CONNECTION THROUGH WEB-BASED EDUCATION

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THE CNS UNIVERSITY OF NEUROSURGERY: REVOLUTIONIZING ONLINE NEUROSURGICAL EDUCATION

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VIRTUAL REALITY SIMULATION TRAINING FOR ENDOVASCULAR NEUROSURGEONS
EDITOR’S NOTE

Over the last two decades we have seen significant advances in technology which has improved our ability to communi cate. The telephone booth and the rotary telephone are just two examples of casualties in this drive for the instantaneous transfer of knowledge, yet their sacrifice seems small when compared to the great advantages we neurosurgeons gain from immediate access to information and knowledge via the internet. The electronic transfer of information provides us with the ability to instantly find the name of an obscure article using PubMed or the appropriate dosing of a medica tion for our patients. Thus, the World Wide Web is now an indispensable part of Neurosurgery practices.

In this issue of the CNSQ, we reflect on the numerous advances and opportunities available in the form of online neurosurgical education. Specifically, we explore the CNS University of Neurosurgery (CNSU) and how it can be utilized to expand our education and knowledge of neurosurgical diseases, practices and treatment algorithms. Jamie Ullman and Ashwini Sharan provide an overview of the CNSU and its framework and design. Ganesh Rao discusses the preparation and development of this new electronic platform and along with Michael Steinmetz and Brian Ragel further examines the CNS web site. Another vehicle used to expand our knowledge and further promote neurosurgical education has been the use of internet based webinars. Phil Theodosopoulos discusses the tumor section webinar series, Odette Harris reviews the trauma section department of the CNSU, and Bernard Bendok covers the cerebrovascular section department. Cathy Mazzola further enlightens us about the Socio-economics portion of the CNSU and Alan Scarrow writes about non-clinical core competencies.

In addition, this issue provides insights about the use of tools such as simulators for education and the internet. The cerebrovascular field has been using these devices for several years particularly for endovascular techniques as Erol Veznedaro glu, Bernard Bendok, Sabareesh Natarjan, Andrew Ringer and Elad Levy explain this innovative technology. The Self-Assessment in Neurological Surgery (SANS) site has been a mainstream of internet education and is discussed by Jason Sheehan, Nader Pouratian and Zach Litvack. Lastly the two most utilized internet resources, the NeuroWiki and Neurosurgery Journal, are expounded upon. Specifically Elad Levy and Sabareesh Natarajan detail the CNS NeuroWiki and Duncan A. MacRae and Stephanie L. Silk from NEUROSURGERY® discuss future innovations.

In addition, Ali Rezai, Russ Lonser, P. David Adelson and Nate Selden provide a summary of last fall’s very successful CNS Annual Meeting in New Orleans. The theme of international neurosurgery is carried forward through Saleem Abdulrauf’s article using PubMed or the appropriate dosing of a medication for our patients.

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CNSQ BACK PAGE

Images in Neurosurgery
This year the Congress of Neurological Surgeons celebrates its 60th Anniversary. On May 10, 1951, twenty-two founding fathers held the inaugural CNS meeting in St. Louis, Missouri. One year later, 121 members met in Memphis, Tennessee for the first Annual Meeting. The CNS was formed to meet the scientific and educational needs of neurosurgeons and neurosurgeons-in-training that were not being met by other organizations. Now, sixty years later, the CNS boasts a membership of nearly 7,000 members from around the world. The mission of the CNS remains dedicated to education and science, and the value we receive as members from our paid dues continues to increase. Members appreciate that the CNS not only provides a tremendous educational resource each year at its Annual Meeting, but also provides a broad continuum of learning opportunities that are useful and pertinent throughout the year.

For the annual cost of $575, CNS Active and Active International members receive the official journal of the CNS, NEUROSURGERY®, as well as its supplement, Operative Neurosurgery. The CNSQ and the composition of Annual Meeting science in Clinical Neurosurgery are also included. Whether you are in between cases in the operating room, standing at the counter in your clinic, or relaxing with your laptop at home, you’re only fingertips away from CNS University of Neurosurgery, our web-based...
resource featuring online courses (currently 40, and growing), webinars on important, timely topics, a comprehensive Image Database, and NeuroWiki. The latter is the world’s largest wiki dedicated to neurosurgical topics to which you can contribute. Perhaps most exciting has been the development and growing popularity of the live webinars. Led by renowned experts in various subspecialty fields of neurosurgery, these have proven to be very informative sessions and equally pertinent to our everyday practice. Previous webinars have been archived and can be accessed for a nominal fee.

Your annual dues go farther still. Membership benefits include reduced registration at the CNS Annual Meeting, reduced prices on other educational resources, and the ability to manage your CME credits, provide critical feedback and document meeting participation, and manage your membership account — all online. The invaluable tool SANS Lifelong Learning, the self-assessment in neurological surgery, is available to members at a reduced price. SANS has become a very important and efficient tool to enhance your practice, prepare to achieve ABNS certification, and maintain certification.

Finally, your membership dues support the important efforts of the AANS/CNS Joint Washington Committee. Public advocacy of neurosurgical interests at the federal, state and local levels is an important part of the CNS mission. The CNS continues to support these efforts consistent with our organizational structure and 501(c)(3) tax status.

Sixty years ago, the CNS founders established the structure and function of a new, vibrant educational organization that would certainly make them proud today.
Internet-based medical education has expanded our ability to obtain information without leaving our desks or offices. In today’s economic climate it is not always feasible to spend time away from busy medical practices to obtain continuing medical education (CME) credits. Additionally, rural and international neurosurgeons who might not have the coverage, means to travel or access to experts at the forefront of their disciplines also benefit from receiving internet-based continuing education. Such education may be cost-effective, easy to use, provide links to other information sources, and is more readily updated in comparison to printed material. Greater access to information and learning can naturally lead to improvements in the quality of patient care and disease outcomes.

While there has been some literature about the effectiveness of internet-based CME, it is difficult to conclude whether a true change in practice patterns has resulted from the availability of this format. A recent controlled trial did find that physicians who participated in non-live internet-based CME activities (N=2785) were more likely to make evidence-based decisions in response to case-based questions than those who did not participate (N = 2836).1

The idea of the CNS University of Neurosurgery (CNSU) was conceived several years ago by Drs. Karin Muraszko and Douglas Kondziolka, along with then Education Committee Chair Dr. Daniel Resnick. The idea was to provide an online resource for neurosurgeons at all career stages, allowing quick access to information about general and subspecialty neurosurgical topics, assisting with Board and Maintenance of Certification (MOC) review, and offering CME credit through online courses. The CNSU included medical student and resident curricula in neurosurgery and provided information and links to the American
The CNSU Tour

The CNSU Tour allows the user to search the CNS University of Neurosurgery for a specific topic of interest. If, for example, the subject is “thoracolumbar trauma,” (Figure 1) approximately 115 results appear, including digital posters and abstracts from the Annual Meetings. By selecting a certain information source, such as “presentations,” the user is directed to relevant topics from the course catalogue and NeuroWiki. Much of the CME-related material and meeting archives are password-protected. Members need only logon once to secure access to these materials by taking advantage of the member login button to the right of the search box. A link to SANS (Self Assessment in Neurological Surgery) Lifelong Learning is below the member login box.

The What’s New section, below the search box, provides important links to popular CNSU sites: the Webinar schedule and registration, Image Database and NeuroWiki. Below What’s New are the Departments, (Figure 2) including Anatomy, Cerebrovascular, Functional/Epilepsy, Non-Clinical Core Competencies, Pain, Pediatric, Peripheral Nerve, Socioeconomic, Spine, Trauma, and Tumor.

Let us click on the Spine department (Figure 3), for example. Each departmental landing page has four boxes at the top left: Course Catalogue, NeuroWiki, Lecture Hall and Video. The Course Catalogue contains lectures placed on presentation software with attached audio, much like entering into a classroom with the teacher present. However, unlike a live classroom, one can review the slides with audio as often as one likes and access to the lecture is permitted at any time after the first encounter — even months later, if needed.

