

Neurotrauma & Critical Care NEWS



Spring 2001

AANS/CNS Section on Neurotrauma & Critical Care

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Chairman's Message



Ross Bullock, MD, PhD

Much progress has been made in the area of improving reimbursement for neurotrauma care over the last nine months.

As one part of an overall initiative designed to increase neurosurgical involvement in neurotrauma care, members of the Trauma Section Executive Committee have been working in a variety of ways to explore the feasibility of improving reimbursement for neurosurgeons involved in neurotrauma care.

First, Don Marion, MD, has been working with the Washington Committee and Katie Orrico, JD, to formulate an action plan to determine the feasibility of obtaining a "neurotrauma modifier" to be added to the CPT codes for emergency neurosurgical procedures such as craniotomy for intracranial hematoma and laminectomies/emergent fixation for spinal injuries. However, after extensive consultation with members of the Washington Committee and the Resource Utilization Committee (RUC), it was determined that this initiative would be extremely difficult to successfully sustain, and concern was expressed that such a trauma modifier might actually deplete neurosurgical reimbursement in other areas.

Therefore, the Trauma Section Executive Committee felt that the most likely short-term means to achieve better neurotrauma reimbursement would be by widespread implementation of the practice whereby neurosurgeons are paid "on-call cover stipends" on a per diem basis for providing coverage to emergency rooms.

John McVicker, MD, working with the Council of State Neurosurgical Societies (CSNS),

completed an analysis of a survey of private practice and academic neurosurgeons. The results of the survey are reported in detail in his article in this newsletter. According to this survey, about 1 in 5 U.S. neurosurgeons are paid a stipend for providing emergency room coverage. This ranges from about \$500 to \$1,500 per 24-hour period of coverage. This obligates the neurosurgeon to provide the highest quality of emergency room coverage and offsets the necessary reduction in working hours which the neurosurgeon inevitably sustains to his elective practice.

The issue is how to increase this practice of stipend payment as rapidly as possible. In informal discussions with Virginia lawyers who are familiar with issues of practice liability and EMTALA laws, it appears that individual contracts between neurosurgeons and their hospitals, which include such payments, do not contravene antitrust laws, EMTALA or any other legal statutes governing neurosurgical practice.

On the other hand, it seems clear that such contracts must be negotiated at an individual level between neurosurgeons and their employing hospitals. We do not see any mechanism by which either the Trauma Section or the parent organizations can intercede in these negotiations beyond education of individuals regarding the issues concerned. John McVicker's survey was the first step.

The Washington Committee has recommended that we specifically formulate a strategy to "empower" neurosurgeons to procure such stipends. On behalf of the Trauma Section, Dr. Marion is working with the AANS and CNS leadership to put forth a position statement to assist neurosurgeons in their negotiations with hospitals. Future AANS and CNS meetings will include updates on these stipend negotiation issues. We would welcome feedback from anyone with ideas or experience in this regard.

Neurotrauma Section Highlights at the 2001 AANS Annual Meeting in Toronto

Sunday, April 22, 2001

Practical Clinics

8 AM-12 PM

024 Surgical Case Coding for Neurosurgery

Director: *Kim Pollock*

Practical Clinics

1-5 PM

031 Head & Spinal Trauma

Director: *Alex B. Valadka*

Faculty: *Michael G. Fehlings, Donald W. Marion, Thomas E. Hoyt, Fred Brenneman*

Monday, April 23, 2001

Breakfast Seminar

7:30-9:30 AM

108 Management of Traumatic Cervical Spinal Cord Injury

Moderator: *Volker K. H. Sonntag*

Panelists: *Christopher G. Paramore, Srinath Samudrala, Charles H. Tator, Paul R. Cooper*

Scientific Session II

2:45-5:15 PM

721 Assessment of Neurochemical Damage in Head-Injured Patients by Magnetic Resonance Spectroscopy

Anthony Marmarou, Stefano Signoretti, Panos Fatouros, Andrew Beaumont, Ross Bullock, Harold F. Young

Discussant: *Alex B. Valadka*

Tuesday, April 24, 2001

Breakfast Seminar

7-9 AM

201 Evidence-Based Approaches to Cerebral Trauma

Moderator: *Jack E. Wilberger Jr.*

Panelists: *Brian T. Andrews, Beverly C. Walters, John H. McVicker, Jamshid Ghajar*

215 Pediatric Head Injury

Moderator: *Ann-Christine Duhaime*

Panelists: *Thomas G. Luerssen, Lorenzo F. Munoz, John P. Laurent*

Wednesday, April 25, 2001

Breakfast Seminars

7:30-9:30 AM

310 Management of the Injured Athlete

Moderator: *Ralph G. Dacey Jr.*

Panelists: *Julian E. Bailes, Jr., Joseph C. Maroon, Arthur L. Day, Charles H. Tator, Brian T. Andrews*

314 Spinal Cord Injury: Contemporary Management

Moderator: *Barth A. Green*

Panelists: *Dennis Jay Maiman, Michael G. Fehlings, Fred H. Geisler, Laligam N. Sekhar*

AANS/CNS Section on Neurotrauma and Critical Care

2:45-5:30 PM

2:45-3:05 PM

Special Lecture I - The Neurosurgeon and the Emergency

Department: What do EMTALA and COBRA mean to us?

