

# Neurotrauma & Critical Care NEWS



Fall 2005

## AANS/CNS Section on Neurotrauma & Critical Care

Editor: Jack I. Jallo, MD

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## From the Chair

Alex B. Valadka, MD

Representing neurosurgery's interests whenever different stakeholders in healthcare delivery come together has never been as important as it is today. The complexity of the questions being discussed at such meetings makes it mandatory that neurosurgeons with detailed knowledge of the issues be present at the table. Otherwise, those with their own agendas may take advantage of our absence to push their priorities forward at our expense. We may not be able to score a victory every time we attend one of these sessions, but on the other hand, we—and especially our patients—certainly cannot afford any losses.

Fortunately, we have enjoyed recent success when it comes to holding our own and to advocating for our patients. Earlier this year, Katie Orrico and I were in Washington, D.C., to present neurosurgery's views at the first meeting of the EMTALA Technical Advisory Group, for which neurosurgeon John Kusske serves as chair of the On-Call Subcommittee. When representatives of the hospital industry presented testimony recommending that mandatory on-call duties be made a condition of physician participation in the Medicare program, we revised our prepared comments to strongly object to that idea. Our comments were echoed by other speakers, who shared our concerns about the potentially disastrous consequences of the hospitals' proposal.

Last spring the American College of Surgeons asked surgical specialty societies to meet and discuss emergency workforce issues. The Trauma Section and the AANS/CNS Washington Committee worked together closely to present neurosurgery's views. Our representatives were Troy Tippet, Jim Bean, Gail Rosseau, Katie Orrico, and myself. Of note, we were the only surgical subspecialty that was asked to prepare a formal presentation.

Our comments to this group of surgeons, emergency physicians, healthcare analysts, and others concluded with five messages. First, we emphasized the tremendous impact of neurological emergencies and, more importantly, the crucial,

unique and irreplaceable role that neurosurgeons play in the treatment of patients with these emergencies. Second, federal medical liability reform is essential if neurosurgeons and other specialists are to continue to participate in emergency medical systems. Third, compensation for on-call services to offset the losses that physicians incur by providing these services is an important way to remove a major disincentive to participation in emergency care systems. Fourth, the recent clarifications to EMTALA must be preserved in order to allow physicians and hospitals maximal flexibility to use the emergency resources in their region in the most efficient way possible. Fifth, regionalization of neurotrauma care and/or creation of centers of excellence in neurosurgical trauma and emergency care are concepts that deserve further study.

Each of these points deserves detailed discussion, but because of space constraints, only the first and last will be expanded upon here. For several years now, trauma surgeons have been working on revamping general surgical training. Plans call for several years of core surgical training, followed by several years focused on all acute and emergency surgery (not just trauma). This training would include at least some neurosurgery and orthopedics. The depth of the proposed neurosurgical instruction is unclear at the moment, i.e., whether it will consist only of an introduction to basic management principles, or whether it will include detailed training on insertion of intracranial pressure monitors and other types of procedures. We must continue to emphasize that no other specialists are as well trained in neurotrauma as neurosurgeons and that no other specialists are in as good a position to help patients with these types of problems.

Proposals for regionalization reflect the desire to bring emergency neurosurgery patients to those hospitals that are willing and able to care for them at any hour of the day or night. Such systems may

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# Neurotrauma and Critical Care Highlights at the 2005 CNS Annual Meeting

The Congress of Neurological Surgeons hosts its 55th Annual Meeting Oct. 8-13 at the Hynes Convention Center in Boston, Mass. The scientific program revolves around the theme Quo Vadis? (Where Are You Going?)

