In this issue of CNSQ, we attempt to delineate the multitude of acronyms and abbreviations that we as neurosurgeons encounter each day. The concept for this issue arose as a result of the increased use of texting and abbreviations in our daily routines. For example, should “LOL” be interpreted as “laugh out loud” or “lots of love”? Incorrectly interpreting this as lots of love could be exceedingly embarrassing and confusing. Therefore, in this issue, we bring together all the common acronyms in neurosurgery so that you the reader can have a quick reference or review such as to maximize your time and energies.

The first two theme articles review the multitude of neurosurgical and spine societies and their associated acronyms and abbreviations. The American Board of Neurological Surgeries (ABNS) Chairman, Daniel Barrow discusses this association, while Nelson Oyesiku contributes an article on the Maintenance of Certificate (MOC) process. Tim Ryken reviews the many abbreviations associated with the Joint Guidelines Committee. John Ratliff and Rachel Groman discuss the National Quality Forum (NQF). Joe Chang deciphers the common use of acronyms in the coding populations, particularly with reference to the neurosurgical population. And lastly, David Piepgras reviews the Committee on the Accreditation of Subspecialty Training (CAST).

Also in this issue, we continue the ongoing discussion of resident work hours with two articles — Daniel Barrow and Costas Hadjipanayis provide a chairman’s perspective, while Krystal Tomei offers a resident perspective in her article, Win Some Lose Some.

Spinal cord injury therapies have evolved rapidly over the last decade. Therefore, an article devoted to cell-based therapies for spinal cord injury by Jared Wilcox, et al is included.

Additionally, James Ausman provides his perspective in What a Spine Surgeon Should Do To Prepare for the Coming Economic Collapse while Jorge Gonzalez-Martinez and William Bingaman review stereoelectroencephalography (SEEG) in the United States.

Lastly, in the Inside the CNS section, Daniel Resnick and Russ Lonser provide a look at the CNS’ financial health in the Treasurer’s Report while Nathan Selden provides an overview of the entire CNS from the secretary’s perspective.

As always, we thank you for your comments and continued ideas and support.
While it is currently Fall, by the time you read this it will be Winter, and I will be well into my term as President of the Congress of Neurological Surgeons (CNS). I would like to thank all members of the CNS for allowing me to serve the organization. I promise to do my best for you and for the CNS. The upcoming year undoubtedly holds numerous opportunities and challenges for the CNS and for the profession of Neurosurgery. I am confident that both will be met with the type of creativity, enthusiasm, determination and hard work typical of the CNS and its volunteer members.

The CNS is currently in the midst of two very important internal activities. The first is an organizational self-study, launched in the Spring of 2011, to review the business operations, governance, communications and long-range infrastructure needs of the organization. A special committee, consisting of past and present CNS leaders, was formed with the charge of soliciting the views and recommendations of a wide cross-section of stakeholders. Further, this committee is charged with, among other things, identifying strengths and weaknesses of the organization and making recommendations to improve future operations. With the assistance of an outside consultant, Dewey & Kaye, this extensive self-study process is due to be completed by Spring of 2012.

Second, the CNS has begun the search for a new Executive Director to replace long-time former Executive Director Laurie Behncke. This nationwide search will be aided by the results of the self-study described above. Tuft & Associates, nationally recognized for executive recruitment, particularly in the areas of foundations and nonprofits, has been retained to assist in the process. During this time, Regina Shupak, CNS Director of Scientific Meetings, will serve as Interim Executive Director. We wish Laurie Behncke the best in all of her future endeavors.

For the upcoming year, members of the CNS Executive Committee have been challenged to consider three important themes while carrying out their duties. The first theme is that of volunteerism. The CNS has always been a volunteer organization, deriving its vitality from the enthusiasm and efforts of its over 7,400 members. For the type of projects that the CNS typically undertakes, volunteer efforts increase the quality and reduce the cost of the end product, substantially increasing its value. Thus, as a result of volunteer efforts, the CNS has been able to complete an increasingly large number of progressively more complex projects while maintaining dues amongst the lowest of any international professional society. A major focus of the CNS, therefore, over the next year, will be to find improved ways to harness the tremendous energy of current volunteers and to recruit even more CNS members to volunteer in the activities of our organization.

The second theme is that of efficiency. If anything has been learned over the last decade, it is that we live in an environment of limited resources. We must therefore make the most of the resources that we have, both monetary and human. Obviously, for an organization as large and diverse as the CNS, choosing the right projects is critically important for
efficiency. How a project is carried out, though, is equally important. Volunteer efforts are the most efficient, as every project completed by a member volunteer preserves resources that can be applied elsewhere, for a different project, to address a different member need. There are, however, some projects and services that cannot be efficiently carried out by volunteers. For many of these, the CNS employs an extremely talented and dedicated staff at the headquarter’s office in Schaumburg, Illinois. For others, the organization purchases services from outside vendors, often at a substantial cost. Thus, a second major focus over the next year is to evolve a system of governance that optimizes the efforts of member volunteers and CNS staff while minimizing the need for outsourcing.

Finally, the third theme is that of creativity. The CNS has a long history of creatively exploring new ideas, techniques and technologies to enhance educational programs and member services. Almost all of these ideas have come from CNS members, often individuals with special talents and unique insights. Many of these ideas, such as the practical course, SANS Lifelong Learning, and the CNS University of Neurosurgery, have revolutionized the way neurosurgeons interact and learn. Interestingly, some of the most creative ideas of the last decade have also been the most effective and least expensive to implement. It is for this reason that I am increasingly convinced that the future of the CNS, and perhaps of the profession, depends on the continued creativity of member volunteers. To this end, a third major focus of the organization over the next year is the encouragement of creative thinking and open-mindedness on the Executive Committee.

In summary, I look forward to the next year, both for the CNS and for Neurosurgery. By emphasizing volunteerism, efficiency and creativity, the CNS will be able to best harness its opportunities and overcome its challenges for the benefit of all neurosurgeons and their patients.
THE ABCs OF THE NEUROSURGICAL SOCIETIES

As physicians we have been taught, since an early age, the advantages and importance of acronyms in medicine. These abbreviations provide for increased speed and efficiency in our busy worlds where time and space are valuable commodities. Therefore, our profession readily accepts abbreviations and acronyms and uses them throughout our work and academic fields. Our society has advanced to the point where three- and four-letter words are no longer discouraged, but readily encouraged. Thus we have amassed a great volume of acronyms which appear to be overlapping and can be quite confusing. It is, therefore, hoped that this article will help elucidate some of these abbreviations and acronyms particularly as they relate to the medical societies and associations dedicated to neurosurgery.

CNS – Congress of Neurological Surgeons
http://www.cns.org

The CNS became an organization in the post-World War II era, due to the influx of the young neurosurgeons returning to their communities after advanced neurological training. The first meeting was held in St. Louis, Missouri on May 10, 1951 and consisted of 22 members.

This group evolved into the first Annual Meeting of the Congress in November of 1951 in Memphis, Tennessee with a total membership of 121 neurosurgeons. The CNS has continued and progressively grown and become the worldwide leader in neurological education, currently having over 7,700 neurosurgical members worldwide.

The CNS is defined by its mission statement: to enhance health and improve lives worldwide through the advancement of education and scientific exchange. This is further clarified through the vision statement which is to be the premier educational organization in neurological surgery. The objectives of the CNS are to improve the quality of healthcare through:

1. The development of educational programs that convey knowledge, enhance self-directed learning and improve patient outcomes.
2. Advancing the science of medical education.
3. Promoting original inquiry and the exchange of clinical and scientific evidence.
4. Public advocacy for enhancement of quality, safety and access to neurosurgical care.

The CNS and AANS jointly sponsor and aid various neurological sections where each subspecialty is dedicated to a specific disease population or focus. These include cerebrovascular, neurotrauma and critical care, pain, pediatric, spine and peripheral nerves, stereotactic and functional neurosurgery, tumor sections and Women in Neurosurgery (WINS).

Within the CNS, again abbreviations or acronyms are commonly used to describe specific educational programs. The CNS developed a web-based educational platform designated the CNS University of Neurosurgery (CNSU). Commonly referred to as the CNSU (http://univ.cns.org), this web-based educational platform consists of 11 departments: anatomy, cerebrovascular, functional/epilepsy, non-clinical core competencies, pain, pediatric, peripheral nerve, socioeconomic, spine, trauma and tumor. This is further supported through webinars, an image database with approximately 2,000 neurosurgical images, and NeuroWiki. SANS Lifelong Learning – The Self-Assessment in Neurological Surgery has been a neurosurgical education resource for more than 25 years, supported and sponsored by the CNS. This program was modeled on a highly successful SESAP program designed by the American College of Surgeons – surgical education self-assessment program. This highly successful program is now incorporated in the Maintenance of Certification (MOC) [see page 8] program for surgeons to maintain board certification.

AANS – American Association of Neurological Surgeons
http://www.aans.org

The AANS was founded in 1931 as The Harvey Cushing Society. With over 8,000 members worldwide, this organization is a scientific and educational association, dedicated to advancing the specialty of neurological surgery in order to provide the highest quality of neurosurgery care to the public. The AANS accomplishes this through its vision statement:

1. Ensuring that neurosurgeons are recognized as the pre-eminent providers of quality care to the patients with surgical disorders that affect the nervous system.
2. Working to expand the scope of neurosurgical care as new technologies and treatments of neurological disorders become available.
3. Speaking for neurosurgery through communications and interactions with the public, media, government, medical community and third party payors.
4. Be its members principle resource for professional interaction, practice information and education.
5. Promoting and support appropriate clinical and basic science to expand the scope of neurosurgical practice.

ABNS – The American Board of Neurological Surgery
http://www.abns.org/content/about_abns.asp

The ABNS was founded upon recognition of a need for specialized training and qualifications in the practice of neurological surgery under a meeting with members of the Society of Neurological Surgeons (SNS) and the Harvey Cushing Society (present-day AANS) in 1939. In 1940, it was recognized by the Advisory Board of Medical Specialties (ABMS) in collaboration with the AMA Council of Medical Education. The
primary purposes of the ABNS are:
1. To define requirements for training in neurological surgery.
2. Develop and administer the Primary Examination.
3. Evaluate the credentials of candidates for certification, including professional practice.
4. Develop and administer the oral examination.
5. Issue certificates.
6. Define requirements of Maintenance of Certification (MOC) in neurological surgery.
7. Develop and administer the Cognitive Examination.
8. Track Diplomate’s progress through MOC.

This organization consists of 14 directors selected from practicing neurosurgeons throughout North America. Directors are elected from nominations received from the following societies: AANS (4), Society of Neurological Surgeons (4), CNS (4), American Academy of Neurological Surgery (1), and Neurosurgical Society of America (1).

ACS – American College of Surgeons
http://www.facs.org
The American College of Surgeons is dedicated to improving the health of the surgical patient and to safeguarding standards of care in optimal and ethical practice environment. The CNS collaborates closely with the ACS, with Dr. Nelson M. Oyesiku serving as a direct representative. Additionally, the CNS has representatives on the Advisory Council of Neurological Surgery (Alex B. Valadka) and Young Surgeones Committee (Allan D. Levi).

AMA – American Medical Association
http://www.ama-assn.org
The AMA was founded over 161 years ago by Nathan Smith Davis and its mission is to promote the art and science of medicine and betterment of public health. This is achieved through the core values of leadership, excellence, integrity, and ethical behavior. The CNS has representatives to the AMA (Phillip Tally and Ann Stroink) as well as a representative on the Young Physicians Committee of the AMA (David F. Jimenez).

CSNS – Council of State Neurosurgical Societies
http://www.csnsonline.org
The Council of State Neurosurgical Societies grew in response to socioeconomic demands for systems in the 1960s and 1970s. Specifically in response to Blue Shield initiating relative value units (RVUs) in various states, the Congress of Neurological Surgeons (CNS) established the Socioeconomic Committee in 1963. Subsequently in 1972, the AANS joined the CNS in forming the Joint Socio Economics Committee (JSEC). Presently, CSNS is composed of members of the various state neurosurgical societies at the ratio of 1 representative per 50 state society neurosurgeon members. Each state has at least one representative and states without a society may have one neurosurgeon from that state declared a delegate by the CSNS chairperson. This group organizes a subcommittee and is under the directorship of the AANS and CNS leadership.

NINDS – National Institute of Neurological Disorders and Stroke
http://www.ninds.nih.gov/
The NINDS is a part of the National Institute of Health (NIH). It is defined by its mission statement as an organization to reduce the burden of neurological disease. The US Congress accredited the NINDS in the 1950s as one of two dozen research institutes comprising the National Institute of Health.

