CONGRESS QUARTERLY
SUMMER 2008

WOMEN IN NEUROSURGERY • THE LEARNING CONTINUUM • NEUROSURGERY WORKFORCE

NEUROSURGERY AND HUMANITY

CNSQ IS THE OFFICIAL NEWSMAGAZINE OF THE CONGRESS OF NEUROLOGICAL SURGEONS
CONGRESS OF NEUROLOGICAL SURGEONS
2008 ANNUAL MEETING
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EDITOR’S NOTE

Dear Colleagues,

Being a neurosurgeon is rewarding in many ways. What many of us say we value most is the ability to improve our patients’ lives and outlook for the future. As neurosurgeons, we are privileged to have the opportunity to help people who can benefit from our expertise to improve their functioning and alleviate suffering.

This issue of the CNSQ was spearheaded by our Associate Editor, Jamie S. Ullman, MD, and focuses on the humanitarian efforts of neurosurgeons. Several endeavors are highlighted across the globe as our colleagues help people receive neurosurgical treatments that would not otherwise be available to them. In many cases they are traveling to remote areas, operating with minimal supplies, and providing access to follow-up care under the most rudimentary conditions. You will read about neurosurgeons providing care to the underserved in diverse areas such as Guatemala, Tanzania, Uganda, and Cambodia. Here in the United States, a neurosurgeon who volunteered in the aftermath of Hurricane Katrina tells of her experiences. And even neurosurgical offspring get in on the act, helping to produce a multi-language DVD series to prevent head and spine injuries by encouraging the use of bike helmets.

Other highlights of this issue are a feature on the WINS (Women in Neurosurgery) organization’s efforts, a pain section report, a Neurosurgery Workforce update, a profile of humanitarian Alexa Canady, MD, and a discussion of the Learning Continuum as it applies to our specialty in the CNS Past-president section.

We are fortunate to count so many dedicated and caring individuals among our fellow neurosurgeons, and we welcome the opportunity to celebrate them here. As always, we encourage you to contribute your feedback and comments on this and future issues of the CNSQ.

Sincerely,

Ali R. Rezai, MD

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According to John Adams, there are two creatures of value on this earth, “those with a commitment and those who require the commitment of others.” This issue of the CNSQ focuses on the astonishing efforts of several individual neurosurgeons, and their children, in reaching out to underserved communities and providing much needed care and understanding. One theme pervades these remarkable stories: commitment and fortitude, qualities of true and outstanding leadership.

Through these stories, we will learn about extraordinary efforts to provide neurosurgical care and promote injury prevention in Cambodia, Uganda, Guatemala, Tanzania, Tunisia, and right here in the United States, including one neurosurgeon who provided much-needed general relief, no matter the task, to Hurricane Katrina victims.

We realize that those featured in this issue do not represent all the efforts in which neurosurgeons throughout the world are involved. We applaud those who have participated in the Foundation for International Education in Neurological Surgery (FIENS) and encourage all neurosurgeons to consider involvement in that important organization. Members of the military have made important contributions to the people of Iraq and Afghanistan. Finally, we welcome submissions from any individual wishing to highlight their own humanitarian accomplishments.
Almost 2000 miles away in San Diego, on a sunny deck overlooking the Pacific Ocean, I sat watching the television during the coverage of, perhaps, the most significant natural disaster to hit the United States in recent years. Having recently elected not to renew my malpractice insurance, I closed a neurological practice, selling the office and using large U-Haul trucks for storage. After returning the rental, I settled back for a brief vacation before embarking upon locum tenens work for which I already possessed medical licensure in eight states, including Mississippi.

After watching the news reports and thumbing through the yellow pages, I began contacting the various disaster response and volunteer agencies such as the Federal Emergency Management Agency (FEMA), the Public Health Service Corps, and Disaster Medical Assistance Team (DMAT), to see how I could provide medical services for the relief effort. None of these agencies were able to accommodate my request, leaving me no recourse but to take matters into my own hands. This effort was difficult, given the fact that communications were wiped out in the places of most need. I began to call various municipalities and the Red Cross shelters directly along the Gulf Coast and planned to head out for the first town that answered the phone. That town was Meridian, Mississippi. They said “Wow, thanks, yes we’ll take your help. As soon as you walk in, we’ll make copies of your medical license and have you working within 20 minutes.” Meridian is a city three hours north of the coast, and the destination of many evacuees. Within the city limits, Meridian has a population of 40,000.

I gave my trailer keys to other relief workers for the opportunity to have a much-needed respite while I volunteered at multiple sites.

The Red Cross had set up numerous shelters citywide at churches, schools, and public facilities. These shelters were staffed entirely by volunteers. Knowing that shelters were overflowing and that many volunteers had no place to sleep, I purchased a camping trailer, the seller of which refused to accept full price knowing its destination and purpose. I received many donations of supplies, water, and food, so much so that I regretted returning the U-Haul truck. With supplies loaded, ten copies of my MS medical license, and my two large mutt dogs, I headed down the highway bound for Meridian. What awaited me was a truly astonishing and indescribable degree of destruction. Even more surprising was the warm, enthusiastic welcome and concern about all of the volunteers’ safety and comfort from people who had lost so much.

As I entered the Red Cross shelter, I was asked to wait as an immediate crisis had arisen. There was an acute shortage of nurses for one of the shelters housing 67 coastal evacuees. Due to the lack of coverage, they were being forced to close the shelter and re-locate those people within three hours. Thus, I readily volunteered for my first assignment: not as a physician, not as a neurosurgeon, but as “a nurse or above.” It did not matter.
what level of training or education one had; basic nursing was the act of mercy so desperately needed. Sixty-seven people were able to remain camped there. In between requests for over-the-counter medications, basic wound care, and emotional support, the night’s urgent clinic held a cot for the new “nurse” to sleep. The shelter was in a church, staffed by volunteers from both the Red Cross and the local residents but also protected by the Army National Guard.

After the return of utilities, I moved onward to Ocean Springs, MS, to the hospital that bears the town’s name. This hospital was, initially, the only one open and accessible on the Mississippi Gulf coast. In addition to its standard emergency room, and an outdoor oversized tent used for urgent care, there was a second improvised ER in what was ordinarily the Cardiac Catheterization lab and recovery area. This was staffed entirely by volunteer physicians, ancillary staff working double shifts, and administrators rolling up their sleeves to assist in direct patient care.

Because hotels were either destroyed or full, churches and schools were converted to large shelters. At the Christus Victor Lutheran Church, there were 150 evacuees, three showers, and two washer/dryer sets. They also allowed tents, campers, and pets. Nurses were given priority to sleep on the pews, while physicians slept on the cots in the hospital hallways. Given my “luxury” accommodations, I gave my trailer keys to other relief workers for the opportunity to have a much-needed respite while I volunteered at multiple sites.

At Christus Victor, there was a walk-in clinic staffed entirely by volunteers, for basic assessments and treatments. The medical supplies were largely donated, with medication hailing from other countries such as Greece.
and Russia. It was amazing to see other countries come to the aid of Americans!

Field work provided the most interesting experience. Teams of nurses led by physicians went door to door in the most devastated areas, providing medical care and tetanus vaccinations. The team bore witness to the extent of destruction to property and livelihoods. However, despite the physical devastation, the mail carriers, construction and utility workers, and many personnel continued their daily routines to the best of their abilities.

The destruction from the large waves spared very few. Prior to my arrival, houses had been searched for survivors. All houses bore the eerie fluorescent orange “X,” allowing a count even when no survivors had been found. The waves affected rich and poor alike, collapsing a vital bridge, effacing the coastline, and moving casino barges from the water across four lanes of traffic only to be found one quarter of a mile away. However, through the tragedy, there was hope. Adjacent to a barren beach-front lot bearing a few components of the wood frame belonging to a once lively structure, stood a sign: “Welcome members and guest of the Oceans Springs Yacht Club. We are currently undergoing remodeling due to Hurricane Katrina. Please contact us below for information to let us know how everyone is.”

Signs like these signified the kindness and generosity of those victimized. Citizens in the hospitals, clinics, and in the field almost invariably demonstrated gratitude, concern, and empathy despite their circumstances and dire need for shelter, food, money, medication, and basic comforts of life. They exuded the sense of kindness, hope, faith, and togetherness so often overlooked in our daily lives. Their generous nature in the face of adversity shone as a beacon of hope that their lives would soon be renewed. For me, this experience was a priceless opportunity of a lifetime.
Guatemala is a country of extraordinary beauty and extreme poverty. It has some of the worst statistics regarding healthcare of any Latin American country. Over a decade ago, this country had just emerged from a forty-year civil war, from which it still bears social and economic scars. Although there is an emerging middle class, the great disparity between economic classes that fueled the socialist revolution remains. Decades of conflict have left little infrastructure to provide medical care for Guatemala’s children. The system is further stressed by the fact that the majority of the population (52%) is under 18 years old. Of Guatemala’s 5.4 million children, 83% live in severe poverty. It is with this background and the understanding that the neurosurgical operating room is a complex environment that we attempted to organize a neurosurgical mission to Guatemala.

For the past eleven years, members of the University of Michigan Departments of Neurosurgery, Anesthesiology, Pediatrics and Operating Rooms have conducted a neuro-

PROJECT SHUNT: UNIVERSITY OF MICHIGAN GOES TO GUATEMALA

Footlockers used to pack Project Shunt equipment.
surgical outreach mission to treat spinal dysraphism and hydrocephalus in Guatemala, entitled “Project Shunt.” Working with Healing the Children (HTC) of Michigan/Ohio, as well as the Pediatric Foundation of Guatemala, the group provides direly needed neurosurgical care to the indigent children of Guatemala. The organization of Project Shunt illustrates several key parameters critical to successful surgical outreach programs founded by small groups in the developing world. First, these efforts depend on a successful collaboration between motivated groups in the donor and recipient countries. Second, small surgical outreach teams are best suited to carry out a narrow range of procedures. Mutual trust, cooperation, and dependence between Project Shunt and the Pediatric Foundation of Guatemala, as well as the high incidence of neural tube defects in Latin America have contributed to the long-term success of the effort.

Neural tube defects are endemic in Latin America in general, and Guatemala specifically. Several factors contribute to the extraordinarily high incidence levels. Prenatal care including large scale folate supplementation is almost unheard of. The prohibition against abortion in this largely Catholic country renders prenatal screening futile. The project began with an outreach for the Michigan/Ohio branch of the international foundation, HTC. This foundation works to provide tertiary care for children in countries with poor access to complex procedures. The foundation pairs individual patients with donor physicians and hospitals, transporting and housing the children for treatment. In cases where endemic disorders create the need for larger scale treatment of a particular problem, they help to organize teams for interventions in developing nations. An HTC volunteer working at the University of Michigan approached neurosurgery residents about the foundation’s desire to mount a mission to treat hydrocephalus in Latin America. An initial trip, funded by Cordis and Codman, was planned in 1998 by several members of the team, including Nicholas Boulis, to evaluate the feasibility of such a mission. The trip was taken only two years after civil unrest had abated in Guatemala and a truce had been established between guerrilla forces and the government of Guatemala. The government stability was, and still is, in question. The fact-finding mission concluded that a surgical mission was both feasible and ethical. As a result, Karin Muraszko agreed to help organize and supervise the mission as Medical Director.

Before embarking on the mission, core team members agreed that volume would be sacrificed in favor of quality. Put another way, the group sought to provide care equivalent to that which would be delivered in the United States. Because
the team was initiated by residents, it has remained a resident organized project. The team-leading resident, traditionally a senior-level resident, delegates the responsibility of operating room, anesthesia, and postoperative care to teams responsible for collecting all of the necessary equipment. Each resident participates one year as a member of the team in order to gain experience and insight as to the needs of the project and to help understand the extensive planning necessary to have a successful mission. The next year that resident will serve as the team leader. The next year they will act as an advisor and, if possible, a participant in the mission. Thus, each participating resident will report on three missions. Since its inception, the mission has now expanded to include some twenty-six individuals. As a result of participation in the mission, several of the residents who have graduated from the program have organized their own missions to Guatemala and now provide additional neurosurgical care on a regular basis.