## Sunday, Oct. 9, 2005

### PC13 Traumatic Adult and Pediatric Brain Injury

Course Directors: John Ragheb, Raj K. Narayan

Faculty: Shelly D. Timmons, Anthony Marmarou, PhD, Lori Anne Shutter, Jack E. Wilberger, Alex B. Valadka, Domenic P. Esposito, Geoffrey T. Manley, Douglas Brockmeyer

## Monday, Oct. 10, 2005

### Section on Neurotrauma and Critical Care I

2:00 PM–5:30 PM

Moderators: Geoffrey T. Manley, Guy Rosenthal

#### Synthes Award for Resident Research on Brain and Craniofacial Injury

2:00 PM–2:15 PM **822**

#### Effect of Cyclosporin A, Topiramate, or 100% Oxygen as Proposed “Neuroprotective” Therapies Upon the Microdialysis Parameters of Patients with Severe Traumatic Brain Injury

Rodney M. Samuelson; Anna Mazzeo; Niki K. Kumene; Charlotte B. Gilman; M. Ross Bullock; Harold F. Young

#### Synthes Award for Resident Research on Spinal Cord and Spinal Column Injury

2:15 PM–2:30 PM **823**

#### Inhibition of the p75 Neutrophin Receptor Does Not Protect Against Cell Death at the Injury Site and Worsens Functional Outcome After a Clinically Relevant Compression Model of Spinal Cord Injury

Gordon K. T. Chu; Michael G. Fehlings

#### 2:30 PM–2:45 PM **Codman Neurotrauma Research Fellowship Presentation**

2:45 PM–2:50 PM **J. Douglas Miller Award**

#### 2:50 PM–3:20 PM **Integra Lecture – Neurotrauma: A 30-year Perspective**

Donald Becker

#### 3:20 PM–3:30 PM **Discussion**

#### 3:30 PM–4:00 PM **Refreshments with Exhibitors**

#### 4:00 PM–4:09 PM **824**

#### Evolution of Diffuse Brain Edema in Experimental Traumatic Injury Model Analyzed by High Resolution MRI and 1H NMR Spectroscopy

Ruth Prieto; José María Pascual; Juan Solivera; Laura Barrios; Sebastián Cerdán; José María Roda

#### 4:09 PM–4:18 PM **825**

#### Indirect Transport of Severe Traumatic Brain Injury Patients to Trauma Centers Increases Mortality

Roger Hartl; Linda Gerber; Quanhong Ni; Laura Iacono; Jamshid Ghajar

#### 4:18 PM–4:27 PM **826**

#### Chronic Anticoagulation With Warfarin Is Associated With Decreased Functional Outcome and Increased Length of Stay Following Craniotomy for Acute Subdural Hematoma

Alexander L. Coon; Matthew McGirt; Graeme Woodworth; Geoffrey P. Colby; Gerhard S. Munding; Mark Foran; Judy Huang

#### 4:27 PM–4:36 PM **827**

#### Mortality Following Severe Head Injury in the Elderly

Hiren C. Patel; Omar Bouamra; A. T. King; F. Lecky

#### 4:36 PM–4:45 PM **828**

#### Neurosurgical Experience in Theater During Operation Iraqi Freedom

Michael K. Rosner; Christopher J. Neal; David T. Floyd

#### 4:45 PM–4:54 PM **829**

#### DVT Prophylaxis in Neurosurgery: A Prospective Randomized Trial- Study Design and Preliminary Data After 8 Months

Samuel R. Browd; Cade Walker; Renee Madsen; Brian T. Ragel; Gary Davis; Amy Scott; Elaine Skalabrin; William T. Couldwell

#### 4:54 PM–5:03 PM **830**

#### Severe Head Injury Patients With Glasgow Coma Score of 3, 4 and 5: To Treat or Not to Treat

Martina Stippler; Yuan Kong; Mary Kerr; Howard Jonas

#### 5:03 PM–5:12 PM **831**

#### Pre- but Not Post-Lesion Inflammation Plus Proteoglycan Degradation Results in Functional Regeneration

Michael P. Steinmetz; Kevin P. Horn;

Jared H. Miller; Dileep Nair; Dan J. Silver; Jerry Silver

#### 5:15 PM–5:30 PM **Oral Posters 37 – 41**

## Wednesday, Oct. 12, 2005

### Section on Neurotrauma and Critical Care II

2:00 PM – 5:30 PM

Moderators: Geoffrey T. Manley, Jamie Sue Ullman

#### 2:00 PM–2:20 PM **Pro: Only Neurosurgeons and their Extenders**

#### Should Place Neuromonitors and Supervise TBI Care

Domenic P. Esposito

#### 2:20 PM– 2:40 PM **Con: You Don't Have to Be a Neurosurgeon to Place**

#### Neuromonitors and Supervise TBI Care

William M. Coplin

#### 2:40 PM–3:00 PM **Discussion**

#### 3:00 PM– 3:30 PM **Oral Posters 42 – 51**

#### 3:30 PM– 4:00 PM **Refreshments with Exhibitors**

#### 4:00 PM–4:09 PM **900**

#### Effect of Cyclosporin (CsA) Therapy on Functional Outcome in Severe Traumatic Brain Injury: Report of a Phase I/II Clinical Trial