As we scroll down the page, we come across a course entitled, “Management of Thoracolumbar Trauma” (Figure 4). Each course is accompanied by a pre- and post-lecture test (often the same question set) to determine if knowledge has been improved after viewing the content. The presentation can only be accessed after taking the pretest. At a modest $25 per credit, members can submit the survey and can purchase AMA-PRA Category 1 credits. Over 70 courses have been added to the site, providing a vast selection for CME credit. It is the CNSU goal to ultimately provide a one-stop method to obtain much of the CME credit providers need for state licensure and hospital re-credentialing. The MOC participants also have access to topics including those needed to satisfy the Non-clinical Core Competencies portion, such as interpersonal and communication skills, professionalism and system-based practice. The Socioeconomic Department also provides such needed coursework in addition to educating members on the latest issues affecting Neurosurgical practice.

As we return to the landing page, clicking on the NeuroWiki button (Figure 5) sends us to more than 50 articles related to Spine. The article on “Burst fracture” provides a definition of thoracolumbar fractures and their evaluation and management. The NeuroWiki owes its format to Dr. Elad Levy and his team. It contains dozens of topics from “AIDS” to “Zollinger-Ellison Syndrome.” NeuroWiki continues to grow as more chapters are authored by neurosurgeons from all over the world. An editorial team reviews the content of each submitted article.

The Lecture Hall on the Spine landing page links to all video-captured material from the CNS Annual Meeting’s general scientific sessions. Clicking on “The SPORT Trial: What Neurosurgeons Need to Know” transports us to another site which maintains these archived sessions. Any meeting attendee who missed all or part of these sessions or neurosurgeons unable to attend the Annual Meeting will see the value of viewing these lectures from the convenience of their desks.

By clicking on the Video section, the user is directed to the currently available video technique library. It is a future CNSU goal to combine these video guides into an online, comprehensive neurosurgical atlas.

The What’s New Section highlights new NeuroWiki submissions as well as newly added course material and the latest webinars hosted by the CNSU departments. At the bottom of the departmental page are links to the Image Database and Abstract Archives (dating back to 1997). The Image Database contains almost 2000 radiographic and photographic images of neurosurgical disease entities. These images are designed to be viewed as educational examples for practicing neurosurgeons as well as neurosurgeons-in-training, and as downloadable images for use in slide presentations. A new taxonomy has been applied to facilitate the search for images related to specific topics and also to add new images to the site, including video.

Returning to the CNSU home page, we are directed to the right of the screen where links are provided for the Dean’s office and important resources for neurosurgeons, residents and medical students. The Dean’s office contains information about the planners for CNSU educational content, a University Library and a faculty resource page providing information for educators contributing their content to the site.
**Webinars and Learning Science**

Immediate Past President Dr. David Adelson is credited for bringing the concept of live web conferencing to the CNSU. The advantages of this format cannot be understated, especially in an era where extensive travel to live meetings is becoming more difficult. As a result, the first CNSU Webinar aired on January 13, 2009. The Pediatric Department hosted a live session on “Management of Arachnoid Cysts.” Since then, nearly every department has hosted a webinar, regularly scheduled on the third Tuesday of each month. Each session has met with excellent reviews and attendance. The webinars have highlighted timely and important topics in neurosurgery and can be viewed in an archived fashion after the live event. While health professionals still desire face to face meetings to receive updates on the latest neurosurgical advances and interact and network with colleagues from around the world, the live webinar affords attendees the opportunity to actively query experts on important topics throughout the year.

At the beginning of 2010, the CNSU initiated its first themed webinar series, *Controversies in NeuroOncology: An Academic-Community Forum*. The idea was generated by the Learning Science Subcommittee Chair, Past President Anthony Asher. Made possible by an educational grant from Eisai and the AANS/CNS Section on Tumors and using an interactive format, the successful series strives to create a community of learners who participate in expert discussions regarding central nervous system tumors. In addition to the live events, participants have been able to continue this interaction via a blog specifically designed for the topic. The seven-lecture series is held on the second Tuesday of each month, and promotes neurosurgeons’ collective understanding of current practice by allowing them to openly evaluate and discuss the effectiveness of current techniques while identifying new avenues of investigation. This thematic approach to online live education has been continued with an Oral Board Preparation Series. In addition, the CNSU has begun to partner with international societies to deliver experts from the United States and abroad in the live webinar format.

**Acknowledgements**

The CNSU is grateful to the CNS leadership for their foresight and innovation in devising methods to enhance neurosurgical education and to the CNSU departmental chiefs for expanding their content areas. In particular, for their development of the new CNSU web site, the CNS Education Committee is proud to acknowledge the hard work of the Information Technology Committee and past Chair Ganesh Rao, the CNS headquarters staff, past Web Chair Michael Steinmetz, and CNS Executive Director Laurie Behncke for her guidance and support.

The CNS University of Neurosurgery has been specifically designed to provide access to current and in depth information suitable to neurosurgeons at all stages of their careers. The unique advantage of web based access to these learning materials has revolutionized the way practitioners can earn their CME and improve patient outcomes through lifelong education. The CNSU is proud of its diverse content, addressing the educational needs of all who step through its virtual doors.

**Reference**

PREPARING THE PLATFORM

Over the last two years, the Congress of Neurological Surgeons (CNS) has spent considerable time and energy developing the definitive web-based learning experience. The CNS University of Neurosurgery (CNSU) is designed to offer unique educational experiences to attending and resident neurosurgeons, as well as medical students interested in neurosurgery. Maximizing their learning experience required creating an online infrastructure that provides numerous educational assets that integrate with one another. The result is extensive course curricula in virtually all areas of neurosurgery.

These courses draw upon educational information from a variety of sources including (but certainly not limited to) the CNS Annual Meeting, our popular Webinar series and the ever-expanding NeuroWiki. The CNS University of Neurosurgery combines all of these educational components in one easy to navigate online site. The CNSU is also designed to facilitate the acquisition of CME credits through participation in pre- and post-presentation examinations.

A critical feature of the new CNSU is the ability for existing and newly acquired materials to be catalogued by our comprehensive neurosurgical taxonomy. The CNSU also features courses that have been put together by leading experts in neurosurgery. These courses are self-contained and can be viewed by any CNS member. CME can also be earned if desired. The courses represent a major component of the curricula offered by the CNSU.

Our video offerings are also expanding. Operative videos have been prominently featured not only at our national meetings, but now are also on the CNSU site. The “Digital Masters” video presentations, a popular component of our Annual Meeting, have now been incorporated into the Lecture Hall of the CNSU, where they are presented with the captured live narration by each surgical master in a format which is rapidly accessible.

The contribution by CNS volunteers and the efforts of our IT personnel at CNS Headquarters cannot be overstated. Our volunteer faculty always provides excellent content, and thanks to several others, that content can now be shared in a way that can benefit the next generation of neurosurgeons.
Two Live 3-D Cadaveric Demonstrations!

Witness the nuance and skill of neurosurgical experts from across the globe – each demonstrating microneurosurgical principles, live from the GSS stage! Utilizing state-of-the-art 3-D technology and videos, these cadaveric demonstrations offer a unique learning experience to help refine your surgical technique.

NEW!

3-D Demonstration of Spinal Surgical Approaches
Tuesday, October 19   1:30 – 3:00 PM

3-D Demonstration of Cranial Surgical Approaches
Wednesday, October 20   1:30 – 3:00 PM

Registration is now available online at www.cns.org.
Celebrate 60 years of the CNS’ commitment to advancing neurosurgery and scientific exchange!
This past fall saw the development of a new concept for continuing education in neurological surgery, the first focused series of CNS webinars titled *Controversies in NeuroOncology: An Academic-Community Forum*. Through the coordinated efforts of the CNS University of Neurosurgery (CNSU), the CNS Education Committee and a small group of organizers from the CNS/AANS Section on Tumors, the CNSU and the CNS (including Past President Tony Asher) have successfully completed the first three in a series of six monthly webinars, each focused on a different topic in neuro-oncology. The inaugural session was dedicated to novel therapies in the management of malignant brain tumors with special emphasis on the use of bevacizumab. Subsequent topics included the evolution of low grade glioma therapy in February and controversies in the management of cerebral metastases in March. Upcoming topics will include management of complex meningiomas in April, management of common spinal cord tumors in May and principles of modern day radiotherapy for neurosurgeons in June.