Anesthesiology is perhaps the most challenging aspect of the mission’s organization. A safe surgical procedure, particularly in children, requires expert anesthesia and we are fortunate that the Department of Anesthesiology has strongly supported this project. Children with advanced hydrocephalus present particular challenges during intubation. Cases are done without mechanical ventilation. When patients are not spontaneously ventilating, bagging is performed. Many of the children are of low birth weight with poor nutrition and concurrent infections. These infants are prone to hypothermia. We have developed creative approaches to this and other problems including wrapping patients in cellophane.

Initially, equipment was limited. Operating rooms were essentially rooms with electrical outlets and the ability to provide inhalation anesthesia was not possible. Oxygen was available through tanks and little else. Slowly we began to collect equipment. A blood bank was not available nor an ICU. All of this has led to careful consideration of which procedures are feasible on such medical missions. Over the last decade, we have expanded our repertoire of procedures by increasing our equipment and inventory and by making appropriate contingency plans. We now take three sterilizer units with us, surgical equipment enough to run three operating rooms simultaneously and adequate medical and surgical supplies to provide preoperative and postoperative care for all of the children. At the end of each mission, we perform quality assurance to determine what we need and, more importantly, how we might improve for the next time.

Support for this mission has been extraordinary. We have received funding, equipment and supplies from AMSCO, Baxter, Codman, Ethicon, Johnson & Johnson, Medtronic, NMT, Shelhaigh, and Stryker. Shunts have been supplied from almost every manufacturer and companies have graciously allowed us to borrow important equipment for the trip. We send thousands of pounds of supplies and equipment to Guatemala in the weeks before our mission. Each team member is allowed one suitcase and will bring along an additional foot locker of equip-

Mutual trust, cooperation, and dependence between Project Shunt and the Pediatric Foundation of Guatemala, as well as the high incidence of neural tube defects in Latin America have contributed to the long-term success of the effort.
ment and supplies. Because the size and the amount of equipment have been enormous we have now begun to rent locker space in Guatemala to avoid the risk of lost and damaged equipment. The Pediatric Foundation of Guatemala has now acquired a more permanent residence and each year we see an improvement in the operating facilities that are available to us. We have purchased new equipment, not only to use during our missions, but also to provide supplies in a primitive fashion for the operating rooms in Guatemala. Funding has always been a challenge and we have established a non-profit fund within the Department of Neurosurgery at the University of Michigan to allow for tax deductible contributions.

Project Shunt participants have learned to better manage personnel and understand the enormous effort it takes to create a functioning operating room. During the first year, we, ideally, took on too many cases. We operated 20-21 hours a day trying to run the ORs continuously. After three days, we had worn out all members of the team. Discontent within the ranks grew and the esprit de corps began to wane. We realized that we needed to think more realistically about the best way to handle large number of patients. Each year, by increasing the number of personnel and carefully selecting cases, we have been able to perform a larger number of cases. On average, we perform 25-30 procedures with each trip and have now operated on over 300 children since commencing the outreach program.

Project Shunt has expanded its postoperative care group to include pediatricians, intensivists, and others. We have set up our own small pharmacy to make certain that all medications necessary for successful outcomes are provided. Every effort is made to create a pleasant environment for our children. This effort includes not just quality healthcare, but also a cheerful environment of colors, balloons, and toys. All of these supplies must be shipped down ahead of time or with us. Only limited amounts of supplies are available in Guatemala, though the cost of manufactured goods is quite high. For example, we do purchase narcotics, oxygen, and some anesthetic agents in Guatemala. An amazing dichotomy exists between handmade and manufactured goods. A handmade embroidered towel may only cost one dollar, whereas a roll of paper towels can cost as much as three.

Guatemala presents many challenges, but also helps each member of the team reaffirm their reasons for becoming healthcare professionals. The generosity and hospitality of our Guatemalan colleagues and the warmth of the patients is something which inspires each of us. In addition to providing care for patients, we have also worked side by side in educating our Guatemalan colleagues and providing them the most up to date information. Through the generosity of the Congress of Neurological Surgeons and our spina bifida association, teaching supplies have been brought down with every medical mission and have been provided to neurosurgeons, pediatric surgeons, nurses, and other healthcare professionals about how to manage the complex problems that they encounter. For example, by developing an intermittent catheterization program, the Pediatric Foundation of Guatemala now reports an 80% decrease in urosepsis among patients with spina bifida and myelomeningocele.

We are in a continuous cycle of fund raising and preparation. We begin planning the next mission within days of our arrival home from the previous mission. On a typical mission we arrive on Saturday. On Sunday we divide into two groups. One group helps set up the OR and the other group evaluates patients and decides which operations will be done during that mission making decisions about whether doing three or four
shorter cases is better than doing one very long case. The schedule is established as in any OR but remains fluid on a daily basis. We try to do the most difficult operations early in the week so that we will have time at the end of the week to manage any problems or complications. On average, we see 50 patients in clinic and decide to operate on approximately 25 to 30 patients. Each year, through HTC, we attempt to bring particularly difficult patients to hospitals within the United States. Preference is clearly given to procedures that will be the only treatment necessary for the child. Because there is a high incidence of spina bifida, we do many complex tethered cord cases along with repair of myelomeningoceles and management of hydrocephalus. Inspired by Dr. Ben Warf’s successes in Africa, we now regularly do third ventriculostomies. We also do a variety of encephalocele repairs and some limited intracranial work. Perhaps the hardest part of the mission is to inform a family that we cannot help their child; many of these families have traveled days to reach the Foundation and all are full of hope that we will provide the “cure” for their child.

Project Shunt has a strong working relationship with the Pediatric Foundation of Guatemala and the Guatemalan pediatric and neurological surgeons who follow these children postoperatively after we leave. Other teams from throughout the United States have participated in such projects and there is an attempt to schedule visiting groups of neurosurgeons on a regular basis. We recognize that we have only a small impact on neurosurgical disease in Guatemala but at least for some children we have made a difference and have had a significant impact on their lives.

Despite the significant effort necessary to launch and continue small surgical relief projects, they affect multiple positive ends. First, and most manifestly, children who would not receive care gain access. Second, the mission demonstrates the good will of Americans in an era when our country’s intentions are often questioned. In 2001, we went to Guatemala two weeks after September 11th. We had a very successful mission and one teenage girl thanked us for coming and told us that we are the best army against terrorism. Third, the mission provides an opportunity for many of the team members to gain insight into the nature of poverty in the developing world. Lastly, residents learn to take responsibility for all aspects of surgical care delivery from material to organization. In the case of Project Shunt, they gain three weeks of experience with complex neural tube defects. Finally, there is an opportunity to educate families and physicians in the developing world to improve the care of the patients. We hope, over time, to use Project Shunt as a means to expand efforts of education and prevention of neural tube defects throughout Latin America. CNSQ

Please see our website for more information: http://www.med.umich.edu/Neurosurgery/about/shunt.htm

Please look forward to a Project Shunt update in a forthcoming issue.
Natalie Rosseau, 13, and her brother, Brendan, 11, often travel with their parents, neurosurgeon Gail Rosseau and orthopedic surgeon Richard Rosseau, to medical meetings. When traveling in the developing world, they noticed that kids in other countries often ride on the handlebars of bikes or mopeds without helmets. They were astounded to learn that there were no head and spine injury prevention programs in many parts of the world, so they decided to do something about it. They looked into existing programs and decided ThinkFirst was the best program for kids their age.

Their first goal was to improve things for kids in French-speaking Africa, but they found that the ThinkFirst program was only available in English and Spanish. Undaunted, they applied for a grant from ThinkFirst, completed a translation into French, and produced a voiceover of the award-winning cartoon program. They then rented a booth at a local French-themed farmer’s market to raise money to purchase copies of the DVD they produced. They presented the program in Senegal in March of this year. It was seen by 120 students and 12 neurosurgeons and was featured by the national news network.

The Chicago Institute of Neurosurgery and Neuroresearch (CINN) Foundation, a philanthropic association which funds neurosurgical research and community service projects, funded their grant application for a program in Tunisia. Natalie and Brendan traveled to Tunis, where they presented their project to neurosurgeons and orthopedic surgeons at the PanArab Spine Society meeting. They presented the French DVD and brain and spine models for teaching head and spine injury prevention in the school system. The children plan to continue their peer-to-peer work, with plans to help with the production of ThinkFirst DVDs in Arabic and Hebrew. They hope to present the work at a future international neurosurgical meeting.
Neurosurgery in Tanzania is led by Dr. Abednego Kinasha, Professor Paul Kahamba, and an additional junior colleague at the main Medical University in Dar es Salaam. These three full time neurosurgeons attempt to provide medical care for 38.8 million people. This is comparable to the entire United States having neurosurgical care exclusively located in the Dallas metropolitan area. This problem, compounded by very poor roads (often impassable during the long rainy season), lack of money for travel, and lack of knowledge of available services is further exacerbated by newly trained Tanzanian medical doctors being lured into jobs with Non-Governmental Organizations (NGOs) paying relatively high wages in Dar es Salaam or Arusha or outside the country (and away from regional or rural hospitals).

These factors leave an estimated 98% of Tanzanians without access to neurosurgical care and, in the absence of this care, thousands die or live with lifelong disability—many from treatable causes.

Haydom Hospital

After finishing a long University of Virginia residency and an additional year of cerebrovascular fellowship, I set out to see the world a bit before embarking on a traditional academic career. Thus, in January of 2006, I left America for 6 months as a purposeful tourist and became an accidental neurosurgeon in remote, rural, Tanzania.

In the course of events, I found myself at Haydom Hospital, a large 450-bed (with up to 600 patients) referral hospital in rural north-central Tanzania, located in a high plateau between two branches of the Great Rift Valley in the Mbulu district of the Manyara region.

Fifty-seven countries have a critical shortage of medical workers, 36 of which are in sub-Saharan Africa, according to the World Health Organization (WHO). In the field of neurosurgery, the WHO recommends a neurosurgeon to population ratio of 1:100,000 to provide adequate, safe, neurosurgical coverage. In the U.S. this ratio is approximately 1:75,000. In Japan the ratio is closer to 1:50,000. In Tanzania, in sub-Saharan east Africa, which has one of the lowest doctor-per-patient population ratios, the neurosurgeon to population ratio is 1 to 12.9 million – and the reality is far worse.

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Estimates of its immediate and intermediate catchment area range from 1.5 million to 1.9 million people who are largely pastoralist, farmers, and hunter-gatherers and have little or no formal education. In 2006, the hospital served 11,082 patients and preformed 1392 major operations. In early 2005, the Hospital had a CT scanner (one of only 4 in Tanzania at the time) donated by the Norwegian Government and when I arrived, there were many abnormal CT scan findings but no one with the knowledge to diagnose or to treat the conditions. Referral to the University Neurosurgical Center in Dar es Salaam was, for all practical purposes, impossible. Travel time to Dar from Haydom Village took 3-4 days if the roads were passable. The nearest larger city (Arusha) is a difficult 8 hour journey by Land Rover. Cell phone coverage at that time was spotty as was internet access. Further, Hay-
dom Hospital had no Tanzanian physicians, only Clinical Officers and Assistant Medical Officers who have a high school education and 2-3 years of technical school training running the day to day clinical operations. This is typical of many referral hospitals throughout Tanzania. These hospitals therefore often survive with the help of visiting foreign medical doctors and medical missions.

In the context of this isolation and resource deficiency, there seemed, for me, two options available—to perform the neurosurgery myself or to teach a local clinician to do it.

**The Challenge**

Traditional medical missions and temporary visiting doctors provide a wonderful humanitarian service. However, once the visiting physicians leave, the country is left in the same situation of anticipation until the next mission arrives. *This creates a cycle of dependency. Worse, it contributes to a mindset of dependency.* This situation perpetuates a problem rather than solving one.