Bonnie Rosbolt; Jimmi Hatton; Richard Kryscio; Byron Young

#### 4:09 PM–4:18 PM **901**

#### Prophylactic Craniectomy for Traumatic Brain Injury: Clinical Results and Complications

John Chi; Matt Potts; Michelle Meeker; Martin C. Holland; Geoffrey T. Manley

#### 4:18 PM–4:27 PM **902**

#### Examination of the Management of Traumatic Brain Injury in the Developing and Developed World: Focus on Resource Utilization, Protocols, and Practices That Alter Outcome.

Odette Harris; Carl A. Bruce; Ivor Crandon

#### 4:27 PM–4:36 PM **903**

#### Frequency and Severity of Brain Hypoxia and Responsiveness to Brain Oxygen Directed Therapy Is Associated With Outcome in Patients Following Severe Traumatic Brain Injury

Alejandro M. Spiotta; Michael F. Stiefel; Stephanie Bloom; Eileen Maloney-Wilensky; M. Sean Grady; Peter D. Le Roux

#### 4:36 PM–4:45 PM **904**

#### Design of a Prospective TBI Quality Improvement Data Bank

Roger Hartl; Linda Gerber; Quanhong Ni; Laura Iacono; Jamshid Ghajar

#### 4:45 PM–4:54 PM **905**

#### Independent Predictors of Outcome Following Acute Subdural Hematoma Evacuation: A Novel Grading Scale for Outcome Prediction

Alexander L. Coon; Matthew McGirt; Graeme F. Woodworth; Gerhard S. Munding; Mark Foran; Geoffrey P. Colby; Judy Huang

#### 4:54 PM–5:03 PM **906**

#### Erythropoietin Enhances Neurogenesis and Restores Spatial Memory in Rats After Traumatic Brain Injury

Asim Mahmood; Dunyue Lu; Changsheng Qu; Anton Goussev; Timothy Schallert; Michael Chopp

#### 5:03 PM–5:12 PM **907**

#### Diffusion Weighted Imaging–Magnetic Resonance Imaging for Cranial Infections

Brian L. Hob; Christopher J. Farrell; William T. Curry Jr.; Frederick G. Barker

#### 5:15–5:30 **Oral Posters 52 – 55**

## Corticosteroids in TBI: The Wider Implications of the CRASH Trial

Ross Bullock, MD, and Dale Hesdorffer, PhD

The *Lancet* recently published an important report of mortality in a large “mega trial” of the role of corticosteroids in traumatic brain injury. This preliminary report indicated that the early in-hospital mortality after use of corticosteroids was higher than in the control group (23 percent versus 18 percent mortality rate). While the authors of the CRASH (Corticosteroid Randomisation After Significant Head Injury) trial, the trial’s funding agency (the British Medical Research Council) and the *Lancet* are to be congratulated for providing the definitive answer with respect to the previously debated question of the role of corticosteroids in traumatic brain injury, the implications of this mega trial are very much wider.

CRASH is the largest trial ever conducted for human traumatic brain injury—a massive achievement in a total of 239 centers in 49 countries. A major concern upon reading the data, however, is the alarmingly high mortality rates reported in this trial, especially for the severe injury category, which accounted for 3,944 patients, or 39.4 percent of the overall trial. Mortality was 39.8 percent in the treated group, and 24.8 percent in the placebo group.

Review of representative publications from the severe brain injury literature reveals that mortality rates have been steadily declining at a rate of approximately 5 percent per decade in larger hospitals in Europe and North America. In small single-center series, mortality rates as low as 20 percent to 25 percent at the six month point have recently been reported (Table 1).

