sciences (NIMHANS): The neurosurgical department at NIMHANS was established by Dr. R. M. Varma in 1958. After doing so, he encouraged one of his early trainees, Dr. G.N.N. Reddy to pursue specialized neurosurgical training in Edinburgh, UK, and created the NeuroCenter in 1973. A series of prominent neurosurgeons have chaired the neurosurgery department including Dr. A.K. Reddy, Dr. B.S. Das and Dr. K.V.R. Sastry. NIMHANS became an autonomous institution in 1983. The program currently utilizes six fully functioning operating theaters with an additional four trauma surgery suites, performing over 4,000 cases annually. NIMHANS is one of the pioneer institutions in Bangalore, Southern India that trains neurosurgeons with specific objectives to improve procedure standards and practices in India to match those elsewhere in the world, and to encourage interdepartmental coordination for research projects in various subspecialties in neurosurgery, in addition to encouraging the residents to participate in clinical research activities. The Department of Neurosurgery is currently headed by Dr. B. Indira Devi.

The Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST):

This institution in Southern India was started based on a philosophic vision of the Maharaja of Travancore in 1974 and was established as an autonomous institution in 1980 for specialized care of patients with cardiovascular and neurological diseases. After gaining autonomy in 1980, this institution has grown tremendously and spawned several neurosurgeons of national prominence and continues to be a leading center for interventional neuroradiology and neurosurgery in the nation. The Department of Neurosurgery is currently headed by Dr. Suresh Nair.

Post Graduate Institute of Medical Education and Research (PGIMER) Chandigarh:

An independent autonomous institute that came into existence in 1962 because of a vision by then Prime Minister Nehru. The neurological department was started under Professor D.R. Gulati, and over the years, has slowly expanded to include such prominent Indian neurosurgeons as Dr. B.S. Sharma (currently head of Neurosurgery at AIIMS) and Dr. V.K. Khosla (former Chief of Neurosurgery at PGIMER and current NSI President). Currently the neurological service runs almost 60 beds every day with 20 new patients being seen almost every day. The Department of Neurosurgery is presently headed by Dr. S.N. Mathurija.

Christian Medical College (CMC), Vellore:

Within two years of India’s independence, the first neurological department started in this institution in April-May 1949 with the appointment of Dr. Jacob Chandy as Associate Professor of Neurosurgery. Along with his close associate Dr. Baldev Singh, a neurologist, the
The authors wish to thank Dr. Paritosh Pandey for his thoughtful input and assistance. Dr. Pandey is currently pursuing fellowship training in endovascular neurosurgery in Detroit and plans to return to NIMHANS, Bangalore to assume a faculty appointment at that institution.
In recent years, the debate about racial disparities in healthcare has been growing louder and receiving more attention. At the 2008 CNS Annual Meeting the Section on Tumors sponsored an international symposium entitled: “The Community of Neurosurgery in Latin America.”

Distinguished colleagues from across Latin America participated and discussed issues in brain tumor management amongst North, Central and South America. The impetus for coordinating this meeting came from our own Section chair’s review of the US population demographics in preparation for selecting topics for the CNS Symposium. These data show that the Hispanic population is the fastest growing ethnic segment of our population (Figures 1 and 2). The objectives of this symposium were to: (1) give examples of how the socioeconomic aspects of the Hispanic population in each country affect the practice of neurosurgeons in Latin America and the United States; (2) provide up to date information on issues regarding training of neurosurgeons in Latin American countries; and (3) discuss the similarities and differences in the management of brain tumors between Latin American countries and the United States.

Speakers discussed the challenges in brain tumor management that currently exist in the different American countries. Dr. Fernando Diaz, Professor, Department of Neurological Surgery, Wayne State University, spoke about the socioeconomic aspects pertinent to neurosurgeons in Latin America and the US; Dr. Edgardo Spagnuolo from the Latin American Federation of Neurosurgery, addressed the issue of neurosurgery and the current status in Uruguay; Dr. Jose Carlos Salerne, President, Brazilian Society of Neurosurgery, spoke about the current status of neurosurgery in Brazil; and Dr. Ramiro del Valle, Director of Gamma Knife Surgery, Mexico City, gave an overview of neurosurgery in Mexico. Dr. Quinones-Hinojosa gave an overview of the Epidemiology of Brain Tumors and other central nervous system diseases in the Hispanic population in the US.

