

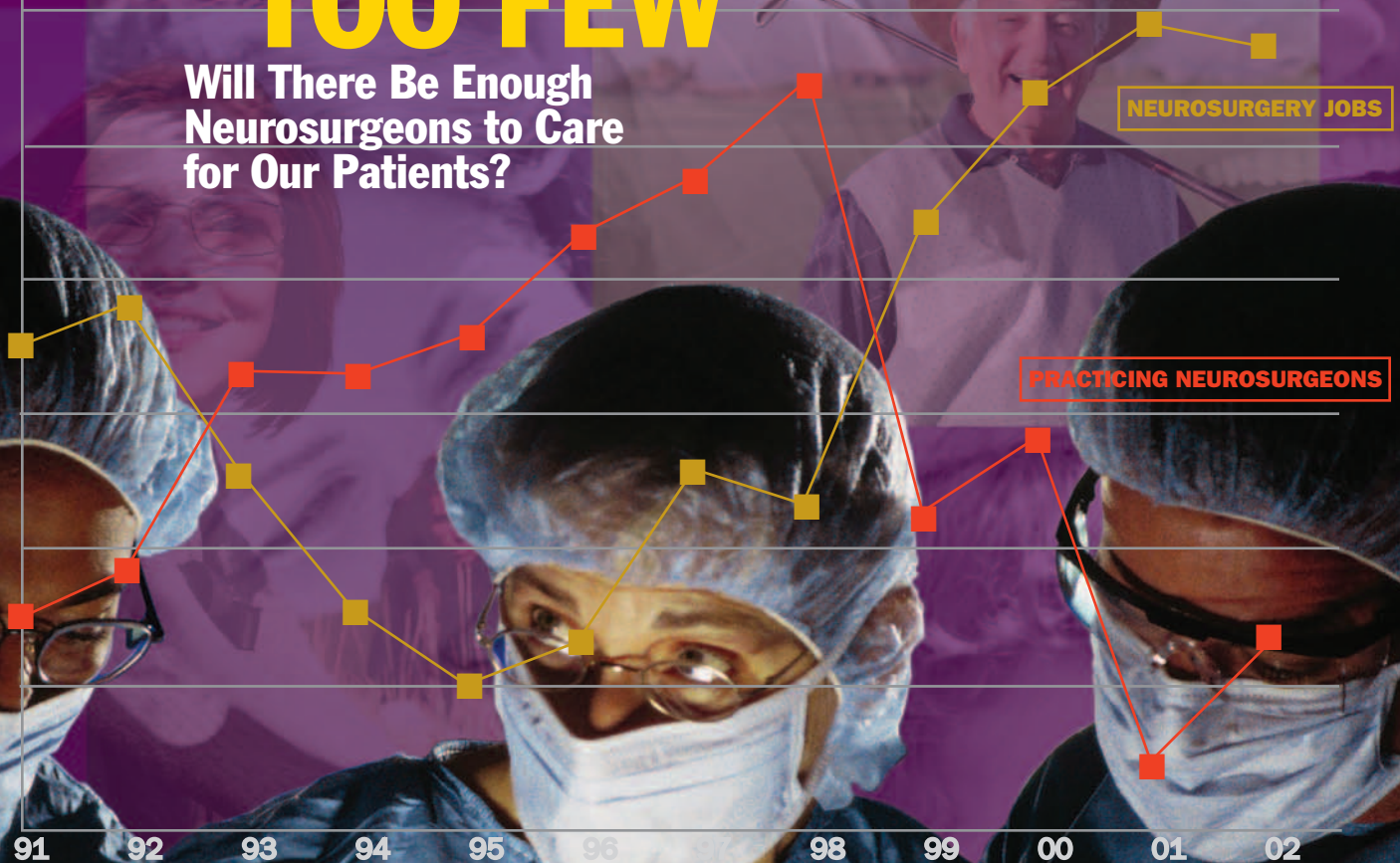
# BULLETIN

AMERICAN ASSOCIATION OF NEUROLOGICAL SURGEONS

The Socioeconomic and Professional Quarterly for AANS Members • Volume 12 No. 4 • Winter 2003

## Too Many? **TOO FEW**

Will There Be Enough  
Neurosurgeons to Care  
for Our Patients?



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The AANS is dedicated to advancing the specialty of neurological surgery in order to provide the highest quality of neurosurgical care to the public.

#### AANS BULLETIN

The official publication of the American Association of Neurological Surgeons, the *Bulletin* features news about AANS and the field of neurosurgery, with a special emphasis on socioeconomic topics.

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# The AANS Symbolizes Neurosurgery

*Our Association's Not Inclined to Rest Its Laurels*

*We are symbols, and inhabit symbols...being infatuated with the economical uses of things, we do not know that they are thoughts.* —FROM "THE POET," RALPH WALDO EMERSON

Emerson's words spring easily to mind at midwinter, a time awash with the symbols of celebration: ringing bells, family gatherings, lights illuminating darkness. The year cycling anew inspires a Janus-like gaze upon both neurosurgery's past and its future.

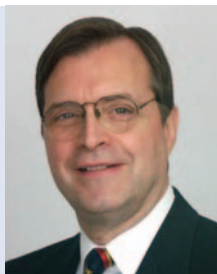
Since ancient times the pledge to act always for the good of patients—the Hippocratic oath—has been recited by physician initiates, providing a moral framework for the duration of one's career. Similarly, the caduceus has symbolically connected doctors both with notions of the divine and renewal. More recently, with the advent of neurosurgery as its own specialty a new symbol emerged: Harvey Cushing, widely recognized as the founder of modern neurosurgery, who serves today as the symbol of the American Association of Neurological Surgeons (AANS).

Cushing himself knew well the importance of symbolism to the profession. As he observed of the Hippocratic oath in a 1926 address to graduating medical students, "There are certain things which concern the code of the doctor, handed down to us from ancient times, which ... deserve reiteration on occasions such as this...for there is nothing that expresses so well, as does this justly famous credo, the ideals which from the first have actuated the doctor and have led to the solidarity of the profession you are entering."

By organizing the Society of Neurological Surgeons and inspiring creation of the Harvey Cushing Society, now the AANS, Cushing nurtured the framework that would help neurosurgeons advance their clinical knowledge and also address the numerous challenges that face us today.

One such issue, workforce, has been a subject of intense interest for me over the years. It presents a formidable challenge, this estimation of what prodigious strides in neuroscience will occur, how the market forces might shift, and how neurosurgery might continue to attract and train high quality people. Since its inception neurosurgery has been highly selective—for training directors the quest for the "best and the brightest" is essential in order to assemble a workforce fit for an intellectual-

*A. John Popp, MD, is the 2003-2004 AANS president. He is Henry and Sally Schaffer Chair of Surgery at Albany Medical College in New York.*



ly challenging and highly demanding specialty. It is certain that neurosurgery will be able to welcome increasing numbers of qualified women and minority physicians in the coming years; it is less certain, given the pressures currently bearing upon us, that neurosurgery will be able to keep sufficient numbers of neurosurgeons available to serve the needs of the U.S. population.

Topping the list of pressures on the profession certainly is the medical liability crisis. Just today I heard from a 52-year-old neurosurgeon who is retiring—quite young considering that most neurosurgeons attain board certification in their mid-30s. He attributed his untimely retirement in large part to medical liability insurance rates that more than doubled within two years. Because his experience is emblematic for

neurosurgeons across the United States, passing meaningful medical liability reform is at the top of the AANS agenda. AANS is diligently working through Neurosurgeons to Preserve Health Care Access to increase awareness of the issue nationwide and effectively apply pressure for medical liability reform during this politically charged election year (see page 4).

The ability of the AANS to renew itself in order to successfully address new challenges is greatly dependent upon its underlying committee structure. The AANS is an organization created by and for neurosurgeons, and neurosurgeons not only govern the organization, they effect change through numerous AANS committees (see page 43).

This committee-based structure in turn allows the AANS to address issues with which neurosurgery has been concerned from the beginning, namely advancing the specialty through education. Committees play a vital role in all four of AANS' peer-reviewed journals, including the new *Journal of Neurosurgery: Pediatrics*, as well as in the upcoming 2004 AANS Annual Meeting, "Advancing Patient Care Through Technology and Creativity," May 1-6 in Orlando, Fla. Looking ahead to 2009, committees will help plan the XIV International Congress of Neurological Surgery in Boston, hosted by the AANS for the World Federation of Neurosurgical Societies.

With a firm grounding in its past, the AANS proceeds to the future ill-content to rest on its laurels. From Hippocrates to Epocrates, change is constant. Today qualifying for AANS membership symbolizes attainment of a milestone in one's neurosurgical career, but the challenges we face beg for more grassroots involvement. Such solidarity in the AANS is the means by which the specialty will advance and its challenges will be resolved. ■

# NEWSLINE

News Members Trends Legislation

## FROM THE HILL

### LIABILITY PREMIUMS LOWER IN STATES WITH DAMAGE CAPS

A *Health Affairs* report released in January 2004 finds that professional liability insurance premiums are 17.1 percent lower in states that have caps on damage awards, although it maintains that the lack of such tort reform measures in other states does not fully explain recent jumps in what physicians pay to cover the cost of medical liability suits. "The Medical Malpractice 'Crisis': Recent Trends And The Impact of State Tort Reforms" is available at [www.healthaffairs.org](http://www.healthaffairs.org).

For frequent updates to legislative news, see the Legislative Activities area of [www.AANS.org](http://www.AANS.org).

- **DMLR Launches TV Campaign for Medical Liability Reform** Doctors for Medical Liability Reform officially launched Protect Patients Now, a national campaign to pass federal medical liability reform legislation, on Feb. 10. The campaign's television programs will air throughout 2004 in a number of crisis states to educate and inform the public about the destructive effects of the medical liability crisis on patients' access to healthcare. The DMLR now includes nine national medical specialty societies, representing more than 200,000 physicians, that together will contribute over \$10 million to fund the Protect Patients Now initiative. Neurosurgeons to Preserve Health Care Access, the advocacy organization of the American Association of Neurological Surgeons (AANS) and the Congress of Neurological Surgeons (CNS), heads up the DMLR. Additional information is available at [www.neuros2preserve.org](http://www.neuros2preserve.org) and [www.protectpatientsnow.org](http://www.protectpatientsnow.org).
- **President Bush Turns Focus to Medical Liability Reform** After signing the Medicare Prescription Drug, Improvement and Modernization Act of 2003, President George W. Bush addressed medical liability reform in Nevada. "One of the things we must work for is a healthcare system which is affordable and available," he said. "Junk lawsuits, the threat of junk lawsuits drive up the cost of healthcare and run good docs out of the system...if you think a lawyer is simply fishing for a rich settlement, is constantly looking over your shoulder, you'll end up practicing what's called defensive medicine...the doctor-patient relationship is disrupted for fear that that advice will be used against them in the court of law. This problem not only affects the doctors, it affects the patients, as well." The AANS/CNS Washington Office has met with Bush administration representatives and Senate leadership to discuss strategy and timing for bringing medical liability reform legislation to the Senate floor in 2004.
- **Scully Resigns, Thompson Names Smith as Interim Head of CMS** Days after the Medicare Prescription Drug, Improvement and Modernization Act of 2003 became law, Thomas A. Scully resigned as administrator of the Centers for Medicare and Medicaid Services (CMS). Tommy G. Thompson, the secretary of health and human services, named Dennis G. Smith interim head of the CMS. Smith was director of the Center for Medicaid and State Operations at the CMS. At the same time, Secretary Thompson said that Leslie V. Norwalk will remain in her position as deputy administrator and chief operating officer at CMS. Norwalk will continue to be the CMS lead in carrying out the Medicare legislation.
- **New Law Again Requires Drug Companies to Test Products on Children** A new law requires pharmaceutical companies to test the safety of their products in children. The law codifies a "pediatric rule" issued in 1998 that had allowed the Food and Drug Administration to require pharmaceutical companies to test their products in children. U.S. District Judge Henry Kennedy in October 2002 struck down the rule, which he said "exceeds the FDA's statutory authority and is therefore invalid." The law reinstates the authority of the FDA to require pharmaceutical companies to test the safety and efficacy of drugs in children before their products receive approval. The law, which will expire in 2007, allows pharmaceutical companies to obtain waivers on the tests in some cases.
- **Expert Witness' N.C. Medical License Suspended** In November the North Carolina Medical Board suspended the medical license of Gary Lustgarten, MD, for one year, finding that as an expert witness in a 1998 case he misstated facts and the appropriate standard of care in North Carolina. He has said that he will appeal. The board previously had revoked his license, but most of the grounds for that action were reversed in Wake County Superior Court. The American Association of Neurological Surgeons (AANS) suspended Dr. Lustgarten twice for his unprofessional testimony as an expert witness; one suspension stemmed from his testimony in the 1998 case. AANS guidelines for testimony in professional liability cases are available at [www.AANS.org/about/aanscodeofethics.pdf](http://www.AANS.org/about/aanscodeofethics.pdf).

## NEURO NEWS

### NEW WEB SITE PROMISES TO STREAMLINE GRANTS PROCESS

A new Web site allows individuals and organizations to electronically find and apply for competitive grant opportunities from all federal grant-making agencies. The Web site, [www.grants.gov](http://www.grants.gov), covers more than 900 grant programs offered by the 26 federal grant-making agencies and awards more than \$350 billion annually to state and local governments, academia, not-for-profits, and other organizations.

- **Subjects Urgently Needed for New Extracranial-Intracranial Bypass Trial** The Carotid Occlusion Surgery Study (COSS), a randomized, non-blinded, controlled clinical trial, is intended to determine the efficacy of bypass of the superficial temporal artery to the middle cerebral artery to reduce subsequent ipsilateral ischemic stroke within two years. According to Robert L. Grubb Jr., MD, executive investigator, subjects are urgently needed for this important study, which is funded by the National Institute of Neurological Disorders and Stroke. "Using modern neuroimaging techniques to evaluate cerebral hemodynamics in patients with carotid artery occlusion, this study will expand upon the findings of the well-conducted 1977-1985 Extracranial-Intracranial Arterial Bypass Trial," he said. "COSS will identify and analyze the subgroup of patients with hemodynamic compromise for whom surgical revascularization might be beneficial." Major inclusion criteria are: complete occlusion of one carotid artery; hemispheric transient ischemic attacks or mild-to-moderate stroke in the territory of the occluded carotid artery within 120 days; and increased cerebral oxygen extraction fraction measured by positron emission tomography distal to carotid artery occlusion. Twenty-two centers in the United States currently are enrolling subjects in COSS. Further details and a list of participating centers can be found at <http://dmchost.public-health.uiowa.edu/coss>.
- **New Process to Claim Category 1 Credit** Beginning this spring, bar-coded tickets will be used to verify physician attendance at American Association of Neurological Surgeons (AANS) and AANS/CNS section meetings for which category 1 credit is conferred toward the American Medical Association's Physician's Recognition Award. The tickets are effective as of April 30 for the 2004 Biennial Meeting of the AANS/CNS Section on Pain, held immediately prior to the 2004 AANS Annual Meeting. This ticketing process, similar to the process the AANS has utilized since spring 2001 for the breakfast seminars and practical clinics, was adopted to comply with the AMA's verification requirements for achieving the AMA PRA. The new process will satisfy the AMA's requirement that the providers "must base [provision of credit certificates] on the actual credit claimed by the physician" in a process that "starts with the physician first claiming their amount of participation to the provider." The bar-coded tickets, clearly printed with session date, time, title and number, will be provided to each meeting attendee in the registration packet. To obtain category 1 credit, following each meeting session an attendee will need to deposit the ticket corresponding to the session into a labeled receptacle, available outside of the room and near meeting rooms throughout the convention center. Collected tickets will be scanned, allowing AANS to apply the credits to attendees' continuing medical education transcripts. Further information and a sample ticket are available at [www.AANS.org/CMEflyer31.pdf](http://www.AANS.org/CMEflyer31.pdf). Additional information is available from the AANS at (888) 566-AANS and from the AMA at [www.ama-assn.org/ama/pub/category/2935.html](http://www.ama-assn.org/ama/pub/category/2935.html).
- **Neurosurgery Addresses Case Volume and Morbidity, Residents as First Responders** The American Association of Neurological Surgeons (AANS) concluded that "a mandate for regionalization of neurosurgical care would be premature and potentially harmful to some patients," in a position statement released in November. The "AANS Position Statement on Recent Literature Correlating Volume to Outcome," is available in its entirety at [www.AANS.org/Library/Article.aspx?ArticleId=20039](http://www.AANS.org/Library/Article.aspx?ArticleId=20039). In addition, the AANS, together with the Congress of Neurological Surgeons, endorsed a position statement by the AANS/CNS Section on Neurotrauma and Critical Care that addressed residents as first responders in trauma cases. The recommendation is that "residents in their first years of training be recognized as appropriate first responders to emergent, urgent or elective neurosurgical consults, including trauma consults," as approved by the respective chairs of their neurosurgical departments. The statement is available at [www.neurosurgery.org/trauma](http://www.neurosurgery.org/trauma).

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# Numbers and Need

## *Maintaining Balance in the Neurosurgical Workforce*

**H**ow many neurosurgeons are needed to fill the nation's medical needs? What geographic area or population number should a neurosurgeon serve? How many neurosurgeons should be in training? How many in practice? Are there too many, too few, or the right number?

These workforce questions have been debated since the beginnings of neurosurgery as a distinct specialty. The answer depends upon whom you ask, and varies over time. Harvey Cushing believed a 1:1 million neurosurgeon-to-population ratio to be a generous plenty, while today's 1:65,000 ratio proves inadequate, based on an analysis of the growing number of unfilled positions advertised.

The workforce issue has been discussed before in the *AANS Bulletin*. The controversy was covered in the Spring 2000 issue in articles by current AANS President A. John Popp, MD, and Richard Cooper, MD. These articles are still timely and can be referenced online at [www.AANS.org/bulletin](http://www.AANS.org/bulletin).