What then, is the explanation for the discrepancy between these mortality rates (Table 1) and the much higher mortality rate of about 34.8 percent reported for severe traumatic brain injury, TBI, in the control group of the CRASH trial? Recently, the National Institutes of Child Health and Human Development have funded the TBI Clinical Trials Network. This network is composed of eight level I trauma centers to facilitate the conduct of clinical trials in TBI in the United States.

The TBI-CT Network initiated a study of complicated mild, moderate, and severe TBI patients in the eight clinical centers. In-hospital mortality data has been obtained to date for 2,284 patients.

In Table 2, the two-week mortality from the TBI-CT Network is compared to that from the CRASH placebo group. From this data, it may be seen that there is a large difference in the mortality between the CRASH trial and our cohort of patients for severe TBI, as opposed to mild and moderate TBI, although the 1,105 patients classified as mild head injury group all had intracranial abnormalities on computed tomographic scan.

The enormous and extremely important data set from the CRASH trial could be used to ascertain whether intercenter differences do, in fact, account for these widely discrepant mortality

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## Perspectives on Methylprednisolone in Acute Spinal Cord Injury

Michael G. Fehlings, MD

Acute spinal cord injury, ASCI, occurs as a result of a primary mechanical injury followed by a complex cascade of cellular and molecular secondary events including ischemia, lipid peroxidation, derangements in cationic homeostasis, glutamatergic excitotoxicity, inflammation and apoptosis. The human and socioeconomic costs of ASCI are enormous. Thus, great efforts have been expended to develop pharmacological approaches to attenuate the secondary injury cascade.

To date nine major prospective randomized clinical trials have been performed to investigate the therapeutic efficacy of pharmacological compounds in ASCI. In four of these clinical trials the glucocorticoid, methylprednisolone sodium succinate, MPSS, has been investigated; two trials have tested the ganglioside GM-1, while thyrotropin releasing hormone, the noncompetitive N-methyl-D-aspartate receptor antagonist gacyclidine and the L-type dihydropyridine sensitive calcium channel blocker nimodipine have each been examined once. In addition, two companies, BioAxone Therapeutics Inc. and Proneuron Biotechnologies, recently received approval to initiate multicenter clinical trials to assess the efficacy following ASCI of the Rho antagonist, Cethrin, and the application of activated autologous macrophages, ProCord, respectively. It is expected that the trials of Cethrin and ProCord will renew attention to multifaceted pharmacological approaches for neuroprotection and regeneration in ASCI research.

The use of MPSS in ASCI, while commonplace in North America since the publication of the NASCIS-2 and NASCIS-3 studies, has been the subject of intense debate. The guidelines committee of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves has reviewed the strength of the evidence regarding MPSS in the treatment of ASCI in adults. This group concluded that — due to concerns regarding potential side effects in certain patient populations, the small effect sizes reported, and the post hoc nature of the data analysis — the data supported a recommendation for the use of MPSS in ASCIS only at the level of a treatment option. This remains a controversial issue. While the effect sizes of MPSS are small, it also must be recognized that relatively modest changes in neurological function (for example gaining one to two myotomal levels in an ASIA A tetraplegic individual) can have an important positive impact on the health, quality of life and costs of care of that individual. It is acknowledged however, that clinicians should have the opportunity to exercise their best judgment on whether or not MPSS is indicated in an individual with ASCI. For example, the elderly diabetic with a thoracic ASIA ASCI would not be a good candidate for the use of MPSS. Similarly, the author would not use MPSS in individuals with minor neurological complaints in the absence of objective documentation of an ASCI.

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## Neurosurgeons and Those They Supervise Should Place and Manage ICP Monitors

Domenic P. Esposito, MD

The care of the severely brain-injured patient is a team effort. The team consists of multiple individuals, including paramedics, emergency room physicians inside and outside level I and level II trauma centers, general surgeons, intensivists, physician extenders and nursing personnel.

In different parts of the world the primary individual responsible for the management of the severely brain-injured patient varies. Chronologically from the time of injury, the primarily responsible individual caring for the severely brain-injured patient also varies since severe traumatic brain injuries seldom occur in isolation. The input from other specialists caring for other injuries which the patient may have suffered is of paramount importance. However, once the initial assessment of these patients has been made, the life-threatening non-neurosurgical emergencies have been addressed, and initial resuscitation has been carried out, the input from the neurosurgeon becomes of paramount importance.