Thomas Hoyt

3:05-3:20 PM

Special Lecture II - Effect of Implementation of Severe Head Injury Guidelines - The Eastern Europe Experience

Jam Ghajar

3:20-3:35 PM

Special Lecture III - Implementation of Severe Head Injury Guidelines - the U.S. Experience

Anthony Marmarou

3:45-3:50 PM

Synthes Award for Resident Research on Spinal Cord and Spinal Column Injury: The Use of Modified EAST Practice Parameters In Clearing the Cervical Spine in the Obtunded Trauma Patient: A Prospective Study

Odette Harris, to be presented by M. Ross Bullock

Synthes Award for Resident Research on Brain and Craniofacial Injury: Tissue Resonance Analysis (TRA)-New Approach to Non-Invasive ICP Monitoring and Measurement

David Michaeli, to be presented by M. Ross Bullock

Scientific Session

4-5:30 PM

The Use of Modified EAST Practice Parameters in Clearing the Cervical Spine in the Obtunded Trauma Patient: A Prospective Study

Odette A. Harris, Frederico C. Moure, E. Thomas Chappell

Tissue Resonance Analysis (TRA)-New Approach to Non-Invasive ICP Monitoring and Measurement

David Michaeli, Petach Tiqva, Zvi Harry Rappaport

Treatment of Traumatic Brain Injury by Intravenous Transplantation of Bone Marrow Stromal Cells

Asim Mahmood, Dunye Lu, Michael Chopp

MRI-Based Noninvasive Method for Measurements of Intracranial Compliance and Pressure

Noam Alperin, Song Lee, Frak Loth, Ben Roitberg, Terry Lichtor, Fady Charbel

ICP is a Better Predictor of Survival than CPP: Analysis of the Turilazad Database

Mark E. Shaffrey, Elana Farace, Jeff W. Humphrey, Andrew I.R. Maas, Chantal Hukkelhoven, Evert Steyerberg, John A. Jane

Intrathecal Administration of Epidermal Growth Factor and Fibroblast Growth Factor 2 Promotes Ependymal Proliferation and Functional Recovery After Spinal Cord Injury in Adult Rats

Atsuhiko Kojima, Charles H. Tator

AANS Board of Directors Meeting

By Brian Andrews, MD

The AANS Board of Directors discussed many issues of concern to the Trauma Section at its meeting in November 2000 in Chicago, Illinois. The AANS supports our Neurotrauma Initiative, which Section Chairman-Elect Don Marion, MD, is pursuing with the Washington Committee. The initiative is reviewing the EMTALA laws to restore them to their original intent and to help us better understand our current legal obligations. The AANS supports the Section developing an Action Plan to assist neurosurgeons in negotiating with their individual hospitals for on-call stipends for emergency department coverage. This should lead to better such coverage nationwide.

Neurosurgical Focus, the AANS Web-based, peer-reviewed, electronic journal edited by Martin Weiss, MD, is eager for Section input and involvement. Section members recently edited and contributed to an issue on neurosurgical monitoring (November 2000 issue).

The AANS supports the Section's efforts to develop and promulgate neurotrauma guidelines. These include the recently completed Early Indicators of Prognosis in Severe Traumatic Brain Injury and an update of the original Guidelines (both published in *J Neu-*

rotrauma 17:449-627, 2000), as well as the Penetrating Head Injury and Spinal Cord Injury Guidelines currently being developed. The AANS is working with the Section on developing a Position Statement on Violence Due to Firearms Injury and is eager to promote such a statement once completed.

The AANS/CNS Young Neurosurgeons Committee will continue to have representation at the Trauma Section Executive Committee. Both the AANS and the Section want to foster resident activities within the Trauma Section.

The Council of State Neurosurgical Societies (CSNS) has recently adopted two resolutions relevant to our Section: a resolution regarding the development of trauma systems and a resolution on the use of helmets for recreational activities. Also, the AANS endorses the CSNS and the Section working together to publish and promote the recently completed CSNS survey on ER on-call coverage.

Brian T. Andrews, MD, is Past Chairman, AANS/CNS Section on Neurotrauma and Critical Care, and Liaison to the Board of Directors of the AANS.

Neurosurgical Contracts with Trauma Hospitals

By John McVicker, MD

Neurosurgeons in many communities are expected to take call as a condition of medical staff membership. Emergency Medical Treatment and Active Labor Act (EMTALA) regulations dictate that specialty availability on a hospital call schedule must extend to the hospital Emergency Department (ED), obligating medical staff to trauma call. As hospital systems expand, market and in many cases profit from participation in trauma care delivery, the neurosurgeon's available time for reliably compensated elective activities diminishes.

The fact there are comparatively fewer available neurosurgeons relative to other high-demand trauma specialists, such as orthopedic surgeons, makes this situation disproportionately worse. Even though neurosurgery is a small specialty, 57 percent of all high-acuity trauma patients have some neurological injury, and half of the 150,000 injury-related deaths that occur annually in the United States involve a serious brain injury that is primarily responsible for the patient's demise.¹ Obviously, neurosurgical availability is key to the success of a trauma program. However, many neurosurgeons now opt out of taking ED call because they simply cannot afford the loss of time and revenue such a service entails.²

Advantages of Contracts

Maintaining enthusiastic support for a trauma program by a medical staff is not an easy assignment for the average community hospital. Contractually agreed-upon call stipends are a reasonable way to assure

adequate neurosurgical coverage by an institution that has made such a commitment. Contracts between trauma hospitals and neurosurgeons can guarantee neurosurgical call availability, as well as mandate neurosurgical participation in quality assurance, education, and protocol and program development, including trauma program outreach. Contracts improve the institution's ability to meet EMTALA obligations, help assure the institution meets standards required for trauma center verification and improve coordination among trauma specialists.

