ASSESSING QUALITY

HOW DO NEUROSURGEONS MEASURE UP?

YOU ARE BEING MEASURED

THY WILL BE DONE... NOW
This issue of the Congress Quarterly (cnsQ) is dedicated to assessing quality. Over the last several decades, there has been a redirection of efforts in order to improve the quality of health care. In order to meet this goal, we must first define our present health care condition, our treatment modalities and patient care.

We have learned that although this seems easy in concept, it is in actuality quite a difficult task. Presently, the modalities to evaluate medical conditions have evolved into global patient outcome scales in addition to several disease specific measurements. Deborah Benzil and Joseph Cheng examine whether the patient satisfaction tools have positive or negative impact in medicine in their article Patient Satisfaction: Friend or Foe.

Additionally in this issue, the neurosurgery subspecialties examine how specific disease focus tools are being used to measure quality. Jason Schwabl and David Nerenz review How do We Measure Quality in the Treatment of Pain? Manish Aghi and Steven Kalkanis discuss outcome measures in the management of tumors, Jamie Ullman and Brian Ragel review outcome measures in head trauma, while Fernando Gonzalez and J Mocco review the cerebrovascular neurosurgeons outcome measurements.

In the Featured Articles section, Deborah Benzil discusses the importance of your last will and testament in the neurosurgical population, in her article Thy Will Be Done (NOW). Katie Orrico reviews and updates the OIGs opinion regarding on-call physician payments.

Within the Inside the CNS section, Darlene Lobel and I cover the CNS simulation curriculum and the recent resident course, while Russell Lonser provides the annual CNS Treasurer’s Report, while Dino Terzic and Aviva Aboch discuss the 2012 CNS Resident and Medical Student Committee Report. Alan Scarrow, Ashwini Sharan and Elad Levy provide insight on the quickly approaching 2013 CNS Annual Meeting to be held in San Francisco, California, October 19-23.

We do hope you enjoy this issue and as always if you have any comments or feedback, we encourage you to submit them to info@1cns.org. We do appreciate your engagement and remind you that this magazine is for all of us.
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Images in Neurosurgery
PRESIDENT’S MESSAGE

THE THRIVING AND INNOVATIVE CNS
THE VALUE OF MEMBERSHIP IN 2013

For over 60 years the CNS has been a leading and innovative organization serving neurosurgery. Our dynamic society provides over 8,000 members worldwide with the most advanced educational experiences, leadership development opportunities, and advocacy. In the last year, our web-based learning and assessment tools drew record numbers of online participants, our pioneering neurological simulation platform (CNS-SIM) was launched in the US with plans underway for deployment on three additional continents this year, and our expert dedicated members continued to develop the most current evidence-based clinical practice guidelines to promote access to the highest quality, most effective patient care in this rapidly changing healthcare environment.

Looking forward, 2013 promises to provide even greater opportunities as we expand our educational offerings, and plan for a comprehensive, state-of-the-art 63rd Annual Meeting. In addition, collaborating with our partner neurological associations, we will increase our advocacy efforts and launch even more informational and educational vehicles, including the interactive learning platform for the Neurosurgery Portal, the largest neurological society online educational collaborative undertaking in our field to date.

Your annual CNS membership dues provide you with many additional benefits, including a free subscription to Neurosurgery®, free access to a multitude of educational products and services, discounts at the CNS Annual Meeting and Courses, and support for the advocacy efforts of the Joint AANS/CNS Washington Committee, among others. We are always searching for new ways to provide the most useful resources for our member volunteers like you, who work hard to make a difference for the advancement of our specialty and to foster the CNS’ mission, to enhance health and improve lives worldwide through the advancement of education and scientific exchange.

The success of the CNS has always been linked to our members and volunteers. It is you who provide the inspiration, dedication, hard work, creativity, passion and spirit of service for our society and specialty. Through your work and the tireless contributions of our all-volunteer board, the profession of neurosurgery is constantly advanced and strengthened. Discussed below are some of the many ways the CNS continues to benefit each of us and our patients, enhance our services, and facilitate collaboration and progress for our specialty in the changing world of medicine.

Collaboration and Partnership with Other Societies

Collaboration and partnership with other neurological societies is crucial for the collective advancement of our specialty. Our leadership works closely with the joint subspecialty sections, as well as the AANS and other organizations such as the Society of Neurological Surgeons and the American Board of Neurological Surgery, on multiple fronts. The CNS and the AANS provide equal financial, committee membership and human resource support for the crucial work of the AANS/CNS Joint Washington Committee, which advocates on behalf of neurosurgery to influence the changing landscape of healthcare policy and to preserve access for our patients. The CNS and AANS have joint officers’ meetings and communicate synergistically to promote our organizations’ efforts. The CNS was a founding constituent of the Council of State Neurosurgical Societies (CSNS), a grassroots organization that facilitates and improves communication with state societies on educational and socioeconomic topics, and we continue to this day to provide half of the budget, meeting space, and other support for this important organization.

Having multiple societies provides more opportunities for participation, multiple seats at the table, and representation for neurosurgeons with different backgrounds and interests. Each of our neurological society partners has its own distinct identity, focus, culture, leadership composition and structure. Each organization is passionate about pursuing its own goals and focusing on its core competencies, and our members can choose from a broad range of targeted services, projects, and priority areas that reflect their individual interests. At the same time, we all benefit from our organizational collaborations and support; for example, the CNS and the AANS each contribute 50% (nearly $700,000 each per year) for our Joint Washington Committee to support advocacy efforts to benefit our patients and specialty. The total cost of those combined efforts would be debilitating if they had to be borne by a single organization. Our societies strive to fulfill their own individual missions, while working together collectively to advance the field and the best care for our patients.

The CNS and the AANS are working closely with the SNS, ABNS and the RRC to create a...
crucial new project called the Neurosurgery Portal. The Portal, the largest single online educational undertaking in neurosurgery, integrates the SNS Matrix curriculum and ACGME Neurosurgery Milestones with case tracking into an interactive educational repository for use during training and thereafter. This ambitious project requires extensive and wide-ranging resources which are being provided synergistically by all partnering societies. The CNS plans to provide critical learning technology infrastructure for this online neurosurgical learning platform, which will effectively become the “curriculum” of modern neurological surgery.

In addition to our partnerships with societies in the US, the CNS strongly believes that international collaboration and global scientific exchange are critical for the growth of our specialty and continuous improvement of patient care and outcomes worldwide. We partner annually with various international societies on education and scientific exchange, and are now further expanding those relationships to create new opportunities for collaboration and teamwork, including for enhancement to residency education abroad. The CNS will continue to work efficiently, effectively and collectively with other societies to advance our specialty and the welfare of our patients.

Education

Education is the core mission and focus of the CNS. Upholding the highest standards for teaching, training and dialogue is crucial for the growth and advancement of our field. The CNS leadership team created the groundbreaking Self-Assessment in Neurological Surgery (SANS), the first web-based learning and assessment tool for neurosurgeons worldwide. SANS is the most popular online resource for lifelong learning, general neurosurgery competencies, practice, and Maintenance of Certification (MOC). This past year, we also launched the new SANS Neurosurgery® free to all ABNS diplomats participating in MOC, the CNS has assisted the ABNS in controlling the individual costs of participation.

In 2013, the CNS Education Committee is significantly expanding its educational catalog and online repository within the CNS University offering and webinars are free to CNS members. They can be accessed at no charge from the convenience of your home or office.

In 2012, the CNS earned Accreditation with Commendation from the Accreditation Council for Continuing Medical Education (ACCME) for its commitment to providing the highest quality education. Only the top 20% of the CME organizations meet this important standard. In addition to our Annual Meeting, in 2013 we are introducing new live courses such as spine and vascular complication courses and the CNS SANS MOC Board Review Course.

Neurosurgical Simulation

This year the CNS will enhance its unique educational offerings with the comprehensive and innovative CNS-SIM simulation platform. Simulation training is standard in aviation, among other fields, and is increasingly becoming a requirement for training and certification in medical specialties. Over the past few years, the CNS has developed a comprehensive platform using the latest in simulation technology in conjunction with a standardized curriculum, task validation, and prospective objective assessments. The CNS-SIM platform includes web-based, virtual reality, haptic feedback devices, as well as physical models for the spine, skull base, trauma, vascular, endovascular and functional sub-specialties.

The CNS-SIM is being implemented in multiple neurosurgery training programs in the US, as well as being integrated with our partner societies in Europe, India, China, and Brazil.

Resident Educational Initiatives

The CNS has always strongly emphasized the education of residents. In partnership with the SNS, the CNS has helped to develop and each year produces the PGY1 SNS Boot Camp course. In 2012, every entering PGY1 resident in the US attended this highly rated course on a complimentary basis at one of six regional centers (206 residents from 101 programs). Each year, the CNS also offers the highly successful senior resident 3D Anatomy Course involving hands-on dissection and 3D video. Senior residents attend this course with all expenses paid by the CNS. In addition, with CNS scholarship support, the CNS and the EANS send faculty and US residents to two surgical dissection-based courses in Europe, while inviting European residents to participate in our 3D course in the US.

The CNS Journal, Neurosurgery®

The CNS’ industry-leading journal, Neurosurgery®, published nearly 500 original research articles, reviews and technical notes in all areas of neurosurgery last year, as well as supplements covering topics such as virtual reality and robotics. Our journal also launched an industry-leading iPad application as well as other social media features, which allows members to access supplemental multimedia videos and images for key articles. Additionally, we have a new Neurosurgery® Journal Club, a quarterly competition designed to introduce Residents to the importance of scholarly review.

Annual Meeting

Our flagship Annual Meeting has always featured unique cutting-edge technology and innovative forums to advance our practices and profession. Decades ago, we pioneered the use of televised live surgery at the Annual Meeting.
The CNS has developed an infrastructure to promote and directly support the creation of evidence-based clinical practice guidelines for high priority topics which are designed to advance practice science along with protecting payer reimbursement for, and patient access to, the most effective neurosurgical interventions.

In 2013, we will strive to have an even more significant impact, sharpening our focus on innovating and improving neurosurgical education and identifying the most relevant strategic priorities, while expanding and providing unique product offerings to meet your needs and those of your patients now and in the future. The CNS is about volunteers and offering opportunities for participation to all neurosurgeons regardless of age, subspecialty, or interest. We will continue to foster a particularly supportive and dynamic environment for our colleagues in the earlier decades of their careers, where the opportunities for involvement, leadership development and advancement may be more limited. Our all-volunteer Board of Directors, the CNS Executive Committee, will continue to tirelessly dedicate their time and professional effort on your behalf. We welcome your participation and look forward to working with you. Together, we will continue to promote progress in our specialty as we navigate the changing culture of the world of medicine.

Thank you for your continued support of the CNS. I am excited about where we are heading and look forward to seeing all of you in San Francisco this fall.