An integral part of virtually every neurosurgical training program in the United States consists of many years of caring for patients with severe traumatic brain injuries and critical care management of patients with compromise of the central nervous system. In contrast, general surgeons during their initial training seldom rotate on the neurosurgical services, and even those general surgeons training in trauma fellowships do not have mandatory neurosurgical rotations. Intensivists from the pulmonary and anesthesia training routes may or may not have exposure to a significant number of severe traumatic brain injuries. With rare exceptions, neurologists tend to avoid neurotrauma. Simply stated, it is rare for a general surgeon—even one subspecialty-trained in trauma—a neurologist, an anesthesiologist, or an internist to have the background and training necessary for management of the severely brain- or spinal cord-injured patient.

The question then becomes, “Can these physicians be trained and qualified to care for severely brain-injured patients in areas where neurosurgical availability is limited?” The answer to this question is certainly that anyone possessing basic medical skills and rudimentary surgical technique and a burning desire to care for this category of patients can, under the direction of neurosurgical mentors, develop the skills necessary to participate in this care. However, simply having a certificate stating that one has completed a critical care subspecialty program, a certificate of added qualification, or a note from one’s mother stating that one is a neurocritical care specialist does not make one qualified to perform invasive cranial procedures or to be responsible for the overall management of the severely brain-injured patient. While the newly founded Neurocritical Care Society and its members desire a certificate of added qualification in neurocritical care, the group is not recognized by the Accreditation Council for Graduate Medical Education and frankly has about as much credibility as other similar unrecognized societies.

In much of Europe the care of the severely brain-injured patient, other than strict neurosurgical procedures, is often left in the hands of neurointensivists. Trauma care in much of Europe is quite regionalized, and many of the individuals performing these functions are highly trained and perform in very specialized units in concert

with their neurosurgical colleagues. In addition, in the vast majority of these centers in Europe a critical care attending staff specialist is in the unit 24/7/365. These individuals are dedicated strictly to the critical care management of these patients. They are not off performing elective cholecystectomies, giving general anesthesia to patients having hysterectomies, evaluating patients with pulmonary carcinoma, or performing electromyography. To use the European system as a template for the extremely non-regionalized American neurotrauma system would be ridiculous.

The bottom line is that in the United States, despite the fact that many neurosurgeons are abdicating their responsibilities in the trauma arena, the best-trained and most qualified individuals to care for the severely brain injured patient are still neurological surgeons and those individuals directly under their supervision. Despite workforce issues, neurosurgery is still the field of medicine which can best handle the management of the patient with severe traumatic brain injury. This of course cannot be done in a vacuum, and the assistance and cooperation of traumatologists, intensivists, physician extenders and nursing personnel interested and trained in neurocritical care is of paramount importance.

There is a movement afoot by organizations other than the AANS and the CNS to sponsor courses that teach non-neurosurgeons the technical aspects of brain monitoring of severely injured patients. These groups wish to instruct physician extenders, intensivists, general surgeons and others in the techniques of performing procedures for intracranial pressure and parenchymal brain oxygen monitoring. Traditionally, organized neurosurgery held that brain monitoring devices should be placed either by neurosurgeons or under their supervision. In the past, training for such techniques has been left up to the neurosurgeons, who would then be responsible for the individuals placing the monitoring devices. Furthermore, the appropriate treatment of complications related to the insertion of intracranial pressure monitors often requires skills that are learned only in a neurosurgical residency, as is the ability to perform more extensive neurosurgical interventions that might be needed by these patients.

In addition to the technical aspects of brain monitoring, the issue of overall management of the severely brain-injured patient is being challenged by certain groups of individuals, including neurointensivists, trauma surgeons and even physician extenders working under the aegis of intensivists or trauma surgeons. This movement could allow the management of the brain-injured patient to drift out of neurosurgical practice and come under the auspices of one or more of these other specialties.