I enlisted a bright, motivated Tanzanian Assistant Medical Officer to help with the neurosurgical patients. We first went through an intensive one-to-one direct training program of basic CT scan interpretation, neurologic examination, and emergency and primary neurosurgical operations. Over a period of 6 months this individual became adept at all primary and emergency neurosurgical operations and was even beginning to teach his skills to other Tanzanians.

Upon returning to the U.S., using the principles of education and one-to-one training, I gathered a dedicated group of colleagues: two talented medical students and a neurologist from the Oregon Health and Sciences School of Medicine (OHSU), a motivated assistant, an African expert and director of a nonprofit organization, with advice from a senior member of the Gates Foundation. We formed the Physician Training Partnership (PTP) with the goal of working to provide neurosurgical independence for Tanzania and to serve as a potential model for training and capacity-building in the developing world.

The next summer, PTP sent two talented students, Jonah Attebery and Rachel Chard from OHSU, to Haydom to perform a semi-independent audit of the operations and outcomes over the previous 18 months. We felt that this auditing would be a critical component in order to ensure adequate quality and to help improve the service. The results of this and a concurrent audit at Dar es Salaam (the local center of excellence for comparison) over the same time period are being prepared for publication.

**The Stryker Educational Fund**

Soon after returning to the U.S., we received tremendous support from Ryan Emery and the Stryker Educational Fund. They stepped in and endowed a semiannual $10,000 grant to send senior American neurosurgical residents to Tanzania to experience neurosurgery in the developing world and to learn how to become a part of its growth. Elisa Beres, MD, from the Barrow Neurological Institute became the first recipient of this award and spent 7 weeks operating and teaching in Tanzania in the summer of 2007. More recently Joshua Seinfeld, MD, Chief Resident in Neurosurgery and Diana Doyle, Administrator at the University of Colorado (UC), spent time in Tanzania teaching and operating, resulting in a strong bond between UC and PTP. Additionally, over the past few months we have expanded the basic neurosurgical capabilities to a second referral hospital in Tanzania.

**FIENS, NSTP-ECSA, and the Tanzanian MOH**

I went to Tanzania as an absolute novice in the area of international medical work,
I went to Tanzania as an absolute novice in the area of international medical work, ignorant of the history of developing neurosurgery in underserved areas.

He and Moody Quereshi in Nairobi, Kenya have been instrumental in setting up the Neurosurgical Training Program of East Central and Southern Africa (NSTP-ECSA) which, in June 2007, began enrolling the first MDs to be trained locally as fully certified neurosurgeons. With their support and assistance, and in accordance with the principles of FIENS and NSTP-ECSA, a pathway was formed for neurosurgery in Tanzania.

In February 2008, the first national, Tanzanian neurosurgical meeting was held in Dar es Salaam, hosted by Dr. Kinasha and organized by PTP. In attendance and participating were the Director of Hospital Services and the Assistant Director of the Ministry of Health (MOH), and representatives from four major regional hospitals in Tanzania. The results of that meeting were strong letters of intent and support from the MOH and a conceptual proposal for the development of basic and emergency neurosurgical capacity at the four regional hospitals to be overseen by the MOH and the neurosurgical center of excellence at the University in Dar es Salaam.

The Future
PTP’s role in Tanzanian neurosurgery shall be as follows: 1. Over the next five years, working within the guidelines of the Tanzanian MOH and NSTP-ECSA and FIENS, we will help to train medical doctors who are proficient in surgical skills to perform basic and emergency neurosurgery at the four major regional hospitals in Tanzania until fully trained and certified neurosurgeons are available to take over this role. Assistant Medical Officers who are interested shall be sponsored to go to medical school prior to obtaining basic skills in diagnosing and, if needed, treating neurosurgical emergencies that cannot be referred to trained neurosurgeons. 2. Auditing of outcomes with transparency and publication of results will be a critical part of this endeavor to ensure that we are not doing harm. 3. Resident participation will be integral as it is the next generation of neurosurgeons who will carry on this work and knowledge of the world outside of the United States. Such participation will enhance “globalization” of neurosurgery and maintenance and dissemination of excellent standards in emerging neurosurgery-capable countries.

Acknowledgement:
I write this from Tanzania having been given strong support both in time and finances to develop this program from Sunil Patel, MD, Chairman of Clinical Neurosciences, and Steve Glazier, MD, Chairman of Neurosurgery at the Medical University of South Carolina. Without their farsighted and novel approach to building a neurosurgical department of the future, very little of this would be possible.
The American Medical Association (AMA) Foundation awarded Gary VanderArk, MD, of Englewood, Colorado, the 2007 Pride in the Profession award. Dr. VanderArk was cited for his devotion to healthcare for the un- and under-insured. He serves as president for the Colorado Coalition for the Medically Underserved (CCMU) and opened Doctors Care, a nonprofit organization, in Littleton, Colorado.

Doctors Care provides care for the underserved in South Denver. The program utilizes 550 physicians and 5 hospitals. Dr. VanderArk’s program has grown to provide affordable, accessible medical care for more than 2500 children and 1000 adults last year alone.

For Dr. VanderArk, caring for the underserved comes naturally, “You have to do good for people.” He notes that present national proposals for uninsured coverage are promising but that the needs of the uninsured in Colorado were pressing: “We [couldn’t] hold our breath waiting for the federal government to take care of things.” Hence, on Valentine’s Day in 1988, he founded Doctors Care, successfully signing up all 129 physicians of the Arapahoe Medical Society. A clinic devoted to pediatric care followed in 1993.

“Through his leadership with CCMU, [Dr. VanderArk] has brought together the best and brightest thinkers, legislators, policymakers, providers, consumers and business leaders to address the growing crisis of healthcare,” said Bebe Kleinman, executive director of Doctors Care, who nominated him for the AMA award. “Dr. VanderArk’s efforts have an impact on nearly 1.5 million people... his vision and perseverance have unquestionably changed the lives of many people who will never know him but will live a better quality of life thanks to the healthcare they received through a channel [he] opened ...Thanks to Dr. VanderArk, Colorado is a better place to live.”

Dr. VanderArk notes that the AMA Foundation’s Pride in the Profession award has been a great means of publicizing Doctors Care. “People are calling from all over wanting to know about [Doctors Care].” He notes that neurosurgeons should be more involved in advocacy and public health efforts: “Neurosurgery is the ultimate specialty for advocacy for our individual patients...but you have to look at the big picture.” Dr. VanderArk also received the 2001 AANS Humanitarian Award.

The AMA Foundation is the philanthropic arm of the American Medical Association. Founded in 1950, the AMA Foundation’s mission is to advance healthcare through support of programs in medical education, research, and service.

More than 47 million Americans are uninsured; 80% come from working families; 20% are children. The United States spends nearly $100 billion to provide uninsured patients with health services, often for preventable diseases or diseases more efficiently treated with early diagnoses. This burden is shouldered by everyone.

The AMA’s “Voices for the Uninsured” campaign highlights the challenges faced by those 47 million American citizens. As part of its advocacy effort, the AMA has forwarded a comprehensive proposal to provide options for purchase of healthcare insurance for all Americans.

The AMA also serves as the primary representative body for organized medicine. With each presidential candidate offering “fixes” for our healthcare system, strong advocacy from organized medicine is necessary to insure patient and physician needs are met.

Neurosurgery representation in the AMA has never been more important. Those interested in the “Voices for the Uninsured” campaign or interested in AMA membership may go to http://www.ama-assn.org for more information.

This article was compiled with contributions from http://www.drscare.org and http://www.ama-assn.org.
As a kid, Mark Kayanja, MD, PhD, aspired to some day make a difference in his country of Uganda. By virtue of his family’s status he received a better than average education and went on to become an orthopaedic surgeon at the Mulago Hospital in Kampala. After ten years of service under the sparsest of medical conditions, Dr. Kayanja realized the limitations of all his efforts. In 2000, Dr. Kayanja showed up on my doorstep, willing to work for free as a spinal research fellow. As impressed as I was by his offer, I was more intrigued by what brought this brilliant young man to my doorstep. After four years of working directly with him, listening to his stories about the lack of spine care in Uganda, I succumbed to his encouragement to accompany him on a visit to Uganda. In retrospect I now realize Dr. Kayanja had this all planned the day he met me.

Our first planned spine surgery mission was preceded by much anxiety and anticipation. I was deeply concerned about the conditions and wanted to ensure that we not leave disasters in our wake. After having done the first ward round it became obvious that we could improve the plight of many of these patients (Figure 1). The care of spinal trauma, osteomyelitis/discitis, and spinal deformity were all far below contemporary North American standards and even basic standards. A second potentially limiting issue concerning the trip was the availabili-
ity of spine surgery equipment. Thankfully, I have found over and over that many are truly generous with their support. The major medical device companies were willing to provide us with all the supplies to essentially handle any spine surgery reconstruction, anteriorly or posteriorly, from the base of the skull to the tip of the coccyx.

The pathology in Uganda is relentless, and healthcare provision is inconsistent at best. The system is plagued by different problems than those we experience in North America, yet the outcome is surprisingly the same. For instance, trying to obtain a CT scan in a timely fashion: in Uganda the patients can’t afford to pay for it and in North America the insurance companies frequently deny coverage. The ultimate result is that if someone does not take responsibility, treatment is delayed or denied.

The hospitals in Uganda are as much of a cottage hospital as imaginable. The facilities are typically cramped and in disrepair. The operating theatres were surprisingly clean, however, the equipment was aged and lacking in maintenance and repair. There were no reliable intra-operative portable or c-arm x-ray facilities. The OR lights typically did not function, the back-up portable OR lights were weak and there was a shortage of surgical linens, sheets and gowns. Much to my chagrin, I found that the hospital recycles everything including the suction tubing, the cautery hand pieces, and even the surgical sponges.

The Ugandan healthcare professionals are compassionate, caring, and, for the most part, a dedicated group. What is lacking is basic infrastructure, i.e. appropriate trauma triage, adequate ward conditions, appropriate equipment maintenance, etc. At this stage of development of their healthcare infrastructure, I would not recommend the acquisition of more costly equipment. What is absolutely essential is education and training.

With each trip I remained troubled as I realize that what we take for granted or consider disposable in our high tech, high cost healthcare environment is absolutely priceless in Uganda. The simplest things like tape, gauze bandages, sterile dressings, and OR linens are all considered a limited resource and potentially re-usable in Uganda.

One of the most disturbing circumstances I witnessed was the lack of expertise in the maintenance or repair of equipment. Some of this was due to economic issues, where manpower is simply unaffordable, and some of it was just lack of training. As an example, at one hospital, a donated computed tomography scanner has been sitting idle in a shed, still unassembled for the past 5 years. Apparently one piece of hardware or software is missing, no one seems to know what, and the administration cannot afford to get the manufacturer to send an expert to sort out the problem. The result is a well meaning, yet wasted, effort. Other examples exist of ward equipment, operating room equipment and, even fluoroscopic units, which with just minimal maintenance could be functional.

The people of Uganda are remarkable. They have absolutely no sense of entitlement and do not seem to adhere to any dependant behavior. They are amazingly appreciative of anything done for them. Even something as simple as the acknowledgement of their predicament is graciously received and respectfully accepted. I found the people

Figure 2. The team examining a 12-year-old girl with Pott’s TB.  
Figure 3. Patient A.F., 9-year-old female with Myositis Ossificans Progressiva.
and patients to be spectacularly resilient to social and physical stressors, ably adapting in order to overcome any obstacles. Most of the patients we examined had succumbed to one of three spine related etiologies: motor vehicle accidents, infections (especially Pott’s Disease/TB of the Spine, Figure 2), and congenital deformities.

In between all of the ordered chaos, treatment discussion, and documentation, not one of us could ignore or deny the sights and sounds of what unfolded around us. The misfortune of patient A.F. was all but impossible to disregard. Akelu, as she was lovingly called by her grandfather and social worker, was a nine-year-old girl with a mangled body, who had seen far too much pain in her short life. Due to the extent of her deformities and the malignant volume of anomalous bone growth that progressively disfigured her, her case was deemed inoperable. This was crushing to her and her family, especially considering the arduous journey from a distant village only to be told there was nothing that could be done (Figure 3).