The art and science of estimating the number of neurosurgeons needed in our nation's healthcare system is akin to forecasting the weather years in advance. Like the "butterfly effect"—described by James Gleick in *Chaos: Making a New Science* as the impact of minor, remote, random atmospheric conditions on major meteorological events around the globe—a multitude of changing factors affects the need or demand for neurosurgeons' services.

Profound changes in neurosurgical treatment often result from apparently inconsequential scientific discoveries or technical reports, commonly dismissed as inappropriate, unnecessary or just irrelevant when first introduced. The transformations wrought upon neurosurgical practice by computed tomography scanning and magnetic reso-

nance imaging; the surgical microscope and more recently the endoscope; an exponentially expanding number of spinal internal fixation devices; growing applications of functional neurosurgery; and stereotactic guidance, endovascular techniques, and radiosurgery, are far reaching. They not only improve standard treatment, but also expand the volume of surgical cases, and the demand for neurosurgical services.

So the estimate of neurosurgical supply shifts with changing circumstances. Some of the reasons for prognostic inexactitude are:

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■ Neurosurgeons are unevenly distributed. An average number obscures regional imbalances of excess, as evidenced by concentration of neurosurgeons in urban areas, and inadequate supply, as often is the case in rural areas.

■ The need for neurosurgeons depends on the range of services provided. Britain's controlled neurosurgeon-to-population ratio of 1:500,000 works by limiting the range of services provided by neurosurgeons; this is not the case in the United States.

■ The demand for neurosurgical services expands as risk is reduced, recovery is shortened, and success is proven. Minimally invasive and noninvasive techniques lower the threshold for initiation of elective procedures.

■ Neurosurgeons are more subspecial-

ized. Now multiple neurosurgeons with special interest or training fill the need formerly satisfied by one general neurosurgeon performing less complex procedures on fewer patients.

■ Interspecialty competition affects workforce needs. While neurosurgery may have lost ground to vascular surgery and neuroradiology with respect to treating cerebrovascular disease, it has gained ground with expanded spinal surgery services, especially minimally invasive decompression and complex stabilization surgery.

■ Medical liability risk is changing the number of neurosurgeons available. Some neurosurgeons in states that are experiencing a medical liability crisis have relinquished cranial privileges to lower premium costs and exposure to liability claims. Others have lost coverage altogether, moved, retired, or switched to nonsurgical practice. As the liability crisis worsens, the gap between the need for neurosurgeons and available neurosurgeons will grow in high-risk states.

■ An 80-hour workweek during training and an expectation of a less rigorous lifestyle with more available personal time may reduce the hours worked by the coming generation of neurosurgeons.

■ The expanding role of physician extenders in neurosurgery practice may reduce the need for additional neurosurgeons, easing the supply problem.

What the "right" size of the neurosurgical workforce is, is not merely idle speculation. Since training time is up to seven years, and longer if a fellowship is included, early recognition of insufficient numbers is important to keep a healthy balance between the training program pipeline and medical market demand.

New analysis of the neurosurgical workforce is timely in a changing medical market. This issue of the *Bulletin* brings the question to the forefront once again and, we hope, provides new information and insight that will aid in maintaining balance between the numbers and the need in the future. ■



# Too Many? Too Few

## New Study Reveals Current Trends in U.S. Neurosurgical Workforce

William T. Couldwell, MD, Oren N. Gottfried, MD,  
Martin H. Weiss, MD, and A. John Popp, MD

*Remarkable changes in the neurosurgical specialty have taken place in the past 15 years. While advances in basic science have occurred and new technologies and therapies have proliferated, other, less propitious factors—such as the promises (some might say false promises) and hopes of managed care—heralded a period of downsizing in specialty care in the United States and an emergence of and emphasis on primary care.*



**T**his downsizing of the neurosurgical specialty is demonstrated by a 2003 University of Utah study that compares the number of practicing U.S. neurosurgeons to the number of positions open to them. The study reveals a 12-year trend toward a shortage of neurosurgeons that has resulted in a distinct shortage of neurosurgeons currently. Based on the study results released herein, this article will explore the factors underlying the shortage of U.S. neurosurgeons and examine how the neurosurgical workforce must adapt to assure U.S. patients of appropriate neurosurgical care in the future.

### Shrinking Pool of Neurosurgeons

For the University of Utah study, 1991-2002 data were obtained from the American Board of Neurological Surgeons (ABNS) to determine the numbers of practicing neurosurgeons and matriculating residents, and from the San Francisco Matching Program Web site, [www.sfmarch.org](http://www.sfmarch.org), to ascertain the number of neurosurgical residency positions.

The total number of ABNS-certified practicing neurosurgeons in the United States, after increasing gradually for many years, has decreased dramatically over the past five years. In fact, fewer neu-

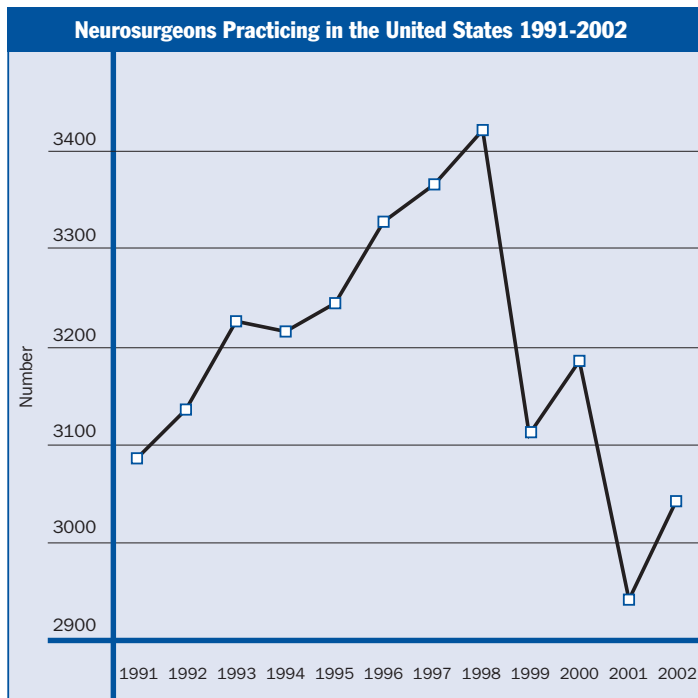
rosurgeons were practicing in late 2002—about 3,050—than 12 years ago (see graph, Neurosurgeons Practicing in the United States, 1991-2002). Several factors have contributed to such a decrease, the most salient of which are the static number of neurosurgical residency training program graduates and medicolegal pressures.

**Static number of neurosurgical residency training program graduates.** The number of neurosurgical residency positions offered through the National Resident Matching Program has remained remarkably stable over the past 12 years (see graph, Neurosurgical Residency Applicants, Positions Matched, and Graduating Residents, 1991-2002). The number of matriculating residents almost mirrors the number of available residency positions. However, the decreasing number of applicants to the neurosurgical match, which may indicate a diminishing interest among graduating medical students in the pursuit of a neurosurgical career, is a worrisome trend.

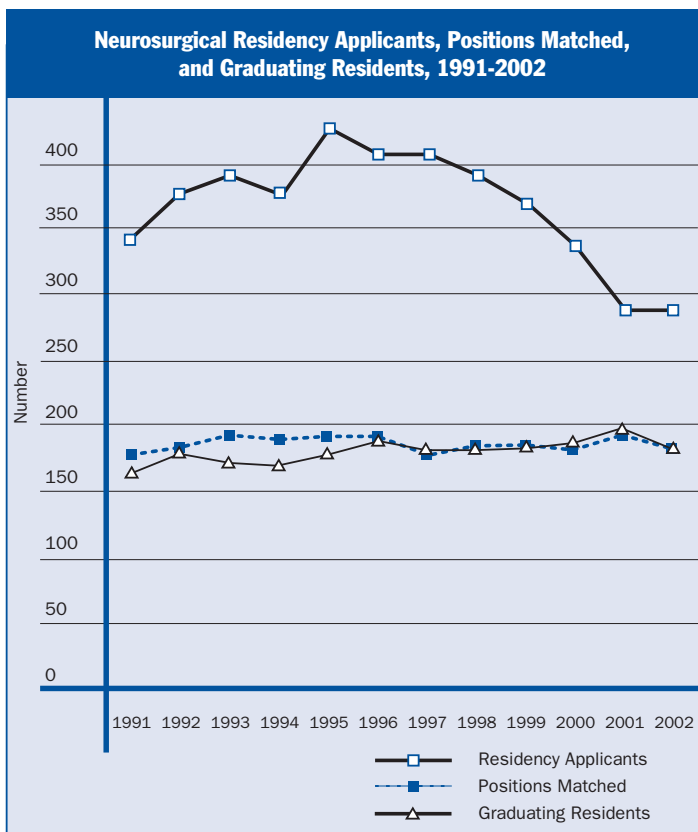
**Increasing medicolegal pressure.** As detailed in the Fall 2003 issue of the *Bulletin*, the current medical liability crisis in the United States has exerted tremendous strain on neurosurgeons, particularly on those in private practice who do not have the benefit of

Continued on page 8

Continued from page 7



Data Source: American Board of Neurological Surgery



Data Sources: American Board of Neurological Surgery; San Francisco Matching Program Web site

working in a self-insured healthcare delivery system or hospital. Rising professional liability insurance costs have produced such pressure on many practicing neurosurgeons that continued practice in many regions of the country has become fiscally untenable. As a result, in many regions of the country patients' access to neurosurgeons has been severely limited. Given the persistent slump in the economy and the failure of federal medical liability reform thus far, a rapid solution to the problem of rising professional liability insurance premiums is unlikely.

In addition to those leaving practice, some neurosurgeons have addressed the problem of escalating liability insurance premiums by limiting their practices to procedures deemed "less risky" by insurance carriers. For example, in the Chicago metropolitan area as in some other regions of the country, many neurosurgeons in private practice have voluntarily limited their practices to spine surgery. Doing so achieves the dual goal of reducing professional liability insurance premiums and avoiding neurosurgical trauma coverage, which requires cranial privileges.

### Burgeoning Demand for Neurosurgeons

While the number of practicing neurosurgeons has been decreasing, a steep increase in the number of advertised positions for both academic and private practice opportunities has occurred. Nearly 800 practice opportunities were available in 2002 compared with fewer than 550 in 1991 (see graph, Available U.S. Neurosurgical Positions 1991-2002).

For the University of Utah study, the number of available neurosurgical positions was estimated by reviewing the advertisements from 1991 to 2002 in the *Journal of Neurosurgery* and *Neurosurgery*. All positions for clinical neurosurgery in the United States were included, but fellowship and research positions were excluded. Although there are limitations to using a review of such advertisements as an estimate of workforce demand, this method has been used previously as a quantifiable and objective index of workforce trends over an extended period.

Adding anecdotal credence to the findings, many neurosurgical program directors have noted the trend toward an increasing number of jobs available to graduating residents and fellows.

### Implications of the Supply-Demand Mismatch

The dramatic increase in practice opportunities coupled with the decreased number of available neurosurgeons places many pressures on the specialty as a whole. This supply-demand mismatch portends serious consequences for the future.

**Neurosurgery's decreased capacity to provide new services** The sparsely populated neurosurgical workforce contributes to the need for the average neurosurgeon to work at capacity. However, this situation limits the specialty in its ability to expand practice into other areas that would be fruitful extensions of neurosurgeons' expertise. For example, the impending renaissance of surgery for psychiatric



disease, such as stereotactic surgery for severe and refractory obsessive compulsive disorder, and new indications or procedures for pain management, such as spinal cord stimulation for angina, represent great potential to expand neurosurgery's breadth of practice.

Another area for potential expansion is endovascular treatment of cerebrovascular disease, a natural extension of neurosurgery that quickly has been accommodated by neuroradiology. Neurosurgery still has the potential for growth in this area. Lessons learned from cardiology's experience with the emergence of endovascular treatment for cardiovascular disorders demand that neurosurgery likewise embraces this improving technology. By doing so, neurosurgeons will be able to retain the ability to offer this therapy to patients.

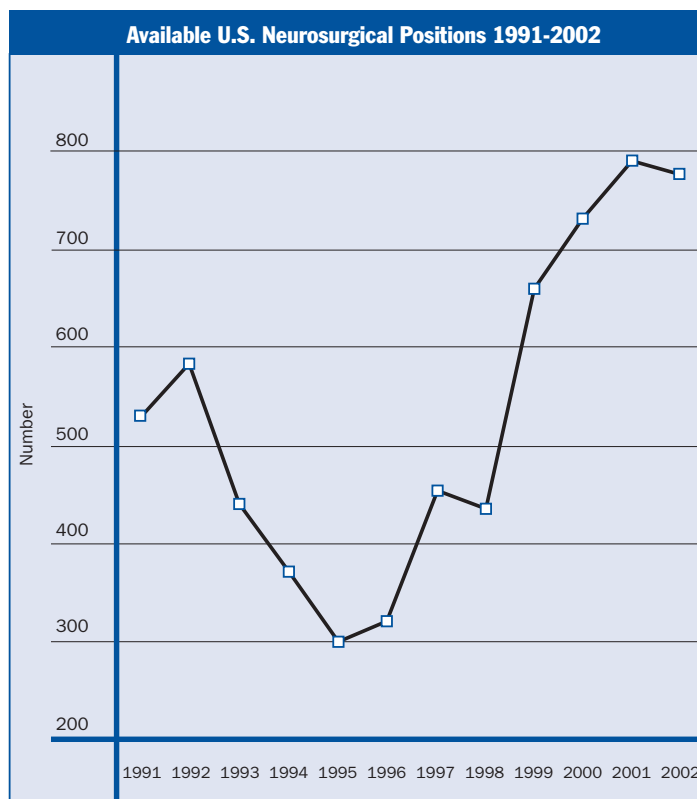
**Neurosurgery's continued ceding of neurosurgical activity to competing specialties.** With neurosurgery constrained in its capacity to provide new services, the door is opened wide for other specialties to step through. One does not have to search far to see the effects of such competition. Over the past generation, there has been a steady decline in neurosurgeons' participation in the management of peripheral nerve disease. Orthopedic and plastic surgeons have undertaken many of the procedures that were once an integral part of neurosurgeons' practices. In particular, orthopedic surgeons' interest in performing spine surgery has diluted neurosurgeons' participation in spine care.

Similarly, anesthesiologists who subspecialize in pain management have undertaken many pain surgery procedures—including independent performance of invasive procedures such as implantation of morphine pumps and spinal stimulators—that once were a fundamental interest of neurosurgery. Further, otolaryngologists/head and neck surgeons now exceed neurosurgeons in Medicare billings for brachial plexus exploration, according to a recent AANS/CNS Washington Office review.

## The most rational and effective method of countering these trends will be to increase enrollment.

Will there be enough neurosurgeons to provide new services in the future, or will other specialties with greater workforce capacity continue to fill the void? Given the declining workforce and whittling away of neurosurgical services by competing specialties, neurosurgery now faces the threat of its own slow dissolution.

**Neurosurgery's lengthy pipeline.** Adding to the factors influencing the supply-demand mismatch is the length of time required to increase the neurosurgical workforce. Most neurosurgical residencies last six or seven years following medical school, and there is an increasing trend among graduates toward pursuing further subspecialty fellowship training. Because recruitment of neurosurgical trainees occurs in the senior year of medical school, it is



Data Source: 2003 University of Utah survey of recruitment advertisements

reasonable to assume that it will take at least seven years to significantly increase the output of fully trained neurosurgeons by expansion of neurosurgical training programs, even if such expansion is initiated immediately.

### A Call for Increased Enrollment in Training Programs

The increasing demand may result in serious shortages of neurosurgeons in the next few years, and increasingly patients' access to neurosurgical care will be jeopardized. The most rational and effective method of countering these trends will be to increase enrollment into the many quality neurosurgical training programs throughout the country.

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# In the Pipeline

## Resident Trends Explored, Proactive Approach Proposed

DEBORAH L. BENZIL, MD

National policymakers wrestling with physician workforce issues for three decades have unsuccessfully tried to achieve the right number of physicians. Fixed ratios and goals that were intended to prevent a surplus of neurosurgeons by limiting the number of training positions, among other measures, resulted in many small specialties, such as neurosurgery, suffering considerably.

Understanding neurosurgical workforce trends requires analysis of the number of current neurosurgeons, as discussed in this issue's cover story, as well as the number of those who have recently entered or who are contemplating entrance into neurosurgical residency—neurosurgery's "pipeline." With less than 150 neurosurgical residency positions available per year and a lengthy training period of five to seven years, long-range planning is essential for maintaining an adequate neurosurgical workforce.

Neurosurgery traditionally has been an extremely competitive specialty, attracting many of the best and the brightest applicants to neurosurgical residency programs. Each year program directors sift through dozens of worthy applications to identify the 10-20 candidates most suitable for interviews for just one or two available positions. The advent of the Central Application System, which is mandatory for neurosurgery applicants, made submission of a vastly increased number of applications possible with no additional effort. For program directors, however, this made the task of determining which of the many applicants to invite to campus even more challenging.

### Trends in Residency Applications

Until the last decade, trends in medical education, economics and technology had little effect on the popularity of the neurosurgical specialty. Applications for neurosurgical residencies remained stable at a time when many other specialties were experiencing significant fluctuations in residency applications due to policy changes, supply and demand issues and technological advances.