It is accepted that an increasing number of neurosurgeons is abandoning the field of neurotrauma; however, many neurosurgeons in both private practice and academic settings continue to be interested in serving as the main caregivers and overall responsible individuals in the management of severely brain-injured patients. Many neurosurgeons are working with physician extenders who assist with the care of these patients in terms of both bedside procedures and ongoing care. The best-trained and equipped individual to care for the severely brain-injured patient is a trained neurological surgeon and those individuals directly under his or her supervision. ■

## Non-Neurosurgeons Can Safely Place and Manage ICP Monitors...and They Should

William M. Coplin, MD

**N**on-neurosurgeons can safely place and manage intracranial pressure monitors...and they should. Heresy! you say. A major decision now confronts organized neurosurgery regarding relations with the other physicians, physician assistants and nurse practitioners who care for critically ill patients with “neurosurgical” diseases. The latter two groups colloquially some tag as “midlevel practitioners,” or MLPs. Other interested physician groups include fully trained neurointensivists, general surgeons, anesthesiologists, and medical intensivists, among others.

The current controversy arises over the role of MLPs or non-neurosurgeon physicians inserting and managing intracranial monitoring devices, which include, but are not limited to, intracranial pressure monitors. These other interested groups some neurosurgeons may lump together as non-neurosurgeons invading territory classically reserved for neurosurgeons alone, but they represent two distinct entities, both friendly to the process and similarly concerned with the care of this select patient group. The level of potential independence from the supervision of a neurosurgeon and the necessary procedural and cognitive skill sets are among the contentious issues before organized neurosurgery. The specific issue is whether the parent neurosurgical professional organizations should create, sponsor and endorse criteria for training, certifying, and monitoring MLPs or non-neurosurgeon physicians in the insertion and management of intracranial monitoring devices.

Job descriptions for MLPs vary somewhat, but in general they work on differing levels of independence in their performance of clinical duties and procedures that extend the reach of the physician under whose direct supervision they work.

Regarding the merits of non-neurosurgeon physicians inserting and managing intracranial monitoring devices, I will focus on the neurointensivists. Some disclosure information before I continue: I am a “card-carrying” neurointensivist. Like many others in my field, I originally was trained as a neurologist. I am fully trained in general critical care and further trained in neurosurgical critical care by board-certified neurosurgeons, among others. This training lasted seven years. I run a busy neurotrauma and critical care service at a level I trauma center. My neurosurgical mentors trained me in the placement, interpretation, and management of intracranial monitoring devices and their complications. I have been privileged and practicing this craft independently at the bedside for nearly nine years as a participating faculty member of a university-based department of neurological surgery. I have trained, and continue to train, neurosurgical residents in this craft, as do a couple dozen programs around the country. I also so train non-neurosurgical critical care medicine and surgery fellows and neurosurgical MLPs. As for all who perform an invasive operative procedure, my practice and its complications are monitored. Our group has repeatedly (not repetitively) published the results of such practice in the peer-reviewed neurosurgical literature (references available on request). We are independent, but cooperative and intertwined with our local neurosurgeons. Neurosurgeons are among the members of an international multidisciplinary society, the Neurocritical Care Society ([www.neurocriticalcare.org](http://www.neurocriticalcare.org)), and *Neurocritical Care* is the society’s official journal.

There is, as of yet, no proof that a neurosurgeon or anyone else can insert and monitor intracranial devices any more safely or effectively than another. This raises the issue of a proprietary skill “owned” by one group and learned by other specialties. Among the many examples, endotracheal intubation was once the province solely of anesthesiologists, but now even paramedics are performing this procedure. Electrocardiogram interpretation is no longer the sole province of cardiologists, electroencephalography and electrophysiological monitoring are not restricted to neurologists, and bronchoscopy is not limited to surgeons and pulmonologists. Bedside tracheostomy is now a skill safely and effectively performed by medical intensivists and other non-surgeons. Interventional cardiology was once under the purview of radiology. Many specialties now manage ventilators. Intra-aortic balloon pump placement was once performed only by cardiothoracic surgeons, but now cardiologists do this procedure. And all the things family practitioners do, some subspecialists think they should not be doing.

All these examples illustrate cases where difficulty may be encountered and where those in other fields may come to the rescue. The successes in these areas may allay concern expressed by some in organized neurosurgery regarding the availability of neurosurgical backup for difficulty or complications in intracranial monitor placement by non-neurosurgeons. Further, the clinically important complication rates are so low, especially for placing non-ventriculostomy intracranial monitoring devices, that this almost becomes a non-issue.