This tumor webinar series was developed in an attempt to disseminate the most contemporary evidence-based treatment guidelines for the most common types of brain tumors, and also to encourage the sharing of best clinical practices from multiple high volume centers around the country. All neurosurgery practitioners are encouraged to participate. This cross-pollination between academic and private practice environments allows for continued learning as well as broader participation in the assessment of important clinical questions that remain unanswered in the field of neuro-oncology.

When participants enroll, they supply important participant demographic and practice data to provide feedback on both the CME success level of each webinar and the nuances of web based learning in neurological surgery education. This information can be used in the evolution of the CNSU web offerings that are open to all practitioners.

New to this web-based endeavor is the extension of the interactive forum into the blogosphere. A secure blog site dedicated to this series of webinars has been established by the CNS, and both faculty and participants have password-protected access. Following each session, participants are encouraged to submit comments and questions through the blog, encouraging an ongoing discussion with the faculty and each other. This string of information is expected to stay open for a week following each session, and will then be archived for future access.

In soliciting some of the best experts for each session and pairing them with seasoned moderators who are themselves experts in the field, the organizing committee has provided a venue for information sharing rarely available on this scale. Making the webinars as well as the follow up blog interactions part of the permanent collection of the CNS University of Neurosurgery ensures continued educational dividends and provides a platform of experience that can be used by others who wish to further subspecialty web-based education.
Trauma is a significant public health issue. Data from the CDC documents over 29 million non-fatal injuries in 2008 resulting in over 179,000 deaths related to trauma.

Specific to traumatic brain injury, approximately 1.4 million people sustain a TBI each year in the United States. This results in over 50,000 associated deaths, approximately 235,000 associated hospitalizations and over 400,000 emergency room visits. These numbers are astronomical and are associated with significant impact and cost to the health care system. Adding to the issue is the growing impact of the military population who have suffered injuries, for which TBI has been identified as the signature wound of the current conflicts. As neurosurgeons, our role in the management of these patients is integral and vital.

The Trauma Section of the CNS University of Neurosurgery has been charged with highlighting and focusing on this burgeoning and important population and their associated issues. As such, we have worked to create a curriculum that is comprehensive. We have focused on both routine and frequent topics, in addition to controversial and timely subjects. Our members including neurosurgeons, resident staff, nurses, critical care colleagues and trauma surgeons, among others, have expressed an interest in these subject areas, seeking further discussion, clarification, debate and a foundation for scholarly research. Our current topics range from hyperosmolar therapy in the management of traumatic brain injury, to hypothermia, to the timing of surgery in acute spinal cord injuries. Our roster also includes lectures that span the realm of critical care management as well as surgical issues and related research and scholarly pursuits. In addition to an extensive course catalog, the section offers NeuroWiki, a Lecture Hall, a Video Theatre and an Image Database. There is also a thorough collection of abstracts from the Congress of Neurological Surgeons Annual Meetings dating from 1997 to present. Digital posters are also available for review from 2006 to present.

The CNS University of Neurosurgery is grounded in web-based education. It actively works in a collaborative fashion with the parent organization and sub-section, the Congress of Neurological Surgeons and Trauma Critical Care Section. The goals of the CNSU are to assist neurosurgeons in acquiring new knowledge and skills. This venue offers a novel and innovative approach to education which allows flexibility and accessibility. This honors the commitment of the Congress of Neurological Surgeons and the CNS University of Neurosurgery to lifelong learning.

We look forward to your participation and input.

References:


The CNS Consensus Sessions provide practicing neurosurgeons with carefully designed and prepared opportunities to learn about, analyze and discuss pressing issues that face our specialty. Build consensus among colleagues and advance the quality of life of our patients.

Let your voice be heard in one or all of the CNS Consensus Sessions!

Consensus Session I: The Carotid Revascularization Endarterectomy Versus Stenting Trial (CREST) and Modern Management of Carotid Stenosis
Course Director: Elad I. Levy

Consensus Session II: Futility or Utility? Hemicraniectomy for Increased Traumatic Intracranial Pressure
Course Director: Geoffrey T. Manley

Consensus Session III: Is Bone Morphogenic Protein Usage in Spinal Surgery Safe, Effective and Worth the Cost?
Course Director: Edward C. Benzel

Consensus Session IV: Unification of Brain Death Criteria
Course Director: Catherine A. Mazzola

Registration is now available online at www.cns.org.
Celebrate 60 years of the CNS’ commitment to advancing neurosurgery and scientific exchange!
T

hanks to the generous efforts of out-

standing contributors, content for the

Department of Cerebrovascular Disease

in the CNS University of Neurosurgery has
grown impressively over the last year. The be-
ginnings of a comprehensive multimedia cur-
riculum for vascular neurosurgery has started
to emerge.

The vision behind the CNS University of

Neurosurgery continues to guide the vascular
content. This vision extends far beyond accu-
mulating neurosurgical information that can
be found in any other textbooks or published
articles. The aim is to engage modern internet
tools to make dynamic high quality education
accessible anywhere and anytime.

Under the Course Catalog tab, we have
accumulated a number of diverse narrated
PowerPoint lectures including talks related to
neurocritical care, submitted by Dr. Andrew
Naidech on the important topics of intracere-
bral hemorrhage and acute ischemic stroke,
and anatomical lectures such as a lecture on
basilar artery microsurgical angiographic anat-
omy submitted by Dr. Daniel Surdell. Other lec-
tures range from technical topics such as ECIC
bypass presented by Dr. Charles Rosen, to the
medical and endovascular management of
vasospasm presented by Dr. Arun Paul Amar.

Aspiring to a comprehensive curriculum,
we have solicited lectures in five areas of vas-
cular neurosurgery: basic science, anatomy,
microsurgery, endovascular and radiosurgery.
We have been careful to draw on experts with
varying points of view and diverse expertise to
enrich the spectrum of perspectives provided.
As an example, AVM management is broadly
covered with a comprehensive easy to follow
lecture from Dr. Felipe Albuquerque on endo-
vascular approaches, an insightful webinar by
Dr. Hunt Batjer focused on the surgical man-
agement of this disease, and a thought pro-
voking lecture on radiosurgery by Dr. Douglas
Kondziolka. While one could read chapters on
these topics, the efficiency of listening to these
three PowerPoints would be hard to surpass.

The Lecture Hall tab leads to a number of
lectures, previously delivered at the Annual
Meeting, on a number of exciting topics. The
lectures are not limited to clinical topics but
also extend to basic vascular biology and ge-
netics and potential implications for disease
management. This is highlighted by Dr. Murat
Gunel’s talk on the therapeutic implications
of the genetics of cavernous malformations and
Dr. Brian Hoh’s presentation on the significa-
cance of vascular stem cells. Exciting and cut-
ting edge procedural topics are also covered
within geographic and procedural diversity in
mind. Dr. Michael Lawton presents superb and
unique technical nuances in a narrated video
of a surgical approach to a giant middle cere-
bral artery aneurysm using a high flow bypass
to reconstruct the bifurcation. Dr. Evandro de
Oliveira weighs in with his approach to com-
plex middle cerebral artery aneurysms as well.
To balance this, Dr. Elad Levy, presents cutting
edge and complex endovascular approaches
to difficult aneurysms. The controversial issue
of how and when to treat brainstem cavern-
omas is covered by Dr. Robert Solomon. Dr. Guy
McKkhan, II, discusses cerebral cavernous
malformations with emphasis and insight on
epilepsy issues. Dr. Teiji Tominaga presents
the latest updates on the management and epi-
ology of moyamoya disease. Dr. Dade Lunsford
shares his views on the role of radiosurgery in
the management of AVMs. Also posted under
the lecture hall tab is an Integrated Medi-
cal Learning® (IML) session from the 2008
CNS Annual Meeting on the management of
ruptured intracranial aneurysms led by Drs.
Sander Connolly, Gregory Zipfel, Brian Hoh,
Robert Friedlander, Ralph Dacey, Jr. and Sean
Lavine. In a high yield lecture, Dr. Sander Con-
nolly summarizes important clinical studies
with significant impact on practice in vascular
neurosurgery. On that same topic, Dr. Michael
Vogelbaum discusses difficulties faced by clini-
cal research trials. In a more philosophically
oriented lecture, the central role of experience
and intuition in vascular neurosurgery is pre-
sented by Dr. Hunt Batjer.