SNS “The Senior Society”—The Society of Neurological Surgeons
http://www.societyns.org/about_sns.html
This society is the oldest neurosurgical society in the world and limits its membership to 200 active members consisting of academic department chairs, residency program directors, and other key individuals. The purposes of the society are:
1. The continuing development of the field of neurological surgery including graduate and post-graduate education.
2. To bestow recognition upon persons of outstanding ability and excellence in their work and teaching.
3. To enhance the role and stature of neurosurgical units in academic medical centers.
4. To ensure that patients with nervous system disease receive the highest quality of care.
5. To encourage and support research in neurosciences.

WFNS – World Federation of Neurosurgical Societies
The World Federation of Neurological Societies was founded in 1955 as a worldwide group in order to enhance communications. At present it comprises organizations on five continents with 114 national neurosurgical societies and five affiliated societies representing approximately 30,000 neurosurgeons worldwide. The goals of the society as stated through their mission statement are:
1. To facilitate the personal association of neurological surgeons throughout the world.
2. To aid in exchange and dissemination of knowledge and ideas in the field of neurological surgery.
3. To encourage research in neurological surgery and allied sciences.
4. To address the issues of neurosurgical demography.
5. To address issues of Public Health.
6. To implement, improve, and promote the standards of neurosurgical care and training worldwide.
Abbreviations and acronyms are common in all medical practices but it appears the spinal community believes in them more than most specialties. This is probably related to the broad overlap of clinical specialties caring for spinal diseases. For the general neurosurgeon this is particularly relevant in that a large portion of their practice is devoted to the care of the spinal patient. Therefore, this article is dedicated to terms, abbreviations and acronyms that focus on spinal societies.

ASIA – American Spinal Injury Association
http://www.asia-spinalinjury.org
In the early 1970s, the “model spinal cord injury systems” program was developed under the Department of Health, Education, and Welfare. It was from this group that ASIA evolved and was formally created in 1973 with a mission to:
• Promote and establish standards of excellence for all aspects of health care of individuals with spinal cord injury from onset throughout life.
• Educate members, other healthcare professionals, patients and their families as well as the public on all aspects of spinal cord injury and its consequences in order to prevent injury, improve care, increase availability of services and maximize the injured individual’s potential for full participation in all areas of community life.
• Foster research which aims at preventing spinal cord injury, improving care, reducing consequent disability, and finding a cure for both acute and chronic SCI.
• Facilitate communication between members and other physicians, allied health care professionals, researchers and consumers.
Presently, the society has nearly 600 members and a regular annual meeting. This society’s dedication to the care and treatment of spinal cord injury population is noted by their significant contribution to the literature where the ASIA spinal cord injury classification system is one example.

CSRS – Cervical Spine Research Society
http://www.csrs.org
The Cervical Spine Research Society is a multidisciplinary organization that provides a forum for the exchange of ideas and promotes clinical and basic science research of the cervical spine. This society was developed from the concept that a sub-specialty group devoted to the cervical spine was necessary. That concept took shape during the 1973 Annual Meeting of the American Academy of Orthopedic Surgeons (AAOS). The Cervical Spine Research So-
ciety is the recognized authority on diseases of the cervical spine.

**FOSA – Federation of Spine Associations**
The Federation of Spine Associations consists of four organizations, the American Spinal Injury Association (ASIA), Cervical Spine Research Society (CSRS), North American Spine Society (NASS), and Scoliosis Research Society (SRS). Each year, this group of subspecialty organizations within orthopedics meets at the American Academy of Orthopedic Surgeons (AAOS) Annual Meeting.

**GSTSG – Global Spine Tumor Study Group**
GSTSG is an international group of spine surgeons (both orthopedic and neurological surgery) that was organized in order to maintain a perspective database of surgical outcomes of patients with extradural spinal metastasis.

**IMAST – International Meeting on Advanced Spine Techniques**
http://www.srs.org/imast
IMAST, a sub-organization of the scoliosis research society, gathers leading spine surgeons, innovative research, and the most advanced spine technologies in an international forum. Recently completing the 18th international meeting, they are currently preparing for their 2012 offering in Istanbul, Turkey discussing, debating and demonstrating new spine techniques to help improve patient care.

**ISASS – International Society for the Advancement of Spine Surgery**
http://www.isass.org
ISASS is a global scientific and educational organization designed to involve all aspects of basic and clinical science of motion preservation and stabilization of the spine through minimally invasive techniques, biologics and traditional surgical techniques. Their mission is to discuss and assess existing strategies and innovative ideas in the clinical and basic sciences related to spine surgery and to enhance patient care.

**ISSLS – International Society for the Study of the Lumbar Spine**
http://www.issls.org
Founded in 1974, ISSLS is an organization designed to bring together individuals throughout the world, who, by their contributions, activities both in the areas of research and clinical studies, have, or indicated interest in the lumbar spine in health and in its diseases.

**LSRS – Lumbar Spine Research Society**
http://www.lsrso.org
The LSRS is dedicated to the free exchange of scientific information regarding the lumbar spine. Its mission is to advance our knowledge and understanding of the lumbar spine; its physiology, pathology, and treatment; in order to improve patient care through the promotion and discussion of research. The LSRS takes pride in their annual meeting as an industry-free meeting with no sponsorships and no vendors present, and is purely scientific. The society was founded in 2008 as a non-commercially biased organization.

**NACTN – North American Clinical Trial Network**
http://www.nactn.org
NACTN is a consortium of academic groups working towards the treatment and care of spinal cord injuries (SCI). It is funded through Christopher Reeve’s Foundation and the Department of Defense Grants. The mission of the North American Clinical Trials Network for the Treatment of Spinal Cord Injury is to bring promising therapies out of the laboratory and into clinical trials, in a manner that provides incontrovertible evidence of effectiveness and safety.

**NASS – North American Spine Society**
http://www.spine.org
Founded in 1984, NASS is a multidisciplinary medical organization dedicated to pursuing the highest quality evidence-based and ethical spine care by promoting education research and advocacy. Members are represented from various disciplines including: orthopedic surgery, neurological surgery, physiatry, neurology, radiology, anesthesiology, research, physical therapy, as well as other spine care professionals.

**SMISS – Society for Minimally Invasive Spine Surgery**
http://www.smiss.org
The mission of the Society for Minimally Invasive Spine Surgery is to improve patient care by advancing the practice of effective minimally invasive spine surgeries through education, research, and advocacy. This society is dedicated to less invasive techniques. Founded in 2007, SMISS has a regular annual meeting which brings hundreds of spine surgeons together to present the latest research, to discuss techniques, and to analyze ways to improve patient outcomes.

**SRS – Scoliosis Research Society**
http://www.srs.org
The SRS society was founded in 1966 with a total of 35 members. Since then, it has since grown to represent over 1,100 spine surgeons in more than 41 countries. In addition to spine surgeons, there are also dedicated researchers, physician’s assistants, orthotists and other members of the society. The organization’s mission is to foster the optimal care of all patients with spinal deformities. The SRS has maintained a commitment to research and education in the field of spinal deformities and has been very successful establishing an outcome study through the society as well as numerous publications.
INTRODUCTION

The goal of Maintenance of Certification is to foster excellence in patient care. Through its MOC program, the Board supports its Diplomates in lifelong learning and self-assessment. MOC provides assurance to patients and their families, payors and funding agencies, and the general public that ABNS Diplomates maintain and continually improve their knowledge and practice of neurosurgery. The MOC program is designed to allow Diplomates to meet ABNS and American Board of Medical Specialties (ABMS) requirements as they maintain pace with changes in the specialty. It also provides an avenue for compliance with evolving state and hospital requirements that include either participation in an MOC program or periodic re-examination and re-certification. The American Board of Medical Specialties on March 16, 2009 approved universal standards for MOC that applies to its member boards. The program reflects the realities of current neurosurgical practice. Emphasis is on core knowledge and practice common to all neurosurgeons. The ABNS Directors realize that neurosurgeons often concentrate their practices in various subspecialty areas. Consequently, the MOC process permits Diplomates to emphasize areas of their expertise as they participate in MOC.

MOC PROGRAM

The MOC program has four basic components:

1. Evidence of Professional Standing
2. Evidence of Lifelong Learning and Self-assessment
3. Evidence of Cognitive Knowledge
4. Evidence of Performance in Practice

Professionalism

Currently, to satisfy this component, Diplomates are required to hold an unrestricted license to practice medicine and surgery in their jurisdiction. It also includes “The Chief of Staff Questionnaire.”

Two other planned requirements of this component of MOC are the Consumer Assessment of Health Providers and Systems (CAHPS) Survey and the Peer Communication Survey - both measure and report on the key Competency of Communication and Interpersonal Skills. The CAHPS tool measures patient perception of physician performance in communication and interpersonal skills. The Peer Survey performs the same function for healthcare providers. Both will soon be required and are also a feature of Performance in Practice (Part 4 MOC). They are also considered developmental standards at this time, that is member boards are allowed time and flexibility to determine what instrument and yardstick is most appropriate for their Diplomates. Most surgical boards, being similar in character, have combined to produce a Surgical CAHPS and possibly a Peer Communication Survey that will best serve the needs of surgical specialists.
Evidence of Lifelong Learning and Self-assessment

This component requires the accumulation of continuing medical credits (CME) for a total of 150 CME Hours, both Category 1 and other, consisting of 60 credits Category 1 (all Neurosurgery) and 90 credits of other. These CME credits are accrued and tracked on a three-year cycle.

A second aspect of this component of MOC is the Self-Assessment in Neurological Surgery (SANS) tool which is available in 3 modules – Spine, Pediatrics and the General Examination. This recognizes the fact that Diplomates engage in subspecialty practice and tailors the self-assessment requirement of Part 2 MOC to the reality of practice. The SANS: Spine module offers nearly 70 questions focused on spinal disorders and treatments. The remaining 170-plus questions cover all areas of neurosurgical practice. SANS: Pediatrics places additional emphasis on the pediatric component with over 80 of the 250 questions focusing on pediatrics. The remainder of the examination includes material covering all areas of neurosurgical practice. SANS General has approximately 250 questions covering a broad range of neurosurgical topics. Each question is accompanied by a peer-reviewed expert critique and hyperlinks to peer-reviewed literature.

The third aspect of this component of MOC is the Patient Safety self-assessment program which is currently a developmental standard but will soon be mandatory. “Patient safety” is now a key aspect of healthcare delivery and the purpose of all the attention is to prevent medical errors that could lead to adverse events. ABMS Boards have made patient safety a key feature of MOC programs and have formally enshrined its place in the ABMS MOC guidelines of March 2009. Patient safety will be required as Part 2 and 4 of MOC. The ABMS guidelines require that “Member Boards ensure that every Diplomate enrolled in MOC complete a patient safety self-assessment program (the ABMS Patient Safety Foundations or other equivalent program approved by COMMOC) by 2012 and then a minimum of once per MOC cycle. Member Boards will also ensure that Diplomates who register into MOC after 2010 complete a patient safety module in the first two years of the MOC cycle”. Presently, there is an ABMS Patient Safety Improvement Program but member boards may develop their specialty-specific module.

Evidence of Cognitive Knowledge

The MOC Cognitive Exam is administered annually in March on the same day as the Primary Examination. The MOC Cognitive exam is well tolerated and easy to administer. There are no plans for major changes in the near-term. The pass rates are very high.