Even with unfathomably discouraging moments came other encounters that quickly reminded me and the team of some of the immense benefit that individuals have experienced. One of our former patients (S.L.) arrived unannounced at the Katalemwa clinic during our recent mission. We had operated on him in 2006 to repair injuries sustained in a devastating industrial accident. After being paralyzed and bedridden for months with a spine fracture, the surgery allowed him to walk into the clinic of his own accord. He appeared to be in great shape and was so thankful to the team for restoring much of his function (Figure 4).

After the first trip I began questioning myself and the purpose of the spine surgery mission. Are we really making a difference? Are we premature in our efforts? Are we causing more harm? Are we upsetting the balance? Are we introducing false hopes? On the day of our departure when we saw the beneficial results of our surgical intervention, it became clear that we can make a difference. A woman with TB moved her legs for the first time in 4 months. A gentleman with a broken neck sat propped up in bed for the first time in 5 months. A child with a congenital spondylolisthesis had a tremendous deformity correction and relief of pain.

On one hand, for myself and, I am certain, for those who accompany me, providing spine care in Uganda is most gratifying. On the other hand, leaving so many patients uncared for is troubling. Today, after three mission trips to Uganda, having provided spine care to well over 200 patients, and establishing life long relationships with colleagues and students, I am deeply indebted to my friend and colleague Dr. Mark Kayanja who, by virtue of getting me involved in Uganda, has re-affirmed in my mind why I am a physician.
FRENCH NEUROSURGICAL HUMANITARIAN MISSIONS AND COOPERATION IN PHNOM PENH, CAMBODIA

Humanitarianism is often part of the medical doctors’ vocation. Neurosurgeons also have commitments in non-governmental organizations (NGOs). Since the late 1970s, French doctors have followed the lead of the French Minister of Foreign Affairs, Bernard Kouchner, who, with others, founded “Médecins Sans Frontières” (Doctors Without Borders) in 1971 and “Médecins du Monde” ([MDM], or Doctors of the World) in 1980. Kouchner also co-founded (in 1995), with a group of friends and surgeons, “La Chaîne de l’Espoir” ([CDE], or Chain of Hope) which is focused on paediatric surgery.

Cambodia is a poor, developing country devastated by a long period of war and political instability, particularly during the Red Khmer period and its horrors during Pol Potist rule. Between 1975 and 1979, a third of the population died. During this period, part of the surviving Cambodian people fled the country to escape the genocide. In 1979, when the Vietnamese army arrived in Phnom Penh, Cambodia’s capital, less than 4 million inhabitants were still living in the country, struggling to survive. Before Pol Pot and his Red Khmer army assumed power, Cambodia’s population was 6 million. At present, the population is 12 million, half of which is under 18 years of age.

One of Cambodia’s main hospitals, Calmette, opened in 1960, named in memory
of Albert Calmette, a well-known French bacteriologist, who, in 1921 along with Camille Guérin, discovered the anti-tuberculosis vaccine. Until the Khmer regime revolution, Calmette Hospital was known as the kingdom’s great medical center and the highlight of French medical presence along with the Institut Pasteur. During the Pol-potist period, it was used as a day-nursery and paediatric center in the deserted capital. When the red Khmer regime collapsed in January 1979, the Calmette was in ruins. Nevertheless, it reopened a few months later in August, with only three surviving doctors ensuring, as best they could, medical care to patients hospitalized in some 150 remaining so-called beds of medicine, surgery, or maternity. Between 1979 and 1988, the hospital survived thanks to help from socialist Vietnam and Bulgaria. It was only in 1988 that a progressive political opening would allow France to get involved again in the Khmer healthcare system through MDM. In 1989, MDM set up a cooperation agreement with the new Cambodian Ministry of Health and restored part of the institution’s buildings, mainly the maternity and the surgical wards, and operating theatres. It is during this period—in December 1990—that I came to Cambodia for the first time and operated on neurosurgical patients in a very basic medical environment. Since then we have endeavoured to help Cambodia upgrade its capacity for treating children and young adults.

The other hospital in which we participate is the National Paediatric Hospital. Its con-

Figure 1. Anterior meningoencephalocele in a 3-year-old boy: preoperatively (left) and 1 year after the operation (right).

Figure 2. Anterior meningoencephalocele in a 6-year-old girl: preoperatively (left) and 1 year after the operation (right).
Construction began in 1974, was abandoned a year later, then resumed operation from 1980 to 1997 thanks to different NGOs. At present, the hospital is a governmental institution.

Since 1998, the neurosurgical group of the CDE have launched regular missions three times per year, representing some 30 missions in the past 10 years. All participating neurosurgeons are active members of the French Speaking Neurosurgical Society (Société de Neurochirurgie de Langue Française, [SNCLF]). Each mission has two neurosurgeons, two anaesthesiologists, a nurse and/or physiotherapist, and lasts for 10 days. The accompanying training program for Cambodian practitioners includes courses held in Phnom Penh and in France, and is supported by the French Ministry of Cooperation. During this period, we operated in two hospitals: more than 200 children at the National Paediatric Hospital, and 100 young adults at Hôpital Calmette. A great majority of the children presented with hydrocephalus, spina bifida, and other malformations such as anterior meningoencephaloceles (85 patients underwent surgery). Most of the patients—even those living far from Phnom Penh—have been regularly followed postoperatively. The adults who underwent surgery suffered from intracranial tumors and pituitary adenomas, cranial and/or spinal trauma, and spinal lesions such as disc herniation or cervical or lumbar canal stenosis. The complete cost of each mission (transportation and lodging for the team, medical examinations, and patient hospitalizations), sponsored by the CDE, was $20,000. Therefore the cost of each operation was about $2000.

Between 1998 and 2008, the French Cooperation Ministry supported an $8 million program for renovating Calmette buildings, purchasing a computed tomography scanner, and training medical staff. In addition, the CDE offered medical and neurosurgical equipment (microscope, operating table, respirators, monitoring devices, beds, etc.). This program created acceptable conditions for neurosurgical operations and led to the inauguration of the first neurosurgical unit (12 beds) on February 23rd, 2004 by the Khmer Prime Minister, Mr. Hun Sen (Figure 3).

However, in spite of the Khmer government’s efforts to develop a better quality healthcare system, the medical infrastructure remains quite deficient. Cambodia still has less than 20 beds devoted to neurosurgical patients when a minimum of 300 would be necessary (1 bed/40,000 inhabitants). There is a great deal to do in the forthcoming years, particularly in our specialty, since neurosurgical diseases represent a real public health problem.

Cambodia still has less than 20 beds devoted to neurosurgical patients when a minimum of 300 would be necessary (1 bed/40,000 inhabitants). There is a great deal to do in the forthcoming years, particularly in our specialty, since neurosurgical diseases represent a real public health problem.
Maya Angelou is hailed as one of the great voices of contemporary black literature and as a remarkable Renaissance woman. She is a poet, historian, author, actress, playwright, civil-rights activist, producer and director. A mesmerizing vision of grace, swaying and stirring when she moves; Dr. Angelou captivates her audiences lyrically with vigor, fire and perception. She has the unique ability to shatter the opaque prisms of race and class between reader and subject throughout her books of poetry and her autobiographies.

Dr. Angelou has authored twelve best selling books and numerous magazine articles earning her Pulitzer Prize and National Book Award nominations. Dr. Angelou, poet, hit the bestsellers lists with *I Know Why the Caged Bird Sings*, a chronicle of her life up to age sixteen, which was published in 1970 with great critical and commercial success. In 1993, Angelou became the second poet in US History to have the honor of writing and reciting original work at the Presidential Inauguration. *On the Pulse of Morning*, at Bill Clinton's presidential inauguration, was an occasion that gave her wide recognition for which she was awarded a Grammy award (best spoken word).

In the film industry, Dr. Angelou's work in script writing and directing, has been groundbreaking for black women. She has written and produced several prize-winning documentaries and her screenplay *Georgia, Georgia*, was the first by a black woman to be filmed. She was also nominated for an Emmy Award for her acting in *Roots*. In theatre, she produced, directed and starred in *Cabaret for Freedom* in collaboration with Godfrey Cambridge; starred in Genet's *The Blacks at St Mark's Playhouse*; and adapted Sophocles *Ajax*, which premiered in Los Angeles in 1974.
Originally from Lansing, Michigan, Alexa Irene Canady is the daughter of Elizabeth Hortense (Golden) Canady, a civic leader and social activist, and Clinton Canady, Jr., a prominent dentist. Not only would she grow up to be the first female African-American neurosurgeon in the United States, the first fellow in pediatric neurosurgery and Neurosurgery Chair at Children’s Hospital of Michigan, she would also become a great humanitarian in the field of medicine.

Growing up, Alexa and her brother were the only two African-American students in their entire Lansing-area school. Despite obstacles of racism and sexism, the future Dr. Canady was an exceptional student and was named a National Achievement Scholar in 1967. She earned her B.S., then M.D. cum laude from the University of Michigan in 1971. She was the valedictorian of her medical school class, but, on her first day of residency at Yale New Haven Hospital, she was referred to as “the new equal-opportunity package” by a hospital administrator. Despite such challenges, she perfected her craft of neurosurgery by taking advantage of learning opportunities, then moving on. As Chair of Neurosurgery at Children’s Hospital in Detroit, as well as associate professor at Wayne State University, she spent countless hours mentoring undergraduate students, medical students, and residents. She spoke at area schools, letting younger children know that they, too, could achieve their dreams. She considered her mentorship “public service.” Many of her humanitarian efforts were aimed at inspiring students, particularly minority and female students, to follow her into neurosurgery. Dr. Canady began mentoring me when I was in medical school. Through my graduation from medical school and through the long years of residency, Dr. Canady advised and encouraged me, as she did innumerable other students. No matter how late the hour or how long she had been in surgery, Dr. Canady always returned our phone calls the same day. When I became her fellow, she continued to blend high academic and clinical standards with empathy and kindness. Among her most important lessons for trainees was that as women neurosurgeons, we would not always be liked, respected, or appreciated. We followed her example, took advantage of all our learning opportunities in neurosurgery, and moved on to become neurosurgeons. As she was fond of saying: “We must do good work, and the work will speak for itself.”

Dr. Canady is revered at Children’s Hospital of Michigan, as well as other institutions around southeastern Michigan, for her expertise in craniofacial reconstruction, epilepsy, hydrocephalus, dysraphism, and neuro-oncology. She is especially proud, however, of her relationships with her colleagues, co-workers, and neurosurgery team members from residents to surgical technicians, nurse specialists to custodians. As a young attending, she advised me to understand not only my own issues but the difficulties and concerns facing all of these individuals as well. She is sensitive and supportive of all of those around her, and actively tries to make their jobs better. She promotes the careers of many of her team members, stating that that level of support is
Dr. Canady is dedicated to making sure all of the children on the neurosurgery service received excellent care. Delivering top neurosurgical care in an inner-city hospital, during a depressed economy, with the largest neurosurgical volume in the country is a constant challenge, but one Dr. Canady mastered with grace.

mandatory even if she loses that person to a promotion or educational opportunity. As a true humanitarian, Dr. Canady strives to elevate the professional pride and potential of all those around her.

The greatest example of Dr. Canady’s humanitarianism is in her care of children. She works tirelessly for her patients, as surgeon as well as advocate. She is skilled at putting children at ease, engaging them, and dissipating their fear. She recognizes the role the family plays in the stresses and ultimate recovery of a child, and is a fierce advocate for the families as well. She is frequently heard defending parents who were not seen by hospital staff during the day: “Did you know that she works during the day, and is here every night? Did you know she has 5 other children? Do you really think she isn’t worried about her child because she isn’t here right now?” Usually, the unfortunate critic would then be sent to call the “absent” parent to give an update on the child’s condition. Dr. Canady is dedicated to making sure all of the children on the neurosurgery service received excellent care. Delivering top neurosurgical care in an inner-city hospital, during a depressed economy, with the largest neurosurgical volume in the country is a constant challenge, but one Dr. Canady mastered with grace. In the urban setting of Detroit, she also worked to positively change the perceptions of African-American patients and physicians, and to eradicate disparities in neurosurgical care across socioeconomic levels. Under her leadership, the Division of Pediatric Neurosurgery regularly makes holiday food and monetary donations to Detroit’s poorest patient families. After noticing that the neighboring public middle school’s American flag was torn, she bought them a new one.