Ultimately, we aim to make this web site
a comprehensive source for both didactic
and interactive education in all areas of vas-
cular neurosurgery. The goal is to engage all
relevant technologies to bring world class
education and expertise directly to the learner
wherever the learner may be: home, OR, office,
airport, beach (hopefully not!), etc...

As computer technology continues to evolve,
the sky is the limit with regards to how interac-
tive education can evolve to meet the needs
of CNS members. One can envision complex
techniques being illustrated in 3-D and holo-
graphically in the not too distant future. By in-
tegrating simulation, one could imagine that
actual “hands-on courses” could be offered via
the CNS University of Neurosurgery.

We would like to thank all contributors to
this project and encourage anyone interested
in vascular neurosurgery issues to give the site
a try. The site will continue to evolve in positive
ways with your input and feedback.
In March 2000, the American Board of Neurological Surgeons (ABNS) at the encouragement of the American Board of Medical Specialties (ABMS) committed to instituting a recertification program for neurosurgeons through Maintenance of Certification (MOC). The expectations of MOC are that training and acquisition of knowledge and skills in medical practice will begin in medical school, be enhanced in residency and maintained throughout the neurosurgeon’s career.

MOC® has four basic components: 1) evidence of professional standing; 2) evidence of lifelong learning and self-assessment; 3) evidence of cognitive knowledge; and 4) evidence of performance in practice. In assessing compliance with the second component, participants in MOC will be required to complete one of the three Self-Assessment in Neurological Surgery (SANS) examinations — SANS Lifelong Learning, SANS: Spine or SANS: Pediatrics. SANS Competencies, developed by the CNS, is an online learning tool that includes material relevant to the “non-clinical core competencies” (competencies). Appropriate knowledge of these competencies is required by the American College of Graduate Medical Education (ACGME) and the ABMS as part of professional training and certification in all medical specialties. The four competency areas include professionalism, communication, practice based learning and systems based practice.

In response to this relatively new requirement for competency knowledge, the CNS formed an ad hoc committee on competencies to develop appropriate curriculum in this area to incorporate into SANS. The committee identified 36 specific topics that addressed each of the four competency areas. Examples of these topics include Emergency Medical Treatment and Active Labor Act (EMTALA), Health Insurance Portability and Accountability Act (HIPAA), principles of medical coding and billing, risk management, ethical principles of informed consent, disclosure of errors, critical reading of the medical literature, cross-cultural issues and quality assurance. To assist in the development of the rather large amount of educational material necessary to cover these topics, the CNS asked for the help of the Council of State Neurosurgical Societies (CSNS).

In April 2006, the CSNS passed a resolution to develop the requisite competency educational material and review questions for SANS. Each CSNS committee chairman was tasked with organizing their respective members to cover a specific set of competency topics pertinent to the committee’s area of interest. For example, members of the CSNS Communication and Education Committee were responsible for developing curriculum for topics such as graduate medical education, patient communication, scientific ethics in publication and information technology. Over the next several months, the seven committees of the CSNS developed and edited more than 100 questions covering the competency requirements. These questions were edited, formatted and submitted to the CNS SANS Committee for implementation in the current online version of SANS in January 2007.

In addition to the three SANS products with competency questions, neurosurgeons will also find SANS Competencies on the CNS University of Neurosurgery web site. The Competencies are specifically dedicated to competency knowledge and may be purchased separately. There are also a variety of lectures that participants may view and complete testing on to obtain CME credits. Finally there are a number of competency related “wiki” articles that neurosurgeons are welcome to review and comment on.

All of us involved in generating competency content for the CNS University of Neurosurgery web site share a common goal of making it convenient for neurosurgeons to obtain high quality education on these issues. We invite you to investigate the site and use the information presented to help improve your skills and enhance your practice.
SOCIO-ECONOMIC DEPARTMENT – CNS UNIVERSITY OF NEUROSURGERY

EDUCATIONAL RESOURCES FOR THE PRACTICE OF NEUROSURGERY

Welcome to the Socio-Economic (SE) Department of the Congress of Neurological Surgeons (CNS) University of Neurosurgery (http://univ.cns.org). As the CNS introduces the newly updated CNS University of Neurosurgery web site, the Socio-Economic Department is proud to unveil our section, devoted to educating neurosurgeons and associated staff about the socioeconomics of neurosurgery. From the CNS University of Neurosurgery main web page, one can access the nine departments within the university, including anatomy, cerebro-vascular, functional/epilepsy, non-clinical core competencies, pain and pediatric, peripheral nerve, spine, trauma, tumor and socio-economics. Each department is easily accessible directly through click-on links.

Through the main menu, neurosurgeons can peruse the recent webinars provided by the CNS. Current and archived webinars are available for viewing. The Socio-economic webinar “The Socioeconomic Impact of Government Mandates and Restriction on Neurosurgical Practice: Tightening the Noose,” completed in the spring of 2009, focused on the increasingly stringent Health Information Privacy and Portability Act (HIPPA), and the red-flag rules. Medicare and Medicaid participation was also discussed. Other additions to the SE web site include links to several new courses, NeuroWiki references, lectures, image database library and archived abstracts from CNS Annual Meetings and video content. Digital poster links are also available. The NeuroWiki division of the SE web site has references linked to topics involving medical malpractice, professional expert witnesses and depositions, informed consent and practice development.

The Socio-Economic course list allows interested neurosurgeons access to over 13 Continuing Medical Education (CME) courses. “The Role of Practice Managers” and “Evaluating a Private Practice Opportunity” give invaluable information to both young and experienced neurosurgeons about non-academic practice development. Those neurosurgeons looking for academic careers may be interested in viewing “Evaluating an Academic Practice Opportunity.” By participating in the pre-test, presentation, post-test and feedback sections, neurosurgeons may be awarded CME credits for a nominal fee. “The Evolution of the Practice of Medicine: Electronic Medical Record Technology in Practice,” “The Business of Running a Practice,” and the “Primer on Neurosurgical Coding” provide neurosurgeons with expert advice on the practice and business of neurosurgery. “Negotiating Reimbursement” educates neurosurgeons about all types of contract negotiations and gives pointers on negotiating with payers and hospitals. Female neurosurgeons may be interested in the presentation “Neurological Surgery: A Woman’s Perspective,” while those interested in the history of the CNS may view “Structure of Organized Neurosurgery.” “Political Action and Organized Neurosurgery” educates neurosurgeons about the importance of social responsibility and activism in local, state and national government. “The IOM and Resident Work Hour Restrictions” details the chronology of the movement to restrict the resident work week and discusses how these changes will affect neurosurgical education and training, now and in the future.

In the Socio-Economic Lecture Hall, there are eight presentations ranging from “Risk Management after Complications” to “Tort Reform: Alternative Models.” The “Reimbursement of New and Emerging Technologies” and the “Government Valuation of Payment” are presentations which update practicing neurosurgeons on the process of relative value unit assignment and assessment. Quality in neurosurgical education and the relationship between accountability and quality are also topic presentations included in the SE Lecture Hall. The futures of personalized medicine in relation to the treatment of cancer and clinical research are presented and discussed.

In short, the Socio-Economic Department of the CNSU offers a variety of resources for neurosurgeons-in-training and experienced neurosurgeons. There are several presentations that provide CME through the CNS. For neurosurgeons preparing for the written or oral boards, there is more than adequate socioeconomic content. Neurosurgeons participating in Maintenance of Certification (MOC) should know that there are questions dedicated to socioeconomics and non-clinical core competencies contained within the examination. All aspects of socioeconomics and non-clinical core competencies are provided by the CNS University of Neurosurgery for easy access and utilization. The CNS is committed to providing the very best educational resources available to neurosurgeons. The Socio-Economic Department of the CNS University of Neurosurgery is proud to be part of these efforts.

Catherine A. Mazzola, MD
NEUROWIKI: YOUR ONLINE NEUROSURGERY LIBRARY

What is NeuroWiki?
The NeuroWiki (wiki.cns.org) (Figure 1) website, an extension of the CNS University of Neurosurgery, features review articles, clinical notes, pearls, and medical images under easily searchable, topic-oriented categories. NeuroWiki is an online neurosurgery encyclopedia that can be edited by any registered user. Its purpose is to serve as an online repository of neurosurgical information that can be accessed by health care professionals.