In addition, the pending Balanced Budget Reform Act of 2000 includes a section (§204) that may allow hospitals to include on-call stipends in their hospital cost reports, which will provide the hospitals direct means of obtaining Medicare reimbursement for these expenses. Such contracts may provide the funds necessary to bring needed neurosurgical workforce to a community and may be the only way some neurosurgeons can afford to remain on a medical staff that requires participation in trauma.

Typical neurotrauma contracts include several sections. Hospital obligations should be spelled out regarding equipment requirements (CT, MRI, microscope, etc.), staffing requirements (ED, intensive care unit, operating room, 24-hour radiology, etc.) and transfer agreements with other hospitals. Transfer agreements are ideally worked out in the context of a state or regional trauma system and should include

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Neurosurgical Contracts with Trauma Hospitals (Continued from page 3)

predefined criteria to avoid EMTALA violations. Unavoidable unavailability of the surgeon and any back-up call requirements, if necessary, should be addressed.

Trauma Program requirements (trauma coordinator, secretarial support, etc.) are the hospital's responsibility. The contract should define neurosurgeon or neurosurgical group responsibilities such as frequency and duration of call, and back-up availability, negotiated appropriate to trauma level, average acuity, trauma volume and available workforce. No neurosurgeon should be expected to cover a trauma service beyond the limits of a safe and reasonable workload. The contract should spell out required committee involvement, anticipated protocol development and updating, and expectations for participation in medical and nursing staff education and trauma outreach programs. Reimbursement type, amount and methodology and whether the contract is with individuals or groups should be decided. Defining peer review and quality assurance parameters is of significant importance.

Few Problems

Most of the problems that a hospital may face if it enters into a contract for neurotrauma coverage and program development are more perceived than real. For example, the "snowball" effect of various other trauma specialties lining up for costly stipends has not materialized in hospitals that have instituted this practice for neurosurgery, except with trauma surgeons or trauma anesthesiologists who are required to provide coverage in-house.

On the other hand, specifically dangerous to the institution is any implication that a neurosurgeon who contracts for trauma coverage is compelled to bring elective work to the hospital. Major regulatory concerns have arisen over these anti-kickback "payment for referral" issues, and hospital systems have been made to pay considerable fines and have undergone substantial federal scrutiny for such schemes.

Nevertheless, legal analysis suggests that physicians could expect fair market compensation for services that go beyond usual medical staff obligations. When limited workforce and high reliance on neurosurgical trauma services are factored, it is apparent that neurotrauma coverage commonly demands more from the neurosurgeon than general emergency coverage does of the average medical staff member and is thus worthy of additional compensation at fair market value.¹

National Survey Done

Estimating fair market value then becomes critical in structuring a fair neurotrauma contract. The best yardstick of this value in a community may be local or regional data as long as demographics, average Injury Severity Scores and the like are comparable. These figures are difficult to come by, and large regional and demographic variability is likely to exist. National figures will reflect reimbursement methodology for similar institutions more broadly, but such data compilations are likewise not widely available.

The Council of State Neurosurgical Societies (CSNS) has recently completed a national Internet survey on key socioeconomic parameters of emergency neurosurgery and neurotrauma. The survey addressed the contractual and practical agreements between neurosurgeons and the hospitals and systems in which they practice. Ninety-one percent of

the 263 respondents actively participated in trauma, about half urban and half suburban or rural. Sixty-two percent of respondents were in private practice, 28 percent in academics, and 10 percent were salaried. Level 1 trauma centers accounted for 40 percent of the institutions, Level 2 about 30 percent, and Level 3 and undesignated about 30 percent. About one in three respondents had a formal contract for neurotrauma coverage with their institution.

Compared to limited prior surveys,^{3,4} contractual arrangements with hospitals for the provision of neurotrauma care appear to be growing more prevalent. Nineteen percent of respondents in the CSNS survey were directly reimbursed for trauma call availability, and more than 31 percent received some form of financial incentive to participate (see below). Call stipends were about twice as frequent in private and salaried practices (21 percent) as in academic practices (11 percent) and tended to be in a lower range (mode \$500-1,000) in academics and salaried positions than in private practice (mode \$1,000-1,500).

As a general rule, call coverage was more frequent, less likely to be reimbursed (or reimbursed at a lower rate) and more likely to be mandatory at Level 3 and undesignated trauma centers than at Level 1 or 2 centers. More than 75 percent of all respondents reported call coverage to be mandatory at their institution. Half the unreimbursed respondents reported trauma call to be disruptive to their practices "most of the time," while about a third reported the same level of disruption if stipends were in place. Hence, stipends appear to allow a practice to adjust in part to the additional time and resources required to participate in trauma call.

Financial Arrangements

Neurosurgeons and their hospitals have developed a variety of creative arrangements for making trauma coverage both fiscally and physically responsible. Smaller community hospitals with a limited number of neurosurgeons have worked out cross-coverage arrangements, periodic locum tenens or temporary transfer agreements to shield their neurosurgeons from the burden of excessive call requirements. Hospitals may bill patients directly and reimburse a guaranteed percentage of the neurosurgeon's trauma receivables or simply provide billing services for the neurosurgeon. Hospitals may supply on-campus office space to allow for ready neurosurgical availability.

