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A GLOBAL EXPERIENCE

Neurosurgeons Analyze Their Practice Environments

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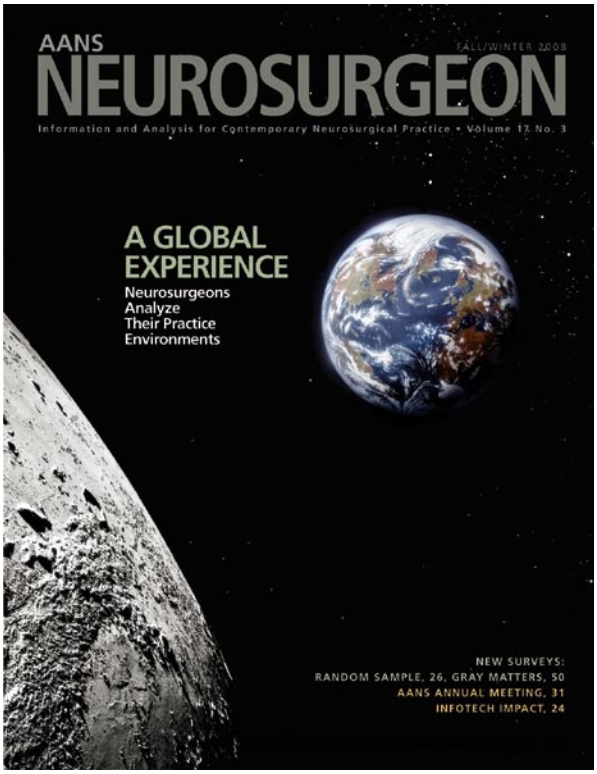

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DEPARTMENTS

American Association of Neurological Surgeons

AANS MISSION
The American Association of Neurological Surgeons (AANS) is the organization that speaks for all of neurosurgery. The AANS is dedicated to advancing the specialty of neurological surgery in order to promote the highest quality of patient care.

AANS NEUROSURGEON
The official socioeconomic publication of the AANS, *AANS Neurosurgeon* (formerly *AANS Bulletin*) features information and analysis for contemporary neurosurgical practice.

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Send your comments on articles you've read in these pages or on a topic related to the practice of neurosurgery to aansneurosurgeon@aans.org. Include your full name, city and state, as well as disclosure of any conflicts of interest that might have bearing on the letter's content. Correspondence selected for publication may be edited for length, style and clarity. Authorization to publish the correspondence in *AANS Neurosurgeon* is assumed unless otherwise specified.

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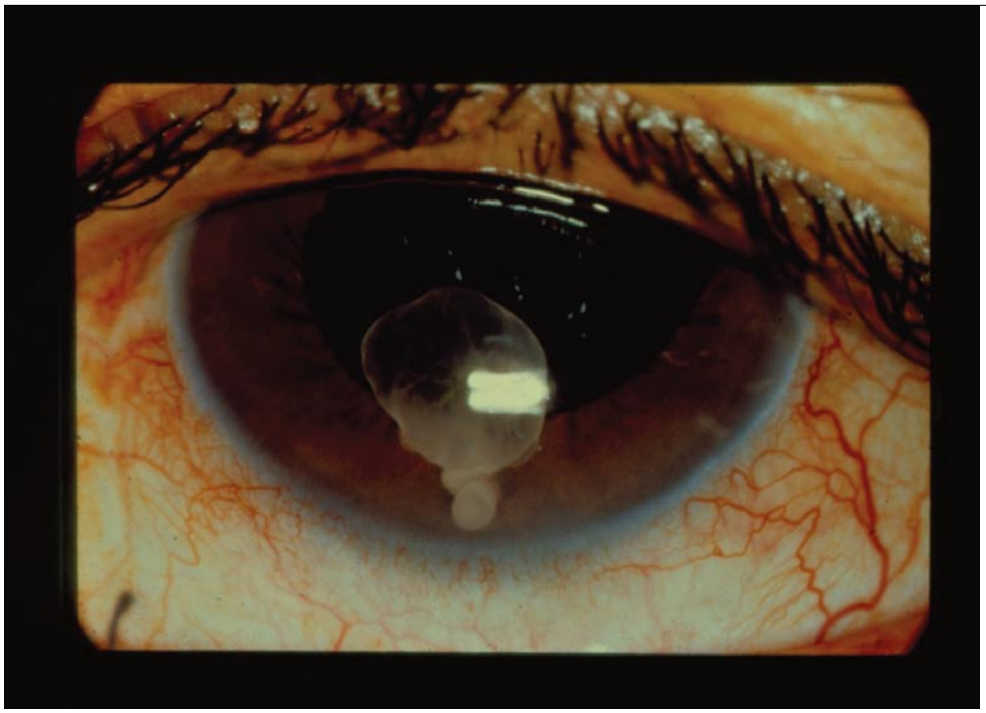

IN THE LOUPE
Ocular Cysticercosis: A cysticercal cyst is noted in the anterior chamber of the eye. The patient had a known history of neurocysticercosis and presented with monocular visual loss. Photograph contributed by William T. Couldwell, MD, PhD, Salt Lake City, Utah, with thanks to James R. Keane, MD, Los Angeles, Calif. No potential conflicts of interest were disclosed.

Two Studies Show Economic Impact of Physician Practices

Physicians Generate Billions in Payroll and Millions in Taxes

With 16 percent of the U.S. gross domestic product devoted to healthcare, healthcare not only is big business but healthcare-related businesses also frequently are among the top employers in communities. Two studies released in October attempt to quantify the economic impact that physician practices, specifically, have on the economic vitality of their communities. The 2008 Metro Medical Economic Footprint study by the Metropolitan Medical Society of Greater Kansas City found that in 2007 the physician practices studied generated $2.7 billion in payroll, $191 million in capital investment and $1 billion in operating expenses. Physicians paid $202 million in taxes and also donated $19.3 million to charitable causes, as well as more than 500,000 hours of volunteer work worth more than $124 million. In addition, financial losses for treating Medicaid and uninsured patients were calculated at more than half a million dollars per physician. Similarly, the Economic Impact of Private Practice Physicians' Offices in Georgia study by the Medical Association of Georgia estimated that in

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▲ **GET IN THE LOUPE.** Compelling digital photos that depict a contemporary event or clinical topic or technique in neurosurgery are sought for In the Loupe. Submit a low resolution image in JPG format to aansneurosurgeon@aans.org with "In the Loupe" in the subject line and a brief description of the photo and its significance in the e-mail message. Submitters must verify copyright ownership of the image and have a 300 DPI resolution image available for publication.

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2008 private practice physicians' offices would support more than 180,000 jobs, over $10 billion in personal income, and nearly $20 billion in total economic activity. It found that each private practice physician supported 13 additional jobs, $640,000 in personal income for those jobs, and nearly $1.5 million in total economic activity. Further, private practice physicians' offices altogether supported more than $1.2 billion in state revenues and nearly $1.5 billion in local government revenues.
www.metromedkc.org/documents/EconomicFootprintStudy.pdf; www.mag.org/pdfs/economic_impact_final_102408.pdf

AANS President Addresses National Healthcare Conference

AANS President James R. Bean, MD participated in the America's Health Care at Risk: Finding a Cure conference held Sept. 17 and 18 in Orlando, Fla. As a member of a panel that discussed healthcare costs, Dr. Bean addressed the impact of medical liability on practice: "Every doctor in the trench out there understands that every time you make a decision, [liability] is in the back of your mind." He also commented on payment system reform and on the role of guidelines and outcomes data in quality measurement. "We're paying more and more attention to the use of guidelines … information is powerful and does make a difference, if it's right information," he said. "We have guideline committees in our professional societies that are gathering the evidence—good evidence; we're trying to do what clinically is effective." He stressed the importance of flexibility, allowing the individual doctor to exercise professional judgment to discern what is best in a given situation for a particular patient. "Outcomes [data] will make a difference, but one size doesn't fit all," he said.

AANS President James R. Bean, MD (center), with panelists Teresa J. Koenig, MD, of SummaCare Inc., and Henry J. Aaron of the Brookings Institution, at America's Health Care at Risk: Finding a Cure.

The conference included a presentation of the Obama-Biden healthcare plan by Irwin Redlener, MD, as well as a discussion between Tommy Thompson, a former secretary of Health and Human Services, and Tom Daschle, who since has been named HHS secretary in the Obama administration. "All the stars are coming together to make 2009 the most important year for the transformation of healthcare," Thompson said. Thompson and Daschle agreed that there is bipartisan support for wellness and prevention and for information technology in healthcare. Daschle indicated his personal support for payment reform, quality improvement and developing a framework for universal healthcare coverage, as well as creation of a health court, a safe harbor for doctors to help resolve medical mistakes, and a fund to compensate victims of medical mistakes. Among the conference sponsors was Doctors for Medical Liability Reform, a coalition of which the AANS is a member. The video of conference proceedings can be accessed from the conference Web site.
www.healthcareatrisk.org

Daschle Nominated as HHS Secretary

Former Senate Majority Leader Tom Daschle is President-Elect Obama's nominee for secretary of the Department of Health and Human Services and director of the new White House Office of Health Reform. Daschle's appointment must be confirmed by the Senate, where he served from 1987 to 2005. Daschle also served four terms in the House of Representatives. His book about the healthcare crisis was published in February.

EMTALA TAG Final Report Published

The Centers for Medicare and Medicaid Services recently published the final report of the Emergency Medical Treatment and Labor Act Technical Advisory Group. The TAG adopted many of the AANS/CNS recommendations, and its recommendations overall appear to be favorable to neurosurgery. The group was created by the Medicare Modernization Act to review and propose suggested revisions to the EMTALA statute, regulations and Interpretive Guidelines. John Kusske, a neurosurgeon from California, was the AANS/CNS representative to the TAG and served as chair of its On-Call Subcommittee.
www.magpub.com/emtala/EMTALA%20Final%20Report_FINAL.PDF

A Global Experience

Neurosurgeons Analyze Their Practice Environments

The United States currently faces what is widely recognized as its greatest economic crisis since the Great Depression. Although this crisis moved healthcare reform from the forefront of the recent presidential campaign, the economic realities facing the American healthcare system are sobering. A 21 percent cut in Medicare physician payment looms in 2010, and healthcare costs continue to increase as new technologies and pharmaceuticals are introduced and the U.S. population gets older, fatter and sicker.

When the new administration takes the helm in January 2009, a concerted effort to repair the U.S. healthcare system is likely to follow. But what, exactly, are the politicians to do? The U.S. is not alone in its struggle with the conundrum of delivering cost-effective yet contemporary neurosurgical care to the greatest possible number of patients. As a point of reference, the *AANS Neurosurgeon* asked neurosurgeons in nine developed countries including the U.S. to describe their practice environments. The resulting summaries, while painted with a broad brush, are instructive.

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Although the U.S. is the only developed country with a large uninsured population and neurosurgical residents in Europe are trained in far fewer hours than those in the U.S. and Australia, there are several commonalities. In most countries there is significant concern about low physician reimbursement and, correspondingly, neurosurgery's future ability to compete with other professions for highly qualified candidates. Maintaining the optimal ratio of neurosurgeons to population is a challenge, particularly when ascertaining the number of neurosurgeons who are practicing in a particular country at any given time itself is difficult. Also among the shared concerns are integrating new practice patterns introduced by increasing subspecialization, paying for rapidly advancing technologies, retaining a sense of professionalism and preserving the doctor-patient relationship in an increasingly impersonal healthcare environment.

Practicing Neurosurgery in the

United States

WILLIAM T. COULDWELL, MD,
AND MANDA J. SEAVER

Compared with other developed countries, the U.S. spends a high percentage of its gross domestic product on healthcare: 16 percent in 2005, up from 15 percent in 2004. This is far and away the greatest percentage of GDP spent on healthcare of any nation for which such data is collected. However, the high level of healthcare spending is not reflected in globally accepted indicators of quality such as comparatively longer life expectancy and lower infant mortality. Moreover, the U.S. government pays for the healthcare of less than half its population, and the percentage of uninsured people is a relatively high 15.3 percent.

Both neurosurgical innovation and patient care are excellent in the U.S. The approximately 3,500 neurosurgeons in the U.S. serve a population of more than 299 million, a ratio of 1 neurosurgeon to 85,542 people. The number of practicing neurosurgeons in the U.S. remained relatively static over the last 15 years, while during this period the U.S.

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Comparison of Neurosurgical

Country (Page No.)	Ratio of Neurosurgeons to Population	Healthcare Expenditure as % of Gross Domestic Product	Healthcare Insurance Coverage
Australia (10)	1:175,000	9.6†	100% government; 35% private insurance.
Germany (16)	1:102,500	10.6†	90% through government-mandated sick funds and 10% private insurance.
Italy (12)	1:38,767	9.7†	80% government; 20% private insurance; 100% government coverage for low income people.
Japan (14)	1:16,114	8	70% government; patient pays 100% for new technologies not approved by government system.
South Korea (13)	1:24,800	n/a‡	80% government, 20% patient; no private insurance system.
Sweden (17)	1:50,000	9.1†	Hospital and outpatient care is primarily financed through taxes, and the patients themselves only pay a minor fee per hospital day or for outpatient consultation.
Switzerland (15)	1:71,400	11†	Government mandated coverage; 66% private households; 27.3% state; and 6.7% private enterprises (mostly through payments to mandatory funds covering accident insurance and pensions for elderly and disabled individuals).
United Kingdom (18)	1:254,063	8.1†	Free coverage to all citizens; 7%–20% private insurance.
United States (6)	1:85,542	16	34% private insurance coverage, 45% government (Medicare for those 65 and older; Medicaid for eligible low-income and disabled people), 15% out of pocket.

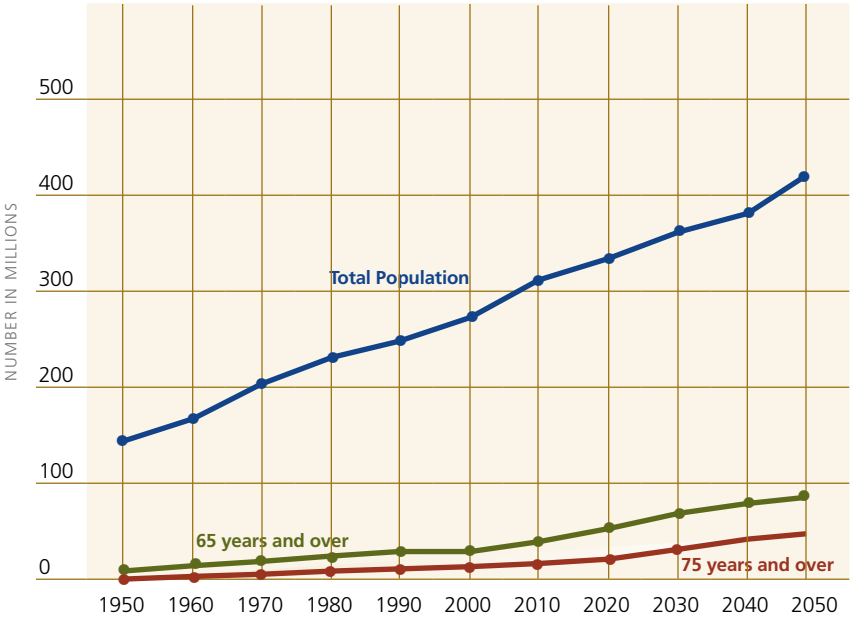
*Data source, unless otherwise specified, is the article published in this issue.
†2004 figures. Data Source: Chartbook on Trends in the Health of Americans, http://www.cdc.gov/nchs/data/hus/hus07.pdf.
‡ n/a, not available.

Demographics for Nine Developed Countries*

	Uninsured (%)	Resident Work Hours (Average Per Week)	Length of Neurosurgical Training (Years)	Medical Liability Status	Greatest Challenge Facing Neurosurgery
	0.0	Variable; most centers limit to 70.	6	Liability litigation and insurance are of major concern to all practicing neurosurgeons.	Attracting neurosurgeons to an academic career currently is difficult, but important for training the next generation of neurosurgeons.
	0.0	40–48 or 50–66 (depends on state and local hospital arrangement).	6	Premiums are lower than in the U.S.; patients with their lawyers bring cases to neutral referees; the rate of success for plaintiffs in malpractice cases is very low.	Limited resident work hours make it difficult to train neurosurgeons adequately.
	0.0	36–38	5	Increasing as a major problem.	Practical training is difficult due to prohibition on the use of cadavers; the Italian Society of Neurosurgeons has made several recommendations for improvements.
	0.0	85–90	4	Payment for medical liability insurance is approximately $500 per neurosurgeon; the number of medical liability cases has doubled in the past 10 years.	High expense related to advancing technology and low reimbursement for neurosurgical procedures stress the national health insurance system and discourage practicing and aspiring neurosurgeons.
	0.0	72-plus, depending on the workload of the hospitals	4, after a 1-year internship	Increasing number of malpractice lawsuits; legal cost per neurosurgeon is higher than for all other physicians.	Tough training conditions, low compensation and high risk discourages recruitment into neurosurgery.
	0.0	40, excluding emergency call (averaged over one year, call can add up to 8 hours per week)	5 minimum	All patients are formally covered by insurance for unexpected complications and bad outcomes; malpractice cases are extremely rare.	Patient access to neurosurgical care, to outpatient care, to be able to choose one's own surgeon and the feasibility of obtaining a second opinion.
	0.0	n/a	n/a	National government is liable for its civil servants (including doctors).	n/a
	0.0	Currently 56; soon will be reduced to 48.	8	Increased in the last 20 years; cases are held in the High Court by senior judges and without juries.	U.K. is well short of the ideal minimum of 360 neurosurgeons suggested by the SBNS; European law restricts working hours, adding to the strain on the U.K. neurosurgical workforce.
	15.3	80–88	6–7	Medical liability climate varies by state, but is generally unfavorable; some evidence suggests that liability insurance premiums have stabilized recently.	Patient access to neurosurgical care and who will pay for patient care are the top U.S. concerns.

