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Meeting Highlights

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- Interactive Neurosurgical Forum and Select Abstracts Session – Monday, September 17.
- Live 3-D Cadaveric Demonstration of Surgical Approaches – Tuesday, September 18.
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Dear Colleague,

Socioeconomic issues and neurosurgical research are the integrated themes of this summer issue of the CNSQ. As medicine evolves and responds to the changing needs of society, we as neurosurgeons must constantly reevaluate our practices and priorities. These elements of change need to be recognized and optimally integrated into our neurosurgical lives. In these articles our contributors discuss some of the many options we have regarding our affiliations, practice models, and opportunities for scientific investigation and funding.

Changes in health care economics and increasing trends toward specialization can translate into many options for neurosurgeons. In order to maximize our productivity and effectiveness, we can partner with colleagues in other specialties. We are also seeing an evolution in the ways in which we interact with hospitals and medical systems. To help us consider some of these issues, our articles deal with topics such as stresses of practice, the reality of hospital settings, and how the decision to specialize today may influence the shape of tomorrow.

Neurosurgical research is fundamental for progress and innovation in our field and we have been fortunate to have access to a wide variety of research opportunities. These opportunities are still available but attaining funding is becoming increasingly difficult. At the same time, balancing research and clinical life is more challenging then ever before. In this context, we discuss the issues facing the neurosurgeon-researcher and offer steps for maximizing funding and writing successful grants. Interviews with the director and deputy director of the NINDS, and Ralph Dacey provide unique insights into the current status and the future of neurosurgical research. Also, experienced colleagues share their perspectives and provide tips about the realities of “working in the lab,” how to obtain grants, and how best to accomplish research goals.

New in this issue is the “Past President’s Section,” where former CNS Presidents offer their perspectives on a variety of topics. And last, but not least, is a very dynamic article in the joint section feature on cerebrovascular surgery.

As always, we look forward to hearing your ideas and comments on this and future issues of the CNSQ.

Sincerely,
Ali R. Rezai, MD

Editor Contact Information:
info@1cns.org or 847.240.2500.
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These are interesting times. We used to understand our practice threats—liability, reimbursement pressures, workforce issues... Now we have mandates to “perform” (whatever that means), to provide “quality care” (did we not already do that?), and to “prove” that we have been continually educated on a myriad of new topics that include terrorism responses, hand washing, ethics, privacy regulations, and industry interaction, just to name a few.

For the most part, our culture has been reactionary, and our primary vehicle to respond to outside pressures has been through organized neurosurgery and lobbying—both locally, and at the state and federal levels. We have been told that we “need to solve our own problems or others will solve them for us.” Who are these others? Neurologists and cardiologists write Guidelines on the diseases we manage. The government provides rules on the timing of antibiotic usage. Private firms comprise scorecards on our performance. If we do not define quality, then it will be defined for us. What are the metrics of quality? Patient survival? Infection rates? The occurrence of a deep vein thrombosis? These metrics are so distant from the real concept of quality, that even mentioning the word in this setting seems far-fetched. Personally, I think that successful surgery, a quality operation, is one that meets the goals of the surgeon and the patient. Did the pain go away? Did they go back to work, if that was the goal? Was this surgery performed without incident or error? Did our anesthesia and nursing colleagues in the operating room help us to meet our goals, or did something happen to reduce that chance?

If these are important concepts for neurosurgeons, and I submit that they are, we will need a real change in our culture. The preoperative visit should not just end with a letter to the referring doctor, but a software-based entry of data on patient and disease characteristics and the management goals for that patient. The surgery should not just end with a dictation of the operative note, but should also end with a computerized entry of operative data. This should include disease-related findings and peer-protected measures of any error (surgical, anesthesia, nursing/hospital). At hospital discharge and at the first clinic visit, entries of immediate and delayed outcome should be included—determining whether the goals of surgery were met. Was quality care achieved? These concepts will require the input of many people, and should be surgeon-directed.
We need to build user-friendly tools that allow efficient neurosurgical practice. This practice should generate meaningful information that neurosurgeons can use to speak to patients, improve patient care, and interact with institutions and payers on behalf of their patients.

Of course, such a change in behavior provides information only on what was done, and not why it was done. A determination of the most appropriate surgery in a specific disease state and condition is Guidelines Science and requires a sophisticated analysis of medical evidence. In neurosurgery, it is more common that we can understand our options for care, rather than know what is the “most appropriate”.

The CNS has created a number of practice guidelines over the past few years, and has partnered in others. Guidelines represent a scientific tool from evidence-based medicine that can be used by practitioners to assist in decision making. We understand that there has been some discomfort at the level of some neurosurgeons, relating to an unwillingness to modify practice patterns away from individual-based decision making to “guided decision making.” This is fair. Indeed, much of what is written in a guidelines document are practice options and not standards. Importantly, some older practice concepts may indeed have little role in patient care and should be discarded. What is clear is that the creation of guidelines uses a scientific method that medical societies and other organizations (public and private) across the breadth of medicine are interested in. Whether or not guidelines will transform neurosurgical care in some fashion is not known. For the present, we need to participate in asking the right questions, performing meaningful research, and assisting in the data evaluation. From the perspective of the medical literature, our journal pages contain many case reports and other simple observations that many would consider of lesser scientific value. The publication of reports that evaluate and synthesize what is known (strong or weak evidence, positive or negative findings), and help guide medical care, are desirable.

At our upcoming meeting in San Diego, Salman Rushdie will speak on “Navigating Change across Cultures.” He provides unique insights into the regional and global dynamics affecting humanity, and mechanisms to deal with adversity. Similarly, the practice of a neurosurgeon needs to evolve in response to external pressures, and it is the job of any organization such as the Congress of Neurological Surgeons to assist their members in this task. We need to build user-friendly tools that allow efficient neurosurgical practice. This practice should generate meaningful information that neurosurgeons can use to speak to patients, improve patient care, and interact with institutions and payers on behalf of their patients. Sure, survival is a patient goal and so is avoidance of infection or a DVT. However, a real measure of quality, of value to both patient and surgeon, will be our own assessments of why the patient came to see us in the first place. Providing a real answer to that question will be welcomed. It will take hard work, and will require our efforts and yours. CNSQ
Join us in San Diego, California, as the Congress of Neurological Surgeons advances neurosurgery with our most influential Annual Meeting yet. The scientific program at the 2007 CNS Annual Meeting is designed to help you navigate the dynamic field of neurosurgery and incorporate the latest technological breakthroughs into your practice.

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Announcing the Joint Meeting with the Japanese Congress of Neurological Surgeons!
Introducing Your Newest Way to Experience Neurosurgery
“This meeting was priceless; thank you for the opportunity,” wrote Dr. Gale Hazen from Lorain, Ohio after attending the Congress of Neurological Surgeons’ Member Think Tank, held on March 23-24, 2007 at the Peninsula Hotel in Chicago. Many other participants echoed his sentiments after participating in interactive open-forum discussions that provided direct feedback on the current and future direction of the organization.

The Think Tank represented a unique opportunity for 25 neurosurgeons who have been CNS members for more than 20 years. Historically, annual meeting evaluations and focus groups have provided some feedback regarding services and educational programs. But recently CNS leadership decided to approach longtime members whose feedback is strategically important for the organization. A letter was sent out to over 500 neurosurgeons and members were invited on a first-come, first-served basis.

The 25 participants live in regions of the U.S. ranging from Hawaii to Florida, and represent all practice types including solo practitioners, private practitioners in large groups, and academic neurosurgeons. The CNS leadership was represented by Dr. Douglas Kondziolka, President of the Congress; Dr. Anthony Asher, President-Elect; Dr. Christopher Wolfla, Secretary; Dr. Joel MacDonald, Treasurer; Dr. Richard Ellenbogen, Past President; and Ms. Laurie Behncke, CNS Executive Director. Two special speakers were invited to participate as well: Dr. Edward F.X. Hughes, Professor of Health Industry Management, Kellogg School of Business; and Mr. Daniel Evans, CEO of Clarian Health Partners.

Following opening remarks on the current state of the Congress by Dr. Kondziolka, Dr. Hughes gave a lively, interactive, and intellectually provocative talk on “Perspectives on the Future of American Medicine and Strategies for Survival.” According to Dr Hughes, there are three keys to understanding our healthcare system: the delivery system is a function of the values of the people; you cannot understand American healthcare without understanding American history; and the system is constantly in a state of change. Healthcare in the U.S., he predicts, will move toward universal access but not under a single-payer system.

Dr. Hughes says the future of the healthcare industry need not be negative, and he discussed why an increasing percentage of GDP going to healthcare should not be perceived as such. Americans, he argued, “are getting value for our dollar as never before in the history of American medicine.” So why is there a problem? Perhaps, Dr. Hughes pointed out, society needs help to make the mental connection between the results they are observing, such as increasing life expectancy, and the cost of healthcare: there is truly measurable value in the dollars spent. Because the American people ultimately direct healthcare spending, a bright future for our system is directly linked to a clear understanding of what they are getting for their money.