Dr. Canady received an honorary degree from Marygrove College in 1994. She has been honored by over 20 organizations, including an induction into the Michigan Women’s Hall of Fame, the American Medical Women’s Association President’s Award, Wayne State University’s Distinguished Service Award, Starlight Foundation’s Shining Star Award, Children’s Hospital of Michigan Teacher of the Year, and Roeper School’s Golden Apple Award. In 1995, she received the Athena Award, which is presented each year to a U-M alumna for professional excellence and public service.

“Medicine,” Dr. Canady frequently states, “is a service business. It’s no different than the corner drugstore. You provide a service as unobtrusively as possible. But you must be human. In order to provide good quality care, it is so important that patients are able to talk to you and not regard you as some deity above them.”
On February 25, 2008, in one of life’s ironies, Samuel Hassenbusch III, respected pain specialist and neuro-oncological surgeon, succumbed after a nearly three-year battle with glioblastoma. He was 54 years old.

Dr. Hassenbusch was diagnosed with a right temporal glioblastoma in May 2005 and underwent surgical resection. He was subsequently featured on the CBS Evening News as he underwent chemotherapy with a novel immunotherapy approach. He remained disease-free for two years until the tumor recurred nine months prior to his passing.

A native of St. Joseph, Missouri, Dr. Hassenbusch was an excellent student, played violin and trumpet, and toured Europe while in high school. In 1972, he married his high school sweetheart, Rhonda Warner. He attended Johns Hopkins University where he also completed his neurosurgery residency. In 1990, he also obtained a PhD in Pharmacology. During his time in Baltimore, he and Rhonda had three children, Samuel IV, Jason, and Amanda.

From 1989-1993, Dr. Hassenbusch was the head of the Section of Neuro-pharmacologic Oncology and Pain Management in the Department of Neurosurgery at the Cleveland Clinic Foundation. He subsequently joined the faculty at MD Anderson Cancer Center in Houston, Texas, advancing to Professor. He perfected intrathecal pain management techniques and had become prominent in Pain societies including presidential positions in the National Neuromodulation Society and American Academy of Pain Medicine, and the Texas Pain Society, among others. He was also president of the Texas Association of Neurological Surgeons from 2006-2007.

Dr. Hassenbusch became involved with the AMA Current Procedural Technology (CPT) Committee, also serving as Chair of the AANS/CNS Coding and Reimbursement Committee, a subcommittee of the AANS/CNS Washington Committee. “It was the symbiotic exchange of ideas and writings between him and the CPT staff that became the Principles of CPT Coding, the many CPT Assistant articles, and the CPT codebook. This remains his legacy to us,” said Grace Kotowicz, a long-time staff member of the AMA CPT Editorial Panel. Dr. Hassenbusch was a recipient of the renowned AMA Burgess Gordon Award for these efforts. “I still find it hard to put into words how unique Dr. Hassenbusch was and what his loss means to our office,” said Cathy Hill of the AANS/CNS Washington Office. “Every time I think of him I smile because of his enthusiasm and his genuine kindness.”

Befitting his role as a neurosurgeon and researcher, he desired to be considered a “six-foot lab rat,” when it came to seeking novel therapies for his tumor. As a result, he became a strong public advocate for clinical trials, testifying locally and in front of Congress, arguing for increased funding, and urging participation. He reached out to cancer victims, offering advice and assistance.

An avid motorcyclist, Dr. Hassenbusch co-founded MD Anderson’s employee group, Riders for the Cure, and participated in numerous fundraisers, including the annual Ridin’ for the Rose as Grand Marshall. This past April, Jason Hassenbusch rode in his father’s stead. Samuel Hassenbusch also began writing a book, Physician Heal Thyself, chronicling his journey and is working on its completion and publication. In addition to a thriving career, Dr. Hassenbusch enjoyed spending time with his family, travelling, and expanding his knowledge of history and the Bible.

While in his lifetime Dr. Hassenbusch was recognized and received many awards (at least one per year over 24 years), his passing has left an immeasurable void in neurosurgery. Through his efforts, we have seen the advancement of cancer pain management, research, and neurosurgical physician advocacy. He is survived by his wife, children, and two grandchildren as well as an entire discipline which can look to him as an example of fortitude, leadership, dedication, and hope.
CNS MICHAEL L.J. APUZZO LECTURER ON CREATIVITY AND INNOVATION

MUHAMMAD YUNUS, PhD
Nobel Peace Prize Laureate and Economist

Professor Muhammad Yunus was awarded the 2006 Nobel Peace Prize for his efforts to use microfinance as an instrument in the struggle against poverty. Through his groundbreaking Grameen Bank and its small micro-credit loans, Professor Yunus has managed to translate his vision of lifting individuals out of poverty into practical action, benefiting the lives of millions of people worldwide. His inspiring life story is a testimony to the power of ideas.

Professor Yunus studied economics in the Vanderbilt University, USA and received his Ph.D. in Economics in 1970. He taught economics in the Middle Tennessee University from 1969 to 1972. Returning to Bangladesh in 1972, he joined the University of Chittagong as Head of the Economics Department. He started the Grameen Bank Project in 1976. It was transformed into a formal bank in 1983, and today it operates 1,781 branches providing credit to 5.6 million poor people residing in 60,815 villages in Bangladesh.

Grameen, Professor Yunis claims, is a message of hope, a programme for putting homelessness and destitution in a museum so that one day our children will visit it and ask how we could have allowed such a terrible thing to go on for so long. The World Bank recently acknowledged that Yunus' business approach to the alleviation of poverty has allowed millions of individuals to work their way out of poverty with dignity.

In September of 2007, Professor Yunus and the Grameen Bank partnered with Intel to launch the Intel World Ahead Program in Bangladesh. This program aims to provide greater accessibility to the world's underserved by creating access to fully capable, affordable PCs tailored to their needs, as well as developing local infrastructures to sustain this access and providing the educational support needed to enable people in this area to effectively utilize this technology. This project is the next logical step toward Yunus' ultimate vision—the total eradication of poverty from the world.

Register Online by August 20, 2008!
www.cns.org
This past year has been a very successful period for WINS in working towards increasing our membership, doubling of our residency travel scholarships, and developing a new format for our web site. Importantly, WINS is working with the larger neurosurgical community in addressing outreach and workforce goals, specifically the recruitment of neurosurgeons at all career and training levels. Such collaboration resulted in a “white paper” addressing the barriers to the recruitment and retention of women in neurosurgery.

Within the past two years, WINS has initiated a strategic planning effort. Included are goals to increase the membership by outreach to international neurosurgeons, and making all female residents and fellows automatic members of WINS free of charge. To help increase international membership, a direct link was placed from the World Federation of Neurological Surgeons (WFNS) web site to the WINS web site and we have seen an increased interest among international neurosurgeons because of these efforts. There is now an “Associate Membership” category, which includes nurses, Physician Assistants, neurosurgery spouses, and other non-physician members of the neurosurgery community. A “Membership Chair” was introduced as a new executive board position to focus specifically on fostering continued membership growth.

The WINS web site, under the supervision of Dr. Roxanne Todor, has been updated to include a password-protected site, My-WINS.org, which will include bulletin board formats. Throughout the bulletin board, established neurosurgeons can post unique practice opportunities. In addition, the “Virtual Mentor” bulletin board, monitored by the WINS Executive Committee, will help provide insight and advice from WINS members to residents and medical students regarding Women In Neurosurgery (WINS)

Mission Statement:
To educate, inspire, and encourage women neurosurgeons to realize their professional and personal goals, and to serve neurosurgery in addressing the issues inherent to training and maintaining a diverse and balanced workforce.

Women In Neurosurgery (WINS) was founded in 1989 by a few women neurosurgeons who recognized the need for camaraderie in a surgical specialty where women were such a small minority. Today, WINS, with its 177 members, has grown into an international organization that includes women neurosurgeons from all practice types and men who are interested in the array of programs that WINS has developed.

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The WINS web site, under the supervision of Dr. Roxanne Todor, has been updated to include a password-protected site, My-WINS.org, which will include bulletin board formats. Throughout the bulletin board, established neurosurgeons can post unique practice opportunities. In addition, the “Virtual Mentor” bulletin board, monitored by the WINS Executive Committee, will help provide insight and advice from WINS members to residents and medical students regarding Women In Neurosurgery (WINS)
This past year has been a very successful period for WINS in working towards increasing our membership, doubling of our residency travel scholarships, and developing a new format for our web site. Importantly, WINS is working with the larger neurosurgical community in addressing outreach and workforce goals, specifically the recruitment of neurosurgeons at all career and training levels.

career options and pathways. The semiannual newsletter as well as the pamphlet, “So You Want to be a Neurosurgeon?” can be accessed through the main web site, www.neurosurgerywins.org.

WINS sponsors two major resident awards. The Sherry Apple Resident Travel Scholarship is presented at the CNS annual meeting and was named in memory of an outstanding neurosurgeon who was a true advocate of women and fairness in residency training. This scholarship is awarded to an outstanding abstract submitted for the CNS annual meeting. The Louise Eisenhardt Resident Scholarship Award is named for Harvey Cushing’s neuropathologist and the first and only female President of the AANS and is similarly awarded at the AANS annual meeting. Since the inclusion of these awards on the abstract selection sites, there has been an increase in the number of residents applying for consideration. These awards have each been increased from $1000 to $2000.

In addition to resident scholarships, WINS also presents the “Friend of WINS” award to an individual who has demonstrated outstanding generosity and support to women neurosurgeons. Past recipients include Stan Pelofsky, Kalmon Post, Robert Ratcheson, Franklin Wagner, and Donald Quest. The 2008 recipient is Chris Philips, WINS administrator, for her extraordinary devotion since beginning her position in 2001.

The past two years have been an exciting time for WINS-sponsored and associated speakers. Celia Sandys, granddaughter of Winston Churchill, spoke at the plenary session during the 2006 CNS annual meeting in Chicago. In 2007, the AANS established the Louise Eisenhardt lecture. WINS held a breakfast with the first lecturer, the first American female astronaut, Dr. Sally Ride. Marcia Angell, the first woman Editor-in-Chief of the New England Journal of Medicine, was the 2008 Louise Eisenhardt lecturer. The Alexa Canady lecture at the 2007 AANS WINS reception in Washington, D.C. featured Joan O’Shea, MD, a spine neurosurgeon at the Spine Institute of Southern New Jersey, who detailed how she started and manages a highly successful outpatient spine surgery center. In addition, recruiter Judy Rosman spoke about finding employment opportunities. During the 2007 CNS Annual Meeting in San Diego, there was an enlightening presentation by Darlene Fitzgerald, Special Agent for U.S. Customs Service, who spoke on: “The Criminality of Honesty.” Most recently, during the 2008 AANS meeting, the Ruth Kerr Jakoby Lecture, named for the first woman neurosurgeon to become Board certified, featured Kali Evans-Raoul, an image consultant.

In response to a member survey indicating that many members are unable to routinely travel to national meetings, WINS conducted its first regional meeting on December 14, 2007 in New York City. The program featured two speakers, Licia Hahn and Susan Longhito, management, marketing, and communications consultants, discussing: “Achieving What You Want in the Workplace.” The program was well attended. WINS will be appointing regional directors to assist with future meetings throughout the United States.