Why select this segment of the American population to study with respect to brain tumors? Whether you look at the absolute or relative numbers it is clear that with the rapid expansion of this ethnic group you can only come to one conclusion: Hispanics are an important population group in the United States that will only continue to grow. It is projected that four decades from now, there will be over one-hundred million Hispanics in the United States and that they will make up a quarter of the entire US population. The current and future predicted
geographical distributions show that people of Hispanic origin are more likely to reside in states close to our southern border, like California and Texas. In 2006, almost half of Hispanic-Americans lived in just these two states (Table 1). However, when looking at the change in distribution since 1980, there is a clear shift to other parts of the country, with Arkansas, North and South Carolina in the top five states with the highest Hispanic growth rate (Table 2 and Figure 2).

This growing ethnic group differs from other ethnicities in several demographics, mainly as a whole, it is a much younger ethnic group (Figure 3A). On average the male Hispanic is eight years younger than the total male population and the difference is even greater for females, an average of 10 years exists between women of Hispanic and non-Hispanic origin. What influence will this younger population have on our neurosurgical sub-specialty needs? Compared to the total population, Hispanics (> 25 years) are less well-educated. Will this impact risk taking behavior and increase trauma rates? Also, within the employed, full-time, year-round workers of 16 and older, they earn less than the average American (Figure 3B). How will health insurance coverage be handled to give this ethnic group equal access to the highest levels of neurosurgical care?

As one of the highest level health care providers, neurosurgeons are made increasingly aware of the cultural and language differences between the major segments of our population. Coupled with the fact that many of the conditions we consult on and treat are serious, understanding expectations and communicating effectively is an important part of the health care we provide. As a group we have many outstanding US based neurosurgeons of Hispanic origin so what better time for us to explore some of the cultural and treatment issues as they relate to brain tumors with our colleagues in Central and South America.
It is with deep sadness that we acknowledge the recent passing of our esteemed colleague, Dr. Setti S. Rengachary. Dr. Rengachary was born in India on October 4, 1937. He attended medical school at the Madurai College of Medicine. Subsequently, he completed a surgical internship at the State University of New York in Syracuse and went on to complete a pre-residency fellowship at Harvard University and a residency in neurosurgery at the University of Kansas. In 1971 he joined the faculty at KU as chief of neurosurgery at the VA Medical Center in Kansas City. Dr. Rengachary was board certified by the ABNS in 1973. He was a dedicated teacher and attained the rank of full Professor. During his long career he also served on the faculty of the University of Missouri, the University of Minnesota and Wayne State University. While at the University of Minnesota, he was the editor (along with Dr. Robert Wilkins) of several classic textbooks including NEUROSURGERY, PRINCIPLES OF NEUROSURGERY, and THE NEUROSURGICAL OPERATIVE ATLAS. He finished his long academic career as Associate Chairman and Professor of Neurosurgery at Wayne State University in Detroit, Michigan (see photo) and retired in December 2007.

Dr. Rengachary was a colonel in the US Army Reserve and served a tour at the 410th Evacuation Hospital in Saudi Arabia during Operation Desert Storm. He continued in the tradition of neurosurgeons serving to treat the wounded during wartime, one initiated by Harvey Cushing during World War I. This bit of neurosurgery history meant a great deal to Dr. Rengachary as he loved the historical aspects of neurology and neurosurgery. To further this interest, he served as a chairman of the History Section of the AANS. During the last year of his life, Dr. Rengachary remained keenly interested in academic pursuits and co-authored several manuscripts on the historical aspects of neurosurgery in the Journal of Neurosurgery, NEUROSURGERY®, Neurosurgical Focus and Surgical Neurology. He often said that neurosurgery – and its history – was his main hobby.

Dr. Rengachary encouraged many young Indian neurosurgeons to pursue academic careers. He was one of the first academic neurosurgeons in the United States of Indian heritage, and he led by example. He was also one of the early members of the American Association of South Asian Neurosurgeons (AASAN), and volunteered his time and energy to sustain its educational efforts.

Dr. Rengachary passed away in December 2008 following a courageous fight with metastatic adenocarcinoma. He is survived by his wife, Dr. Dhana Rengachary, his daughter, Usha, and his son, Dave. The AASAN honors his memory. Many members of the AASAN have volunteered their time and energy in the spirit of Dr. Setti S. Rengachary in order to carry on his vision to the next generation in training.