The CNS was awarded the 6-year ACCME Accreditation with Commendation for continuing medical education, a designation achieved by only 21% of all providers evaluated under the Accreditation Criteria!
The recipe for perpetual ignorance is: Be satisfied with your opinions and content with your knowledge.
Elbert Hubbard

Getting an A was what most of us aspired to during our education, a B or even B+ might well be considered almost unacceptable. Perhaps surprising, however, to many of us, the same concept applied to patient satisfaction scores is incomprehensible. Just the idea of being subjected to patient satisfaction surveys seems abhorrent to many.

In a medical world of increasing complex mandates, reduced reimbursements, rising malpractice costs, and changing employment environments, patient satisfaction surveys seem another meddlesome burden. What do they really mean, why are they important, and should you care? The bottom line is they are an absolute requirement in the reality of today’s medical world, so understanding them is crucial to survival.

The origin of today’s surveys rests with data acquired by Xerox in the 1990s and then confirmed and refined by many over the ensuing two decades. What Xerox found simply was that fully satisfied customers (those who gave a score of 5/5) were six times more likely to repurchase a Xerox product than even those who gave a 4/5 score. Thus, it was recognized that in a competitive environment, loyalty was the reward for excellence. It was quickly recognized that the relationship between customer satisfaction and loyalty was not “regular”, that the steps between a seemingly linear Leikert scale (1-5) were not equal.

Excellence is the only way to assure customer loyalty, and the more competitive the market, the more this is important. There are two kinds of loyalty — true long-term loyalty and false loyalty. The latter can be observed when there is limited competition (single hospital system), there is a high-cost of changing (in the middle of a hospitalization/treatment), there are limited alternatives, or if strong loyalty promotion programs exist. For us as physicians, it is critically important to recognize false loyalty and the potential threats that could impact our practice. One easy example would be the appearance of an alternative spine surgeon in a local orthopedic practice. The only fool-proof way to protect yourself is to strive for true loyalty.

Surprisingly, poor service or products may not be the main or only cause of dissatisfaction. Equally important could be an inadequate process encountered after a bad experience or of attracting the wrong customer. The latter might seem unlikely in a neurosurgical practice but in fact, such a patient can demand huge resources for little gain or worse, a disgruntled individual capable of sabotage (see box below). Patients who doctor shop or those who have had a bad outcome from another physician encounter can fall into this category.

Increasing customer loyalty is the single most important driver of long-term financial performance. Achieving satisfaction in our patients reflects many disparate issues and thus may require different approaches to realize change. There are 5 categories of listening to a customer — they should all be used AND incorporated into the strategies derived. These include:
1. Customer Satisfaction Surveys
2. Random Feedback (such as a suggestion box)
3. Market Research
4. Frontline Personnel (requiring a formal mechanism to capture information)
5. Involvement in Strategic Planning (community members on boards, as an example)

Analyzing the sum of information gained from such efforts requires time, honesty and creativity in developing solutions. Recent analysis has led to the concept of key drivers, those specific factors that most influence satisfaction. Within hospitals, overall impact of excellence was related to the following in diminishing order:
1. Staff care
2. Nursing care
3. Physician care
4. Admission process
5. Room
6. Food

Important Customer Types

Loyalist/Apostle: This is what we strive to achieve, they not only will return unwaveringly to us and our group but they loudly sing our praises to their friends, neighbors, co-workers and more.

Defector/Terrorist: The dissatisfaction of this group is a serious threat. With the growth of web-based ratings such as Angie’s List, HealthGrades, and RateMDs, today’s impact can be monumental.

The Mercenary: A satisfied but not loyal group who constantly seek alternatives. They require high resources for little gain.

The Hostage: A less than satisfied group who remain loyal only because they have no alternative. Not optimal as changes may suddenly make an acceptable change possible.
In addition, despite an excellent rating on each component, an overall rating of excellent may not be achieved (as well as the converse—overall excellence may be scored in spite of several lower ratings). Key drivers may be very specific for a given hospital or practice and they can also change over time. Development of strategies to address identified problems should be a high priority for every practice environment though investment of resources for correction will obviously be limited. Just one example might prove illustrative. If difficult building access to patients is identified as a key driver of dissatisfaction, then building a new parking structure could be costly and take many years while providing valet parking could be an acceptable alternative.

There are many other benefits of and reasons to care about having satisfied patients. Studies show they are not only more loyal but they are more compliant with treatment regimens and ultimately more efficient (using fewer resources to achieve the same results). Increasingly, patient satisfaction is a critical part of national and local outcomes QI efforts, something likely to impact reimbursement in the coming years. Finally, many practices do or will soon link financial incentives to performance on these types of surveys. As our employment structures continue to shift away from small subspecialty groups to larger practices, multispecialty groups, and hospital employment, this will loom ever larger.

Patient satisfaction is not synonymous with good patient outcomes. Patient satisfaction is often defined as “The degree to which a patient feels they have received high-quality health care” (Chow), but this concept of quality health care should not be misconstrued to be the same as a good clinical outcome. As neurosurgeons, we frequently balance what we feel is medically appropriate for the patient versus satisfying the patient requesting new technologies or treatment that they saw advertised. An example may be seen with the proliferation of “pill mills” or pain clinics in Tennessee which cater to those with chronic pain and in search of narcotic medications. While they do have a high patient satisfaction rate, this was associated with Tennessee having a growth rate of narcotic use rising 206% from 1997-2005 and associated rising death rate from drug overdose to 26% above the national average (Tennessee Medical Association 2006 Data Set). However, while patient satisfaction may not be a valid proxy for surgical quality with respect to safety and effectiveness, as Neurosurgeons, we frequently struggle to balance patient satisfaction with becoming too utilitarian in focusing on a patient’s medical needs only.

This life is not for complaint, but for satisfaction. (Henry David Thoreau)

Patient satisfaction surveys are here to stay. If you understand the critical importance of achieving excellence in assuring true loyalty and commit to the process for improvement, they can be your friend rather than your foe. In the end, think for a moment of yourself as a customer rather than a provider — what would you want and demand?

References
Key Drivers of Excellences: FAQ. Professional research Consultants (www.PRConline.com)
YOU ARE BEING MEASURED

In 2013, the Council of Medicare and Medicaid Services (CMS) will begin to capture Physician Quality Reporting Systems (PQRS) data with the aim of restricting Medicare reimbursements for the 2015 fiscal year. **Without intervention and change in coding practices, neurosurgeons in the US face a $10,000,000 cut in Medicare reimbursement in 2015 from this single CMS measure.**

Many neurosurgeons do not participate in the PQRS system. The measures that are available do not directly apply to our specialty, and most only deal with process issues, at best an indirect means of assessing quality of care. In the last year where data was available, only 19% of neurosurgeons participated in PQRS.

However, even if you are not participating in federal quality reporting efforts, your practice is still being measured by many different entities, including:

- Third Party Payers
- Third Party Benchmarking Companies
- Industry (Device and Pharma)
- Professional Societies
- Hospital Systems
- Your Practice or Group

Even if you do not participate in PQRS, your practice data, quality metrics, and patient process and outcomes results are still being tracked.

The Institute of Medicine estimates that medical errors account for between 44,000 and 98,000 deaths each year, in addition to adding over $15 billion in health care costs. Hence, there is great interest in measuring clinical practice, identifying clinical variation, and reducing, where possible, unexplained variation.

Improving the quality of care provided to our patients is a noble goal. Focusing upon patient safety and avoiding medical errors, while raising quality expectations and providing more integrated clinical services, will optimize individual patient experiences. But, there may be other factors at play. Identifying, managing, and reducing costs may disadvantage some providers and patients. Economic profiling of physicians may reward health care savings and low-cost providers, but at the expense of high-quality care. While practice data may be used to identify opportunities for improvement, the potential for abuse is present as well.

Who is Measuring You?

The federal government, through CMS, is one of the primary agents collecting clinical data. CMS has tremendous access through aggregating patient data via Medicare billing and by developing and monitoring incorporation of PQRS measures into physician practices. CMS also contributes to new measure development through interacting with the National Quality Forum (NQF), the Agency for Healthcare Research and Quality (AHRQ), and the Patient Centered Outcomes Research Institute (PCORI); CMS is a major force in determining the focus of new quality efforts. CMS, through tracking billing records of beneficiaries, has access to a wealth of patient- and physician-specific data.

Some of this data may be publically accessible in the near future. The Patient Protection and Affordable Care Act (PPACA) mandates that physician compliance with PQRS measures be publically reported. These measures may be combined with other data as well, including effi-
ciency (cost) and patient experience measures. Numerous errors with other publically reported CMS physician-specific data have occurred.

Medicare spending per beneficiary is tracked as an efficiency measure. CMS has also been mandated by the PPACA to consider other payment approaches than the present Medicare fee-for-service system. Piloting of bundled payment systems is being explored, and likely will be introduced for select clinical diagnoses in 2014. Claims data will provide spending for an episode of care, with pre- and post-operative spending, hospital costs, Medicare A and B costs, pharmacy costs, and long-term care costs all available for modeling. Physician-specific information on beneficiary expenditures might be misused for economic credentialing, another area where physicians must remain vigilant.

Your hospital likely also tracks numerous clinical elements referable to your practice. Hospital acquired conditions (HACs) are an increasingly important element in hospital billing. The Hospital Inpatient Quality Reporting Program mandates tracking and reporting a set of hospital acquired conditions; hospitals not complying with reporting mandates face a 2% cut in CMS reimbursement. Some of the HACs that may impact neurosurgery include surgical site infections and venous thromboembolism. By 2015, there will be 76 separate measures followed by this program. Physician- and department-specific incidences of these HACs are routinely generated by hospitals as part of their internal quality efforts.

Private insurers maintain their own proprietary databases and share clinical and cost data on their enrollees. There are large claims-based databases maintained by industry research groups, where insurers contribute de-identified data and then share data mining capabilities. Modeling of these large administrative databases may allow for cost of care analyses to be linked to individual providers.

Industry and pharmaceutical concerns also track clinical data. Spine manufacturers maintain registries of individual provider’s case load, and can construct models of local trends. Pharma companies maintain records of physicians prescribing records and medication use. Each of these may factor into industry marketing efforts.

There is a whole additional class of third-party benchmarking concerns. Online resources, including HealthGrades and Angie’s List, may provide information about providers. US News and World Report publishes their annual widely read ranking of US hospitals by specialty. For readers in an academic environment, it is quite possible your facility reports to the University Healthcare Consortium already, where outcomes and process of care data are pooled between academic facilities and where facility to facility comparisons are possible.

How Does our Specialty Face These Challenges?

First is to realize that, whether or not you participate in PQRS, whether or not you are responsive to your hospital quality personnel, and regardless of how you feel about process measures being deemed quality predictors, you are being measured. You are being measured by many diverse entities throughout the breadth of your clinical practice.