NeuroWiki is based on the Wikipedia online encyclopedia, but it is intended for health care professionals and not the lay public. Currently, there are 16 known medical Wikis of different specialties, such as “AskDrWiki.” The concept of NeuroWiki originated with CNS Past President Douglas Kondziolka and has grown into a living medical library that includes 1300 freely usable articles, pages and content from multiple contributors. NeuroWiki was founded with contributions from highly qualified volunteers and features an elaborate multi-step, peer-review process. A mailing list of interested editors has generated a fast-growing, web-based encyclopedia.

What is special about NeuroWiki articles?
NeuroWiki articles are increasingly linked, or cross-referenced, making your reading experience very different from reading a paper-based article. Wherever there is highlighted text, there is a link that will lead you to another relevant article or NeuroWiki page with further in-depth information that you can swiftly browse. There are other useful links towards the end of most articles that may interest you — including relevant articles, external web sites, pages, reference material and organized categories of knowledge. Some articles may also have links to dictionary definitions, audio-book readings, quotations and further information available on other CNS University of Neurosurgery, SANS or CNS sites. If you find a relevant link missing, you can easily add that link to the web site.

Can I use NeuroWiki?
If you are a CNS member, you can explore NeuroWiki for browsing, enriching board review, or finding a quick reference to a specific subject. The registered users are the authors and editors of this online library, and you could easily be one of them. Only your name, degree, training and hospital or medical school is required to register. Once you are registered, you will be able to ask or answer questions and edit pages and you will have your own “User Page.” It is recommended that you post your medical training, degree, specialty, research or anything else that you would like to share with other users on your user page. Only CNS Members will be able to view your user page. Once you register, you also have your own discussion page (also known as a talk page) where you can leave messages and have conversations with other users.

Is editing NeuroWiki laborious?
Editing NeuroWiki pages is simple. Clicking on the Edit this Page tab at the top of a NeuroWiki page (or on a section-edit link) will bring a new page with a text box containing the editable text of the original page. You should write a short edit summary in the small field below the edit-box. The Show Preview button allows you to see how the changes will look. The Show Changes button will show you the difference between the page with your edits and the previous version of the page. The Save Page button will save the changes you made and the changes will immediately be visible to all fellow NeuroWiki users. The Discussion tab contains comments about that page from other NeuroWiki users. By clicking on the + tab on the discussion page, you can add a new section or edit the discussion page in the same way as you would an article page. In page histories, the software keeps track of which user makes each change.

How are my edits monitored?
The edits can be of two types, “Minor edit” and “Major edit.” A minor edit is a change that requires no review and could never be the subject of a dispute. A check to the “minor edit” box signifies that only superficial differences exist between your changes and the previous version; for example, typographical corrections, formatting and presentational changes, and rearranging of text without modifying content are minor edits. A major edit is one that should be reviewed to confirm that it is consensual to all concerned editors. Therefore, any change that you make that could affect
> **(NEUROWIKI) WILL BE A VERY IMPORTANT COMPONENT OF THE CNS LEARNING TOOLS, SUCH AS SANS, AND COULD BE USED BY RESIDENTS AND PRACTICING NEUROSURGEONS AS A QUICK BOARD REVIEW. IT COULD BE A GOOD PLATFORM FOR DEVELOPING GUIDELINES AND CREATING A COMPREHENSIVE SUMMARY OF EVIDENCE.**

the meaning of an article, even if the edit is a single word, is major. Before engaging in a major edit, you should consider discussing proposed changes on the article discussion/talk page. Once the edit has been completed, include an edit summary to assist in documenting the changes. These steps will help ensure that your major edits are well received by the NeuroWiki users. If these steps are not followed, your edits may be reversed by the editors or by fellow users in the future.

**Can I search NeuroWiki?**
There is a search box on the left hand side of the screen. Typing what you are looking for and pressing the Search button will allow you to search for articles on that topic. The Go button next to the Search button functions to display a page directly, instead of first having to select it from the search results page, if you know the exact name of the page. Another way you can search is through categories. On the Main Home Page, there are categories (such as Board Review, Pediatric, and Critical Care) that will lead you to a list of all articles that are filed underneath that particular category.

**Can I rely on everything written here?**
Although it is envisioned that NeuroWiki will be increasingly used like Wikipedia by neurosurgeons, residents, medical students and health care professional from allied fields, it is not meant to be a replacement for but to complement the knowledge base from the traditional literature, such as journals and textbooks. It is important to realize that articles with content supported by peer-reviewed reference citation are more reliable than unreferenced information that is solely the opinion of the author.

**Is this something sustainable?**
We believe that the number of users and editors for NeuroWiki will increase over the coming years. There will be constant improvement in the layout and software of this web-based learning tool, with more integration of multimedia and audiovisual learning tools. It will be a very important component of the CNS learning tools, such as SANS, and could be used by residents and practicing neurosurgeons as a quick board review. It could be a good platform for developing guidelines and creating a comprehensive summary of evidence, such as recent advances for important topics in the neurosciences. In the future, individual NeuroWiki sections may exist for each specialty of neurosurgery, and there may also be medical Wikis from different specialties that could be integrated into a central medical Wiki for all medical professionals.
For more than 25 years, Self-Assessment in Neurological Surgery (SANS) has been utilized as a neurosurgical training and examination preparation tool as well as a continuing medical education (CME) resource. SANS has been integrated into the maintenance of certification (MOC) process overseen by the American Board of Neurological Surgery (ABNS). Last fiscal year alone, nearly 400 US neurosurgeons participated in SANS Lifelong Learning as part of their MOC accreditation. The Congress of Neurological Surgeons awards MOC-eligible, Category I CME credits for participation in SANS as part of this process.

SANS currently offers subscribers a wide variety of options for lifelong learning. The currently deployed SANS web-based learning platforms include the SANS Lifelong Learning general examination, SANS: Pediatrics, SANS: Spine and SANS Competencies. This latest version of SANS has a more sophisticated interface and allows users to compare to one’s peers and highlight and bookmark information of interest. This web interface is faster and is easily accessible from any internet linked computer.

The SANS products are used by hundreds of subscribers each year in America and also internationally. Because SANS is learner-driven, allows for self-assessment, and provides immediate formative and summative feedback on performance, the program represents a validated tool for neurosurgical training and education.

SANS committee members are presently assisting in the development of SANS “fundamentals” which is an online educational product aimed at neurosurgical residents and fellows education. Currently, the majority of US residency training programs utilize SANS for some aspect of training and education. In a recent survey of US residency program directors, SANS was noted to be used most frequently for board (ABNS) preparation. Other uses included intra-rotation learning, annual evaluation and teaching during departmental conferences.

In addition, SANS sponsors the highly successful CNS Resident SANS Challenge — a game show-style tournament at the CNS Annual Meeting. This event involves competition from resident teams in the US, and this past year expanded to include international colleagues with resident participants from India.

With the assistance of the trauma section leaders, SANS is also developing a neurotrauma module. This platform will provide much needed education related to head and spine injury. It will also afford those in need of specific annual state licensing requirements to receive CME targeted to neurotrauma.

It is anticipated that in years to come, SANS will serve as an online education tool for international colleagues. Country specific learning programs are being explored. Use of the robust IT platform coupled with the validated methodology of SANS is a reasonable option for MOC in other countries.

Lifelong learning which spans the professional “cradle to grave,” allows SANS users to participate from residency through MOC for board certification and post-residency educational updates. We welcome your suggestions, support and volunteerism for the SANS lifelong learning efforts in neurosurgery.
In 2010, NEUROSURGERY® will employ an aggressive online strategy to improve the quality and breadth of online content, and also expand its “network.” In addition to a new “look and feel,” the journal will embrace new distribution technologies and provide content that goes beyond a simple reiteration of its printed matter. In particular, the goal is to increase the reach and lifespan of our content.

The blog model — regular entries of commentary, descriptions of events, or other material such as graphics or video — provides an excellent opportunity for NEUROSURGERY® to not only promote the contents of the printed journal, but expose the audience to information that would not make the printed edition for a variety of reasons. With the boom in broadband access and multimedia distribution, supplemental materials have become not simply a footnote to print, but an important element in promoting content and creating interest in an article prior to print publication.