Reference:
Neurosurgeons from 20 of the nation’s top medical institutions battled it out on June 6, 2009 in Central Park at the 6th Annual Neurosurgery Charity Softball Tournament (www.ColumbiaKidsNeuro.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, Barrow Neurological Institute, Emory, Harvard, Duke, Yale, Alabama, Florida, Penn State, Northwestern, Johns Hopkins, Cornell, NYU, Dartmouth, Thomas Jefferson, University of Pennsylvania, Albert Einstein and Mt. Sinai. Columbia claimed their third overall championship by defeating Emory in the Finals. Harvard and the University of Pennsylvania put on strong showings to tie for third place.

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. Harvard followed by winning in convincing fashion during the 2008 tournament. The championship trophy, named “The J. Lawrence Pool Memorial Trophy” in honor of the former Columbia chairman, will be housed at The Neurologic Institute of New York for the upcoming year.

For the sixth consecutive year, George M. Steinbrenner, III and the New York Yankees have sponsored the tournament, which has raised nearly $200,000 to date. This year featured a celebrity team led by captains Andy Samberg of Saturday Night Live, Actors Jason Schwartzman and Danny Masterson, as well as rock star Julian Casablanca. Jeremy Schaap of ESPN threw out the honorary first pitch. 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 2010 at the 7th Annual Neurosurgery Charity Softball Tournament, with the potential for an expanded field to include 24 teams from across the country.
Dear Colleague:

The Congress of Neurological Surgeons (CNS) recently concluded a comprehensive evaluation and modernization of our journal, NEUROSURGERY®. This included extensive reviews of our publication’s efforts, in general, followed by an international search process for the selection of the new editor of the journal. The purpose of this article is to provide our membership with insights into that unprecedented evaluation and selection process.

NEUROSURGERY® is recognized as one of the most outstanding scientific and medical journals in the world. The CNS has long been committed to enhancing the journal and its proud history of excellence. As part of that commitment, and consistent with oversight of the journal’s business and financial operations, during 2007-2008 the CNS Executive Committee conducted a comprehensive review of the journal. This review involved independent consultants, outside auditors and advisors to the CNS, and months of extensive communications and discussions with the former journal Editor, Dr. Michael L.J. Apuzzo, and the journal’s staff.

In September 2008, following consideration of those detailed reviews and discussions, the CNS Executive Committee established the CNS Committee for Long-Range Planning and Development of NEUROSURGERY® (“LRP Committee”). The Executive Committee directed the LRP Committee to: (i) prepare a detailed mission statement for NEUROSURGERY®; (ii) prepare a contemporary description of the duties and responsibilities for the Editor-in-Chief and the editorial staff, including a recommendation as to the length of the Editor’s term, and (iii) develop and undertake a search process for a new Editor-in-Chief of NEUROSURGERY®.

The initial members of the LRP Committee were:

- Dr. Anthony L. Asher (Chairman)
- Dr. Daniel L. Barrow
- Dr. Kim J. Burchiel
- Dr. Ralph G. Dacey, Jr.
- Dr. Nathan R. Selden
- Dr. Ali R. Rezai

The committee was subsequently expanded to include:

- Dr. H. Hunt Batjer
- Dr. Sean M. Grady
- Dr. William T. Couldwell

Beginning in October 2008, the LRP Committee met bi-weekly. Initial efforts were aimed at researching and defining the parameters for an international search process and determining current standards of best practices in the medical publishing industry. That process also involved interactions with editorial consultants, leaders in the neurosurgical community along with editors and managing editors of major surgical journals including our own journal. The LRP Committee then finalized a process for conducting the search, and a process for soliciting continued input throughout the process from the international community.

On December 8, the CNS issued an official “call for applications” for the new Editor-in-Chief of the journal. That announcement included a detailed job description and an online process for submitting application materials. Concurrently, letters announcing the position were sent to senior neurosurgical leaders, including Chairs of all AANS/CNS Sections, principals of the ABNS, Senior Society, CSNS and AANS, neurosurgical residency Program Directors and Department Chairs, senior members of the Editorial Board of NEUROSURGERY®, and leaders of all major international neurosurgical organizations. Notices were also placed in NEUROSURGERY®, the Journal of Neurosurgery, and the Congress Quarterly.