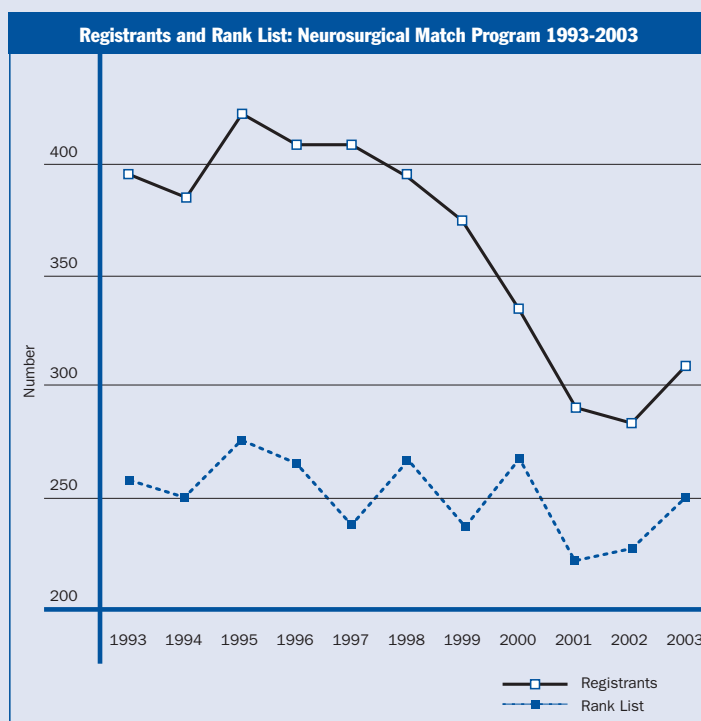
By the beginning of the 1990s, the proliferation of health maintenance organizations and their "gatekeepers" propelled many medical students into family practice residencies. However, by the end of the 1990s the number of physicians seeking family practice entered a rapid decline. The number of family practice residency positions filled fell from 85.5 percent in 1998 to 79.1 percent in 2002. During the same period, the number of U.S. medical school graduates ripe for residency fell from 66.2 percent to just 47.2 percent.

General surgery was once a highly sought residency; in 1981, more than 12 percent of medical students chose general surgery after graduation. However, by 2001 the number of available general surgery residencies exceeded the number of medical students applying. The expectation now is that the percentage of medical students who will apply for a general surgery residency will drop below 5 percent by 2005.

For neurosurgical residencies, the number of applicants remained stable for many years. Since 1995, however, there has been a slow, but steady decline in medical students' choice of neurosurgical residencies. This decline parallels the considerable drop both in the overall number of residency applications, as measured by registrants for the National Resident Matching Program, and in the number of rank lists—those committing to the match (see graph, Registrants and Rank List: Neurosurgical Match Program 1993-2003).

Neurosurgery's January 2003 match marked the first reversal of this trend along with a decline in the specialty's residency vacancy rate. While it is too early to know whether interest in neurosurgery truly is resurging or if this increase will remain a one-year phenomenon, it is worth noting that even the January 2003 match amounted to just over 300 registrants, compared with a high of 425 registrants in 1995.

The quality of applicants for neurosurgical residencies is more difficult to assess than simply their sheer numbers. The percentage of U.S. medical school seniors matching peaked at 92 percent in 2000, but has remained near 90 percent since then (see graph, U.S. Medical School Seniors and International Medical School Graduates in Neurosurgical Residencies 1991-2003). During this same time, positions filled by international medical school graduates also peaked between 6 percent and 10 percent, suggesting that they are filling the slots made available by the declining number of U.S. graduates. Average scores of U.S. Medical Licensing Exam Step 1,



Data Source: American Board of Neurological Surgery

only recorded from 1998 to 2003, rose only slightly during that from 226 to 234, about 20 points above the national average. Scores for those who did not match were at or below the national average and ranged from 207 to 215.

### Pool of Medical School Graduates

The pool of candidates for neurosurgical residency is dependent to some extent on the pool of medical school graduates. Taking a look at this group, it is noteworthy that between 1980 and 2000 the U.S. population grew by 24 percent while U.S. medical school graduates increased only 12 percent, suggesting that eventually there may be too few physicians to serve the U.S. population in the future.

Looking a bit further down the pipeline, applications to medical schools were down 6 percent for 2001-2002, continuing a six-year decline, but there was a slight increase in applications of 3.5 percent for 2002-2003.

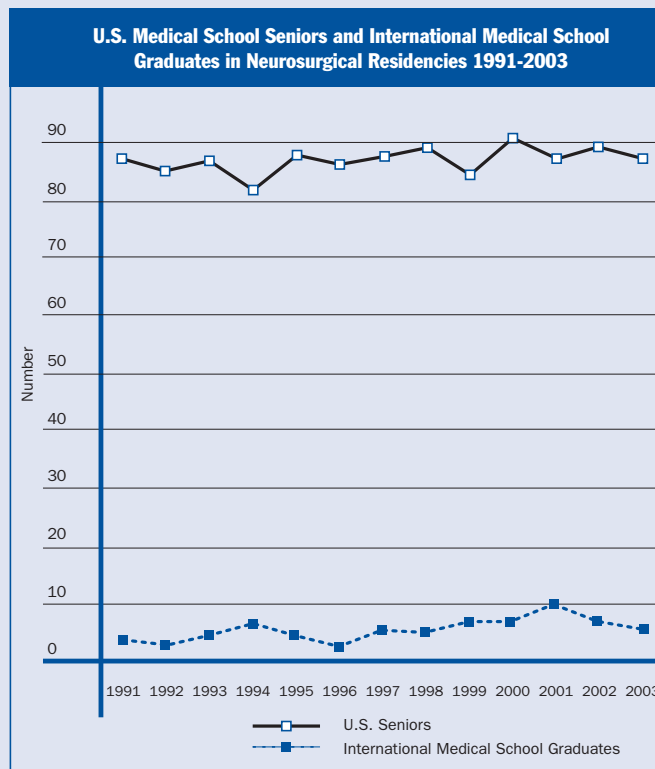
A variety of factors may be influencing the shrinking pool of medical school graduates, among them the openly expressed message of physician discontent with the practice of medicine, a discouraging message that increasingly has made its way to college campuses. This dissatisfaction is illustrated by a 2004 Merritt, Hawkins & Associates survey in which more than half of physicians ages 50 to 65 said they would choose another career if they were starting out today.

Another factor may be resident burnout, which often is cited as an increasing problem. Association of American Medical Colleges President Jordan J. Cohen, MD, wrote in *Annals of Internal Medicine* that “the stresses, both professional and personal, that residents now experience do seem much more intense than in the past. Patients are sicker, hospital stays are shorter and attendings are more hassled...” Whether last summer’s Accreditation Council for Graduate Medical Education-mandated resident work hour restrictions will reduce residents’ stress levels over time—and improve patient care—has yet to be seen (see related articles on pages 12 and 13 in this issue).

### Influences on Specialty Choice

Among the benefits of the resident work hour restrictions purportedly is an increase in residents’ quality of life. A recent study by E. Ray Dorsey, MD, and colleagues concluded that the “perception of controllable lifestyle accounts for most of the variability in recent changing patterns in the specialty choices of graduating U.S. medical students.”

Although Dorsey and colleagues found that lifestyle now trumps determinants such as pay in choosing a specialty, the average debt load has reached more than \$125,000 for today’s graduating medical student, perhaps tarnishing the appeal of longer training programs like neurosurgery’s five-to-seven year program. The high debt load likely will encourage medical students to gravitate toward lucrative specialties, as well. For example, the advent of coronary artery stents advanced interventional cardiology to



Data Source: American Board of Neurological Surgery

the highest median income of all subspecialties, resulting in the increased popularity of this specialty among medical students.

### Attracting the Best and Brightest

Attracting the best and brightest physicians over the next decade may start with an understanding of who will be in the pool, as well as how they will make their specialty choice.

Women now comprise more than half of all first-year medical classes, and over the next two decades it is expected that women will comprise more than half of all practicing doctors. This expectation is well founded, given that the number of female physicians grew 300 percent between 1980 and 2000, while the number of male physicians increased just 44 percent. While few women traditionally have chosen to enter neurosurgical residency—only about 5 percent of practicing neurosurgeons are women—nearly 10 percent of all current neurosurgical residents are female, a significant rise over the last decade that bodes well for neurosurgery’s future.

An increased number of minority candidates are expected to enter medical school in the coming years. In 2003 the number of medical school applicants who identified themselves as other than white was approximately 42 percent; slightly fewer U.S. neurosurgeons identify themselves the same way, approximately 31 percent.

Suitable experience with neurosurgery seems to improve the

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# Restricted Workweek

## Survey Documents Concerns for Tomorrow's Neurosurgical Workforce

RICHARD D. FESSLER, MD

**M**ost neurosurgeons are available to referring physicians and patients seven days per week, 24 hours per day. Many of us believe that our training prepared us for this through years of intense, often exhausting training. The recently mandated Accreditation Council for Graduate Medical Education (ACGME) training guidelines has altered this approach.

Beginning last July 1, all core and subspecialty training programs in the United States are required by the ACGME to include in their training guidelines language strictly delineating resident duty hours, call requirements, and days off. The guidelines include an 80-hour workweek; restriction of in-house call to a maximum of every third night; and limitation of each work shift to 24 consecutive hours, followed by a minimum of 10 hours off between these shifts. Each resident has one day free of responsibilities for every seven days of work.

Each neurosurgical program has coped with the guidelines in its own way, putting in place schedules that ensure adequate time off for trainees, and hiring ancillary medical professionals (physician assistants, nurse practitioners, and moonlighters) to bridge the gap in coverage. According to the ACGME, preliminary data suggests that residents in training overwhelmingly support the new training hours and report increased satisfaction.

In an effort to gauge how the ACGME guidelines have specifically affected neurosurgical training programs, the Council of State Neurosurgical Societies surveyed program directors and residents last summer.

### The CSNS Survey

Nine multiple choice and open-ended questions were sent by e-mail to 93 program directors and more than 600 residents in training. The survey was distributed in July, August and September. Respondents were removed from the listserve as their surveys arrived. Non-responders received the survey up to three times. Response rates were 45 percent and 23 percent for program directors and residents, respectively.

More than 90 percent of neurosurgical programs represented by a survey response had initiated measures to comply with the ACGME guidelines before or on July 1. Not surprisingly, there was strong agreement between the residents and program directors on several issues. The majority of residents and program directors felt that their programs had experienced a negative impact from the ACGME guidelines. Patient continuity of care was the most significant issue.

More than two-thirds of program directors and residents felt that the ACGME guidelines had affected continuity of care. Ninety percent of those who noted a change felt that there was a negative effect on patient care. Interestingly, most of the program respondents who noted no significant change in continuity were involved in programs that trained more than two residents per year or that

**The majority of residents and program directors felt that their programs had experienced a negative impact from the ACGME guidelines.**

did not maintain coverage of a level one trauma center. Residents and program directors noted that patient care suffered from the intermittent absence of the chief and senior residents. In addition, they felt that patient care was negatively influenced when the on-call resident had to leave the hospital the next morning. Details concerning the neurological exam and plan of treatment were often "lost in translation" and the call resident was unable to follow his or her patient to the operating room or follow the progression of the disease.

Program directors commented on a significant change in the daily knowledge of the residents relative to the patients and an emerging "shift mentality" in the resident corps. While most program directors believed that their patients were well cared for, they noted an increasing reliance on staff physicians and ancillary professionals to maintain continuity of care.

Chief and senior residents were most vociferous in their comments, many noting that their "chief year has been ruined" by limited duty hours and that their interaction with the junior residents in the operating room has diminished. Several chief and senior residents complained of the ethical dilemma caused by limited duty hours relative to their patients and their perceived training needs. The chief and senior residents often are charged with "maintaining compliance" and bear the brunt of the additional workload caused by the limited availability of junior residents post-call. Many noted that they, themselves, were not in compliance, but that the remaining residents were. This difficulty in maintaining compliance was an issue primarily at smaller, high-volume programs. Program directors appear to be unaware of this, as nearly 90 percent believe their programs are in compliance versus less than 80 percent of residents who believe this to be true.

### Training Programs in Flux

It is clear that neurosurgical training programs are in a state of flux on the heels of the new work rules and have not yet reached equilibrium. Unfortunately for neurosurgery, the lessons learned in New York State over the past 10 years do not appear to have been taken into account by the ACGME relative to surgical training programs. In New York, junior residents report greater satisfaction than senior residents due to limited work hours, yet senior residents note a decline in the quality of their training due to limited work hours. Similar findings appeared in the current survey, with a shift of nonoperative responsibilities to the senior residents as junior residents left the hospital post-call.

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# Training Programs Need Enriched Environment

Survey Needs to Ask the Right Questions, Says Program Director

EDWARD C. BENZEL, MD

**T**he new 80-hour workweek mandated by the Accreditation Council for Graduate Medical Education last July 1 represents a significant reduction in clinical time expended by neurosurgery residents during their course of training. Previously, resident work hours commonly exceeded 110 hours per week and occasionally exceeded 120 hours per week for residents on clinical neurosurgery services.

The Council of State Neurosurgical Societies' study conducted by Richard D. Fessler, MD, and colleagues gauges the opinions of both program directors and residents regarding the new work hour restrictions. Both essentially agree that under the new mandate: the provision of appropriate continuity of patient care will be hampered; residents will not attain enough experience performing the broad spectrum of neurosurgical procedures; and the educational process will be degraded by the inability of residents to follow patients throughout their episode of care.

## Interpreting Surveys? Use Care

One must always exercise care in the interpretation of surveys. In this case, one might inquire: Does the survey ask the right questions? What truly are the questions at hand? Do we want to know whether or not the change represented by the new mandate angers us or makes us uncomfortable? Or, do we want to know whether or not there indeed were significant problems with the "old system? If the latter question is answered affirmatively, as I believe it would be, one might want to know if the "new system" represents at least a change in the right direction.

The CSNS study answered the question pertaining to how neurosurgeons feel about the workweek restrictions. It indeed angers neurosurgeons to have new rules and regulations thrust upon us; and with change there always is a period of discomfort. However, a careful, thoughtful and methodical introspective analysis might yield markedly different results. Isn't it true that residents were commonly used as agents of service for both the faculty and the hospital? Late rounds at the faculty member's convenience, scrubbing in on or performing "boring" cases of questionable educational value, and performing "scut work" that hospital employees could readily perform: Each represents an abuse of the resident and his or her status as a neurosurgical trainee.

The "old system" wasn't as educationally oriented as some would like to think it was. The "new system" possibly could be better, particularly if neurosurgeons work to modify and improve it. However the 80-hour workweek may not be long enough, and most programs should apply for the 10 percent extension. Eighty-eight hours, particularly if averaged over four weeks, should be enough time to train residents in a humane manner if the training occurs in an enriched environment.

**The "new system" possibly could be better, particularly if neurosurgeons work to modify and improve it.**

## Training in an Enriched Environment

An enriched environment requires that program directors and faculty become more involved with the process of education. Rotations and conferences must be modified. Clinics and operating times need to be scheduled, at least in large part, on the basis of their educational impact rather than on the basis of their convenience for the faculty. Senior faculty cannot and should not expect "senior resident coverage" for uncomplicated surgical procedures simply because they are "senior faculty." Cases should be distributed on the basis of their educational value to each resident and on the basis of the provision of quality patient care. The hospital must assume a greater portion of the burden of routine inpatient and outpatient ancillary care, such as blood drawing and patient transport. Some rotations perhaps could be eliminated. Smaller training programs may no longer have the luxury of rotating residents through multiple hospitals.

When the aforementioned adjustments are accomplished, a quality training program most certainly can be achieved in a workweek of 80 to 88 hours. The burden for its success, however, lies with the faculty members and the hospital in which they practice, as well as with the residents themselves. The residents must be allowed, and in fact encouraged, to actively participate in this process.

Is the new mandate totally appropriate? Residents are, indeed, sleeping less during educational conferences, reading and studying more, and demonstrating a greater knowledge base on rounds, in the clinics, in the operating rooms, and in conferences. Has their surgical and outpatient clinical experience been improved by the mandate? This depends on the commitment of the faculty and the institution to the educational process.

## Room for Improvement

There most certainly is room for improvement in both the mandate and in neurosurgery's implementation of it. I suggest that neurosurgeons strive to improve the existing mandate in a proactive manner, rather than resist, defile and defame it. If an average of 80 to 88 hours per week is enough time to acquire a good education, then the main problem with the new mandate centers on the rigid nature of the work hour limitations. Neurosurgery indeed is not shift work. Clinical neuropathological processes are not predictable. The demand they place on caregivers also is unpredictable. The ebb and flow of the workload thus is significant. In this regard, the guideline of 10 hours off duty between 24-hour shifts on duty perhaps requires modification to provide the neurosurgical resident the latitude to care for

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# Subspecialists Contemplate Their Future

The Horizon's Aglow With Promise, but Clouds Loom

**T**he specialty of neurosurgery emerged as late as 1919 with the realization that special training was required in addition to that of the general surgeon. Expanding on the same general principal and driven in large part by advances in research and technology, several neurosurgical subspecialties have emerged since that time: cerebrovascular surgery, neurotrauma and critical care, pain management, pediatric neurosurgery, surgery of the spine and peripheral nerves, and stereotactic and functional neurosurgery.

The *Bulletin* invited representatives of neurosurgery's subspecialties to provide their personal perspectives on the outlook of the neurosurgical workforce over the next 10-20 years with regard to their respective areas.

Each was asked to consider these questions:

- What changes are on the horizon regarding the scope of services offered in your subspecialty?
- Is the number of neurosurgeons being trained for your subspecialty sufficient given the scope of neurosurgical services that can be offered?
- What factors, if any, do you feel are significantly impacting (or will significantly impact) the number of neurosurgeons choosing or leaving your subspecialty?

The responses by Jaimie M. Henderson, MD, Donald Marion, MD, Andrew D. Parent, MD, Raymond Sawaya, MD, and Warren R. Selman, MD, expressed enthusiasm for the promising therapies and opportunities on the horizon, but this enthusiasm was tempered with concern about how the mounting pressures that affect all of neurosurgery are affecting their own subspecialty in particular ways.