Performance in Practice

The key tool in Part 4 MOC is the Key Case report. The ABNS has provided sixteen Key Cases that represent common diagnoses seen and procedures performed by neurosurgeons. Reporting modules have been developed for each one. The cases and outcomes are self-reported (unaudited) on standardized questionnaires. These modules can be accessed from “MyMOC” on the ABNS website, www.abns.org and the questionnaires are completed online. As participants log their data, references to relevant literature pop up, providing a significant educational aspect. Once completed, Key Case participation is validated and feedback given. The Diplomate is able to compare his or her outcomes to other Diplomates who selected the same Key Case. The list of Key Cases, which covers the major areas of practice, currently consists of:

1. Anterior Cervical Discectomy and Fusion
2. Chiari Decompression
3. Clipping of Supratentorial Aneurysm
4. Craniotomy for Newly Diagnosed Glioma
5. Craniotomy for Temporal Lobectomy for Mesial Temporal Sclerosis
6. Endovascular Embolization of Anterior Circulation Aneurysm
7. Lumbar Discectomy
8. Management of Head Trauma
9. Management of Low Back Pain
10. Radiosurgery for Brain Metastasis
11. Release of Tethered Spinal Cord
12. Removal of Cerebral Hematoma
13. Surgery for Pituitary Tumor
14. Surgical Treatment of Trigeminal Neuralgia
15. Ulnar Nerve Decompression
16. Ventriculo-Peritoneal Shunt

MOC PROVIDES ASSURANCE TO PATIENTS AND THEIR FAMILIES, PAYORS AND FUNDING AGENCIES, AND THE GENERAL PUBLIC THAT ABNS DIPLOMATES MAINTAIN AND CONTINUALLY IMPROVE THEIR KNOWLEDGE AND PRACTICE OF NEUROSURGERY.
For each Key Case, the data collected is tailored for relevancy, but the concept is the same. The information is standardized into three areas: history, treatment and outcome. Great care is taken to protect the anonymity of patients. Diplomates select a Key Case from the list and submit the details from ten recent, consecutive cases of that type. Diplomates receive feedback on their own cases, as well as anonymously compare that to the collective results reported by other Diplomates who selected the same Key Case. Thus, they can track their outcomes and compare them to others or the extant literature. In addition, they can monitor their own progress over mini-cycles.

In response to the requests of our Diplomates the ABNS Directors and the MOC Committee are developing additional Key Cases in addition to the existing 16. Coming soon are the Lumbar Stenosis and Cervical Spine Trauma Key Case modules. The MOC committee also provides review of ad hoc Key Cases for Diplomates with unique or special practices not suited to the current Key Case sample. For example, requests have been granted and completed for ~ Surgery for Intramedullary Tumor; Lumbar Laminectomy and Fusion, Surgery for Spine Tumor, Piriformis Syndrome, Surgery for Acoustic Neuroma and Deep Brain Stimulation.

**MOC Compliance**

Diplomates participating in MOC are advised to track their progress closely at MyMOC and adhere to all deadlines for completion of requirements. This is particularly so as MOC is still being modified and refined. Although they may petition the Board for exemptions from particular requirements or extensions of time, such exceptions and extensions are granted only in rare cases. Only under compelling circumstances will they be considered, not in the normal course of events in which an individual simply missed a deadline or is “unable” to complete requirements within the mandated time frame.

**Recent Developments**

**PQRS/MOC PROGRAM INCENTIVE**

CMS has offered a new MOC Incentive. Beginning in January 2011, physicians who are eligible for the Physician Quality Reporting System, or “Physician Quality Reporting”, (formerly known as the Physician Quality Reporting Initiative, or PQRI) can receive an additional 0.5% incentive payment when MOC Program Incentive requirements have also been met.

In order to qualify for the additional 0.5% incentive payment, the Diplomate will need to complete the following:

- Satisfactorily submit data, without regard to method, on quality measures under Physician Quality Reporting, for a 12-month reporting period as an individual physician or as a member of a group practice.

  and

- More frequently than is required to qualify for or maintain board certification:
  - Participate in a MOC Program and
  - Successfully complete a qualified MOC Program practice assessment.

As defined in section 1848(m)(7) of the Act, a “Maintenance of Certification Program” is a continuous assessment program that advances quality and lifelong learning and self-assessment of board certified specialty physicians by focusing on the competencies of patient care, medical knowledge, practice-based learning, interpersonal and communication skills and professionalism. Such a program shall require a physician to do the following:

- Maintain a valid, unrestricted medical license in the United States
- Participate in educational and self-assessment programs that require an assessment of what was learned
- Demonstrate through a formalized, secure examination, that the physician has the fundamental diagnostic skills, medical knowledge and clinical judgment to provide quality care in their respective specialty
- Successfully complete a qualified MOC program practice assessment.

A “qualified Maintenance of Certification program practice assessment,” as defined in section 1848(m)(7) of the Act is one that includes an initial assessment that demonstrates the physician’s use of evidence-based medicine; a survey of patient experience with care; and implementation of a quality improvement intervention to address a practice weakness identified in the initial assessment. The practice assessment must also require the Diplomate to reassess performance improvement after the intervention. The ABNS MOC Program utilizes the Key Case report as the main practice assessment tool for its Diplomates. There are 16 Key Cases that represent common diagnoses and procedures performed by neurosurgeons. Reporting modules are web-based. The cases and outcomes are self-reported on standardized questionnaires. The ABNS reserves the right to audit if required. The modules can be accessed from “MyMOC” on the ABNS web site, www.abns.org.
The phrase “more frequently” may be interpreted differently by different MOC Programs. CMS requires an attestation from the ABNS MOC Program that both the MOC Program and the practice assessment are completed more frequently by a Diplomate than is required by the usual MOC Program. Typically, the ABNS MOC process consists of three successive three-year mini-cycles and a final 10th year. The requirements of each mini-cycle are fulfilled independently.

To satisfy CMS requirements for the purpose of the PQRS/MOC Program Incentive, the ABNS has defined “more frequently” as five successive two-year mini-cycles for the MOC Program. ABNS member boards who wish to enable their Diplomates to be eligible for the additional incentive completed the self-nomination process by the January 31, 2011 deadline.

The ABNS functioning in the interest of its Diplomates successfully completed the self-nomination application and has been “conditionally qualified” by CMS for participation in the PQRS/MOC program based on:

• Letter of self-nomination
• Conference call interview

Definition of “more frequently”

• Part II – CME – 2-year cycle
• Part III – examination in 8th or 9th year
• Part IV – Key Cases every 2-year cycle
• ABNS Diplomates must have a patient experience of care survey (CAHPS or Press-Ganey) and ABNS will report whether or not the survey occurred.

The ABNS MOC Program will submit to CMS in a secure format by March 31, 2012 the information on its Diplomates who wish to participate.

ABNS has demonstrated satisfactory transmission of data in CMS required format and ABNS has been granted “full qualification”.

Further information is available on the Physician Quality Reporting System section of the CMS website (www.cms.gov).

**Patient Care Survey**

According to ABMS guidelines “By 2010, each Member Board will assess Diplomate’s communication skills with patients using at least a “Communication Core” physician CAHPS patient survey (or other equivalent survey that addresses communications as determined by COMMOC) at least every 5 years - Boards may choose to offer this survey as a Part 4 component and this will satisfy Part 1 requirement”.

These mandates prompted all member boards to explore methods for compliance. In early 2010, the CAHPS Consortium voted to adopt the Surgical Care Survey as an official CAHPS survey. This survey was sponsored by the American College of Surgeons (ACS) and the Surgical Quality Alliance (SQA), which was created by the ACS in 2005 to coordinate and unify over twenty surgical and anesthesia specialty societies. The Surgical Care Survey is precisely designed to cater to surgeons and surgical patients and has been adopted by the ABNS as a potential solution since it has already been vetted and approved by COMMOC. Despite the ubiquity of other tools such as the Press-Ganey Patient Experience of Care Surveys, currently, no version of Press-Ganey has been approved by COMMOC as equivalent to CAHPS for the Patient Experience of Care component and none of the ABMS Member Boards have requested COMMOC to review a version of the Press-Ganey surveys. Therefore, earlier this year ABNS Directors directly petitioned COMMOC for consideration of Press-Ganey as an approved tool to fulfill this requirement to ease the burden on ABNS Diplomates. The matter remains under consideration by COMMOC. More importantly however, Press-Ganey surveys are acceptable to CMS for fulfilling PQRS/MOC incentive payment requirements. As advised by the ABMS, the ABNS intends to “exercise caution in reporting the survey results”. The ABNS will limit its initial reporting to “participating” or “not participating” as currently prescribed by the ABMS.

**Patient Safety Module**

To comply with the directives of the ABMS guidelines the ABNS MOC Committee in collaboration with the AANS has developed a Patient Safety Module for its Diplomates patterned after the ABMS product but stylized to neurosurgical practice. The ABNS provided directives and parameters for the tool but the heavy lifting and the lion’s share of the credit belongs to Dr. Larry Chin and his team who translated the concept into reality. The module consists of PowerPoint and multimedia files to teach and assess the key concepts of patient safety. When a module is completed, Diplomates will be directed to a brief quiz, an evaluation and a form to claim CME credit. AANS will record CME credit.

The modules include:

1. Systems Approach to Patient Safety
2. Infections and Hand Hygiene
3. Medication Safety (Preoperative Meds– Screening, Interactions and High Alert)
4. Surgical Errors (e.g. Wrong Site, Wrong Level Surgery)
5. Physician-Patient Communication (Communication of Critical Results – Labs, Imaging, Surgical Findings; Discharge Communication)
6. Communication Between Team Members

All that remains for implementation is approval by COMMOC. The ABNS has submitted the tool for COMMOC review at its upcoming December meeting. Once approved, it will be piloted to a small subset of Diplomates to work out any final kinks and later deployed to the MOC cohort.

**SUMMARY**

Clearly from all the aforementioned, the process of MOC is undergoing intense flux and evolution. The phenotype will change and the species will alter with each new mandate (funded or not), initiative and directive. The causative agents are multifactorial – public, payors, patients, government, peers – they are emboldened and empowered and we will have to adapt. In the end, the good news is that it is all for the betterment of our patients, our specialty and the common good.

Videbimus, as the Romans say.
The American Board of Neurological Surgery (ABNS) includes:

A. Review the credentials and practice experience of, and conduct examinations of, eligible candidates who seek certification by the Board.

B. Issue Certificates to those individuals who meet the Board’s eligibility and other requirements and satisfactorily complete its examinations, thereby conferring Diplomate status.

C. Implement and administer a program for Maintenance of Certification (MOC).

D. Issue new time-limited certificates to Diplomates who successfully complete the Board’s MOC program, upon expiration of time-limited certificates.

E. Active involvement in overseeing resident training and educational requirements which includes participation with the ACGME Neurosurgery Residency Review Committee (RRC) and the Society of Neurological Surgeons (SNS).

F. Develop and administer the primary written examination for residents-in-training as a component of eligibility for Board certification.

G. Oversight of neurosurgery clinical practice and, when required, determining disciplinary actions.

The 14 Directors are selected from nominations submitted by the:

- American Academy of Neurological Surgeons (1)
- Neurosurgical Society of America (1)
- American Association of Neurological Surgeons (4)
- Congress of Neurological Surgeons (4)
- Society of Neurological Surgeons (4)

Each Director serves a six-year term, then moves as a former Director to the Advisory Council for another six years. Among many responsibilities, the Directors’ primary tasks include review of candidate practice data, review of applications for initial certification, development of questions for the primary and MOC cognitive examinations, administration of oral examinations, and development and administration of the various components of MOC.

The role and importance of board certification has gradually changed over the 71 years since the ABNS was established. Board certification has always been a “stamp of approval” that asserts Diplomates have met a set of expectations in training, professionalism, medical knowledge and clinical decision-making. Formerly a rite of passage; since the introduction of managed care in the 1980s, board certification has become a necessity for certain insurance plans and staff privileges at many hospitals. Initially a singular event that provided certification for the career of the surgeon, since 1999, board certification is now a time-limited process that requires MOC.

In the future we can anticipate additional changes in the role of certification and its maintenance. Negotiations are under way between the American Board of Medical Specialties (ABMS) and the Federation of State Medical Boards (FSMB) to utilize MOC programs as a mechanism for acquiring maintenance of medical licensure. The Affordable Healthcare Act of 2010 included language negotiated by the ABMS to allow MOC to augment Physician Quality Reporting System (PQRS) reporting. Under the leadership of Dr. Nelson Oyesiku, Chair of the ABNS MOC Committee, the ABNS has submitted a self-nomination to the Center for Medicare Service (CMS) to allow neurosurgeons to comply with PQRS requirements by participating in MOC. The ABNS is “conditionally qualified” as one of seven such ABMS boards for the CMS PQRS/MOC incentive. This will initially provide incentive pay and later avoid penalties.

Although board certification remains an important milestone in one’s professional career, it now has even greater significance and even financial impact. What are the next changes in the board certification process?

Many believe the next change depends upon the response of ABMS member boards to a transformation occurring in US medicine. That transformation is due to the fact that US healthcare is too expensive and its quality too inconsistent. As a result we have entered an era of demand for physician assessment and performance measurement. That is a change and we must find a way to meet that demand or someone else will... and is.