During the search process, the LRP Committee received widespread participation and input from the CNS members domestically, as well as members from around the world. Committee members personally communicated with numerous individuals and received detailed advice and recommendations, including from Dr. Apuzzo, editors of other surgical specialty journals, leaders in neurosurgery, and publishing executives, regarding the search process.
and the new Editor. The committee has also separately solicited and received advice from a senior advisory group of approximately forty distinguished individuals from the American and international neurosurgical community. Based on recommendations from these senior advisory group members, the LRP Committee encouraged and received applications from highly qualified candidates who were suggested for the position. In addition, the committee identified new and emerging publication standards, goals, and responsibilities for the future Editor and journal staff, as well as criteria to be utilized as part of the selection process for the new Editor. This consultative process was expanded during the application and final selection process, thereby ensuring a process for the CNS and its members that was not only thorough, but one that was transparent. This transparency included a detailed summary of the selection process that was distributed electronically to our entire membership on February 13, 2009.

The LRP Committee continued the application process through the February 27, 2009 deadline. As of that date, eleven extraordinarily well-qualified candidates had submitted applications for consideration. From February 27 until March 29, the LRP Committee thoroughly assessed and considered each application. This process included analyses of each candidate’s submitted data, including written and verbal vision statements, letters of recommendation, curriculum vitae and responses to detailed written inquiries. Interactive webinar interview sessions were conducted with each candidate. Additionally, the committee received significant input from senior neurosurgical leaders during this period, each of whom shared their extensive clinical, scientific and/or publishing experiences.

On March 31, the LRP Committee convened to review and discuss the complete applications of the candidates. Following that review, the committee members voted to select candidates for a second round of interviews. On the basis of that vote, three candidates were selected for a final round of evaluations. From April 8-27, additional materials were requested of the three finalists, including detailed conflict of interest statements. The LRP Committee continued to solicit input from senior neurosurgical leaders during this period. On April 22, the committee conducted a teleconference with Dr. John A. Jane, Editor-in-Chief of The Journal of Neurosurgery, Dr. Apuzzo, Editor-in-Chief of NEUROSURGERY® and Ms. Carol Pippin, Vice-President Journal Publishing, Wolters Kluwer Health Medical Research, LWW, regarding the editor selection process and criteria, as well as trends in modern medical publishing.

Throughout the selection process, the LRP Committee provided regular updates to the CNS Officers and Executive Committee regarding the LRP Committee’s activities. On May 1, the Executive Committee received a comprehensive report on the selection process. Following that presentation, the Executive Committee authorized and directed the LRP Committee to make a final selection of the new Editor. On May 2, personal interviews were conducted with each of the three finalists in San Diego. Participants included the nine members of the LRP Committee, along with invited advisors, including Drs. William Friedman, Vince Traynelis, Gerald E. Rodts Jr., and the CNS Legal Counsel, Mr. Greg Willard. On May 3, the LRP Committee conducted a confidential vote. The results of that electronic vote were communicated on May 4 to the LRP Committee chair, the LRP Committee and the CNS President, Dr. P. David Adelson.

On May 5, the CNS proudly announced to its membership the selection of Dr. Nelson Oyesiku as the new Editor-in-Chief of NEUROSURGERY®, effective July 1, 2009.

During May and June, the LRP Committee facilitated the transition process, and worked to better define the responsibilities and duties of the new editor, along with refining the mission statement of our journal. The CNS would like to thank each of the candidates who submitted applications for the position of Editor-in-Chief, and the hundreds of individuals who assisted the CNS in this eight month process for their unwavering assistance and support. We are extremely proud of Dr. Oyesiku’s selection and look forward to his future contributions to the success of NEUROSURGERY®.

Sincerely,

[Signature]

---

CNS Membership

The CNS Executive Committee approved a proposed membership dues increase at its June 2009 Executive Committee meeting, which will be presented for ratification at the Annual Business Meeting in New Orleans, Louisiana during the 2009 CNS Annual Meeting.

The CNS continues to emphasize fiscal responsibility, value and service for the CNS membership. The proposed dues amount continues to represent a superior cost efficiency compared with other professional medical organizations. The proposed annual membership dues amount will increase to $575. The last dues increase by the CNS was ratified in 2002. The CNS Executive Committee voted for this increase in membership dues in an effort to maintain fiscal responsibility in light of rising expenses relative to:

• Joint programs such as the Washington Committee and its subcommittees:
  • The Quality Improvement Workgroup.
  • The Joint Guidelines Committee.
• SANS support for the American Board of Neurological Surgery.
• Support for the Joint Sections.
• CNS Headquarters costs to maintain membership growth and benefits.