FIGURE 1

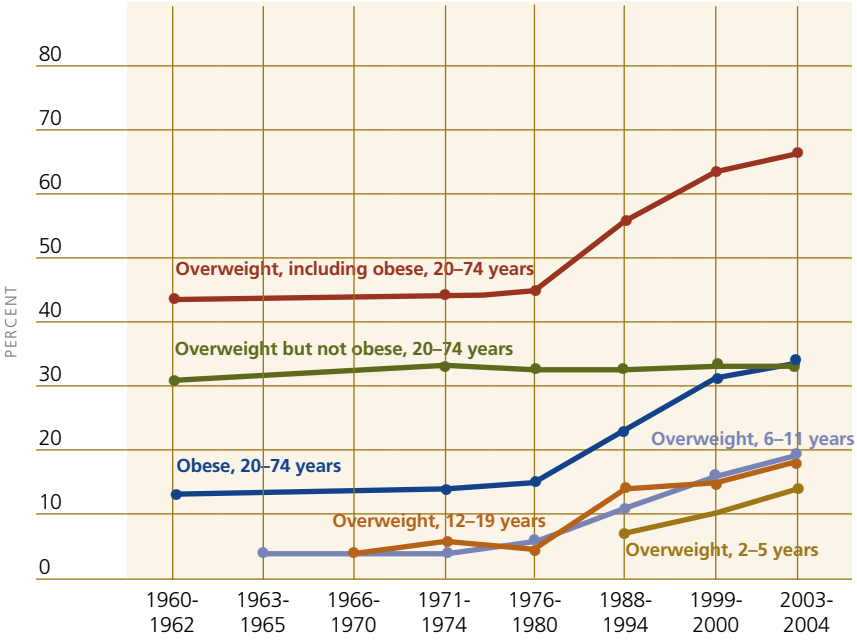
Total Population and Older Population in the United States, 1950–2050



Data Source: U.S. Census Bureau

FIGURE 2

Overweight and Obesity by Age of Americans, 1960-2004



Data Source: CDC/NCHS, Health, United States, 2007

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population increased by 20 percent, from roughly 250 million in 1990 to 300 million in 2005.

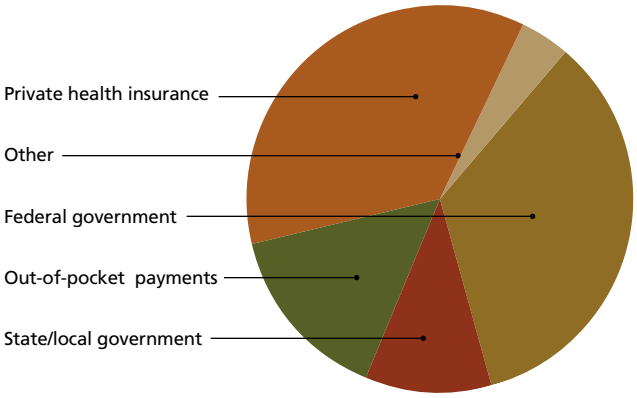
Every year approximately 150 residents graduate from the 99 accredited U.S. neurosurgery training programs. Since July 2003 residents in most programs have been limited to an 80-hour workweek, although in some programs they are allowed to work up to 88 hours. The six- or seven-year training program begins with one year of internship (recently changed to NS-1 of residency) and traditionally ends with one year of chief residency.

U.S. neurosurgeons remain concerned about the unfavorable medical liability climate, the scope of which varies significantly by state. Although there is some evidence that liability insurance premiums have been stabilizing recently, the U.S. continues to be a litigious nation. Even so, lawsuits brought against physicians are actually tried only 6 percent of the time, and plaintiffs receive monetary awards in only 27 percent of claims made against physicians. For cases in which the physician prevailed, the legal fees for the defense averaged $94,284 in 2004. U.S. neurosurgeons can expect to be sued, and more than once, during their careers.

The risk of being sued is among the factors that seem to have changed practice patterns among some U.S. neurosurgeons. Financial stress caused by expensive liability insurance premiums and low reimbursement, among other things, make it attractive to focus a practice on low-risk, high-volume procedures without the interruption of emergency cases. A 2004 survey of neurosurgical emergency care found that nearly two-thirds of respondents did not take emergency call for pediatric cases. These cases carry long exposure for liability litigation and, frequently, a low incidence of reimbursement, which may in turn have negatively impacted the pediatric neurosurgery

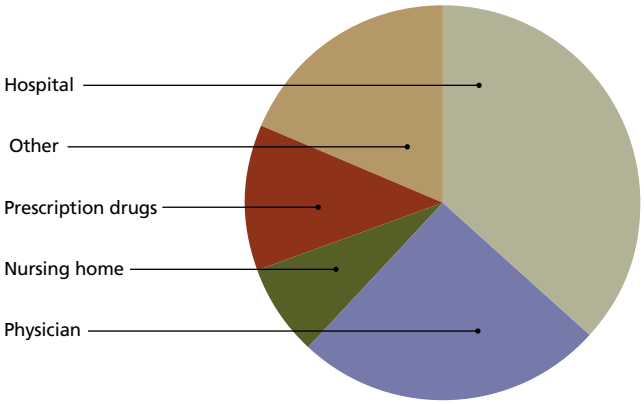
FIGURE 3

Healthcare Expenditures, United States, 2005



Source of Funds

Private health insurance	35.9%
Federal government	34.2%
Out-of-pocket payments	15%
State/local government	10.7%
Other private funds	4.1%



Type of Expenditure

Hospital	36.8%
Physician	25.4%
Other	18.4%
Prescription drugs	12.1%
Nursing home	7.3%

Data Source: CDC/NCHS, Health, United States, 2007

workforce, as fewer than 10 graduating residents are entering this subspecialty area annually.

The apparent changes in practice patterns and the difficulties in some areas of patient access to emergency neurosurgical care also are leading to regionalization of care. Other general trends include decreases in the numbers of solo and private practitioners and an increase in the number of full-time academicians. A survey of neurosurgical procedural statistics conducted by the AANS in 2007 found that the number of neurosurgeons practicing alone decreased by 13 percent from 1999 to 2006. During the same period the number in private practice decreased by 14 percent while the number in full-time academic practice increased by 11 percent. The survey also found that neurosurgeons typically performed between 200 and 300 surgeries per year and that more than half of all operative procedures were related to the spine.

The high number of spinal procedures performed by neurosurgeons probably is related not only to recent innovations in spinal devices and the increasing incidence of spinal disease in an aging population, but also to organized neurosurgery's initiative for training neurosurgeons in complex spinal surgery. But while the success in the area of spine surgery is laudable, it is noteworthy that neurosurgery is a specialty of few practitioners, and without demonstrated commitment, many procedures considered "neurosurgical"—pain or peripheral nerve surgery, for example—may increasingly fall under the purview of other specialties.

Three trends in the U.S. expected to greatly impact neurosurgeons in the near future are the aging population, unhealthy lifestyles, and advancing technology. These trends are reviewed in Health, United States, 2007, and are summarized below.

Aging population. Life expectancy in the U.S. continues to lengthen. In 2004, American men could expect to live more than three years longer, and women more than one year longer, than they did in 1990. Mortality from heart disease, stroke and cancer has continued to decline in recent years. Yet, even as progress is made in improving life expectancy, increased longevity is accompanied by increased prevalence of chronic conditions and their associated pain and disability. With the increasing population of older individuals (Figure 1), there will be significant increases in the incidence of age-related neurosurgical problems. At the top of this list are degenerative spine disease, cerebrovascular disease (both hemorrhagic and ischemic), primary and metastatic tumors involving the central nervous system or axial spine, and degenerative disease of the central nervous system, such as Parkinson's disease.

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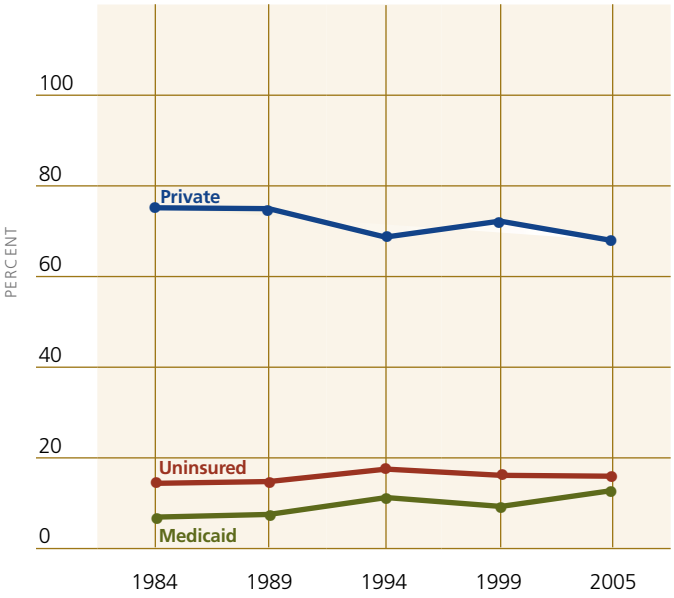
FIGURE 4

Health Insurance Among Individuals Younger Than 65, 1984–2005



Data Source: CDC/NCHS, Health, United States, 2007

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Unhealthy lifestyles. Insufficient exercise and being overweight are risk factors for many chronic diseases and disabilities, including heart disease, diabetes, hypertension, and back pain. The increasing number of overweight children and adults (Figure 2) and the high percentage of those who are physically inactive raise additional concerns about Americans' future health. The obesity epidemic, a topic well covered in a recent issue of the *AANS Neurosurgeon*, shows no evidence of slowing. Lifestyle-related illness will increase, and it certainly will be associated with an increasing incidence of degenerative spine disease, vascular disease, and prevalence of tumors (both cranial and axial spine) that will require treatment.

Advancing technology. Neurosurgery is a technology-intensive specialty. Much of the recent innovation in such areas as spinal surgery, stimulation for pain or degenerative neurological disease, and endovascular interventions are contingent upon expensive technology. The continued expansion of spinal surgery, especially with the use of expensive implants such as fusion devices and disc replacement, may be limited by the inability of payers in either the government or the private sector to cover the cost. For example, few payers initially have been willing to cover the cost of artificial disc technology until compelling, class I or class II evidence of benefit exists. Inevitably, the cost of technology innovation will be closely scrutinized in the future, and cost containment will become a foremost interest.

Who Will Pay?

With the cost of healthcare expected only to increase, one might well wonder who will pay for it. The demographics of health insurance coverage are changing. Currently, private insurers and the federal government provide most insurance coverage. Private health insurers paid for 36 percent of total personal

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Practicing Neurosurgery in Australia

ANDREW KAYE, MD

Neurosurgery has been practiced as a distinct specialty in Australia since the early 1930s. The Neurosurgical Society of Australasia, which includes more than 95 percent of the neurosurgeons in Australia and New Zealand, was formed in Melbourne in April 1940. Membership in the NSA is voluntary, and the society currently has 264 members throughout Australia and overseas.

There currently are approximately 120 actively practicing neurosurgeons and a population of 21 million in Australia, resulting in a ratio of roughly 1 neurosurgeon to 175,000 people. Most neurosurgeons primarily are engaged in private neurosurgical practice while maintaining an association with a "public" (government-funded) hospital. Consequently, the vast majority of neurosurgical departments are mostly staffed by "sessional" neurosurgeons who spend up to half of their working time in the public hospital, and the rest in private practice. There are very few full-time hospital neurosurgeons, and these tend to be mostly in the larger departments. While many neurosurgeons may have an honorary title with a university, there are very few who are employed through the university as academic surgeons. The reason for this is multifactorial, with lack of opportunity for advancement and financial reasons probably among the major considerations. In addition, most universities require applicants for senior academic positions to have formal research

qualifications, which few neurosurgeons possess.

The Royal Australasian College of Surgeons provides training and education in nine surgical specialities including neurosurgery, in which it admits surgeons to fellowship. The RACS is accredited by the Australian Medical Council for delivery of specialist medical education and training, and this is instituted through the nine specialty boards. The final examination in neurosurgery is an exit exam, usually taken in the final year of training and administered by the RACS. The Board of Neurosurgery is responsible for the selection of trainees, accreditation of hospitals for training and the training program. Consequently, the RACS in essence is responsible for selection, training and examinations in specialties of surgery, including neurosurgery. At present there are approximately 55 neurosurgical trainees in Australasia, with some also studying in Singapore.

The neurosurgery training program in Australia recently has changed from a five-year program, which could commence in the fourth year after finishing medical school and general rotations through surgery and medical specialties, to a six-year program that can commence two years after finishing undergraduate training. The course includes a compulsory year of research. It is hoped that this will encourage neurosurgeons to go into academic neurosurgical practice in the future. It is noteworthy that many Australian medical schools now have followed the "North American" model and have instituted graduate medical programs in which the medical course is undertaken following an undergraduate program in sciences and humanities.

The number of hours most neurosurgical trainees work per week is variable, but most centers limit trainees to 70 hours per week. In the past they worked much longer hours, but there is now a strong push to further reduce the number of hours trainees can work per week, and such a reduction may seriously impact training.

In the past neurosurgical training has been aimed primarily at producing general neurosurgeons. Given the recent trend toward subspecialization, most major neurosurgical units now have well-developed specialty programs with some neurosurgeons restricting their practice to subspecialty areas. Subspecialization has been easily achieved in the few high-volume neurosurgical departments, but this achievement is more problematic in smaller departments where there are fewer patients.

Neurosurgery in Australia is mostly restricted to the six major state capital cities, although there are also neurosurgical programs in Townsville in far North Queensland, in Newcastle just north of Sydney and in Wollongong just south of Sydney. As a result, patients may have to travel considerable distances to access neurosurgical care, and there are special problems relating to emergency neurosurgery in remote locations. Most states have instituted a well-organized retrieval or emergency transport care for patients in remote regions.

All Australians are covered by a type of national insurance scheme ("Medicare"), which entitles them to free medical care in public (government) hospitals. In addition, approximately 35 percent of the population has purchased private insurance, which will cover them for most of the cost of being a private patient in a private hospital. In general, the quality of neurosurgical care in the public hospital system is very high, but there are access issues for nonurgent or elective surgery.

Medical liability litigation and insurance is of major concern to all practicing neurosurgeons. For example, liability premiums for neurosurgeons increased nearly 300 percent from 1995 to 2005, and annual insurance premiums are now in the range of $39,000 to $59,000, depending on the state. Subsidies announced by the Australian government in 2003 offset premiums to a degree, but the medical liability system remains of great concern to physicians.

The major problems facing the Australian medical system include serious medical workforce issues, particularly in remote and rural regions, and adequate funding of public hospitals to cope with the increasing burden of elderly patients and complex illnesses. In addition, a poorly understood and not often recognized serious problem is the inability of the Australian system to attract surgeons (including neurosurgeons) to an academic career. It is these clinical academics who will be training the next generation of the medical workforce, including neurosurgeons and other specialists. NS

Andrew H. Kaye, MD, is professor of surgery and head of the Department of Surgery at the University of Melbourne, and director of neurosurgery at the Royal Melbourne Hospital, Melbourne, Australia. The author reported no conflicts for disclosure.

FOR FURTHER INFORMATION

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- Medical Indemnity Report, Medical Indemnity Industry Association of Australia, July 31, 2008, www.miiaa.com.au/media/files/587.pdf
- Neurosurgical Society of Australasia, www.nsa.org.au

Practicing Neurosurgery in

Italy

LUCIANO MASTRONARDI, MD

The approximately 150 units of neurosurgery in Italy include units of neurotraumatology, spine surgery, and pediatric neurosurgery. Each unit serves an average of 400,000 inhabitants and performs on average 600 operations per year, with a case-mix of 50 percent to 70 percent spine and peripheral nerve surgery versus 50 percent to 30 percent of brain surgery.

Numbering about 1,500, Italian neurosurgeons serve an overall population of more than 58 million inhabitants, equating to one neurosurgeon per 38,767 citizens. This proportion represents adequate coverage for the general population. On the whole, people are satisfied with the medical delivery system, including neurosurgery, especially in the north and midsection of the country. For "minor" surgical (including neurosurgical) procedures, there are waiting lists of six or more months in almost all hospitals.