Since neurotrauma coverage is widely perceived as increasing exposure to medicolegal liability, some institutions have agreed to pay for additional malpractice coverage and, in some cases, cover the entire amount. "Neurotrauma Director" positions may be created for neurosurgeons most involved in program development, along with a negotiated annual consulting fee.

Summary

Neurotrauma contracts can be a win-win situation for the neurosurgeon and the hospital. The hospital can reduce its EMTALA exposure, improve its performance in the trauma center verification process and ensure neurosurgical participation in quality assurance and program development by supporting the concept of voluntary trauma contracts.

For the neurosurgeon, these contracts help alleviate the double burden of providing mandatory uncompensated care even as reliably compensated elective practice is negatively impacted. Everyone negotiates for and knows what their agreed-upon responsibilities in

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Report of the Washington Committee

By Donald Marion, MD

The Washington Committee discussed reimbursement issues, issues related to biomedical research and graduate training, neurosurgical practice issues and several other topics related to the government and our specialty at its meetings on December 1, 2000.

In terms of reimbursement, Katie Orrico, JD, continues to speak on our behalf to maintain values for RVUs at the year 2000 level, rather than proceeding with the cuts proposed for 2001-2003.

Changing the EMTALA regulations recently received important support when the president of the AMA wrote to the Health Care Financing Administration on December 15 urging it to "refrain from issuing further regulations until such time that the GAO study can be completed ... and we can get back to the original intent of the Act." As a subspecialty that is frequently placed in difficult situations by the EMTALA regulations, neurosurgeons are obviously grateful that the AMA is taking a strong stand for the

review and modification of these regulations.

During the Washington Committee meeting we had several discussions about neurotrauma reimbursement. I reported that I had met with Drs. Brian Andrews, Greg Przybylski and John McVicker regarding the "Neurotrauma Action Plan" and was advised by all three that it was unlikely we would be able to obtain a new CPT modifier for trauma codes. The group was much more positive about the possibility that we could convince trauma center administrators that neurosurgeons taking trauma call should receive a stipend.

The Washington Committee meets three times a year. All members of the Trauma Section are invited to contact me if they have issues they would like addressed at those meetings.

Donald W. Marion, MD, is Chairman-elect and Washington Committee Liaison, AANS/CNS Section on Neurotrauma and Critical Care.

Report of the Guidelines Committee

By Jam Ghajar, MD, PhD, and Ross Bullock, MD, PhD

There are various neurotrauma guidelines in development and implementation. The following is an update.

Surgical Management of Traumatic Brain Injury (TBI): This guideline document will address indications, timing and methods of surgery for intracranial mass lesions. The first meeting of the guidelines author group (Drs. Bullock, Ghajar, Gordon, Hartl, Newell, Servadei, Walters and Wilberger) was at the Brain Trauma Foundation offices on December 15, 2000. Representatives of the AANS Guidelines Committee, American College of Surgeons, European Brain Injury Consortium, Brain Trauma Foundation and the AANS/CNS Section on Neurotrauma and Critical Care attended. The scheduled completion of the document is summer of 2001. It then will be submitted to pertinent organizations for review.

Management and Prognosis of Penetrating Brain Injury: This guideline is completed and is under review first by the AANS/CNS Section on Neurotrauma and Critical Care and then by the Board of Directors of the AANS as well as the CNS Executive Committee. The project began early in 1998 under the leadership of Robert Florin, MD, and has included members of the Section as well as European neurosurgeons. The *Journal of Trauma* is scheduled to publish the entire work as a supplement to their main journal. This guideline, especially the prognosis section, will be very useful to clinicians who deal with victims of TBI and their families.

Pediatric Traumatic Brain Injury: The neurotrauma research group at the Oregon Health Sciences University is currently mining Medline for evidence that will be presented to the Section representative, David Adelson, MD, to develop recommendations. The goal for completion of the document is summer 2001. Eighteen topics have been identified, 14 of which are the same as the adult TBI Guidelines and four of which are new and unique to the pediatric age group.

Management and Prognosis of Severe Traumatic Brain Injury: The latest update on the original guidelines, which now includes a new section on prognosis, was published in the *Journal of Neurotrauma* in the June/July 2000 issue (Volume 17, Number 6/7). A hardcover book version is available from the AANS (for U.S. neurosurgeons) and from the Brain Trauma Foundation (for others). Reviews of TBI appeared in the *Lancet* (Ghajar J:356:923-929, 2000) and in *Neurosurgery* (Marshall L:47:546-561, 2000). The guidelines will be posted at www.guideline.gov. Implementation of the guidelines is under way in New York state, Eastern Europe and Colombia using an Internet quality assurance database and education programs.

Prehospital Management of Traumatic Brain Injury: Both this and the in-hospital guidelines can be viewed at www.braintrauma.org and are available in book form from the Brain Trauma Foundation. The implementation program is under way in 10 U.S. states and will be expanding to other states next year (see Fall 2000 newsletter).

Management of Spinal Injury: Mark Hadley, MD, has assumed the leadership role in developing the Spinal Cord Injury Guidelines for the AANS/CNS Spine Section. Nelson Oyesiku, MD, represents the Trauma Section in this effort, and the Trauma Section looks forward to the opportunity of reviewing these guidelines in due course.