Mr. Daniel Evans engaged the audience in more of a focused socioeconomic discussion from his perspective as CEO of Clarian
Health Partners. A number of issues facing both hospitals and surgeons were identified during his talk on “Transparency, Reimbursement, and the Value Proposition and What It Means to the Future of Private and Academic Practice.” Mr. Evans shared his experiences dealing with politicians in Washington and in the state of Indiana regarding financial transparency in the health care system, consumerism (high deductibles and empowering patients to make decisions), and quality initiatives for both hospitals and physicians. He feels particularly strongly about the issue of tracking and reporting quality measures, as his hospital is one of the leaders in this arena. He warned the group that physicians should “develop a personal rating system before someone else does” as consumer reports for MDs are already beginning to appear with sometimes inaccurate information. Mr. Evans agreed with Dr. Hughes in that physicians must engage in educating the public on the value they receive for their healthcare dollars.

The majority of Think Tank discussion was structured around specific presentations, ranging from a review of the member survey results to the needs of neurosurgeons 2007-2020, including defining current and future issues facing subspecialty practice areas in neurosurgery. A number of important ideas emerged. The general consensus was that pay-for-performance is likely to present a burden to the practicing neurosurgeon, and a discussion was held on how individual neurosurgeons can measure and then participate in quality initiatives.

Many members are concerned about a lack of consensus on what constitutes the best outcome measures. For instance, how often does one see the postoperative spinal x-ray used as a measure of outcome versus the patient’s functional status or level of pain? In addition to developing systems to measure and track meaningful outcomes, it was suggested that the CNS and AANS help to establish national disease registries for the benefit of the specialty towards the goal of public education.

Members also discussed the issue of disclosure for neurosurgeons with specific corporate affiliations when they submit papers for publication in our national journals. Those participating feel that full disclosure, including the extent of the physician/corporate relationship, is important and suggested that manuscripts be accompanied by a detailed disclosure statement. Furthermore, they feel that the policy should also extend to the editorial board of the journals in order to assure unbiased reviews. Members are also concerned that personal biases by physicians championing a particular technique or device can make the evaluation of new technologies difficult, and they are interested in developing a method free of potential conflicts of interest for more objective comparison.

Continuing education and practice development is an issue facing all neurosurgeons upon graduation from residency. The further out from training one gets, the more difficult it can be to learn and incorporate new techniques into one’s practice. The question was raised: how does this occur now, and can a better system be developed? The ideas discussed included an educational experience along the lines of the integrated medical learning concept (IML), where practical courses taken at the annual meeting could subsequently be linked to online education material in the CNS University, followed by a practical operative mentorship program with feedback throughout the process.

At the conclusion of the program members had presented a number of practical ideas in the areas of education and advocacy. The Think Tank was conceived and implemented as part of an ongoing effort to help guide the future direction of the Congress. The CNS leadership is grateful to those members who, realizing the value of this opportunity, volunteered their time to be involved with and provide feedback for their organization. CNSQ

Members are also concerned that personal biases by physicians championing a particular technique or device can make the evaluation of new technologies difficult, and they are interested in developing a method free of potential conflicts of interest for more objective comparison.
Specialization: The Most Important Fact for Planning your Future

One simple fact will determine your future as a neurosurgeon: the growth of scientific information is exponential, and it is occurring so rapidly that no one physician can keep up. (According to some estimates 50% of scientific knowledge is out of date in 7 years.) Therefore, you will never be able to keep current in all of the areas of neurosurgery. This may already be obvious if you are in your residency or in practice, either private or academic.

Once you accept this fact, what do you do? First, you must specialize in some area of neurosurgery. In addition, you should either join or form a group with other neurosurgeons or doctors so that you can command a larger market share for your specialized interest.

Many neurosurgeons have specialized in spine because that is the most common problem they see. Many other physicians, including orthopedists, are also choosing this specialty so professional competition has increased. One spine surgeon I know developed a “focused factory” where all he did was spine, and was very successful. Though such examples are encouraging, the future is more likely to reward those who develop multidisciplinary back pain and spine centers treating all phases of the disease—including psychological, surgical, rehabilitative, and pain management. Regardless of what happens to spine surgery in the areas of legislation or payment, you cannot lose because your multidisciplinary group will address all aspects of the spine patient.

A successful businessman told me the secret of innovation is to find out what everyone else is doing and don’t do it. Look at the options available and find out how you can be unique. That is the way to look into the future.

Neurosurgeons and practitioners are getting into the “business” of medicine by owning imaging facilities and outpatient surgery centers, and also by employing physical therapists and other specialists. Since payments are decreasing for professional work, one way to make up revenue is to develop other aspects of the business, possibly by growing into a larger group. While there are risks to starting new ventures, you can find creative ways to support your plan if you can demonstrate a return on investment.

It may be easier for a younger neurosurgeon to join with a group than it is for a neurosurgeon who has been independent. If you are in a city with competing neurosurgical groups, consider collaborating to enlarge your market share and possibly merge your practices to achieve more visibility in your community. If you are in a remote area, you might associate with a larger group in a bigger city using your office as a satellite location. Your patients will benefit and you will have a greater range of experience in the referral group for problems you cannot handle. This is a win-win for both parties.

To get an idea of what is happening to the healthcare market, access the Johnson and Johnson web site at www.jnj.com and under “Our Company” on the home page, check “Fast Facts.” These facts describe companies with $53 billion dollars in revenue each year, operating in 57 countries with 121,000 employees. Information such as this calls us to unite, to gain more visibility in the marketplace and to have national organizations that are powerful.

Remember the key to the future is specialization, and with that comes group practice—you see them forming all around you. Learning how these collaborations can work for you will help you plan your career.

I would be happy to answer your questions at jamesausman@mac.com. CNSQ
Hospital–Physician Relations: Opportunities for Enhancing Neurosurgical Practice

The relationship between physicians and hospitals is changing. Traditionally physicians have been relatively independent of hospitals, using them as “workshops” in which to engage in professional services. In the older medical staff model, physicians and hospitals did not have a market relationship. They neither bought services nor competed with each other. The physicians’ use of hospital facilities was “paid back” by their serving on various medical staff committees and being involved in governance. Taking emergency department (ED) call was also viewed as an obligation, necessary to receive and maintain medical staff privileges.

Physician hospital organizations (PHOs) started in the early 1990s but were abandoned over the decade as the use of capitation to pay providers disappeared, accompanied by the demise of managed care. Hospitals shifted their focus from organizing PHOs to building stronger relationships with physicians to benefit from high margin, specialized services (e.g., neurosurgical services) while attempting to avert competition with physicians based in outpatient settings and specialty hospitals. This concept has taken the form of new approaches by hospitals to branding, marketing, and providing services, called a “service line strategy.” These developments are focused on bringing hospitals and physicians’ interests, such as the need to collaborate on service lines, closer together.

Affiliated specialist physicians, such as neurosurgeons, are essential to hospital-based service product lines. Many specialists, including neurosurgeons, are involved in developing or expanding physician-owned facilities such as ambulatory surgical centers (ASCs) and specialty hospitals, e.g., spine hospitals. These facilities directly compete with full service hospitals. Competition over service lines has rapidly evolved and it has become apparent that market forces are threatening long standing relationships between hospitals and physicians.

Service Line Strategy
Despite these problems and others (including declining participation by specialist physicians in ED call panels) hospitals and physicians continue to engage in activities which provide
a nexus for closer alignment. Hospitals, in order to expand revenue, are competing by aggressively branding specialty services such as heart, cancer and the neurosciences. Berenson points out that as part of service line branding, physicians are emphasized in marketing materials and, in some instances, play major management roles in running the service line products. Some hospitals have ascertained that it is simpler to work with small groups of employed physicians to attain these goals. In other instances, hospitals have initiated joint ventures with physicians with the same goals in mind.

Hospital Joint Ventures
The rationale for hospitals to enter into joint ventures with physicians is clear. If they are faced with losing a large share of a particular service to a competing entity such as an ASC or a specialty hospital, hospitals often decide it is more to their advantage to share some of the revenue rather than none. For neurosurgeons, hospitals might be viewed as desirable joint-venture partners because of their management experience and the broader pool of available patients. Hospitals may be increasingly interested “in joint ventures with medical groups to provide physicians with the profit they might otherwise seek through for-profit ambulatory care and surgical centers.” Studdert et al. also assert that the hospitals face growing competition from medical staffs interested in tapping into profits from procedure-based care that can now be performed in an outpatient setting. (All joint ventures with hospitals will have to pass muster with Internal Revenue Service regulations and provisions of the federal antikickback statute before they are approved.)

Hospital Employment of Physicians
The forces threatening physician–hospital relations have prompted some hospitals to employ physicians such as neurosurgeons. This tactic serves a number of purposes. It offers hospitals a close working relationship with physicians that provide a specific service—in this case, neurosurgery. Employed physicians are often integrated into management of the service line in order for the hospital to have greater control over how services are provided and marketed. The employment model also permits hospitals to associate with prominent physicians who have a market following in order to enhance the hospital’s service line. This is what many academic medical centers (AMCs) have done for years. The exploitation of the service line strategy, however, is now an integral part of the promotion of many AMCs. Hospitals have also hired specialists to meet their obligations to staff the ED as an alternative to paying physicians per diems. Additionally, specialists have been hired because of the professional liability environment in their area, thus ensuring their continued presence and their ability to serve the hospital and its patients.