Thanks to online commenting, reader correspondence that was once published after months of delay can be written, published and responded to within days, if not minutes, facilitating exchange between authors, readers and reviewers. Commenting systems have evolved far beyond the simple unmediated feedback form at the end of an article. Sophisticated systems such as IntenseDebate and Disqus allow comments to be moderated, organized, ranked and distributed across multiple media sites simultaneously. The conversation need not take place in one defined area of the web, but across the spectrum of social networking sites.

This is not to say that feedback should not be monitored. It is essential that online communication among authors, readers and editors be held to the same high standards as printed communication, and the editorial office will play an active role in ensuring that online exchanges maintain an appropriate level of decorum and relevance.

To capture this new model of rapid online communication, the editorial office has outlined a strategy that utilizes not only the blog model, but also social networking channels. You can now follow NEUROSURGERY® updates on both Facebook and Twitter (@NeurosurgeryCNS). These developments serve to not only provide timely neurosurgery-related information that is beyond the usual scope of the journal, but also to expand the online footprint of NEUROSURGERY®. The longstanding multilingual Podcasting in English, Mandarin Chinese, Italian, Japanese, Korean and Spanish will now include expanded content and expanded distribution. We are also actively exploring new avenues of electronic distribution of the journal to personal devices.

The goal in all these initiatives is simple: to enhance health and improve lives worldwide through the advancement of education and scientific exchange — the CNS mission.
Surgical training has traditionally been based on the age old tenet of “see one, do one, teach one.” However, with the ever increasing complexity of surgical intervention and a shift toward less invasive techniques, training has become more complex. Add to this the restricted work hours of residency training and a dichotomy grows between clinical progress and training physicians to use new technology. Virtual reality technology has been in use for years in the military and aerospace fields to train pilots for complex and often life threatening maneuvers. The development of haptics to translate a human maneuver into a measurable result, i.e., landing a plane or deploying a coil in an aneurysm, is now revolutionizing training in medicine.

The first use of simulation in medicine was for training of surgeons in surgical endoscopic procedures such as laparoscopic cholecystectomies and biopsies. The positive impact of simulation on performance has been well validated, and it is now used in almost all areas of procedural medicine to enhance education. The complexities of neurosurgical procedures make them a natural fit for simulation training. Endovascular neurosurgery has been at the forefront of this trend, and simulation is now in use for coiling of aneurysms, cerebral angiography and carotid stenting. Data has shown that this type of training and exposure improves residents’ skills and technique. The use of virtual reality simulation to teach endovascular techniques has been integrated into CNS practical course offerings over the past five years, with technologies ranging from simple in vitro models to highly complex computer simulators with haptic feedback. Applications for other areas of neurosurgery such as spine and functional have also begun to emerge.

One example of cutting edge simulation is the Procedicus Vascular Interventional System Trainer (VIST) (Mentice AB, Gothenburg, Sweden), which has been used widely in carotid stent training and has been featured in the endovascular practical courses at the CNS for the past five years (Figure 1). It reproduces a realistic “cath” lab environment with full size mannequin that is ideal for team training. The system models the appearance of real-time digital subtraction angiography with computer-generated images responsive to actual hands-on catheter manipulation. The translational and rotational movements of real endovascular instruments are simultaneously recognized through the haptic interface. Other input comes through the control panel, foot switch, syringe injection and deflator. Output is seen as realistic angiographic images and may also be felt through resistance and torque applied to the catheters. Software packages for the VIST system simulate carotid artery disease, intracranial aneurysm coiling and intracranial stenting. It also enables objective assessment of the clinician’s skill level. There is a new portable version of the VIST with a smaller footprint and a laptop for visualization.

Another example is the AngioMentor System (Symbionix, Cleveland, OH) which has a cerebral intervention module to allow surgeons to practice performing intracranial aneurysm coil embolization and intracranial stenosis stenting, as well as react to relevant complications such as aneurysm perforation (Figure 2). The module allows surgeons to simulate performing stent/balloon assisted coil embolization and treatment of stenosis and features an innovative and unique simulated biplane x-ray system. Virtual patients show a range of cerebral vasculature, including a variety of aortic arch types and aneurysm locations, with variation in sizes and neck types. Vital signs including simulation of heart rate, invasive and non-invasive blood pressure, and ECG leads and oxygen saturation accurately reflect the outcomes of interventional procedures and procedural complications. A full assortment of drugs is available for administration during the simulated procedures. The effects on the virtual patient are accurately reflected in the angiographic images and in the patient’s vital signs. The simulation system provides a comprehensive report of performance parameters for both the learner and the educator. The report, customized for each module, enables
objective assessment of the clinician’s skill level and training success, and generates extensive statistics for individual or group performance. There are two portable versions of this system that run on laptop computers for individual training or for smaller courses.

The Future
In the future the ability to visualize the simulation on laptops, the availability of portable simulator modules and the increase in bandwidth of web connectivity will allow web based learning and courses remotely proctored by experienced endovascular neurosurgeons (Figure 3). Other upcoming improvements may include simulated use of new instrument prototypes and pre-procedure rehearsal using patient-specific anatomy. Recent carotid stent post-market approval studies have mandated simulator-based training before these devices can be used in the clinical setting by the clinician. We envision that with the future standards for endovascular training, certification and maintenance of certification in endovascular neurosurgery will involve training and assessment with simulators. And through increased connectivity it will likely become possible to download specific actual cases that may have unique teaching points. Not only can these be used for the novice in training but also for the most experienced surgeons to discuss challenging cases virtually.

Reference

INSIDE THE CNS

2009 CONGRESS OF NEUROLOGICAL SURGEONS ANNUAL MEETING:
“A CULTURE OF EXCELLENCE”

The 59th Annual Meeting of the Congress of Neurological Surgeons (CNS) meeting took place in New Orleans, Louisiana from October 24-29, 2009. The meeting theme, “A Culture of Excellence,” exemplified how neurosurgeons define, pursue, and measure excellence in their everyday practice and specialty. Excellence was exemplified by the 2009 meeting’s Honored Guest, Dr. James T. Rutka and the invited speakers. The CNS also had the privilege of partnering with our neurosurgical colleagues from India and South Asia, as well as programmatic coordination with the 2009 Joint Meeting of the Society for Neuro-Oncology and AANS/CNS Section on Tumors.

The 2009 CNS Annual Meeting was a record breaking conference with regards to the largest CNS member participation and scientific abstract submissions (1281 abstracts). The CNS Honored Guest, Dr. James T. Rutka, provided interesting and inspiring lectures each day pertaining to neuro-

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Education and Innovation
oncology research, clinical neurosurgery and neurosurgery program building. Our meeting was further highlighted by Dr. APJ Abdul Kalam, the immediate Past President of India, Walter Isaacson, internationally acclaimed author (Benjamin Franklin: An American Life, Einstein: His Life and Universe, Kissinger: A Biography), Governor Bobby Jindal of Louisiana, Peter Agre, MD, the 2003 Nobel Prize winner in Chemistry, and performance expert, Dr. Terry Orlick.

**CNS Original Science Program**
The CNS’ Original Science Program took place on Monday afternoon and was very popular as evidenced by the large attendance and participant interaction. The first half of the program involved platform presentation of the “Top Ten Abstracts” in each section. The second half consisted of the interactive “Neurosurgical Forum” program which provided the attendees with an opportunity to view additional highly ranked abstracts being presented by their authors via a live poster presentation format. The discussion of these abstracts was facilitated by senior section representatives who toured the posters with attendees, and provided additional insight into the presented research. The top ranked forum presentation from each section was selected by the section leadership, and this list was presented to the general assembly the next day.

**Practical Courses and Luncheon Seminars**
The scientific program consisted of 33 pre-meeting Practical Courses and 55 Luncheon Seminars covering a broad range of fundamental, practical and cutting-edge aspects of clinical and academic neurosurgery. The practical courses included a first ever live 3D spinal dissection and technical course.