Management of Mild and Moderate Head Injury: Andy Jagoda, MD, an emergency medicine physician from New York, has recently convened a group to formulate evidence-based guidelines on this topic. The representative from the Trauma Section is Alex Valadka, MD, and a first meeting is planned for March 2001.

Jam Ghajar, MD, PhD, is Chairman, Guidelines Committee, AANS/CNS Section on Neurotrauma and Critical Care. M. Ross Bullock, MD, PhD, is Chairman, AANS/CNS Section on Neurotrauma and Critical Care.

Military Neurosurgery: The Steadfast Torch Continues

By James T. Ecklund, MD, LTC, MC, USA, and William T. Monacci, MD, LTC, MC, USA

A number of medical and neurosurgical advances have emerged from the military experience. The military neurosurgeon is exposed to a vast number of casualties during wartime. This situation creates an opportunity for rapid professional growth of the surgeon and refinement in medical and surgical techniques. As early as 400 B.C., Hippocrates commented, “War is the only real school for the surgeon.”

One of the first applications of Lister’s principles of antisepsis was during the Russo-Turkish War of 1877 by Ernst von Bergmann. In World War I, Col. Harvey Cushing demonstrated how impeccable neurosurgical technique could vastly improve operative mortality, reducing it from 54 percent to 28 percent in 3 months. During World War II, antibiotics, transfusions and improved techniques were used by neurosurgeons to further reduce mortality to 14.5 percent. The Seddon nomenclature and Sunderland classification of peripheral nerve injury grew out of World War II experiences.

The ambulance concept, introduced by Dominique-Jean Larrey during the Napoleonic Wars and later applied by Jonathon Letterman during the American Civil War, was expanded as air-mobile evacuation in the Korean and Vietnamese conflicts. Research by military neurosurgeons during Vietnam, the Israeli-Lebanese conflict and the Iran-Iraq conflict has helped define the extent of surgical debridement necessary in penetrating head injury. Currently, a prospective data collection system has been established for use in future conflicts.

A Unique Mission

The military neurosurgeon has the unique responsibility to provide care for soldiers, sailors, airmen and Marines during combat and in remote environments. While it is an honor to deliver care to the brave men and women who defend our nation’s shores, we must also remember our unique responsibility to champion research efforts addressing neurosurgical care before the patient reaches a fixed hospital facility.

To effectively address this mission, it must be recognized that warfare is changing, and the practice of military neurosurgery must respond to meet new demands. Bayonets and lower velocity slugs have been replaced by nuclear, biological, and chemical weapons and computerized ordinance delivery systems. Injuries have and will continue to become more complex. The battlefield and enemy are often less defined as we deal with more urban conflicts and terrorism threats. Deployments are steadily becoming more austere. While civilian trauma systems are designed to deliver care within a regional network, the military must be prepared to deliver care throughout the entire world, often in remote locations and under extreme conditions.

A goal in the military is to continuously improve the care we deliver to the injured soldier or sailor who may be in the middle of a firefight, aboard a submarine, on a mission in Antarctica or in

any number of remote locations. The Glasgow Coma Scale is a wonderful tool to use in a hospital environment, but it is unrealistic to expect a young, 18-year-old medic to administer this exam while under fire. The Marine Corps is investigating the development of a more basic clinical evaluation tool that can be reliably administered in the heat of battle and easily place the neurologically injured Marine into one of three categories—evacuate, return to battle or expectant. This tool relies on simple assessments of disorientation, weakness, seizure, pupil abnormality, scalp laceration and skull fracture. A retrospective review of 146 patients has been completed using this tool, and a very high correlation with outcome has been shown. A prospective study is currently in progress to further validate and possibly modify the exam.

After his initial evaluation, the medic must then independently manage the patient until such a time that he can be evacuated to the next echelon of care. Depending on the tactical situation, evacuation can be quite delayed, requiring the combat medic to provide care with the limited equipment contained in his aid bag. In Desert Storm, a war in which the Allied Forces had complete air dominance, medical evacuation time averaged 4.5 hours. Understanding this dilemma, military research laboratories, like their civilian counterparts, continue to do active research in brain protection and inflammatory cascades, looking for neuroprotective medications that medics can administer to the neurologically injured patient in the field. The military is also actively investigating artificial blood substances, fibrin bandages and a noninvasive hydration instrument for determining the degree of shock.

Sophisticated Support

When the patient reaches the first line of a more sophisticated medical support, his electronic dog tag (personal information carrier, or PIC) can be read by a laptop computer. The PIC contains the patient’s entire medical history, including medications, lab tests, x-rays and EKG. Currently, in order to image the brain, the patient must be evacuated to a field hospital that has portable CT capability. At the neurotrauma lab at Uniformed Services University of the Health Sciences (USUHS), a handheld Radiofrequency Triage System (RAFTS) that uses high-frequency radio waves to detect intracranial hematomas, pneumothorax and compartment syndromes is being developed. The RAFTS operates between 1-6 gigahertz and uses .01 watt of power. In comparison, a cell phone operates at 1-3 gigahertz and requires 1 watt of power. Animal trials have been completed, and this instrument can reliably detect as little as 2 cc of intracranial blood.