The CNS Member benefits include:

• Complimentary subscriptions to NEUROSURGERY®, Clinical Neurosurgery and Congress Quarterly, available in print and online.
• Reduced registration fees at the CNS Annual Meeting.
• Representation and access to all joint programs, including the Washington Committee and subspecialty sections.
• Eligibility for a variety of funded educational fellowships and grants.
• Complimentary access to the CNS University of Neurosurgery.
• Complimentary access to SANS Lifelong Learning, as part of MOC.
• Complimentary access to the CNS University Image Library and much more.
The Congress Quarterly would like to congratulate Nelson M. Oyesiku, MD, PhD, as the recently appointed Editor-in-Chief to *NEUROSURGERY*®, the official journal of the Congress of Neurological Surgeons. Dr. Oyesiku is an exceptionally rare individual who has been able to master the clinical practice of neurosurgery and also serve as a leader in the scientific community. His unique experiences and perspectives will serve him well in this future endeavor.

Dr. Oyesiku was born in Nigeria, received his undergraduate training at St. Gregory’s College, and subsequently received a Doctorate of Medicine from the University of Ibadan. He received additional training at the University of London as a Commonwealth Scholar, where he obtained a Masters of Science degree. He went on to get his neurosurgical training at Emory University in Atlanta, where he also completed a PhD in the Neuroscience graduate program. His Doctorate was on the role of neurotrophic factors in neural survival and regeneration. Upon the completion of neurosurgery residency, he was retained as a facility member in the Department of Neurosurgery. Currently he is a Professor of Neurologic Surgery, Vice Chairman and Director of the Neurosurgical Residency Program, Al Lerner Chair in Neurosurgery, and Director of the Laboratory of Molecular Neurosurgery and Biotechnology. His clinical and research focus is dedicated to pituitary tumors, and he has been prolific in this field receiving numerous academic awards and grants. Specifically, he has received an NIH CIDA award and Medical Faculty Development award from the Robert Wood Johnson Foundation. He received an NIH (KO8) CIDA and RO1 award for molecular imaging and targeting of pituitary tumors.

In addition to his successful scientific laboratory and clinical practice, he has been quite active in the academic neurosurgical arena. He is a recent Past President of the CNS, and served on the Executive Committee of the CNS and AANS/CNS Section on Neurotrauma and Critical Care, as well as the AANS/CNS Section on Tumors. He has also served on the CNS Scientific Program Committee and was chair for the 2002 CNS Annual Meeting. Dr. Oyesiku has also been a member of the CNS Publications Committee and served on the Editorial Board of *NEUROSURGERY*®.
Growth of the Congress of Neurological Surgeons (CNS) membership remains robust and total membership is at an all-time high of 6,703 members. With the recent addition of the Medical Student membership, the CNS now has 11 categories of membership. They include Active (3108 members), Active International (500 members), International Vista (395 members), Senior (961 members), Resident (1004 members), Affiliate (71 members), Associate (28 members), Inactive (452 members), Transitional (165 members), Honorary (12 members) and Medical Student (seven members). Because of increases in each of these categories, total membership has grown 28% in the last five years (Figure 1).

Based on focused efforts by the CNS to develop ties to our international neurosurgical colleagues, total international membership (Active International and International Vista) has seen dramatic growth in the last two and half years. After the initiation of the International Vista membership category in January 2007, the CNS experienced a 42% increase in total international membership (currently at 895). We will continue to enhance international membership growth and collaboration by providing membership options via the existing categories, as well as increased integration of our international colleagues at the CNS Annual Meeting and a global recruitment effort.

To build on its commitment to educate and support future neurosurgeons, the CNS introduced the Medical Student membership category this spring. By including medical students, the CNS hopes to provide the critical information necessary for them to choose a career in neurosurgery, as well as access to important neurosurgical educational resources. Benefits of the CNS Medical Student membership include an internet subscription to all of our publications (including Neurosurgery®), discounts on SANS Lifelong Learning online assessment tools, access to the CNS University of Neurosurgery and reduced registration fees at the CNS Annual Meeting.