## Cerebrovascular Surgery

Warren R. Selman, MD

**T**he dynamic nature of the field of cerebrovascular surgery is evidenced by the sustained growth experienced by the AANS/CNS Cerebrovascular Section over the past 15 years. The section currently has 591 active members, and the AANS census indicates that about 25 percent of AANS neurosurgeons list cerebrovascular surgery as their primary, secondary or tertiary subspecialty.

One of the driving forces behind the growth of cerebrovascular surgery is that stroke continues to be a major healthcare concern. It is estimated that more than 700,000 individuals will suffer a stroke each year, and stroke remains a leading cause of loss of independence in adults. As the population ages, it is estimated that the impact of stroke will be even greater in the future. Balanced against this is the development of new therapies designed to treat and prevent strokes.

These new technologies initially engendered concern that the role of neurosur-

geons in the treatment of cerebrovascular disease would be eliminated. In the article "Endovascular Treatment for Cerebral Aneurysms Will Replace Clipping," DeWitte T. Cross III, MD, stated, "It is only a matter of time before traditional vascular

**The "traditional vascular neurosurgeon" of the future will be skilled in all the techniques needed to treat the entire gamut of cerebrovascular disorders and will be viewed as anything but "quaint."**

neurosurgeons performing craniotomies and clippings of cerebral aneurysms will be as quaint and endearing as the Amish driving their horses and buggies on the interstate highways of Pennsylvania." I am reminded of Mark Twain's famous observation, "The report of my death was an exaggeration." The distinction that must be appreciated here lies in the definition of the "traditional vascular neurosurgeon." The "traditional vascular neurosurgeon" of the future will be skilled in all the techniques needed to treat the entire gamut of cerebrovascular disorders and will be viewed as anything but "quaint."

It is clear that the need for neurosurgeons with microsurgical cerebrovascular expertise will remain strong. Nonetheless, it would require an ostrich-like view to believe that new technology will not affect the scope and practice of neurosurgeons in the treatment of cerebrovascular disorders. Neurosurgeons must possess all the tools needed to treat patients with cerebrovascular disorders, or find their role marginalized in ways that few would find acceptable.

Fortunately, the trend already is clear and more neurosurgeons are acquiring endovascular skills. According to the AANS Census, the number of neurosurgeons with endovascular skills continues to grow. In several training programs, vascular access and basic endovascular skills are already part of residency training. As proficiency in both microsurgical and endovascular technique becomes second nature, the dichotomy between practitioners of each treatment will disappear. In the future, the neurosurgical cerebrovascular specialist will be identified by the disease and the patient treated, not by the technique employed.

There is no question that the allure, availability, and in some cases, the advantages of "minimally invasive" techniques affect patient flow and decision-making.

The cerebrovascular specialist of the future will be required to have all the tools available to treat all forms of cerebrovascular disease, or may be left waiting for others to decide when and if to refer a patient. With this understanding, the need for neurosurgeons who specialize in the treatment of cerebrovascular disease will remain strong, and neurosurgeons will continue to find fulfillment in treating patients with cerebrovascular disease. ■

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## Neurotrauma and Critical Care

Donald W. Marion, MD

**A**ccording to data published by the Centers for Disease Control and Prevention, 1.5 million people sustain traumatic brain injuries each year, 50,000 die from their injuries, and 80,000-90,000 experience prolonged or lifelong disability. In 2001 traumatic brain injury caused 3,000 deaths and 29,000 hospitalizations for children age 14 and younger. Brain injuries remain the leading cause of death and disability for people in the United States between the ages of 1 and 45.

But the availability of neurosurgical care for these people may be deteriorating. Today far fewer neurosurgeons are taking emergency call. Increasingly, hospitals are complaining that they have a difficult time

residents threatens to persuade neurosurgical trainees that their careers will not involve more than this amount of time each week.

These are all very difficult workforce issues which must be resolved to the satisfaction of the trauma centers, trauma surgeons, and neurosurgeons.

Some in the neurotrauma community are promoting the concept of "regional neurotrauma centers." Concentration of patients with severe traumatic brain injury at one hospital can make sense in larger communities where the covering neurosurgeons could be fellowship-trained trauma neurosurgeons who would be most equipped to provide consistent, high quality, cutting-edge care. The volume of patients cared for at such centers would allow for large clinical trials. Such centers could develop fellowship programs in neu-

surgeons must also play a greater role in the planning of regional trauma systems. They must make themselves available to sit on committees planning the development of new trauma centers and the recertification of existing trauma centers.

It is not reasonable for a neurosurgeon to be required to take call every other night, but taking some call is a part of being a good physician and good surgeon. The Trauma Section supports stipends for trauma call that are reasonable, but they should not be excessive. Finally, neurosurgeons must recognize that theirs is the specialty that is most equipped and most capable of providing high quality care to the patient with traumatic brain injury. We must not abdicate our role in treating the most important cause of trauma-related death and disability. ■

Donald W. Marion, MD, is chair of the AANS/CNS Section on Neurotrauma and Critical Care, professor and chair of Neurosurgery at the Boston University School of Medicine, and chief of Neurosurgery at the Boston Medical Center.

## A teleradiology linkage could allow a neurosurgeon to direct the rural trauma surgeon during a lifesaving cranial procedure.

obtaining neurosurgical coverage.

The underlying problems are insufficient numbers of neurosurgeons and their frequent on-call schedules combined with little or no reimbursement in return either for time on call or for the resulting lost income from their own practices. Neurosurgical practice opportunities are frequently advertised with the enticement that there will be little or no trauma call. While the AANS/CNS Section on Neurotrauma and Critical Care worked hard to develop and publish a position statement endorsing reasonable stipends for providing on-call service, it seems increasingly apparent that reimbursement for trauma care is not as important to many neurosurgeons as spending more time with family and other quality of life issues.

This is particularly a concern for the next generation of neurosurgeons. Neurosurgeons just finishing their residencies increasingly are choosing spine or other neurosurgical subspecialties that they think will reduce their on-call obligations. Further, the new 80-hour workweek restriction for

rotrauma and truly promote this subspecialty. However, there also are concerns that such regionalization would risk the potential for prolonged transport of patients with time-sensitive intracranial hematomas. Also, general trauma surgeons would likely view regional neurotrauma centers as encroaching on their livelihood.

In rural communities neurosurgeons may find it appropriate to expose select general surgeons to the basics of performing a trauma craniotomy and develop close relationships with those surgeons who live in rural communities where a neurosurgeon is unavailable. A teleradiology linkage could allow a neurosurgeon to direct the rural trauma surgeon during a lifesaving cranial procedure.

The responsibility of caring for emergent neurosurgical patients must be instilled early during neurosurgical training. The Society of Neurological Surgeons should review its curriculum requirements for training programs and attempt to ensure that residents are taught the ethical responsibilities of their profession. Neuro-

## Pediatric Neurosurgery

Andrew D. Parent, MD

**P**ediatric neurosurgery is a small subspecialty that focuses on the evaluation and surgical management of congenital and pediatric problems. The recent AANS demographic census of neurosurgical subspecialties suggests that more than 30 percent of all U.S. neurosurgeons consider pediatric neurosurgery to be one of the subspecialties that they practice. On the other hand, only 264 neurosurgeons belong to the AANS/CNS Section on Pediatric Neurosurgery, while the more formally focused American Society of Pediatric Neurosurgeons records only 175 members, of whom 114 currently practice in the United States.

Despite these small numbers, an informal survey of the employment advertisements in medical journals seeking pediatric neurosurgeons during the past year reveals that approximately 40 positions were available and that many of those positions were

in academic practices. Most of these advertisements solicited fellowship-trained pediatric neurosurgeons, but only 23 fellowship training positions currently exist in North America, and less than half of these positions were filled last year.

**Despite these strains, which have contributed to a steady attrition in the workforce, pediatric neurosurgeons continue to practice productively because they are dedicated to children's neurosurgical care.**

These estimates suggest that not enough pediatric neurosurgeons are being trained. Furthermore, during the next five years the first generation of pediatric neurosurgeons will begin to retire, causing roughly a 20 percent decrease in the pediatric neurosurgical workforce.

During the last decade, pediatric neurosurgery adopted new therapies that include endoscopic third ventriculostomies, baclofen pump insertions for spasticity, and recent advances in pediatric epilepsy surgery. Obviously, the demand for specialists trained in these techniques exceeds the number that is being trained. In the future, new therapies (such as deep brain stimulation, neuroaugmentation surgery, and, conceivably, genetically engineered procedures) might further strain our present workforce.

Other factors strain the subspecialty as well. It is unclear precisely how many pediatric neurosurgeons have altered their career paths for professional satisfaction, family or lifestyle considerations, a more financially lucrative practice in neurosurgery, or a more compatible locale. Medical liability pressures also negatively impact pediatric neurosurgeons. Depending on the state, medical liability exposure may extend from the current age of the child to 21 years plus two years to allow for discovery, and in some cases, general neurosurgeons are dropping pediatric privileges.

Despite these strains, which have contributed to a steady attrition in the workforce, pediatric neurosurgeons continue to practice productively because they are

dedicated to children's neurosurgical care. The everyday spectrum of procedures includes recurrent shunt malfunctions, spinal dysraphic defects, and pediatric neoplasms, as well as pediatric trauma that too often is the result of child abuse.

Pediatric neurosurgeons uniquely interact not only with parents but also with school systems, social workers, and pediatricians, following patients over many years. This characteristic commitment of caring for patients in the long term is especially time-intensive and almost always requires a group practice. ■

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### **Stereotactic and Functional Neurosurgery**

Jaimie M. Henderson, MD

**A**s a subspecialty, stereotactic and functional neurosurgery has experienced steady growth in recent years. The advent of image-guided surgical techniques, the resurgence of interest in surgical treatment of movement disorders, and the burgeoning applications for neuroaugmentation have

glance through the classified ads in *Neurosurgery* and the *Journal of Neurosurgery* shows that a growing number of practices are looking specifically for neurosurgeons with expertise in stereotactic and functional neurosurgery. Is neurosurgery prepared to meet the growing demand in this subspecialty area?

Although no firm figures are available, there are an estimated 10-12 programs in North America with formal, structured fellowships in stereotactic and functional neurosurgery. It appears at the present time that the supply of graduates from these programs is equal to or greater than the demand.

In most private practice settings, functional neurosurgical procedures make up a relatively small percentage of cases compared to spine or general cranial operations. In some communities, neurosurgical practices have met requests to provide services such as deep brain stimulation for Parkinson's disease by designating one of the general neurosurgeons in the practice to perform these procedures. By and large, these neurosurgeons approach the task of learning functional techniques conscientiously, and under most circumstances can probably achieve reasonable, if not optimal, outcomes. However, specific fellowship training in stereotactic and functional neurosurgery can expose surgeons to a range of difficulties and problems, allowing them to develop troubleshooting skills in a controlled, monitored environment. Although it has not been rigorously stud-

**Within 10 years, sophisticated chronic electrode systems will allow unprecedented access to many different parts of the cortex and a whole host of subcortical structures.**

led to an increase in the number of surgeons with an interest in this area. The recent meeting of the American Society for Stereotactic and Functional Neurosurgery attracted the most attendance in its history, and abstract submissions likewise increased by 50 percent. Further, a

ied, one would expect that this additional training would lead to better outcomes, especially given how dependent these outcomes are on the complexities of proper anatomical and physiological localization.

One of the key issues now being faced by stereotactic and functional neurosur-

geons is reimbursement, both for professional fees and for the equipment that is increasingly becoming an integral part of our practice. Within 10 years, sophisticated chronic electrode systems will allow unprecedented access to many different parts of the cortex and a whole host of subcortical structures. Working on the assumption that today's science fiction is tomorrow's science fact, there is no technical reason that augmentative brain implants could not become as widespread as many other types of implants are today. Great scientific strides have already been made in neural interfacing and in new targets for neurostimulation, but so far there has been little planning for the economic impact of a growing number of implantable devices. As deep brain stimulation for Parkinson's disease has become a standard treatment, hospitals and neurosurgeons are finding that reimbursement, both from the federal government and private insurers, in many cases cannot keep pace with the high cost of providing these services. Neurosurgeons need to take a proactive stance to be certain that the incredible technology now being developed in the laboratory and in initial clinical trials becomes available to the intended recipients, our patients.

In the end, workforce issues in stereotactic and functional neurosurgery will revolve around the willingness of government, insurance companies, and patients to pay for new technology, and the willingness of manufacturers to stimulate the growth of this field by keeping their devices affordable. If current trends continue, neurosurgeons and hospitals will be unable to financially support the applications of new technology, and stereotactic and functional neurosurgery will be relegated to "hobby" status for most neurosurgeons. If, on the other hand, the success of the spine surgery community can be emulated in making certain that the devices are covered by patients' insurance and the surgery is adequately reimbursed, then the growth of stereotactic and functional neurosurgery specialty could be dramatic, forcing a reevaluation of

the workforce available to deliver these services to our patients. ■

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### **Tumors and Neurosurgical Oncology**

Raymond Sawaya, MD

A vast array of oncological disorders affects the nervous system of hundreds of thousands of individuals each year in the United States. Historically, neurosurgeons were called upon to evaluate or treat most patients with a primary brain tumor, and a limited and select number of patients with a single metastatic tumor to the brain. Through improvements in training, surgical techniques, and technologies, neurosurgeons have had a greater impact on the survival and quality of life of a much wider spectrum of patients, including those with multiple brain metastasis, skull base tumors, primary and metastatic spinal and sacral tumors, peripheral nerve tumors, and cancer-related medically refractory pain disorders. To this list one must add the equally challenging number of patients whose tumor recurs or whose nervous and/or skeletal system

ogy. It is not surprising, therefore, that most neurosurgical training programs have recruited or are seeking to recruit at least one faculty member whose specialty area is oncology. In recognition of the need for trained neurosurgical oncologists, the Society of Neurological Surgeons is imminently expected to approve a document on the accreditation of neurosurgical oncology fellowship training programs.

The practice of neurosurgical oncology is one that demands technical, biological, and interpersonal skills. The disorders that require a neurosurgical oncologist's intervention consume substantial amounts of time at all levels of the physician-patient interactions and in particular in the operating room. My own estimation over one year of the average duration per case of all neurosurgical procedures in one comprehensive cancer center is 5 hours 15 minutes. To this figure one must factor in the added time required to inform and guide the patient and the family members in selecting the most suitable form of intervention or therapy, and if a clinical trial is under consideration, the time requirement is possibly doubled.

In the final analysis, a neurosurgical oncologist is a central figure among the

**The neurosurgeon is now expected to provide greater good with lesser morbidity. Such heightened levels of performance require specialized training and focused experience in neurosurgical oncology.**

suffers from the side effects of therapy and requires neurosurgical intervention or care.

Traditionally, the basic training of neurosurgical residents was sufficient to meet the needs of the population relative to the level of expectations of the time. The dramatic explosion in our understanding of cancer biology, coupled with the technological advances in imaging and in intraoperative instrumentation, has led to a shift in expectations: The neurosurgeon is now expected to provide greater good with lesser morbidity. Such heightened levels of performance require specialized training and focused experience in neurosurgical oncol-

group of individuals that comprises the modern multidisciplinary team. Without the leadership provided by such an expert, accurate diagnoses, gross total resections, adequate reconstructions, and functional recoveries would not be maximized, and the progress experienced in molecular oncology would not be matched by progress in the delivery and the outcome of the therapies. These are exciting times, and neurosurgery as a specialty is up to the task. ■

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odds that students will choose this specialty. During medical school, exposure to neurosurgery is usually very limited and typically only is available as an elective. Also, role models and mentors often are cited as important influences on specialty choice. Increasing students' exposure to the specialty during medical school as well as increasing neurosurgery's access to and active involvement with the "best and brightest" medical students likely would aid in their successful recruitment.

### Taking a Proactive Approach

Several medical entities recently have addressed the possibility of an overall physician shortage. In September the Council on Graduate Medical Education (COGME) recognized a shortage of physicians and recommended a 15 percent increase in medical school enrollment over the next 10 years. In December, the Association of American Medical Colleges announced the establishment of the Center for Workforce Studies to assess physician supply. The new center will be headed by Edward Salsberg, who authored the report on which the COGME's recommendation was based. Also in December, the American Medical Association withdrew its 15-year physician surplus position and declared a shortage of physicians in some geographic areas and in some specialties.

Clearly the lesson to be learned about the physician workforce, and specifically the neurosurgical workforce, is that there must be continual assessment and evaluation. The changing demographics of medicine require a fluid approach to attracting the most qualified students to neurosurgery.

Proactive policies such as increasing neurosurgery's involvement in medical education and in undergraduate neurosurgical curriculum development, as well as active mentoring, may be necessary to

assure that the neurosurgical workforce of the future can meet the demands of the U.S. population.

**Deborah L. Benzil, MD**, is associate director of the Department of Neurosurgery, New York Medical College in Valhalla, N.Y.

### For Further Information

2004 Survey of Physicians 50 to 65 Years Old ([www.merrihawkins.com/merrihawkins/pdf/2004\\_physician50\\_survey.pdf](http://www.merrihawkins.com/merrihawkins/pdf/2004_physician50_survey.pdf))

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### Restricted Workweek

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While it may be reasonable to adjust resident work hours, it is apparent that "one size fits all" does not meet the needs of neurosurgical training programs. Compared to other specialties, neurosurgical programs are small, but they vary widely among themselves in number of trainees and clinical volume. Major changes in training, as mandated by the ACGME, will have far-ranging effects in a small, labor-intensive specialty such as neurosurgery. It is clear that neurosurgical program directors and residents are unhappy with the initial effects on their training programs. However, in spite of what we perceive to be the current limitations imposed on neurosurgical training programs, we must continue to provide appropriate cases, teaching, and mentoring to our future neurosurgeons.

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### Training Programs

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patients in a "real life" environment in which the normal and natural ebb and flow of work occurs.