Taking ownership of your data, benchmarking your own practice both locally and nationally, and participating in registries are important means of insuring the integrity of this data and of guaranteeing that patients maintain access to neurosurgical care.

How Does this Affect a Practicing Neurosurgeon?

Even ignoring the risk of economic profiling and penalizing high-cost providers, the measurement society that we function within may impact day-to-day aspects of our practices. Observed-versus-expected mortality incidences are common for cerebrovascular patients; insuring accurate medical records and capturing comorbidities that may impact expected mortality rates are important in generating accurate modeling. Similarly, complications such as surgical site infections may entail observed-versus-expected modeling.

This activity may herald a pendulum shift in health care financing, with a transition from rewarding physicians with busy, high volume practices to a model rewarding cost control via a move to an Accountable Care Organization or shared savings model.
MEASURING OUTCOMES IN NEUROSURGERY: THE CLEVELAND CLINIC EXPERIENCE

Introduction

The measurement of quality and value in healthcare has become increasingly important in the last decade. Many, including those outside of medicine, are calling for improved reporting of performance of both hospitals and individual physicians. In 2006, President Bush via executive order mandated “...that health care programs administered or sponsored by the federal government promote quality and efficient delivery of health care through the use of health information technology, transparency regarding health care quality and price and better incentives for program beneficiaries, enrollees and providers.” In response to this order, the Center for Medicare and Medicaid Services (CMS) developed an initiative for value driven health care. This initiative heralded a push to change the American healthcare system from a purely fee-for-service to a value-based system. Within this paradigm, the measurement of outcomes is of great importance as value – or, in economic terms, is defined as outcomes.

Currently, mainly process measures, such as administration and timing of perioperative antibiotics, are used for determining quality. Unfortunately, these measures often have very little to do with how the patient actually fares. Although, more difficult to obtain, improvement in patient derived validated disability and quality of life surveys may be a more useful and fair means of determining quality in health care.

The Knowledge Project

In 2007, the Cleveland Clinic started the Knowledge Program (KP) as a collaborative effort between the Neurological Institute, the Imaging Institute and the Division of Information Technology. The goal of the program is to collect outcomes data on every patient seen in the Neurological Institute (NI) at Cleveland Clinic and store it in a database that can then be used for quality improvement initiatives. As the NI consists of 15 disease based specialty centers accounting for over 154,944 ambulatory visits in 2010 and includes neurosurgeons, orthopedic surgeons, neurologists, psychiatrists, radiologists and physiatrists, this proves to be a very complex and daunting task.

Obviously, only the broadest of health status measures would be applicable across the entire population of patients that are seen in the NI. Although, these measures can allow for comparison across disease states, they are of limited usefulness when assessing specific procedures or treatments. Each disease specific center, therefore, was tasked with choosing disease specific validated outcome measures to be used on their patients. The appropriate disease specific measures along with the Euroqol quality of life measure and PHQ-9 depression scale would then be administered to every patient at each visit. In the Center for Spine Health, for example, the panel of questionnaires includes the aforementioned Euroqol and PHQ-9 as well as the Patient Disability Questionnaire (PDQ), a Visual Analog Scale (VAS). For patients complaining of neck pain the modified Japanese Orthopedic Association myelopathy score (JOA) is administered as well. This panel of validated health status measures allows for the measurement of patient outcomes not only at an individual level but also for evaluation of the effectiveness of treatments across the population.

In order to improve work flow and efficiency, the health status measures are collected electronically on tablets in the waiting room (Figure 1). The data is then downloaded into the database via secure WiFi and simultaneously into the electronic medical record (EMR) for real-time review by the clinician. Patients also have the option to complete their questionnaires prior to their visit by logging on to “my Chart”, the secure patient internet portal, from home.

In addition to the health status measures, the KP database automatically captures discrete elements from the EMR including demographic information, vitals, laboratory values, operative procedures, and radiographic studies.
The KP in Practice

When a patient is seen as a new outpatient in the Center for Spine Health they are given a tablet upon registration. Once completed, the data from the questionnaires is automatically downloaded into the database and made available to the clinician via the EMR. On each subsequent visit to the outpatient clinic a similar questionnaire is administered. The data from each administration can then be compared to see if the treatment or intervention is "working”. Pre- and post-operative scores can be compared at a variety of time points (6 weeks, 3, 6, and 12 months). In the example below, one can see the dramatic improvement in PDQ (disability) and PHQ-9 (depression) scores of a patient who underwent a L4-5 decompression and instrumented fusion for degenerative spondylolisthesis and stenosis (Figure 2).

In addition to looking at outcomes on individual patients, storing the data on an IRB approved searchable database allows one to study outcomes for groups of patients. For instance, one could compare different treatments for patients with a particular diagnosis. Alternatively, one could look at outcomes for all patients undergoing a specific therapy/intervention (Figure 3). These data can then be used for both quality improvement initiatives as well as comparative effectiveness research.

Conclusion

It is still uncertain what outcomes measures will be mandated for pay for performance initiatives on a national level. Ideally, measures that take into account the patients’ quality of life and disability level will be chosen. Regardless of what measures are eventually chosen, collection of outcomes will become a necessity for practicing neurosurgeons in the near future. A web-based, patient-centered outcomes system, such as the Knowledge Project, can provide an efficient cost effective means for collecting and utilizing outcomes data.

Acknowledgement:

Eric A. K. Mayer, M.D. and The Knowledge Program Data Registry of Cleveland Clinic, Cleveland, OH, for assistance with the data and figures used in these analyses.

Figure 2: Health status measures over time for an actual patient that underwent L4-5 decompression and fusion for L4-5 stenosis with mobile grade 1 degenerative spondylolisthesis. Note the dramatic improvement in disability (PDQ) and depression (PQ-9) scores postoperatively (December 2011). The patient also showed improvement in overall quality of life scores (EQ-5D, top).

Figure 3: Graph showing changes in health status measures for patients undergoing lumbar microdiscectomy for lumbar disc herniation with radiculopathy at Cleveland Clinic in 2011.

In addition to looking at outcomes on individual patients, storing the data on an IRB approved searchable database allows one to study outcomes for groups of patients. For instance, one could compare different treatments for patients with a particular diagnosis. Alternatively, one could look at outcomes for all patients undergoing a specific therapy/intervention (Figure 3). These data can then be used for both quality improvement initiatives as well as comparative effectiveness research.
DOES PRESS-GANEY REALLY MEASURE PATIENT SATISFACTION?

“Performance, competency and quality in medicine”... for the past few years, we have heard about how we, as neurosurgeons, are evaluated, rated and graded. We have seen the hospital advertisements, awards, and accolades, boasting about their respective ranking on patient satisfaction scores. But what does all this mean for neurosurgeons? Do our patients and their families really care about these seemingly subjective metrics of quality? In 1979, Dr. Irwin Press of the University of Notre Dame spoke to his university anthropology class about this very topic. Dr. Press was interested in developing an effective survey to assess patient satisfaction as it related to their experience with physicians and hospitals. He partnered with Rod Ganey, PhD, an expert in survey methodology and statistics to create what we now know as Press Ganey. Press Ganey, located in South Bend, Indiana, was founded in 1985 and has become one of the leaders in health care performance improvement. Press Ganey has been utilized by more than 10,000 health care organizations in the United States. The company has developed and marketed survey tools which assess the patient’s perspectives about the care they received in order to benchmark the performance of a specific health care organization. These surveys are not based on medical outcomes alone; in fact, they rely on the patient’s opinion about the care that they received. The data collected are used to provide feedback to the respective hospital or organization which theoretically assists the organization improve quality and efficiency and strategically increases their competitive market share.

According to the Press Ganey website, their core values are partnership, innovation and service. The company partners with organizations to assess metrics of performance which should help the organization improve the quality of medical care and service it delivers. Their impressive team of senior executives are all experts in marketing, business, political science, sociology and law, psychology, math, computer science and personnel management; although one of their team does have an MBA with a concentration in healthcare. Press Ganey offers various assessment tools or “suites” to evaluate clinical performance in the areas of safety, quality, and value-based purchasing. Operational performance and partnership performance survey tools are created and marketed to improve “clinical quality, efficiency and outcomes” by defining “variations” in standard of care.

Although most hospitals attempt to assess patient satisfaction, there was no national standard for collecting or reporting data that would permit valid comparisons. HCAHPS (the Hospital Consumer Assessment of Healthcare Providers and Systems Survey) was created in order to provide standardized survey questions and data collection methodology for measuring patient satisfaction. HCAHPS was developed by the Centers for Medicare & Medicaid Services (CMS) and the Agency for Healthcare Research and Quality (AHRQ), another agency in the Department of Health and Human Services. HCAHPS is basically a series of questions that can be combined with organization specific queries, and the survey questions can be administered and the data collected and reported by an outside vendor, such as Press Ganey. Surveys may be collected online, via telephone or by direct mailings to patients. Survey data is uploaded to a HCAHPS data “warehouse” called QualityNet.

The Health Services Advisory Group (HSAG) evaluates the available data. “Benchmarks of care”, based on the data uploaded to QualityNet are then developed. Achievable Benchmarks of Care™ (ABC) are reported to reflect superior performance by the “top” institutions. These care “levels” represent the quality of medical service provided by “best-in-class” performer hospitals and organizations. The top 10th percentile scores are used to identify the top 10 percent of all hospitals on a national basis. Although hospitals voluntarily implement HCAHPS under the auspices of the Hospital Quality Alliance, there is significant public pressure to participate in quality assessment and improvement. Additionally, many hospitals utilize their performance “scores” for the purposes of advertising and marketing. CMS even provides a “Hospital Compare” website, to allow, and perhaps encourage patients to look at their local and regional hospitals at www.hospitalcompare.hhs.gov. Once you enter your zip code of interest, hospitals located within 25 miles of that zip code are provided with comparisons of patient survey results, timely and effective care, readmissions, complications and deaths, use of medical imaging, payments, and number of Medicare patients served for a specific surgery or diagnosis. One interesting reported metric, available for patient viewing, is the percentage of outpatients who received a head CT and who received an “unnecessary” CT scan of the sinuses at the same time.

So, whether you like it or not, patients are able to look at and compare patient numbers, outcomes and satisfaction, between hospitals and organizations. These data are submitted by the hospitals themselves or by organizations
such as Press Ganey, who are employed to collect and report data for the hospitals. Large hospitals provide high volume care to acutely ill, complex patients and in doing so they accept the risks associated with those patients. The increased morbidity and mortality associated with the education and training of resident physicians and surgeons are also carried by large academic medical centers. The validity of reported summaries and “benchmarks” relies completely on the truth and honesty of the data entered and uploaded to QualityNet. Hospitals employ nurses, social workers and others to assist in collection of hard data and input the data. Errors are possible and hospitals have incentives to report “quality care”. Many physicians contend that the validity of these metrics have not been truly determined. However, the data we have available through websites such as the aforementioned, are the only data we have and that data are already being used by the government to determine payments for services rendered. How patients utilize, interpret and depend upon these reported metrics are completely different questions and for the most part, have yet to be determined. Yet it is certain, that hospitals who reportedly perform well do utilize their “high scores” for marketing and advertising purposes. There are many hospitals and organizations that will selectively publicize their highest rankings, which is a self-serving, but often successful promotional tactic.