Hospital Payment Issues
In order for neurosurgeons to participate in joint activities with hospitals they must understand the manner in which hospitals are reimbursed. The introduction of diagnosis related groups (DRGs) in the 1980s created a misalignment between the incentives for hospitals and those for physicians. Interest in gain sharing or shared accountability arrangements represented an attempt by physicians to receive and hospitals to offer some of the savings for the hospital bottom line generated by physicians. This was stopped when the Office of the Inspector General of the Department of Health and Human Services issued Advisory Bulletins advising against such practices in the late 1990s.

Recently the Medicare Payment Advisory Commission has again advocated gain sharing proposals, asserting that such arrangements might increase the willingness of physicians to lower costs and improve care. They also opine that the restrictions on gain sharing have hindered the hospitals’ working in a positive fashion with physicians. Hospitals are precluded from offering financial incentives to physicians to work to reduce costs. The ability to reduce costs through cooperative purchasing, for example, is a factor in the attraction of specialty hospitals to physician owners, according to Berenson.

Distortions in reimbursements for the facility component defined by the DRGs have set physicians against hospitals. However, this discrepancy may offer neurosurgeons opportunities for enhanced revenue streams when working in specialty hospitals or in conjunction with branded hospital service lines. For a start, it is necessary for neurosurgeons to learn the methods by which their hospitals are reimbursed, and to identify the services they can provide that are especially profitable for their hospitals. This will help in the development of a mutually beneficial relationship between the neurosurgeon and his or her hospital. CNSQ

For neurosurgeons, hospitals might be viewed as desirable joint-venture partners because of their capital, management experience and the broader pool of available patients.
Mismatched Career Expectations and Realities in Neurosurgery

When we encounter our colleagues at national conferences, we often hear distressing tales of practices dissolving, physicians relocating, and other areas of dissatisfaction among practicing neurosurgeons. Escalating malpractice insurance costs is one widely-cited factor in physicians’ changing their practice situations. Less discussed, and more difficult to study, would be the effects of a mismatch between expectations and realities for neurosurgeons entering practice.

One broadly accepted statistic holds that 25% of physicians will relocate within 5 years of entering practice. While our residency programs have historically done a stellar job training neurosurgeons, they have fallen short in educating them about the realities of practice. Having spent roughly 60% of my 12 years of practice in academia and 40% in private practice, I will attempt to address issues that affect both.

Income

“$750,000 – guaranteed!” Each month, ads promoting high-paying jobs fill our journals. But beware—the current means for “guaranteeing” such large salaries most often involves hospital-based forgivable loans.

It is important to understand the ramifications of these packages. When hospitals are willing to underwrite these loans, their primary expectation and desire is Emergency Room coverage. Providing the surgeon a good lifestyle is of no concern to the hospital. If the agreement results in a long-term relationship between the physician and the hospital, it generally favors the physician. Unfortunately, if things do not work out, whatever the cause, the physician may take a huge financial hit, often owing the hospital $500,000 or more.

Hospitals will not hesitate to pursue litigation against the surgeon to recover the loaned monies in the event of a failed practice. In addition it may not be possible to make this level of income once the term of agreement has lapsed (usually 2 years). The surgeon involved may also ultimately determine that the sacrifices required to make these astronomical figures are unacceptable in terms of either lifestyle or personal ethics.

Salary model. There are various paradigms for salary, ranging from “eat what you kill” to “socialism.” Both systems have their problems. In the “eat what you kill” model, neurosurgeons may find themselves competing with their partners for cases. A “socialism agreement,” in which all revenues are split equally, may generate arguments over who takes the most vacation and who handles the greatest number of cases. It is crucial to understand the pros and cons of each of these systems and the impact that they will have on relationships between partners.

In addition, physicians may be lured to join a practice based on the potential for passive income opportunity (i.e., surgery centers, etc). These can be risky endeavors and can ultimately result in a low financial yield. While some of these arrangements have paid huge dividends to investors, their success is often more related to their being in the right place at the right time.

Reason for job opportunity. A major reason for recruiting physicians is to share the call burden of the practice. Partners or associates may not be eager to give up parts of their practice to help get a new physician up and going. And in academia, the ability to develop a subspecialty interest may become a bone of contention, independent of finan-
cial revenues. A surgeon should attempt to ascertain whether the current faculty is providing a service which he or she would like to provide, or whether the current surgeons in place are so overwhelmed that they are eager to give up cases. It is also vital to try to determine why a physician may have left a position for which you are interviewing. It is common to hear answers like “wanted more money,” which may be overly simplistic and not represent all of the issues.

**Stresses of Practice**

**Malpractice.** No matter how well we practice, statistics indicate that most of us will be sued eventually. With that said, it is almost impossible to be prepared for the sense of betrayal and helplessness that accompanies being a defendant in a lawsuit. However, litigation is an inevitable byproduct of the practice of medicine. (It can also be a shock to discover that there are neurosurgeons out there who will testify against you.)

**Communication.** Surgeons often cannot be frank with their associates and partners or share feeling constructively. Often these feelings are allowed to fester or are communicated to third parties in a destructive way. Developing a culture of sincere and open sharing of grievances is one means of defusing tensions that inevitably build within practices.

**Competition.** It is often difficult for young neurosurgeons to know how to interact with competing surgeons, since they are not usually called upon to do so during training. But one must learn to be collegial to competitors. Because circumstances within a practice may change, competing surgeons may end up becoming partners or sharing call duties. A surgeon may rely on a cordial relationship during a difficult peer review proceeding. Being able to relate to others professionally will carry a surgeon far in practice.

**Trauma Call.** Some surgeons may find practices in which they are not initially required to cover trauma call, but such situations do not always continue. It helps to be adaptable when circumstances change within a practice.

**Lifestyle.** Trainees must realize that it is nearly impossible to control one’s life and practice after residency. For example, if other physicians want to refer patients, trainees cannot refuse, even if the referrals interfere with previous plans. Situations like these may result in delaying vacations and other adjustments in personal life.

**Hospital or Department Culture**

The culture of a hospital, practice, or department where a neurosurgeon enters practice will invariably be different from where he or she trained. There may even be significant professional jealousies that come into play within a new practice setting, either within a neurosurgical department or between specialties. It is not uncommon for non-neurosurgeons to harbor resentment toward neurosurgeons, under the mistaken impression that we make outrageous sums of money for the same amount of work they provide.

Other physicians and ancillary personnel within the hospital frequently perceive us differently than we perceive ourselves. These misperceptions may potentially (and inexplicably) result in complaints filed in peer review. A young physician might find him or herself facing potential disciplinary actions by a hospital, the origin of which may be difficult to comprehend. Alternatively, in an academic setting, a young surgeon cannot necessarily expect the same degree or type of support from a chairman that he or she had during residency training. Ultimately, we are the ones in control of how our careers evolve.

**Expect the Unexpected**

Circumstances change. Partners relocate, retire, or die. New hospitals may be built, which require covering call in multiple locations, lest the new institutions recruit new, competing surgeons. No one is entitled to a certain amount of call duty or a particular salary.

In fact, surgeons cannot expect sympathy from a hospital or medical staff when asked to provide additional call. Call paradigms differ from those seen in training; neurosurgeons may be on call for a practice more nights than they were for the Emergency Room.

**The Bottom Line**

All practices and partners experience conflict. Nothing is guaranteed, from the standpoint of lifestyle, income, or career longevity. Moreover, the grass may be greener elsewhere, or it may not. One must ultimately choose what one can and cannot live with in order to be professionally content.

If you do decide to leave a job, try to depart on good terms, no matter the cause behind the move. The future is unpredictable and you may find yourself interacting with former colleagues in new situations.

In the end, being adaptable and having appropriate expectations allows your practice and philosophies to evolve. They are keys to a successful and satisfying career.

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While our residency programs have historically done a **stellar job training** neurosurgeons, they have fallen **short in educating** them about the **realities of practice.**
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Announcing the Joint Meeting with the Japanese Congress of Neurological Surgeons!

**2007 CNS Neurosurgical Forum & Select Abstracts Session**

**Monday, September 17, 2007**
**2:00-5:45 PM**

*The centerpiece of Monday afternoon is the CNS Neurosurgical Forum and Select Abstracts, now featuring a new, interactive format!*

**Neurosurgical Forum**
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IN JULY

SURGERY OF THE CEREBRUM

Michael L.J. Apuzzo, Editor

PART 1 TOPICS

History
Anatomy
Imaging
Trauma
Intrinsic Tumors
Vascular Malformations

Michael L.J. Apuzzo, MD
Albert L. Rhoton, Jr., MD
Chi-Shing Zee, MD
Alex B. Valadka, MD
Mitchel S. Berger, MD
Nobuo Hashimoto, MD, PhD
Three decades ago I was fortunate to begin my neurosurgical career with Dr. Peter Jannetta, a daring iconoclast, at the University of Pittsburgh Medical Center. Together we experienced the resistance to change that comes with the introduction of new ideas such as microvascular cranial nerve decompression for tic douloureux and hemifacial spasm. I also worked with a brilliant and compassionate physician, Maurice Albin, Director of Neuro-Anesthesia, who repeatedly stated, “The operating room is our laboratory.” In this “laboratory” Dr Albin made important observations about intracranial pressure, various neuro-anesthetic agents, the pathophysiology of air embolism, and much more.