On October 27, 2011, my 82-year-old father retired from the practice of medicine, 50 years to the day he started that practice. Throughout his 50-year career his patients trusted him and rarely questioned his judgment or his motives. They had no reason to. My father’s generation was one among generations of physicians whose competence and judgment were assumed and not questioned. From the genesis of modern medicine in the early 20th century a nearly mythic image of the medical profession emerged; an image of an altruistic enterprise, committed by moral purpose and technical competence to patient welfare. The era of “trust us” is over. The profession of medicine must deal with this reality and develop reliable methods to inform the public of the quality of their physicians and of their medical care.

Over the past year the ABMS has been working with the Center For Applied Research (CFAR), an outside consultant, to evaluate the future of the board enterprise; that is, the ABMS and its 24 member boards including the ABNS. CFAR believes this era of demand for physician
assessments and performance is occurring in parallel with three important trends: 1) increasing regulation (primarily from government and quality organizations); 2) the proliferation of market solutions; and 3) disenchantment with the profession of medicine. The ABNS is unlikely to have any significant effect on regulation but all in the profession of medicine can alter the disenchantment with our profession and the proliferation of market solutions.

Studies have demonstrated that the publicly available data on physicians—the medical school they attended, their malpractice lawsuit history, and specialty board certification—are poor predictors of their adherence to accepted standards of medical care. The market solutions to this demand for more relevant criteria by which to evaluate physicians include 1) health systems, which are developing the means to assess quality and cost of care; 2) insurance companies, many of which are “tiering” physicians on the basis of the quality of their care; and 3) new companies outside the health care delivery system. CFAR has pointed out that there is good reason to believe more profound change will come from sectors outside those that provide healthcare. Currently, there are over 200 health-oriented web portals with health-related web traffic increasing at a staggering rate. Thirty-two million Americans use these sites daily and 71 million use the internet for prescriptions. Many of these health-oriented web sites are extremely well-funded. But is the information they provide to patients looking for health-oriented web traffic increasing at a staggering rate. Thirty-two million Americans use these sites daily and 71 million use the internet for prescriptions. Many of these health-oriented web sites are extremely well-funded. But is the information they provide to patients looking for the right doctor accurate and useful to guide these patients? I recently looked myself up on healthgrades.com, one of these well-funded sites. I was delighted to see that I was given 4½ stars out of a possible five from patients reporting on various categories of my practice. I was curious, however, to learn that one of my current residents, not yet in practice, had been given five stars. I was shocked to see the web site report the three most common operations I do as: 1) spinal fusion; 2) bone protein insertion; and 3) bone removal for graft, as these are cases that I have rarely or never performed.

I believe the profession of medicine in general, and the specialty of neurosurgery, in particular, should create the solutions to this demand by the public for assessment and performance management. Currently, the Society of Neurological Surgeons (SNS), is working with the ABNS, ACGME (and the neurosurgical RRC), and the AANS/CNS Sections to develop a Matrix Curriculum for training in our specialty. This Matrix Curriculum is being designed to align the educational goals of the SNS, the format of the ACGME competencies, and the medical knowledge and technical skill components required by the ABNS and RRC for successful completion of residency and board certification in neurosurgery. The Matrix defines, by ACGME competency category, the objectives of training, teaching methods, assessment tools and educational goals at each training level. The underlying motivation for the Matrix project is to align the education of residents in neurological surgery with the expectations for successful attainment of the ABNS primary examination, residency training in an ACGME accredited program and the ABNS oral examination. This curriculum will define, for the first time, a roadmap for residency training in neurological surgery. It has the further advantages that it adheres to the ACGME format, uses established goals of the ABNS and RRC, and acknowledges levels of educational goals in each training level, including the completion of training at the end of the chief resident year.

A logical extension of this project would be the development of objective criteria for defining competence, proficiency and expertise in the various neurosurgical subspecialties (pediatrics, functional and stereotactic, skull base, neuro-oncology, cerebrovascular, endovascular, neurocritical care, spinal neurosurgery) to inform the public of individuals possessing the appropriate skills and experience necessary for proficiency. Because of the depth and breadth of subspecialty practice, not all neurosurgeons are expected to be, nor can be, proficient in all areas. Recognition of subspecialized focus through the MOC process may be a logical and useful mechanism for individual neurosurgeons to document their unique proficiencies and inform the public.

Currently the ABMS has three focused practice innovation pilot projects. These Recognition of Focused Practice (RFP) pilots are organized by the American Board of Internal Medicine for hospital medicine and the American Board of Radiology for brachytherapy and for cardiac CT. Diplomates in these programs participate in a unique MOC program designed to demonstrate that their practice is focused in that subspecialty. The ABNS is closely following these pilot projects as a potential model for addressing subspecialty recognition for our Diplomates and as a potential solution to the public demand for information on physician assessment and performance.

Potentially, after achieving Board certification, a neurosurgeon could choose an MOC pathway that demonstrated his or her focused practice in a subspecialty such as spinal neurosurgery or endovascular neurosurgery. Just as the Matrix curriculum will define a roadmap for residency training in neurosurgery, the unique MOC program could define a roadmap for achieving proficiency in subspecialties. Like the Matrix curriculum, RFP would require the efforts of the AANS/CNS Sections to assist in developing criteria for demonstration of proficiency, including training, case volume, continuing education and outcomes. The latter will almost certainly require a change in Part IV of MOC from the current submission of ten Key Cases each three-year mini-cycle to a national databank similar to that created by the thoracic surgeons many years ago. Through the pioneering efforts of Robert Harbaugh, the AANS and ABNS formed NeuroPoint Alliance (NPA) to achieve the advantages of a single, consistent data entry system to collect patient care information. This will serve as a platform for neurosurgical data collection for a variety of purposes, including a national databank.

The certification process and its maintenance will continue to change as our profession and its relationship to the public changes. As Abraham Lincoln said, “The best thing about the future is that it comes one day at a time”.  ■
The American Association of Neurological Surgeons (AANS) and the Congress of Neurosurgeons (CNS) Joint Guidelines Committee (JGC) was created in 2006 and tasked with developing an agenda for developing multidisciplinary evidence-based medicine (EBM) clinical practice parameter guidelines for those areas of neurosurgical practice most likely to be targeted by “Pay for Performance” initiatives (P4P).

“Pay-for-performance” is an initiative to improve quality in health care often referred to as QI (quality improvement). Strategic planning initiative of the Institute of Medicine (IOM) and the Center for Medicare and Medicaid Services (CMS) included P4P as one strategy to improve the quality of healthcare delivery. The IOM is a division of the National Academy of Science (NAS) and CMS was formerly known as Health Care Finance Administration (HCFA).

The JGC is in a position to assist organized neurosurgery in meeting the challenges posed by the Agency for Healthcare Research and Quality (AHRQ), which is a part of the United States Department of Health and Human Services (DHSS). The stated goals of the AHQR are to improve the quality and outcomes of healthcare through research and education. The Effective Health Care (EHC) Program was created in 2003 with the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) and sponsors evidence-based research, systematic reviews and the dissemination of research findings.

The development of the Evidence-based Practice Center Program is a cornerstone of the AHQR-sponsored EHC Program. A number of Evidence-based Practice Centers (EPCs) have been created to support evidence-based medicine, quality improvement and in some cases technology assessment. An additional task of the AHQR is the production of the annual National Healthcare Quality Report (NHQR).

Comparative effectiveness research (CER) is a stated tool of the AHQR and specifically focuses on improving resource utilization while maintaining quality.

Guidelines and clinical practice parameters when developed may be posted at the National Guidelines Clearinghouse (NGC), although there is no uniformity or review prior to posting which can limit the overall quality of the postings.

The enactment of the 2010 Patient Protection and Affordable Care Act (ACA) is likely to further increase the interaction of the JGC with various government entities. The Patient-Centered Outcomes Research Institute (PCORI) was created to support the application of EBM. Although created by Congress, the PCORI is by law an independent, non-profit organization. Episode-based payment (EBP) is a proposed payment reform process in which reimbursement is linked to episodes of medical care rather than individual services. The current diagnosis-related group (DRG) used by Medicare is one form of EBP. The goal is to create incentives for improving the efficiency of healthcare, similar to those in comparative effectiveness research. Providers are referred to as Medicare Administrative Contractors (MACs) and concern exists on the ability of providers to administer and meet the goals of broad evidence-based programs. The creation of the Center for Medicare and Medicaid Innovation (CMMI) is charged with providing the technical support to assist in the dissemination and implementation of “best practice” healthcare. Based on the amount of interest and stated need for overhaul of health care finances and resource allocation, these abbreviations will likely achieve center-stage in the years ahead, with new ones appearing with dizzying frequency.

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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACA</td>
<td>Patient Protection and Affordable Care Act</td>
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<tr>
<td>AHRQ</td>
<td>Agency for Healthcare Research and Quality (formerly AHCRP Agency for Health Care Policy and Research)</td>
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<tr>
<td>CMMI</td>
<td>Center for Medicare and Medicaid Innovation</td>
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<tr>
<td>CMS</td>
<td>Center for Medicare and Medicaid Services (formerly HCFA—Health Care Finance Administration)</td>
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<tr>
<td>DHHS</td>
<td>Department of Health and Human Services</td>
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<tr>
<td>DRG</td>
<td>Diagnosis-related group</td>
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<td>EBM</td>
<td>Evidence-based medicine</td>
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<td>EBP</td>
<td>Episode-based payment</td>
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<td>EPC</td>
<td>Evidence Practice Center</td>
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<td>IOM</td>
<td>Institute of Medicine</td>
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<td>MACS</td>
<td>Medicare Administrative Contractors</td>
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<td>MMA</td>
<td>Medicare Prescription Drug Improvement and Modernization Act</td>
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<td>NAS</td>
<td>National Academy of Science</td>
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<td>NGC</td>
<td>National Guidelines Clearinghouse</td>
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<td>NHQR</td>
<td>National Healthcare Quality Report</td>
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<tr>
<td>P4P</td>
<td>Pay-for-performance</td>
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<tr>
<td>PCORI</td>
<td>Patient-Centered Outcomes Research Institute</td>
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<td>QI</td>
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NATIONAL QUALITY FORUM (NQF)

The National Quality Forum (NQF) is a voluntary standards-setting organization that endorses, implements and promotes national standards for health care quality measurement and reporting, including performance measures, quality indicators, preferred practices and public reporting guidelines. The NQF does not develop quality measures; rather it is a neutral body that endorses measures developed by other groups, such as the Centers for Medicare and Medicaid Services (CMS), the Agency for Healthcare Research and Quality (AHRQ), and the American Medical Association’s Physician Consortium for Performance Improvement (PCPI). The main objective of the NQF is to promote a universally accepted set of measures that are scientifically sound, meaningful, and feasible in everyday practice.

Voluntary consensus standards developed by the NQF have special legal status under federal law, and federal agencies are obligated to adopt NQF standards in the absence of “government-unique standards.” As such, NQF standards must be developed through a consensus-based process that includes transparency, due process, and an appeals process, and relies heavily on the input of a variety of stakeholders, including physicians, hospitals, allied health professionals, public and private payers, purchasers/employers, consumer groups, and healthcare research entities. NQF endorsement has become the “gold standard” for health care performance measures, which positions the NQF as a prime leader in health system reform efforts. Recent expansion into the assessment of measures of value, efficiency and cost of care further expands the potential reach of the NQF.

The NQF receives funding from both public and private sources, including grants from foundations, corporations and the federal government, which has contracted to provide the NQF with $10 million a year through 2012. Thirty-four percent of the organization’s total funding comes directly from membership dues. Because membership in the NQF requires a substantial financial outlay, only about 10 percent of NQF members are professional societies representing medical and surgical specialists.

The Congress of Neurological Surgeons (CNS) and the American Association of Neurological Surgeons (AANS) are active members of the NQF. John Kusske, the Health Policy Liaison to the AANS/CNS Washington Committee, and Jack Knightly, the chair of the AANS/CNS Quality Improvement Workgroup (QIW), serve as organized neurosurgery’s official representatives to the NQF.

The AANS and the CNS continue to work to ensure representation of neurosurgical experts on NQF projects that have potential impact on neurosurgical practice. The NQF’s Episode-Based Resource Use Project, for example, recently developed a white paper on methodological issues that will be used to evaluate measures of resource use. John Ratliff, vice-chair of the AANS/CNS QIW, has been appointed to this project and will help to review two measures, developed earlier by the American Board of Medical Specialties with input from the AANS/CNS Section on Disorders of the Spine and Peripheral Nerve’s Joe Alexander.