Healthcare expenditure is about 9 percent of Italy's gross domestic product. Patients have both government-sponsored care (80 percent) and private insurance (20 percent), with sharp differences among the northern, middle and southern areas of the country; for example, comparatively few people in the south have private insurance. Nevertheless, people in the lower socioeconomic stratum throughout the country are completely covered by

government-sponsored healthcare.

Malpractice litigation is increasing as a major problem for practicing neurosurgeons. This can be linked to avoidable medical errors, to the sometimes unclear information given to patients, and to patients' and their relatives' often unrealistically high expectations for outcomes.

There are 25 schools of neurosurgery in Italy. The five-year neurosurgical training program commences after the six-year Medicine and Surgery degree. Each school admits one to four new residents each year, and at the end of their five-year residency program each of them is expected to have performed approximately 500 surgical procedures. On average, residents work a minimum of 36 to 38 hours per week. Notwithstanding some difficulties in neurosurgical training and finding employment, the neurosurgical residency programs in Italy seem to attract several very good medical students every year.

The problem of practical training in cadaver laboratories has not been completely resolved. Despite the significant Italian tradition of important anatomical studies, an outdated law that was influenced

Italian Society of Neurosurgery

The Italian Society of Neurosurgery, SINch, was founded on May 29, 1948. Its aim is to unite Italian neurosurgeons for the purposes of defending and protecting their prestige and interests, promoting the progress of the specialty, developing the relationship between Italian and foreign neurosurgeons, and networking with other Italian, foreign, and international scientific associations. The official journal of the SINch is the Journal of Neurosurgical Sciences, and the official Web site is www.sinch.it. The 16 fundamental articles of SINch were approved on Feb. 18, 1962. The SINch has 10 active study groups, including neurotraumatology, spine surgery, surgery of the peripheral nervous system, functional and stereotactic neurosurgery, pediatric neurosurgery, neurooncology, neuroendoscopy, radiosurgery, hemodynamics, and the history of neurosurgery. Through the scientific cooperation among various national centers and by the activity of the study groups identified by the SINch Board of Directors, several guidelines for the diagnosis and treatment of various neurosurgical pathologies have been elaborated.

The scientific activity of the Italian neurosurgical community consists of: (1) an increasing number of published articles in international neurosurgical journals; (2) active participation to international prestigious meetings, courses and conferences; and (3) organization of local, national, or international meetings each month in Italian cities.
The SINch concurs with the European Association of Neurosurgical Societies directives regarding the implementation of uniformly high standards of neurosurgical care throughout Europe and at the national level.

historically by the Catholic Church restricts the use of cadavers for teaching and scientific purposes. Considering the new Common European Constitution, it seems reasonable that the European community could offer a political solution in this matter, improving the quality of training in neurosurgery and in other disciplines.

In concert with the 2005 Annual Meeting of the Italian Society of Neurosurgery, SINch, in Turin, the Minister of Health declared his assent for dissection courses that use cadaver heads imported from other countries during well-established educational events. The Turin meeting was the first in the history of the SINch to be both preceded and followed by dissection courses using injected cadaver heads and temporal bone specimens. The minister's declaration opened the doors to many dissection courses: During the last two-and-a-half years, more than 10 dissection courses were organized in Turin, Rome, L'Aquila, Naples and Como. At the moment, it seems very difficult to organize dissection courses for spine surgery that use cadavers. It is hoped that in the near future the restrictions on the use of cadavers for educational purposes will be lifted, and work toward this goal continues.

With the aim of raising standards in the care of patients and in the training of young neurosurgeons, the SINch recently submitted the following recommendations to the Italian authorities.

1. The number of neurosurgical centers in Italy should be limited.

2. Existing centers should have an adequate number of intensive care unit beds (20 percent), and independent neuroradiology and neuroanesthesia services should be created.

3. Neurosurgical subspecialty services should be encouraged and implemented in neurosurgery departments at the large medical centers.

4. New residency schools should be limited and the existing programs upgraded to European standards; the number of trainees should be reduced.

5. The presence of a consulting neurosurgeon at all local health service clinics should be ensured.

6. The training of nurses should be reorganized to include the development of university courses of diploma for operating room nurses, neurosurgical nursing, and intensive care unit nursing.

These recommendations, if implemented, are expected to significantly strengthen the specialty of neurosurgery in Italy. NS

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Practicing Neurosurgery in

South Korea

HEE-WON JUNG, MD

With a population of 49.2 million and 1,985 neurosurgeons in active service, South Korea has 1 neurosurgeon for every 24,800 people. Since July 1, 1989, the country has been adopting a universal medical insurance system that covers all of its citizens.

Under the National Health Insurance Act, South Korea's medical insurance system administers treatment, medical checkups, treatment expenses and hospital charges. Fees, including those for neurosurgical services, are based on a relative-value point system. As for drugs and treatment material expenses, the government is responsible for setting the ceiling and effecting reimbursement. Patients pay approximately 20 percent of the total medical expenses as their share of the cost, and the rest is covered by government insurance. In case of certain medical examinations and treatment, the medical expenses in their entirety are paid by patients. Medical insurance for patients in the lower income brackets is entirely covered by the state through the medical benefit system. A system of private medical insurance currently is not available.

South Koreans have easy access to a variety of neurosurgical treatments. However, people feel strong resistance to being charged for the cost of treatment, while doctors are very discontent with their level of reimbursement. The problem originates with Health Insurance Review and Assessment Service, which sets the medical fees and determines what constitutes quality medical performance.

Korea's medical delivery system breaks down into primary treatment (public health centers and clinics), secondary treatment (hospitals, general hospitals and general hospitals with specialty) and tertiary treatment (general nursing centers). Currently, about half of all neurosurgeons are practicing in the primary and secondary treatment field, with the rest working in the tertiary treatment area.

There is a general unpopularity for the specialty of neurosurgery among Korean medical students. They consider the training course to be strenuous and out of proportion to the compensation, which is relatively low because the reimbursement for neurosurgical treatment is unrealistically undervalued. The neuro-

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surgical training in Korea consists of a four-year resident course after one year of internship. Neurosurgical residents work approximately 72 hours per week; however, actual time may be far greater depending on the workload of hospitals. Fellowship and its training period are optional after achieving board certification by the Korea Neurosurgical Society.

The increasing amount of medical malpractice litigation is a serious problem in South Korea. The number of medical malpractice lawsuits has increased exponentially, rising to about 8,000 at an average annual rate of 36 percent from 2003 to 2007. While neurosurgery ranked fourth—after obstetrics and gynecology, internal medicine, and orthopedics—with regard to number of lawsuits and amount of legal cost, the legal cost per neurosurgeon than was higher than for all other physicians.

In summary, tough training conditions, relatively low compensation and high risk obstruct recruitment into neurosurgery in South Korea. NS

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Practicing Neurosurgery in

Japan

TAKESHI KAWASE, MD

In Japan, approximately 7,900 neurosurgeons currently serve a population of 127.3 million, a ratio of 1 neurosurgeon to 16,114 people. Healthcare consumed approximately 8 percent of Japan's gross domestic product in 2001, according to the World Health Organization.

Japanese medical care, including neurosurgery, is completely covered by National Health Insurance alone. The insurance covers 70 percent of the total payment except for premium room charge. The Japanese NHI is often thought to be among the best systems in the world, and it functions well in that it allows those in the lower socioeconomic groups to receive an average level of medical care, including neurosurgery. But the NHI does not allow people to

choose their surgeons or to select advanced medical techniques. Until recently, people did not complain about these limitations because they were generally uninformed about potential choices, in part due to a law that prohibits hospitals from delivering any information regarding medical results. However, recent advances in information technology such as the Internet allow them to compare hospitals, surgeons and treatments, and this has negatively impacted patients' level of satisfaction with the NHI.

In addition, the NHI faces two major economic threats. The first is the increasing expense related to recent advances in medical technology, such as intracranial stents, navigation surgery, and intraoperative neurophysiological monitorings, for which the NHI excludes payment. Patients who require these techniques must pay all related medical fees themselves because additional payment to cover them has been prohibited by law for patients using the NHI. The original intent of this law was to protect the NHI system, but it has limited patient choice and delayed medical advancement. The second economic threat to the NHI is low physician reimbursement. For example, a neurosurgeon will receive the same fee for operating on either a large skull base meningioma or a small convexity meningioma. The hospital payment to neurosurgeons is equal to that of dermatologists or ophthalmologists. The NHI system has been supported in part by doctors' self- sacrifice and willingness to work with relatively low payment, in the spirit of Samurai, but this spirit, which characterizes my generation, threatens to disappear in those who are training today. Given these challenges, it may be time to reconsider the NHI system. I anticipate that private insurance will become an option for people in the near future.

Neurosurgical training in Japan lasts four years, and trainees work an average of 85 to 90 hours per week. The number of qualified medical students aspiring to neurosurgery, and to other demanding specialties such as cardiac surgery and obstetrics, is decreasing. The main reason relates to reimbursement, or, more specifically, to the low fees and the comparatively high demands on neurosurgeons. The physician fee system is not present in Japan, and young physicians cannot justify the sacrifice of their private lives without commensurate compensation.

Malpractice litigation in Japan still occurs less

frequently than in the United States, and a Japanese neurosurgeon's annual payment for medical liability insurance is only $500 for $1.8 million dollars of coverage. However the number of malpractice lawsuits in Japan is increasing, doubling in the last 10 years, and the fee for medical liability insurance no doubt will increase in the near future. Interestingly, the Japanese government recently increased the number of law school admissions, a troubling choice to those who have observed the relatively high number of U.S. lawyers compared to U.S. doctors and the frequent occurrence of medical malpractice lawsuits in the United States. NS

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Practicing Neurosurgery in

Switzerland

HELMUT BERTALANFFY, MD,
AND NICOLAS KOECHLIN, MD

The Swiss healthcare system is one of the world's most extensive with respect to its availability of care for the general population and its expense relative to gross domestic product. A 2005 study by the Organisation for Economic Co-operation and Development found that the Swiss healthcare system is funded with about 11 percent of the nation's GDP. In net figures this corresponds to approximately $48 billion.

This financial burden is distributed among three collectives: Private households (66 percent, mostly through mandatory healthcare insurance), the state (27.3 percent, direct and indirect subsidies deriving from tax earnings) and private enterprises (6.7 percent, mostly through payments to mandatory funds covering accident insurance, and pensions for elderly and disabled individuals).

Health insurance is mandatory for every citizen in Switzerland. Public funding provides partial or full subsidies, depending on an individual's ability to fund his or her own insurance. Therefore, every citizen is eligible for treatment in one of Switzerland's publicly operated hospitals. There are 12 public hospitals that offer cranial and/or spinal neurosurgical care, and among these are five university hospitals in Basel, Bern, Geneva, Lausanne and Zurich.

In addition to these centers, there is wide availability of private inpatient clinics and privately operating doctors (52 individuals in 2007), who mostly focus on spine surgery. In 2007, the Swiss Medical Association listed 105 neurosurgeons as medical specialists, leading to a ratio of 1 neurosurgeon per approximately 71,400 inhabitants.

There are no direct figures that reliably indicate the Swiss public's satisfaction with the delivery of medical care in general and neurosurgical care in particular. Yet in 2002, a survey by the Federal Office of Public Health found that 85.8 percent of the interviewed individuals (16,141 permanent residents older than 15) felt their state of health to be "good" or "very good." The relationship between this subjective perception and the quality and availability of medical care in Switzerland remains open for discussion.

After graduation from university there are no specific entry level tests for further specialization, and the graduation scores are not considered in the allocation of residencies. In many instances applicants for residencies in neurosurgery are advised to acquire basic surgical skills in general surgery or to gain experience in a closely related discipline like neuroradiology prior to their engagement as a resident in neurosurgery.

The legal system in Switzerland differs quite substantially from the legal system in the U.S. With respect to medical practice it is most notable that the term "punitive damage" has no equivalent in Swiss courts. What an aggrieved party might expect as an indemnity for damages is in fact quite narrowly defined. Additionally state liability laws basically devolve the liability of a medical practitioner in a public hospital unto the state itself, and the state is made liable for its civil servants (the doctors) and their actions. It is therefore quite safe to say that a neurosurgeon's life in Switzerland can be relatively free of legal hassles and the astronomical costs of insurance to prevent them. NS

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Practicing Neurosurgery in

Germany

MANFRED WESTPHAL, MD,
AND MANDA J. SEAVER

While Germany spends less than 11 percent of its gross domestic product on healthcare, 100 percent of the population—20 percent of which is older than 65, compared to 12 percent in the U.S.—has health insurance coverage.

Everyone in Germany is required to carry healthcare insurance, and about 90 percent of residents are covered by the public system. Participants in the public system pay "sickness funds" a percentage of their salaries that is offset by employer contributions; the government pays the premiums for those who are unemployed or who otherwise cannot afford it. About 10 percent of the population is covered by private insurance. This healthcare system has been instituting significant reforms since the early 1990s, and additional reforms will become effective in 2009.

With approximately 800 neurosurgeons and a population of 82 million, Germany has approximately 1 neurosurgeon per 102,500 people. In most areas there is ample neurosurgical coverage, but in the east and in rural areas there are open staff positions. Approximately two thirds of the neurosurgical recruitment advertisements published in medical journals are for staff positions in these areas. If all of these vacancies were filled, it is likely that patients who need neurosurgery would get their operations sooner—within a week to 10 days—and emergency call schedules would be eased for neurosurgeons already working in those areas.

Neurosurgery remains an attractive specialty in Germany, but there are two concerns that may impede its appeal in the near future. The administrative burden for a neurosurgeon is onerous: Perhaps 50 percent of a neurosurgeon's time is spent on administrative responsibilities such as coding and other tasks not involving patient care. Of perhaps greater concern is the limited pay. An international ranking of physicians' pay published in Der Spiegel magazine in 2006 showed German doctors at the bottom, below their colleagues in other European countries as well as those in the U.S. and Australia. Physician pay in Germany increased by 10 percent after physician strikes in 2006, but the dissatisfaction with pay remains, as was evidenced in September by protests for higher physician pay and increased hospital funding. Neurosurgery is a hospital-based specialty, and most neurosurgeons are salaried employees of hospitals. Neurosurgeons, like most physicians, see private patients to supplement their income.

These concerns are likely to negatively influence the recruitment to neurosurgical training programs in the future. This problem is compounded by the fact that approximately 70 percent of medical students are women, to whom other specialties have appealed more than neurosurgery. Roughly one third of all neurosurgeons in Germany, including those already certified and those in training, are women.

The neurosurgical training program lasts six years, and trainees work 40 to 48 hours or 50 to 66 hours per week, depending on state and local hospital arrangement. Providing adequate training within the prescribed time frame remains a challenge.

Despite these challenges, neurosurgeons are able to practice in an environment that is relatively free of medical liability concerns. Medical liability insurance premiums are lower than in the U.S. When a mistake clearly has been made, such as with wrong level surgery, there is immediate conversation with patient and the patient is reimbursed. When there is an unresolved dispute, the patient and lawyer bring the case to unbiased referees. Generally, there is compensation if a mistake has been made, but the success rate for these cases is very low. Most patients have a realistic expectation for neurosurgery, and the majority of claims hinge on poor physician communication during the consent process.

There is much to recommend the German healthcare system, and the population, including patients and physicians, is generally satisfied with the overall

quality of the system. However, the system only works well when costs are contained. In addition to the previously mentioned demand for physician payment that is commensurate with the level of services delivered, advancing technologies and new drug therapies threaten to greatly increase the healthcare budget.

For neurosurgery in Germany, the greatest challenges involve training neurosurgeons while complying with the work hours limitations, and adapting to increasing subspecialization. The transition from generalized neurosurgery to subspecialization in spinal surgery—which on its way to becoming its own specialty—neurooncology, peripheral nerve, vascular, and functional neurosurgery requires certification, among other adjustments, but it often is difficult for neurosurgeons in a particular setting to obtain the number of hours required for certification in one of these areas. NS

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Practicing Neurosurgery in

Sweden

TIIT MATHIESEN, MD

The approximately 180 neurosurgeons in Sweden serve a population of 9.2 million people, a ratio of 1 neurosurgeon to 50,000 people. One fourth of the neurosurgeons are retired and one tenth are female. The approximately 100 individuals active in neurosurgery typically work in one of six university centers.

These university centers are distributed throughout the country and cover a designated catchment area that serves between 800,000 and 1.8 million inhabitants. The catchment areas are overseen by county councils that organize and supply healthcare. Hospital and outpatient care is thus primarily financed through taxes, and the patients themselves only pay a minor fee per hospital day or for outpatient consultation. By law all citizens are guaranteed access to equal and good healthcare.

A large part of the population is satisfied with the Swedish healthcare system, and there is a general feeling that it is reliable, accessible and of high quality. Although private insurance is becoming increasingly popular, it is still rare and expensive. Private insurance is not valid in the general hospitals and, because difficult neurosurgical cases are sometimes handled outside of Sweden, private insurance would need to cover this care.