It is only with these minor modifications of the existing mandate in place that neurosurgery residents truly will learn the craft of neurosurgery in an enriched and humane environment and accomplish more within a restricted timeframe than in days gone by. Then, and only then, the characteristics that both the specialty and society want to see in a neurosurgeon—knowledge, skill, professionalism, responsibility, and an unflagging commitment to the patient—will not be lost. ■

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# TIMELINE: Neurosurgery Through History

## The Neurological Workforce

There are too many neurosurgeons.  
There are too few neurosurgeons.

Most neurosurgeons have seen the supply-demand debate swing back and forth. More than 20 years ago a chief resident boasted to me that he had secured “the last job in New Jersey.” (He was wrong.) The American answer to the “right number” question has been to let the marketplace decide, aided by occasional tweaking of the number of trainees. Most of us probably agree that this approach has served the public and our profession quite well.

Other models of managing the neurosurgical workforce have existed for a long time, however. The transition to peacetime after World War II left the United Kingdom with a five-fold increase in the number of neurosurgical beds for civilians. No longer needed for military casualties, these beds were filled rapidly by patients with civilian

head injuries and a variety of other diagnoses, mainly brain tumors. At the same time there was a great shortage of properly trained neurosurgeons to meet the need for patient care, let alone to handle such new surgical indications as might be developed (or to participate in their development).

In 1947 the Society of British Neurological Surgeons Planning Committee published “Notes on the Neurosurgical Needs of the Population and the Training of the Neurosurgeon.” In the context of a centrally regulated health system, the committee laid out a plan for the education of medical students and neurosurgical trainees and for a rational expansion of regional centers and sub-centers where tertiary neurosurgical care should be rendered.

Our British colleagues of a half-century ago were not merely addressing bureaucratic niceties. They were aware that the rigors of our profession could eventually deter trainees, and they emphasized the importance of maintaining adequate levels of compensation. As we continue to recruit and train new generations of neurosurgeons, let us heed their concluding words: “It would have been a mistake to pretend that we offered an easy and sheltered life, to invite the unwary, if such there be, to enjoy the pleasures of our life. Better to state frankly the difficulties of our tasks and to rely on the challenge being replied to by the right men.”

**The “right”  
number ... Let  
the marketplace  
decide?**

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# Neurosurgeons On Call

## *What to Do When a Reporter Is on the Line*

**HEATHER L. MONROE**

*It is 10 a.m. Between patients you duck into your office to catch up on paperwork. The phone rings; a reporter is on the line. What do you do?*

**A** North Dakota neurosurgeon learned a difficult and costly lesson when a reporter for his hometown paper called him about a medical liability suit that had been settled, and he decided not to participate in the interview. He told *American Medical News* in a recent article ([www.ama-assn.org/amednews/2003/11/10/prca1110.htm](http://www.ama-assn.org/amednews/2003/11/10/prca1110.htm)) that at the time he thought he couldn't talk about the case because it had been sealed. In May 1999 *The Bismarck Tribune* ran a nearly 1,900-word, front-page article about the case and the neurosurgeon—an article that did not include the doctor's perspective on the events. The doctor sued the newspaper for defamation and emotional suffering, and, nearly four years later, the paper printed an apology and clarification.

The concluding observations of the doctor and the reporter speak volumes: "If a reporter calls, talk," the doctor told *American Medical News*. "I wish I would have asked: 'Are you going to write a story?'" The reporter said, "I wish he had been willing to say all the things he has said since. It would have been a better story if he had said all of those things then."

### **What Would You Do?**

Back to our scenario. A reporter calls. What do you do? If saying "no comment at this time" or ignoring the call occurs to you, go back to paragraph one. Remember: The reporter most likely will write the story, with or without your assistance.

### **Prepare for the Interview**

Talk to the reporter briefly to find out the reason for the call. Ask the reporter to describe the story idea and the audience for the publication, as well as what the reporter's deadline is. Next tell the reporter that you are very interested in working with him or her on the story, ask for a contact number, and say that you will call back in 15 minutes.

Those 15 minutes will set the stage for an interview in which you work hand-in-hand with the reporter to control the content and direction of the story.

First, decide upon three or four points that you want to drive home in the article. If the story is about a neurosurgical procedure and the audience is the general public, you may want to emphasize the causes of the disorder (if known), treatment options, the role of a neurosurgeon in treating it (board certification, expertise, etc.), and finally, what the patient can expect during recovery.

Write down these main points and turn the conversation toward



them during the interview. Work with the reporter, but keep in mind that the information is yours to give. You are not required to answer every question the reporter asks. In addition, your schedule may not permit a lengthy discussion (which may or may not be the expectation of the reporter). Politely inform the reporter of your estimated time frame for completing the inter-

view and work with the reporter to keep on track. The reporter most likely will thank you for your time and will be pleased to have a knowledgeable resource for the story. Keeping these few guidelines in mind when returning the reporter's call will help ensure a successful interview.

### **Resources for AANS Members**

Members of the American Association of Neurological Surgeons (AANS), have support for their media relations efforts. If you receive a call from a reporter, but you are not comfortable with the topic (for example, the reporter asks for comment on AANS policy, or on a procedure that you do not perform in your practice), the call should be referred to the director of communications at the AANS Executive Office. The call then will be directed to the appropriate neurosurgeon spokesperson.

Those interested in honing their media relations skills can take advantage of opportunities at the upcoming 2004 AANS Annual Meeting, May 1-6 in Orlando, Fla.

- AANS Media Training Breakfast Seminar: 7:30-9:30 a.m. on Monday, May 3.
- AANS Hometown Radio Interviews: Offered in 10-minute interview time slots 9 a.m.-5 p.m. on Monday, May 3, and Tuesday, May 4.
- First Annual Neurosurgical Media Awards Program: 1-3 p.m., Tuesday, May 4. The program honors journalists for excellence in neurosurgical reporting, and AANS members can participate in a question and answer session geared toward learning more about working with the reporters to produce a positive outcome for both the writer and interviewee.

In addition, the AANS Spokesperson Policy, available at [www.AANS.org](http://www.AANS.org), outlines the appropriate response to media calls. ■

**Heather L. Monroe** is the AANS director of communications. She can be reached for further information regarding media relations at (847) 378-0517 or [hlm@AANS.org](mailto:hlm@AANS.org).

# CPT 2004

## *Coding Changes for Neurosurgery*

In 2003 several new Current Procedural Terminology (CPT) codes pertinent to the neurosurgeon's practice were developed and valued, and existing codes in several subspecialty areas were revised.

The AANS/CNS Coding and Reimbursement Committee and its members were involved in this process: Jeffrey W. Cozzens, MD, spearheaded a major expansion of epilepsy codes; R. Patrick Jacob, MD, led development of a set of arthrodesis and decompression procedures for spine surgery performed through a lateral extracavitary approach; and Robert E. Florin, MD, guided code revisions that reflect the continued evolution of techniques for deep brain stimulation and acknowledge the separate, additional work of microelectrode recording. In addition, several minor codes were developed or revised in the areas of shunting, pain management, and nerve injections.

A discussion of these CPT changes for 2004 follows.

### **Additional Epilepsy Procedures**

A series of CPT codes describing a variety of procedures for localizing and treating epilepsy has been available for years. However, technical improvements with more selective identification of epileptogenic foci have necessitated seven new or revised CPT descriptors to capture the variety of additional procedures.

Former codes for temporal lobectomy (61538) and non-temporal lobectomy (61539) using intraoperative electrocorticography were complemented with separate new codes for temporal lobectomy (61537) and non-temporal lobectomy (61540) without intraoperative electrocorticography. Additional techniques, including selective amygdalohippocampectomy (61566) and multiple subpial transections (61567) with intraoperative electrocorticography, were added to the

coding nomenclature. Finally, an editorial change in the hemispherectomy code (61543) added the term "functional" to the CPT descriptor.

### **Spine Surgery: Lateral Extracavitary**

Although less commonly performed than anterolateral and posterior approaches, the lateral extracavitary approach is an important technique in a spine surgeon's armamentarium. However, the approach classifications available in CPT were limited to anterior and posterior approaches alone. In order to parallel the arthrodesis and decompression codes using these more common approaches, a series of six codes was developed to describe similar procedures using the lateral extracavitary approach.

An interbody arthrodesis performed in the thoracic spine (22532) or lumbar spine (22533) includes the minimal discectomy needed for the arthrodesis, whereas each additional level is coded 22534. Similarly, a decompression involving a partial or complete vertebrectomy is described in the thoracic spine (63101) and lumbar spine (63102), with each additional level coded as 63103.

If both arthrodesis and decompression codes are performed in the same operative setting, the lesser valued arthrodesis codes would be subject to the multiple procedural rule and thus would be appended with the -51 modifier.

### **DBS: Microelectrode Recording**

Several years ago, codes were developed for implantation of neurostimulator electrodes in cortical or subcortical sites, including the thalamus, globus pallidus, subthalamic nucleus, periventricular regions, and the periaqueductal gray. In order to improve stimulation efficacy in subcortical loca-

tions, some neurosurgeons have incorporated the technique of microelectrode recording to facilitate more precise targeting of neurostimulator electrodes.

Placement of the first electrode (61863) and additional electrodes (61864) in a subcortical site without intraoperative microelectrode recording is differentiated from the initial (61867) and additional (61868) neurostimulator electrode placement in a subcortical site with intraoperative microelectrode recording.

In prior years the Centers for Medicare and Medicaid Services valued codes for the procedure without microelectrode recording, which was to be reported separately using codes 95961 and 95962 when performed by the operating surgeon. For 2004, codes 61867 and 61868 include the neurophysiological monitoring, and the functional mapping codes should not be billed additionally by the operating surgeon. However, a neurologist additionally participating in neurophysiological monitoring may report these time-based codes.

As previously utilized, these codes would be paired with the placement of a cranial neurostimulator pulse generator with a single array (61885) or multiple array connections (61886).

### **Miscellaneous Changes**

Although a spinal cord syrinx commonly is shunted into a variety of locations, coding nomenclature has specified the subarachnoid space and peritoneal cavity, but not the thoracic cavity. An editorial change to the code describing peritoneal placement (63173) now allows for pleural placement as well.

Also, coding for refilling implantable pumps excluded consideration of physician work, but a physician may be required to inject pumps with intrathecal or intraventricular drugs. To accommodate this situation, a companion code was developed that specifies refilling performed by a physician (95991).

Finally, a code for catheter placement to

*Continued on page 23*



# Medicare Reform Legislation Enacted

*New Law Includes Much More Than a Prescription Drug Benefit*

**T**he Medicare Prescription Drug, Improvement and Modernization Act of 2003 is not only the largest expansion of the Medicare program since its creation, but it also contains provisions that will have a significant impact on neurosurgeons and other providers. The \$395 billion law contains a temporary increase to the conversion factor used to set reimbursement under the Physician Fee Schedule, a moratorium on physician ownership of specialty hospitals, bonuses to physicians providing services in rural areas, changes in the reimbursement of physician administered outpatient drugs, health savings accounts, grants and safe harbors to encourage electronic prescribing, and regulatory relief for physicians.

The bill passed both the House of Representatives and Senate in dramatic fashion. On Nov. 23 the House voting started at 3 a.m. and, after the longest roll call vote in history, a flood of phone calls from President Bush from Air Force One, hard lobbying and negotiating by Republican leaders and a flurry of last-minute vote changes, the bill passed 220 to 215. In the Senate, the bill had to survive three separate votes and squeaked through by a margin of 54 to 44 on Nov. 25. President Bush signed the bill into law on Monday, Dec. 8.

The primary focus of the law is the addition of a prescription drug benefit to the Medicare program. The optional program will be offered and managed by private insurers under contract with the Centers for Medicare and Medicaid Services (CMS). While estimates and models have been developed, no similar programs exist and private insurers have the ability to vary programs. Many lawmakers also have vowed to make significant changes to the bill before it goes fully into effect in 2006.

**This is a temporary victory because the 1.5 percent increase will have to be paid back, with interest, over the following years.**

"Medicine has changed, but Medicare has not—until today," President George W. Bush said while signing the bill into law. "Drug coverage under Medicare will allow seniors to replace more expensive surgeries and hospitalizations with less expensive prescription medicine."

## Physicians Receive Temporary Increase in Medicare Reimbursement

Before the bill was signed, the CMS had announced an across-the-board 4.5 percent decrease in physicians' Medicare reimbursement for 2004. The new law halts the 4.5 percent decrease and replaces it with a 1.5 percent increase for both 2004 and 2005. Neurosurgeons saw this increase beginning Jan. 1. However, this is a temporary victory because the 1.5 percent increase will have to be paid back, with interest, over the following years. This likely will lead to negative updates for 2006 to 2010 and, while updates will be positive for 2010 to 2013, they still will be significantly less than the 2003 level. The AANS/CNS Washington Office estimates that the conversion factor will be \$36.70 in 2004, up from \$36.16 in 2003, and will rise to \$37.30 in 2005.

The AANS/CNS Washington Office has received assurances from Republican leadership, including Senate Majority Leader Bill Frist, that the entire method for determining the conversion factor will be evaluated by Congress over the next two years and action will be taken before the negative impact of the Medicare bill is felt. In essence, the two years of positive updates to the Physician Fee Schedule may buy enough time for Congress to fix the com-

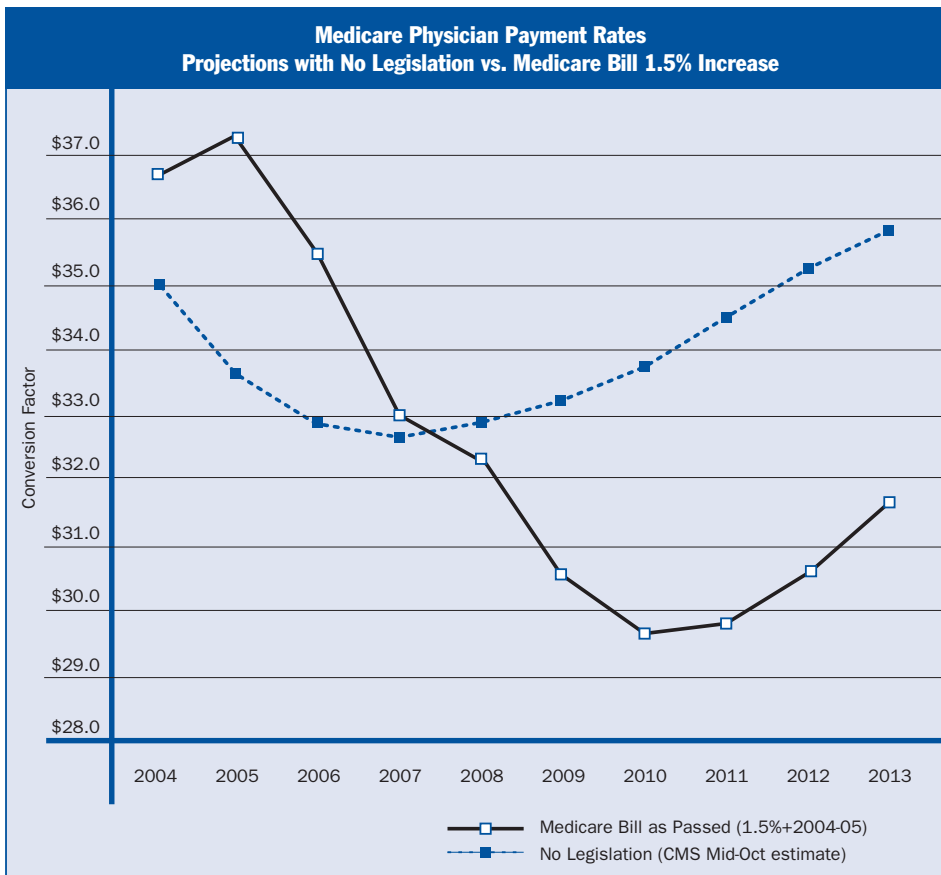
plicated formula used by the CMS to determine physician reimbursement. Without a fix to the formula or other Congressional action, neurosurgeons will see significant decreases in fees after 2006 and actually will be in a worse position than if the Medicare bill had not included the 1.5 percent increase. Estimates provided by the CMS in mid-October demonstrate that fees will plummet over the next five years, settling at \$29.70 in 2010 and slowly rising back to \$31.70 in 2013 (see graph).

## Other Provisions

Additional provision of the Medicare legislation may affect neurosurgeons.

**Rural Bonus Payments** While the law provides numerous incentives and subsidies to rural areas, one element that may benefit neurosurgeons is a straight bonus of 5 percent to 15 percent for services provided in a designated rural area. This includes services provided at weekly or monthly clinics and does not require the physician to permanently locate to a rural area.

**Specialty Hospital Moratorium** The new law also contains an 18-month moratorium on the physician ownership of specialty hospitals during which time the Medicare Payment Advisory Commission will conduct a study on the costs of providing services in these hospitals to determine if the current payment system should be refined. The moratorium does not affect existing physician-owned hospitals or those under construction. While the moratorium is not welcome news to neurosurgeons considering investing in surgical or spine hospitals, the moratorium is considered somewhat of



a victory as the Senate version of the bill provided for immediate and final elimination of the Stark exception. After MedPAC completes its study, neurosurgeons who currently have an investment in a specialty hospital, or who are considering such an investment, will have a better idea of any changes in the Stark exception and the reimbursement rates for these hospitals.

**Health Savings Accounts** The bill adds a new tool for patients interested in saving for future medical expenses. Health savings accounts will allow Americans to put away pretax dollars for future medical expenses, and unlike current medical savings accounts, funds will roll over each year and will be permitted to earn interest. Future withdrawals also will be tax-free. The Internal Revenue Service has stated the new health savings accounts will likely act like an individual retirement account, but additional analysis needs to be done to determine exactly how these accounts will

be treated under the tax code. It is anticipated that HSAs will allow patients to better manage their healthcare expenditures and will provide them with greater flexibility in seeking medical care from the physician of their choice.