Soon after, because of my athletic background and interest in sports medicine, I was asked to become the team neurosurgeon for the Pittsburgh Steelers. Initially, I was awe-struck having veto power of playability over such legends as Jack Lambert, Terry Bradshaw, “Mean” Joe Greene, Lynn Swann and Franco Harris—not that they really listened to what I said!

However, I also began seeing many local high school and college athletes with brain and spinal cord injuries. I was shocked by the high incidence of quadriplegia in western Pennsylvania from high school football participation. Inspired by both Dr. Jannetta and Dr. Albin, I consciously began looking at the sports locker and training rooms, like the O.R., as laboratories for investigating neurosurgical injuries.

My first project was to assess the incidence of spinal cord injuries in our area. I discovered that a high school football player in western Pennsylvania had a 1 in 11,000 chance of being quadriplegic by the end of the season. This was 10-15 times higher than the national average.

Using this information, we initiated lectures, seminars, and coaching clinics to emphasize the high number of these injuries and suggest preventive measures. These included proper conditioning of the head and neck muscles, improved equipment, correct blocking and tackling techniques, and better coaching methods. This education even-
tually resulted in a major reduction in spinal cord injuries in our area, consistent with the national average of 1 per 150,000 players. At about the same time I cared for two spinal cord-injured high school football players who presented with extreme burning of the hands following axial loading tackles. They had no neck pain and no other neurological deficits despite fractures/dislocations of the cervical spine. This observation led to the publication of the paper, “Burning Hands Syndrome in Athletes” in JAMA (now a commonly recognized entity and indicative of a central cord syndrome). Another colleague, Dr. Jack Wilberger, and I subsequently confirmed the central cord nature of this injury with MRI imaging several years later.

We were able to make additional observations in sports-related injuries because of the very high incidence of spinal cord trauma that we managed. In fact, we were the leading institutional contributor of spinal cord injuries to the NASCIS I study. Using this clinical data, Dr. Julian Bailes (a co-physician with the Pittsburgh Steelers) and I published a classification of sports related injuries based on pathophysiological mechanisms primarily derived from our sports spinal cord injury observations.

**Think First**

In 1985-86 during my tenure as President of the Congress of Neurological Surgeons, Dr. Fletcher Eyster, aware of my interest in the prevention of neck injuries in adolescents, approached me with observations and ideas of his own. As a prominent neurosurgeon in Pensacola, Florida, Dr. Eyster cared for several young males rendered quadriplegic from diving head first into streams, the ocean, and above ground pools. Motivated by these tragedies, he set out to document the incidence of head and spinal cord injuries from diving accidents. He found that Florida had the highest number of such injuries in the entire country.

On his own initiative he began a program called “Feet First, First Time.” After enlisting the support of the state legislature, signs were placed on all of the bridges and near pools and streams throughout the state to caution adventurous adolescents to always enter any unexplored water feet first.

After discussing the program with Bob Ojemann, then President of the AANS, and with Dr. C. Everett Koop, then Director of the Department of Health, Education and Welfare, we jointly announced the formation of the Think First Program in 1986. Think First has subsequently become the premier preventive medicine program of the joint AANS/CNS organizations. It has reached several million adolescents and unquestionably has prevented untold numbers of catastrophic head and neck injuries.

**ImPACT™**

Perhaps the most important contribution derived from our locker room laboratory was the introduction of neurocognitive testing to determine when an athlete might safely return to contact sports following a cerebral concussion. In 1990, I informed Coach Chuck Noll, four time, Super Bowl coach of the Pittsburgh Steelers, that his
starting quarterback could not play against the Dallas Cowboys due to the cerebral concussion he suffered the week before. Coach Noll informed me that by every parameter he could measure in terms of the quarterback’s activity level, he should be able to play. Then he asked what criteria were used to keep him out. When I informed him of the various guidelines I followed he asked, “Who wrote the guidelines? What scientific basis was there for these? And, are you simply protecting yourself from a malpractice suit?” I considered his questions. He continued, “If you want me to keep an athlete out of contact, give me hard data, not your impression.”

I conducted a literature search on return-to-play criteria and spoke to my neuropsychological colleague, Dr. Mark Lovell. In response to the issues Coach Noll raised, we designed a paper-and-pencil neurocognitive test for athletes. We then obtained permission from Coach Noll and the Team owner, Mr. Dan Rooney, to baseline the entire team. Subsequently, this testing grew to include most of the NFL teams, all of the NHL teams, and many high schools and colleges.

In 1997 we realized that this manner of testing was cumbersome, labor intensive, and difficult to expand to meet the required demand. We devised a computerized neuro-psychological test that assesses reaction time to 1/100th of a second, and also evaluates working memory, the processing of information, and other domains. Called ImPACT™ for Immediate Post-concussion Assessment and Cognitive Testing, this program has now expanded to include 28 of 32 NFL teams, most major college programs, over 1,000 high schools, NASCAR and Formula I drivers and many players in soccer, rugby and professional boxing. Dr. Lovell and Dr. Mickey Collins, both brilliant neuropsychologists, are now co-directors of the International Concussion Program at the University of Pittsburgh and have over 20,000 athletes in the largest MTBI sports-related database in the world.

From the Locker Room to the Battlefield
With the improvement of Kevlar body armor and helmets, cerebral concussions secondary to blast injuries have become one of the most common injuries to our troops in Iraq. It is estimated that 20% of all military casualties have sustained a traumatic brain injury.

When to safely return to combat in battle is analogous to when an athlete is safely able to return to physical combat in sports. Premature return to active military duty may result in increased risk of reinjury as well as increased danger to team members. A missed assignment within the context of an athletic event may be relatively minor, but a missed assignment for military personnel can mean the difference between life and death.

Since our athletes and the military personnel are in the same age range, our extensive database serves as a repository of normative data even without baseline testing. Since baselining is optimal, however, in April of 2005, prior to deployment in Iraq, we contacted the 528th Medical Detachment/Combat Stress Control Team at Ft. Bragg. After informing them of the value of ImPACT™ in athletics they quickly bought into the ImPACT™ software program. Prior to deployment of the 5,000 members of the 528th, training was given in the administration of the test, and the program has since been used under combat conditions in Iraq to assess post-traumatic neurocognitive ability just as we do with the NFL athletes. This program is now being discussed with other branches of the armed forces as a major initiative to obtain baseline testing and use under combat conditions.

Research Initiatives
Several additional “locker room” initiatives are ongoing. Using recently developed neuroimaging modalities, we are now evaluating the utility of diffusion tensor imaging, functional MRI, and magnetoencephalography in the evaluation of concussed athletes and correlating these modalities with the effectiveness of ImPACT™. To date, ImPACT™ remains the standard of care and the simplest tool to assess neuropsychological and neurocognitive function following cerebral concussion.

Recently we published our results on using Omega-3 fatty acids (fish oil) as an anti-inflammatory to supplant nonsteroidal anti-inflammatory medication in the management of discogenic spine pain. We have now taken these essential fatty acids into the locker room. With a grant from the NFL Charities,
we, along with team physician Tony Yates, head athletic trainer John Norwig, and coordinator Jeff Bost, are assessing the utility of fish oil as a replacement for NSAIDs in soft tissue injuries in professional athletes. We are also simultaneously performing a controlled study with the Pittsburgh Steelers to assess the effects of these Omega-3 fatty acids on various risk factors for cardiovascular disease, which is significantly higher in professional football players and associated with decreased longevity.

Our “locker room—laboratory” has thus far acquired over $5 million in research grants and has led to the publication of over 75 papers, 3 books, and postdoctoral fellowships and resident collaboration for over 20 physicians and neuropsychologists. Most importantly, the studies and observations garnered from the locker room have led to enhanced safety and preventive measures and management protocols to best protect the brains and spinal cords of athletes worldwide.

Recently, Ian Dunn summarized the contributions of physician-scientists in sports medicine including Richard Schneider, Robert Cantu, Julian Bailes, Art Day and Michael Apuzzo, who as editor of NEUROSURGERY has greatly facilitated the dissemination of scientific sports information. As Hippocrates observed of the practice of medicine over 2500 years ago, “The art is long, time is short, judgment difficult, experience fallacious and the opportunity fleeting.” But the rewards can be great!

For the young neurosurgeon desiring to get into the locker room, there are some less attractive factors to be considered. These include liability issues, the lack of evidence-based data to support return-to-play decisions, a major time commitment from dealing not only with the athlete but also coaches, families, trainers, and sometimes agents, and finally fairly inconsequential financial reimbursement for the exposure and commitment.

Despite these negatives, considerable professional satisfaction can be found by making lemonade out of these lemons. Sports medicine represents an excellent opportunity to apply knowledge unique to neurosurgeons, including biomechanics, most current minimally invasive treatment modalities, rehabilitation, and rehabilitative medicine. Athletic careers may be saved—and if indicated, terminated—to the athlete’s long-term benefit.

The science and art of sports medicine is relatively neglected by most neurosurgeons. But the clinical and investigative opportunities are immense. I strongly encourage increased neurosurgical participation.