When the patient needs to be evacuated to the next echelon of care within the field environment, or back to a fixed hospital stateside, the portable ICU or “LSTAT” is used. This self-contained unit mounts inside a Blackhawk helicopter or C130 with a protective cover for flying through contaminated areas. It has a ventilator, suction, IV pumps the size of cigarette cases that each

pump up to 6 liters per hour, and monitors capable of reading vitals, end-tidal CO₂, ICP and CPP. The data can be transmitted via telemedicine links to a physician who can then direct the flight crew on patient management issues.

When the patient arrives either at a field hospital or a hospital ship with neurosurgeons, the capability and equipment are quite good. A full selection of surgical instruments, including power drills and operating microscopes, is standard in all the DEPMEDS and hospital ship operating rooms.

Developments in Telemedicine

When the tactical situation doesn't allow timely evacuation or when the need for evacuation isn't clear, telemedicine is utilized to consult and advise on the need for evacuation. Telemedicine helps keep the soldier and sailor on the job while reducing the forward deployment of medical personnel and equipment.

On an attack submarine, "store and forward" technology is utilized with a digital camera, video camcorder, optical camera, electronic stethoscope and digital vital signs. These submarines have independent duty corpsmen who are exceptionally trained, but no physician is on board. They will gather and store the data on a patient and then rise to a depth where they can deliver a "data burp." They can then drop back to tactical depths while the data are reviewed and a response is generated. They will then rise again to receive a data burp containing guidance from a specialist.

During the summer of 2000, relay buoys were deployed at appropriate depths in select locations to allow submarines to remain at more tactical depths while exchanging information. On the USS George Washington aircraft carrier, which has approximately 5,000 hands and 10 physicians, the store-and-forward technique is used for non-emergency consultations. Real-time consultation is also available for complex and emergency cases.

Telepresence surgery combines real-time telemedicine with robotics technology. Visual and audio stimuli are transmitted to the surgeon via real-time telemedicine signals. The biggest obstacle in telepresence is refining haptics, or the ability to feel the tissue interaction with your instruments as if you were actually holding them. Haptics have improved dramatically but still require a substantial amount of refinement, which will likely limit our deployment of this technology for several years. USUHS has developed an early prototype instrument in which two robotic arms hold instruments that are controlled by a surgeon sitting in an adjacent room. The surgeon places his hands inside two gloves, looks into a pair of goggles that display the image from the camera and directs his assistants, who are with the patient, through a microphone. Vessels and lacerations have been experimentally sutured, and appendectomies have been performed with this apparatus.

If this technology continues to progress and the haptics significantly improve, a future battlefield could include the following scenario: a casualty is evacuated to a far-forward medical unit with a Warfighter Information Network for Telemedicine, real-time consultation is performed and a technician assists a surgeon in performing a telepresence life-saving operation.

The military traditionally has been and will continue to be a leader in research and technological innovation as it applies to the

military mission. Today there are 38 neurosurgeons on active duty in the U.S. Armed Forces, stationed at 15 different hospitals worldwide. There are approximately 60 neurosurgeons in the reserves. Deployments for neurosurgeons vary from K-teams containing 1-2 neurosurgeons supporting field hospital needs to larger neurosurgical groups supporting hospital ships and theater hospitals. Many members of the AANS and CNS have experienced the honor of providing neurosurgical care to our military patients. With our continued collective support, our soldiers, sailors, airmen, and Marines will be well served far into the next century.

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Resident/Fellowship Awards

By Michael G. Fehlings, MD, PhD

Two Synthes Resident Research Awards were presented at the CNS Meeting in San Antonio, Texas.

- The Synthes Award for Resident Research on Spinal Cord and Spinal Column Injury was presented to Deepa Soni, MD, for her paper “Extensive axon regeneration in the adult rat corticospinal tract after spinal cord injury.”
- The Synthes Award for Resident Research on Brain and Craniofacial Injury was presented to Roman Hlatky, MD, for his paper “Time course of cerebral autoregulation in severely head-injured patients using dynamic testing.”

The 2000-2001 Codman Fellowship in Neurotrauma will be awarded to Kevin Stevenson, MD, University of Pittsburgh, for his study of the hypothesis that moderate hypothermia begun in the early period after controlled cortical impact in immature rats and maintained for three hours will attenuate the posttraumatic inflammatory response as measured by the abnormal expression of IL-1 β within the brain. The award will be presented at the CNS meeting in October in San Diego.

The Executive Committee of the AANS/CNS Section on Neurotrauma and Critical Care, together with the Synthes and Codman companies, is pleased to invite applications from residents for the 2001-2002 annual awards. The Synthes Award for Resident Research on Spinal Cord and Spinal Column Injury and the Synthes Award for Resident Research on Brain and Craniofacial Injury will be awarded at both the annual AANS and CNS meetings. The Codman Fellowship in Neurotrauma supports



The Synthes Awards were presented at the 2000 CNS meeting in San Antonio. Involved in the presentation were (from left) Paul Gordon of Synthes Spine, Steve Murray of Synthes Maxillofacial, award winner Roman Hlatky, MD, Trauma Section Awards Committee Chairman Michael Fehlings, MD, PhD, award winner Deepa Soni, MD, and Trauma Section Chairman Ross Bullock, MD, PhD.

young neurosurgeons in obtaining additional clinical and research training in the field of neurotrauma.