This upcoming year promises to be even more productive and historic for WINS. In light of the expected workforce shortages in neurosurgery, the WINS Executive Committee are drafting a “white paper” to address the barriers to recruiting and retaining women in neurosurgery. The ultimate goal is to recruit and retain the “best and the brightest,” regardless of gender. WINS continues to work closely with organized neurosurgery by appointing liaisons to the AANS and CNS executive bodies and Scientific Program Committees in addition to a newly created liaison position to the American College of Surgeons Committee on Women. CNSQ

We welcome all neurosurgeons, spouses and family members, nurses, physician assistants, and neurosurgical supporters to attend WINS receptions, visit our web site, and work with WINS in our continued efforts to help educate, recruit, and retain the most talented individuals to our specialty. All those wishing to join WINS can contact Chris Philips (cap@aans.org) or Sandy Meyer (sjm@aans.org).
The Section continues to sponsor programs at both the AANS and CNS Annual Meetings. The program at the 2008 AANS Annual Meeting featured the 3rd annual John Loeser Lecture, delivered this year by Dr. Kim Burchiel. The program at the 2008 CNS Annual meeting includes a provocative Integrated Medical Learning session on neuromodulation for failed back syndrome. The discussants will be Drs. Daniel Resnick and Richard Osenbach. The Section session will host a mini-symposium titled “Advances in Pain Physiology from Head to Toe.” Speakers will discuss new research into the mechanisms of thalamic pain, the medullary control of pain, and the development of chronic neuropathic peripheral pain. In lieu of a formal separate Joint Section Annual Meeting, the Section sponsored its Biennial Symposium on the Friday before the recent 2008 AANS Annual Meeting. The Symposium, titled “Back Pain: Understanding Causes and Treatments,” was attended by almost 80 registrants.

The Joint Section on Pain was deeply saddened by the tragic and untimely loss of John Oakley, MD, in an airplane crash just before the 2006 AANS meeting. He was a highly respected friend, teacher, and mentor to many who delve into neurosurgical pain management. It is difficult for a neurosurgical resident to become very interested in a field to which they have little exposure. Just about every training program provides extensive experience in neuro-oncology, cerebrovascular surgery, and spinal surgery. Not surprisingly, most trainees who do subspecialize choose to enter one of these arenas. However, only a few programs provide any substantive experience in surgical management of chronic pain. Therefore, it is imperative to provide interested residents with a mechanism to increase their exposure to the field if we are to have any hope of building up our presence. In John Oakley’s honor, the Section has decided to build an endowment for a fellowship that would allow a neurosurgical resident, or post-residency fellow, to travel for the purpose of studying the neurosurgical management of pain. We have obtained commitments to build the endowment to over $100,000 by 2010. We hope to begin accepting applications for the fellowship in July 2009 and have the first award begin in July 2010. Further contributions to the endowment are always welcome.

The Joint Section on Pain has also recently lost one of its most distinguished and beloved members. The passing of Dr. Samuel Hassenbusch after a long and courageous fight against glioblastoma was not just a loss for the Section, but for all of neurosurgery. Dr. Hassenbusch had long been one of those neurosurgeons who fought the fights for all of us. He was neurosurgery’s representative on the AMA CPT advisory council and was deeply involved in most every important pain management organization. His loss, like that of John Oakley, leaves a large hole in the family of surgical pain management specialists.

In an effort to obtain better data on the efficacy of neuromodulatory pain management interventions, under the leadership of Chris Winfree, MD, we are endeavoring to begin developing multicenter standardized protocols. We hope that this allows us to obtain better data from larger populations than could be obtained from a single center alone. The first protocol will likely involve a trial of trigeminal branch stimulation for neuropathic facial pain. For years we have published reports primarily focused on visual analog scale pain ratings. Going forward, this will clearly not be good enough. We need to perform larger multicenter studies of many of our treatments using not just visual analogue scale ratings, but validated functional measures as well. In this way, we can more precisely define the impact that our efforts have on patients’ lives. Some of these results may not be exactly what we expect and may defy some commonly held beliefs. However, properly devised, these studies can not only improve the way we practice, but also preserve access to advanced therapies for our patients. By providing real validated outcome measures and taking the lead in defining quality care, we maintain our status as the true best advocates for our patients.

We continue to work closely with our colleagues within neurosurgery, as well as other pain management fields, such as anesthesia, physiatry, and neurology, to educate them on existing treatments and to collaboratively bring relief to our patients. The Joint Section on Pain encourages neurosurgeons to join the Section and be a part of this exciting time in the field of surgical pain management.
It is my honor to contribute to this issue of the CNSQ. As we all know, the CNS is dedicated to the education of neurosurgeons in training and the provision of continuing medical education for practicing neurosurgeons. The CNS has a tradition of producing Annual Meetings which are on the forefront of neurosurgical education techniques: the recent implementation of the Integrated Medical Learning sessions is a great example. SANS has become an integral part of continuing medical education, board preparation and, now, maintenance of certification. Our journal, Neurosurgery, is one of the finest medical journals in the world. And so on.

As members of an organization dedicated to education, it might be interesting to step back and examine, briefly, some of the theories, old and new, on “how we learn” neurosurgery or, for that matter, any-

The Learning Continuum: From Novice to Master
thing. Epistemology, or “explanation of knowledge” from the Greek, is one of the classic philosophical questions. And, in the following paragraphs, I propose to briefly review a few of the answers, from well-known philosophers throughout history and up to our time.

Plato lived from 427-347 BCE in Athens. He was a student of Socrates and the teacher of Aristotle. He established a school, called the Academy (hence the “Academy” of Neurological Surgeons). He is arguably the most important philosopher who ever lived. Alfred North Whitehead famously remarked, “All of philosophy is Plato. The rest is footnotes.” Plato is well known for a dualistic approach to philosophy—we perceive the world around us, but what we perceive are merely inferior copies of the “intelligible” world of perfect forms. His best known writing is the “parable of the cave” in The Republic, wherein he describes our perception of the world as akin to being chained in a dark cave, with our back to the light, only able to see the projection of the forms dimly on the cave wall in front of us. For Plato, only the philosopher might be capable of breaking those chains and walking from the cave into the light, finally able to perceive the truth.

Plato expounded his theory of epistemology in The Meno. Meno asked the question, subsequently known as Meno’s paradox: “How can you learn something when you have no idea that what you don’t know exists?” Plato’s answer was that all learning is simply recollection. Learning, for Plato, was the discovery of pre-existing knowledge. The soul remembers the forms from prior lives (yes, Plato believed in transmigration of the soul).

Aristotle lived from 384-322 BCE in Athens. He was a student of Plato and the teacher of Alexander the Great. He founded the Lyceum. He was, briefly, one of Alexander the Great’s tutors. For over 1000 years his thinking dominated Western thought. He invented physics, zoology, and botany. Importantly to this discussion of epistemology, he was the founder of syllogistic, deductive logic. This approach toward knowledge was based on using simple observations and complex reasoning—starting with “revealed first principles” and deriving all else from logic. In the Middle Ages, those revealed first principles were the Bible and Aristotle, called “The Philosopher.”

So what is a syllogism? A syllogism is a logical argument that requires a major premise, a minor premise, and a conclusion. The most famous example is “All mortal things die,” “All men are mortal things,” therefore “All men die.” The term shared by the major and
The Congress of Neurological Surgeons has, as an organization, been masterly at “rule breaking.” We have used our skepticism about the “rules” to achieve amazing creativity in our approaches to neurosurgical education. and exhausted because there are so many rules. Examples might be “shift up when the motor sounds like it’s racing” or “attack a weakened king’s side.” A neurosurgical example is “listen to the sound of the suction to determine whether it’s clogged.”

The competent learner (this may be relevant to the “six competencies”) learns to pay attention only to what’s relevant and important. They don’t necessarily rely on rules. If they fail, they know it’s no longer because someone else didn’t provide them with enough rules. To be competent, one must be emotionally involved in the outcome. Examples might be “pay attention to the car speed, surface conditions, and time” or “don’t pay attention to the loss of your own chess pieces if not critical to your attack.” In neurosurgery, a competent assistant would select the appropriate suction size, verify function, adjust the lighting, and keep his head out of the light.

The proficient learner immediately sees goals. Even if he doesn’t have enough experience to automatically know the answer, he will decide what to do based on rules and maxims. The proficient driver controls the car and feels it “through the seat of his pants.” The proficient chess player can recognize a large number of solutions but still must choose amongst responses. The proficient surgeon can “feel” how hard to pull on a tumor but still must consciously choose amongst tools or maneuvers.

The expert performs the appropriate action without thinking. There is no problem solving or reasoning involved. This involves a switch to a non-analytic, non-Platonic mode of reasoning which is much more intuitive or Zen-like. A grand master recognizes a chess situation like a familiar face and knows the right move without thinking. An expert neurosurgeon moves his hands and instruments thousands of times during a case, without thought about individual moves, to quickly and efficiently remove a lesion.

Finally, the master understands what it is to be a ...in this case, plug in a neurosurgeon. He is never satisfied with his current level of knowledge. He understands neurosurgery in its broadest context, understands what is at stake and, not infrequently, breaks the rules. In fact, it is in masterly rule breaking that much of the knowledge and progress we have witnessed in our field has likely been accomplished over the past 50 years. To give one personal example: radiosurgery was a much maligned rule breaker when neurosurgeons like Leksell and Lunsford proposed its use in place of more traditional neurosurgical procedures. Ditto for the operating microscope, spinal instrumentation, cranial base approaches, microvascular decompression, functional surgery for Parkinson’s disease, etc., etc.

Every S is P
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No S is P

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Some S is P
I
subcontraries

O

Some S is not P

Figure 1.
Surgery of the Human Cerebrum

A Three-Part Supplement

Michael L.J. Apuzzo, Editor

June 2008 Part 3 Topics

Psycho-affective Disorders and Pain
3D Microsurgical and Tractographic Anatomy
Intraventricular Tumors
Extra Axial Lesions
Basal Lesions
Giant Aneurysms
Revascularization
Endovascular Techniques
Advanced Methodologies

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L. Nelson Hopkins, MD
Michael L.J. Apuzzo, MD

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September 2007 marked the fifth anniversary of the inaugural meeting of the Neurosurgery Executives’ Resources Value and Education Society, more commonly known as NERVES. Prior to that time, there was no organized group for neurosurgical practice administrators. As a result, little benchmarking data existed for the specialty and practice administrators found it difficult to find answers to questions specific to the practice of neurosurgery.

The Council of State Neurosurgical Societies (CSNS) identified the need for a professional society for their practice administrators. An organizational meeting was held in Philadelphia in September 2002. Although less than forty people attended the meeting, NERVES began its work immediately. At the first meeting the organization was named, bylaws were adopted, and the first officers were elected.

Much has been accomplished in the time since the Philadelphia meeting. NERVES has grown from three dozen interested individuals to a professional society boasting a roster of over 250 members. All NERVES members are involved in neurosurgical practice, but the membership is as diverse as the specialty. Members from all areas of the country represent private, academic, and hospital-based practices varying in size from solo providers to large, multidisciplinary clinics.

One of the driving forces for the inception of NERVES was the need for benchmarking data. Historically, surveys prepared by other national organizations did not provide neurosurgery with any significant statistics. NERVES will soon release its fourth socio-economic survey results. The survey tool was developed by NERVES members in conjunction with Heaton & Eadie, a healthcare consulting and accounting firm located in Indianapolis, Indiana. The survey results are based on completed questionnaires from neurosurgical practices.

The results released in 2006 represent over 360 neurosurgeons from 63 practices, making the NERVES survey the only statistically significant data available to neurosurgeons and their practice administrators. The socio-economic survey provides information on relevant issues in neurosurgery, such as trauma call pay, malpractice insurance, and the use of ancillary services, as well as data on provider productivity, compensation, operating costs, and support staff ratios for neurosurgery and related specialties. We encourage all neurosurgical practices to participate in the survey to increase the validity of the data. All NERVES members who complete the survey receive the results free of charge.

Another major initiative of NERVES is to provide education to neurosurgical practice administrators and managers. NERVES has hosted six educational meetings to date, with the latest annual meeting held April 24–26, 2008 in Chicago, Illinois. The meetings include general sessions, round table discussions, and break-out sessions on topics pertinent to the practice of neurosurgery today. Since all meeting attendees are neurosurgery practice administrators or managers, the annual meeting is also an excellent platform for networking.