Finally, the question is “How might participation in sports as a neurosurgeon and an athlete be tied in with our own lives?” In my Presidential Address in 1986 I emphasized the importance of balance in one’s life and outlined a guaranteed formula for attaining it. Draw a square and list the most important features in our lives, including Work, Family/Social, Spiritual, and Physical. Think about each of these activities, and then draw a line the length of which is commensurate with the time and effort put into each. Optimally, the resulting figure should at least resemble a square. At times in my own life it has been more like a flat line EKG with work displacing all other activities. Each time I allowed such imbalance to occur, I paid a very heavy personal price.

I have been “saved” more than once by looking at my own square and taking conscious, positive, active steps to improve the physical, spiritual, and family sides that all tend to be insidiously neglected and diminished by our magnificent obsession with neurosurgery. The inspiration that comes from working and interacting with athletes who constantly strive to go faster, longer, and higher can be a motivating force and confirms the motto of the Hawaiian Ironman triathlon event “Anything is possible.”

The discipline, commitment, and perseverance required for success in athletics are the same qualities required to balance our lives. Balance and equanimity demand a conscious daily assessment of what we can do to strengthen the physical, spiritual, and family sides of our square. Work is a given for neurosurgeons. Commitment to the physical reduces anxiety, alleviates depression, promotes self esteem, and facilitates the discipline and perseverance needed to elongate our spiritual and family lines as well.

Neurosurgical participation in sports medicine results in tremendous professional rewards and greatly facilitates attaining balance in our personal lives. As Peyton Manning, Rex Grossman, and Tiger Woods (and Nike) would say, “Just do it!” CNSQ
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Grant Writing 101: Four Keys to Attaining Funding

The future of Neurosurgery depends on progress in clinical, translational, and basic research. We have to develop better therapeutics for diseases that we have already become so good at diagnosing. As knowledge in the neurosciences advances, it is clear that we are headed for a very exciting period. The era of molecular neurosurgery is approaching, and scientific developments are going to translate into clinical care. To utilize these advances in routine neurosurgical care, neurosurgeons need to be participants in the teams performing the work.

However, the challenge in these exciting times is securing the funding for research. Funding from federal sources has been limited in recent years, challenging the ability of neurosurgeons to be members of this research revolution. Securing sufficient funding requires a serious and organized approach.

Collaborative teams are often more successful in competing for funding, as well as in delivering a product of substance and impact. Therefore, assembling a highly effective and synergistic multidisciplinary team is key. Collaboration with industry at the proper time and with the appropriate partner can be critical for the translation of scientific work. The focus of this article will be to describe funding strategies to increase the likelihood of success in the current competitive environment.
Four keys to success in the funding world:

1) Innovative project.
The most critical aspect of the application is successfully demonstrating the importance of the proposed project. No matter how well your application is put together, if the work is not exciting and inspiring the grant is highly unlikely to be funded. (And even an exceptional research plan may not be funded unless it is presented in an engaging, clear, and easy to follow format.) Therefore, it is critical to develop an important field of work, aiming to produce high impact and practical results. The work must be exciting and innovative; it needs to answer an important question.

Developing such a program must be done in steps. It is necessary to enhance your “research knowledge” throughout your educational career. Research knowledge goes beyond culturing a cell, running a gel, or memorizing the nuances of the Krebs cycle. It involves the ability to recognize an important question, determine if a project is realistic, and know how to execute it.

As part of the application, a researcher should describe his or her hypothesis and outline expected results. In addition, reviewers will be looking to see if the application covers potential pitfalls and how he or she proposes to address them. Developing a section on expected results, pitfalls, and possible solutions demonstrates a certain degree of thoroughness and scientific maturity.

As you begin to assemble a grant application, ask yourself if you would be drawn to the ideas presented and want to fund the grant. If you would not, then you must reconsider your approach.

2) Apply to the appropriate funding agency and the appropriate funding mechanism.
Applying to the appropriate funding agencies maximizes your chances for success. As a neurosurgeon physician-scientist progresses through the different stages of training, he or she should carefully evaluate the funding agencies to be targeted. Important sources of funding include foundations, professional societies, and federal and industrial sources.

Funding sources that are particularly appropriate for residents include research awards from the CNS, AANS, and NREF, as well as disease-oriented foundations. New neurosurgical faculty should consider applying for NIH KO8 (mentored grants), and eventually RO1 (independent grants), and PO1 (program projects).

3) Allow ample time to prepare the application.
Submitting a substandard application wastes both the applicant’s and the reviewer’s time. In today’s competitive environment a less-than-stellar application is almost certain to be rejected. Therefore, you should not be in a rush to submit, but carefully evaluate the deadlines and allow ample time to prepare.

How much time is adequate? This depends on the type of application, the experience of the applicant, and the time he or she can dedicate to its completion. For example, one solid month without other significant responsibilities is not the same as several months of operating two days per week and handling a clinic.

Budget adequate time to be able to complete the application, taking into account the time constraints imposed by a clinical prac-
Collaborative teams are often more successful in competing for funding, as well as in delivering a product of substance and impact. Therefore, assembling a highly effective and synergistic multidisciplinary team is key. Collaboration with industry at the proper time and with the appropriate partner can be critical for the translation of scientific work.
The future of neurosurgery will be determined by innovators. Short term innovation will always be guaranteed by the profit motive. This means that harvesting ripe technology to solve immediate technical problems is rewarded with intellectual property, patents, and the profits that come with these. In this arena, neurosurgery faces the threat of a device industry that has evolved highly effective strategies for siphoning off much of the financial reward paired with the innovation. However, the symbiosis of neurosurgery with industry is, for better or worse, a guarantee of rewards for near term innovation as well as a critical means for clinical translation. Unfortunately, industry tends not to interest itself with the longer horizon. If clinical translation lies further than 5 years in the future, the interest of venture capital and corporations tails off dramatically. The translation of engineering and biology into therapeutic applications, must precede clinical translation. An understanding of pathophysiology must precede the rational adaptation of technology. Both of these occur with a much longer timeframe for translation. Who or what will guarantee this process for the diseases that we treat? Who or what will expand the populations that we treat by developing neurosurgical techniques for diseases that have traditionally lain outside our charge? Most importantly, is the future of our discipline controlled more by market dynamics than the needs of our patients?

Of course, these questions are loaded. The longer horizon of neurosurgery lies in the hands of neurosurgical scientists who are willing either to address these problems directly, or who are versed enough in science to establish the collaborations that will address the problems. In 2007, the neurosurgical scientist is an endangered species. Given the current trend, they will go the way of the buffalo if not the dinosaur. Ironically, neurosurgery attracts tremendous scientific talent. Many of the medical students selecting neurosurgery are the product of an expansion in neuroscience. They are drawn by the promise of applied neuroscience. Moreover, we select for the ones who have accomplished serious research. However, by the completion of residency, this number has dropped dramatically. Further attrition occurs at the level of junior faculty who opt out of academics. Of those that remain, few are true clinician/scientists. What then are the evolutionary pressures driving this attrition?

The pressure is derived from a simple imbalance in reinforcement that occurs even within the academic medical center. Because the centers depend on the profits generated by neurosurgery, clinical productivity and efficiency must remain high. In this environment, most neurosurgery departments simply cannot afford to support clinician/scientists. Even in those that can afford it, the job will never command the salary available to full time clinicians. More importantly, the culture of neurosurgery canonizes technical virtuosity. Achieving technical virtuosity is improbable while simultaneously achieving recognition as an independent scientific or clinical investigator. Put simply, the resident or junior faculty who pursues research faces the bleak risk of becoming at worst a “Lab Rat,” and at best an ultra-subspecialist. These dual pressures do not exist for our colleagues in nonsurgical specialties. Grants are ultimately more lucrative than the clinical practice in most of these departments. Therefore, they divide quickly into a cadre of tenure track individuals who face a brutal selection process enforced by the scarcity of funding, and a cadre of second class clinical track academics tasked with fulfilling the departments’ clinical responsibilities. This structure ensures that the department profits. While less than ideal, the equilibrium insures the advancement of neurology as a field.

Let us, therefore, examine the evolutionary pressures on our neurosurgical scientist. Survival for any researcher is determined by the ability to secure funding. Funding pays for three critical resources; labor, time, and space. Grant budgets pay the salaries of the technicians, postdoctoral fellows, graduate students, and project scientists who kill the rats, culture the cells, run the gels, and stain the tissue. Boulis Rule #14 states that two out of three experiments will fail. Rule #9 states that the more innovative an experiment is, the more likely it is to fail. Thus, we can stack the odds in our favor if we avoid truly innovative work. Unfortunately, this dodge undermines Rule #1; Research only matters if it matters. Grants require preliminary data. Advancement requires publications. Therefore, to succeed, you must conduct at least three simultaneous experiments (see Rule #14). To run three simultaneous experiments in the small percentage of time that will be allotted to you, you must have workers. In the past, these workers could be paid by clinical revenue. In
2007, the increasing demand for this revenue has largely eliminated this expediency. Thus, to survive you must delegate (Rule #21), and delegation requires funded grants.