**Electronic Prescribing** At one point lawmakers seriously considered mandating that physicians utilize electronic prescribing to remain in the Medicare program. This

would have represented an enormously expensive unfunded mandate, similar to the Health Insurance Portability and Accountability Act, requiring physicians to purchase new computer software and hardware in order to comply. However, the final law makes electronic prescribing voluntary for physicians. It also includes a number of grants to help physicians purchase the necessary equipment for electronic prescribing.

**Regulatory Relief** The new law also provides a number of reforms to streamline Medicare regulations and set clearer guidelines for physicians undergoing Medicare payment audits or appeals. The law allows for faster resolution of payment problems, additional provider education, minor modifications to claims without risk, and repayment of overpayments over time. It also limits audit triggers and the use of extrapolation. In addition, the legislation created the Technical Advisory Group to review Emergency Medical Treatment and Labor Act regulations and advise the Health and Human Services secretary accordingly. It additionally would allow treating physicians to determine whether EMTALA-related Medicare services are “reasonable and necessary” based on the information available at the time the care was provided. Finally, the bill addresses various issues related to Evaluation and Management Documentation Guidelines, requiring pilot testing of new E&M guidelines before implementation. ■

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infuse anesthetic agents to the lumbar plexus (64449) was added to complement 64448 for femoral nerve infusions. Two codes for neurolysis of the celiac plexus (64680) and superior hypogastric plexus (64681) also were added.

CPT coding must be refined constantly to account for changes in techniques as well as technology. The AANS/CNS Coding and Reimbursement Committee remains

committed to contemporizing the nomenclature of CPT with the current practice of neurosurgery. ■

**Gregory J. Przybylski, MD**, is professor and director of neurosurgery at JFK Medical Center in Edison, N.J. He is a member of the AANS/CNS Coding and Reimbursement Committee and he is on the faculty for AANS coding and reimbursement courses. He is also council director of socioeconomic affairs for the North American Spine Society and program chair of its coding update courses.

# Liability Crisis Dominates Discussion

## *Plenary Session Tackles Neurosurgical Workforce, Education, and More*

**T**he Council of State Neurosurgical Societies (CSNS) held its semiannual plenary session in Denver in conjunction with the annual meeting of the Congress of Neurological Surgeons (CNS). The well-attended sessions were dominated by concerns about the escalating medical liability crisis. States that were not perceived to have a problem two years ago now have seen doubling of professional liability insurance rates, liability insurance carriers leaving their states, and neurosurgeons receiving notification that they will no longer be able to receive liability coverage. The general impression is that there now is no such thing as a state which is *not* at risk.

In response, neurosurgeons are relocating to areas where liability insurance is affordable and the litigation climate is tolerable. Missouri, for example, reported that last year 15 percent of its neurosurgeons either chose not to practice any longer or moved to another state. With a steep rise in premiums again this year, it is anticipated that another 20 percent may leave the state. The high rates of relocation in Missouri are related to the fact that many of the neurosurgeons on the Missouri side of Kansas City are moving their practices to the Kansas side of the city where the liability insurance rates are considerably lower.

Another response to the medical liability crisis is that, in increasing numbers, neurosurgeons are limiting their practices to non-pediatric spine procedures. During the quadrant sessions a number of delegates offered anecdotal instances of a patient either becoming comatose or dying because of an intracranial emergency in a hospital where neurosurgeons were on call, but had given up their intracranial privileges. By the time air transport had

been arranged, the patients had deteriorated beyond saving. In contrast, neurosurgeons reported instances in which they were able to save as much as \$100,000 per year in liability premiums by relinquishing their intracranial privileges. In one instance, a neurosurgeon was told by his carrier that he could continue his liability coverage only if he revoked his intracranial privileges and limited his practice to spinal procedures.

### **Plenary Session Sparks Lively Discussion**

During the plenary session, seven resolutions were presented. The deliberations are summarized below, and additional information is available at [www.neurosurgery.org/csns](http://www.neurosurgery.org/csns).

**Resolutions I and II** called for the formation of an ad hoc committee to develop guidelines as to which neurosurgical procedures might be appropriate for Allied Health Professionals to perform. Andrea Strayer, CNRN, representing the American Academy of Neuroscience Nurses, testified that currently no guidelines exist and that hospital medical staff often struggles with what procedures a physician's assistants or neurosurgical nurse specialists should be allowed to perform. She felt that guidelines developed by neurosurgery's national organizations would provide the medical staff with the necessary direction.

The resolutions further suggested that the committee examine the workforce of neurosurgical physician assistants and nurse practitioners and consider creating guidelines for the development of new training programs in academic centers for PAs and NPs who might be interested in specializing in the neurosciences. These two resolutions were referred to an ad hoc committee chaired by Mick Perez-Cruet, MD, who will report back to the CSNS at

the spring plenary session.

**Resolution III**, submitted by the California Association of Neurological Surgeons, addressed the planned requirements by the American Board of Neurological Surgery (ABNS) for continuing medical education: every two years, 100 hours of category 1 CME credit approved by the Accreditation Council of Continuing Medical Education, with 40 hours being "neurosurgical CME." The resolution pointed out that attending meetings of the North American Spine Society, the American Epilepsy Society, the American College of Surgeons, and others, should count toward continuing education in neurosurgery. The resolution implored the ABNS to do away with the requirement for 40 hours of "neurosurgical CME" and requested that all category 1 CME be recognized as part of the requirement for 100 hours every two years.

The decision was made to refer to this matter to committee. David Jimenez, MD, was asked to bring this resolution to the attention of the ABNS and to report back to the CSNS at the spring plenary session.

**Resolution IV** also was offered by the California Association of Neurological Surgeons. It pointed out that the recently adopted CNS bylaws change in Article V, Meetings and Elections, requires eligible candidates for office to have served for at least three years on the CNS Executive Committee. The resolution also addressed the issue that under the current structure, the CNS Nominating Committee is appointed by the Executive Committee rather than elected by the members, thus bypassing input by the membership. Further, the resolution asserted that this bylaws change was adopted by an e-mail vote, with the e-mail ballot failing to reach a large percentage of the membership.

More time was spent in debating this

resolution than any of the others. The CNS leadership testified that their in-house attorney had counseled that, under CNS bylaws, an e-mail ballot was acceptable. Furthermore, when bylaws changes are voted upon at the annual CNS business meeting, typically only 40 to 50 members are present, compared with the more than 500 votes received by e-mail on the recent bylaws change. The CNS leadership stated that they were committed to pursuing change to an electronic format for the benefit of their membership, but would take steps to be more inclusive of the membership in the future.

The CSNS felt that an electronic ballot needed to provide an opportunity for debate, as well as adequate time for the membership to evaluate the issues before the close of the voting. The CSNS also requested that regional members-at-large be elected to the CNS Executive Committee and that the CNS Nominating Committee be elected by the CNS membership rather than appointed by the Executive Committee.

**Resolution V** called for the AANS and CNS to publish a list of neurosurgeons who had been sanctioned for breaching the rules of the organizations. Testimony was given that in New York State, plaintiff's attorneys are not required to name expert witnesses in advance of the trial and that often times, sanctioned neurosurgeons may give testimony in court without the court being apprised of the relevant history of that "expert." The decision was made to defer the resolution to the Medicolegal Committee to see if it might be permissible for the AANS and CNS to publish such a list on a password-protected Web site that is accessible by the membership.

**Resolution VI**, submitted by the CSNS Workforce Committee, proposed the development of a peer-reviewed journal dedicated to socioeconomic issues affecting neurosurgeons. It was noted that the *Journal of Neurosurgery* and *Neurosurgery* are scientific journals and have not been interested in publishing articles on economic issues in the past. This resolution

was referred to the Workforce Committee with a report on the cost and feasibility of such a journal to be given at the spring plenary session.

**Resolution VII** called for the CSNS to ask the ABNS to conduct a study to evaluate the impact of the proposed Maintenance of Competence program on practicing neurosurgeons. David Jimenez, MD, who would be representing the CSNS at the ABNS meeting, stated that he would bring the issue to the attention of the ABNS and report on the outcome at the spring plenary session.

#### **2004 NLDC Planned in Washington, D.C.**

Fernando Diaz, MD, reported that plans for the next Neurosurgical Leadership Development Conference, which will be held in

Washington, D.C., July 18-20, are well underway. The purpose of the NLDC is to train individual neurosurgeons on how to be effective grassroots leaders so they can develop relationships with their members of Congress and become effective lobbyists for neurosurgery.

Each state society has been asked to send a minimum of three delegates. Lobbying for medical liability reform will likely be at the forefront, given that the conference is planned to take place two weeks before the Democratic National Convention. It is hoped that all of you will make plans to attend and to use the conference as an opportunity to visit with your legislators to express your concerns. ■

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**Frederick Boop, MD**, is chair of the Council of State Neurosurgical Societies.

For advertising information, see the Bulletin's rate card at <http://www.aans.org/bulletin/bulletinratecard.pdf>, or contact Holly Baker, [hbaker@ascendmedia.com](mailto:hbaker@ascendmedia.com), 913.344.1392.



# RVUs and Practice Profitability

## *Relative Value Units of Value as a Management Tool*

**R**elative value units (RVUs) have steadily become the mechanism that determines procedure code payment levels. Third party insurers, including Medicare, have used RVUs to decrease fees over the past 10 years. However, practice managers can use RVUs to make improvements in expense control, contract negotiation, fee setting, physician productivity and compensation, and benchmarking, thereby increasing practice profitability.

This article will focus on a practice's expense control and fee setting, but first, a brief review of RVUs.

### What are RVUs?

RVUs are part of the Medicare Resource Based Relative Value System. Medicare first used this system in 1992 to establish its fee schedule. Each Current Procedural Terminology (CPT) code is based on a relative value that consists of three components: physician work effort, practice expense, and malpractice insurance expense. All of the components are multiplied by geographic practice cost indicators to develop a final value. Once a final RVU figure is developed, it is multiplied by conversion factor to establish the fee. The Medicare conversion factor for 2003 is \$36.7856. The table showing the calculation for code 63030 is available at [www.AANS.org/bulletin](http://www.AANS.org/bulletin).

It should be noted that RVUs change over time. For example, office visit code 99213 initially was established at 1.0 RVUs and is now at 1.40, a positive change from a practice's standpoint. However, there has been a decrease in value for surgical codes. The change of values over time is one of the weaknesses of the RVU system. However, because this system is being used by an increasing number of payers, it is good business practice to learn to use RVUs to advantage.

### Use RVUs to make improvements in expense control, more.

#### RVUs as a Management Tool

Charges vary dramatically by neurosurgical practice within a city, let alone across a state or country. A practice's charges frequently are established without a direct correlation to cost or physical effort. Cash payments by practice vary by payer mix and the great differences in payment rates for each payer. Thus, the strength of RVUs as a management tool lies in the national-ly based numbers.

To utilize RVUs as a management tool, it is necessary to calculate how many RVUs have been performed over a period of time (a year, for example). First, the volume is needed by physician for each CPT code. This information usually can be obtained from the practice's management system. Next, all the CPT RVU values need to be obtained from Medicare. Fortunately, Medicare provides the values already formatted in a Microsoft Excel worksheet available at [www.cms.gov](http://www.cms.gov). The sum of RVUs for each physician will equal the RVU total for the practice.

This total is key to determining additional information. Total practice expenses can be divided by total RVUs to develop the cost per RVU. Then the cost per RVU can be compared with costs of previous years, showing whether or not the cost is stable, increasing or decreasing, and why.

This simple "apple to apple" measurement is one of the most effective ways to determine management control of expenses. This cost per RVU analysis is a much superior tool to the "normal" tools used in the healthcare industry, such as comparing overhead expenses to cash, or expenses to office visit and surgical volume charges. The latter tools do not take into account the changes in payment rates from year to year

or the complexity of services provided.

With cost per RVU in hand, cost for each procedure easily can be developed by multiplying the cost per RVU by the number of RVUs for each procedure. Then it is a simple matter to multiply the cost-per-procedure by a set factor to develop a price or a fee for all procedures.

Using cost is how most other industries set prices, rather than using a multiple of Medicare fees, which is a common methodology in healthcare. Note also that the cost per procedure is now the breakeven point. It can be further defined into fixed- or variable-cost detail. All of this information is useful for insurance contract negotiation.

#### RVUs as Benchmarking Data

Development of a national cost per RVU to use as a benchmark would be helpful information to neurosurgical practices. Unfortunately, there is no statically valid information on neurosurgical costs per RVUs at the present time.

Development of benchmark information for use by neurosurgical practices is one of the primary goals of NERVES, Neurosurgery Executives Resource Value & Education Society. In order to develop RVU benchmark information, all neurosurgical practices need to be included in the NERVES database.

A presentation on RVUs and their use as management tools will be held at the next NERVES meeting in Orlando, Fla. on April 29 and 30. ■

**Nick Green**, [nickg@unsg.com](mailto:nickg@unsg.com) or (248) 784-3730, is practice administrator at University NeuroSurgical Associates, P.C., in Southfield, Mich., and northeast regional director of NERVES, [www.nervesadmin.com](http://www.nervesadmin.com).

# AANS Annual Meeting Advances

*Thursday's Socioeconomic Session a Fitting Finale*

MANDA J. SEAVER

**T**he theme "Advancing Patient Care Through Technology and Creativity" defines the 72nd Annual Meeting of the American Association of Neurological Surgeons (AANS), to be staged May 1-6 in Orlando, Fla.

"Technology leads the way to better diagnoses and treatments for our patients," stated AANS President A. John Popp, MD. "At the same time it challenges neurosurgeons, at times to the limits of their expertise and creativity, to employ the increasing array of diagnostic tools and therapies in patients' best interest. This meeting celebrates the science and technology at the heart of our profession as well as the individuals whose innovative minds create the art of our profession."

The meeting's comprehensive scientific program features four plenary sessions, six scientific sessions, nine section sessions, 80 breakfast seminars, 43 practical clinics, 137 oral papers, and more than 500 posters.

In addition to previously announced Cushing Orator Ken Burns, a deft hand at creatively combining social science and art in his documentary films, five special lecturers highlight the meeting with their experience and perspective. Among them, it was just announced, is leading health economics and policy authority Uwe Reinhardt, PhD, who will deliver the Rhoton Family Lecture during the fourth plenary session—new this year—which will focus exclusively on socioeconomic issues.

## **Rhoton Family Lecture—Thursday, May 6**

Uwe Reinhardt, PhD, is James Madison Professor of Political Economy and professor of Economics and Public Affairs at the Woodrow Wilson School of Public and International Affairs at Princeton University where he has taught since 1968. He received the Bachelor of Commerce degree from the University of Saskatchewan, Canada, in 1964 and earned a doctoral degree in economics from Yale University in 1970.

## **Hunt-Wilson Lecture—Wednesday, May 5**

Pasko Rakic, MD, PhD, is professor of Neurobiology and Neurology at Yale University School of Medicine, where he is chair of the Department of Neurobiology. At Yale his research objective has been to understand the cellular events and molecular mechanisms that govern development of the mammalian central nervous system. Dr. Rakic received his medical and doctoral degrees from the



Orlando/Orange County Convention & Visitors Bureau, Inc.

University of Belgrade in the former Yugoslavia.

## **Theodore Kurze Lecture—Wednesday, May 5**

Robert F. Spetzler, MD, has served as the director of the Barrow Neurological Institute in Phoenix, Ariz., since 1985. His contributions to neurosurgery have included innovative surgical approaches for skull-base surgery. Dr. Spetzler received his medical degree in 1971 from Northwestern University and completed his residency at the University of California at San Francisco in 1977.

## **Van Wagenen Lecture—Tuesday, May 4**

Anders Bjorklund, MD, PhD, professor and section chief of Wallenberg Neuroscience Center at Lund University in Sweden, focuses his research on the development of new therapeutic approaches in Parkinson's disease based on neurorestorative and neuroprotective strategies. He is former president of the European Neuroscience Association, and he has been a member of the Royal Swedish Academy of Sciences since 1989.

## **Richard C. Schneider Lecture—Monday, May 3**

Regis W. Haid Jr., MD, PhD, a neurosurgeon with Atlanta Brain & Spine Care, specializes in the management of spinal disorders. Dr. Haid is the chair of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves. He completed much of his medical training and residency at West Virginia University. ■

Manda J. Seaver is staff editor of the *Bulletin*.

## **"Official" Annual Meeting Hotels**

Annual Meeting registrants who book their rooms at one of the official AANS Annual Meeting hotels through the housing bureau enjoy the advantages of staying in hotels that are closest to the convention center, offer a variety of rates and a high level of service. Official hotels also are either within walking distance or have shuttles available to the convention center. Registrants staying at official hotels help the AANS meet its contractual commitment for filling a minimum number of rooms, thus avoiding significant financial penalties and future difficulty obtaining sufficient meeting space.

The advance registration deadline is April 2. Updated meeting and registration information are available at [www.AANS.org/annual](http://www.AANS.org/annual).

# NEWS.ORG

AANS/CNS Sections Committees Associations Societies

## Neurosurgical Focus Calls for Papers

*Neurosurgical Focus*, the peer-reviewed, online journal of the American Association of Neurological Surgeons (AANS), is accepting papers on the following topics:

- Neuroendocrinology, submission deadline, Feb. 15; publication, April 2004.
- Brachial Plexus, submission deadline, March 15; publication, May 2004.
- Cauda Equina Syndrome, submission deadline, April 15; publication, June 2004.

Instructions for contributors are available at [www.AANS.org/education/journal](http://www.AANS.org/education/journal).