There are many variables that may influence and invalidate the data collection and reporting process, from the erroneous interpretation of a physician’s notes, to an accidental omission from the patient’s chart. I will never forget a child’s death that was attributed to “pediatric neurosurgery”, because when I was called in to explain the occurrence, I was surprised to discover that neurosurgery had never even been consulted for the child. The child had experienced such severe closed head injury that the child experienced a cardiac arrest in the trauma bay and expired. The death from “severe traumatic brain injury” immediately made the mortality “mine”; yet, as a matter of fact, I had never even seen this unfortunate child. So was that death, assigned to “pediatric neurosurgery” as a reportable mortality truly “owned” or “earned” by our service? I do not believe that any of us would agree to accept this responsibility, yet there it was. The data could not be changed. It was “true” but in my opinion, not “valid”. So how does Press Ganey interpret that? Does anyone care to tease out the reality, or is Press Ganey and other similar organizations, such as CMS, just interested in “selling” sexy statistics? Statistics that may not be valid...but are still sold to the public as true measures of performance and quality! You may make your own decision, but in my opinion, the quality and legitimacy of these surveys and the data they generate still have not been proven.
HOW DO WE MEASURE QUALITY IN THE TREATMENT OF PAIN?

One would think measuring quality in pain treatment might be straightforward: use a numeric rating or visual analog scale and ask a patient at different points in time how much pain he or she has. Those treatments or programs providing the best outcomes - greatest pain relief with the fewest complications and/or lowest cost - would be judged to be of the highest quality.

However, pain is an inherently subjective experience: treatment outcomes are almost always assessed through some form of patient-reported measure about pain perception. Perception of pain is dependent, though, on emotional valence, availability of comparison experiences, distraction, and expectations. Unless pain is completely eliminated by a treatment or program, the subjective experience of pain may be too variable over time to know if measuring it at points A and B provides a valid and representative picture of that treatment or program. Therefore, a number of assessment methods have been developed. Each method used tends to correspond to the priorities of the different stake-holders in the quality measurement activity.

Patients are concerned with overall reduction in pain and suffering, quality of life as measured by what they can do after an intervention compared to before that intervention and, potentially, reducing the need for medications that have side effects or are expensive. Patients are also concerned about the complications or side effects of pain relief interventions themselves (e.g., Vioxx), or about the costs of pain treatments. Pain relief itself, then, is only one component of a patient assessment of quality.

The treating clinician is concerned with patient satisfaction with the result of a pain treatment and in not doing the patient harm. The former is most easily measured by asking the patient whether, knowing the result in advance, he or she would undergo the intervention again. The clinician is generally not particularly cost-conscious, unless compelled to address cost issues by outside forces. In fact, he or she may be incentivized to encourage or use expensive treatments that result in increased compensation.

Payors may have different priorities. Payors do not just include insurers, be they private or public, but also private citizens, who do not want to see their insurance premiums or taxes increase to pay for treatments that are ineffective or to support people who are perceived as taking advantage of the system, and even patients themselves, in the form of deductibles, co-payments, or co-insurance for treatments received. Payors are much more concerned with the “big picture” of whether an intervention is worth the expense, either when implemented in a population or for an individual. For example, Deep Brain Stimulation for pain seems to be an effective treatment for central pain in 20% of patients. However, it is expensive and a subpopulation with a higher rate of success has not been identified yet. Therefore, it is not worth doing, either as a general policy judged by society as a whole or for an individual considering a 20% chance of benefit.

The definition of a meaningful outcome may be different to the payor than to either the patient or the clinician. A 20% reduction in pain (as assessed on a formal pain scale) may be meaningful to the patient and clinician, but an insurer or employer is more likely to encourage interventions that get the patient back to work and reduce health care utilization over the long run. In choosing whether to cover an intervention or in choosing one intervention over another, even the most compassionate payor is interested in maximizing quality adjusted life years (QALY) per dollar spent.

One problem in assessing treatment or program quality, even with the availability of quantitative pain measures as outcome measures, is that pain is treated by a variety of different clinicians who all use different outcome scales, even when treating the same disease, making such comparisons near impossible. The SPORT trial used SF-36 bodily discomfort and physical function subscales and the modified Oswestry Disability Index (ODI) as primary outcome measures.2 PROCESS and other trials on spinal cord stimulation (SCS) have used 50% reduction in a visual analog scale (VAS) measure of pain in the leg as primary outcome measures.3 Trials on epidural steroid injections, exercise, and chiropractic manipulation have tended to use the Roland-Morris Disability Index and numeric rating scale (NRS) of pain, although some have used the ODI. A proposal for standardized outcome measures for low back pain research4,5 including measures of pain, has not resulted in standardization of pain measurement across all relevant clinical domains.

North’s prospective, randomized trial of spinal cord stimulation vs. repeat lumbar spine surgery demonstrates the problems that different outcome assessments present when trying to analyze comparative effectiveness.5 Fifty percent pain relief and whether the patient would undergo the operation again were the primary outcome measures, as opposed to...
Patients who underwent repeat spine surgery did very poorly, with only 3 out of 26 patients in the surgical arm meeting criteria for success, much worse than would be expected when compared with historical controls that have used ODI, SF-36 or other functional outcomes. This finding raises the question as to whether the traditional bar for success used in papers on SCS is too high or that used in papers on lumbar spine surgery is too low.

Some traction on this problem may be gained by using concepts of “minimum clinically important differences (MCID)”. Psychometric studies for several commonly-used pain measures have used both patient and clinician judgments to identify the smallest absolute or relative decrease in pain that either patients or clinicians would consider to be clinically significant. The effects of spinal cord stimulation in neuropathic pain are sustained: a 24-month follow-up of the prospective randomized controlled multicenter trial of the effectiveness of spinal cord stimulation. Neurosurgery. 2008 Oct;63(4):762-70; discussion 770.

There are other approaches that can be used to assess quality in pain treatment programs. Quality can be assessed in terms of structure, process, and outcome variables. Our focus here has been on quality in the domain of patient outcomes (i.e., pain relief). We recognize, though, that there can be evidence-based guidelines and related quality measures focusing on either structural features of pain treatment programs, or on processes of care. An approach like this has been developed in the context of cancer pain treatment, with a strong focus on evidence-based process measures of quality.

Because of the difficulty in determining comparative effectiveness, we recommend the NINDS hold a meeting on Pain outcomes, bringing together stakeholders from the different professional societies whose members treat pain, patient advocates and payors, to address both the common data elements that should be used in future studies as well as what is a meaningful difference in pain. Given implementation of the Affordable Care Act in 2014 and the Institute of Medicine’s 2011 Report on Pain in America, the timing is perfect.

References
HOW DO WE MEASURE QUALITY IN THE NEUROSURGICAL CARE AND MANAGEMENT OF TUMORS?

The passage of the Patient Protection and Affordable Care Act (PPACA) has led to an increasing emphasis on quality and cost of healthcare and includes numerous changes to the Medicare and Medicaid programs aimed at making healthcare providers more accountable for outcomes and overall value of care, with a similar emphasis on outcomes reporting also occurring in private insurers. But defining and measuring quality is challenging, and will likely need to be specialty and disease specific.

There are several challenges particular to measuring quality in neurosurgical oncology. First, patient and provider preferences can make it difficult to perform the randomized clinical trials that would be needed to determine what populations might benefit from surgery, leading to limited availability of Level 1 evidence in neurosurgical oncology. Second, acceptable rates of morbidities must be normalized to the oncologic diagnosis and cancer-related treatments being used, since some morbidities are influenced by oncologic factors, such as the tendency for glioblastomas to secrete specific factors that can increase thromboembolic complications or the adverse effect of bevacizumab chemotherapy on wound healing. Third, the risk of many morbidities is elevated in neurosurgical oncology because the cancers often trigger case-specific decision making, such as the decision regarding whether the risk of hemorrhage into a resection cavity is high enough to preclude the use of thromboembolism prophylaxis, or the decision to start chemotherapy or radiation soon after surgery due to aggressive tumor behavior outweighing the need to wait an adequate amount of time for wound healing. Fourth, the aggressive behavior of some brain and spine tumors must be accounted for to determine acceptable postoperative mortality rates.

In the Explorations in Healthcare Quality and Monitoring series published between 1980 and 1985, Donabedian divided quality measures into Structural, Process, and Outcomes measures. Examples of structural measures of quality include whether the provider has certifications or proof of sufficient completed case volume for the case in question. The former is challenging in neurosurgical oncology because board certification is relatively common and not always reflective of subspecialty-specific training, while neurosurgical tumor fellowship training is often done by a small percentage of neurosurgeons specializing in tumors in order to learn from a specific mentor rather than to acquire a skill set that can be considered essential to neurosurgical oncology. Proof of sufficient completed case volume for the case in question has some appeal as a quality measure, given that studies analyzing the Nationwide Inpatient Database have shown that greater surgeon experience improves patient outcomes in a variety of neurosurgical tumor operations, including pituitary surgery. Despite this data, when studied in terms of either clinical outcomes or cost effectiveness, structural measures of quality are only poorly correlated with the quality of healthcare delivery.

Process measures include adherence to evidence-based guidelines in terms of use of perioperative antibiotics and thromboembolism prophylaxis. The development of tumor-specific evidence-based guidelines can be challenging because of difficulties performing randomized clinical trials in neurosurgical oncology, but the recent development of guidelines produced by neurosurgical organizations like the CNS for areas of neurosurgical oncology like glioblastoma and metastases could eventually give rise to tumor-specific quality process measures. However, the development of reliable tumor-specific guidelines that measure every aspect of quality will require mobilizing neurosurgeons to work in collaboration with neuro-oncologists, cognitive neuropsychologists, and other specialists in a concerted effort to generate more guidelines focused on outcomes and quality measures that go beyond traditionally reported metrics to help further the field. Specifically, measured outcomes will need to be expanded to include endpoints focusing on quality of life and return to function, as other fields like spine surgery routinely emphasize, in addition to conventional outcomes after tumor trials which are often radiographic or survival-based. While the latter will continue to be important, ignorance of the former would mean overlooking a key component of quality.

Efficiency process measures include whether or not the procedure was justifiable under evidence-based care criteria, the individual providers’ average length of stay after the procedure in question, or cost-of-care in performing the procedure. While process measures generally perform better than structural measures in predicting quality of healthcare delivered, the correlations to clinical outcomes remain poor.