For a grant to be funded, your department signs a contract to protect the time that you have budgeted to the project. Grant reviewers pay attention to percent effort when determining the feasibility of a proposal. However, the NIH caps your salary support at $186,600 and this standard is used by nongovernmental agencies as well. So, if you earn $250K/year and your grant dedicates 50% effort, on paper you lose $31.7K/year for your department. More importantly, your productivity is measured in billing and RVUs, not percent effort. As such, it becomes extremely difficult to establish reasonable expectations for clinical productivity in the remaining 50% effort. Moreover, a clinical practice will only thrive if the surgeon is responsive to referring physicians, and call responsibility is rarely affected by the percent effort calculation. Finally, you are only entitled to protected time without a grant, as part of a start-up package. Therefore, your brief window for acquiring funding occurs in the first two to three years of your academic appointment, precisely when your practice requires the most attention.

Finally, the grants must ultimately pay indirect costs. Indirect costs are the mark-up on the budgeted expenditures (direct costs). Indirects pay for space. The term “metrics” describes the means whereby an institution determines the amount of space to which your funding entitles you. As a junior faculty member you are given space to conduct research. However, ultimately your occupancy of this space will be challenged if you are not paying the rent. In most institutions, the indirect cost rate is about 52% of the direct budget. Indirect costs are almost exclusively provided by federal grants from the Department of Defense (DOD), NIH, and NSF. Even career awards from the NIH like the NRSA or K awards do not pay indirect costs. Thus, while foundation grants and philanthropic contributions can pay for your time, supplies, and workers, they will not pay the rent.

As such, your survival as a neurosurgeon researcher depends on your ability to get a federal grant (at or above the R level). Currently, 5-10% of these applications are funded. Since the study section requires regulatory documents for human or animal use. This process, in itself, requires significant writing and time. Since you need to author 10 grants to be funded, you need to write approximately 700 pages of grants supported by regulatory documents and data. Thus, as a neurosurgeon, you can generate revenue much faster by doing clinical work. Remember also that institutional profit will only come from indirects, since you will lose money for your department on salary support, and the rest of the grant budget is encumbered. This fact may be reflected in the salary that you can command as a neurosurgeon/scientist. Beginning to feel like a buffalo?

These facts have several important implications. First, they need to be incorporated into the goals of resident research education. Since very few of us will become neurosurgeon/scientists, why compel all of us to dedicate time to research training? Since survival as a neurosurgeon/scientist is entirely dependent on the ability to delegate the tasks of research, lead teams, and procure resources, residents aspiring to be a clinician scientist must be trained to be Principle Investigators, not just to do research. This requires an understanding of lab management, and grantsmanship. Thus, teaching residents to do research may be a lost cause, since only those who are already capable researchers can emerge from residency prepared to be Principle Investigators. After all, residency is postdoctoral training. Second, we must facilitate the funding of neurosurgical research. The neurosurgery research and Education Foundation has provided much needed seed funding to many of our junior investigators. This is a critically needed bridge to other funding vehicles. We must further support representation of neurosurgery on NIH and foundation study sections. Study sections will only fund Neurosurgical research if they understand the problems addressed by the proposals. Finally, the discrepancy between the effort required for clinical billing and grant funding must be addressed. Ignoring this discrepancy creates extraordinary disincentive for our most talented researchers. Neurosurgery must ask itself, what price it is willing to pay to prevent the future of our discipline from being dictated by the short term profits of industry. CNSQ
The Future of Neurosurgeons and Research

Increasing time and economic constraints have changed the landscape of neurosurgical research. To gain insight into this evolving environment and to develop successful strategies for neurosurgeons working in this setting, the Congress Quarterly asked leaders in neurosurgical-neuroscience research for their viewpoints. In the first interview, Story Landis, PhD, (Director, NINDS) and Walter Koroshetz, MD, (Deputy Director, NINDS) discuss research from the perspective of NIH. In a second interview, Ralph Dacey, MD (Washington University) was asked for his observations as a member of the National Advisory Neurological Disorders and Stroke Council of the NINDS and as the Chairman of a Neurosurgery Department.

An interview with Story Landis, PhD and Walter Koroshetz, MD

Story Landis, PhD
Director
National Institute of Neurological Disorders and Stroke
National Institutes of Health
Bethesda, Maryland

Walter Koroshetz, MD
Deputy Director
National Institute of Neurological Disorders and Stroke
National Institutes of Health
Bethesda, Maryland
CQ: How do you see neurosurgeons working to advance neuroscience understanding and treatment of neurologic disease?

Koroshetz: Neurosurgeons have incredible potential because of their background and very high skill level. They can test hypotheses in clinical neuroscience that no one else can, so the neurosurgeon’s research potential is phenomenal. As neurosurgeons come out of training, the sky’s the limit. Later, I don’t think the research productivity matches the potential.

Organized neurosurgery should look carefully at whether the field really delivers what brought bright people in the first place. I was involved in training neurosurgeons at the Massachusetts General Hospital over 17 years. Many have gone on to very productive academic careers. However, it was not uncommon that an amazingly talented, inquisitive, scientifically mature neurosurgeon left academia after residency.

CQ: What do you see as the cause of this (neurosurgeons dropping out of research)?

Koroshetz: I don’t presume to know. In clinical medicine we diagnose, put together a treatment plan and then execute it all within days. The equivalent takes months or years in research. Financial remuneration is considerably lower for the neurosurgeon starting out in research as compared to private practice. But the academic salaries are not bad, probably higher than what your parents made and they did fine!

Landis: There is pressure from hospitals to generate income, to have inpatients, to use operating rooms and to use other services. These pressures increase as reimbursements from procedures drop. There is also the cost of time required to do surgery to generate the income, in terms of salary and hospital expectations. I think that this is true of many surgical disciplines.

There are great people going into neurosurgery and somehow the academic research field is not prospering the way that would be expected. It’s a real paradox.

CQ: In your view, what are ways neurosurgeons can circumvent these pressures/obstacles to accomplish their research goals?

Landis: It used to be that every neurosurgery department had its own research enterprise that was funded by clinical income. That model is disappearing and neurosurgeons need to look for collaborations that will enable them to use different approaches. To the extent that they find the right partners, I think that would be very profitable.

You could argue that the NIH intramural neurosurgery program has certainly benefited from collaboration with people who are not neurosurgeons. Extramural funding for multiple principal investigator grants is a mechanism by which collaborations can be fostered. The neurosurgeon, the biomedical engineer, or the molecular biologist do not have to be the sole principal investigator. As a result, the difficult discussion about who’s the boss doesn’t have to happen anymore.

CQ: In what other ways has the extramural NIH funding for neurosurgeons changed over time?

Landis: When I became director, I increased significantly the number of K award applications that were being funded. The success rate for funding went from 15 to 18% to about 33%. Obviously, that is going to benefit neurologists and neurosurgeons. We also made a change from requiring 75% research (time) effort to 50% effort. Currently, the biggest problem for young neurosurgeons getting K award funding is the support letters that come from the departments explaining that the research will be after hours and on the weekends. Neurosurgery departments need to realize that there’s no point in putting someone forward and having the NIH investing a million dollars in that person if he or she is not going to have the time needed to develop a research career.

Koroshetz: Anybody at an early stage in their career who thinks that 40 hours in the laboratory is going to get them a research career is wrong. My colleagues in the lab averaged 12 to 14 hours a day and worked weekends as well. The competition for grants, because the number of grants has gone up, is very intense. That’s true for everybody, not just neurosurgeons. My sense is that a research neurosurgeon has an advantage in peer review just because the research projects have great potential and reviewers know how important it is to support them.

Landis: One of the most important qualities necessary for NIH funding is persistence. If you write your first grant and don’t get it funded, then you have to revise it and resubmit—and you may not get it the next time. I’m sure that the pressure on neurosurgeons who don’t have evidence of NIH funding is even more than on neurologists, so persistence is critical. I know the pressures are very hard for neurosurgeons to say, “the heck with it, I can’t do it.”

CQ: In general, what do you feel is a successful model for a neurosurgeon-researcher?

Landis: Probably, a successful model is having neurosurgeons whose bench research or clinical research ties naturally to their clinical activities. If the clinical work contributes insights into the research and the research contributes insights to the clinical work, then you are only working in one literature and on one set of complex issues. Traditionally, people have gotten into trouble when they are doing something in their research that has no relationship to what their clinical expertise is. Then you really are doing two jobs.

Koroshetz: I think Story is right. You want to integrate your scientific and clinical questions. I think neurosurgeons can make contributions at a variety of research levels—the basic level, applied level, the clinical research level, whichever they are most comfortable.
CQ: What advice would you give to newly graduated neurosurgeon-scientists (to maximize their success)?

**Landis:** Make sure that during their residency research years they position themselves well for their post residency, establishing collaborations with people who will be supportive. That may be outside the neurosurgical department, in neurology, basic neuroscience, or something else. So when you pick where to do your research for that year or two during residency, you want it to be a place or on a project that you can work on post-residency where you might continue to have collaborations.

**Koroshetz:** If you went into medicine because you wanted to make a contribution to the field don’t let that die, don’t let any situation kill that. There are so many opportunities to do investigation that you can’t lose as long as you don’t give up. Neurosurgeons have techniques that can answer research questions that no one else can. The big problem is if people get themselves into situations that suppress their scientific talents and as a result never fulfill their professional dreams. CNSQ

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**An interview with Ralph G. Dacey, MD**

**Ralph G. Dacey, MD**  
Member, National Advisory Neurological Disorders and Stroke Council

**CQ:** You were elected last year to the National Advisory Neurological Disorders and Stroke Council of the National Institute of Neurological Disorders and Stroke (NINDS). As a Council member and neurosurgeon, can you tell us about the Council and how you see its role in guiding neurological research and its priorities as it relates to neurosurgery?