With the general availability of neurosurgical care, private facilities cannot provide competitive alternatives for cranial surgery. However, four or five private hospitals offer spinal surgery and some of the neurosurgeons work there full- or part-time. The development of spinal surgery outside of university neurosurgery is fairly recent. The patients utilizing private facilities may be covered by private insurance or pay out of their own pockets. County councils also may cover patient expenses in private facilities if they have decided to purchase care from external producers or if their own hospitals are unable to provide care within a reasonable time frame. By law, patients should not have to wait more than three months for surgery, but in practice waiting lists for nonurgent tumor surgery, pain, cervical stenosis and vascular problems may extend well beyond this limit.

Still, trauma, stroke and tumor patients are admitted to neurosurgical wards as urgently as needed.

For most people, contact with neurosurgery is pro-

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vided via their general hospitals; usually their treating physicians consult with the physicians at a regional neurosurgery center to recommend further workup or treatments. The patients are then admitted to neurosurgery centers, treated, and returned to the local hospitals as soon as possible. The number of neurosurgical beds is limited (Sweden has the fewest in Europe). It therefore is often very difficult for neurosurgeons, and for all hospital specialists, to admit patients.

Naturally, treatment traditions may vary among different regions. For example, metastases may be treated very aggressively or not treated at all, radiosurgery is not readily offered for acoustic tumors at all centers, and follow-up and radicality of meningioma treatment varies. Additionally, it is comparatively easy to terminate or withhold treatment in Sweden.

While patients theoretically have the freedom to choose their caregivers, it is frequently difficult to exercise this freedom because many regions refuse to send patients elsewhere for treatment. Patients usually do not ask for second opinions or to be transferred, and they typically are satisfied with their treatment. However, an increasing number of educated patients seek information via external sources or personal contacts, and the demand for choice appears to be slowly increasing.

The public system, which frequently provides very high quality care to the taxpayers, increasingly is encountering problems with accessibility. There is a general feeling that the society cannot support all demanded healthcare and that priorities must be established. All medically indicated treatments cannot be covered by the county councils, but whether the public will accept the concept of out-of-pocket payment for care that is not provided free is uncertain.

As I see it, access to neurosurgical care, to outpatient care, to be able to choose one's own surgeon and the feasibility of obtaining a second opinion are the major problems of neurosurgical care in Sweden. The practice of neurosurgery may be at risk of becoming too depersonalized and aimed at treating patients expeditiously rather than at optimizing and individualizing treatment. Possible developments are a higher degree of private insurance to decrease delays in treatment, acceptance of private insurance coverage in public hospitals, or maybe even increased practice of in- and outpatient neurosurgery outside of the large university centers.

Neurosurgery is a very demanding speciality also in Sweden. The hours are comparatively long, work is difficult and salaries are similar across all specialities: An experienced neurosurgeon has a basic salary that is similar to that of a newly qualified general practitioner. While work hours per day are long, the total hours at work per week are restricted to 48. Neurosurgeons also are free on the days before and after a night-duty shift. Further, Swedish vacations are comparatively long: Most neurosurgeons are on summer holiday for four to five weeks, and they also need to take several weeks off to compensate for overtime.

Neurosurgery seems to attract students who are ready to invest time and who can handle the difficult issues and rapid decisions associated with the specialty. Medical students who enter neurosurgery cannot be compared easily with those in other specialities because Swedish medical schools grade students on a pass/fail basis. Neurosurgical trainees typically work 40 hours per week, excluding emergency call (averaged over the course of a year, call duties can add up to eight hours to a trainee's workweek), and the training program lasts for a minimum of five years.

In case of unexpected complications and bad outcomes, all patients are covered by insurance without having to prove malpractice, but it is quite difficult to get compensation and the levels are low. Even so, medical malpractice cases are extremely rare. It is generally felt that this system functions well, but critics say that without such a pressure on both hospitals and individuals to always provide the best quality care, medical practice may sometimes deteriorate.

As in every system, being a neurosurgeon in Sweden has its pros and cons. It is a fascinating speciality, it can be practiced at a high level, the population has general access to excellent neurosurgery and the working hours allow for the practitioner's good quality of life. **NS**

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Practicing Neurosurgery in

United Kingdom

MICHAEL POWELL, FRCS, FRCP

In the U.K. neurosurgery is based in National Health Service hospitals that are funded by income tax and thus are free to all U.K. residents. There are 34 neurosurgical units and for the most part, each of the 240 consultant

(fully trained) neurosurgeons practices in only one hospital within the NHS. An NHS position is salaried, although there are some incentive-pay supplements.

Given that the U.K. population is 60.9 million, the number of trained neurosurgeons is one of the lowest per capita in the developed world: 1 neurosurgeon per 254,063 people. Despite a government strategy that foresees healthcare delivery provided directly by fully trained surgeons, the U.K. is well short of the ideal minimum of 360 neurosurgeons suggested by the Society of British Neurological Surgeons. European law restricts working hours, adding to the strain on the U.K. neurosurgical workforce. It may be inevitable that a significant increase in the number of neurosurgeons is initiated within the next year.

Selection into university for medicine is directly from high school graduation and demands the highest grades. Of those graduates selected into neurosurgery, the majority choose neurosurgery by the end of their undergraduate years, to which many choose to add an extra year in neuroscience. Currently, neurosurgery appears to be attracting highly motivated and well-qualified young doctors. However, despite reduction in on-call hours, surgery in general and neurosurgery in particular is failing to attract women—who represent 60 percent of medical school graduates—in significant numbers.

Postgraduate training in medicine is undergoing radical change in the U.K. Recently taken over by a government committee from the medical and surgical Royal Colleges, arrangements are in a state of flux. Currently, medical school graduates enter a two-year probationary period of which a four-month module of neurosurgery is very occasionally included. Neurosurgical training starts after this and takes eight years. Trainees currently work an average of 56 hours per week, a number that soon will be reduced to 48. Annual assessments and two exams certify successful applicants as Members of the Royal College of Surgeons then as Fellows of the Royal College of Surgeons (Surgical Neurology).

The public's access to medical care has been speeded considerably by recent government changes. All nonemergency care must be provided within 18 weeks, counted from the initial referral by the family practitioner, who is the gateway to nonemergency care, to initiation of definitive treatment. However, 60 percent of neurosurgical cases are urgent.

There is a significant but small private healthcare sector running parallel to the free NHS service. Depending on geographical area, between 7 percent and 20 percent of the population has private health insurance for the purpose of speeding access to trained specialists and time to treatment. Most neurosurgeons have a small private practice in terms of patient numbers; the fees generated significantly supplement their NHS salaries. At some NHS hospitals, hospital management encourages private practice and there are wards for fee-paying patients.

Malpractice insurance is related to type of practice and age. Surgeons who have no private practice are covered by Crown Indemnity. There are virtually no surgeons practicing exclusively in the private sector, with the exception of a few after their retirement from the NHS, usually in their 60s. The cost of private malpractice insurance for neurosurgeons is related to net private fees per annum, but premiums remain significantly below those in the United States. Indemnity insurance for surgery is not extended to those over age 70.

Medical litigation has steadily increased in the last two decades. However, because cases are held in the High Court by senior judges and without juries, and with strict reforms in litigation rules, the situation does not dominate U.K. medical practice. Furthermore, lawyers paid by contingency fees are not permitted. Poor litigants are funded by the Legal Services Commission. **NS**

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James W. Holsapple, MD, and Lawrence S. Chin, MD

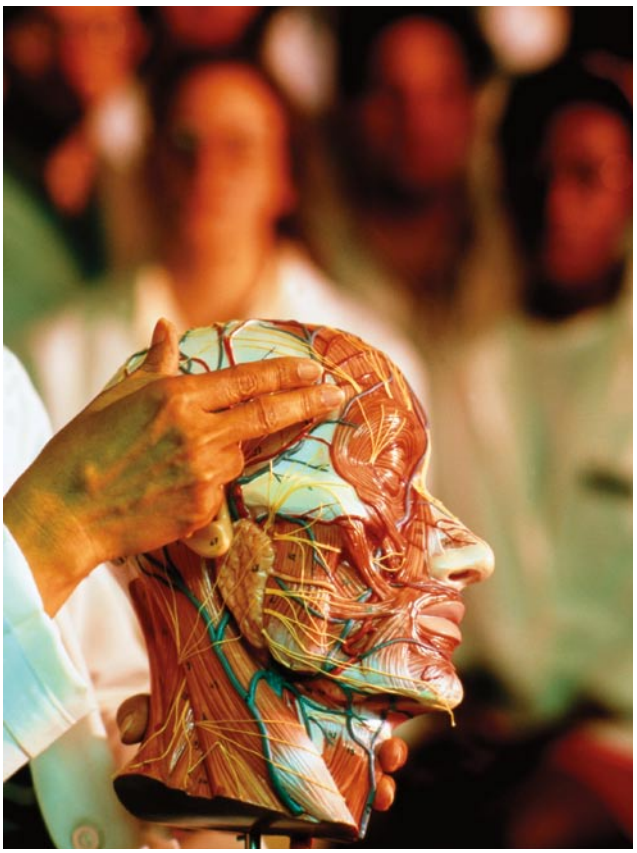
Neurosurgical Training in the U.S. and European Union

Toward a Worldwide Standard

In the U.S., the recent restrictions of resident work-hours have resulted in significant changes to neurosurgical training programs. Given the possibility of additional work hour reductions, it is instructive to examine European training programs, which already have experienced many of the changes potentially facing U.S. programs.

Despite the recent development and approval of the European Training Charter in neurological surgery, it remains difficult to make direct comparisons between U.S. residency programs and those in Europe. Training programs and standards for acquisition of a certificate of completed training, CCT, vary significantly between EU member states, and it is not useful or accurate to speak of a "typical" European neurosurgical residency. It is possible, however, to make some broad comparisons and to contrast neurosurgical training standards in the U.S. with those approved in 2007—but not yet universally adopted—by the European Union of Medical Specialists, UEMS, Section of Neurosurgery.

With the approval of the European Neurosurgical Training Charter, it is possible that training programs worldwide will converge to a recognizable standard.



Before beginning neurosurgical training, residents in both the U.S. and the U.K. must complete a formal program of postgraduate training. In the U.S., trainees complete a required internship year that has increasingly come under the control of program directors and that requires exposure to elements of general patient care. In the U.K., trainees must complete a similar basic clinical program (two foundation years). Throughout the remainder of Europe, requirements for basic clinical training prior to neurosurgical residency are variable.

As in the U.S., European neurosurgical trainees are recruited and enrolled in a home-base program where most training takes place over nearly a decade. In the U.S., approved residency tracts last six or seven years. In most of Europe, the formal training period is of similar length (five to six years) although many graduates continue a less formal education for an additional two to five years in a non-private, state hospital setting—often at the home-base institution. Neurosurgical residents in the U.K. train for eight to nine years (specialty training, termed STn), after which, like U.S. graduates, they seek positions as independent consultants or fellows.

Like U.S. trainees, European neurosurgical residents obtain the bulk of their training experience at the home-base institution. In some instances (in the U.K. and Germany), trainees must "log-in" thresh-

old numbers of cases across a range of procedures to obtain a CCT, a custom that echoes American neurosurgical Residency Review Committee requirements for program accreditation. Utilization of non-neurosurgical training time during residency varies throughout Europe, although neurology, radiology and laboratory rotations are not uncommon. Interestingly, European training programs, including those in the U.K., have not embraced the American notion of "chief resident," and there is no consistent counterpart of this period of enhanced administrative responsibility outside the U.S.

Certification examinations similar to those administered by the American Board of Neurological Surgery are utilized throughout Europe, although they typically vary in content among EU member states. U.K. trainees at the ST-7 or ST-8 level are required to take the intercollegiate Fellowship Examination in Neurosurgery (written, oral and clinical-practical) to obtain FRCS-SN (Fellow of the Royal College of Surgeons–Surgical Neurology) status. Other EU member states require similar, although country-specific, oral and written certification examinations. In addition, the European Association of Neurological Surgeons, EANS, offers a certification exam that can be taken by EU trainees, although not all member states recognize the results. At present, the UEMS is working on the development of a "standard European examination" that may be more broadly accepted.

Program directors, mentors and trainees in both the U.S. and the EU are confronting stringent and evolving government generated resident work hour constraints. In the U.S., restrictions on the number of hours trainees spend "in hospital" have been imported by the Accreditation Council for Graduate Medical Education from the New York State Health Code and applied across all specialties, including neurosurgery. The current ACGME work hour requirements limit resident in-house activities to roughly 80 hours per week and rigidly define periods of rest. In the EU, enactment of the European Working Time Directive presently limits trainees to 56 hours in-hospital weekly. Allowed to evolve as planned, the EWTD constraints automatically will become more severe in 2009 (48 hours per week with a 15,000 euro penalty for program chairs with trainees in violation.). U.S. bureaucrats are contemplating the adoption of similarly restricted work hours.

With the approval of the European Neurosurgical Training Charter, modeled in part upon the perceived strengths of U.S. and U.K. residency training and certification, it is possible that training programs worldwide will converge to a recognizable standard. Devised by a joint committee of the EANS and the UEMS Section of Neurosurgery, the European Charter outlines parameters for program accreditation and training that are largely consistent with those in the U.S. and U.K. and may contain some improvements. Model programs would be six years in duration (four years of clinical neurosurgery and a minimum of three years at a UEMS member state institution) and would be required to demonstrate periodic progress for individual trainees through log book documentation, training portfolios and case mix and quantity standards set by the EANS and UEMS. The charter also describes a plan for trainee remediation. Certification exams would be prepared and administered throughout the EU by the EANS.

Despite present differences in U.S. and EU neurosurgical training, educators in both regions face similar challenges and evolving constraints. Adaptation and improvement may lead us to common ground. **NS**

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Gregory J. Przybylski, MD

Coding Combinations Leave Coders in Doubt

Perplexing PLIF

Having received several denials of payment after billing for spine surgery, a reader recently requested clarification about the appropriate use of lumbar discectomy and decompression codes when also performing a posterior lumbar interbody fusion, PLIF. The specific Current Procedural Terminology codes involved are 22630 with 63047, and code 22630 with 63030.

Both private and governmental payers are more closely scrutinizing coding combinations for potential overlap, and unfortunately a simple method of correctly coding them does not exist. However, payers unilaterally can choose to bundle certain procedures, and CPT rules and Relative Value Scale Update Committee vignettes and surveys can serve as a basis for making these decisions.

The CPT descriptor for code 22630, PLIF, summarizes the procedure as an arthrodesis performed using a posterior interbody technique that includes laminectomy and discectomy to prepare the interspace at a single level. The descriptor was revised with an editorial change a number of years ago to include the parenthetical "other than for decompression," reflecting the possible performance of laminectomy or discectomy for decompression in addition to the PLIF. The National Correct Coding Initiative Coding Policy Manual for Medicare Services under most circumstances bundles with PLIF 22630: lumbar discectomy 63030; lumbar laminectomy without facetectomy 63005 (one or two levels); 63017 (more than two levels); Gill laminectomy 63012; and lumbar laminectomy with facetectomy 63047. A prior NCCI edit bundling PLIF 22630 with posterolateral lumbar fusion 22612 was reversed after an appeal was made to the contractor managing the NCCI process. Last year, a Blue Cross and Blue Shield carrier in the Midwest published an advisory regarding bundling the decompression code 63047 with PLIF, citing the NCCI Coding Policy Manual as well as the American Academy of Orthopedic Surgery Global Service manual. Since the descriptor for PLIF specifically addresses the work of laminectomy and discectomy for performing the PLIF, it is important to analyze the vignette that more completely describes the clinical setting for which PLIF was valued.

The "typical patient" vignette that was the basis for valuing 22630 at the most recent Relative Value Scale Update Committee meeting involves a middle-aged man with prior discectomy and posterolateral fusion who has pseudoarthrosis, intractable back pain, and minimal signs of nerve root dysfunction. The surgical work includes previous operative site exposure to the facets with removal of scar tissue; extension of the prior laminectomy as well as medial facetectomy; nerve root mobilization from surrounding tissues, including scar tissue; removal of cartilaginous endplates; and insertion of graft material. This procedure is performed bilaterally in sequence. Graft harvest and spinal instrumentation are considered possible separate additional procedures. Based upon the surgical work involved, a significant portion of laminar, facet, and disc removal are considered components of PLIF.

However, the typical patient does not have signs of nerve root dysfunction. If symptomatic nerve compression is present and treated, how does one categorize the surgical work? Sometimes, the tissue removal needed to perform the PLIF safely also decompresses the spinal canal and lateral recesses. For example, the bilateral threaded cage or bone dowel technique necessitates complete or near complete facetectomy with significant mobilization of the thecal sac and nerve roots, leaving no additional bone or other tissue to remove for decompression. The difficulty in categorizing this work lies in the variety of ways that interbody fusions are currently performed. For example, a unilateral transfacet approach can be used for a posterior interbody technique. While this technique does not require any tissue removal on the contralateral side, it also reflects a reduced service from the PLIF procedure, which was valued as a bilateral approach. It obviously is difficult to summarize every clinical variation in a single CPT code. Since a nearly total discectomy is

necessary for preparing the interspace for arthrodesis, one can infer that posterior lumbar discectomy 63030 and re-exploration discectomy 63042 would be included in PLIF 22630 under nearly all circumstances. Similarly, medial facetectomy (63012 and 63047) and laminectomy (63005 and 63017) to expose and mobilize the traversing nerve root (and perhaps the exiting nerve root) also typically would be included in the work required to perform a PLIF. These exposure and disc space preparation activities incidentally and concurrently result in decompression of the spinal canal and nerve roots.