NERVES provides other resources to its membership, including a list-serve where members can post questions to their colleagues. This has been a very popular service and has been used for a wide variety of topics including coding/reimbursement questions, human resource issues, and practice development.

Since that first small gathering NERVES has lived up to its name. With nominal membership and meeting registration fees of $175 and $225 respectively, the education and resources it provides to neurosurgical executives are truly valuable. Furthermore, the organization is financially sound, without utilizing any of the seed money pledged from the physicians’ societies.

Despite its success, NERVES is still a young organization. We need the continued support of the neurosurgical community to continue to grow, both in numbers and resources offered to the membership. If your practice administrator is not a member of NERVES, encourage them to join, attend the annual meeting, and participate in the Socio-Economic survey. The return to your practice will be invaluable.
Neurosurgery Workforce Update: 2008

The adequacy of the neurosurgical workforce has come under great scrutiny in recent years. Significant changes in the healthcare system, both within neurosurgery and without, have affected the supply of and demand for neurosurgical services in complex and often unexpected ways. The present manuscript attempts to examine this complex issue by exploring some of the factors that affect supply and demand.

**Supply**
The American Board of Neurological Surgery (ABNS) currently recognizes some 3378 actively practicing Diplomates. The number of Diplomates, after reaching a decade low of 2936 in 2001, has now rebounded to a number slightly greater than its previous peak of 3346 in 1998. Nationally, there is currently about one neurosurgeon for every 89,000 United States (U.S.) citizens or 11.2 neurosurgeons/million U.S. citizens (Figure 1). This number represents a nearly 10% drop in the number of neurosurgeons per capita when compared to the 1998 peak of 12.4 neurosurgeons/million U.S. citizens. Additionally, the population of neurosurgeons is aging, with approximately 1400 (44%) neurosurgeons over age 50 and approximately 600 (19%) over age 60. The mean retirement age of a neurosurgeon has been estimated to be approximately 60, raising at least potential concerns regarding a decline in numbers.

There are currently approximately 1087 neurosurgery residents tracking towards ABNS certification, 994 male and 93 (8.6%) female. One hundred and forty-two residents completed their training in 2007. With the exception of 2001, when 162 residents completed their training, this number has been stable, between 140 and 160 per year, since 2000. One statistic that appears to be consistently overlooked is the contribution of the neurosurgical resident workforce to the work product of the profession. While not practicing independently, resident physicians represent approximately 24% of the neurosurgical workforce. Since the introduction of American Council for Graduate Medical Education (ACGME) mandated work hours restrictions in 2003, the work product of this group has decreased substantially. One study documented a nearly 23% reduction in Chief Resident case volume after the introduction of these restrictions (AANS Bulletin 14, 2005).

Other factors affecting the neurosurgery workforce supply have been identified in recent studies. For a variety of reasons, nearly 38% of neurosurgeons have chosen to voluntarily limit their practice. Of those that have, greater than 50% no longer provide pediatric neurosurgical care, greater than 11% no longer provide cranial care, and nearly 13% no longer provide trauma care (AANS Bulletin 15, 2006). The geographical distribution of the neurosurgical workforce has also been examined. Disproportionate allocation of the workforce effectively reduces the supply when long travel times preclude transfer of acutely ill or injured patients. While accurate data are extremely dif-
Specific concerns regarding the neurosurgical work force have been raised, particularly regarding trauma and emergency care. Of the three specialties affected most by trauma care, neurosurgery is by far the smallest: 3378 Practicing Board Certified neurosurgeons (2007 ABNS data) versus 35,403 Board Certified General Surgeons and 22,711 Board Certified Orthopaedic Surgeons (ABMS 2004 data). Facilt to gather, there is evidence that increasing professional liability costs have had demonstrable local effects on specialist physician supply apart from traditional market forces (Ann Surg 242:621-628, 2005; Geographical Neurosurgical Workforce Analysis from 1990-2005 Improves Our Understanding of the Role of Market Factors (Abstract). Presented at the 2007 CNS Annual Meeting, San Diego, CA, September 17, 2007).

Demand
The current U.S. population is approximately 303 million and aging, with greater than 12% over age 65. The percentage of U.S. residents over age 65 is expected to increase to over 33% by 2050 (United States Census Bureau, Annual Population Estimates). This increase is associated with a corresponding increase in the demand for healthcare resources. It has been estimated that the annual cost of providing healthcare for an individual aged 65 or older is three to five times higher than for an individual less than age 65 (The State of Aging and Health in America 2007. Centers for Disease Control and Prevention and The Merck Company Foundation). Though the relationship between overall healthcare costs and demand for neurological services is tenuous at best, Barker et al., in 2005, documented a 50% increase in the volume of non-trauma cranial surgery between 1998 and 2001 (Neurosurgery 55:506-517, 2004). While data on spinal surgery are sparse, National Inpatient Sample data reveal a 16% increase in hospital discharges for spinal degenerative disease between 1998 and 2002, a figure which ignores the current trend toward outpatient spinal surgery. Additionally, in 2006, Weinstein et al. reported a significant increase in the rate of both fusion and non-fusion lumbar surgery between 1992 and 2003 in the concurrently increasing Medicare population (Spine 31:2707-2714, 2006).

Specific concerns regarding the neurosurgical work force have been raised, particularly regarding trauma and emergency care. Of the three specialties affected most by trauma care, neurosurgery is by far the smallest: 3378 Practicing Board Certified neurosurgeons (2007 ABNS data) versus 35,403 Board Certified General Surgeons and 22,711 Board Certified Orthopaedic Surgeons (ABMS 2004 data). Given a 10-year period between 1994 and 2003 (Abstract). Presented at the 2007 CNS Annual Meeting, San Diego, CA, September 17, 2007).

Conclusion
The data presented largely depict a stable or, perhaps, decreased workforce in the face of an increasing demand for neurological services. Is there any evidence that supply is inadequate? Certainly, the Canadian experience illustrates the pitfalls inherent in trying to predict future neurological workforce needs. Hugenholtz, in 1996, documented a shortage of surgeons in Canada and emphasized the importance of strategies to “increase and retain the number of Canadian neurological graduates” (CMAJ 155:39-48, 1996). A 2007 Canadian Neurosurgical Society study, however, concluded that Canadian programs are training nearly twice the number of neurosurgeons needed.


While prediction of future neurological workforce needs is by definition imprecise, it does appear that recent scrutiny is justified. Even with current efforts designed to more efficiently utilize neurological manpower for trauma and emergency care through regionalization, vigilance is needed to ensure that such efforts result in satisfactory solutions. Inasmuch as quality neurological care can only be provided by neurosurgeons, it is our responsibility to provide it. CNSQ
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SPECIAL LECTURER

Atul Gawande, MD
Surgeon and Acclaimed Author

Dr. Atul Gawande is a practicing surgeon at Brigham and Women’s Hospital and the Dana Farber Cancer Institute and an Assistant Professor at Harvard Medical School, as well as the author of several acclaimed books examining healthcare and surgical practice. He received the MacArthur Fellowship in 2006, for the “fresh and unique perspective, clarity, and intuition” in his written work and his “energetic and imaginative” approach to finding practical ways to improve surgical practice.

Dr. Gawande is a unique and important voice on the increasingly newsworthy and complex subject of healthcare and healthcare reform. His books combine an eloquent reflection of surgeons’ conflicts and concerns with a deep insight into the issues of ethics and performance that all professionals face.

Dr. Gawande’s book, Better: A Surgeon’s Notes on Performance, uses the high stakes challenges that he faces as a surgeon to explore the universal struggle to perform well. Through gripping stories of diligence, ingenuity, and what it means to do right, he gives us an inside look at the life of a practicing surgeon and offers unique insights into what it takes to succeed in any area of human endeavor.

In his book Complications, Dr. Gawande offers a raw view from the scalpel’s edge, where science is ambiguous, information is limited, the stakes are high, yet decisions must be made. Full of dramatic and revealing stories of patients and doctors, Complications is nuanced and lucid, unafraid to confront the conflicts and uncertainties that lie at the heart of modern medicine, yet always alive to the possibilities of wisdom in humanity’s heroic attempts at healing.

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Acadia, Government and the Pharmaceutical Industry: A Collaborative Effort

In the summer 2007 issue of the CNSQ, Nicholas M. Boulis, MD, wrote about the plight of “Natural Selection and the Neurosurgeon Clinician/Scientist.”

Dr. Boulis outlines the all-too-familiar difficulties of the academic neurosurgeon conducting basic science or clinical research, especially in regard to funding and protected time. He has also framed some solutions to these issues that neurosurgery itself can implement in order to ensure the future of this vital segment of our discipline. However, for Dr. Boulis to state that the undesirable alternative to a neurosurgery-led effort is “to be dictated by the short term profits of industry” is an unfair characterization which will only encourage polarization. As both a neurosurgeon affiliated with the AANS and CNS and a member of the pharmaceutical sector, I would like to offer a different perspective to consider.

Innovation is at the core of both the discipline of neurosurgery as well as the pharmaceutical sector. The overwhelming majority of key therapeutics in the world are developed by the pharmaceutical industry. In the fall 2007 issue of the CNSQ, Edward C. Benzel, MD, promotes innovation in neurosurgery and “in life itself” as “essential for the betterment of mankind.” I certainly concur. However, it is clear that innovation takes time—lots of it. It remains very typical for the lifecycle of an innovative medicine to exceed a decade from idea to approval. And in the background there are hundreds, if not thousands of other potential medicines that fail at various stages of development.

I believe that the truly spectacular successes within science and medicine will require the collaboration of disciplines and individuals with complementary skill sets. Diversity is the operant factor. Collaboration results in communication within the biomedical field—a visionary outlook which can result in a level of understanding and insight previously unavailable. In this context, the individual contributor (the “Renaissance” person) rarely, if ever exists. Few of us have the ability, let alone the time, to assimilate and integrate data from various scientific fronts and then weave them all into a cohesive hypothesis that provides a spectacular medical advance.

How do we all participate in leveraging this diversity of skills and knowledge? One very successful way is to engage in pre-competitive consortia. An excellent example of this is the Alzheimer’s Disease Neuroimaging Initiative (ADNI), largest public-private initiative ever undertaken. ADNI has enrolled three cohorts of aging individuals: the cognitively healthy elderly, those with dementia of the Alzheimer’s type, and a third group with prodromal Alzheimer’s dementia (mild cognitive impairment). These groups are followed for up to 3 years in a natural history longitudinal setting. Despite the fact that no therapeutic interventions are being studied and that all the data is readily accessible within the public domain, the pharmaceutical sector has provided approximately two-thirds of the $60 million needed to fund this initiative. Academicians and other investigators have provided the infrastructure and the patients, whose increasing numbers have resulted in full enrollment in 2007.

This very successful collaborative effort has now spawned other “ADNI-like” Alzheimer’s trials worldwide. These trials will undoubtedly accelerate our understanding of Alzheimer’s disease pathophysiology and hopefully result in disease-modifying therapeutics for a condition that, if left unchecked, will be at epidemic proportions within a few short decades. ADNI and similar activities are a core aspect of drug development and certainly speak strongly about mutual collaboration and long term investment.
Even with the current explosion of scientific and medical discoveries, fundamental gaps remain in our knowledge base. A proactive solution is the creation of tissue, genomic, and biofluid banks to address future critical questions or to refine the current hypotheses at some later time. Again, this is an investment that the pharmaceutical industry strongly endorses and actively funds at many levels.

Of course, for individuals to be able to engage in innovative research in any area they must have rigorous training in various scientific techniques and disciplines. While individuals commit their time and energy, who provides the necessary funding? Many, if not all, major pharmaceutical companies support these endeavors through a myriad of activities, including training grants within academic institutions and the public sector. Support for research and studies in both the basic science and clinical spheres is also an important mission of the biomedical industry. This can take the form of collaborating in a therapeutic or disease area on a question of mutual interest, as with an independent unrestricted research grant, or providing financial support for scientific-medical meetings at all levels ranging from local to worldwide.