## AANS Appointment of Associate Executive Director Emphasizes Education

The American Association of Neurological Surgeons (AANS) underlined its commitment to education with the appointment of Joni Shulman, associate executive director-education, to the executive management team. "Education is the core product of every medical association," said Thomas A. Marshall, AANS executive director, in a statement announcing the move. "Our tremendous growth in the development, delivery, and financial stability of the AANS educational product mix has been a major part of the association's resurgence over the past several years." Shulman assumed her new role Jan. 14. She is charged with directing all the functions, activities, and staff of the Education and Practice Management Department, as well as assuring that all AANS educational programs, meetings, and activities are closely coordinated with the Meetings Department. Rounding out the AANS executive management team are Susan M. Eget, associate executive director-governance, and Ronald W. Engelbreit, CPA, deputy executive director.

## AANS Retains Right to Representation in AMA House of Delegates

The American Association of Neurological Surgeons (AANS) recently successfully completed the American Medical Association's Five-Year Review, required of specialty societies to maintain representation in the AMA's House of Delegates. Through this review process the AANS demonstrated that it bases membership on medical credentials and does not discriminate on the basis of race, religion, national origin, sex or handicap; that it represents a field of medicine with recognized scientific validity; and that physicians comprise the majority of voting members. The AANS' annual meeting, educational courses, the Van Wagenen Fellowship, oral board reviews, HIPAA Resource Center, Neurosurgical Research and Education Foundation, *Neurosurgical Focus*, and the practical clinic, "Innovations in Spinal Fixation," were among the evidence showing the AANS' activity in the field of medicine. The AMA compared its membership list with that of the AANS and reported that 47 percent of the AANS' members in the "Active" membership category also are AMA members. AMA membership is approximately

250,000 members, "down 3.8 percent from the previous year and [continuing] a downward trend that has plagued the association for nearly two decades," according to *American Medical News*.

## Free CME Opportunities Offered at 2004 AANS Annual Meeting

The American Association of Neurological Surgeons (AANS) seeks dedicated individuals to participate in the Marshals Program during the 2004 AANS Annual Meeting, May 1-6, in Orlando. The program offers complimentary registration for individuals—particularly residents, fellows and international attendees—who are willing to collect tickets, complete evaluation forms, and assist speakers as needed at every practical clinic and breakfast seminar at the Annual Meeting. To participate in the program, every marshal must be registered for the Annual Meeting. In addition to receiving complimentary participation in practical clinics and breakfast seminars, the Marshals Program benefits residents and international attendees by allowing them to network early on in their careers with many neurosurgeons involved in organized neurosurgical meetings. Additional information is available from Jennifer Phillips, AANS meetings coordinator, at [jlp@AANS.org](mailto:jlp@AANS.org).

## AANS Launches Media Awards Program

Journalists in the United States and Canada who have produced written materials or broadcasts aimed at helping the general public better understand neurosurgery or a neurosurgical procedure are eligible for nomination to the 2004 AANS Media Awards Program. Sample topics include stories on back pain, brain tumors, epilepsy, carpal tunnel syndrome, Parkinson's disease, or stories outlining the neurosurgical specialty. Nominations are accepted from journalists, AANS members or staff, and members of the public who have benefited from neurosurgical information within a story. Winners will be honored on May 4 during the 2004 AANS Annual Meeting at an awards ceremony geared toward helping AANS members learn more about working with the reporters to produce a positive outcome for both the writer and interviewee. A detailed brochure that includes a nomination form is available at [www.NeurosurgeryToday.org/media/awards.pdf](http://www.NeurosurgeryToday.org/media/awards.pdf).

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**NREF Offers E-Philanthropy** The Neurosurgery Research and Education Foundation offers e-philanthropy—the opportunity to make a contribution to a nonprofit organization via the Internet. E-philanthropy was conceived as a fast and secure way to support neurosurgical research, encourage contributions to NREF, and increase the percentage of grant applications received each year that can be funded. E-philanthropists can make contributions to NREF at [www.AANS.org/research/make](http://www.AANS.org/research/make). Additional information on e-philanthropy or on other giving opportunities is available from Michele Gregory, AANS director of development, at (847) 378-0500.

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**Practice Managers to Meet April 29-30** NERVES will hold its annual meeting on April 29 and 30, 2004, at the Orlando Convention Center. More than 250 neurosurgery practices now are represented in NERVES, the Neurosurgery Executives' Resource Value & Education Society. The purpose of NERVES is to establish a home within the neurosurgery community for those responsible for the management of neurosurgery practices. Emphasis is placed on providing practical information on the business of neurosurgery. The collection of reliable data by NERVES will enable all member practices to have access to information that is not available from any other source. The ability to network with practice managers from across the country offers members the opportunity to get fresh approaches to common problems. The American Association of Neurological Surgeons and the Congress of Neurological Surgeons, through the Council of State Neurosurgical Societies, sponsor NERVES and encourage all practices to participate and take advantage of this critical organization for the future success of the business of neurosurgery. Additional information is available at [www.nervesadmin.com](http://www.nervesadmin.com).

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**AANS/CNS Section on Tumors Prepares for 20th Anniversary** (contributed by Jack P. Rock, MD) Increased membership heads the news involving the AANS/CNS Section on Tumors over the past nine months. As of October 2003, the membership in the section totaled 1,808. The section's recent decision to grant membership benefits to all neurosurgical resi-

dents free of charge will provide all residents with online access to the semiannual newsletter, which updates section activities, announces clinical trials, and calls attention to peer-reviewed articles on advances in brain tumor management. Section membership also includes a 50 percent discount on subscription rates for the *Journal of Neuro-Oncology*, and discounted registration rates at the biennial Tumor Satellite Symposium, which updates basic and clinical research.

In addition, James Rutka, MD, spearheaded significant progress toward standardization of neuro-oncology fellowships with the Committee on Accreditation of Subspecialty Training of The Society of Neurological Surgeons. Also, prompted by the 20th anniversary of the founding of the Section on Tumors, the section recently created the History Subcommittee to record both the history of the section's activities and, more generally, the overall developments in the field of neuro-oncology. Finally, the section continues to support the activities of the Immunotherapy Task Force, led by Roberta Glick, MD; this is a multidisciplinary group of approximately 50 section members, including clinical and basic science researchers, whose focus is the role of immunotherapy for brain tumors. The Section on Tumors serves as the official voice of the American Association of Neurological Surgeons and the Congress of Neurological Surgeons in all matters related to tumors. Detailed information about the Section on Tumors is available at [www.neurosurgery.org/tumor](http://www.neurosurgery.org/tumor).

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**NASS Offers 2004 Spine Research Grants and Fellowships** The North American Spine Society is offering spine-related research grants and fellowships to be awarded in 2004 for proposals involving investigative research on the spine. Applications must be received in the NASS office by May 7. For the Clinical Traveling Fellowship, at least one month must be spent in three to five different medical centers studying spine techniques. For the Research Traveling Fellowship, at least five months must be spent at one medical center (other than the facility at which the applicant currently practices). Applications are available from the NASS office at (877) 774-6337, and online at [www.spine.org/research/researchprogram.cfm](http://www.spine.org/research/researchprogram.cfm).

**CSNS Sets Dates for 2004 Neurosurgical Leadership Development Conference**

The Council of State Neurosurgical Societies is hosting the third Neurosurgical Leadership Development Conference July 18-20 at the Washington Court Hotel in Washington, D.C. The NLDC is designed to help neurosurgeons learn how to be effective grassroots leaders; develop relationships with members of the U.S. Congress; and assist in expanding neurosurgery's influence on Capitol Hill. The registration fee is \$500 per person, or complimentary for residents. Details are available at [www.aans.org/legislative/council](http://www.aans.org/legislative/council).



## IN MEMORIAM

**Collin Stewart MacCarty, MD**, 87, died on Aug. 22 in Rochester, Minn., of complications from Alzheimer's disease. He was president of the American Association of Neurological Surgeons (AANS) from 1970 to 1971. Dr. MacCarty graduated from Dartmouth College in 1937 and from Johns Hopkins Medical School in 1940. He completed a fellowship in neurological surgery at the Mayo Graduate School of Medicine in 1944, and there progressed through the academic ranks, becoming full professor in 1961, chairman of neurological surgery from 1961 to 1975, and director of education of the Mayo Foundation from 1975 to 1980.

**Frank P. Smith, MD**, who strongly influenced the evolution of neurosurgery, died in California on Sept. 22, one month shy of his 88th birthday. Dr. Smith, a 1941 graduate of the University of Rochester Medical School, trained in neurosurgery under William P. Van Wagenen. Later in his career, Dr. Smith was instrumental in organizing the Van Wagenen Fellowship, which is administered by the American Association of Neurological Surgeons (AANS). "Frank dedicated himself to the preservation of the Van Wagenen fellowship," said Robert A. Ratcheson, MD. "He was instrumental in securing its continued existence in a form that will be of great benefit to future fellows. Frank was a remarkable fellow and will be missed by all of us."

Dr. Smith served as chairman of the neurosurgical service at the University of Rochester from 1954 to 1974. During his two decades as

chief, he was very involved in clinical research on surgical treatment for pain management and brain aneurysms, arterial chemotherapy for brain tumors, bioengineering as it related to lumbar disc protrusion, and pediatric neurosurgery. In 1974 Dr. Smith relocated to Monterey, Calif., where he practiced until 1991. He endowed the Frank P. Smith Chair in Neurosurgery in 1981 and was instrumental in developing the Frank P. Smith Neurosurgical Laboratories in 2002, both at the University of Rochester Medical Center. In 2001 the AANS honored Dr. Smith with the Distinguished Service Award.

### Members Deceased in 2003

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Howard W. Blume, MD, PhD  
Richard J. Brzustowicz, MD  
David W. Cahill, MD, FACS  
Bland W. Cannon, MD  
Frank B. Clare, MD  
William H. M. Finney, MD  
Robert G. Fisher, MD  
Benjamin C. Guerra, MD  
John W. Holter, DSc  
Robert L. Imler, MD

Michael J. Jerva, MD  
Gary L. Kellett, MD  
Collin S. MacCarty, MD  
George Nash, MD  
Arnold Schoolman, MD, PhD  
Frank P. Smith, MD  
Robert R. Smith, MD  
Harry R. Stauffer, PA-C  
Eric D. Weber, MD, PhD  
Steven R. Woodman, RN, CNRN

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# Dear Dr. Subach

## Workforce Pressures Concern Tomorrow's Neurosurgeons

**H**ow do we, as a specialty, deal with the progressive shortage of neurosurgeons available to serve our patients? The cover story in this issue of the AANS *Bulletin* quantitatively documents a trend toward a shortage of neurosurgeons and suggests some of the reasons underlying this trend. One of these reasons, as neurosurgeons know all too well, is the medical liability crisis that has prompted many to retire earlier, leave the specialty sooner, and limit their practices in an attempt to shield themselves from the inherent risks associated with the practice of neurosurgery and regain control of their lives.

Additional pressures on the specialty abound. The pressures resulting from last summer's restriction of resident work hours to 80 hours per week, a topic discussed in detail in the summer issue of the *Bulletin*, is still very much on the minds of neurosurgeons.

To get an idea of current attitudes about the neurosurgical workforce, I informally surveyed neurosurgeons in different stages of neurosurgical training and practice to gauge their views on workforce issues. Anonymity was guaranteed and rewarded with 16 e-mail responses (and occasionally multiple responses from the same author). These responses, expressing emotions ranging from frustration to disillusionment to confusion, demonstrated that the workforce issue is clearly a highly charged topic for many of our colleagues.

Here are a few of their responses:

■ **MD No. 1:** Dr. Subach, I am responding to your request for opinions regarding the ongoing changes in the neurosurgical workforce resulting from pressures on both practicing and training neurosurgeons. The 80-hour workweek may minimize sleep deprivation, however my fellow residents and I remain concerned that we

**It is ridiculous that a politician is able to tell me when to go home, but refuses to legislate against frivolous lawsuits ...**

will have inadequate training to go out on our own. It is ridiculous that a politician is able to tell me when to go home, but refuses to legislate against frivolous lawsuits which are killing our specialty.

■ **MD No. 2:** The applicant pool for neurosurgery residency spots will degenerate. The competition is what kept the best people and weeded out [the others]. Since all residencies are capped at 80 hours per workweek, what is the difference now? Mediocrity will abound, and I bet the applicant pool will be diluted by less driven, less determined individuals. The workforce issue will be compounded by novice neurosurgeons with lukewarm motivation and marginal experience.



Brian R. Subach, MD,  
a neurosurgeon at  
The Virginia Spine  
Institute, Reston, Va,  
is secretary of the  
AANS Young  
Neurosurgeons  
Committee.

■ **MD No. 3:** I never thought that I would worry about finding a job and supporting my family. After all these years of training, my once clear vision of the future has become cloudy.

■ **MD No. 4:** Why is this my problem? The neurosurgeons in practice are the ones who allowed the situation to deteriorate to this point. Now it is a "crisis" and an "emergency." Perhaps some "forethought" back then could have averted this situation. Now I have to donate time and money toward this cause. What happened to the team concept?

### An Undercurrent of Unrest

These comments universally reveal an undercurrent of unrest. Neurosurgeons in training are entering a world very different from the one in which many of neurosurgery's current leaders were trained. Now there is a limited amount of time to train, a limited amount of resources to utilize, and a world of turmoil to conquer.

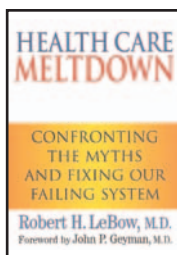
I wish it were easy to identify a single cause for the workforce shortage and related problems so that the damage could simply be repaired. The reality is that the causes are complex, as likely are the solutions. However, it is clear that neurosurgeons must say enough is enough. Enough to the insurers who negotiate contracts paying 15 cents on a dollar. Enough to the five hospitals who demand our availability to their call schedule. Enough to the lawyers who cause irreparable damage to our reputations by bringing completely frivolous suits.

Yet, neurosurgeons of the next generation must do more than talk. We need to add our voices to the discussion and become involved in implementing solutions to neurosurgery's challenges. For example, residents on the front lines of the work hour reforms can suggest refinements that are in the best interest of our specialty and our patients.

In answer to the medical liability crisis, Stewart Dunsker, MD, called for all neurosurgeons to "be part of the solution and give their ideas, time and money" in his fall *Bulletin* article on neurosurgery's campaign for liability reform. Neurosurgeons of the next generation can heed his call both individually and as a group working for our common interests through the AANS Young Neurosurgeons Committee. ■

# More Healthcare, No Additional Cost?

*Doctor's Research Suggests Ways to Achieve Healthcare Reform*



**Health Care Meltdown: Confronting the Myths and Fixing Our Failing System**, by Robert H. LeBow, MD, 2003, Alan C. Hood & Co, Chambersburg, Penn., 280 pp. \$25.00

**H**ealth Care Meltdown begins by debunking 13 myths with solid data. A sampling of the surprising facts includes:

- 18,000 adults die each year in the United States because of lack of health insurance;
- the healthiest 20 percent of Americans spend only about \$14 a year on health;
- the federal subsidy for employer-based health insurance was about \$140 billion in 2001;
- drug companies have the highest profit margin of all U.S. corporations; and
- the pharmaceutical industry spends almost three times as much on marketing and administrative costs as it spends on research and development.

Those who doubt that the present system is broken need only recall their last patient. Author Robert H. LeBow, MD, illustrates through chilling examples just how frightful the healthcare system has become. There now is a paperwork nightmare that does not seem to improve with electronic communication. The complexity of the paperwork multiplies when the government pays the bill, yet at the same time the government assumes that physicians are all criminals who must be investigated for fraud and abuse.

Professional liability insurance premiums continue to increase and the number of suits filed multiplies because patients

always expect a perfect result. Our society has created a huge monster that continues to be nourished by powerful financial interest groups like the pharmaceutical industry, the insurance companies, large employers, and some elements of the medical establishment because they know that any real solution could threaten their bottom lines.

This book offers hope for the 43 million people without health insurance in this country. A groundswell of grassroots support could bring about change. The author believes that healthcare for all is achievable and that it will require a single risk pool with a common benefit package.

A new system of healthcare that works would not necessarily cost more. Many economic studies actually show a savings with universal coverage. The most recent studies done as a part of the state health planning grants funded by the Health Resources Service Administration show an overall savings of more than 5 percent in some states with a single-payer plan. This type of system with one risk pool may be the only affordable solution.

It is worth noting that to be successful, any system must place an emphasis on prevention because prevention provides maximum bang for the buck. For example, every dollar spent on prenatal care can save \$7 in the long run. Three hundred thousand people die each year from complications of obesity. Further, for every pack of cigarettes sold, the U.S. healthcare system spends \$3.50 on medical care of smokers.

Neurosurgeons, who understand firsthand that something needs to be done about our healthcare system, will enjoy this book. ■

**Gary Vander Ark, MD**, is director of the Neurosurgery Residency Program at the University of Colorado and past president of the Colorado Medical Society. He is the 2001 recipient of the AANS Humanitarian Award.

## New on the Shelf

Information about the following resources is available in the AANS Online Marketplace at [www.AANS.org](http://www.AANS.org).

■ **CodeManager 2004**, American Medical Association, \$2,650 (6-10 users). This coding software package on CD-ROM features the entire text, graphics and guidelines of Current Procedural Terminology Professional 2004. Electronic features such as instant searches by name or number are possible, and three information updates are included throughout the year. Several standard medical references also are included. A demonstration of the CodeManager software is scheduled in the technology pavilion of the AANS Resource Center during the 2004 AANS Annual Meeting.

■ **Rightsizing: Appropriate Staffing for Your Medical Practice**, by Deborah L. Walker, MBA, FACMPE, and David N. Gans, MSHA, CMPE, 2003, Medical Group Management Association, \$112. This book discusses tools, resources and a five-step process to benchmark current staffing and analyze practice needs. Data tables for benchmarking with better-performing groups, case studies to demonstrate the process, and a staffing resource allocation tool are included.

■ **Performance and Practices of Successful Medical Groups: 2003 Report Based on 2002 Data**, 2003, Medical Group Management Association, \$437. This report shows which business strategies drive better performance in specialty categories, what the key indicators are for financial and operational success, and which management tactics lead to better performance. Success stories detail processes of some of top medical groups.