Because allied healthcare professionals (nurse, nurse practitioners, physician assistants) are a critical component of all neurosurgical practices and to provide an educational/professional resource for this group of medical professionals, the CNS has initiated an effort to further integrate and recruit Affiliate members into the organization. Specifically, we will increase educational offerings directed to allied healthcare professionals at our Annual Meetings, provide opportunities for further integration into the CNS and initiate recruiting efforts. Additional benefits of Affiliate membership include reduced subscription rates to all the CNS publications (including Neurosurgery®), discounts on SANS Lifelong Learning online self-assessment tools, access to the CNS University of Neurosurgery and reduced registration fees at the CNS Annual Meeting.

The CNS remains dedicated to the education and career development of all its members. Based on our founding principles of volunteerism, development of neurosurgical leadership and public service, we are excited about the continued expansion of membership. Membership information and/or membership applications and be found online at http://www.cns.org/membership/. Please feel free to contact us with questions or comments by email at info@cns.org or by phone at 1-877-517-1267.
The Information and Technology Committee and Web Editor have been busier than ever planning new projects and developing enhancements to the existing CNS products. The most relevant of these to the CNS members is the redesign of the CNS web site (www.cns.org). The new look is a reflection of our global outreach and commitment to our national and international members (see Figure 1). You will find the site very organized and succinct. Additionally, the site is searchable with the Google Tool Search bar, so navigation has become even easier.

As a NEW feature, a member login area now provides a snapshot view of important items including a member profile, a link to NEUROSURGERY®, CME, Accounting, Favorites, Searches on the site, Calendar, Online Products and the Faculty Services Center (see below). These features can be seen on the right-hand side of the new home page (see Figure 2).

Working with the Education Committee, the IT Committee is developing the infrastructure to support the ever-growing CNS University of Neurosurgery (http://univ.cns.org) (see Figure 3). We are developing a comprehensive taxonomic database to allow for easier searching through all the educational products. The image database, a popular educational tool, is being redesigned to maximize ease of use and searchability. IT also supports the increasingly popular CNS webinars. Many more are planned for the upcoming year. The NeuroWiki (http://wiki.cns.org) remains as popular as ever with tens of thousands of hits. Enhancements to the NeuroWiki, including an easier method to enter references, are coming soon.

For our members who serve as faculty at our Annual Meetings and those selected to give presentations, we are overhauling the Faculty Services Center. Members will be able to see all of their scheduled obligations in one place - the member login area on the new web site. This single location will offer more convenience and information than the previous iteration which required navigation to multiple login sites. The Faculty Services Center will also incorporate and centralize disclosures and conflict of interest forms. Committee members will also be able to see the locations and times of their meetings.

Of course, most of the effort of the IT Committee is behind the scenes. This includes upgrading hardware and software to match the demands of ever-changing technologies, developing applications for handheld devices and supporting important CNS endeavors such as the Annual Meeting and SANS Lifelong Learning.

The CNS remains committed to providing its members with the most valuable educational experience. We have been at the forefront of neurosurgical education, with products such as SANS, specialty-driven webinars and the University of Neurosurgery leading the way. Maintaining a robust and adaptable IT infrastructure is critical for our continued success and we are honored to work for the membership in this capacity.
“THE CONGRESS OF NEUROLOGICAL SURGEONS EXISTS TO ENHANCE HEALTH AND IMPROVE LIVES WORLDWIDE THROUGH THE ADVANCEMENT OF EDUCATION AND SCIENTIFIC EXCHANGE.”

At the core of the CNS mission rests the Education Committee. The CNS is committed to novel and creative production of educational content and science. The Education Committee is dedicated to engineering and providing methods for live and online learning to expand the knowledge of our members at all career stages—from student to established practitioner.

Under the leadership of past Chairs Daniel K. Resnick and Saleem I. Abdulrauf, the CNS has developed new ways to enhance education. The CNS University of Neurosurgery was developed to provide a means to obtain CME credit and act as a resource for residents and practicing neurosurgeons alike. The 3-D Surgical Anatomy Course for Senior Residents is in its fourth successful year, providing a unique opportunity for chief residents to learn important operative anatomy from renowned experts led by Albert L. Rhoton, Jr., MD.

In January, Nathan R. Selden assumed the position of Education Chair as the committee underwent a transformation to incorporate and oversee the diverse CNS educational projects. As a result, the new Education Committee is comprised of three subcommittees: Programs, Education Science and Regulatory Affairs.