Indeed, the Neurosurgery Research and Education Foundation, mentioned by Dr. Boulis as a mechanism for funding neurosurgical research, has been actively encouraging medical device manufacturers and pharmaceutical companies to contribute to this cause since 1995 (http://www.aans.org/corporate/nref.asp). This is clearly a joint investment of the future of the biomedical sciences and of neurosurgery itself, both within and outside of our discipline.

Although the biomedical industry has become an irresistible target of late, I would urge neurosurgeons and the medical community not to subscribe to a divisive stance but to seek ways to facilitate and to expand the scientific and medical dialogue. This cross-collaboration will encourage diversity of thought and synergy and, in the end, improve our service and care to patients—the ultimate goal for us all.

I believe that the truly spectacular successes within science and medicine will require the collaboration of disciplines and individuals with complementary skill sets. Diversity is the operant factor.

**Response to Editorial**

Nicholas M. Boulis, MD

Dr. Bednar’s points are well taken. The issue of creating incentive for innovation within the field of neurosurgery is a complex problem, and the risk of oversimplifying the issues in a short editorial is high. It is clear that industry and, more importantly, the entrepreneurial spirit play a critical role. Governmental and philanthropic funding are simply not sufficient to fuel true clinical translation. Moreover, it would be naïve to think that the drive to create and explore is sufficient unto itself. My use of “short term profit” should not be misconstrued as an attempt to degrade efforts driven by this type of self interest. After all, America was not discovered due to curiosity alone.

However, the primary responsibility of corporations and investment capital is to the investors, while the primary responsibility of clinicians is to our patients as individuals and groups. These differing motives dictate that neurosurgery cannot afford to depend on the private sector to determine the direction of innovation in our field.

The examples of the ADNI investment by the pharma industry, as well as the support of tissue, genomic, and biofluid banks, is undeniable evidence that industry plays a role in providing resources for long-term innovation. The creation of these types of resources is supported by various governmental funding mechanisms, but these efforts are rarely “sexy” enough to form the basis for individual investigator funding. They provide valuable tools and hence opportunity to individual researchers, but are a relatively minor incentive for the neurosurgeon/junior investigator. Dr. Bednar also discusses the many training fellowships funded by industry which do provide a vehicle for junior investigators. The Kline Award, which provided seed money to my research team, is an example.

Nonetheless, it is healthy for our discipline to take a critical look in the mirror. There is no denying the history of extravagant “consulting fees,” as well as the temptation to allow the pharma and device industry to fuel our personal visibility. In the brutally Darwinian environment that I illustrated in “Natural Selection,” it is all too easy for marketing to wear the mask of research.

If we, as a group, can afford to allow Ferrari dealers to exhibit on the floor of our national meetings, we can also afford to invest in our own future. This investment should rank equal to our lobbying efforts to protect our reimbursement. Industry support and collaboration for rigorous science should be courted, but as a discipline, we need to acknowledge that limited time and increased financial demands form a real hurdle to innovation in our field.
THIRD ANNUAL JOHN THOMPSON HISTORY OF MEDICINE LECTURER

Wendy Moore
Medical Journalist and Author

Wendy Moore is a British writer and journalist, and the author of The Knife Man, The Extraordinary Life and Times of John Hunter, Father of Modern Surgery. Moore has specialized in health and medical topics for more than twenty years. Her work has been published in a range of newspapers and magazines, including the Guardian, the Observer and the British Medical Journal, and has won several awards.

Moore holds a Diploma in the History of Medicine from the Society of Apothecaries and won its Maccabean Prize for best dissertation. She began in depth research in 2003 on the life of John Hunter, the 18th century, Scottish-born surgeon who launched a revolution in medicine by his insistence that all surgery should be based on sound scientific evidence. Her biography of Hunter was published in 2005 and again in paperback as The Knife Man, Blood, Body Snatching and the Birth of Modern Surgery, in 2006. The highly acclaimed Knife Man won the Medical Journalist’s Association Consumer Book Award, was short-listed for the biennial Marsh Biography Award, and was commended by the British Medical Association.

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MEMBERSHIP NEWS

CNS Bylaws: Proposed Amendments

At the April 2008 meeting of the CNS Executive Committee (EC), four proposed CNS Bylaw amendments were discussed and approved for a vote by the membership. In addition, a proposal was made to add a new member category. These proposals are to be reviewed by the CNS membership prior to voting at the CNS business meeting in Orlando in September 2008.

Proposed CNS Bylaws amendment #1
In order to diversify and strengthen the membership of the CNS Executive Committee, there is a growing need to bring in a broad group of CNS members that can represent the general membership. As such, the composition of the CNS Executive Committee should be altered to have the six (6) Members at Large positions of the CNS Executive Committee appointed for two (2) year periods rather than the current three (3) years. A Member at Large may be reappointed to the CNS Executive Committee at the end of their two-year term, as an Ex-Officio member, at the discretion of the CNS President.

Current CNS Bylaw
Article III, Section 2. Number and Election. The Executive Committee shall consist of twelve voting members: (a) the President, President-Elect, Vice President, Secretary, Treasurer, and Immediate Past-President, who shall serve during their terms; and (b) six other Members of the Executive Committee who shall be elected (each for a three-year term) by the members at the Annual Business Meeting. In addition, the President may appoint ex officio members of the Executive Committee. Each Member of the Executive Committee elected shall hold office until such Member’s successor is elected or until such Member’s earlier resignation or removal. No person shall be elected as a member of the Executive Committee after such person reaches the age of forty-eight (48) years.

Proposed amendment
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Proposed CNS Bylaws amendments #2, #3, and #4
The Leadership Development Committee (LDC) was established to act as a clearing-house for the identification, solicitation, and monitoring of leadership development among members of the Congress of Neurological Surgeons. Over the past several years it has become apparent that there is unnecessary redundancy in having a separate standing committee for those purposes. Members of the Executive Committee felt that the duties of the LDC could be more effectively served by appointing a “Volunteer Coordinator” within the existing CNS Membership Committee. The Volunteer Coordinator would serve as a point person for volunteers within the CNS. This person would request the help of volunteers for specific projects at the direction of the CNS Executive Committee. The following three bylaw amendments [Article VII, Section 1(I), Article VII, Section 1(U), and Article VII, Section 1(K)] would address that change.

Current CNS Bylaw
Article VII, Section 1(I): The Council of State Neurosurgical Societies shall be established jointly by the Congress and the American Association of Neurological Surgeons. The CSNS will be comprised both of elected delegates from the State Neurological Societies and of members appointed by the Presidents of the American Association of Neurological Surgeons and the Congress. The purpose of the CSNS is to provide a national forum for the State Neurosurgical Societies of the United States. This forum is primarily for discussion, consideration and proposal of action regarding socioeconomic issues concerning neurological surgery. The rules and regulations governing the operation of the CSNS are those which have been approved by the Board of Directors of the AANS and the Executive Committee of the Congress. Amendments to the rules and regulations are subject to approval of the Board of Directors of the AANS and Executive Committee of the Congress. The Chairperson of the CNS-appointees shall be appointed by the CNS President to a three-year term. The Chairperson should have experience as a State or Regional delegate or as a CNS-appointee to the CSNS. The responsibility of the Chairperson is to promote attendance of the CNS-appointees to the two annual meetings of the CSNS and provide leadership during the weekend activities of the CSNS. The Chairperson shall report to the Leadership Development Committee on the performance of the CNS-appointees.

Proposed amendment
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Current CNS Bylaw
Article VII, Section 1(U): The CNS Leadership Development Committee shall be chaired by a member of the Executive Committee who is appointed to this role by the President for a period of three years. The Committee shall also include the current President-elect, Annual Meeting Chairman, Scientific Program Chairman, and other members selected by the Chairman to assist in the activities of the Committee. This Committee will act as a clearing house for the identification, solicitation, and monitoring of leadership development among members of the Congress of Neurological Surgeons. The Committee is charged with reporting to the CNS Nominating Committee with objective documentation of talent and merit in consideration for leadership promotion within the Congress of Neurological Surgeons.

Proposed amendment #3
Delete Article VII, Section 1(U)

Current CNS Bylaw
Article VII, Section 1(K): The CNS Membership Committee shall consist of up to seven members and shall review and vote on all the applicants for membership. The Chair shall be selected from among the members of the Executive Committee who are not officers, and shall serve a 2-year term which is renewable by the CNS President. Appointment to the Membership Committee shall be made by the President in conjunction with the Chair of the Membership Committee and with the approval of the Executive Committee. Members of the Committee shall be appointed for a 2-year term.

Proposed amendment #4
Article VII, Section 1(K): The CNS Membership Committee shall consist of up to seven members and shall review and vote on all the applicants for membership. The Chair shall be selected from among the members of the CNS Executive Committee who are not officers, and shall serve a 2-year term which is renewable by the CNS President. Appointment to the Membership Committee shall be made by the President in conjunction with the Chair of the Membership Committee and with the approval of the Executive Committee. Members of the Committee shall be appointed for a 2-year term. One of the selected members of the CNS Membership Committee will serve as a Volunteer Coordinator. The Volunteer Coordinator will serve as a point person for identification, solicitation, and monitoring of volunteers within the Congress of Neurological Surgeons.

This Volunteer Coordinator will also request the help of volunteers for specific projects at the direction of the CNS Executive Committee.

New category of CNS membership
Rationale:
In order to serve neurosurgeons from the international community better, the CNS Executive Committee has proposed to offer a hybrid form of Congress membership. Neurosurgeons that live and practice outside North America and have a current membership in their local neurosurgical society would be eligible for International Vista Membership. International Vista Membership would offer some but not all of the benefits of Active International Membership including a discounted registration fee at CNS annual meetings, an attendance requirement of once every 10 years and access to CNS publications and benefits via the internet. In order to accomplish this, the following two (2) CNS Bylaw amendments need to be approved by the CNS membership.

Current Bylaw: Article IV, Section 1. Members. There shall be eight classes of membership in the Congress: Active Membership, Honorary Membership, Senior Membership, Inactive Membership, International Membership, Resident Membership, Associate Membership, and Affiliate Membership. Only active members shall be entitled to vote. The membership may be international in scope, and there is no limit to the number of members.

Proposed Amendment #1: Article IV, Section 1. Members. There shall be nine classes of membership in the Congress: Active Membership, Honorary Membership, Senior Membership, Inactive Membership, International Membership, International Vista Membership, Resident Membership, Associate Membership, and Affiliate Membership. Only active members shall be entitled to vote. The membership may be international in scope, and there is no limit to the number of members.

Proposed Amendment #2: Article IV, Section 4(A) International Vista Membership. Neurosurgeons who live and practice outside of North America (the United States, its territories, Canada and Mexico) and who have been certified by their regional certification board for neurosurgery training and practice may become International Vista Members. Except as provided herein, an International Vista Member shall have all of the rights, privileges, duties and obligations of an Active Member. International Vista Members will have access to electronic but not printed versions of Neurosurgery, Congress Quarterly, and Clinical Neurosurgery. An International Vista Member must be duly licensed and must be a member in good standing of at least one other recognized neurosurgical organization. The credentialing process for International Vista Members shall be completed by the International Committee, subject to final review and approval by the Membership Committee and Executive Committee, respectively. In circumstances where there is no local certification or licensing board, applications will be reviewed on a case-by-case basis by the International Committee, the Membership Committee and the Executive Committee. International Vista Members may participate in all Congress activities and as members or chairpersons of committees; however, they may not as Officers of the Congress of Neurological Surgeons.
A 27 year-old male collided with a coworker holding an industrial nail gun. He was neurologically intact. Coronal reconstruction shown above reveals a three-inch nail penetrating the left frontal lobe ending just anterolateral to the head of the caudate nucleus. 3-D reconstructed images confirm the entry point to be approximately two centimeters posterior to the left coronal suture. The patient was taken to the OR for cranietomy and nail removal under direct vision.