**Dacey:** The council has a couple of roles. First, it serves to assist the NINDS in developing policy regarding clinical and translational research and it advises the institute on areas of promising potential research that it may want to fund with requests for proposals. Another role of the council is to approve grants that are funded by the institute. And so what happens with that is the scores from the initial grant review groups are ranked according to percentiles (to determine grant funding). Generally, the grant pay-line is determined by a percentile score and there isn’t too much special consideration. But occasionally, a grant with very special programmatic importance to the institute will be considered sort of outside of the percentile.
CQ: How do you see neurosurgeons-scientists working to advance the understanding and treatment of neurological diseases and disorders?

Dacey: First of all, neurosurgeons potentially have a huge advantage over other scientists who are trying to understand and improve treatments for neurological or neurosurgical diseases, because they have complete access to the nervous system as part of the treatments that they give. Neurosurgeons are also in a position to see the pathophysiology of neurological disease occur rapidly in a very dramatic way. We should be positioned to do some of the best clinical and translational research.

The problem that we have is that the nature of our specialty does not lend itself to having a lot of time to do research outside of clinical, regulatory and training demands and, so, that is sort of the “horns of the dilemma.” I think we have big opportunities and big challenges with regard to research. Clearly, the current (NIH) funding situation, with the pay-line being around 9%, makes it difficult for both young neurosurgeons and mid-career neurosurgeons to get and maintain extramural funding. Having said that, there are many neurosurgeons who have, over the years and now, been successful in getting a variety of training and independent investigator grants. There are also some very big and effective clinical research efforts going on that involve neurosurgeons. It is in effect, the “glass is half empty or half full.” On the one hand, the NIH has been and continues to be a huge source of funding for the research but because of a variety of things, including the fact that there are many new investigators who over the past 10 years have come to depend on the NIH, there is a huge pressure on the granting process. So, it’s a difficult situation.

Neurosurgeons need to continue to be absolutely at the forefront of understanding the diseases that we are commonly called on to treat. No one else, not neurologists, not radiologists, not basic neuroscientists are going to be able to have the kind of exclusive insight we have on coming up with effective treatment for a lot of these disorders. Clearly, all those people will help, but it’s going to be up to the neurosurgeon to really define some of these treatments--so neurosurgical research is critical.

CQ: What advice would you give to new neurosurgeon-scientists?

Dacey: Well, I think that when they start they need to realize that the transition from being a chief resident to an independently funded investigator as a faculty member is a huge transition and it’s very difficult for anybody to achieve—not just now—it always has been. Because neurosurgery is such a fascinating and consuming specialty, it is difficult for young neurosurgeons to have enough focus and protected time to develop an initial research program. Young academic neurosurgeons need to anticipate that and they need to plan to be very closely associated with a scientific mentor. Most of the time, that’s not going to be another neurosurgeon. Their scientific mentor needs to be someone who can really help them and has the time to lead them through the process of designing experiments, asking questions and writing grants.

When young investigators go to write a grant they need to get as much help as they can. The grant needs to be flawless in terms of presentation, rationale and the technical aspects of writing. So, if the grant needs to be sent in electronically on May 1st, a smart neurosurgeon would have it done in January and would farm it out to various people who will take a critical look at it—people who are really going to sit down and help them get it perfect. Now that’s easier said than done, but I think these are some of the things that are important.

Then you need to realize that there are good sources for initial funding within many of our universities and private foundations. The transition to getting federal funding is something that may take some time and you just have to be patient and persistent.

CQ: What’s your view on research during residency training now and in the future?

Dacey: Well, I think that you need to be trained to do basic, translational or clinical research these days. You have to spend a significant amount of time as a post-doctoral fellow either within or alongside your residency to get that kind of training. I think that research is going to continue to be very important because very rapidly if we don’t continue to develop new treatments and improve the treatments we are doing we are going to be irrelevant as a specialty. There is no way that neurosurgery can be sustained if we are just doing what we have always done in the past for patients because we have to continue to improve and continue to get better.

CQ: Any final thoughts?

Dacey: The last thing I would say, is that medical schools are understanding that teams of investigators are going to be doing research in the future. The typical ways that people are rewarded and promoted with regard to research are probably going to change. It’s going to be much more of a team effort and that is really going to benefit neurosurgeons because for a lot of the diseases we take care of, there is no way that you can have a team without a neurosurgeon. That is a favorable thing. CNSQ
Annual Meeting Highlights

- Live 3-D Cadaveric Abstracts Session.
- Interactive Neurosurgical Forum and Select Abstracts Session.
- Enhanced Digital Poster format.
- Complimentary Housing for Resident Members (limited availability).

Opening Reception – Sunday, September 16
Aboard the USS Midway
San Diego Aircraft Carrier Museum.

Enjoy an exciting evening with your colleagues aboard this historic naval ship as you take in an unmatched, 360-degree view of San Diego’s sparkling skyline, Coronado Island and the Coronado Bay Bridge.

Integrated Medical Learning℠ (IML)

The CNS Annual Meeting introduces Integrated Medical Learning℠, a new educational process designed to enhance individual learning experiences and improve the overall process of medical education.

IML Sessions will be held during the Monday, Tuesday and Wednesday General Scientific Sessions—each focusing on a specific area of neurosurgery. Prior to the Annual Meeting, attendees will have an opportunity to review critical articles and guidelines related to the topic and complete a related online survey. Presenting experts will then incorporate the survey data into their talks. During the sessions, attendees will also have an opportunity to participate in further polls and submit questions to the presenters using handheld devices. A post-meeting online survey will correlate new knowledge, attitudes and practice.

IML Sessions Sponsored by the Integra Foundation, CNS Neurosurgical Education Partner.

For More Information: info@1cns.org  www.cns.org
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Register Online by August 15, 2007!
www.cns.org
SANS Lifelong Learning: Competencies Module

The Self Assessment in Neurological Surgery (SANS Lifelong Learning) has emerged as an important tool for continuing education, self-directed learning, and maintenance of certification (MOC). Over 850 individuals and more than 80 institutions have participated in SANS since its online release in October 2003. Participants include residents in neurosurgical training programs, young neurosurgeons preparing for American Board of Neurological Surgery (ABNS) examination, and established neurosurgeons.

One novel component of SANS Lifelong Learning has been the incorporation of information relevant to the “non-medical competencies”: Professionalism, Communication, Practice-based learning, and Systems-based practice. Competency information is useful to neurosurgeons faced with complex and rapidly evolving changes in evidence-based medicine, risk management, patient safety, and the regulatory landscape. Competencies learning is a requirement of the ABNS for MOC and of the American Council on Graduate Medical Education (ACGME) for residency program accreditation.

To meet the needs of both residents and practicing neurosurgeons anxious to learn about the competencies, the SANS Editorial Board and the Council of State Neurosurgical Societies have crafted a complete module dedicated solely to this material. The SANS Competencies module, which will launch by the summer of 2007, will contain 100 questions, each dealing with a non-medical competency topic. As with past online SANS programs, SANS Competencies will utilize instant learner feedback, peer-reviewed expert critiques, and hyperlinked learning references to web-based resources for further study. The web is a particularly rich source of peer-reviewed, governmental and regulatory information on patient safety, compliance, health care administration, health economics, medicolegal issues, and other key competency topics. Registrants who complete SANS Competencies will receive up to 10 hours of Category I CME credit.

The SANS Editorial Board also plans to release SANS Pediatrics and SANS Spine modules in late 2007 and early 2008. These programs will resemble the current SANS Lifelong Learning, but with an emphasis appropriate for neurosurgeons planning to take either of the corresponding subspecialty versions of the ABNS MOC examination. Approximately 100 of the total 240 questions in each module will be devoted to subspecialty-focused material.

For those who wish to read more about the regulatory background, planning for, and educational scientific design of SANS, a peer-reviewed white paper is available in Neurosurgery, published in October, 2006. The white paper also contains data regarding users’ response to the initial online version of SANS (SANSwired), as well as statistical analysis of SANS question content.

All SANS programs, when released, can be found at: www.sanswired.com. Subscriptions may be obtained online and the SANS Lifelong Learning program may be accessed from any broadband, web-enabled browser in the world. CME credits are also awarded online and registered by the Congress of Neurological Surgeons for transmission of credit to the SANS participant and, when requested, to the ABNS to validate this component of MOC participation.

Finally, the Congress of Neurological Surgery Education Committee is collaborating with SANS in formulating plans to link SANS questions to a wealth of new educational material available from the Congress on the web, including the University of Neurosurgery. Our hope is that SANS will serve as a critical node in an increasingly rich network of digital education tools that offer lifelong learning, practice improvement, and efficient regulatory compliance to neurosurgeons across America and beyond.
Congress of Neurological Surgeons
Proposed Bylaws Changes:

Rationale: The CNS Bylaws Committee recently undertook the task of reviewing the CNS Bylaws with regard to committee Chair terms and term limits. After a detailed analysis and discussion, a motion was proposed, seconded, and approved by the CNS Executive Committee to recommend removal of standing committee Chair terms and term limits from the CNS Bylaws. The CNS Executive Committee also approved a motion to incorporate within its Policies and Procedures Manual a categorized system for standing committee chair terms and term limits. These proposed changes would allow the CNS to more vigorously incorporate member neurosurgeons into its committee and leadership structures.