John Ratliff also serves on the National Priorities Partnership’s (NPP) Overuse Committee, which has identified inappropriate spine care as one of its areas of focus. The NPP is a coalition of 28 key healthcare stakeholders, including the NQF, the AMA’s PCPI, the AFL-CIO, Consumers Union, and the Centers for Disease Control (CDC), which has set out to focus on six cross-cutting priorities for transforming US healthcare, including overuse.

Patricia Raksin, a member of the AANS/CNS Neurotrauma and Critical Care Section and JGC, recently completed work on the NQF’s Hospital Imaging Efficiency Steering Committee. Dr. Raksin applied her knowledge of the clinical literature to review measures related to the appropriateness of imaging for traumatic brain injuries and headaches.

John Kusske also was recently appointed to serve on the NQF’s Regionalized Emergency Care Project Steering Committee. This project will explore approaches for systematically regionalizing emergency care services and will seek to identify a set of performance standards for measuring and reporting the quality of emergency services at the national, state, and regional levels.

To date, the NQF has endorsed over 500 consensus standards, which can be viewed online at: http://www.qualityforum.org/Measures_List.aspx. The NQF recently converted 113 of its measures from a paper-based format to an electronic “eMeasure” format, which should ensure that performance measure data are consistently defined, implemented and usable in the context of electronic health records (EHRs).
Coding Acronyms: HCPCS and Neurosurgery

Current Procedural Terminology (CPT) coding is all about acronyms, as would be expected from a system that in essence, is meant to simplify the reporting of procedures and services performed by physicians. In addition to the five-digit CPT code identifiers, there are also descriptors based on acronyms used in conjunction with the codes to report the procedure. For example, when we perform a L5-S1 lumbar discectomy, we would want to choose the CPT code to describe the procedure:

63030  Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc, including open and endoscopically-assisted approaches; 1 interspace, lumbar

But 63030 is a unilateral code, and if we perform this bilaterally, we would have to add a modifier to indicate this as:

50  Bilateral procedure

But if we only performed a decompression unilaterally, how do we tell which side we did? If a revision discectomy is billed for in the future, how does a payor audit and see if we decompressed the ipsilateral or contralateral side based on the coding? Well this is where a Healthcare Common Procedure Coding System (HCPCS) Level II code would be used of either:

LT  Left side (used to identify procedures performed on the left side of the body)

RT  Right side (used to identify procedures performed on the right side of the body)

What is a HCPCS Level II? It is a set of alpha-numeric codes to describe products, supplies, and services not included in the CPT codes. In the United States, there are over 5 billion payment claims submitted each year, and standardized coding systems are essential for orderly processing, as most are done electronically. HCPCS is one of the standard code sets used, and adopted by many private payors in addition to its use by public payors such as Centers for Medicare and Medicaid Services (CMS).

The HCPCS system is divided into two principal subsystems, referred to as level I (CPT) and level II (HCPCS/National) codes. Level I of the HCPCS is the CPT numeric coding system, which is maintained by the American Medical Association (AMA) and in which our AANS and CNS CPT advisors play a role in updating and maintaining. These codes are used primarily to identify medical services and procedures furnished by physicians to bill public or private health insurance programs. However, CPT codes alone do not include the codes needed to separately report medical items or services that are regularly billed by suppliers other than physicians.

Level II of the HCPCS is primarily used to identify products, supplies and services not included in the CPT codes, such as bills by non-physicians including ambulance services and durable medical equipment (DME). These Level II codes are also known as the alpha-numeric codes because they consist of an acronym of the code represented by a single alphabetical letter followed by 4 numeric digits. Modifiers have also been developed with Level II codes, as there are times in which additional information is needed regarding the HCPCS code. These are also based on acronyms, such as differentiating right (RT) and left (LT), or with state of equipment dispensed such when a patient receives a DME such as a walker which was used (UE) versus new (NU).

Prior to December 31, 2003, there were also Level III HCPCS codes which were developed by Medicaid State agencies, Medicare contractors and private insurers referred to as "local codes". These local codes were established to identify a service performed in that region for which there was no level I or level II code, and to avoid the use of a “miscellaneous or not otherwise classified code”. With the elimination of the HCPCS Level III codes, AMA created the CPT Category III codes to fill in this void and codify new emerging technologies and to track their usage in the medical community rather than use the unlisted procedure code, which does not permit data collection to substantiate widespread usage of the specific procedure or service. These Category III codes are commonly known as “T-codes”, as they are identified by an alpha-numeric code which includes the acronym letter T for tracking code.

As you can see, acronyms abound in the area of coding and reimbursement. I believe that it is important for all neurosurgeons to understand their meaning and proper use by your individual payors to ensure appropriate reimbursement.
As in other specialties, preceding generations of neurosurgeons, especially our preceding generation or two, experienced growing inclinations for subspecialization in neurosurgical practice and scholarship. This trend posed a dilemma for the leadership of our relatively small specialty with a desire to maintain its science and practice under one umbrella so as to discourage fragmentation, while still supporting and encouraging subspecialization for the benefits of patients and practitioners alike. In this climate, neurosurgery’s leadership explored alternatives for oversight and promotion of subspecialty education and fellowships.

It became apparent that for neurosurgery, unlike some other specialties, accreditation of fellowships through the Accreditation Council for Graduate Medical Education (ACGME) was not desirable or likely possible and that a framework should be developed to accomplish this end within our own organizations. Also, there was a clear message from neurosurgery’s “grass roots” that subspecialization and fellowships should not lead to subspecialty certification by our Board. “Accreditation (of fellowship programs) without certification” (of subspecialty neurosurgeons) was the mantra.

These considerations led to a joint directive from the American Board of Neurological Surgery (ABNS), the Residency Review Committee for Neurological Surgery (RRC), and the leadership of the AANS and the CNS for development of educational requirements, including institutional, faculty, case material and a specified curriculum for each subspecialty fellowship. CAST accreditation of a neurosurgical department’s fellowship(s) may be achieved through voluntary application with online submission of programmatic data to the CAST Secretary. This data is then assigned for preliminary review by at least two subspecialty experts from its Fellowship Review Committee (FRC). Based on their review, critiques of the specific fellowship are forwarded to CAST for a decision regarding accreditation. A decision for accreditation of the fellowship is determined by a vote of CAST; duration of accreditation is commensurate with the ACGME accreditation of the sponsoring neurosurgical residency. Feedback from CAST and subspecialty reviewers relative to any perceived deficiencies and opportunities for improvement of the fellowship is provided to the Fellowship Director in the course of this process. CAST policies specify that only fellowships within or under the auspices of ACGME or FRCS (Canada) accredited neurosurgical residencies are eligible for CAST accreditation.

Current CAST policies specify that only fellowships within or under the auspices of ACGME or FRCS (Canada) accredited neurosurgical residencies are eligible for CAST accreditation.

Information regarding CAST background, policies, accreditation requirements and educational requirements for the various subspecialty fellowships, as well as application procedures for fellowship accreditation, can be found on the SNS web site http://www.societyns.org. As identified thereon, there are currently SNS/CAST accredited fellowships in:

- Neurosurgical Critical Care
- Cerebrovascular Neurosurgery
- Endovascular Neurosurgery
- Neurosurgery of the Spine
- Neurosurgical Oncology
- Pediatric Neurosurgery
- Peripheral Nerve Neurosurgery
- Stereotactic and Functional Neurosurgery

Current CAST members include: Volker Sonntag, Chair; Steven Giannotta, Secretary/Treasurer; Robert Rosenwasser, Dennis Spencer, Frederick Boop, Charles Branch and Antonio Chiocca. As already stated above, CAST is greatly aided in its activities and appreciative of the contributions of the ad hoc subspecialty reviewers who provide insightful critiques of the fellowship application and their recommendations back to CAST. Additionally, CAST requests ongoing input from the Joint Sections and their CAST liaisons relative to updating subspecialty educational (fellowship training) requirements and curricula. Comments or questions regarding CAST can be directed to its Secretary, Dr. Steven Giannotta at 323-226-7421 (giannott@usc.edu).
Since the Libby Zion case in 1984 the medical profession and the public have been preoccupied with the subject of residents’ work hours. Once unthinkable, a new era in postgraduate medical education began in July 2003 with implementation of the 80 hour work week.

There is evidence that sleep-deprived residents are more prone to errors and accidents. But reduced work hours of residents have not been demonstrated to have a positive effect on quality and safety. The inevitable contradiction behind lowering duty hours is that there is little science behind it to justify or criticize it. One explanation is that errors occur when systems designed to enhance patient safety fail, and fatigue among residents does not have an overriding impact. Another explanation is that reduced work hours leads to an increase in the number of handoffs and this outweighs the potential benefits of reducing residents’ fatigue.

In 2008, a committee of the Institute of Medicine (IOM) proposed further reductions to duty hour limits. The IOM recommendations were generated by a committee that included no active surgeon, one program director and only two active clinicians. The IOM committee listened to 15 minutes of presentation by two surgical specialties including neurosurgery. By contrast, the ACGME response to the IOM report was created by a task force that included 16 members made up of 13 program directors, 3 active surgeons, 15 active clinicians and one public representative. Dr. Ralph Dacey was one of the members of that task force that considered extensive testimony from dozens of experts and stakeholders, in an effort to address patient safety as opposed to focusing solely on sleep and residency duty hours.
In September of last year Occupational Safety and Health Administration (OSHA) was petitioned to intervene and place federal restrictions on resident duty hours. The petition was from, among others, the Service Employee International Union (SEIU). From the original congressional request for the IOM study, this issue has been fostered by the SEIU. When the ACGME showed some spine and didn’t cave in, they simply changed tactics. This is about power and an opportunity to organize more medical professionals.

From a practical standpoint, there are a few important issues to address. 1) The rules came about as a result of inadequate supervision and not just because residents were deprived of sleep. There are differences among specialties with regard to training. Surgical specialties provide far more supervision of their residents, particularly for surgical management. The public has been given the perception that neurosurgery residents are performing complex surgical procedures in the middle of the night, unsupervised, in a zombielike state on unsuspecting patients. This simply does not happen. It was not unusual, however, for sleep-deprived medicine residents to manage a large number of sick patients with little or no supervision from their attendings.

2) All medical specialties cannot be lumped under one umbrella when it comes to duty hours. Although the ACGME stated that there is no “one size that fits all”, the rules themselves make no distinction among specialties. We all recognize differences among our colleagues. Naturally there are differences in our individual needs for sleep. We remember classmates in medical school who hated going to the operating room and others who could not be kept away. People who require 8 to 10 hours of sleep each night to function well are generally not attracted to fields like cardiothoracic surgery or neurosurgery.

3) An important part of residency training in a field like neurosurgery is learning to function at a high level even when you have not had as much sleep as you desire. Many believe individuals can learn to perform better under less than ideal circumstances through training. The Navy SEALs program has a high attrition rate and only a rare few percentage complete the program. But we would not advocate for severe limitations on the number of miles they run, the number of meters they swim or the number of hours they are asked to work under the most stressful conditions. Just as there is the Merchant Marines or other armed services suitable for those who are not capable of the rigors of the SEALs program, there are less demanding specialties for those who are uncomfortable with long hours and demanding conditions to manage.

4) Restrictions on resident work hours have resulted in some very positive changes in training programs. If nothing else, they have forced residency program directors to reassess what we ask residents to do. Even those of us who long for the “good old days” must admit that many of our sleepless hours were spent performing menial tasks that had little or no educational value. For example, I believe it is very important for junior neurosurgical residents to dictate discharge summaries. It requires them to stop and think about why the patient was in the hospital, what we did to manage their condition, and what their disposition is. But after having dictated hundreds of medical records we reach a point of diminishing returns. It is perfectly appropriate to pass that task off to other health care providers to relieve the resident from duties that he or she will gain very little educational value from. Work hour restrictions forced educators to actually consider the duties and tasks we place on residents and prioritize them with respect to educational importance.

> THERE IS EVIDENCE THAT SLEEP-DEPRIVED RESIDENTS ARE MORE PRONE TO ERRORS AND ACCIDENTS. BUT REDUCED WORK HOURS OF RESIDENTS HAVE NOT BEEN DEMONSTRATED TO HAVE A POSITIVE EFFECT ON QUALITY AND SAFETY. THE INEVITABLE CONTRADICTION BEHIND LOWERING DUTY HOURS IS THAT THERE IS LITTLE SCIENCE BEHIND IT TO JUSTIFY OR CRITICIZE IT. <
The Accreditation Council on Graduate Medical Education (ACGME) is the accrediting body for post-graduate medical training programs. Within the purview of the ACGME is the hot topic of resident work hours as well as general residency requirements within the core competencies. The Accreditation Council on Graduate Medical Education (ACGME) has recently implemented new duty hour standards after completing their five-year review of the work hour restrictions that were initially implemented in 2003. They released their initial recommendations for revising the work hour standards in June of 2010. After a 45 day comment period, they finalized the work hour standards into the most current version that took effect on July 1, 2011. Several stakeholders, including organized neurosurgery, gave input into the duty hour standards, and the final product has areas of concern as well as areas that are an improvement over the previous standards. They demonstrate some wins, but also some losses.