For more information, contact Michael G. Fehlings, MD, Chair, Fellowship/Awards Committee of the AANS/CNS Section on Neurotrauma and Critical Care, at michael.fehlings@uhn.on.ca.

Michael G. Fehlings, MD, PhD, is Chair, Fellowship/Awards Committee, AANS/CNS Section on Neurotrauma and Critical Care.

Neurosurgical Contracts with Trauma Hospitals (continued from page 4)

the provision of trauma care will be, and excessive and potentially unsafe workload on the neurosurgeon can be avoided. These legal agreements appear to be increasingly prevalent nationwide. Contractual relationships between neurotrauma centers and trauma neurosurgeons that include reimbursement for guaranteed availability will greatly facilitate neurosurgical participation in trauma care as they become common practice.

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John McVicker, MD, is a senior partner of the Rocky Mountain Neurosurgical Alliance, Englewood, Colo.

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James M. Ecklund, MD, LTC, MC, USA, is a lieutenant colonel in the United States Army and Chief of the Department of Neurosurgery, Walter Reed Army Medical Center, Washington, D.C. William T. Monacci, MD, LTC, MC, USA, is a lieutenant colonel in the United States Army and Neurosurgery Consultant to the Surgeon General.

Legislative and Regulatory Update

By Katie O. Orrico, JD

At the request of the Section, the Washington Committee has made improving neurotrauma care a high priority on its advocacy agenda for the next several years. The Committee is working with the Section to develop an “Action Plan for Improving Neurotrauma Care,” which will include suggested legislative and regulatory modifications to the Emergency Medical Treatment and Active Labor Act (EMTALA) laws and mechanisms and strategies for increasing trauma reimbursement (including reimbursement for on-call coverage).

In addition, the plan will incorporate recommendations for trauma systems development, including increasing federal financial support. The timing for this is ideal, as there are a number of governmental initiatives currently under way on this topic. Some recent government actions are summarized below.

Payment for On-Call Stipends – Last year’s budget bill included a provision allowing “critical access” hospitals to include on their Medicare cost reports the costs associated with paying on-call stipends.

Trauma Systems Funding – In the final FY 2001 appropriations bill, Congress allocated \$3 million for the Trauma Care Systems Planning and Development Act. The AANS and CNS, along with the American College of Surgeons, actively lobbied for funding this program, which will help states and localities develop organized trauma systems.

GAO Report to Congress – Congress has mandated that the General Accounting Office (GAO) conduct a review of EMTALA. The report will evaluate 1) reimbursement for EMTALA-mandated services (including on-call physician compensation), 2) the extent to which EMTALA is an “unfunded mandate”, and 3) whether the “scope” of EMTALA has been inappropriately expanded. The AANS and CNS recently met with GAO officials and will make recommendations related to this report.

Proposed HCFA Regulations – The Health Care Financing Administration (HCFA) has been preparing a new EMTALA regulation that would likely significantly expand the reach of EMTALA to apply not just to patient “transfers” but also to all “discharges.” The AANS and CNS, along with the AMA and others, led an effort in drafting a letter to HCFA requesting that it not issue this regulation pending the GAO study. We were successful in preventing the issuance of this rule.

OIG Reports – In January, the HHS Office of Inspector General (OIG) issued two EMTALA-related reports. While the AANS

and CNS were initially worried that these reports would be negative, particularly on the problems related to on-call physicians, they actually should help support our efforts toward legislative and regulatory relief.

The first report, “The Emergency Medical Treatment and Labor Act: Survey of Hospital Emergency Departments,” describes the results of a mail and telephone survey of emergency department managers, doctors, nurses and registration staff as well as on-call physicians. The OIG found that most emergency department staff are familiar with EMTALA, but many are unaware of recent policy changes and believe that current regulations exceed the intent of the legislation. In addition, the OIG found that managed care reimbursement practices create special problems in complying with EMTALA.

Finally, the report notes that hospitals are having difficulty staffing on-call panels for some specialties because of a lack of payment for these services. Neurosurgery was listed as the number one specialty in which specialist coverage is a problem. The report concluded that additional efforts should be made to communicate policy decisions and that legislation should be supported that compels managed care plans to

reimburse hospitals for EMTALA-related services. The report noted that the payment issue is a very complex problem and beyond the scope of the OIG study, but solutions may involve action at the federal, state, and local levels, as well as from private entities.

The second report, “The Emergency Medical Treatment and Labor Act: The Enforcement Process,” was critical of HCFA’s enforcement process, finding that the enforcement process is compromised by long delays and that EMTALA investigations and their ultimate disposition vary widely by region. In addition, the OIG found that HCFA does not always obtain peer review before the agency considers terminating a hospital for EMTALA violations. Finally, despite HCFA instructions, the OIG found that state survey agencies don’t always use review physicians that are board-certified and actively practicing in the same medical specialty as the physician whose case led to an alleged violation. The report recommended that HCFA establish an EMTALA technical advisory group that includes representatives from the medical specialty societies.

Copies of both reports can be found on the OIG’s Web site at <http://www.hhs.gov/oig/oei/whatsnew.html>.

Katie O. Orrico, JD, is Director, AANS/CNS Washington Office.

Congress has mandated that the General Accounting Office (GAO) conduct a review of EMTALA.

Trauma Section Surveys AAST

By Alex B. Valadka, MD

The Trauma Section is working hard on many fronts to promote optimal care of neurotrauma patients. Numerous guidelines projects, modifications of EMTALA laws and efforts to promote emergency room on-call stipends for neurosurgeons are but a few areas in which the Trauma Section is heavily involved.