Outcomes measures are the most difficult and expensive measures to collect and analyze. Outcome measures like mortality or “rate of discharge to other than home” require care-
ful risk adjustment to ensure fair assessment, particularly for malignant brain tumor patients. While properly defined outcome measures can assess the quality with which a particular operation was performed, these measures do not address whether the procedure should have been performed in the first place – an important cost-effectiveness consideration for asymptomatic benign tumors like pituitary tumors and meningiomas or multiply recurrent malignant tumors with a poor prognosis.

The increasing emphasis on quality and cost of healthcare will require the development of reliable ways of measuring quality. These methods will need to account for specialty specific factors, particularly in neurosurgical oncology, where numerous factors including but not limited to preoperative decision making, tumor pathology, and adjuvant therapies will need to be accounted for. In order to create measurements that accurately account for these challenges, it is imperative for neurosurgeons specializing in the care of tumor patients to take a leadership role in this process, including the publishing of evidence-based guidelines and the creation of large nationwide databases that will record outcomes and morbidities to ensure that any implemented measures are successful in reducing morbidity. An example of such a database could include the N2QOD/NPA platform. N2QOD/NPA, which was originally designed for spine outcomes, is now being expanded to include a new module focusing on tumors, which is currently in the planning stages.

References

Traumatic brain injuries (TBI) are responsible for approximately one third (30.5%) of all injury-related deaths in the United States, with 1.7 million injured on an annual basis. Advances in the treatment of TBI and the institution of TBI guidelines have significantly reduced severe TBI mortality from 50% to 35% to 25% and lower over the last 30 years (www.braintrauma.org and www.cdc.gov/traumaticbraininjury).

When faced with the patient with severe TBI (Glasgow Coma Scale < 8), neurosurgeons need simple-to-administer, reliable, and reproducible quality outcome measurement scoring systems that assist with prognostication so that doctors and families can make long-term medical decisions. In fact, defining quality outcomes for medical decision making is becoming increasingly important as we move toward increased oversight from governmental and insurance agencies that will demand not only institutional but also doctor-specific measurements of outcome.

In dealing with TBI, meaningful scoring systems should analyze both patient functional outcome and their overall quality of life to provide accurate predictions of how patients will ultimately fare based on data that are clinically available within the first few days after injury. The Glasgow Coma Score (GCS), especially the motor score, which is assigned in the acute admission and post-resuscitation stages, has correlated with outcome. In addition to GCS, the literature has consistently shown that age, pupillary response, and initial computed tomography findings have good correlation with outcome. It is important to note, however, that recovery from head injury can be ongoing for a year or more. Although many TBI outcome scoring systems have been designed, the ex-

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<th>Table 1. Functional and quality-of-life outcome measures used in patients with traumatic brain injury</th>
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<td>Glasgow Outcome Scale (GOS)</td>
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Note: For complete list of outcome measures used in patients with traumatic brain injury, see Center for Outcome Measurement In Brain Injury (COMBI) website at www.tbims.org/combi.
tended Glasgow Outcome Scale (GOSe) for patient function and the SF-36 for patient quality of life remain the most widely used in the TBI literature (Table 1). Other scoring systems include the disability rating scale, functional independence measure, and functional assessment measure; however, these functional outcome scoring systems do not address a patient’s quality of life, an important component in counseling patients’ families.

The original Glasgow Outcome Scale (GOS) was first described in 1975 and categorized patients into five outcome categories based on broad functional outcomes ranging from resumption of normal life to coma (Table 2). Because of wide variations in patients with the same GOS score, the GOSe was proposed and offers a total of eight possible functional outcomes (Table 2). By adding an “upper” and “lower” functioning category to the severe disability, moderate disability, and good recovery categories, doctors were able to better subcategorize TBI functional outcomes. Currently, the GOS and GOSe at 6 and 12 months are the most researched and reliable outcome measures.

The SF-36 is a multi-purpose, short-form health survey with 36 questions covering eight profiles of health-related quality-of-life (HRQOL) items, including physical functioning, social functioning, physical role, emotional role, mental health, vitality, bodily pain, and general health. Each separate item is scored between 0 and 100 (100 best). The SF-36 is a generic measure that does not target a specific disease status, but the test can be divided into mental and physical health summation scales. For example, using the SF-36 and psychiatric measures, authors have shown that TBI patients are at increased risk for psychiatric disorders, major depression, and chronic pain.

As research efforts focus on improving TBI outcomes, these long-term outcome measures of both functional limitations and quality of life are invaluable; however, for the busy clinician to utilize scoring systems they must be easy to administer, reliable, and repeatable. Hopefully, with the aid of well-established guidelines for the surgical and medical management of acute TBI, our initial and ongoing efforts will result in improved long-term functional outcomes in this challenging patient population.

### References


SPINE HEALTH-RELATED QUALITY OF LIFE (HRQL) MEASUREMENTS

The medical community at large, including patients, payors, physicians, and regulatory bodies, has had difficulty defining the meaning of the term “Quality,” and this has been particularly true for the spine community. The Merriam-Webster dictionary defines Quality as:

1. Peculiar and essential character: nature or an inherent feature

However, the sub-definition of Quality is:

2. Degree of excellence or grade

It is this definition that the medical community is presently focusing their efforts upon. As physicians we would like to assure that our patients are getting the maximal quality of life benefit from our interventions with the least amount of exposure to risk or harm. As a direct or indirect payer of medical care there is the issue of the maximizing quality of care with the least expense, and achieving the greatest additional quality per cost unit. For example if one procedure improves quality twice as much as another, but costs one hundred times greater, is that expense beneficial to the patient, society, or the physician?

With these variables in mind it becomes obvious that we as physicians need to remain focused on this complex matrix, how it is measured, and the factors that introduce bias. As an example, some measures of quality for an experimental technique may be irrelevant to the patient’s principal outcome and the “success of the operation,” such as the cosmetic appearance of the surgical incision. While a more precisely re-approximated incision may heal more effectively, it is unlikely that this would affect the patient’s primary outcome, which is typically pain relief and improvement in neurologic function. Nevertheless we can be judged severely by these factors. If two surgeons perform the same operation and one resulted in better cosmetic result, does that necessarily translate into a better outcome or higher quality procedure? Another example which has been used previously in numerous spine studies to measure success has been the arthrodesis rate. In studies of type II odontoid fractures, an easily obtainable metric is fusion rate. It was not until recently that surgeons have noted that a painless pseudoarthrosis might not be a “bad” outcome compared to cost and potential morbidity of an operative procedure. This question is still being debated, and several studies are attempting to answer this question.

Furthermore, the indications for a procedure have to be further explored, and the goals and expectations of patients better understood in order to assess concepts of “quality” and “success.” For example, if a lumbar decompression is performed for a disc herniation in one patient with severe sciatica and minimal axial back pain, compared with another patient presenting with minimal radiculopathy and mostly back pain, it is likely that the patient with sciatica will have greater improvement. This illustrates the importance of defining the question when investigating outcomes and quality.

Over the last two decades, significant efforts have been made to standardize and validate patient outcome measures. One of the difficulties has been that as questionnaires have become more thorough and inclusive, they have also become exceedingly onerous for patients to complete. We all know from personal experience that with limited time and attention spans this has resulted in a reduced percentage of patients completing these surveys. As such, there have been recent attempts to streamline these outcome measures, without losing validity. The goal of this article is to review selective outcome measures that are frequently used in the spinal population.

**VAS – Visual Analog Scale:** The VAS is a widely recognized quality measure in spinal surgery. It is a psychometric scale, which is used to attempt to measure and quantify patient’s pain level. This measure was one of the first attempts to elucidate that pain occurs in continuum and not discretely. This measurement should be performed with a 100 mm line anchored with no pain or 0 on the left side and very severe pain or 10 on the right side. The patients are asked to “mark their pain at that time on this line to represent.” There have been several variations on this scale with using further visual annotation such as smiley faces and color algorithms to help patients make a more accurate description.

**NPS – Numeric Pain Score:** Similar to the VAS, this linear measure of pain intensity has been widely popularized due to its easy and quick administration. The patient is asked to rate his or her pain on a scale from 1 to 10, with 1 being the least and 10 being the greatest. This method has been popularized for the acute setting to assist allied health personnel in their documentation of pain as “the 5th vital sign.” For both the VAS and NPS it is critical for the spine clinician to provide context. For example is the pain rating for neck vs. arm pain or back vs. leg pain?

**Likert Scale:** One of the first psychometric scales used in treatment of spinal disorders...
were graded scales and this methodology was attributed to psychologist, Rensis Likert. In this scale, patients are asked several questions and are asked to respond to them in a five-level scheme:
1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

The patient again is asked to answer several questions and based on these questions, tallies are summarized.

**SF 36 - Short-Form 36:** The 36-item Short-Form questionnaire was designed as a tool for the Medical Outcome Study (MOS). These 36 questions were felt to illustrate the minimal psychometric standards for group comparisons. This tool uses eight distinct assessments of health concepts:
1. Limitations of physical activities because of health problems
2. Limitations of social activities because of physical or emotional problems
3. Limitations in usual role activities because of physical health problems.
4. Body pain
5. General mental health
6. Limitations of usual activities because of emotional problems
7. Vitality
8. General health perceptions

These eight domains provide a physical component score and a mental component score. This form has been validated in several spine domains. One limitation is that scoring is not through simple arithmetic. Overall this form has been used in numerous medical studies and has been shortened to SF-12 and SF-6 forms. Thus, by using fewer questions, there is a better compliance rate of the patients with very significant reliability.

**Oswestry Disability Index (ODI):** The Oswestry Disability Index was developed by John O'Brien in 1976 and published in Physiotherapy in 1980, (66):271-3 by Fairbanks, et al. Although this outcome measurement is over 20 years old, it is still consistently applied to spine patients and utilized in spinal outcomes and has several versions. The present version is ODI 2.1 and is free to academic and clinical practices. This outcome measure has been validated in several languages (Danish, Dutch, Swedish, etc.).

The ODI has 10 questions where patients are asked to rate their activities (i.e. sleeping, sexual activity, walking,...) from normal to disabled. Each question is valued and from 0 to 5, where zero is no impairment and five is a significant loss in function. The total points are subtracted from fifty and multiplied by two to get the patient’s percentage of disability. For example a patient with no dysfunction would score zero points and have zero disability.

**Neck Disability Index (NDI):** The NDI is an additional HRQL tool that is specific for cervical disorders and consists of a 10-item questionnaire. The test was designed due to limitations of the ODI in the cervical region, but modeled after it due to its relative ease for patients. There question categories are divided into pain (n=2), activity of living (n=7), and concentration (n=1).