The largest areas of change to the duty hour regulations concern intern work restrictions, most notably, the 16 hour shift rule. According to the new duty hour regulations, an intern may not work more than 16-hours straight. Having spoken with colleagues in other fields, this is a commonly shared concern of residents. A recent survey of 140 institutions conducted by the AMA showed that the method of compensation of these work hour limitations was primarily to shift this work up to residents of higher years (54% of responses). Contrast this to only 31% of responding institutions who added staff (MDs, NPs, PAs) to compensate for decreased intern work hours and 14% of institutions that decreased the number of patients on each teaching service. (http://www.ama-assn.org/ama/pub/meded/2011-july/2011-july.shtml) Among specialties whose interns have a mixed-discipline preliminary year such as our own, different concerns surface. From my own experience training at a Level One Trauma Center, I realize that overnight call shifts can be incredibly busy, and the type of pathology I see overnight can vary greatly from what I see during the day in both type and acuity. My ability as an intern to take supervised calls with the junior residents allowed me to learn how to juggle covering an inpatient service while also covering neurosurgical consults from the ER and trauma bay. The ability to see how the junior residents determined the acuity of a situation and acted rapidly on a trauma patient was crucial to my preparation to take this level of call the following year. Without the ability to remain at the hospital beyond the 16-hour limit, one must choose between exposing these interns to daytime or nighttime shifts, which may impact their readiness upon ascending to a junior resident status.

Despite the increased restrictions upon intern work hours, the work hour changes concerning more senior residents have become more lenient and appropriate to their ascension into practice. The mandatory time off in

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between shifts was decreased to 8 hours (though 10 hours is still the encouraged time) however, return prior to 8 hours is allowed if clinical necessity is documented. Additionally, remaining past the 24+4 hour shift limit is now allowed to care for a single patient if the resident wishes to continue to provide care to a critically ill patient, attend to the humanistic needs of a patient or family, or if there is academic importance to the transpiring events as long as the remainder of the patients are signed out to another individual. The ACGME acknowledges that “Residents in the final years of education [as defined by the Review Committee] must be prepared to enter the unsupervised practice of medicine and care for patients over irregular or extended periods.” As such, they allow for extended periods which still remain within the 80 hour limit and “one day off in seven” regulation to residents in their final year with appropriate documentation of extended shift necessity.

Several of the initial proposals were of concern to organized neurosurgery, and thanks to a widespread response from many realms of organized medicine, they were not incorporated into final recommendations. These proposals included the removal of allowance for averaging when determining number of days off, frequency of call and total hours worked. In smaller programs such as in neurosurgery, this ability to average is often necessary to allow for vacation and research or elective time. Additionally, the initial proposed changes mandated that if an intern were to be in the hospital during the night, an attending would have to be available for direct supervision. However, as previously mentioned, the supervised call model that can be seen in several specialties provides direct supervision to interns by residents overnight, with an attending available for indirect supervision – defined by the ACGME as a situation where the supervising physician is immediately available by being on premises or via telephone or pager. This type of supervised call was not necessarily the target of concern (as it was more focused on interns in-house with no form of supervision even at a resident level) however could have had a large impact on neurosurgical attending staff. And mandatory naptime, which was a controversial part of the initial recommendations, ended up being simply a recommendation to attempt strategic napping on call.

The ACGME also changed several other aspects of the general residency requirements which have a large impact upon resident learning as well as resident fatigue. They have changed the requirements for resident supervision, encourage teamwork, monitoring of fatigue, and improved transitions of care.

Overall, neurosurgery has been a loud and firm voice in the duty hour debate, and our concerns have been heard. Recently, the American Medical Association (AMA) adopted policy that seeks to monitor duty hours as it impacts resident education and patient care. In addition, this new policy aims to keep the regulation of resident duty hours within the medical community and apart from outside regulation, which was influenced by our neurosurgical delegation to the AMA.

Though the 16-hour work limit for interns is certainly a concern, the increasing flexibility of work hours at the junior and especially senior resident level reflect an understanding that residency is about learning more than just patient care. Rather, our journey through residency represents increasing understanding of not only patient care and operative technique, but also of working under stressful conditions, of recognizing our own limits, of attending to our patients’ needs when they need us most, which may not fall at the most convenient times. Whether the overall result of these regulations is a win or loss for us, my only hope is that it will be a win for our patients.
Over the last decade there has been a substantial increase in the number and type of therapies utilized for the treatment of spinal cord injuries (SCI). While there have been advancements in the medical and surgical care of SCI, many individuals with SCI continue to have major neurological impairment. This has created the urgent need to search for additional therapies. The use of cell-based therapies for SCI has recently gained prominence as a potential therapy or component of a combination strategy. It is the goal of this article to briefly summarize the cell types and experimental treatment efforts using cell implantation or delivery.

Benefits and Concerns of Cell Therapies

Cells are an attractive therapeutic agent because they are naturally regulated to some extent by factors within the tissue environment. Some cell types may be transplanted autologously, obviating a need for immune suppression. If directly implanted, there is control over their distribution unless migration is extensive. Certain cells such as oligodendroglia and neurons are known to be highly susceptible to cell death and, although there is some endogenous turnover, replacement is quite limited. Recent experimental data suggests that cell delivery can replace and repair lost and degenerating cells, especially when multi-agent approaches are taken.1 Concerns related to cell transplantation for SCI include the risk of abnormal growth including tumors, the anticipated difficulties to remove implanted cells, and studies in which emergence of neuropathic pain has been reported. All spinal cord implanted cells lead, to some degree, to tissue changes including inflammation, immigration of Schwann cells and fibroblasts, and neoangiogenesis.

Stem Cells

A stem cell is generally defined as: (1) an undifferentiated cell that can reproduce itself by symmetrical division, and (2) has the potential to differentiate into a variable range of specific cell populations. Stem cells can be classified based on the range of cell types they can derive, or on their source. Differentiation potential, or potency, is often used to characterize stem cells and uses the designations—in descending order—pluripotent stem cell, multipotent stem cell, and progenitor cells. The two major divisions of stem cells by source are: embryonic and somatic stem cells.

Embryonic stem cells (ESCs) are pluripotent cells created during early embryogenesis. At 3-5 days, the blastocyst is formed with an inner cell mass that gives rise to all cells in the human body, from neural to visceral to musculoskeletal. Adult or somatic stem cells are rare multipotent or progenitor cells located in specific organs. These stem cells have the potential to divide and produce organ-specific cells. However, unlike ESCs, somatic cells produce only a restricted subset of cell types of the body. In the adult central nervous system, stem cells are present in the hippocampus, periventricular zone, olfactory region and central canal of the spinal cord.

Pluripotent Stem Cells

One difficulty with ESCs, beyond the ethical concerns often cited, is that they are allogenic when transplanted and patients require immunosuppression. Presently, the extent and duration of immune suppression is unknown. Fortunately, mature adult cells (from skin or blood) can now be reprogrammed to go back into a pluripotent, ESC-like state, called induced Pluripotent Stem Cells (iPSCs). This technology is able to generate patient-specific stem cells,
and was first demonstrated on human cells in 2007 using the insertion of four transcription factors. While the original approach carried significant barriers for clinical use, iPSC technologies have improved at an incredible rate and iPSCs can now be created over a period of weeks without genetic manipulation. iPSCs can be differentiated into most neural cell types. It is also hoped that with continued development iPSCs could be manipulated to correct disease-causing genetic defects prior to re-implantation.

**Neural Stem Cells**

Earlier neural repair studies utilized fetal CNS tissues. Extensive experimental studies showed transplant engraftment, and ingrowth of axons from the host. This tissue transplantation was limited by small quantities of available donor material and ethical concerns. The discovery of neural stem cells (NSCs) within the adult brain opened up exciting new possibilities for CNS repair and NSCs remain amongst the most promising cell candidates. Initial strategies involved biopsy from the periventricular region and then culture with growth factors leading to neurospheres containing cells that could be differentiated into neurons, oligodendrocytes and astrocytes upon growth factor withdrawal. More recently, standard methods have been developed to derive NSCs from ESCs and iPSCs, and generating restricted precursors from NSCs that can only differentiate into either glial or neuronal fates. While very exciting it has proven difficult to produce certain classes of neurons from NSC such as pyramidal and motor neurons. However, NSCs can efficiently remyelinate injured axons and spare endogenous tissue to return sensory and motor function, even at chronic stages of injury. While animal data suggests transplantation of NSCs could lead to neuropathic pain and allodynia, simple alterations in differentiation and culture methods can eliminate this complication while leading to significant functional recovery. Currently, fetal-derived NSCs and ESC-derived glia-restricted NSCs are in clinical trials for ALS, Batten’s disease, Pelizaeus-Merzbacher disease, and subacute SCI (see Box 1).

**Bone Marrow-derived Mesenchymal Stem Cells**

Bone marrow-derived mesenchymal stem cells (BMSCs) are a type of mesenchymal stem cell that have established efficacy for restoration of the full repertoire of marrow and circulating blood cells. These cells have been shown to

<table>
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<tr>
<th>Table 1: Summary of the Cell-based Therapeutics for Spinal Cord Injury</th>
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<tbody>
<tr>
<td><strong>Approach</strong></td>
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<tr>
<td>Cell Replacement</td>
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<tr>
<td>Neuroprotection</td>
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<td>Trophic Support</td>
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**Transplantable Cells**

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<tr>
<th><strong>Cell Type</strong></th>
<th><strong>Repair Mechanism</strong></th>
<th><strong>Preclinical Data</strong></th>
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<tr>
<td>Pluripotent Stem Cells</td>
<td>These are the most potent stem cells, and can become any cell type including other stem cells or specialized cells.</td>
<td>ESCs and iPSCs have been differentiated into oligodendrocytes and neurons, to provide cell replacement, neuroprotection, and trophic support.</td>
</tr>
<tr>
<td>Induced from a patient’s skin (iPSC) or isolated from an early embryo (ESC)</td>
<td>These cells can become myelinating cells and neurons, and successfully replace and support dying cells and deteriorating tissue.</td>
<td>In numerous rodents and primate SCI models, NSCs significantly improve sensorimotor function electrophysiology, even in chronic lesions. Human clinical trials have begun.</td>
</tr>
<tr>
<td>Neural Stem Cells (NSC)</td>
<td>Each cell is capable of remyelinating denuded axons to spare neurons with compact myelin (OPC) or peripheral myelin (SC), and can guide axons across inhibitory giosis (OEC).</td>
<td>Clinically relevant, significant recovery in locomotion and sensation has been shown.</td>
</tr>
<tr>
<td>Present in adult brain and the spinal cord central canal.</td>
<td>Able to home to injured environment, and provide trophic support and immune modulation to increase survival of neurons, oligodendrocytes</td>
<td>Greatest success is seen with the combinations of NPC+Chondroitinase and SC+OEC.</td>
</tr>
<tr>
<td>Myelinating Precursors</td>
<td></td>
<td>Variable efficacy in animals models, with degree of functional recovery relating to isolation method, and severity of the injury.</td>
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<td>Oligodendrocyte (OPC), Schwann cells (SC), Olfactory ensheathing cell (OEC)</td>
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<td></td>
</tr>
<tr>
<td>Bone Marrow Stem Cell (BMSC)</td>
<td></td>
<td></td>
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<tr>
<td>Easily isolated from a patient and expanded</td>
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have the capacity to differentiate into cartilage, bone and adipose cells. In addition, there is evidence that neural lineage cells, (e.g. Schwann cells) have been obtained under certain conditions in culture. Because BMSCs are readily available and easy to harvest and culture, there has been enthusiasm to test them in patients with acute and chronic SCI. They have been utilized through local injection into the site of the SCI as well as indirect routes as in lumbar punctures and circulatory infusion, and do not require immune suppression since they are autologous tissue.