# The Right Fit With Just One Click

## Introducing the AANS Online Career Center

**F**inding the right fit when searching for an employee is integral to the future success of a program or practice. The new AANS Online Career Center provides a real-time means of customizing recruitment to a neurosurgical audience and reaches the most candidates for recruitment dollars. Through a partnership between the American Association of Neurological Surgeons (AANS) and HealthCareers, this convenient online tool offers the power and ease of popular career search engines like Monster.com, but is geared toward careers related to neurosurgery.

"Attracting the best and brightest neurosurgeons to one's program or practice is no easy task in today's highly competitive environment in which there are more open positions than there are neurosurgeons to fill them," observed Ron Warnick, MD, chair of the AANS Member Benefit Development Committee. "With the advent of the powerful recruitment tool that is the AANS Online Career Center, we hope to provide a practical, easy-to-use service for



When a hospital or medical center posts an open position on the AANS Online Career Center, it can reach hundreds of busy neurosurgeons and allied professionals who are looking for new career opportunities.

practice recruiters, neurosurgeons, and also allied professionals, that aids them in achieving 'the right fit.'"

### If You Post It, They Will Come

When a hospital or medical center posts an open position on the AANS Online

Career Center, it can reach hundreds of busy neurosurgeons and allied professionals who are looking for new career opportunities. With 6,500 members, the AANS offers a deep pool of qualified candidates. Through the AANS Online Career Center, employers are connected to neurosurgeons, nurses, physician assistants and support staff in the many areas of neurological surgery, increasing the likelihood that a posting will reach the right candidate. Busy employers and candidates alike can use the center at their convenience, 24 hours a day, seven days a week.

The interactivity of the AANS Online Career Center is evidenced through several helpful features:

**Job Alerts** The "Resume Alert" feature automatically can send an e-mail notice to the employer when a prospective candidate posts a resume. In similar fashion, the "Job Alert" function reaches out to candidates, advising them as soon as an employment opportunity that meets their criteria is posted.

### Looking for Career Advancement?

**N**eurosurgeons and allied neurosurgical professionals can take advantage of the AANS Online Career Center, which is designed to make the search for a new neurosurgical position both quick and easy.

AANS members can search open positions by specialty or location as a complimentary benefit of their membership. For greater assistance with a job search, additional features are available to those who register with a login and password. These features include "Job Alerts," which can be e-mailed to candidates as new jobs are posted, and activity tracking, which allows candidates to view their current and past Career Center activity.

Candidates also can post their resumes, anonymously if preferred. Information about the HealthCareers privacy policy is available online by going to [www.AANS.org](http://www.AANS.org), selecting the Career Center tab and choosing the "Privacy" link at the bottom of the page.

**Attracting the best and brightest neurosurgeons to one's program or practice is no easy task in today's highly competitive environment in which there are more open positions than there are neurosurgeons to fill them.**

**Activity Tracking** Three different options allow an employer to see if job seekers are looking at a posted position: "Summary Views" indicates the number of times a job's tagline has been viewed; "Detailed Views" indicates the number of times someone has clicked on an ad; and "Click Throughs" indicates the number of times the employer's Web site has been visited.

**Resume Databank** Access to the resume databank is available to logged-in employers after their job posting is activated. Resumes that match the same discipline(s) as specified in the job posting(s) will be visible. These resumes can be accessed by going to the "Account Man-

agement" page and clicking on the "Resume Databank" link.

**Conference Tool** The conference tool lets recruiters view a list of annual meetings, conferences and other events. Both candidates and employers can indicate that they will be attending the AANS Annual Meeting, facilitating face-to-face meeting during the event.

**Online Offers Value**

Pricing is structured in units (one unit equals one job posting per day). A three-month posting that seeks a physician or surgeon listing starts at \$250 per month. If a position is filled quickly, the remainder

of the contract can be utilized for another job posting. A detailed pricing schedule is accessible at [www.AANS.org](http://www.AANS.org) by selecting the Career Center tab and clicking first on "For Employers," then on the "Employer Service Agreement" link.

Employers can start using the AANS Online Career Center within minutes by visiting [www.AANS.org](http://www.AANS.org), selecting the Career Center tab and choosing the "Employers" link. Alternatively, they can e-mail the job description and billing information to [info@healthcareers.com](mailto:info@healthcareers.com). Recruiters will be contacted within one business day to confirm the job posting. Once a login and password are established, recruiters can manage postings and check responses at any time. ■

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**Laurie M. Singer** is marketing coordinator in the AANS Marketing Department.

For advertising information, see the Bulletin's rate card at <http://www.aans.org/bulletin/bulletinratecard.pdf>, or contact Holly Baker, [hbaker@ascendmedia.com](mailto:hbaker@ascendmedia.com), 913.344.1392.

# Celebrate a Life

*New NREF Giving Opportunity Offers Solace, Hope*



*"In lieu of flowers ..."*

The new *Celebrate A Life* memorial and tribute giving program of the Neurosurgery Research and Education Foundation (NREF) not only enables family members to remember a loved one who has passed, it also offers patients a way to honor and thank their surgeon and medical team for care. The program additionally affords medical professionals the opportunity to recognize and appreciate their colleagues and loved ones ... all for the benefit of resident and young clinician neurosurgical research and education.

For example, surgical procedures may not be enough to save the life of a loved one. However, many families find comfort in knowing that their loved one's life could contribute in some way to helping the lives of others. Frank Culicchia, MD, from West Jefferson Medical Center in suburban New Orleans, had just such a case.

When his patient, Cindy Gough Barbier, died after battling a glioblastoma multi-

forme, her family wanted to know how they could honor her memory. Dr. Culicchia suggested honoring her memory and providing hope for others by supporting neurosurgical research and education at the American Association of Neurological Surgeons (AANS).

"If we as neurosurgeons can talk to our patients' families about the option of organ donation, why not also approach them about remembering their loved ones in another positive way," Dr. Culicchia observed. "As an alternative to routine remembrances, we can offer the family and friends information about making a gift in support of neurosurgical research through the NREF."

Others have chosen to make gifts in appreciation of the care given to them or their family members by their neurosurgeon and medical staff. One such donor expressed extreme gratitude to her neurosurgeon. While others told her that the tumor in her brain was inoperable and she had only a few months to live, her neurosurgeon saw a different outcome, operated

and saved her life.

Support of research projects can be designated for a desired area, such as glioblastoma multiforme, and a family can find comfort in knowing that intense research is being funded and monitored by the NREF. Most importantly, supporting NREF allows family members to pay tribute to their beloved while allowing them to give the gift of hope to other families.

## Celebrate A Life Program Materials

Armed with NREF's new brochure, neurosurgeons now have the means for educating patients and their families on ways to memorialize or pay tribute to those closest to them. Copies of the *Celebrate A Life* brochure will be sent to all AANS members in hospital or private practice settings. Information regarding the program also is available online at [www.AANS.org/research](http://www.AANS.org/research).

All donations support the NREF's one- and two-year fellowships and Young Clinician Investigator awards to the most promising young neurosurgeons in support of their research projects. Their studies are aimed at solving the neurosurgical crises of today, paving the way for life-changing advances in the neurosciences. The grant applications are scrutinized by a committee of neurosurgeons to determine which projects merit funding. Support of NREF through the *Celebrate A Life* giving program will assist the foundation with funding key research projects in areas such as brain tumors, epilepsy, spinal cord injuries and Parkinson's disease.

More information about the *Celebrate A Life* program, NREF and other ways of making a contribution is located at [www.AANS.org/research](http://www.AANS.org/research) and is available by phone at (847) 378-0540. ■

Michele S. Gregory is AANS director of development.

# The AANS Key to Success

## *Committees Deliver Programs, Link AANS and Members*

**C**ommittees serve a key function for the American Association of Neurological Surgeons. Not only do they develop and deliver effective products and programs for the benefit of members, they also serve as a link to member attitudes and values.

For the individual member, service on a committee is an opportunity to represent and serve colleagues. Specific efforts have been made in recent years to diversify committee membership by seeking members from private practice, residents or young neurosurgeons, and on several committees, nurses and physician assistants. Geographic and subspecialty diversification also is desired.

From December through mid-February every year, the AANS goes through the committee appointment process. The incoming president reviews the AANS committees and determines which chair and member position terms are expiring. Committee members are appointed or reappointed as necessary.

All AANS committee appointments begin or end in conjunction with the AANS Annual Meeting, during which the new president and members of the Board of Directors officially take office. Most committee members and chairs serve a three-year term, with the expiration dates staggered to provide consistency for the committee, while also ensuring some turnover within the committee's membership.

A recent change in the management of committees was introduced in April 2003 as a result of the AANS' strategic planning process. All committees, led by the chair working with a staff liaison, now organize their work and align it with the committee budget using the Committee Work Plan. The plan features the committee's "charges," that is, its function and responsi-

bilities, which in turn are aligned with the objectives of the AANS Strategic Plan.

The Committee Work Plan is divided into three parts: major activities of the past year; activities for the current year with action steps, timelines and responsible parties identified; and a listing of and time frame for major activities planned for the upcoming year. In this way, the committee's continuity is assured even when there is turnover on the committee. Furthermore, a review process ensures that AANS goals are being met.

A complete list of AANS committees is available online at [www.AANS.org/about/membership/aans\\_c.asp](http://www.AANS.org/about/membership/aans_c.asp). The committee list also is included on the 2003-04 AANS Membership Directory CD-ROM. Those interested in service on a specific committee, or wishing to indicate an interest in committee participation in general, can contact Susan M. Eget via e-mail at [sme@AANS.org](mailto:sme@AANS.org).

Another way to indicate interest is to update one's census record at [www.MyAANS.org](http://www.MyAANS.org). The census provides a space where specific committee interest can be indicated, and that information is provided to the president-elect annually during the appointment process.

The AANS offers many opportunities for committee service. However, because most committee positions are multiyear terms, only a limited number of positions on a particular committee become available each year. ■

**Susan M. Eget** is AANS associate executive director-governance.

### For More Information

#### AANS Committees

[www.AANS.org/about/membership/aans\\_c.asp](http://www.AANS.org/about/membership/aans_c.asp)

#### AANS Strategic Plan

[www.AANS.org/Library/Article.aspx?ArticleId=18651](http://www.AANS.org/Library/Article.aspx?ArticleId=18651)

## NOTICE OF SUSPENSIONS

■ **L. David Rutberg, MD** On Nov. 21 the AANS Board of Directors suspended the membership of L. David Rutberg, MD, for one year for unprofessional conduct arising from certain statements contained in a sworn Medical Opinion Declaration and in his later deposition testimony.

Dr. Rutberg had very limited training or experience in the treatment of discitis and had not done any independent research into the treatment of lumbar discitis, yet he testified that if antibiotic treatment had been started 10 days earlier, a chronic low back pain syndrome following a second lumbar discectomy would with reasonable medical probability have been averted. The lawsuit was settled for a nominal amount when the plaintiff attorney could find no other neurosurgical experts and no infectious disease experts who would support Dr. Rutberg's statements. The plaintiff attorney in a subsequent letter to his own client stated that "the case does not have legal merit."

■ **Gerald Freifeld, MD** On Nov. 21 the AANS Board of Directors suspended the membership of Gerald Freifeld, MD, for one year for unprofessional conduct consisting of certain statements made in a medical opinion letter supporting a medical malpractice lawsuit.

In his medical opinion letter Dr. Freifeld stated that "the disengagement of the instrumentation can *only* [emphasis added] be blamed upon the inefficient surgical application and the inappropriate placement of this instrumentation" in an unstable L1 compression fracture in which there was an instrumentation failure after initial good reduction and in which a subsequent reoperation was needed for a good surgical result. Dr. Freifeld provided no evidence or reasoning to support his conclusion. In addition, Dr. Freifeld had reportedly never performed thoracolumbar instrumented fusion—a report that he did not dispute.





American  
Association of  
Neurological  
Surgeons

#### AANS LEADERSHIP 2003-2004

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Vincent C. Traynelis, MD  
W. Brian Wheelock, MD

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Ronald W. Engelbreit, CPA,  
*deputy executive director*  
Susan M. Eget, *associate executive director-governance*  
Joni L. Shulman, *associate executive director-education*

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*Development*, Michele S. Gregory  
*Information Services*, Kenneth L. Nolan  
*Marketing*, Kathleen T. Craig  
*Meeting Services*, Lisa M. Sykes, CMP  
*Member Services*, Chris A. Philips

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Web site: [www.neurosurgery.org/socioeconomic/dcstaff.html](http://www.neurosurgery.org/socioeconomic/dcstaff.html)

# EVENTS

## Calendar of Neurosurgical Events

### Richard Lende Winter Neurosurgery Conference<sup>+</sup>

Jan. 31-Feb. 6, 2004  
Snowbird, Utah  
(801) 581-6908

### AANS/CNS Cerebrovascular Section Annual Meeting<sup>+</sup>

Feb. 1-4, 2004  
San Diego, Calif.  
(888) 566-2267  
[www.neurosurgery.org/cv/meetings](http://www.neurosurgery.org/cv/meetings)

### American Society of Pediatric Neurosurgeons<sup>+</sup>

Feb. 2-7, 2004  
San Diego, Calif.  
(713) 522-3645  
[www.aspn.org](http://www.aspn.org)

### 6th Jaslok Neurosciences CME

Feb. 6-8, 2004  
Mumbai, India  
91-22-56573185  
[www.jaslokhospital.net/conference.htm](http://www.jaslokhospital.net/conference.htm)

### 5 Day Gamma Knife Radiosurgery Training Course

Feb. 9-13, 2004  
Cleveland, Ohio  
(800) 423-2273 ext. 47591  
[www.clevelandclinic.org/neuroscience](http://www.clevelandclinic.org/neuroscience)

### 42nd Annual Kenneth M. Earle Memorial Neuropathology Review Course

Feb. 23-27, 2004  
Bethesda, Md.

(202) 782-2637  
[www.afip.org/departments/edu/upcoming.htm](http://www.afip.org/departments/edu/upcoming.htm)

### EANS Wintermeeting 2004

Feb. 27-29, 2004  
Budapest, Hungary  
[www.budapest.eans2004.hu](http://www.budapest.eans2004.hu)

### Interurban Neurosurgical Society Annual Scientific Meeting<sup>+</sup>

March 5, 2004  
Chicago, Ill.  
(715) 542-3201

### Annual Meeting of the New York State Neurosurgical Society

March 5-7, 2004  
Grand Bahamas  
(954) 346-3678

### 11th Workshop on Endoscopic Neurosurgery

March 7-9, 2004  
Ghent, Belgium  
32-9-240-32-54

### 2004 Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves<sup>+</sup>

March 17-20, 2004  
San Diego, Calif.  
(888) 566-2267  
[www.neurosurgery.org/spine/meetings/index.html](http://www.neurosurgery.org/spine/meetings/index.html)

### Southern Neurosurgical Society<sup>+</sup>

March 24-28, 2004  
Amelia Island, Fla.

(336) 716-4020  
[www.southernneurosurgery.org](http://www.southernneurosurgery.org)

### American Academy of Neurology Annual Meeting and Exhibition

March 25-April 3, 2004  
San Francisco, Calif.  
(612) 623-8115

### AANN 36th Annual Meeting

April 17-20, 2004  
San Antonio, Texas  
(888) 557-2266  
[www.aann.org](http://www.aann.org)

### 5 Day Gamma Knife Radiosurgery Training Course

April 19-23, 2004  
Cleveland, Ohio  
(800) 423-2273 ext. 47591  
[www.clevelandclinic.org/neuroscience](http://www.clevelandclinic.org/neuroscience)

### American Academy of Neurology Annual Meeting

April 24-May 1, 2004  
San Francisco, Calif.  
(651) 695-1940  
[www.aan.com](http://www.aan.com)

### 2004 Annual Meeting of the American Association of Neurological Surgeons

May 1-6, 2004  
Orlando, Fla.  
(847) 378-0500  
[www.AANS.org/annual](http://www.AANS.org/annual)

<sup>+</sup>These meetings are jointly sponsored by the American Association of Neurological Surgeons. A frequently updated Meetings Calendar and continuing medical education information are available at [www.AANS.org/education](http://www.AANS.org/education).

### 2004 AANS Courses

For information or to register call (888) 566-AANS or visit [www.AANS.org](http://www.AANS.org).

#### ■ Advanced Coding & Reimbursement Challenges in Neurosurgery

March 19-20, 2004 . . . . .Atlanta, Ga.

#### ■ Basic Principles of Anatomy and Terminology

Jan. 29, 2004 . . . . .New Orleans, La.  
Feb. 19, 2004 . . . . .Phoenix, Ariz.

#### ■ Managing Coding & Reimbursement Challenges in Neurosurgery

Jan. 30-31, 2004 . . . . .New Orleans, La.  
Feb. 20-21, 2004 . . . . .Phoenix, Ariz.  
May 21-22, 2004 . . . . .Boston, Mass.  
Aug. 27-28, 2004 . . . . .Chicago, Ill.

Sept. 24-25, 2004 . . . . .Philadelphia, Pa.  
Nov. 12-13, 2004 . . . . .San Diego, Calif.

#### ■ Neurosurgery Review by Case Management: Oral Board Preparation

May 16-18, 2004 . . . . .New Orleans, La.  
Nov. 7-9, 2004 . . . . .Houston, Texas

#### ■ Neurosurgical Practice Management

May 23, 2004 . . . . .Boston, Mass.  
June 11-12, 2004 . . . . .Chicago, Ill.  
Aug. 29, 2004 . . . . .Chicago, Ill.

#### ■ Beyond Residency: The Real World

May 1, 2004 . . . . .Orlando, Fla.

#### Spine Course

Sept. 17-18, 2004 . . . . .Memphis, Tenn.