Nineteen Proposed Changes (Deletions struck out):

ARTICLE VII
Committees

Section 1. Standing Committees.

C. The Clinical Neurosurgery Committee... The Editor shall serve three years and shall serve on the Annual Meeting Committee.

D. The Directory - U.S. Canada and the World Committee shall consist of a Chair appointed by the President for an indefinite term and members whose function shall be to edit and publish periodically a directory of neurosurgeons of the United States, Canada, and the World.

I. The Council of State Neurosurgical Societies... The Chairperson of the CNS-appointees shall be appointed by the CNS President to a three-year term...

K. The CNS Membership Committee... The Chair shall be selected from among the members of the Executive Committee who are not officers, and shall serve a 2-year term which is renewable by the CNS President. Appointment to the Membership Committee shall be made by the President in conjunction with the Chair of the Membership Committee and with the approval of the Executive Committee. Members of the Committee shall be appointed for a 2-year term.

L. The Neurosurgery News Editor(s) – shall be appointed for a 3-year term which is renewable by the CNS President. The Editor(s) shall appoint an editorial board and prepare editions of the Neurosurgery News as directed by the Executive Committee.

N. The CNS Publications Committee... The Committee shall be composed of five members: The Committee Chairperson (to be appointed by the CNS Executive Committee for a three-year term), a Vice-Chairperson (three-year term), and three Advisory Board Members-at-Large (two-year term)...

T. The Joint Committee on the Assessment of Quality... The Chair and Vice-Chair shall be appointed for three-year terms renewable once.

U. The CNS Leadership Development Committee (LDC) shall be chaired by a member of the Executive Committee who is appointed to this role by the President and shall serve for a period of three years...

V. The CNS Fellowships Committee shall be chaired by a member of the Executive Committee who is appointed by the President for a one-year term. The term is renewable...

W. The CNS Information and Technology Committee... The Chair shall be appointed by the President of the CNS to a three-year term...

X. The CNS Public Relations Committee... The Public Relations Committee Chairpersons shall be appointed by the President of the CNS for a three-year term. The term is renewable...

Y. The CNS Research Committee... The Chair shall be appointed by the President for a three-year term...

Z. The CNS Self Assessment in Neurological Surgery (SANS) Committee... The Chair shall be appointed by the President for a two-year term. The Vice-Chair will be appointed for a two-year term by the Chair in consultation with the President...
The CNS Nominating Committee met on Sunday April 15th, 2007 at the AANS Annual Meeting.

The following slate of officers was reached by unanimous consensus:

President-Elect: Dr David Adelson (Pittsburgh, PA)
Vice-President: Dr Christopher Getch (Chicago, IL)
Members-at-Large: Dr Ganesh Rao (Houston, TX)
Dr Jamie Ullman (Elmhurst, NY)

Respectfully submitted,

Nelson M Oyesiku, MD, PhD, FACS
Chair, CNS Nominating Committee
Neurovascular Surgery is a field in rapid evolution. Over the past two decades the development of microsurgical, cranial base, and most recently, endovascular techniques have combined to revolutionize the care of patients. Technical advances in these areas, along with concomitant technological advances in neuroanesthesiology and neurointensive care, have transformed our subspecialty.

While this certainly benefits our patients, such rapid change can and does present challenging issues for organized Neurosurgery. Training requirements for endovascular neurosurgery in fellowship and residency must be reconsidered, Continuing Medical Education (CME) must be reassessed, and certification issues must be addressed. The Executive Committee of the Cerebrovascular Section is acting to meet the changing needs of our membership.
Training and Certification in Endovascular Neurosurgery

Members of the CV Executive Committee, first under the leadership of Robert Harbaugh, and later under Robert Rosenwasser, have worked diligently to formalize subspecialty endovascular training standards. In 2004 the CV Executive Committee began work on a “White Paper” for the future of Cerebrovascular Neurosurgery. This document outlined the path necessary to bring endovascular neurosurgery (ENS) into the core curriculum of neurosurgical training.

The ABNS, Resident Review Committee (RRC), and the Senior Society (SNS) subsequently took practical measures to pave the way for that process. In 2004, the ABNS added cognitive testing questions on diagnostic and interventional radiology to the Written Board Examination. In June 2006, at the SNS Meeting, Drs. Rosenwasser, Harbaugh, and Donald Quest, the AANS President, led a panel discussing the alternatives for formalized endovascular subspecialty accreditation pathways. This culminated in the SNS’s approval of the request for formalized endovascular subspecialty accreditation, based upon recommendations from the Committee on Accreditation of Subspecialty Training (CAST). The SNS approved document, “Program Requirements for Training in Endovascular Neurological Surgery,” was based on the existing ACGME document originally written jointly by the leadership of the CV Section and the ASITN, and published in AJNR in 2000.

Most recently, in 2006, the RRC added an endovascular neurosurgery training component into the Residency Program Requirements. This mandate states comprehensive cerebrovascular neurosurgery residency training must include a microsurgical, radiosurgical, and endovascular training experience.

CV Section Annual Meeting Changes

The AHA Stroke-CV Section-ASITN Meeting

Over the last decade, the CV Section developed a very successful annual meeting with the American Society of Interventional and Therapeutic Neuroradiologists (ASITN). The meeting fueled the growth and technological evolution of our subspecialty, and the strategic scientific coupling with the ASITN allowed the CV Section to evolve in a manner that almost certainly would not have been possible otherwise.

During the past few years we have come to a crossroads. To remain the leading specialty for the treatment of neurovascular disorders, we must progress on a larger scale and in a wider venue. After several months of careful consideration and negotiation, the CV Section Executive Committee elected to integrate the CV-ASITN annual meeting with the AHA Stroke Conference. This agreement offers an unparalleled opportunity to strengthen our subspecialty through participation in this top quality, multi-disciplinary research conference.

The integration of the meetings will not leave the CV Section devoid of a dedicated gathering. A summer 2008 meeting is currently being planned for Jackson Hole, Wyoming. Preliminary plans call for the meeting to emphasize endovascular and microsurgical techniques, clinical management, complication avoidance and neurovascular technological progress.

The meeting, open to all neurosurgeons, will be smaller and less formal so as to meet the growing needs of our SENS members. It will likely include Special Practical Courses, and will provide a voice and a venue to a burgeoning population of Endovascular Neurosurgeons, although ASITN members may attend as well.

The summer meeting will also honor the legacy of the Jackson Hole “Complications” meeting and the seminal contributions of Nick Hopkins to Endovascular Neurosurgery. (Plans include 1-2 days using the Jackson Hole Complications Format.)

Resident Training Course in Endovascular Neurosurgery

In order to further “kick-start” resident participation in endovascular neurosurgery training, members of the AANS/CNS Cerebrovascular Section, under the direction of Drs. Jon Robertson and Robert Rosenwasser, have collaborated to develop an annual “Endovascular Neurosurgery for Residents” course. Now in its second year, this practical course serves as an introduction for residents who have had little previous opportunity for exposure to endovascular techniques. This course offers didactic lectures and animal lab instruction in ENS, and is offered every April at the Medical Education Research Institute in Memphis.

The past year has been a dynamic and eventful one for the Cerebrovascular Section, and it has truly been an honor and a privilege for me to serve as Chair. I thank you, my colleagues, for entrusting me with this responsibility, and look forward to another tremendous year for the Section under the dynamic leadership of Dr. Joshua Bederson. CNSQ
Announcing a NEW CNS International Membership Opportunity ($135 US) offered online at www.cns.org.

The Congress of Neurological Surgeons proudly announces its International Vista Member category. Because of its commitment to education and innovation, the CNS is investing in the future of every International neurosurgeon worldwide, by offering this new internet membership option.

CNS INTERNATIONAL VISTA MEMBERSHIP BENEFITS

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  ♦ NEW Congress Quarterly.
• Internet access to the NEW CNS University of Neurosurgery and other selected CNS educational publications and products!
• Reduced CNS Annual Meeting Registration Fees!
• Opportunity to contribute to the CNS through volunteer service on CNS committees (such as the International Committee).
• Low annual fee of $135.00 US.

We Would Love for You to Join Us!

All eligible neurosurgeons must:
• Reside and practice outside North America (United States, Canada, and Mexico).
• Be a member of your local or regional Neurosurgical Society.
• Provide a verification letter from your local or regional society, confirming membership status.

Online applications for the CNS International Vista Membership are available online at the CNS Web site www.cns.org.
Confocal microscopy image depicts a cultured embryonic dorsal root ganglion treated with a viral vector that expresses a green fluorescent protein. Antibodies are used to stain neurons (red) and glia (blue). The efficiency and specificity of gene delivery can thus be measured to aid in the development of therapies for pain, nerve injury, and neuropathy (Courtesy of Nicholas Boulis).