Schwann Cells
Schwann cells are located in the peripheral nervous system where they function to myelinate the peripheral neurons. Normally, SCs are excluded from the parenchyma of the CNS due to inhibition from astrocytes, especially those of the glia limitans. SCs are quite easy to culture and purified transplanted SCs have been shown in numerous studies to have neurotrophic and pro-regenerative effects. Furthermore, there is some evidence that transplanted SCs can repair the myelin of injured central axons. Two additional factors make clinical transplantation of SCs for SCI attractive. One, SCs normally enter regions of SCI as part of a process known as Schwannosis, which has no known negative consequence. Secondly, SCs can be prepared autologously from a sural nerve biopsy, and it is believed that immune suppression following transplantation is not needed. While SCs have been shown to effectively myelinate spared axons in animal models of SCI, it is unclear to what extent they are able to cross the glial scar or exit graft tissue.

Olfactory Ensheathing Cells
Olfactory ensheathing cells (OECs) are unique glial cells that promote the differentiation and directional growth of olfactory neurons. The system is unique because olfactory neurons are born throughout the full lifetime and OECs support the axons of the new olfactory neurons as they extend from the mesenchymal tissue of the nasal cavity, through the lamina cribrosa and into the olfactory nerve fiber layer. Within that layer they form synapses with central neurons and interface with astrocytes. OECs can be taken from the olfactory mucosa or the olfactory bulb nerve fiber layer may be cultured and transplanted. The central concept is that other classes of neurons could be ensheathed by OECs and their regenerative growth supported and that possibly re-entry into the CNS could be facilitated by favorable OEC-astrocytic interactions. Published experimental data has been encouraging overall, although inconsistent, and is shown to depend on the source of OECs and combination with other cells or therapeutic agents. The only phase I/II study performed thus far (in Australia) was encouraging in terms of safety; however, clear efficacy was not observed, and was limited to a small sample size of chronic complete lesions.

Important Directions for SCI Cellular Therapy
Numerous important questions critical to cell therapy remain to be solved through preclinical translational and clinical studies. These include the optimal timing, dose and site of transplantation. For allo- and xenograft cell sources immune suppression must be optimized for cell survival and patient safety. The utility and feasibility of recently developed patient-specific cell reprogramming technologies such as iPSCs must be determined. The survival, distribution, engraftment and integration of transplanted cells, and associated inflammatory and injury responses due to the implantation procedure should be determined to permit therapeutic optimization. The authors believe that cell implantation will ultimately be part of a multi-agent approach to SCI that will include the use of neuroprotection, modulation of the inflammatory response, biomaterials, and optimized activity to shape post-injury plasticity. Spinal cord repair is an exciting discipline whose discoveries may have broader application for several neurological diseases.

References
In the USA and across the world, governments have spent more than they can afford. The government credit cards paid by taxpayers are overdrawn and cannot be paid back. So some are headed to bankruptcy. That is the simple message of what is happening to world economies.

What will happen is that governments will need to slash expenses and find ways to get their economies moving. As the governments cut expenses, spine surgery will certainly be one of the prominent areas of medicine to suffer cuts. There is little scientific justification for the instrumentation being used. Yet, the costs for spine procedures have risen while the disease rate has not. When spine surgery reimbursement is cut, which is inevitable, many neurosurgeons will find themselves with drastically reduced incomes.

What should a spine surgeon do? Back pain is the most common cause of loss of work in the USA. Yet surgeons, only treat 10% of this market and ignore the other 90%. This strategy makes no business sense.

Be creative! What spine surgeons need to do is to treat the other 90% also. Yes, that means incorporating physical therapy into your practice or combining with others to do this. Also add epidural blocks by associating with anesthesiologists or learning to do it yourself. The public sees acupuncturists and chiropractors for back pain. Add them to your practice. Add psychologists, as functional problems are a significant part of the back pain issue. Add and do a competent job of Workman’s Compensation Evaluations. These types of examinations are well-paid in most places. Work hardening, or reconditioning a patient to return to work, is another area of back pain that would help employers take patients off the medical disability lists. Outpatient spine surgery can be done at lower costs with higher reimbursement. Get into this area of cost savings. Treatment of drug abuse is also an area of interest. Most neurosurgeons send the patient back to the referring physician who is frustrated treating the patient. Hire someone to help you with this population. If the practitioners had a place to refer these patients, the volumes of patients you would see would skyrocket.

Eventually, the goal is to get into the treatment of pain. You are doing it anyway if you are evaluating patients for spine surgery. Pain is the most common symptom in medicine. After the practicing physician has exhausted the evaluation of the patient with pain, a referral to a “Pain Center” would be just what they would want. They do not have the time to care for these patients. In that group of pain patients would be those with cancer pain, trigeminal neuralgia, diabetic neuropathy and other common pain syndromes that are frustrating to treat.

The goal is to capture the patient with back or spine pain and pain. Then you have 100% of the market and more. It does not matter what happens economically. Because the patient is still coming to you for treatment.

This strategy is a winner for the future. It may require combining with others to do it but the goal is not to refer these patients out of your practice but to incorporate them into your practice.
Epilepsy surgery is based on the principle that resection of the epileptogenic zone (E.Z.) can result in freedom from seizures. The E.Z. is defined as the area of the brain necessary and sufficient to generate seizures. The corollary to this is that it is the exact amount of brain that needs resected to render the patient seizure free. Precise localization of the E.Z. and its relationship to eloquent cortex is crucial for the success of epilepsy surgery. In certain clinical scenarios, invasive electrode recordings allow accurate localization of the epileptogenic zone and mapping of functional cortical regions.

The most common indications for intracranial electrodes include lateralization or better localization of the E.Z. and functional mapping of eloquent cortical areas. In the first case, preoperative noninvasive studies and semiology often suggest focal epilepsy, but not precisely enough to adequately localize or lateralize the epileptogenic zone. In the United States, the most common invasive monitoring procedure is the implantation of subdural grids and strips. The subdural method of invasive monitoring has several advantages including: (1) extraoperative recording capabilities to record both spontaneous seizures and interictal activity during various stages of arousal, and (2) high spatial resolution, allowing higher degree of precision for superficial cortical recordings and functional mapping. Unfortunately, this method has several limitations and disadvantages including: (1) the limitation in retrieving information from deep cortical and subcortical areas, (2) the need for relatively large craniotomies, and (3) limitations in recording from insula, cingulate gyrus, and posterior orbito-frontal areas. In order to overcome these challenges and limitations, the stereoelectroencephalography methodology (aka SEEG) may be used as an alternative and/or complementary procedure to the subdural methodology. This technique was developed in the 1950s in France and enables precise recordings from deep cortical and subcortical structures, as well as allowing for bilateral explorations while avoiding the need for large craniotomies. Despite a long safety record (almost 60 years), it remains underutilized in the United States. Therefore, SEEG may be considered a re-discovered methodology that differs in principle from any other current method for extra-operative long-term monitoring used in the diagnosis and treatment of refractory focal epilepsy.

We incorporated the SEEG methodology in our clinical practice in March 2009, implementing our epilepsy center’s surgical capabilities by offering additional diagnostic and treatment options for patients with medically refractory focal epilepsy. SEEG is now routinely indicated in selected patients with refractory focal epilepsy who need further definition of the areas in the brain responsible for the generation of seizures.

SEEG methodology implies a rigorous preimplantation scrutiny of all available findings obtained during the noninvasive phase to define a coherent hypothesis of the likelihood of localization of the epileptogenic zone. In this decision-making process, the respective weight of pre-surgical evaluation testing may vary greatly, depending on each patient. After a localizing hypothesis is formulated, a tailored implantation strategy is planned, with the goal of confirming or rejecting the pre-implantation hypothesis. In this phase, the exploration is focused to sample the anatomic lesion (if present), the more likely structure(s) of ictal onset and the possible pathway(s) of propagation of the seizures. The desired targets are reached using commercially available depth electrodes, implanted using conventional stereotactic technique through 2.5mm drill holes. Depth electrodes are implanted using orthogonal or oblique orientation, allowing intracranial recording from lateral, intermediate or deep cortical and subcortical structures in a three-dimensional arrangement, thus accounting for the dynamic, multidirectional spatiotemporal organization of the epileptic seizures (Figure 1). Conventional cerebral angiography is performed routinely, providing us with an additional degree of safety and precision without compromising the less aggressive features intrinsic to this methodology. Additionally, SEEG implantation can be also performed by the use of robotic assistant devices. Robotic assisted technique represents an opportunity to decrease radiation exposure, to reduce operative time and cerebral angiogram complications, to minimize patient time under general anesthesia, and to implant trajectories not accessible with a framed system. (Figure 2)

Up to now, 100 patients were successfully implanted using the SEEG methodology.
The epileptogenic zone was located in 97 patients and no permanent morbidity was observed. From this group, 60% underwent resective surgery guided by the information provided by this method. The seizure outcome is still short (mean follow-up of one year), but so far 65% of these patients remain seizure-free or with an important reduction of seizures. It should be highlighted that this difficult group of patients with medically refractory epilepsy were considered non-surgical candidates in the past, with no further options for curative treatment. The described method brings a new treatment option for patients with refractory focal epilepsy who are not candidates for invasive monitoring techniques using subdural grids due to difficulties of mapping deep areas in the brain or due to the high morbidity associated with larger craniotomies required by subdural grids implantations.

References
The Congress of Neurological Surgeons remains fiscally sound and fiduciarily responsible. Significant challenges faced by the Congress over the last several years include the effects of the recession on long-term investments as well as the effects of the recession on the behavior of our members, exhibitors and fellowship sponsors. There is a changing playing field with regards to the relationships between corporate exhibitors and medical societies due to increased scrutiny of such relationships by the federal government, the Accreditation Council for Continuing Medical Education (ACCME), and by the lay press. Increasing activities at the Washington Office result in increasing expenses as the importance of efforts such as public relations, development of clinical practice guidelines, and support of quality improvement through meaningful outcomes research becomes more and more evident.

Total assets currently hover around $20M. Long-term assets are divided between three investment funds which have specific purposes. The reserve fund, currently containing approximately $6M is conservatively invested in order to preserve wealth and is designated as a hedge against financial hardship. An endowment fund, also containing approximately $6M is more aggressively invested as a growth fund in order to fund educational initiatives as part of the mission of the Congress. A small “R&D” fund is a cash fund used to fund educational projects that come up during the fiscal year for which funds have not otherwise been set aside. The remainder of the CNS assets are reflected in the operating budget which describes the “business” of the Congress.

The annual budget exceeds $10M and covers the major revenue generators (Annual Meeting, publications, membership fees) and expenses (Annual Meeting, headquarters operations, and joint activities such as the Washington Committee). This past year, we were projected to run a deficit budget and to run down the reserves. Fortunately, due to stronger than anticipated revenue from the Annual Meeting and from advertising sales in NEUROSURGERY®, efficient headquarters operations and deferred spending on capital expenditures, fiscal year 2011 ended with an overall gain (income) of approximately $300,000. Unfortunately, the 2011-2012 budget is also projected to be a deficit budget, however the major driver of the deficit is investment in new infrastructure at the headquarters office and the funding of new educational projects.

This past year the Congress received our third consecutive audit with a “clean unqualified opinion.” This reflects exceptional transparency and consistency in business practices which encompass everything from running of the headquarters office, negotiating meeting contracts, running the editorial offices for CNS publications, to substantial investments in information technology.

The good news is that the Congress has weathered the financial storm and is well positioned for the challenges of the foreseeable future. Our long-term investments have, through careful selection of investments, the modest market recovery, and new investments, re-
turned to pre-recession levels providing for the security of the Congress and ensuring the ability of the Congress to continue to pursue its educational mission. The editorial office of NEUROSURGERY®, while physically located at Emory University, is now administered through the CNS Headquarters office in Schaumburg, IL. Dr. Oyesiku and his team have managed spectacular success in enhancing the impact and importance of the journal while operating under budget. Advertising and royalty revenue were better than expected and provided a welcome dividend.

The Annual Meeting remains the centerpiece of the CNS’ educational mission and remains the largest single expenditure and largest single income generator for the Congress. This year’s meeting in Washington, DC was a success in every category including financial. Revenues from the meeting exceeded budget due primarily to aggressive cost savings and an excellent turn-out by neurosurgeons from around the globe. The Annual Meeting is a team event and all who contributed to this massive effort are to be congratulated. We look forward to yet another outstanding meeting, October 6-10 in Chicago, Illinois.