**EuroQol-5D (EQ5D):** The EQ5D is another health-related quality of life (HRQL) instrument which was created for cost-utility analyses and in particular to assess and compare therapeutic effects across different disease processes. This form is free for academic use depending on number and purpose. Please use the site (http://www.euroqol.org/) to register and for more information. This form is easy to use and consists of five questions, but in addition to HRQL information also provides utility data for cost per quality adjusted life year (COST/QALY). This information is very important as we attempt to allocate limited resources to society.

There are several studies that have analyzed myelopathy in an attempt to quantitate the degree of neurological dysfunction and reductions in quality of life. The Nurick Scale is the oldest and commonly used for cervical myelopathy. It broadly measures nerve root, spinal cord and gait dysfunction, and is limited in ambulatory measurements. The Japanese Orthopedic Association (JOA) Score measures upper extremity, bowel/bladder, and gait function. It was modified by Benzel and present form is mJOA were 0 is complete dysfunction and a 4 or 5 is normal. Based on total score patient’s myelopathy is categorized as: normal (>16), mild (16-12), moderate, (12-9), severe (<9).

The spine community has seen a rapid expansion in the number and variety of outcome measurement tools over the last several decades. These metrics are becoming more specialized, precise, and validated which will aid us in our ability to maximize patient’s goals and objectives. As stakeholders in this space, it is critical that we continue to frame our studies with careful attention to how investigational questions are defined so that we can ensure that the results not only reflect the scientific realities but also so that the conclusions are meaningful and relevant.
CEREBROVASCULAR NEUROSURGERY AND OUTCOMES

General Frame

The federal government has recently emphasized the importance of comparative effectiveness research (CER) to the future of US healthcare by allocating over 1 billion dollars from American Recovery and Reinvestment Act (ARRA) to this purpose. As further emphasis from the US government in healthcare quality evaluation, the Patient-Center Outcome Research Institute (PCORI) was recently created under the Affordable Care Act to compare clinical results and assist patients and clinicians during the decision making process.

By 2015, CMS Value Based payment will be applied to all US physicians. As a result, co-payment will be inversely related to the value of a specific intervention, resulting in higher co-payments for low-benefit interventions and reduced, or no, co-payment for high benefit interventions (preventive medicine, screening for devastating diseases, etc.) The ultimate goal of this legislation is to maximize both outcome and health system outcomes (Advisory Board, 2012)

Outcomes in Cerebrovascular (CV) Disease

A recent effort at improving health care quality in CV disease has also come from the non-governmental sector. The American Heart Association through the American Stroke Association established the Get with the Guidelines® program to improve data collection, provide national benchmarks, and improve the overall quality of stroke care. The program involves hospitals, committing them to maintain a prospective database through which results can be evaluated periodically in order to evaluate their adherence to the evidence based guidelines, obtain benchmark data for comparison between centers, and have risk adjusted stratified outcome analysis. Incorporation of the Get with the Guidelines® program has been shown to result in improved outcomes at participating centers.1

Despite these efforts, a recent study2 demonstrated that the time from symptoms onset-to-hospital-door (OTD) hasn’t changed in the last number of years, showing large opportunities to improve during the preadmission stage. Given the very narrow time window to administer iv-tPA, between symptoms onset and admission (3 hours and with some exceptions 4.5 hours), successful iv-tPA administration can be a significant challenge. Particularly since emergency rooms must draw lab samples, obtain results, get a CT head, prepare the medication and administer the drug. Based on this rational the door-to-needle (DTN) time

> BY 2015, CMS VALUE BASED PAYMENT WILL BE APPLIED TO ALL US PHYSICIANS. AS A RESULT, CO-PAYMENT WILL BE INVERSELY RELATED TO THE VALUE OF A SPECIFIC INTERVENTION, RESULTING IN HIGHER CO-PAYMENTS FOR LOW-BENEFIT INTERVENTIONS AND REDUCED, OR NO, CO-PAYMENT FOR HIGH BENEFIT INTERVENTIONS (PREVENTIVE MEDICINE, SCREENING FOR DEVASTATING DISEASES, ETC.) THE ULTIMATE GOAL OF THIS LEGISLATION IS TO MAXIMIZE BOTH OUTCOME AND HEALTH SYSTEM OUTCOMES (ADVISORY BOARD, 2012). <
benchmark has been established to 60 minutes or less. Unfortunately just 26% of eligible patients receive it in less than that. The next step will be to establish door-to-intervention (DTI) times, for comprehensive stroke centers, measuring the lapsed time from admission to beginning of the arteriogram for mechanical thrombolysis.

While outcomes following SAH have been well studied in randomized trials including International Subarachnoid Aneurysm Trial (ISAT) and the more recently Barrow Rupture Aneurysm Trial (BRAT), there remains a significant lack of systematic outcomes recording or reporting across a larger breadth of treatment centers. Some efforts to evaluate outcomes have been performed through analysis of data linked to financial data, as such data remains the most robustly collected data for analysis. This carries large gaps in the kinds of information available, as well as raises significant concerns for the lack of valid risk adjustment. For instance, both ISAT and BRAT used death and disability (mRS) at one year as primary outcome measures. The results are very similar favoring endovascular therapy, with a risk reduction on those measures in 7.5 and 10% respectively. However, simple data such as the mRS is not available in financial data based analyses, thereby preventing an evaluation of whether the results found for these highly selected patients are truly applicable to the population at large, based on current public databases. As with any thoughtful analysis, the metrics selected to evaluate outcome may have significant influence on the conclusion generated from the investigation.

“Quality” Databases

For these reasons it is of paramount importance that physicians and their collective societies develop and maintain quality widely applicable registries. It is only with such large volume high integrity data that we, as physicians, will be able to truly quantify the “Quality” of the service we provide, and in the future, such quantification will be an absolute necessity. Furthermore, if the desire is to truly understand benefits of our care then we must evaluate that care through the collection of physician designed, evidence driven data points. Only with clinically relevant data, we hope to provide appropriate risk adjustment and data interpretation.

To this end the AANS has developed the National Neurosurgery Quality Outcomes Database, N2QOD. This data registry is designed for the purposes of quality assurance and will allow the realization of the aforementioned needs. Currently two separate spinal modules are available. Cerebrovascular and tumor modules are in development. With the data generated by the N2QOD neurosurgery will be able to appropriately evaluate, document and improve on the care we provide to our patients at large.

References

Always go to other people’s funerals otherwise they won’t come to yours.

Yogi Berra

A mazingly, 55% of Americans and more than 40% over the age of 45 do not have a will. Many who do, have not kept it updated to reflect their changing financial or personal circumstances. Most of us have worked hard for many years to earn money and buffet our savings accounts but without a well conceived will, we may leave a complicated mess at the time of our death. If you don’t have a will—waste not a moment longer in preparing one and if you haven’t reviewed it in the last five years, dust it off and make sure it still reflects your wishes. None of us like to think about our own death but ignoring it doesn’t change the fact we will all face that day and your will is a critical part of your legacy. If you have complex finances or family, you may require intricate solutions and each state has its own laws regulating these matters but getting started remains most important.

There are a few basic rules to keep in mind.

1. **Be exact:** Regardless of legal jargon, this basic tenet is essential. State clearly who gets what and how. In some cases, you may choose to use specific dollar (or amounts (or items)) while other times percentages or general descriptions are more appropriate. Anything you do not specify exactly will make the execution of your will more difficult and can potentially delay making critical resources available in the wake of your passing.

2. **Forget the past:** Your will should not be a vehicle for revenge or restitution. When your will is carried out, you will no longer be in a position to explain, refute, or renegotiate. Take the time to clear these issues before that time comes.

3. **Communicate about your will:** Tell your family and any other involved individuals...
about the contents of your will and if necessary, the rationale for your choices. Needless to say, you also should inform them where you keep your will and who prepared it for you.

4. **Make it legal**: It is not essential for a simple will to be prepared by a lawyer though most of us will have sufficient considerations that make such professional advice wise. There are many online resources that can facilitate this process in part or entirely. (See references below.)

5. **Make it available**: These days, it is convenient to safeguard your will by creating an electronic version (such as a PDF file) that can be stored safely. This can become particularly useful if something happens to your home, if you travel frequently or if your death occurs away from your primary residence.

Beyond these basic principles are the more difficult decisions that can perplex us and thus lead to procrastination in completing this important process. The following covers just the essentials you must contemplate.

1. **Executor**: This individual(s) is the one who will insure that your will does what you intended. The executor had a huge responsibility including such tasks as taking charge of the assets of the deceased, paying any debts, and distributing the remaining assets to the named beneficiaries. (See references below.) Remember your spouse and children may have many challenges in the period after your death and may find filling this role a challenge. A trusted friend may be a better selection. Naming an alternative is also worth considering.

2. **Guardian**: While the thought of someone else raising our children is daunting, leaving this to chance is unacceptable. Many find this the single most difficult decision and one for which the best answer changes significantly over time. Considerations include not only the person themselves but location, finances and living environment. In the wake of parental loss, a teenager nearing the end of high school may most need to remain in their known environment with the support of their friends, neighbors and teachers. Alternatively, very young children may benefit from proximity to grandparents or other family members. Most likely, the perfect guardian doesn’t exist but with honest consideration of your choice and then clear communication with that individual(s), a reassuring scenario can be crafted.

3. **Trustee**: Many find it necessary or advantageous to divide the financial obligations from the personal ones by creating a trustee in addition to a guardian. This may apply, for example, if your preferred guardian has limited experience or expertise in managing what may be complex financial matters. Often, you may trust the experience of an older person with this task while choosing a contemporary to steer your child’s education and day-to-day environment.

Finally, there are important considerations about distributing larger amounts of money. While the legal age of majority is 18, few would consider most at that age likely to take optimal advantage of a large inheritance. For this reason, many use alternative strategies such as delayed distribution (a trust fund can provide needed expenses such as college but the principle amount becomes available at a later age such as 25 or 30) or staged distribution (a percentage available as age 18, 25, and 30). The older your children get, the more many of us decide to postpone the age at which they have free access to their inheritance. Warren Buffet advised to leave your children, “enough money so that they would feel they could do anything, but not so much that they could do nothing!” If you are fortunate enough to have acquired a significant estate, think seriously of making a meaningful charitable contribution.

Once you have acknowledged that preparing your will should be a priority, take just a few more minutes to execute a Power of Attorney, Health Care Proxy, and a Living Will. Taken together, these can facilitate things for you and your loved ones during challenging times. Keeping your head buried in the sand is just not an acceptable option.

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**Select Internet Resources**

**Writing a Will**  
http://www.usa.gov/topics/money/personal-finance/wills.shtml


**Selecting a Guardian**  


**Executors**  
http://www.estatesettler.com/What_are_executor_responsibilities_4489.html
OIG ISSUES OPINION REGARDING ON-CALL PAYMENTS TO PHYSICIANS

O

On October 30, 2012, the Department of Health and Human Services’ Office of Inspector General (OIG) published an advisory opinion addressing whether the anti-kickback statute may be triggered when a hospital pays a per diem fee to physicians for providing on-call hospital emergency department coverage. The anti-kickback statute makes it a criminal offense to knowingly and willfully offer, pay, solicit, or receive any remuneration to induce or reward referrals of items or services reimbursable by a Federal health care program. A hospital requested the opinion to bless its on-call per diem structure due in part to shortages in neurosurgery and neurology.