As the Trauma Section investigated other ways to serve the needs of its membership, it became evident that very little data existed about the extent of neurosurgeons' involvement in trauma. To fill this void, the Section surveyed the membership of the American Association for the Surgery of Trauma (AAST) to learn how the AAST membership views the trauma care provided by neurosurgeons. The AAST is the oldest academic trauma society in this country and is considered by many to be the most prestigious such society. It was felt that its members would make good judges for "grading" neurosurgical performance.

The results of this survey have been published in the January edition of *Neurosurgery* (*Neurosurgery* 48:17-25, 2001) and also may be read on *Neurosurgery's* Web site (www.neurosurgery-online.com). Although almost 60 percent of respondents reported that neurosurgeons were in charge of the care of adults who had required a craniotomy for isolated head injury at their hospital, only 31.5 percent indicated that neurosurgeons were in charge of the care of nonoperated adults with isolated head injury ($P < 0.001$). Likewise, although over 60 percent of respondents thought neurosurgeons should be in charge of the care of adults with isolated head injury who had required a craniotomy, only 42 percent thought neurosurgeons should be in charge of the care of nonoperated adults with isolated head injury ($P < 0.001$). These questions were repeated for pediatric patients with isolated head injury and for both adults and children with combined head injury and systemic injury. Overall, the frequency with which neurosurgeons acted as "leaders of the team" depended upon whether a craniotomy had been performed. Furthermore, the responses consistently indicated that neurosurgeons should be in charge of the care of head-injured patients more frequently than they actually were in charge.

The survey also asked about the frequency of specific problems with neurosurgeons taking trauma call. Almost 45 percent of respondents thought neurosurgeons were too reluctant to place intracranial pressure (ICP) monitors in trauma patients, 35 percent thought neurosurgeons were too slow in getting trauma patients to the operating room, 43 percent thought neurosurgeons did not answer pages promptly and 18 percent reported neurosurgeons on trauma call did not answer pages at all. The likelihood of respondents indicating that non-neurosurgeons should be allowed to insert ICP monitors and even perform trauma craniotomies was significantly related to whether the respondent reported inadequate neurosurgical performance of these activities.

This report provides a rare opportunity for neurosurgeons to

view themselves as others see them. The results indicate that management of head-injured patients is commonly directed by non-neurosurgeons, especially when these patients have not undergone a trauma craniotomy. If the trauma surgeons at particular hospitals experience continuing dissatisfaction with how neurosurgeons provide neurotrauma care, it is possible that the trauma surgeons may begin inserting ICP monitors and performing other interventions that historically have been the domain of the neurosurgeon.

Like several articles in this newsletter, this survey provides food for thought for neurosurgeons who are re-evaluating the goals and priorities of their involvement in their local trauma systems. The Executive Committee of the Trauma Section continues to try to help all neurosurgeons provide care for critically ill neurosurgical patients and welcomes suggestions and requests for additional projects.

Alex B. Valadka, MD, is Secretary/Treasurer, AANS/CNS Section on Neurotrauma and Critical Care.

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Application for Membership



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I. Biographical

- (A) Name: _____
- (B) Home Address: _____
- (C) Office Address: _____

- Phone: _____ Fax: _____
- (D) E-Mail: _____

II. Category of Membership Requested: (Must be a member of the AANS or CNS.)

- Active Associate
- International Resident

III. Membership, Certification and Practice:

- (A) Are you certified by the American Board of Neurological Surgery? Yes No
- (B) Are you a member of
1. The American Medical Association? Yes No
 2. A Local or Regional Medical Society? Yes No
 3. A State or Provincial Medical Society? Yes No
Name: _____
 4. The American Association of Neurological Surgeons? Yes No
 5. The Congress of Neurological Surgeons? Yes No

Signature of Applicant

Date

*Membership dues are waived for applicants currently enrolled in a neurosurgical residency program.

Please return the completed application with your membership fee of \$50 to:
AANS/CNS Section on Neurotrauma and Critical Care
Dept. 77-7597
Chicago, Illinois 60678-7597

Visiting Neurotrauma Fellowship Offered

The AANS/CNS Section on Neurotrauma and Critical Care is pleased to announce the availability of a Visiting Neurotrauma Fellowship. The Fellowship is intended for senior neurosurgeons from outside the United States and Canada who have made a major contribution in the area of neurotrauma within their own country.

The Fellowship recipient will use the funds to attend the AANS or CNS meeting and to visit an academic center in the United States or Canada for further clinical or research experience in neurotrauma. He or she may be asked to speak at the meeting.

Prospective candidates should submit a letter of intent, including details of their proposed visit and their identified

host institution. In addition, a letter from a neurosurgical colleague outlining the applicant's achievements in neurotrauma is requested. The fellowship provides a grant of \$5,000 (U.S. dollars). Letters of application should be submitted to Michael Fehlings, MD, PhD, Fellowships and Awards Committee, AANS/CNS Section on Neurotrauma and Critical Care, Toronto Western Hospital, Suite 2-417, McLaughlin Pavilion, 399 Bathurst St, Toronto, ON M5T 2S8. The application can be e-mailed to michael.fehlings@uhn.on.ca or michael@uhnres.utoronto.ca.

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