Currently, the Education Committee emphasizes both established and recently developed programs that allow for self-study from the convenience of the office or home. Such programs include the popular NeuroWiki, SANs (the Self Assessment in Neurological Surgery) Lifelong Learning and the CNS University of Neurosurgery. Here, the CNS Education Committee works closely with the Information

> THE EDUCATION COMMITTEE EMPHASIZES... PROGRAMS THAT ALLOW FOR SELF-STUDY FROM THE CONVENIENCE OF THE OFFICE OR HOME. <
and Technology Committee, chaired by Ganesh Rao, to create the most accessible and user-friendly programs available.

The Education Committee is dedicated to enhancing and improving online education. As the CNS restructures its web site, the Committee is restructuring the core of the CNS online activity. At its center will be a curriculum-based structure guiding development of area-specific education for individual learners. For example, SANS provides evidence-based questions on a wide spectrum of neurosurgical topics, allowing users to assess their current knowledge and expand upon specific areas in need of improvement. SANS is currently developing additional subspecialty modules, including Spine and Neurotrauma-Critical Care. An international version is being planned as well. SANS also remains an integral part of the ABNS’ Maintenance of Certification (MOC) process, and is provided, complimentary, to all MOC participants.

The CNS University of Neurosurgery is also undergoing an extensive restructuring slated to debut this fall. The site has offered course content for CME in clinical and non-clinical areas, an extensive image database, video lectures from Annual Meetings and resources for residents, such as fellowship listings, a resident curriculum, PDA resources and research funding opportunities. The new University will provide many of the same educational opportunities. However, these opportunities will be subspecialty-based, thereby allowing members to access content specific to personal CME and educational needs. More than 50 new courses will be added to the site. In addition, a live webinar series was successfully launched in January 2009, allowing members to interact with neurosurgical leaders and educators from the convenience of their home or office computers. Covering topics from spinal trauma to management of AVMs to understanding Medicare, the series has garnered significant member interest. The webinar series will continue with involvement of all subspecialties and covering a broad variety of current topics. In addition, a special series on brain and spinal tumors will be offered as well as the debut of the Integrated Medical Learning® process in webinar format. There is no limit as to the number of participants and all those interested can register at www.cns.org.

The Education Science and Strategic Planning Subcommittee, chaired by Immediate Past President Anthony L. Asher, serves to continually monitor the field of education science and apply these principles to optimizing continuing medical education for the purpose of improving neurosurgical practice. Based upon extensive research, the CNS has developed various learner-centered programs. Integrated Medical Learning® (IML) and Consensus Sessions involve the learner in defining topics, collecting novel information about practice or policy, and integrating this information into new knowledge. The outcomes of past IML and Consensus Sessions are currently being highlighted in the peer-reviewed literature. A recent publication in the Journal of Neuro-oncology evaluated the results of an IML program on the treatment of cerebral metastases and other publications in preparation and in press evaluate further IML topics and the overall process of IML itself. In a similar vein, the CNS Consensus Sessions were developed at recent Annual Meetings to garner input from practicing neurosurgeons on important socioeconomic issues pertinent to our field. The result of the initial session on the aging neurosurgeon and retirement is in press in Neurosurgery® and four new compelling and topical sessions are planned for the 2009 Annual Meeting in New Orleans.

The Regulatory Affairs Subcommittee, co-chaired by Alan M. Scarrow and Michael P. Steinmetz, endeavors to maintain the highest standards of oversight and quality in the educational endeavors of the CNS. The Subcommittee is also anxious to make compliance easier for members and faculty of the CNS, incorporating a new, updatable conflict of interest disclosure form into the Member pages of the CNS web site. The Subcommittee is also looking for new ways that the CNS can help its members comply with the regulatory requirements for specialty CME in their home states and at their home institutions.

Through its commitment to education for all neurosurgeons, the CNS Education Committee has entered an exciting new phase. Anyone interested in joining the Education Committee is welcome to contact us at info@1cns.org.
The patient is a 39 year old male who developed hydrocephalus after E.Coli meningitis at seven weeks. The patient had developed medically intractable epilepsy and presented for a dominant temporal lobectomy after being diagnosed with mesial temporal sclerosis. The picture above represents the intra-operative view of a phalangated catheter in the temporal horn indenting on the hippocampus. The catheter was placed from a posterior approach and the distal end was removed at the time of the temporal lobectomy. The patient has been seizure free since the operation.