The OIG concluded that this particular arrangement presented a low risk of fraud and abuse and would not give rise to administrative sanctions due to a variety of factors outlined in the opinion, including:

• The hospital certified that, based on an independent valuation, the per diem payment amounts are commercially reasonable, within the range of fair market value for actual and necessary services provided without regard to referrals or other business generated between the parties. Additionally, the per diem rate paid to the on-call physicians is tailored to reflect the burden on the physicians and the likelihood that a physician in a particular surgery will actually be required to respond while on-call, as well as the likelihood that he or she will have to provide uncompensated care — in the ED, as an inpatient and any necessary follow-up care.

• Second, the hospital allocates funds for call coverage for each participating specialty and calculates the per diem annually, in advance, based on a detailed methodology. It uniformly administers the per diem payments for all participating physicians in a given specialty without regard to individual referrals to, or other business generated for, the hospital.

• The on-call physicians provide actual and necessary services, for which they are not otherwise compensated. For example, participating physicians must respond within 30 minutes to a request from the hospital’s ED and, in some cases, must provide inpatient and follow-up care.

• The hospital offers all the specialists on its staff who are required by its bylaws to take unrestricted call the opportunity to participate in the per diem payment arrangement. Additionally, the method of scheduling on-call coverage is uniform within each specialty. Thus it appears that the hospital employs an equitable policy that is not used to selectively reward the highest referrers.

• Finally, the hospital absorbs all the costs and none accrue to Federal healthcare programs.

The OIG also noted “that nothing in this opinion should be construed to require a hospital or other facility to pay for on-call coverage. To the contrary, on-call coverage compensation should be scrutinized closely to ensure that it is not a vehicle to disguise payments for referrals.”

While this opinion only applies to this specific arrangement, OIG advisory opinions are generally relied upon by the healthcare community to gauge the basic parameters for appropriate financial arrangements. If you have any questions please contact Katie O. Orrico, Director, AANS/CNS Washington Office at korrico@neurosurgery.org.
The Congress of Neurological Surgeons mission statement notes the organization exists “to enhance health and improve lives worldwide through the advancement of education and scientific exchange.” Our society has utilized and created numerous venues in order to maximize this educational goal. Several examples are the prestigious Neurosurgery® journal, CNS Annual Meeting, the CNS University of Neurosurgery (CNSU), Webinars, and most recently an extensive and comprehensive simulation-based education initiative.

Simulation models are being used with greater frequency in medical fields due to the necessity to maximize medical education with a shortened residency workweek. In addition they provide for objective measurements of skills. In neurosurgery, simulator training is even more critical due to the unique nuances and complexity of neuroanatomical structures. Additionally, numerous neurosurgical procedures are performed only sporadically and, as such, have a steep learning curve. Therefore, to maximize proficiency as well as limit adverse operative events, the use of simulation models seems to be among the most appropriate tools.

The CNS began their initiation into simulation several years ago and recently at the 2012 CNS Annual Meeting in Chicago, Illinois had an instructional course “Simulation Based Neurosurgical Training.” The training modules in this seminar were formatted to provide a foundation for those surgeons beginning their neurosurgical residencies (PGY2-4). There were 40 residents from around the globe with 36 faculty members present. The residents rotated through three major areas of neurosurgery; vascular, spinal, and cranial disorders. Due to the success of the initial simulation practical course in Washington, DC, the CNS expanded the modules and formalized an educational curriculum. Each of the twelve modules was designed to take 2 hours to complete with clear learning objectives and a predefined course curriculum. All residents proceeded through the three simulators, which encompassed a written and practical pre- and post-tests as well as didactic and hands-on training with the simulator.

The vascular simulation module directed by J D. Mocco, Elad Levy and Bernard Bendok. These consisted of an endovascular model and a new vascular bypass model. The spinal simulation modules were subdivided into four
The CNS thanks the following faculty for making the CNS Simulation Course a huge success!

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distinct subsets; dural injury repair, posterior cervical laminectomy, percutaneous lumbar instrumentation (MIS), and new for 2012 and anterior cervical discectomy and fusion model. These models being physical models had a varying degree of complexity. The simplest physical model was the dural repair challenge. An incision made in a closed-circuit pressurized system tube (dura) had to be closed with sutures; skills measured included speed and tensile strength of repair. The cervical and lumbar systems were much more complicated and sophisticated. These utilized image-guidance technology as well as computer based systems. The cranial rotation consisted of several innovative simulators and was organized and coordinated by Darlene Lobel. There were two skull-based models, one virtual reality based and the other a physical model which allowed residents to contract the two educational mediums. In addition there was a VR ventriculostomy/thoracic pedicle screw placement model. Lastly there was a complex physical model skull fracture model with subdural hematoma.

Overall, the entire course was extremely successful based on both resident and faculty responses, thus illustrating that education can be enhanced through a simulation environment. Further the models utilized grading assessments that confirmed significant improvements in educational parameters. As the CNS moves forward we will be expanding these modules such that they can be employed in a local environment. Therefore, this will provide residents with greater exposure and frequency of use in order to continuing in the knowledge and technical advancement.

The CNS looks forward to continued advancements in this field such to further maximize education and skills of our residents and neurosurgeons in order to the benefit our patients.
The Congress of Neurological Surgeons continues to grow financially in a consistent, sound and responsible manner. The current CNS assets are at an all-time high and are in excess of $20 million dollars. Growth of CNS assets has been primarily the result of continued and now record membership expansion, the sustained strong financial success of the CNS Annual Meeting and outstanding CNS publications (Neurosurgery®, Clinical Neurosurgery, and Congress Quarterly) and fiscal management.

The CNS Finance Committee provides stewardship to the financial activities of the CNS and is composed of Russell R. Lonser, MD, (Committee Chair and CNS Treasurer), Daniel Resnick, MD, (CNS Past-Treasurer and CNS President-Elect), Christopher Wolfla, MD, (CNS Past-President), Ali Rezai, MD, (CNS President), Alan Scarrow, MD, (CNS Secretary), David Westman, MBA, CPA, CAE (Chief Executive Officer of the CNS) and Steve Lothary, MBA, CPA (Chief Financial Officer of the CNS). The CNS Finance Committee provides organizational financial reporting and recommendations to the CNS Executive Committee.

CNS 2012 Assets
CNS long-term assets are principally contained within two investment instruments that include the reserve and long-term asset funds. The first fund is the reserve asset fund that contains over $6 million. This fund is a conservatively invested asset designed to preserve wealth and hedge against potential future financial hardship. Based on its overarching objective, this asset is maintained and grown in a manner that continues to adequately meet its stated purpose. The second fund is the long-term asset fund that contains over $10 million. This fund is used primarily to finance critical initiatives related to the CNS educational mission (new educational efforts, fellowships and other mission specific innovative opportunities). Overall, this fund represents the largest defined asset to drive the critical goals of the organization and is invested in a lower-risk moderate growth portfolio. The remaining CNS assets are defined in the fiscal operating budget that underwrites the day-to-day business of the CNS.

CNS 2013 Operating Budget
The annual CNS annual operating budget (revenue and expenses) exceeds $10 million dollars. Primary revenue generators (these account for nearly 90% of total CNS revenues) include membership, the CNS Annual Meeting and CNS publications. Principal expenses include the CNS Annual Meeting, headquarters operations, journal operations and CNS/AANS joint initiative support (e.g., the Washington Committee, Joint Section expenses and others). Additional expenses this fiscal year will include investment in supplementary headquarters office personnel to support rapidly growing membership needs, expansion of headquarters office infrastructure (particularly enhancement of information technology capabilities) to better and more efficiently drive CNS educational efforts, as well as funding of new innovative educational opportunities, including a rapidly growing and critical guidelines effort.

Future Budgetary Opportunities
Based on responsible fiscal management and innovation in its primary revenue sources, the CNS is well-positioned for future financial
growth. Specifically, the principal revenue sources (CNS Annual Meeting, publications and membership) are continually being improved and streamlined to more cost effectively provide first-rate member offerings.

**CNS Annual Meeting.** Because of its broad based educational appeal and volunteer drive, the CNS Annual Meeting continues to be an outstanding financial success. Meeting program leaders, including Ganesh Rao, MD, (2012 Annual Meeting Chair), Alan Scarrow, MD, JD, (2012 Scientific Program Chair; 2013 Annual Meeting Chair) and Ashwini Sharan, MD, (2012 Annual Meeting Vice-Chair; 2013 Scientific Program Chair), along with the meeting organizers and volunteers, deserve all the credit for producing a world-class scientific program offering. New and innovative educational opportunities continue to be planned to drive the success of future CNS Annual Meetings for our membership.

**CNS Publications.** Continued excellent fiscal management and production of outstanding offerings, including *Neurosurgery*©, by Dr. Nelson Oyesiku, CNS Publications Committee and the headquarters office has led to sustained and robust profitability of the CNS published products. Better than expected advertising revenue in *Neurosurgery*© and sound economic responsibility across CNS publications provide opportunities for sustained CNS publication profitability and exceptional products.

**Membership Growth.** Continued growth of CNS membership nationally and internationally (currently at a record 8,284 members) has created a secure financial foundation for the CNS to continue to develop innovative products, educational efforts and advocate for neurosurgery (e.g., Washington Committee) in a manner that achieves member needs. Continued outreach and response to member desires will be used to grow CNS membership nationally and internationally in the years to come.

**Investment Funds and Development.** Improving returns in the current economic environment on reserve and long-term investment funds continue to improve the CNS bottom line. To better exploit future financial opportunities, the CNS has hired Steve Lothary as Chief Financial Officer. Steve will work closely with the CNS Finance Committee and David Westman, to develop strategic opportunities to better position the organization in the future and ensure its financial success in a variety of areas, including philanthropic support, collaborative relationships and other mechanisms.

**2012 Financial Audit**
This year’s independent audit of the CNS finances and business practices returned a clean and unqualified report. This audit represents the fourth consecutive outstanding audit of the CNS business and finances. The audit findings underscore the transparent and careful oversight that marks the management of CNS assets and business practices. Specifically, translucent administration of CNS business practices, including contracts, business relationships with vendors, the CNS Annual Meeting, investment planning, publication offices and the headquarters office, have led to the consistent unqualified audits. The CNS Finance Committee, along with the CNS Executive Committee, will continue to remain vigilant in maintaining fiscal transparency and oversight in the years to come.