**Consensus Sessions, Integrated Medical Learning® (IML) and Special Courses:**
The meeting featured innovative interactive sessions including four CNS Consensus Sessions and four Integrated Medical Learning® (IML) workshops. The Consensus Sessions focused on policy and socioeconomic topics including the role of mid-level health care providers in neurosurgery, options for insurance plan participation, regionalization of emergency cerebrovascular care, and defining quality measures in neurosurgery. The IML sessions included discussion of Anterior Temporal Lobectomy versus Selective Amygdalohippocampectomy, Best Management Strategy for Single Level Medically Refractory Cervical Radiculopathy, What Extent of Decompression Is Necessary in the Surgical Management of Chiari I Malformation, and “Small Hemispheric AVMs: To Treat or Not Treat and Surgery versus Radiosurgery” These Consensus Session and IML gatherings provided attendees the opportunity to contribute their experience, ideas and questions to the process, benefiting from these cutting edge interactive educational offerings by the CNS to advance knowledge and understanding in these key and controversial areas.
The two Special Courses featured experts introducing and discussing for the first time the new Evidence Based Guidelines on the Management of Cerebral Metastases, recently created by the Joint Guidelines Committee, as well as a global central nervous system infection course being directed by our NSI colleagues with their unique and vast experience with CNS infections.

Operative Techniques with the Masters
The always popular Operative Techniques with the Masters: 3-D Live Cadaveric Demonstration of Surgical Techniques took place on Wednesday afternoon. This live session from the GSS stage included world-renowned neurosurgeons demonstrating surgical techniques in different subspecialties with cadaveric demonstrations, state-of-the-art 3-D visualization and videos.

The CNS is proud of the 2009 Annual Meeting. The meeting was organized and developed by the hard work and the exceptional efforts of the scientific program committee, CNS headquarters office, and the CNS leadership. There were approximately 2800 medical attendees, 600 faculty and 400 international participants.
The CNS proudly welcomed as 2009 joint meeting partners, the Neurological Society of India (NSI) and the American Association of South Asian Neurosurgeons (AASAN). The CNS also invited both the past and current Presidents of NSI, Drs. Basant K. Misra, and Virender K. Khosla. In addition, leading Indian neuroscientist and neurosurgical educator, Prof. Prakash Narain Tandon, and approximately 100 NSI members attended and participated in various aspects of the CNS Annual Meeting. The expertise of the NSI members enriched our program in various capacities. This included the Practical Course, ‘NSI and Excellence in Global Neurosurgery’ as well as a Special Course on ‘Global Disease: Infections’ which attracted an audience of over 100 neurosurgeons. Additional luncheon seminars focused on international topics, including such themes as ‘Managing Head Injury Internationally and in the US’, ‘Managing Intracranial Mass Lesions in the Developing World’, and ‘Management of Congenital Anomalies in the Developing World’. NSI members also served as faculty on a broad range of scientific and surgical topics for almost every luncheon, practical and special course throughout the meeting.

AASAN is an organization of South Asian neurosurgeons based in the United States and promoting scientific and personal ties between these two regions. The AASAN leadership, including Past president Dr. Jogi Pattisapu, and current President, Ashwini Sharan, and many of its over 200 members were intimately involved in scientific planning for the CNS 2009 Annual Meeting and in generous sponsorship of scholarships for South Asian neurosurgeons to attend and participate in the meeting. The CNS was pleased to also contribute an additional $25,000 towards these travel scholarships, with matching contributions from AASAN members and from industry, making a total meeting travel bursary for South Asian guests of over $75,000.

The CNS, AASAN and NSI were honored to have Dr. Pattisapu introduce the Past-President of India, Dr. APJ Abdul Kalam, who gave the 2009 International Leadership Oration at the CNS Annual Meeting. In addition, AASAN member and member of the CNS Nominations Committee, Dr. Anil Nanda, introduced Governor Bobby Jindal, of Louisiana, who gave the Third Annual Julian T. Hoff Lecture. Governor Jindal is the first American of South Asian ancestry elected to a statewide office. Both Dr. Basant Misra and Dr. P.N. Tandon also gave distinguished addresses from the main stage of the General Scientific Sessions at the meeting.

Finally, the CNS was proud to host the CNS International Reception for our guests from South Asia and around the world at the Audubon Aquarium of the Americas. This well attended gala event provided a captivating environment for the congenital interaction of our international faculty and guests with the leadership of the CNS and the CNS Annual Meeting participants.

The Congress of Neurological Surgeons and its Executive Committee and Annual Meeting Committee extend sincere thanks and heartfelt gratitude to NSI and AASAN. Because of this collaboration, North American neurosurgeons learned a tremendous amount about the history, tradition and accomplishments of the profession of neurosurgery in India and South Asia. We look forward to future exchanges and collaboration with the NSI and AASAN. Planning is currently underway for the CNS and North American participation in the 2010 NSI meeting in Jaipur, India.
The best clinical and basic science will again be presented during the CNS Original Science Program, featuring the Top Ten Abstracts and the Neurosurgical Forum. Join your colleagues to hear their latest research in each subspecialty in this neurosurgical marketplace of ideas.

The Top Ten Abstracts session presents the highest ranked abstracts from each neurosurgical subspecialty in eight-minute platform presentations followed by two-minutes of expert and audience discussion.

Immediately following, Neurosurgical Forum authors will make dynamic oral presentations to small groups in this interdisciplinary session with senior section leaders facilitating discussions between audience and authors.

Registration is now available online at www.cns.org. 
Celebrate 60 years of the CNS’ commitment to advancing neurosurgery and scientific exchange!
The worldwide economic climate, as well as recent public policy decisions, have had a significant impact upon the finances of the Congress of Neurological Surgeons. The CNS does not live in a bubble, and to expect otherwise is not realistic. Nevertheless, the CNS remains fiscally sound and continues to adhere to strict “best business practices”. This has ameliorated much of the potential impact and enabled the CNS to weather the economic storm in excellent position for the challenges ahead. I would like to use this opportunity to describe some of the highlights of the past year and to comment upon some of the issues facing us in the immediate future.

I am extremely pleased to report that the Congress of Neurological Surgeons has received an “unqualified clean opinion” from Wolf & Company, an independent auditing firm. This is the best result that can be achieved and reflects the efforts of Laurie Behncke and headquarters staff, as well as upon the past leadership of the CNS in establishing protocols, policies and procedures that are transparent, reasonable, and most importantly, adhered to. While it is easy to pay lip service to such principles, the CNS has demonstrated a commitment and dedication to these principles where “the rubber meets the road.”

The CNS has established long term investment funds in order to provide financial security, as well as to fund strategic initiatives consistent with the educational mission of the Congress. These funds were not immune to the recession of the last several years. However, due primarily to the sage advice of our investment counselors at Crawford and Long, the long term investments held up very well in comparison to the market as a whole and have participated in the subsequent recovery. While we have not realized a complete recovery, the CNS continues to operate in a fiscally responsible fashion and remains well positioned for the challenges facing us in the near and long term.
The rainy day has come and gone, and we remain strong.

The CNS derives revenue from three primary sources: member dues, our Annual Meeting, and NEUROSURGERY®. The CNS raised its dues this past year to $575 for active members — the first dues increase in seven years; still, the CNS is among the most valued and valuable memberships of any specialty society. Since 2006, costs associated with public advocacy and other critical activities have increased substantially and rapidly. In fact, CNS support of the Washington Committee and associated activities exceeded revenues from dues in FY 2008 and 2009. Given the current political climate, the importance of such activities is clear; however, the CNS plans to continue to support advocacy and public education to the extent that is consistent with the CNS Mission and our tax exempt status. When one considers that another $125 is spent per member for the journal subscription, the need for a realistic adjustment of the dues structure became clear. I am pleased to report that the publication contract with LWW has been renewed with mutually favorable terms. Most importantly, the editorial office finances have been brought under control through application of standard accounting and business practices by the CNS administrative office.

Corporate relationships with physicians and with medical societies are “hot button” topics, and significant attention is being paid to the nature, structure and value of such relationships. As such, the Annual Meeting of the future may bear little resemblance to the Annual Meeting of the past in terms of the involvement of corporate vendors in various aspects of the meeting. The CNS has always maintained a strict interpretation of ACCME guidelines and responsible corporate relationships, a fact that has served us well during periodic ACCME reviews and audits. Rules, regulations and practices are changing rapidly, and medical societies and vendors are committed to accommodating the new realities. As all parties examine best business practices, the economic benefits of the Annual Meeting may change. The CNS is actively working to understand the changing landscape and position itself in order to meet the challenges of the next decade.