Despite the typical inclusion of these decompressive procedures in PLIF, there may be clinical circumstances in which symptomatic compression exists lateral to the exposure needed to perform the PLIF. For example, an extraforaminal compression of the exiting nerve root would require exposure and tissue removal solely for the purpose of decompression. Since there are circumstances that require additional decompression beyond what is already required to perform a PLIF, the NCCI system allows for use of bundled decompression codes by applying modifier –59 to demonstrate the distinct surgical site in which the decompression is performed.

The coding combinations for decompression and PLIF have been the source of confusion and numerous questions over the past decade. Revision of the single CPT description of PLIF to reflect the variety of techniques and technological advances that have evolved to perform this procedure has been considered. However, the evolution of CPT and the valuation of procedures by the Relative Value Scale Update Committee are lengthy and unpredictable processes that are unlikely to simplify this area of coding confusion in the near future. **NS**

Gregory J. Przybylski, MD, chair of the AANS/CNS Coding and Reimbursement Committee, represents the AANS on the American Medical Association's Relative Value Scale Update Committee. He instructs coding courses for the AANS and for the North American Spine Society. He is a member of the Practicing Physicians Advisory Council to the Centers for Medicare and Medicaid Services, and he is a consultant to United HealthCare and Humana Inc.

K. Michael Webb, MD

Reaching Potential Patients on the Internet

How To: Search Engine Advertising

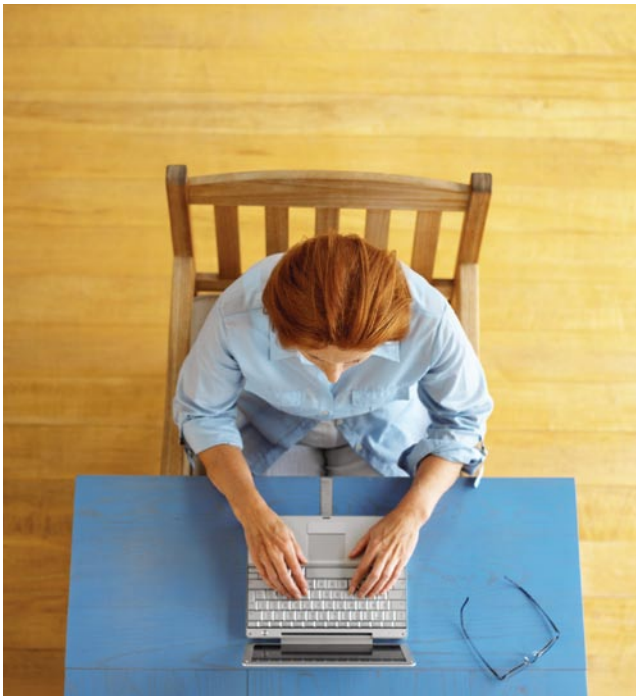
Advertising via traditional media—print, radio and television—is expensive and perhaps unseemly for a neurosurgery practice. But the Internet is a different story. Patients today frequently use the Internet to find information about neurosurgical procedures and specialists rather than solely trusting the opinion of their primary care physicians, and most practices have Web sites that provide information about themselves and their practices. Many Internet search engines offer advertising programs that will feature a Web site prominently within search results related to neurosurgery, and these programs can be a cost-effective means of informing patients about you and your practice in today's healthcare market.

Setting Up an Ad Campaign

While several search engines offer similar offerings and setup, the following example describes the creation of a Google AdWords advertising campaign.

First, set up an account from the Google Web site and then, through the account, access the Google AdWords link. The first step in creating a campaign is to write the ad. An important principle is to differentiate your practice from the competition. Is there some sort of service your practice provides that is unique? Do you have an additional level of training, such as a fellowship, in a particular area? In addition to a brief informational statement, the ad should also clearly state the name of your practice, telephone number, and Web site address.

The next step is to choose the keywords or search phrases under which you would like your ad to appear, being as broad or specific as you like. You also can choose negative keywords that specify the content with which your ad specifically will not appear. To help with picking keywords, the software can provide an estimate of the traffic that a particular keyword receives, and there also is an expansion tool that suggests related keywords. You will be charged every time someone clicks on your ad, so keep in mind that you want your ads to target people who actually need your services. For example, although headache can be a symptom of a brain tumor, you probably do not want patients with migraine headaches to click on your ad; therefore, "headache" would not be an optimal keyword, but you might consider using it as a negative keyword.



Lastly, determine a budget. Pick the maximum amount you would like to spend, and then determine your cost-per-click, or CPC, which is how you will be charged. Google AdWords works as an auction: The higher the CPC, the more prominently and frequently the ad will be displayed. You can choose your CPC yourself or let Google optimize your CPC based on your budget and estimated traffic.

Monitoring Ad Performance

Ideally, your advertisements actually will bring patients to your practice. Google has a number of reports and optimization tools to determine if that

in fact is what your ad is accomplishing. Two of the most useful tools are the Campaign Performance and Keyword reports. The Campaign Performance report details the number of times your ad appears, or "impressions"; the number of clicks on your ad; and the average CPC. The Keyword report helps to determine which search phrases are generating the most impressions and clicks on your ad so that you can better determine which keywords to eliminate and thus increase your CPC and ad prominence.

You also should make some attempt to determine your conversion rate, or the rate at which a click on your ad results in a patient in your office. Google offers a conversion rate tool, which reports the number of times someone who clicks on your ad also performs a specific action on your Web site, such as clicking a "Request an Appointment" button. Or, you might specifically ask patients not referred by a physician how they became aware of your practice. Either way, the goal is to divide the revenue generated by patients you see as a result of your ad by the costs of running the ad, which gives you the return on your advertising investment.

Lastly, remember that your ad is likely only to send patients to your Web site. It follows that you should critique your Web site and optimize it to drive patients from the Web site to your office. One of the best ways to do this is by a call to action, such as a prominently displayed "Request Information" or "Request an Appointment" button.

In summary, Internet search engine advertising can be a cost-effective way to market your practice in this age of increased competition and choice. As with all business investments, planning carefully, tracking your results, and calculating your return on investment are essential to success. NS

K. Michael Webb, MD, is a founding partner with NeuroTexas PLLC, Austin, Texas, and an executive medical director of the NeuroTexas Institute at St. David's HealthCare. The author reported no conflicts for disclosure.

What's the Top Concern for Neurosurgeons in the Next One to Five Years?

Medicare Reimbursement

In late August, the *AANS Neurosurgeon* asked members of the AANS who are practicing neurosurgeons to select the most critical healthcare issue for neurosurgeons in the next one to five years. The top concern, Medicare reimbursement, was selected by 35 percent of respondents. Medical liability reform ranked second, (24 percent), followed by uninsured and underinsured patients (21 percent). Unfunded mandates (10 percent) ranked a distant fourth, followed by "other" (four percent) and then workforce—defined as the ratio of practicing neurosurgeons to patients—and research funding, which were tied at 3 percent.

When asked to rank each concern by severity, medical liability reform (68 percent) outranked Medicare reimbursement (63 percent) as a "critical" concern, followed by uninsured and underinsured patients, which was selected as a critical concern by 49 percent of respondents (see table). "Important" concerns included unfunded mandates (49 percent), research funding (44 percent) and workforce (41 percent). Half of respondents said that electronic medical records were of some concern.

Survey participants were given the opportunity to comment on these pressing issues, and 29 percent responded. Responses will be available in the online edition at www.aansneurosurgeon.org.

Methodology and Demographics

Randomly selected neurosurgeon members with e-mail addresses were asked to participate in this online survey. Residents and fellows were not included in the pool surveyed. Invitations were successfully sent by e-mail to 299 individuals, and 68 neurosurgeons participated in the survey for a response rate of nearly 23 percent. Most respondents were between the ages of 46 and 55 (40 percent), followed by those in the age ranges of 56 to 65 (31 percent), 35 to 45 (22 percent), 66 and older (6 percent) and under 35 (1 percent). Most respondents were in full-time academic practice (35 percent) followed closely by those in private practice (34 percent). Other respondents were in private practice with academic affiliation or appointment (15 percent), hospital employees (12 percent), or other (4 percent). No respondents were employees of the federal government. NS

Random Sample, a new, regular feature of the *AANS Neurosurgeon*, engages AANS members to assess their views on a topic of current interest.

EACH ISSUE RANKED BY SEVERITY

Issue of Concern	Critical (%)	Important (%)	Of Some Concern (%)	Inconsequential (%)
Medicare Reimbursement	63.2	36.8	0	0
Workforce—Ratio of Practicing Neurosurgeons to Patients	16.2	41.2	35.3	7.4
Uninsured and Underinsured Patients	48.5	33.8	14.7	2.9
Medical Liability Reform	67.6	27.9	4.4	0
Research Funding	10.3	44.1	35.3	10.3
Unfunded Mandates	22.1	48.5	25	4.4
Electronic Medical Records	2.9	27.9	50	19.1

INSIDE Neurosurgeon

News of Neurosurgical Organizations

Inside Neurosurgeon focuses on the news and views of the AANS and other neurosurgical organizations. A sampling of this section's content is listed at right. The *AANS Neurosurgeon* invites submissions of news briefs and bylined articles to Inside Neurosurgeon. Instructions for all types of submissions to the *AANS Neurosurgeon* are available at www.aansneurosurgeon.org.

AANS President's Perspective

Politics, Healthcare Reform and the Future of Neurosurgery: Tides of Change

James R. Bean, MD

In a presidential election year, longstanding policy conflicts float to the surface of the American political debate. It is a time of constitutionally planned instability in American governance, when policy principles are argued anew, ambitions flourish, rhetoric runs high, hopes soar, and aims are redefined. Candidates' platforms expose the ideological gulfs that divide American political thought, and elections pose the chance for the world's most successful democracy to devise anew its priorities and revise its direction for another four years.

Healthcare reform is again on the national agenda. Over the course of the past 75 years, healthcare reform reached a level of serious policy discourse in the administrations of Franklin Roosevelt, Truman, Johnson, Carter, and Clinton, each a Democrat. From the liberal perspective, healthcare reform embodies an unrealized quest for universal healthcare coverage, while from the conservative perspective it constitutes another run at socialized medicine. It invariably resurrects for public discussion the principles of individual entitlement and federal regulation versus individual choice and responsibility through market competition.

Healthcare Reform: A Recent History

Two legislative events in particular serve as examples of a political process that produces successful federal healthcare legislation in the post-1966 Medicare era. After the Clinton Health Security Act sank under the weight of intense political opposition in 1994, a more modest healthcare coverage goal was achieved in the 1997 bipartisan SCHIP legislation that expanded coverage to children who didn't qualify for Medicaid. In 2003 the Senate Finance Committee crafted a bipartisan bill, the Medicare Modernization Act, which among others things expanded Medicare to include pharmacy benefits. Both bills involved compromise and aimed for limited, not radical, reform.

In 2007 a bipartisan compromise attempt to reauthorize SCHIP and expand the number of children eligible for the program passed by large majorities in both houses of Congress. President Bush vetoed the legislation, stating his opposition to "a step toward government-run healthcare for every American." The veto turned SCHIP reauthorization into a referendum on federal healthcare reform.

Neurosurgery has an interest in this debate. Each piece of major federal healthcare legislation affects, directly or indirectly, the practice of neurosurgery. Public coverage and payment policy is mirrored in private healthcare policy, leaving no one immune to the decisions of federal lawmakers. Additionally, new political entitlements generally mean new federal program costs, commonly enacted without additional tax funding, which means renewed federal sallies to combat costs: fee cuts, bundled payments, coverage denials, and campaigns against fraud that turn billing errors into criminal abuse.

Political High Jinks of Summer

An example of political high jinks occurred in June when Congress attempted to prevent the 10.6 percent Medicare physician fee cut that had been delayed since January. When bipartisan negotiations on a Senate Finance Committee compromise bill broke down over Medicare Advantage payment cuts, Democratic leaders brought bills that included the controversial Medicare Advantage provision to a vote in each chamber of Congress, inviting a presidential veto and creating political embarrassment for legislators opposed to the legislation as well as fodder for campaign leverage in an election year. The bill passed in the House 355 to 59, but failed a cloture vote (which prevents filibuster) in the Senate by a narrow margin. The 10.6 percent cut officially became effective July 1. The Senate returned from the Fourth of July holiday and reversed the cut, buoyed by the applause-stirring, surprise appearance of glioblastoma-plagued Ted Kennedy, with a 69 to 30 vote on July 9. President Bush vetoed the legislation on July 15, but both chambers swiftly overturned the veto by even larger margins: 383 to 41 in the House and 70 to 26 in the Senate. Physicians, spurred by the American Medical Association, celebrated victory as the fee cut was averted.

Three things can be learned from this summer's vote. First, neurosurgery was not and should not be drawn into partisan wrangling. Healthcare legislation arouses strong partisan differences, bitter recriminations and deceptive political bargaining. The physician groups that supported the summer veto override won a Pyrrhic victory without achieving a permanent solution to the flawed sustainable growth rate formula that determines Medicare physician payments—fees remain flat for another 18 months, and 20 percent cuts in physician payments are looming in 2010—and they earned the resentment of the legislators they politically threatened without gaining any real concession from those they supported. This summer's drama will be replayed until the sustainable growth rate formula is replaced by one that fits the reality of medical inflation. The next battle likely will occur in the setting of broader healthcare reform proposals, and Medicare physician payment and other key issues will be used as bargaining chips.

Second, neurosurgery must advocate for its defined principles and political goals without becoming a pawn, useful as a decoy but sacrificed for larger political purposes, for either side on a large political chessboard. We must define policy goals, stick to them, and stay out of the political mud fight. While legislative opponents brush themselves off and tackle

Tommy Thompson (left), a former secretary of the Department of Health and Human Services, and Tom Daschle, President-Elect Obama's nominee for the post, frequently found themselves on common ground at the America's Health Care at Risk conference in September. See page 4 for more information.

the next fight, lobbying groups remain tarnished with the partisanship of the previous battle. A political opponent on today's issue is an ally on tomorrow's measure. Consistency with nonpartisan, principled positions prevents whipsawing between opposing parties and pays off in the long term.

Third, there is no final victory in advocacy. There is only an unending series of negotiations and a continuation of a political quest for compromise that satisfies the needs and budgets of diverse interests and opposing viewpoints today while preserving a process for negotiation and compromise again tomorrow.

Neurosurgery's Stake in Anticipated 2009 Reforms

With the U.S. economy in recession, healthcare consuming 16 percent of the nation's gross domestic product, and a new president taking office in January, we can expect healthcare reform proposals in 2009. They commonly are initiated as grand schemes to overhaul the U.S. healthcare system. Opponents whose interests are threatened by proposed changes use fear tactics and rhetorical exaggeration to publicly combat the measures. Successful proposals are generally those offered as compromise legislative agreements that do not overreach and that see U.S. healthcare reform, in the absence of true (not rhetorical) social crisis, as an incremental rather than revolutionary process.

The goals of neurosurgery are to preserve for all access to specialty care, to offer the best neurosurgical care available to those in need, to preserve professional judgment in healthcare, and to ensure fair compensation for services provided. We must stick to these goals and measure all reform proposals against them. NS

James R. Bean, MD, is the 2008–2009 AANS president. He is president and managing director of Neurosurgical Associates PSC in Lexington, Ky.
The author reported no conflicts for disclosure.

IN MEMORIAM

Carl H. Hauber, JD

First AANS Executive Director Dies at 77

The first AANS executive director, Carl H. Hauber, JD, died on his birthday, Aug. 4. He served as AANS executive director from 1977 to his retirement in 1996. During his 19-year tenure, the AANS received a number of awards for organizational excellence, including the American Society of Association Executives awards for Excellence for Finance and Administration in 1994 and for Excellence for Educational Programming in both 1983 and 1994. The AANS also received the American Medical Association's National Congress on Adolescent Health Award in 1989, and the Professional Convention Management Association's Award for Excellence in Meeting Management in 1994.

He previously served as executive director of the American Dental Hygienists' Association and of

the American Oil Chemists' Society. He was an American Society of Association Executives-certified association executive. A 30-year member of the U.S. Air Force Reserve, from which he retired in 1986 at the rank of colonel, he was decorated with the Legion of Merit, Meritorious Service Medal and Air Force Commendation Medal with Oak Leaf Cluster. He received his law degree from the University of Illinois in 1961.