**Conclusions**
Based on its volunteerism, innovative spirit and cost-conscious efforts, the CNS remains one of the most cost-effective specialty medical organizations in North America. These inherent organizational qualities continue to underlie the CNS financial and mission success. The CNS is proud that its Annual Meeting registration fees, membership dues and other associated fees remain the lowest in the field and across other medical specialties. The CNS remains committed to maintaining and providing world-class cost-effective educational opportunities for its members, while also supporting the broader goals of its membership. Please feel free to contact me at any time at info@1cns.org if you have questions or comments.
The Congress of Neurological Surgeons is a world leader in neurosurgical education and innovation, and is strongly committed to providing the best educational resources for residents within and outside the United States. Resident membership offers access to all CNS publications, the University of Neurosurgery, discounts on SANS Lifelong Learning products, and the opportunity to attend the Annual CNS Meeting and courses at reduced rates. The University of Neurosurgery, a comprehensive portal of peer-reviewed information, is becoming a cornerstone in the day-to-day education of neurosurgery residents.

In 2011, the CNS Executive Committee voted to approve complimentary, automatic membership to all residents training in programs approved by the American Board of Neurological Surgery (ABNS). CNS Resident Membership is also available to residents training in neurosurgical residency programs that are approved by the Royal College of Physicians and Surgeons in Canada, and the Mexican Council of Neurological Surgery. For a one-time application fee of $25, Canadian and Mexican residents enjoy free online subscriptions to Neurosurgery®, Operative Neurosurgery, Clinical Neurosurgery, all associated supplements to these journals, the University of Neurosurgery, and discounts for annual meetings and for SANS.

The International Vista Resident Membership category provides international residents enrolled in a neurosurgical training program outside of North America with the opportunity to participate in CNS activities, for annual dues of $50 USD. International fellows who have completed residency training are also allowed into this category of membership. International Vista Resident members are provided with online access to all CNS publications, the University of Neurosurgery, as well as reduced registration rates for the CNS Annual Meetings and discounts on online access to SANS.

Medical Student Membership is complimentary for medical students enrolled in a school that is accredited and approved by the Association of American Medical Colleges (AAMC), the American Osteopathic Association (AOA), or the Faculties of Medicine of Canada (AFMC). This membership category includes access to the CNS University of Neurosurgery, discounts on SANS Lifelong Learning products, as well as various CNS courses and opportunities to volunteer on various CNS committees, such as the Education Committee, and the Annual Meeting Committee.

As of March 1, 2013, the CNS currently has 8,284 members. Residents account for 20% (1,729) of the total membership, with 1,560 North American residents and fellows, and 169 International Vista resident members. On completion of residency, neurosurgeons are promoted into the Transitional Membership category, before becoming full Active Members. There are currently 114 Transitional Members. The annual trends in resident and fellow membership are provided in Figure 1, with the notable inflection point corresponding to the granting of complimentary US resident membership in 2011. There are currently 156 Medical Student Members.

The membership benefits provided by the CNS to neurosurgical residents and interested medical students, both nationally and internationally, are substantial, and contribute to fulfilling the CNS mission of international leadership in neurosurgical education. This mission is served through innovative educational opportunities made available to the global neurosurgical community.
Does this sound like it might be of interest to you? Five days and four nights in one of the most beautiful cities in the United States, with iconic scenery and fantastic restaurants serving some of the best food and wine to be found, surrounded by old friends and colleagues from medical school and residency in addition to more than 2,500 of the world’s brightest and most innovative neurosurgeons and neurosurgical residents. Your mornings will be spent listening to lectures from best-selling authors, world-class educators and luminaries in neurosurgery. In the afternoons, discuss the latest innovations in our profession, as well as look ahead to where our industry is heading – including both the opportunities and challenges we face. Evenings offer a chance to continue the discussion in one of the city’s premier restaurants or the opportunity to take in the sights, tastes and sounds of the city.

Interested? If so, you will want to attend this year’s Annual Meeting, taking place October 19-23 in San Francisco. Past attendees know that the unique culture and beauty of San Francisco combined with its favorable location to neurosurgeons along the Pacific Rim, create an atmosphere for a great meeting experience.

We anticipate this year’s Annual Meeting will be the largest CNS gathering in history as we host our colleagues from the Chinese Neurosurgical Society, our 2013 international partner organization. But, while we may be in a familiar city, the 2013 Annual Meeting will be unlike any neurosurgical meeting in history.

The 2013 Annual Meeting, themed Evolution of Neurosurgery explores the past, present and future of neurosurgery and takes an in-depth look at how far we’ve come, where we are and what’s coming next. The daily General Scientific Sessions have been completely reinvented with a new, more dynamic format that features a daily anatomy lesson, platform debates on controversial topics, and talks by authors of some of the top papers published in Neurosurgery® in the past year. Other portions of the Sunday through Wednesday plenary sessions will focus on the evolution of technology and techniques in the subspecialties of neurosurgery.

The CNS is also very proud to announce several marquee speakers in the 2013 line-up, centering on a common theme of innovation. Sunday’s kick-off will feature Charles Elachi, Director of the NASA Jet Propulsion Lab and leader of the Mars Exploration Rover project as well as Steven Johnson, author of the best-selling book Where Good Ideas Come From. Also new this year, we will welcome three neurosurgical luminaries as Honored Guests—each having their own Resident/Honored Guest Luncheon to discuss their perspective on leadership and career lessons both within the US and globally. First, Nick Hopkins from the University of Buffalo has been a pioneer in the catheter-based treatment of stroke and has spearheaded one of the largest and most respected stroke treatment centers in the world where new and innovative methods have been developed to reverse acute stroke and will speak on Sunday and Wednesday. Andrew Kaye, Head of the Department of Neurosurgery at The Royal Melbourne Hospital, Australia, one of the best known brain tumor scientists in the world with numerous awards and many contributions to neuro-oncology, will speak...
during Monday’s General Scientific Session. Johannes Schramm, Professor and past Chair of the Department of Neurosurgery at the University in Bonn, Germany, will speak on Tuesday morning. His research has ranged from the basic understanding of the pathogenesis of epilepsy to innovative surgical techniques for its treatment. Dr. Schramm has also published widely on surgical treatment of tumors and non-neoplastic lesions.

The changes in this year’s program actually begin before the General Scientific Sessions, on Saturday and Sunday, with a series of four new full-day symposia that highlight advances in neurosurgical technology. There are three new symposia exclusively for neurosurgeons and residents—Neuromodulation, Brain Injury 2020, and a World Stroke Symposium. Each symposium offers 4 hours of CME lecture and discussion, along with a two-hour interactive technology session where attendees can get their hands on the latest devices in the subspecialty and learn how this technology is used in various techniques. The fourth symposium, the Innovations in Neuro-technology Symposium, is geared specifically toward physician innovators and entrepreneurs, engineering groups, R&D professionals and others engaged in the development of new technologies for neurosurgery. This interactive session allows surgeons to interface directly with those engaged in new product development to discuss neurosurgical innovation.

Of course, we will still offer all your favorite session formats, each with exciting new content created just for the 2013 CNS Annual Meeting. Saturday and Sunday Practical Courses are back, featuring new courses in hospital negotiations, developing clinical trials, and endoscopic and keyhole approaches. New Luncheon Seminar topics range from new technologies and innovations in cranial neurosurgery and peripheral nerve entrapment syndromes to controversies and innovations in vestibular schwannomas. Afternoon sessions will see the return of Aaron Cohen-Gadol’s complications sessions exploring new cases, as well as a new Special Course on Neuroscience Institutes. As always, afternoon sessions for each section will include presentation of top abstracts and current topics will expose attendees to the latest in contemporary neurosurgery. Finally, returning to the city where Dinner Seminars originated, we have added new seminars, from head injuries in sports to the culture of safety, quality initiatives allowing you to gain additional CME in a more intimate setting at some of San Francisco’s finest restaurants.

Perhaps most importantly, each CNS Annual Meeting is a great opportunity to reconnect with friends and colleagues from around the world. Look for exciting changes to Sunday’s Opening Reception at the San Francisco Marriott that will allow you to connect more with your colleagues and friends.

So, join us in ‘the city by the bay’ as the CNS highlights the latest advances and technology, provides outstanding networking opportunities for our attendees from around the world, and offers innovative learning experiences as we explore the Evolution of Neurosurgery. Registration is now available online at www.cns.org. We look forward to seeing you there!

Case Report

History of Present Illness. A 20-year-old man presented severe back pain in a nonradicular manner. He had been previously diagnosed with idiopathic skeletal osteoporosis.

Imaging. Lateral plain films demonstrated a bone-in-bone appearance [Figure 1, 2], which is suggestive of interrupted bone growth during adolescence.

Physical Exam: The patient’s motor exam was unremarkable with intact neurologic exam.

Discussion

“The bone within a bone appearance is a non-specific radiological sign infrequently encountered in clinical practice” (Williams et. al, 2004). This term describes an infrequent condition where it appears that a bone contains another bone within it on a radiograph. Any bone disorder that causes a split or double-layered cortex may result with this appearance on radiographs. There are a myriad of conditions that have been associated with this finding including sickle cell anemia, Leukemia, or Paget’s disease, to more rare (i.e. Scurvy and Caffey’s disease). This may also be seen in normal bone remodeling and as a normal variant seen in neonates. When this radiological abnormality is observed in adults it is usually indicative of a pathological condition.

Submitted by:
Amit Mishra, Kim A. Williams, Jr., MD, Tristan B. Fried, Angud S. Mehdi, BA,
James S. Harrop, MD, FACS
The Congress of Neurological Surgeons... Representing Global Neurosurgeons

Thank you for continued support of the Congress of Neurological Surgeons...

Our members provide a strong global presence and we are proud to have members spanning six continents and more than 100 countries represented! Each member, whether from Algeria to Zimbabwe, is a vital partner in realizing the CNS mission of enhancing health and improving lives worldwide through the advancement of education and scientific exchange.

Are you taking full advantage of your membership? The CNS offers many educational resources and professional development opportunities – often complimentary or at great discounts, including:

- Complimentary subscriptions to leading neurosurgical publications – including, Neurosurgery®, Operative Neurosurgery, Congress Quarterly and Clinical Neurosurgery
- Complimentary member access to the popular Neurosurgery® iPad app, Neurosurgery® Online’s Video Gallery and Podcasts in eight languages
- Collaboration with your esteemed colleagues from around the globe at the 2013 CNS Annual Meeting in San Francisco, CA, October 19-23 – at exclusive member rates
- Discounted rates for SANS Lifelong Learning – neurosurgery’s most trusted online self-assessment tool
- Education at your fingertips with access to the CNS University of Neurosurgery – featuring free member Webinars and the interactive Case of the Month
- Contribution to the future of neurosurgery through volunteer service on CNS Committees

Visit www.cns.org often for updates on events, programs and educational opportunities. Inquiries regarding your CNS Membership should be directed to 001-847-240-2500 or via e-mail at membership@1cns.org.