In summary, I am pleased to report that the CNS continues to operate in a fiscally responsible fashion and remains well positioned for the challenges facing us in the near and long term. Members can be justifiably proud of the transparency of process, adherence to best business practices, and consistent efforts at improvement which have marked the growth of the Congress of Neurological Surgeons. ■

Advance Your Neurosurgical Career!
CNS International Vista Membership.

The Congress of Neurological Surgeons exists to enhance health and improve lives worldwide through the advancement of education and scientific exchange. Gain access to outstanding CNS publications and other world-class educational resources through the convenience of the internet with the CNS International Vista Membership.

Benefits Include:
- Internet access to NEUROSURGERY®, the official CNS journal, and all other CNS Publications.
- Access to the CNS University of Neurosurgery and other educational products!
- Discounted rate on SANS Lifelong Learning.
- Reduced registration fees at the CNS Annual Meeting.
- Opportunity to contribute to the CNS through volunteer service on various committees — including the International Committee.

The CNS is a world-leader in neurosurgical education and innovation. Join the CNS today to enhance your leadership skills, advance your education and further your neurosurgical career.

Applications for CNS International Vista Membership are available online at www.cns.org.

Become a member today and reap the benefits of membership with the Congress of Neurological Surgeons!

Applications and eligibility requirements are online at www.cns.org.
As you may have noticed, the Congress of Neurological Surgeons has recently launched a significant update to their web site, www.cns.org. The web site has been completely redesigned, not only for aesthetics but also to improve functionality. The CNS Web Committee believes this updated site captures the essence of the CNS and our dedication to membership and our mission of innovation, education and internationalism.

The sleek new design affords easy navigation (Figure 1). If you are not able to find a certain subject, simply type it into the search engine and the entire site will be searched. One of the most exciting new features is the member login present on the home page (Figure 2a and b) which replaces the old CNS PA. This feature allows members access to their profile, CME, NEUROSURGERY®, and the CNS University of Neurosurgery, among other resources all from one universal login.

Lastly, the CNS University of Neurosurgery has launched a new web portal (Figure 3). This new design allows the member much easier navigation of the CNSU site. It is easier to rapidly locate educational content. If you are unsure where to find what you are looking for, simply type the subject in the box “What do you want to learn about today.” This feature can be further modified to only search abstracts, images or videos.

We hope you find the CNS web site much more organized and streamlined. We believe the content is much easier to locate and the site much more user friendly. If you have suggestions please do not hesitate to call the webmaster.
The aim of the Congress of Neurological Surgeons is to be the premier neurological education organization, recognized internationally for its excellence. The International Division (CNS ID) is the operational arm for developing and providing neurological education globally through a multimedia approach. The goals of the CNS ID are to promote the interests and mission of the organization worldwide through teaching, enhancing patient care and the development of novel educational content.

The primary roles of the CNS ID Chair are to organize this effort and to serve as an ambassador for the CNS International initiatives. The CNS International Division Senior Advisor (Dr. David Adelson, CNS Past President) will provide an advisory role to the leadership of the CNS ID regarding ongoing and future initiatives. The concept and the vision for this entity, CNS ID, was developed by Dr. Adelson during his Presidency of the CNS in 2009. The CNS ID is also creating a senior advisory board which will involve some of the more senior neurosurgeons from around the world, representing continental, regional, and international societies. The CNS ID working group will be formed by volunteers from the CNS membership and will be representative of both the US and international members. This latter group will meet at the Annual Meetings of the CNS and AANS as well as at regularly scheduled telephone conferences.

A key goal for the CNS ID is to collaborate with neurosurgical colleagues and neurological societies through the world. The first of many initiatives to come has been with the Neurological Society of India (NSI). The first joint meeting was held with the NSI at the 59th CNS Annual Meeting in New Orleans (October 24-29, 2009). The leadership of the NSI joined the leadership of the CNS in formulating the scientific program and the activities of this meeting. This was a significant success in developing new working relationships.
relationships and plans are underway for a second collaborative meeting scheduled to be held in India in December this year.

The 59th Joint Annual Meeting will be held in Jaipur, India (December 15-19, 2010). A joint NSI-CNS Committee has been formed to develop the scientific program. CNS members will be included as speakers in the plenary sessions as well as the luncheon symposia. The joint task force includes Professors Jain, Rajshekhar, and Misra from the NSI, and Drs. Abdulrauf, Adelson, Sharan, and Pattisapu representing the CNS ID. The CNS will sponsor a single day course before the meeting: Operative Techniques with the Masters 3-D Symposium. This symposium will incorporate 12 presentations from 12 senior speakers from throughout the world in a similar forum as of those conducted at the CNS Annual Meetings.

Another key goal for the CNS ID is to develop collaborative resident educational models for US and international residents. The first such initiative has been successfully developed with the European Association of Neurological Surgeons (EANS) and the initial phase of this new program was an exchange of faculty. The first exchange of faculty was Dr. Saleem Abdulrauf’s visit to the EANS Senior Residents Course dedicated to Vascular Neurosurgery (September 13-17) in Opatija, Croatia. This was considered a highly successful collaboration by both societies and the European residents. The next phase will involve a visit by the senior leadership of the EANS to the CNS Annual Chief Residents course to be held in St. Louis, MO, August 12-15, 2010. The first group of US residents (10 residents) will be traveling to Europe to the EANS Tumor/Skull Base course, to be held in Greece between September 26-30, 2010. Dr. Anthony Asher (CNS Past President) as well as other CNS leadership figures will be accompanying this first group of US Chief Residents to the course. The first group of European Senior Residents will visit the CNS Chief Residents Course in 2011. All resident accommodations and registration fees will be covered by the parent societies.

The CNS is in the planning phases of generating similar relationships with other major neurosurgical organizations around the world to expand resident educational initiatives and interactions to improve future collaborations among young neurosurgeons. An additional initiative scheduled to launch in March 2010 are several specialty-specific webinars. The first webinar will be held in collaboration with the Brazilian Neurosurgical Society (SBN) featuring Dr. Daniel Barrow from the CNS and Dr. Evandro de Oliveira, also a CNS member, from the SBN on the management of cerebral aneurysms.

The CNS, at its 60th Annual Meeting in San Francisco this fall (October 16-21), will partner with the Korean Neurosurgical Society. Dr. Gerald Rodts (CNS President) and Dr. Kyu-Sung Lee (KNS President) and their respective Scientific Program Committees are developing a strong collaborative scientific program for this meeting. Dr. Tae Sung Park is serving as liaison for the CNS in developing this collaboration with the Korean Neurosurgical Society.

The CNS is very proud of this new initiative that will lead to multiple international endeavors directed at improving neurosurgical education globally and increasing collaboration among future generations of neurosurgeons.
The 2010 CNS Annual Meeting
is a Joint Meeting with the
Korean Neurosurgical Society!

Our daily scientific sessions will explore the role of pioneering discoveries on current neurosurgical practice and address emerging scientific and clinical strategies for managing neurosurgical disorders around the globe, while the afternoon sessions offer attendees an opportunity to weigh in on timely and controversial topics pertinent to the specialty.

Don’t miss this year’s science-packed program, offering more CME opportunities than ever before!

- **NEW** Opening Session on Sunday.
- **CNS Original Science Program.**
- **NEW** Dinner Seminars.
- **Consensus Sessions.**
- **NEW** Spine-based 3-D Cadaveric Demonstration.
- **Cranial 3-D Cadaveric Demonstration.**

Plus two Special Courses, eight Section Sessions and more than 70 optional courses and seminars covering a variety of subspecialty and non-clinical topics. Secure your spot today at the neurosurgical meeting of the year.

Registration is now available online at [www.cns.org](http://www.cns.org).
A 20-year-old college baseball player presented with meningioma that eroded through the skull creating a scalp cosmetic deformity and causing difficulty putting on his baseball cap. After removal of the tumor, a complete calvarial resection and reconstruction was performed.

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