His family requested that in lieu of flowers donations be sent to the museum he started, the Museum of Military Memorabilia, P.O. Box 112800, Naples, Fla., 34108. A service with an Air Force honor guard was held Aug. 9 at Naples Memorial Funeral Home in Naples, Fla.

FOR FURTHER INFORMATION

- AANS Executive Director Retires, www.aans.org, Article ID 10525

AANS GOVERNANCE

Members Approve Bylaws Amendments

Newly Revised Bylaws Available Online

At the AANS Annual Business Meeting on April 28, several bylaws amendments were presented to the membership. On May 30, ballots were sent to AANS voting members, who were asked to vote on the bylaws amendments. All of the amendments were approved, with between 91 percent and 95 percent of members voting in favor of each issue. Approved changes include: (1) clarifications regarding eligibility for the Associate and Lifetime member categories; (2) name change of the Long Range Planning Committee to the Strategic Planning Committee; and (3) editing of bylaws wording, such as grammar corrections or committee name changes, without a full membership vote and the attendant time and expense. The complete, newly revised AANS bylaws are available at www.aans.org/about/membership/aans_bylaws072208.pdf.

AANS ANNUAL MEETING

Shaping Neurosurgery's Future: A Global Enterprise

May 2–6, 2009, San Diego, Calif.

The 77th AANS Annual Meeting, themed Shaping Neurosurgery's Future: A Global Enterprise, will be held in sunny and inviting San Diego May 2–6, 2009.

Sander E. Connolly, MD, chair of the AANS Meeting Committee, and Vincent Traynelis, MD, chair of the Scientific Program Committee, together with their committee members and numerous others, already have been working to create a landmark meeting that offers relevant and well-researched science complemented by an entertaining and enjoyable social program.

The conference's keynote speaker is Cushing Orator Uwe E. Reinhardt, PhD. A prominent economist and health policy analyst, Dr. Reinhardt delivered a compelling, informative and frequently humorous talk in which he explored the comparatively high cost of the U.S. healthcare system, among other pressing issues, during the socioeconomic session at the 2004 AANS Annual Meeting. This year's presentation, which will be delivered in the first few months of a new president's administration, promises to be particularly relevant.

Dr. Reinhardt, a native of Germany, has taught at Princeton University since 1968. He is currently the James Madison Professor of Political Economy and professor of Economics and Public Affairs.

Uwe E. Reinhardt, PhD

He received his undergraduate degree from the University of Saskatchewan, Canada, in 1964, when he was also awarded the Governor General's Gold Medal as most distinguished graduate of his class. He earned a doctorate degree in economics from Yale University in 1970. His doctoral dissertation, entitled Physician Productivity and Demand for Health Manpower, was subsequently published as a book.

In 1998 the Columbia University School of Nursing honored him with the Second Century Award for Excellence in Health Care. He also has received honorary doctorate degrees from the Medical College of Pennsylvania, Mount Sinai School of Medicine, City University of New York, and from the College of Optometry of the State University of New York.

In 1978 he was elected to the Institute of Medicine of the National Academy of Sciences, serving on the Governing Council from 1979 to 1982. At the institute he has served on a number of study panels, among them the Committee on the Implications of For-Profit Medicine.

San Diego Skyline

Professor Reinhardt has served on numerous governmental committees and commissions. From 1986 to 1995 he served three consecutive three-year terms as a commissioner on the Physician Payment Review Commission. Currently, he is a member of the Council on the Economic Impact of Health Reform. He is also on the Board of Advisors of the National Institute of Health-Care Management, a Washington-based think tank devoted to issues in managed care.

In 1997 he joined the Pew Health Professions Commission and was appointed to the External Advisory Panel for Health, Nutrition and Population of The World Bank. In 1998 he was appointed as commissioner of the Kaiser Commission on Medicaid and the Uninsured. Since then, he has served on the Board of Trustees of the Duke University Health System, and he has chaired the Coordinating Committee of the Commonwealth Fund's International Program in Health Policy.

Dr. Reinhardt has been or is a member of numerous editorial boards, among them the Journal of Health Economics, the Milbank Memorial Bank Quarterly, Health Affairs, the New England Journal of Medicine, and the Journal of the American Medical Association.

Additional information about the 2009 AANS Annual Meeting is available at www.aans.org. NS

WASHINGTON WATCH

Advocating for Neurosurgery

AANS Tackles Imaging Preauthorization and ICD-10 Implementation

The AANS is among 19 signatories of a letter to Congress that expresses concern with the findings of the report, Medicare Part B Imaging Services: Rapid Spending Growth and Shift to Physician Offices Indicate Need for CMS to Consider Additional Management Practices, which was recently released by the Government Accountability Office. The first of two installments, this report advised the Centers for Medicare and Medicaid Services to consider implementing prior authorization, using radiology benefit management companies, RBMs, for imaging services provided to Medicare beneficiaries. According to the letter, which was addressed to the two senators who requested the report, John D. Rockefeller IV, chair of the Senate Committee on Finance–Subcommittee on Health, and Gordon H. Smith, ranking member of the Senate Special Committee on Aging: "Physician members have found that prior authorization through RBMs is an intrusion in the physician-patient relationship and amounts to a large administrative burden for physician practices, particularly small practices, and negatively impacts the quality of patient care." The letter further states that "prior authorization is not effective at enhancing the quality of imaging tests" and concludes, "we do not believe prior authorization is the solution and have significant concern about its negative impact on quality patient care." www.gao.gov/new.items/d08452.pdf

ICD-10 Implementation

The AANS is part of a coalition that has been seeking to delay implementation of the new ICD-10 diagnoses and hospital procedure code system until after 2012. On Aug. 15 the Centers for Medicare and Medicaid Services published a proposed rule, effective Oct. 1, 2011, changing the current ICD-9 coding system to the new ICD-10 system. The ICD-10 is mandated by the Health Insurance Portability and Accountability Act. Doctors will need to use new ICD-10 diagnosis codes, which now number about 155,000 rather than the current 17,000 under the current system. In addition, a separate rule also was released that requires adoption of a new electronic transaction standard, version 5010, by April 2010, which is essential for using ICD-10. The CMS accepted comments on the ICD-10 code sets and on the transaction standards proposed rules until Oct. 21. www.hhs.gov/news/press/2008pres/08/20080815a.html

CSNS REPORT

Communication and Education

CEC Brings Socioeconomic Concerns to the Forefront

Ann R. Stroink, MD

The CSNS functions during the year through committees that address socioeconomic concerns pertinent to neurosurgery. To provide educational materials through continuing medical education offerings throughout the year, the CSNS Communication and Education Committee meets regularly, led by its dedicated chair Michael Steinmetz, MD.

The CEC is responsible for the development and delivery of socioeconomic educational programs. The planning process for the CEC includes topic selection, based on the reported needs of neurosurgeons, and identification of appropriate faculty members to address socioeconomic learning objectives. Abstracts related to pertinent socioeconomic neurosurgical issues are reviewed and selected by members of the CEC.

Additionally, the CEC develops skill-based learning activities for neurosurgeons and their staff members on the topics of negotiation, time and risk management and medicolegal development. These activities address core competencies related to professionalism and systems-based practice, generating material that could be useful for the SANS and ABNS Maintenance of Certification examinations.

The CEC is looking for interested members who attend the CSNS meeting and who are willing to promote education through socioeconomic avenues. They should be able to provide time and talent for reviewing and selecting abstract submissions and promote the creation of publications and informative Web site offerings. An in-depth interview with Dr. Steinmetz concerning the CEC is available at www.csnsonline.org. NS

Ann R. Stroink, MD, is a member of the Editorial/Publication Committee of the Council of State Neurosurgical Societies, www.csnsonline.org. The author reported no conflicts for disclosure.

ADVANCING NEURORESEARCH

NREF Contributors

Jan. 1–June 30, 2008

The Executive Council of the Neurosurgery Research and Education Foundation of the AANS gratefully acknowledges the many individuals, groups, corporate partners and members of the general public who munificently supported the NREF between Jan. 1 and June 30, 2008.

It is important not only to recognize but to show appreciation for their generous support in the last six months of the fiscal year. They understand the growing need for research support and the important role their contributions have in the funding of NREF's annual grants; without their support, the scientific investigations of some of the specialty's brightest researchers would not be funded. These studies have set a high standard in the neuroresearch community, serving as key indicators of our ability to advance science, medicine and technology, while also improving the delivery of quality patient care.

Innovation is possible thanks in part to the donations of AANS members, AANS/CNS sections, NREF Corporate Associates, and grateful patients and their families.

The investment these NREF supporters have made in the future of neurosurgery will reap positive rewards—new advances in the areas of brain tumors, strokes, cerebrovascular disease, stem cell research, biomechanics and disorders of the spine. The outcomes of NREF-funded research projects will translate into medical breakthroughs and longevity of life for the many inflicted with neurological disorders and diseases.

Those supporting the NREF during the latter half of fiscal 2008 are listed below.

Additional information about the NREF, the research it funds, and the process for awarding grants is available at www.aans.org/research.

Gifts of $50,000 and Above

AANS/CNS Section on Cerebrovascular Surgery
DePuy Spine, a Johnson & Johnson company

Gifts of $20,000 to $49,999

American College of Surgeons

Gifts of $10,000 to $19,999

Biomet MicroFixation
Codman & Shurtleff Inc., a Johnson & Johnson company
Porex Surgical Inc.

Gifts of $5,000 to $9,999

Anspach Companies
Hans C. Coester, MD, FACS
Griffith R Harsh IV & Margaret C. Whitman Foundation
Kelly Suzanne Schmidt, MD
The Harold & Mimi Steinberg Charitable Foundation
University of Virginia - Department of Neurosurgery

Gifts of $2,500 to $4,999

Monica W. Loke, MD
Dr. & Mrs. Paul C. McCormick
Charles L. Branch Jr., MD
Drs. Robert Rosenwasser & Deborah August

Gifts of $1,000 to $2,499

Ghanem Al-Sulaiti, MD
Michel W. Andre Kildare, MD
Dr. & Mrs. Nicholas M. Barbaro
Gary M. Bloomgarden, MD
Boston Pediatric Neurosurgical Foundation
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ACS/AANS-NREF Faculty Career Development Award

The American College of Surgeons and the Neurosurgery Research and Education Foundation of the AANS are offering the two-year Faculty Career Development Award to neurological surgeons. The award, cosponsored by the ACS and the NREF, supports an independent research program in an area of neurological surgery. The award is $40,000 per year for each of two years (2009–2011), to support the neurosurgical research.

The award is open to surgeons who (1) are members or candidate members of both the ACS and the AANS; (2) have completed specialty training within the preceding five years; and (3) have received a full-time faculty appointment at an accredited medical school in the U.S. or Canada.

The applications are reviewed by the NREF's Scientific Advisory Committee. The SAC is composed of 12 highly respected and experienced neuroscientists from many of neurosurgery's subspecialty areas. Each year this committee reviews all applications and makes recommendations based on the scientific merit and value of each proposal. Final funding decisions are made by the Executive Council of the NREF and in this case, by the chair of the ACS Scholarship Committee. Funding for NREF-supported research grants is possible thanks to generous contributions from AANS members, hospitals, private medical practices, corporate partners, general public and groups like the American College of Surgeons.

Applicants should provide evidence of productive initial efforts in laboratory research (by publication or otherwise). The award is to be used to support the research of the recipient. It should not replace the usual, expected compensation or benefits. Indirect costs are not paid to the recipient or to the recipient's institution.

The awardee is expected to attend both the AANS Annual Meeting and the ACS Clinical Congress to present reports to the ACS Scholarship Committee and the NREF. The application submission deadline was Nov. 15 and funding will commence for the period of July 1, 2009, to June 30, 2011.

The 2007–2009 ACS/AANS-NREF Faculty Career Development Awardee is Uzma Samadani, MD, PhD, of New York University Medical Center for her project, sonic hedgehog therapy after lysis of intracranial hemorrhage. NS

2008 NREF Grant Recipients

11 New Projects Funded

The Neurosurgery Research and Education Foundation is dedicated to funding research training in the neurosciences and has done so since its establishment in 1981. The NREF ensures the continued viability and expansion of the field of neurological surgery, based on fundamental research in the basic sciences and clinical enterprises relevant to neurosurgery.

Since its inception, the NREF has funded 81 Research Fellowships and 58 Young Clinician Investigator awards. With these grants, some of the nation's most promising neurosurgeons have begun their research careers. The young investigators supported by the NREF are paving the way to finding cures for diseases and serious ailments such as Parkinson's disease, aneurysms, brain tumors, epilepsy, spinal cord injury and traumatic brain injuries. Research related to biomechanics and stem cells have also received support in recent years. The activities of the NREF have been critical to providing the opportunity for neurosurgical scholars to advance the basic understanding of these diseases and improve the quality of patient care. The awards have been made possible through the generosity of AANS members, corporate partners, foundations and associations.

Some of the cosponsored research grants the NREF currently offers are:

- ACS-AANS/NREF Faculty Career Development Award
- NREF/Spine & Peripheral Nerves Section Young Clinician Award
- NREF/American Academy of Neurological Surgery (AAcNS) Research Grant
- NREF/AANS Pinnacle Partners in Neurosurgery Research Grant
- Various corporate supported grants including collaborations with Biomet, Microfixation, Codman, DePuy Spine, Kyphon, and Porex Surgical

This year, the Scientific Advisory Committee reviewed 48 applications and approved 11 individuals for funding, which commenced July 1.

NREF Research Fellows

Rollin Hu, MD, Massachusetts General Hospital
Project: Development of a cerebral-spinal motor neural prosthesis

Rahul Jandial, MD, University of California San Diego Medical Center
Project: Role of MELK in self-renewal of neural progenitors

Betty Kim, MD, University of Toronto
Project: Integrated nano-platform for high throughput multiplexed detection of pathogenic biomarkers in cerebrospinal fluid

Pawel Ochalski, MD, University of Pittsburgh
Project: The effects of modulating GABA receptor activity on neuronal cellular function and behavioral outcomes following controlled cortical impact on rats

NREF/Spine and Peripheral Nerves Section Research Fellow
Timothy Vogel, MD, University of Iowa
Project: HOX mediated development of the human craniovertebral junction

NREF/Codman Research Fellow
Jason S. Weinstein, MD, Oregon Health and Sciences University
Project: Optimization of N-acetylcysteine (NAC) administration for neuroprotection in the experimental rat CNS injury model and investigations into the pathophysiology of posttraumatic hydrocephalus (PTH)

NREF/Kyphon Research Fellow
Daniel Sciubba, MD, Johns Hopkins University
Project: Effects of BMP-2 and BMP-7 on human breast cancer spine tumors using a rat intravertebral tumor model

NREF/Porex Surgical Research Fellow
Suzanne Tharin, MD, Harvard Medical School
Project: Cellular and molecular controls over corticospinal motor neuron segmental specificity of Axon targeting

NREF Young Clinician Investigators
John Kuo, MD, University of Wisconsin, Madison
Project: Identifying molecules that regulate the blood-brain barrier using stem cells
Aaron Dumont, MD, University of Virginia
Project: Inflammatory cytokines and smooth muscle cell phenotypic modulation in cerebrovascular disease

NREF/Biomet Microfixation Young Clinician Investigator Award
Jonathan Miller, MD, Case Western Reserve
Project: Evaluation of six degree-of-freedom control of a virtual upper extremity neuroprosthetic via intracortical vs. surface ECoG electrodes

CALENDAR/COURSES

AANS COURSES

Goodman Oral Board Preparation: Neurosurgery Review by Case Management
May 17–19, 2009,
Houston, Texas

Managing Coding and Reimbursement Challenges in Neurosurgery

Feb. 6–8, 2009,
Las Vegas, Nev.

March 20–21, 2009,
New Orleans, La.

June 26–27, 2009,
Chicago, Ill.

July 17–18, 2009,
Washington, D.C.

Practice Management Workshop
Feb. 8, 2009,
Las Vegas, Nev.

Weekend Update: Interactive Review of Clinical Neurosurgery by Case Management
Feb. 21–22, 2009,
Scottsdale, Ariz.

For information or to register, call (888) 566-AANS or visit www.aans.org/education.

Additional listings are available in the comprehensive and interactive Meetings Calendar at www.aans.org/education/meetings.aspx, where calendar items can be submitted.