The Congress of Neurological Surgeons continues to be among the most cost-effective organizations in organized medicine with a dues structure well below that of the vast majority of similar organizations in specialty medicine. In addition to providing a premier educational experience through the Annual Meeting, the CNS’ educational portfolio also includes the SANS (Self-Assessment in Neurological Surgery) product, the CNS University of Neurosurgery, the NeuroWiki, and the webinar series. The SANS product, despite the fact that it is complimentary to all who are participating in the ABNS Maintenance of Certification program, still earns enough revenue through subscriptions to support itself as it evolves over time, incorporating new topics, questions, and technologies. Recently, the SANS ABOS module was licensed by the Board of Orthopedic Surgeons as an assessment tool for MOC for orthopedic surgeons, opening a new revenue stream outside of the traditional CNS membership. The CNS University of Neurosurgery, and particularly the webinar series provide an exceptional CME value for CNS members, and as more members take advantage of these opportunities both of these products have gone from being educational investments requiring support to profitable enterprises in their own right. The committee chairs and members who have dedicated hundreds if not thousands of hours to these important initiatives deserve tremendous praise and illustrate the volunteerism that continues to set the Congress apart from other organizations.

Anticipated investments in simulation technology, changing ACCME requirements, and the ever-changing landscape with regards to relationships between medical societies and industry will be significant issues moving forward. It has been my pleasure to serve the CNS membership as treasurer for the past three years and I am pleased to report that Russell Lonser has taken over as treasurer. I am relieved to be handing over a financially strong and fiscally responsible portfolio.
The Congress of Neurological Surgeons (CNS) has had a busy and highly successful year. Under the leadership of President Christopher C. Getch, President-Elect Christopher E. Wolfla, Past-President Gerald E. Rodts, Jr., Vice President Saleem I. Abdulrauf, Secretary Nathan R. Selden, and Treasurer Daniel K. Resnick, the CNS has continued to provide cutting-edge neurosurgical education, premier member services, and thoughtful public advocacy.

The 2011 CNS Annual Meeting was held October 1-6 in the US capitol, Washington, DC, and celebrated a unity of purpose in the profession of neurological surgery. Annual Meeting Committee Chair, Dr. Russell Lonser, and Scientific Program Chair, Dr. Ganesh Rao, and Vice Chair, Dr. Alan Scarrow, gathered a faculty of internationally renowned leaders in neurosurgery, science, policy, and technology. Outstanding presentations by the CNS Honored Guest, Dr. H. Hunt Batjer highlighted the meeting, along with invited speakers including the Walter E. Dandy Orator, Pulitzer Prize winning author Jon Meacham, the John Thompson Lecturer, General (Ret.) Stanley McChrystal, and the Julian T. Hoff Lecturer, author and journalist Frank Deford.

Other special lecturers included Albert Rhoton, Jr., on the anatomic foundations of neurological surgery, Gerald Imber on the double life of Dr. William Stewart Halsted, Peter Burger on new paradigms in genetic and molecular pathology, NIH Director Story Landis on translational neuroscience, Charles Limb, Jeffrey Kahane and Margaret Batjer on music and the mind, Leigh Hochberg on the human-robotic interface, and Colonel Geoffrey Ling on training in extreme environments.

The Spanish Society of Neurosurgery (SENEC) was the 2011 Guest Society at the CNS Annual Meeting. In addition to an array of innovative, interactive educational programs, including CNS Consensus Sessions and Case Controversies with the Masters, the Annual Meeting Program included a wide variety of Practical Courses, Luncheon Seminars, and Special Courses. Both live surgical presentations and 3-D surgical video were used to demonstrate the art of managing complex neurosurgical cases. The popular dinner seminar program was expanded to four of Washington’s top restaurants and a new Operative NEUROSURGERY® session highlighted fresh information from the CNS’ world-class journal.

Up-to-the-minute neurosurgical science was presented in subspecialty section platform presentations at the CNS Oral Presentations, interactive Neurosurgical Forum, and as CNS Digital Posters. Additional original science was highlighted at a new multidisciplinary oral presentation session. All of this original neurosurgical science has been added to the archive of CNS Annual Meeting material available online at the CNS University.

The CNS also joined a major new educational initiative for neurosurgical residents. Invited by the Society of Neurological Surgeons, which represents US residency program directors, the CNS took on responsibility for the financial management and administration of a national fundamentals curriculum for PGY1 residents entering neurological surgery training. In July 2011, this curriculum was provided to over 200 PGY1 residents entering each US residency program, via ‘Boot Camp’ courses carried out in six regional centers. This level of participation by all residents in an entire class of trainees is unique in neurosurgery and other surgical specialties. The SNS and CNS have entered into a five-year agreement with
Stryker to support the infrastructure of these multi-sponsored neurosurgery PGY1 Boot Camp courses.

The CNS remains vitally engaged in resident education in the US and abroad in a number of additional ways. The very popular CNS 3-D Surgical Anatomy Course for Senior Residents in the United States was moved this year to Chicago and successfully led by Dr. Michael Lawton. The CNS welcomed a number of guest senior residents from Europe to the Chicago course this year. Conversely, CNS faculty and US residents, with CNS scholarship support, participated in a number of surgical dissection based courses led by the European Association of Neurosurgical Societies in various European cities. Leadership of the CNS International Division passed in the fall of 2011 from Dr. Saleem Abdulrauf to Dr. Anil Nanda, who plans to continue this vital engagement with the CNS’ international educational partners.

All of these CNS educational efforts depend, in different ways, on simulated surgical experiences, some with traditional cadaver or other models, and some with modern computer generated simulators. Led by Dr. Ali Rezai, the CNS is actively studying the future of neurosurgical simulation and launched a new practical course devoted to this area at the 2011 CNS Annual Meeting.

As reported by Treasurer Dr. Daniel Resnick, the CNS has maintained a strong financial position in the past year through careful management, prudent cost savings, and efficient performance in each major area of organizational activity. The CNS finances received a ‘clean’ review by our professional auditors again this year. In addition to deep discounts for the CNS Annual Meeting and other educational events, the CNS provides superb additional member benefits, including subscription to the journal NEUROSURGERY® and to Congress Quarterly, and access to a wide array of online educational products.

The CNS also completed a comprehensive review of its important public advocacy activities this year. Led by CNS Past President, Dr. Mark Hadley, and Secretary, Dr. Nathan Selden, the Public Advocacy and Review Committee (PARC) was charged with analyzing, strengthening and focusing the public advocacy missions of the CNS. The PARC issued a unanimous report in January 2011, which was also unanimously adopted by the CNS Executive Committee, and is now part of an ongoing implementation effort in collaboration with the CNS’ neurosurgical and advocacy partnership organizations. In one early success, the CNS and AANS officers have re-established regular and vigorous joint meetings to promote collaborative projects and policies for the benefit of neurosurgery as a specialty.

The Self-Assessment in Neurological Surgery (SANS) program, SANS Lifelong Learning, continues to serve as a major component of the American Board of Neurological Surgery MOC process. Other SANS programs provide additional learning and review opportunities, including SANS Competencies and the recently launched SANS Neurotrauma. SANS Committee Chair, Dr. Jason Sheehan, recently announced the endorsement of SANS ABOS by the American Board of Orthopedic Surgery for continuing orthopedic surgery education, an additional sign of the innovative and high quality curriculum promoted by SANS programs.

The CNS Education Committee, chaired by Dr. Jamie Ullman, has continued its series of high quality webinar programs with faculty drawn from the leading experts in all areas of neurosurgical endeavor. The CNS University (led by Dr. Ashwini Sharan) continues to add new offerings, including a series of case-based learning modules pioneered by Dr. Elad Levy,
which will be available online to learners at all stages of training and practice. Technology infrastructure for these online activities plus introduction of a completely modernized CNS web site with real time data feeds and updated content are directed by Drs. Michael Steinmetz and Brian Ragel.

Dr. Mark Linskey leads a major new effort in the planning, formulation and review of medical evidence based guidelines by the CNS. The expanded commitment of our organization to evidence based medicine includes the help of expert guidelines professional staff at the CNS Headquarters Office. The CNS is also partnering with other neurosurgical organizations in support of a newly created national clinical outcomes registry, launched by the AANS under the banner of the NeuroPoint Alliance, NPA. Overall, the efforts of organized neurosurgery to measure and report on the quality and effectiveness of neurosurgical care will help to preserve patient access to life and function saving interventions.

The CNS has completely re-organized its powerful fellowship program for mentoring future neurosurgical leaders and pioneers, with support from the Industry Sponsored Initiatives for Teaching and Education (InSITE) foundation. The first applications for the prestigious new, year-long CNS Fellowship Award were accepted in the fall of 2011, and the first CNS Fellow will be announced early in 2012 by Fellowships Committee Chair, Dr. Steven Kalkanis.

The CNS publications group has moved from strength to strength in the last year. The official journal of the CNS, *NEUROSURGERY*, continues as the highest impact neurosurgical journal in the world, with a significant increase this year in its impact factor. Editor-in-Chief Nelson Oyesiku has introduced extensive new online and tablet viewing and search capabilities for the journal, and has connected journal content to social media channels. The journal continues to attract and represent some of the highest quality scientific content in our field. The publication you are holding, the *Congress Quarterly*, serves as the official membership publication of the CNS. Editor James Harrop has maintained a focus on important socioeconomic and professional developments in our specialty, new technology and trends in health care. *Clinical Neurosurgery*, edited by Dr. Gerald Grant, continues to highlight the top peer-reviewed science and leadership represented at our Annual Meeting.

The CNS and AANS serve as partners to provide socioeconomic service and leadership to organized neurosurgery via the AANS-CNS Washington Office, Chaired by Dr. Alex Valadka. The AANS-CNS Washington Office, under the experienced and effective leadership of Ms. Katie Orrico, JD, oversees numerous activities. The activities of the Washington Office have been particularly important recently during the constantly changing landscape of health care reform. The CNS also continues to strongly support the activities of the Council of State Neurosurgical Societies (CSNS). Leadership of the CNS Caucus of the CSNS passed this year from Dr. Charles Rosen to Dr. Darlene Lobel.

The CNS Executive Committee also warmly thanks Dr. Chris Getch for his superb and loyal tenure of service to this organization. Similarly, the officers thank the continued tireless pursuit of excellence by each member of the CNS Headquarters staff, which enables all of our activities and initiatives to succeed.

The CNS Research Committee, led by Dr. Ashok Asthagiri, is committed to enhancing the success of neurosurgical scientists in obtaining federal research funding and providing optimal research training to neurosurgical residents. The committee repeated its highly successful grant application course at the 2011 CNS Annual Meeting and supports discussion of potential new funding mechanisms with the NIH.

As of October 2011, CNS Membership continues to grow to record levels. There are currently 7,735 CNS members, including 3,368 Active members, 1,142 Resident members, 426 Active International members, and 714 International Vista members. Membership growth has been ably promoted by Committee Chair Dr. Zoher Ghogawala and Resident Chair Dr. Catherine Mazzola.

The CNS officers and Executive Committee are preparing to celebrate a spectacular 11-year tenure of organizational leadership by CNS Executive Director, Laurie Behncke. Ms. Behncke has sheparded our organization from the inception of an independent CNS Headquarters Office and independent meeting management, through a period of tremendous growth in activity and financial stability. Her term of leadership has been marked by a dedication to professionalism and corporate best practices, and to an extremely successful history of producing some of the finest professional society meetings in the country. Ms. Behncke’s skill and dedication to the CNS will be difficult to replace, but the CNS Executive Committee has initiated a vigorous process to search for a highly-qualified successor. Similarly, the officers thank the continued tireless pursuit of excellence by each member of the CNS Headquarters staff, which enables all of our activities and initiatives to succeed.

The CNS Executive Committee also warmly thanks Dr. Chris Getch for his superb and loyal tenure of service to this organization. Finally, we also welcome Dr. Christopher Wolfia as the new CNS President and Dr. Ali Rezai as the new President-Elect.
**Neurocysticercosis**

A 46-year-old man from Mexico presented with acute obstructive hydrocephalus (Figure 1). Cysts were identified within and inferior to the 4th ventricle concerning for neurocysticercosis (Figure 2). Faint GAD enhancement on MRI suggested a vesicular cyst stage parasite (Figure 3). CSF flow was restored via a suboccipital craniectomy with cyst retrieval and opening of subarachnoid adhesions. Postoperatively, steroids were administered prior to initialization of Albendazole.

Submitted by:
**Terry Burns, MD, PhD**, **Joshua J. Loya, BA** and **Harman Singh, MD**

*Stanford University Hospital and Clinics, Stanford University School of Medicine*
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