January

16-18
CANS Annual Meeting
Jan. 16–18, 2009, Carmel, Calif.
www.cans1.org

17-20
18th Annual Dr. Tom Lowe Spine Symposium: The Surgical Management of Spinal Disorders
Jan. 17–20, 2009, Beaver Creek, Colo.
www.broad-water.com/meetings/surgical-management.html

28-31
American Academy of Pain Medicine 25th Annual Meeting
Jan. 28–31, 2009, Honolulu, Hawaii
www.painmed.org/annual_mtg

30-Feb. 4
Richard Lende Neurosurgery Conference
Jan. 30–Feb. 4, 2009, Snowbird, Utah
www.lendeconference.com/info.php

February

1-5
4th Annual Mayo Clinic International Spine Symposium
Feb. 1–5, 2009, Kapalua, Hawaii
www.mayo.edu/cme/spine

16-17
2009 AANS/CNS Cerebrovascular Section Meeting
Feb. 16–17, 2009, San Diego, Calif.
http://cvsection.org

March

4-7
34th Annual Meeting of the Egyptian Society of Neurosurgical Surgeons
March 4–7, 2009, Hurghada, Egypt
www.esns2009.com

15-18
First World Congress on Spina Bifida Research and Care
March 15–18, 2009, Lake Buena Vista, Fla.
www.spinabifidaassociation.org

15-19
4th Fred J. Epstein International Symposium on New Horizons in Pediatric Neurology, Neurosurgery and Neurofibromatosis
March 15–19, 2009, Eliat, Israel
www.fredhorizons.com

April

15-18
9th European Skull Base Society Congress
April 15–18, 2009, Rotterdam, Netherlands
www.esbs2009.eu

17-22
21st Bethesda Annual International Spine Workshop
April 17–22, 2009, Bethesda, Md.
www.bethesdaspine.com

25-May 2
American Academy of Neurology 2009 Annual Meeting
April 25–May 2, 2009, Seattle, Wash.
www.aan.com

Neurosurgery in Ethiopia: A Review of Current Status, Residency Training and Future Directions

Ashwin Viswanathan, MD, Baylor College of Medicine, Houston, Texas; **Leslie Linehan, RN**, Lehigh Valley Hospital, Allentown, Pa.; **Sarah Woodrow, MD**, University of Toronto, Toronto, Canada; **Mersha Abebe, MD, Abat Sahlu, MD, Zenebe Gedlie Damtie,** MD, and **Tadios Munie, MD**, Addis Ababa University, Addis Ababa, Ethiopia; **Stephen R. Freidberg, MD**, Lahey Clinic, Burlington, Mass.

The authors reported no conflicts for disclosure.

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ABSTRACT

The BLH neurosurgical training program in Addis Ababa, Ethiopia, began in July 2006 fostered by a strong alliance between local leadership and FIENS. Through FIENS, three neurosurgeons volunteered to work at BLH with the program's two residents and faculty. To determine the dominant pathologies presenting at BLH, the authors reviewed the neurosurgical operative registry and the charts of all patients awaiting admission for neurosurgical care. They also evaluated the major infrastructural challenges to the delivery of effective neurosurgical care. In the eight months after the inception of the residency program, 194 neurosurgical cases were performed. Fifty percent of operations were for head injuries. Eleven percent of the operations were for brain masses, and more than half of these were of infectious etiology. A total of 438 adults and 338 children awaited admission for neurosurgical care. The main pediatric pathologies that needed treatment were myelomeningoceles (41 percent), hydrocephalus (29 percent), and encephaloceles (9 percent). For adults, the most common conditions were degenerative spine disease (71 percent) and brain tumors (9 percent). The authors found that the delivery of neurosurgical care at BLH is constrained by limited diagnostic imaging (no in-hospital CT scanner, intraoperative X-ray or ultrasound), equipment needs (power drill, neuroendoscope), and extremely limited operative time. They conclude that neurosurgical care must progress with the development of Ethiopia's healthcare infrastructure and call for active collaboration of the international neurosurgical community for the continued success of the residency program in Ethiopia.

Introduction

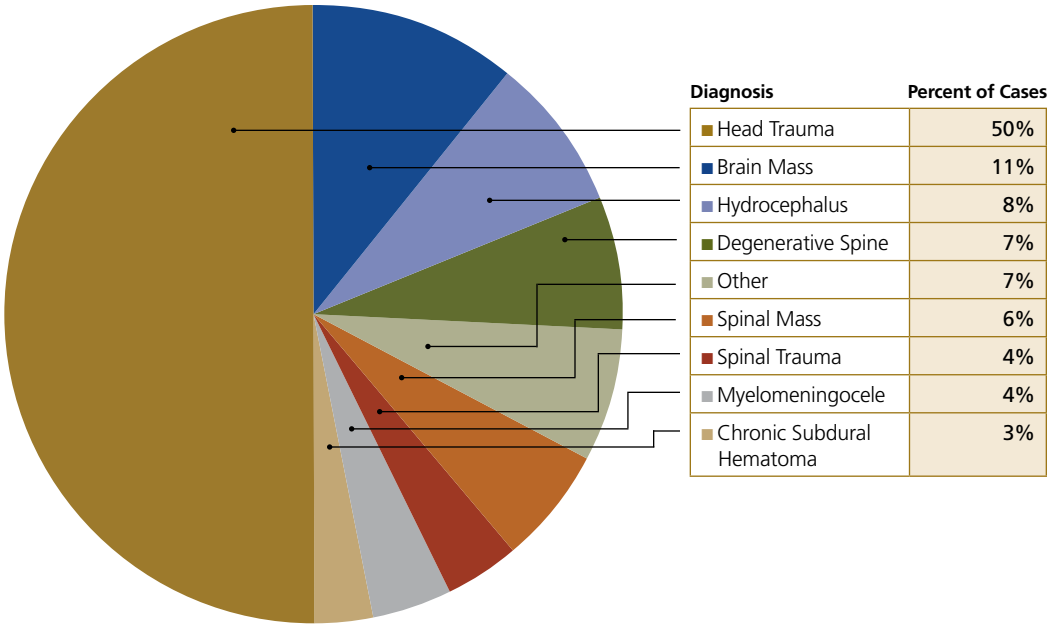
Demand for healthcare in developed nations commonly is perceived as a basic right. However, in developing countries quality medical care remains the luxury of the few. Ethiopia, a nation of more than 70 million people, faces both great challenges and great opportunities in the pursuit of improved national access to healthcare. Of 175 countries Ethiopia ranks 171st in health expenditures per capita and 169th in terms of the Human Development Index, which seeks to quantify the longevity, knowledge and standard of living of a country's population (3). In 2001 annual per capita expenditure on healthcare in Ethiopia was $4.50 compared with an average of $10 in sub-Sahara Africa and $4,500 in the United States (1). In addition to the daunting socioeconomic challenges, the development of medical knowledge in Ethiopia also has been hindered by physician emigration. Approximately 15 percent of Ethiopian physicians now are practicing in the United States, Canada or Australia, with another significant portion serving other portions of Africa and the Middle East (4).

The impact of physician emigration has been experienced by all medical specialties in Ethiopia. Historically, physicians in Africa who were interested in neurosurgical specialization trained abroad. Tadios Munie, who completed his training in the U.K., brought neurosurgery to Ethiopia in 1991. Zenebe Gedlie Damtie, who pursued his neurosurgical training in Cuba, later joined him. Four neurosurgeons currently practice in Ethiopia, caring for more than 70 million residents. This ratio of 1 neurosurgeon per 17.5 million inhabitants is in stark contrast to the approximately 1 neurosurgeon per 338,000 inhabitants in North Africa, and 1 neurosurgeon per 81,000 inhabitants in the United States (2).

Providing quality

FIGURE 1

Neurosurgical Cases Performed at BLH July 2006–February 2007



Diagnosis	Percent of Cases
Head Trauma	50%
Brain Mass	11%
Hydrocephalus	8%
Degenerative Spine	7%
Other	7%
Spinal Mass	6%
Spinal Trauma	4%
Myelomeningocele	4%
Chronic Subdural Hematoma	3%

neurosurgical care directed toward reversible pathologies is an attainable goal for developing countries. FIENS has been instrumental in the development of neurosurgical residency programs, particularly in underserved regions. In June 2006 a neurosurgical training program was initiated in Ethiopia through the strong collaborative efforts of local leadership and FIENS. Under the auspices of FIENS, authors A.V., S.W. and S.F. volunteered in Addis Ababa, participating in all aspects of patient care and resident education.

The immediate goals for the training program include adequately preparing trainees to handle the neurosurgical conditions commonly presented and increasing the access of both rural and urban populations to neurosurgical care. In the longer term, maintaining a training program in Ethiopia may serve to counterbalance the continued emigration of local talent. In this review, we describe the neurosurgical service and residency training program in Addis Ababa and ascertain current needs as well as future directions.

Neurosurgery Service at the Black Lion Hospital

The four neurosurgeons of Ethiopia all are located in Addis Ababa. The rest of Ethiopia is without trained neurosurgical care. In order to be evaluated and treated, patients often must travel more than 300 miles, a nearly insurmountable feat given their generally poor access to transportation, particularly in rural areas.

The general surgery department at BLH encompasses all surgical services with the exception of orthopedic surgery. The workday at BLH begins with a morning report of the general surgery department, during which admissions from the previous 24 hours and cases of patients seen in the outpatient department are reviewed. Hospital rounds are performed before clinic or proceeding to the operating theater. The department averages 15 patients, including those admitted for trauma and neurosurgical consults, children, and those awaiting operative time.

Patients are recommended for admis-

Continues ▶

Abbreviations: AAU, Addis Ababa University; BLH, Black Lion Hospital; CT, computed tomography; EEG, electroencephalography; ETV, endoscopic third ventriculostomy; FIENS, Foundation for International Education in Neurological Surgery; HIV, human immunodeficiency virus; MCM, Korean Myungsung Christian Medical Center; MRA, magnetic resonance angiography; MRI, magnetic resonance imaging; SICU, surgical intensive care unit

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Key Words:
education, Ethiopia, health policy, healthcare, public health, socioeconomic, training

PEER-REVIEWED RESEARCH

▶ Continued

sion to BLH after evaluation in either the outpatient department or in the neurosurgery clinic, where both pediatric and adult patients are seen. The cases from clinic are prioritized as emergent, urgent, or elective cases, and their subsequent admission to the hospital is contingent upon bed availability. Admissions from the outpatient department also are subject to bed availability. It is not uncommon for a patient requiring surgical intervention (including emergent neurosurgical intervention) to be transferred to another hospital due to lack of bed space. If a patient has financial resources to pay for a private room, or has some personal connections to the hospital, the admission process may be expedited.

TABLE 1

Training Objectives for Neurosurgical Residents

Three Months	Six Months	Thirty Months
Application of Mayfield Pins	Craniotomy Planning	Corpus Callosotomy
Carpal Tunnel Release	Dural Closure	Resection of Intradural, Intramedullary Spinal Tumor
Positioning for Cranial and Spinal Cases	Craniotomy Closure	Clipping of Intracerebral Aneurysm
Insertion of External Ventricular Drain and Pressure Monitor	Spinal Wound Closure	Resection of Arteriovenous Malformation
Placement of Burr Holes	Insertion of Ommaya Reservoir	
Microscope Setup and Balancing	Ulnar Nerve Decompression, Transposition	
	Lumbar Spine Exposure to Lamina	

TABLE 2

Demographics and Average Waiting Time for Admission to BLH for Neurosurgical Patients, July 2006–February 2007

	No. of Patients	Average Age, Years (Range)	Average No. of Days (Range)
Adults	438	41 (13–78)	242 (17–871)
Males	272	42 (14–78)	236 (17–665)
Females	166	39 (13–72)	252 (17–871)
Pediatrics	338	1.49 (0–12)	447 (9–1941)
Males	186	1.71 (0–12)	447 (9–1941)
Females	152	1.22 (0–12)	447 (22–1623)

The neurosurgical residency training program began in Addis Ababa in June 2006. The program is supported by BLH, the only hospital in Ethiopia that provides neurosurgical care to the more than 90 percent of the country's population of limited or no means. Residents receive their training at both BLH and the affiliated MCM, which are located in Addis Ababa.

Medical residents in Ethiopia are financially supported by a hospital or university. The neurosurgical residents are funded through AAU, and neurosurgical staff also is supported by AAU, with monthly salaries ranging between $300 and $500. Neurosurgeons often must supplement their income through private practice, which can increase monthly income to between $2,000 and $5,000. Medical services outside of Addis Ababa are focused on gynecology, general surgery and primary care, and neurosurgical care is not supported. The limited availability of government and hospital funds has precluded investment in the neurosurgical unit at BLH. Donations of operating theater equipment (Mayfield headrest, microinstruments) and supplies (bone wax, hemostatic agents) have supplied the training program.

The postgraduate training program consists of a four-year surgical fellowship awarded to certified general surgeons. The curriculum consists of a minimum of 36 months of neurosurgery and three months each of neuropathology, neurology and neuroradiology. Dr. Tadios and

Dr. Zenebe lead the neurosurgery service at BLH. Ethiopian-born Gabriel Lende completed his neurosurgical training in Bergen, Norway, and returned to Addis Ababa to lead the neurosurgery service at MCM. The learning objectives for the Ethiopian neurosurgical residents have been based on the North American training model (Table 1), although many of these objectives cannot be fulfilled given current resource limitations. Trainees also are expected to display a breadth of physician competencies based on the CanMEDS model: collaborator, communicator, manager, health advocate, scholar and professional. Four residents were initially recruited into the program, but two of them left for personal reasons within the first six months of the program.

Resident teaching sessions include a Wednesday morning radiology conference in which cases from any service can be presented and management options discussed. In addition, a neurosurgical curriculum tailored to the most commonly encountered pathologies has been established by the training program. Every week MCM and BLH jointly hold a neurosurgery conference based on this curriculum. The conference consists of a didactic session followed by case presentations.

Materials and Methods

To gain insight into the dominant pathologies presenting to BLH, we reviewed the neurosurgical operative registry as well as the charts of patients awaiting neurosurgical admission. The operative registry was reviewed for the eight months after the inception of the training program, July 2006 to February 2007. The neurosurgical procedures performed and the patient diagnoses were tabulated. The list of outpatients awaiting neurosurgical care consisted of 438 adults and 338 children. For adult patients, age, diagnosis and date when recommended for admission were recorded. For pediatric patients, age at presentation, diagnosis, interval to neurosurgical evaluation, and date when recommended for admission were recorded.

Results

In the eight months between July 2006 and February 2007, 194 neurosurgical cases were performed at BLH. Procedures for head trauma comprised 50 percent of the total number of operations (Fig. 1). Among the head trauma patients, 46 percent of patients had depressed skull fractures. Of patients who presented with a depressed skull fracture, the predominant mechanism of injury was stick fighting (more than 80 percent). The remainder of the operative depressed skull fracture patients presented after auto-pedestrian accidents or other motor vehicular accidents, and kicks by farm animals. Because BLH does not have a working CT scanner, the other 54 percent of head trauma patients either underwent exploratory burr holes based on clinical suspicion or craniotomy if a CT scan was brought from an outside facility.

Eleven percent of operative neurosurgical cases involved a brain mass. In 55 percent of these cases the brain mass was due to infection, and the dominant pa-

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TABLE 3

Adult Neurosurgical Cases Awaiting Admission to BLH, July 2006–February 2007

Diagnosis	No. of Patients	Percent of Cases	Ave. No. of Days (Range)
Degenerative Spine	311	71	253 (17–871)
Brain Tumor	41	9	156 (17–486)
Head Trauma	17	4	202 (38–538)
Spinal Trauma	19	4	165 (24–430)
Other	19	4	303 (17–566)
Spinal Tumor	13	3	175 (59–331)
Skull Mass	9	2	422 (181–671)
Peripheral Nerve	9	2	263 (143–530)

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thology was tuberculosis. The remaining 45 percent of intracranial masses included meningiomas, gliomas and other brain tumors. Spine trauma comprised only four percent of the operative cases, although spine trauma is an extremely common pathology presenting to BLH. The reason for this discrepancy is the lack of appropriate instrumentation for realignment of the spine. Consequently, many patients with spinal cord injuries and significant deformities are treated with bed rest.

The average time that adult neurosurgical patients waited for admission was 242 days, while the average time for children was 447 days (Table 2). Of the adult patients awaiting admission, degenerative spine disease comprised the majority of the cases (71 percent). Patients with brain tumors, including skull base meningioma, sellar masses, and posterior fossa tumors, comprised another 9 percent of cases. The composition of the adult neurosurgical waiting list is detailed in Table 3.

Children with myelomeningocele and children with hydrocephalus together comprised 70 percent of the pediatric population awaiting admission (Table 4). The average interval from initial diagnosis until completion of evaluation by the neurosurgery service was between two and three months. However, once a patient was recommended for admission, there was a significant interval until a hospital bed became available to admit the patient for surgery. The other commonly seen pediatric cases included encephaloceles (9 percent), craniosynostosis (5 percent) and brain tumors (4 percent).

Discussion

Constraints Faced in the Delivery of Neurosurgical Care In beginning a neurosurgical residency program, Ethiopia is making significant progress toward overcoming one major obstacle to the delivery of neurosurgical care: the critical shortage of trained surgeons. However, many other administrative and social factors continue to constrain the country's ability to provide quality neurosurgical care. The following three scenarios encountered during our stay in Addis Ababa demonstrate some of the key issues that are repeatedly faced.

1. Limited Operating Time

R.M. is a 40-year-old HIV-positive man who presented to the clinic with a two-week history of progressive headaches, nausea and vomiting. A CT scan revealed a right thalamic mass with significant obstructive hydrocephalus. He was listed for emergent admission, but he was not admitted due to lack of bed space.

The situation that R.M. faced unfortu-

TABLE 4

Pediatric Neurosurgical Cases Awaiting Admission to BLH, July 2006–February 2007

Diagnosis	No. of Patients	Percent of Cases	Average Age at Presentation, Years (Range)	Average No. of Days to Neurosurgical Evaluation (Range)	Average No. of Days to Admission (Range)
Myelomeningocele	140	41	0.6 (NB*–10)	75 (0–977)	393 (17–1584)
Hydrocephalus	99	29	1.5 (NB–12)	81 (0–1162)	488 (52–1672)
Encephalocele	32	9	0.7 (NB–7)	63 (1–323)	582 (52–1261)
Craniosynostosis	18	5	0.6 (NB–5)	197 (12–994)	369 (9–1941)
Brain Tumor	12	4	7.3 (1–12)	79 (5–232)	303 (45–723)
Other	37	11	4.2 (NB–12)	109 (2–1003	508 (59–1623)

*NB, newborn

nately is not an unusual one. Numerous adults with treatable pathologies and children with ruptured myelomeningoceles or hydrocephalus must wait months for bed space to become available. The critical factor is the limited operating time available. Currently there are three days per week of dedicated operating time for the neurosurgery service. Further, the operative day begins at 9 a.m., after morning report, and the anesthesia team is reduced to emergency staff after 2 p.m. As a result of this limited schedule, inpatients often spend three or more weeks waiting for surgery. The ultimate result is the inability to admit patients emergently for neurosurgical intervention. Further, during the evenings and weekends, a single nurse anesthetist is available to provide anesthesia support for all emergency operations. Because BLH is a tertiary referral center caring for all parts of Ethiopia, there are often multiple emergencies during the night, forcing a triage of emergent operations among all the surgical services.

2. Blood Donation

T.H. is a 24-year-old man admitted to the SICU after a stick fight. On presentation he was localizing to painful stimulus bilaterally. Soon after admission, his right pupil dilated, and he developed left hemiparesis. No blood had been prepared for the patient, but the decision was made to proceed with surgery regardless. A large epidural hematoma was found, and he lost a significant amount of blood intraoperatively. However, no blood was available for transfusion until the family donated blood.

Like many other developing countries, Ethiopia has faced cultural barriers, such as fear of contracting HIV or of developing medical illness, to the development of a strong voluntary blood donation program. Consequently, before proceeding with surgery a patient's family or friends must donate the amount of blood necessary for an operation. This poses a dilemma for all emergent cases and particularly for neurosurgical emergencies, for which outcomes often are related to expeditious operation.

3. Limited Diagnostic Modalities

G.A. is a 19-year-old man who presented to the hospital after a motor vehicle accident. On presentation he could intermittently follow commands but was very lethargic. As there was no CT scanner at BLH, G.A. was transported unmonitored to another facility for a CT scan. The imaging revealed a large, right-sided intraparenchymal hematoma with uncal herniation. Upon return to BLH four hours later, G.A.'s exam had deteriorated to decerebrate posturing, and the family elected comfort care.

Only basic diagnostic tests such as plain radiographs, ultrasonography and myelography are available at BLH. CT and MRI devices are unavailable in the hospital. Consequently, the patient must be transported to another facility to undergo neuroimaging. As in G.A.'s case, the significant delay in treatment can lead to preventable morbidity. However, for most people in Ethiopia the cost of neuroimaging is prohibitive. A CT scan with contrast in Addis Ababa costs 1000Birr ($113) and an MRI with contrast requires 2500Birr ($284). If financial resources allow, however, there is capability within Addis Ababa to perform MRI, MRA, CT, and EEG.

Areas for Further Development

Pediatric Neurosurgery

Hydrocephalus remains a significantly undertreated pediatric health concern in Ethiopia. BLH has no neuroendoscope, and the cost of a ventriculoperitoneal shunt is approximately 2500Birr ($284). In a country where 78 percent of the population is living on less than $2 per day, this cost is prohibitive. Uganda's experience with ETV can serve as an excellent teaching model for Ethiopia. In his time with CURE Children's Hospital of Uganda, neurosurgeon Benjamin Warf led significant research evaluating ETV as a treatment option for infants with hydrocephalus. His work has shown that ETV is particularly effective in patients older than 1 and in patients younger than 1 with both postinfectious hydrocephalus and aqueductal stenosis (6). Further, in

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patients younger than 1, ETV combined with bilateral choroid plexus cauterization yielded a higher success rate than ETV alone (7). Developing competency in ETV in Ethiopia can serve to free part of the dependence on costly shunt assemblies, making treatment of hydrocephalus more accessible.

Postgraduate Training

Residents in Addis Ababa are exposed to a diverse set of pathologies, including pediatric, oncologic, spine and trauma cases, providing a rich environment for a postgraduate training program. However, system-wide resources significantly limit resident exposure in the operating room to an average of only six cases per week at the primary teaching site. Further, although the operating theater at BLH is outfitted with basic instruments such as a Hudson brace, Gigli saw, punches and rongeurs, there are critical deficiencies that limit resident training and patient care. The addition of a headlight, neuroendoscope, intraoperative radiographs and ultrasound, and intraoperative frozen section are essential for the development of the neurosurgery service.

Due to these limitations, the program's learning objectives (Table 1), which are modeled after those of North American training programs, may not be realistic today in Ethiopia. Although they do represent a target toward which the Ethiopian program should strive, a more immediate goal may be to focus training on the commonly presenting pathologies using the resources available. With trauma representing half of all operated cases, neurosurgical training should be extended to those general surgery trainees rotating with the neurosurgery service because they represent the practitioners who likely will be managing head trauma outside of Addis Ababa.

The long-term goal of the program is the development of world-class neurosurgical care in Ethiopia. Providing world-class neurosurgical care is not necessarily predicated on access to the latest technology. Neurosurgeons in developing countries must be aware of the latest techniques and technology but must simultaneously optimize the appropriate technology available (5). A consistent supply of international volunteers with a strong interest in neurosurgical education, such as those being supplied through FIENS, can serve a critical role in augmenting the practice of neurosurgery in Ethiopia.

Conclusions

While Ethiopia's journey to improve access to neurosurgical care begins in Addis Ababa, the road is a long one. The development of neurosurgery services in rural areas is decades away—but this is the ultimate vision. As the infrastructure of the healthcare system in Ethiopia develops, the delivery of quality neurosurgical care must progress as well. Integral to this process is the success of the residency program in Addis Ababa. The strong collaboration between local neurosurgeons and FIENS has provided a solid framework. It is now up to the international neurosurgical community as a whole to ensure continued success. NS

Acknowledgements

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UNITED STATES

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health expenditures in 2005, the federal government 34 percent, state and local government 11 percent, and individuals accounted for 15 percent (Figure 3). The share of total expenditures paid out-of-pocket has declined from 27 percent in 1980 to 15 percent in 2005. This decline resulted from an expansion of benefits in both private health insurance plans and in government programs. Between 1984 and 1994, private coverage declined among people younger than 65 while Medicaid coverage and the percentage of uninsured people increased (Figure 4).

The cutbacks in Medicare physician payment that are expected beginning in 2010 may result in increasing numbers of neurosurgeons and other physicians who will choose not to participate in Medicare. Meanwhile, the increase in uninsured patients and the percentage of the population covered by Medicaid and Medicare is likely to exacerbate the shift in provision of their care to publicly funded hospitals and academic medical centers. AMCs already treat a high percentage of Medicaid patients, and this patient population, in addition to the population of nearly 50 million uninsured or underinsured (those who are working but who cannot afford health insurance), will impose an unsustainable financial burden to providers in these institutions.

Traditionally, the hospital has been reimbursed adequately for Medicaid patient care expenses, but the neurosurgical provider has not. Elective care for underinsured patients has been provided by altruistic neurosurgeons as charity care within their private practices and by teaching services at AMCs, which either may not be compensated at all or not compensated at fair market value. This fact simply has not been appreciated by the public or by politicians. As the ability of providers to subsidize such care within their practices erodes, other sources of support must be identified.

Of major concern to neurosurgery in the near future, therefore, is patient access to care, secondary to the question of who will pay for this care. Given the astronomical costs a patient having neurosurgery faces—the hospital, diagnostic tests and imaging, pharmaceuticals, devices and physician fees—resolving the question of who will pay is in the best interest of all neurosurgeons and their patients. **NS**

William T. Couldwell, MD, PhD, editor of the *AANS Neurosurgeon,* is professor and Joseph J. Yager chair of the Department of Neurosurgery at the University of Utah School of Medicine. **Manda J. Seaver** is staff editor of the *AANS Neurosurgeon.* The authors reported no conflicts for disclosure.

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Jacob Alant, MD, and Rajiv Midha, MD

Primary Cerebral Malignancy

Treating Malignant Brain Tumors in the Elderly Population

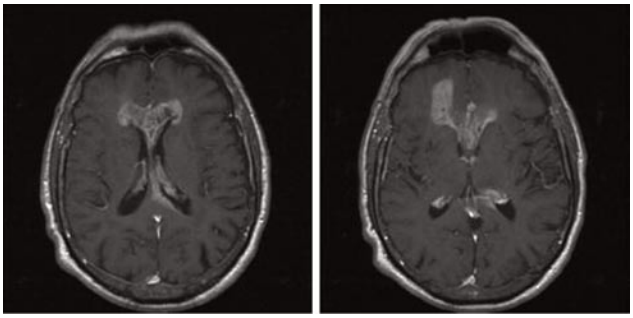
The following case presentation is intended to assess current practice habits for common neurosurgical challenges when class I evidence is not available.

The Case

A 78-year-old man with Type II diabetes, hypertension and a several-week history of progressive confusion was brought to the emergency room. His confusion was noticed by the home care nurse attending to his self-administered peritoneal dialysis for chronic renal failure. He denied headache but was clearly disorientated to time and place with severe short-term memory impairment. Family members commented that this represented a major change compared to his condition just a month ago. In addition, his neurological examination also demonstrated blunted affect, and he only could engage in superficial conversation. There were no other neurological findings.

He previously operated his own business from his home, where he lived alone. However, he could no longer look after his business or his day-to-day affairs. On the hospital ward he was able to feed himself, but his gait was unsteady and he fell and lacerated his forehead. He was given a score of 50 (requires considerable assistance with daily activities) on the Karnofsky Performance Scale, although because he required dialysis this was adjusted to a Karnofsky score of 40 (disabled and requires special care and assistance).

Laboratory investigations revealed no metabolic causes for his deterioration. An MRI scan with contrast demonstrated a bifrontal enhancing lesion with extensive involvement of the corpus callosum. These images also identified areas of apparent necrosis and ependymal spread. Very little edema was demonstrated on the T2-weighted images.



Gadolinium-enhanced T2-weighted axial MRI images demonstrating the butterfly wing enhancement pattern and ependymal spread.

Considerations

The apparent undertreatment of malignant brain tumors in the elderly population is an area of debate (1, 3), especially with more effective and better-tolerated chemotherapeutic agents (9) and alternative hypofractionated radiotherapeutic courses available (4). Poor KPS status has been validated as a negative prognostic factor (6). Advanced age, decreased extent of surgical resection (7), and certain tumor characteristics such as large size, eloquent location (8), necrosis, the type of enhancement pattern (7) and methylation status of the promoter of the MGMT gene (5) are additional variables that may modify outcome. It is, however, unreasonable to exclude patients from aggressive multimodal therapy purely on the basis of chronological age.

There are a number of factors that may explain why more than 20 percent of elderly patients with malignant gliomas are not treated more aggressively (2). In an elderly patient with neurological and or cognitive compromise, treatment may offer the prospect of prolonging survival or significant symptom relief for perhaps only a few months. In worse-case scenarios, there may be no symptom relief offered by treatment. This may not be sufficient motivation to a patient approaching the end of his or her life or for a neurosurgeon caring for this patient to opt for what may be perceived as aggressive therapy. Despite recent advances, it remains a challenge to provide responsi-

Responses: Idiopathic or Aneurysmal Hemorrhage?

This case was published in the *AANS Neurosurgeon* 17(2):44–45, 2008. Review the case at www.aansneurosurgeon.org.

THE CASE

Angiogram-Negative Subarachnoid Hemorrhage: Idiopathic or Aneurysmal Hemorrhage?

SURVEY RESULTS SUMMARY

Virtually all of the respondents (95 percent) recommended that further investigation was required to determine a potential underlying anatomical lesion that would explain this patient's subarachnoid hemorrhage. Greater than three quarters of the respondents favored repeating a vascular imaging study, with approximately half choosing the more invasive catheter angiogram, while one quarter felt that a CT angiogram was sufficient. MRI of the cervical spine was suggested by just greater than 15 percent of those responding, while a single respondent said an MRI study of the brain was indicated.

There was a range of opinion about when the imaging study should be carried out, but a clear majority favored a relatively early study. While 30 percent would do the study in one to two days, most (just less than half) would order the repeat study to be performed in one to two weeks. For those suggesting a study at three weeks or longer, a wait of more than six weeks was the preference.

CASE COMMENTARY

The CT appearance of perimesencephalic subarachnoid hemorrhage is more commonly an isolated and localized area of hemorrhage anterior to the upper brain stem. In that setting, I am more comfortable in making this diagnosis, and if a catheter angiogram is negative and there is no vasospasm, I do not routinely restudy the patient. I will do a C-spine MRI to rule out the rare upper cervical arteriovenous malformation. In the case presented here, the large amount and diffuse distribution of subarachnoid blood would lead me to obtain an arteriogram again in one to two weeks even if the first study were negative. If the second study also were negative, I would not do a third. I am not comfortable enough with MR angiography or CT angiography to consider either definitive if negative in a CT-documented subarachnoid hemorrhage and still rely on a catheter study.

Steven J. Barrer, MD, Abington, Pa.

ble guidance to individual patients whose functional status and quality of life are poor. Clearly, the wishes of the patient and family are important determinants in the decision-making.

Take the Gray Matters Survey

Please indicate how you would manage this patient by taking the brief multiple choice survey at www.aansneurosurgeon.org; select the Surveys link in the tool bar and then the link to Primary Cerebral Malignancy. An optional open comment field is offered at the survey's end.

- Web Address: www.aansneurosurgeon.org
- Take the Survey: Primary Cerebral Malignancy
- A synopsis of all results will be published in the next issue. Signed responses will be considered for publication.

Jacob Alant, MD, is a clinical fellow, and **Rajiv Midha, MD**, is professor and deputy head of the Department of Clinical Neurosciences at the University of Calgary in Canada. The authors reported no conflicts for disclosure. Send case presentation ideas for Gray Matters to Dr. Midha at aansneurosurgeon@aans.org.

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Michael Schulder, MD

Neurosurgeons' Role in the Political Process

"Dr." Smith Goes to Washington?

In an election year, attention inevitably is drawn to the presidential contest, but American doctors should pay special note to the Congressional races. All 435 seats in the U.S. House of Representatives are in play every two years, and that is where the financial legislation that affects us all usually begins. We hear a good deal about socioeconomic issues at our meetings, and we have set up political action committees to influence Congressional decision-making. Beyond that, is there a role for neurosurgeons in the political process?

Around the world there are practicing doctors, past and present, who have attained great political prominence. Charles Tupper, MD, of Nova Scotia was active for many years in Canadian politics, and became prime minister (for 69 days, the shortest tenure in Canadian history) in 1896. Jivraj Mehta, MD, studied medicine in London and ultimately was the chief minister of the state of Gujarat in India. The current foreign minister of France and the president of Syria are physicians. And Jacques Brotchi, longtime chair of neurosurgery at the Erasmus Hospital in Brussels, is a senator in Belgium.

American doctors have not reached these political heights. But in the first century of the U.S. Congress they accounted for 4.6 percent of members. Of 56 signers of the Declaration of Independence four were physicians, as were two of the 55 framers of the Constitution. Doctors in Congress in 2008 are a small minority, numbering seven representatives and no senators since cardiac surgeon Bill Frist retired in 2006. Between 1960 and 2004, physicians accounted for just 1.1 percent of Congress (and about 0.3 percent of the population). This may seem unsurprising, given how the professional demands of a medical career make a run for office seem impossible. Neurosurgery is a relatively young specialty, and a neurosurgeon has not yet held a seat in Congress (although not for lack of trying—there have been occasional candidates over the years). The highest office held by an American neurosurgeon is that of lieutenant governor of Nevada (Lonnie Hammargren) in the 1990s.

Time magazine published an article in 1939 describing the opposition of the New York Medical Society to federally funded, compulsory health insurance (sound familiar?). A dinner was held to rally support against the proposal, a part of Franklin Roosevelt's New Deal that never did become law. The article concludes by noting that "the majority of Manhattan physicians, congenitally afraid of politics … went about their business, blissfully ignorant of the whole affair." In our era of increasing governmental involvement in reimbursement and management of medical services, ignorance (blissful or otherwise) is a luxury we can ill afford. Doctors in general, and that includes neurosurgeons, should seek political office to advance the interests of our patients, our profession, and society as a whole. NS

© Getty Images.

Actor James Stewart as Jefferson Smith in Frank Capra's "Mr. Smith Goes to Washington" (1939), a film that portrayed the impact an individual can have on American government.

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