What about the interpretation of information garnered from these devices and the wherewithal to act properly upon that information? In many institutions, medical, surgical and neurointensivists are left to manage these devices and their information with perhaps as little as daily (usually more) contact with a neurosurgeon. Most neurosurgeons prefer the operating theater to the intensive care unit, and there are the workforce issues....

Workforce issues (especially in more rural areas) and neurosurgical trauma coverage in general have been discussed in this forum before, and I will not belabor them, but I offer one example. According to three members of a rural Midwestern neurosurgical practice who cover three hospitals in a catchment area with a 70-mile radius, the impractical nature of “being there” around the clock for monitor placement and minute-to-minute management is obvious. The extenders of their practice allow and enhance patient care. The concern of these neurosurgeons is that intracranial monitors are safely placed and used, rather than not having them placed at all. Their practice is but one example where neurosurgeons have trained and then monitor non-neurosurgeons in the safe and effective use of intracranial monitors.

A stimulating debate offers the opportunity to educate everyone on the advantages and disadvantages of non-neurosurgeons’ placement and management of intracranial monitors. While it is unlikely that organized neurosurgery will suddenly decide to embrace this idea, it clearly is not rejecting it outright without reasoned discussion. The pragmatism of patient care has to take precedence over the dogmatism of proprietary “turf.” Organized neurosurgery can take the lead in the training and monitoring of other interested and competent parties in this practice. ■

rates, and, in particular, whether this CRASH data set could be used to ascertain if there is any effect upon mortality for individual treatment modalities such as craniotomy for mass lesion, intracranial pressure monitoring, or management in a specialized clinical neuroscience intensive care unit. Only by standardizing and optimizing care, using guidelines, can we achieve the best possible outcomes in TBI.

**Table 1. Mortality Rates From Recent Studies of Patients With Severe Traumatic Brain Injury**

Study	Year	Mortality Before Guidelines	Mortality After Guidelines	Overall Mortality
Spain, et al.	1998	49 (12.2%)	84 (21.4%)	133 (18.0%)
Palmer, et al.	2001	37 (43.2%)	56 (16.1%)	93 (26.8%)
Fakhry	2004	219 (17.8%)	423 (13.8%)	642 (15.1%)
Bulger, et al.	2002	106 (45%) <sup>1</sup>	74 (27%) <sup>2</sup>	180 (37.8%)
Masson, et al.	2003 <sup>3</sup>	NA	NA	248 (51.6%)

<sup>1</sup>In centers with non-aggressive approach to treatment

<sup>2</sup>In centers with an aggressive approach to treatment

<sup>3</sup>Population-based study in Aquitaine, France

**Table 2. Comparison of Two-Week Mortality From the Traumatic Brain Injury Clinical Trials Network and from the Crash Trial**

Severity of Injury <sup>1</sup>	TBI-CT Network N (% Dead)	Placebo Group CRASH Trial N (% Dead)
Severe TBI	851 (23.9%)	1972 (34.8%)
Moderate TBI	328 (8.5%)	1476 (9.7%)
Mild TBI <sup>2</sup>	1105 (2.9%)	1531 (4.1%)
Total	2284 (11.5%)	4979 (17.9%)

TBI – Traumatic Brain Injury; CT – Clinical trials

<sup>1</sup> Severity of injury was assigned according to the highest Glasgow coma score in the first four hours in the TBI-CT Network, and according to a qualifying Glasgow coma score in the 8 hours prior to randomization in the CRASH trial.

<sup>2</sup> Mild TBI was defined as a Glasgow coma score of 13-15 and an intracranial computed tomographic scan abnormality in the TBI-CT Network, and as a Glasgow coma score of 13-14 in the CRASH trial.

## Perspectives *continued from page 3*

Table 1 summarizes the approach and recommendations regarding the use of MPSS in ASCI published in the focus issue of *Spine* (*Spine*;26(Suppl 24):2001), in which the pro and con positions are reviewed in detail. Clinicians are encouraged to read the primary data regarding MPSS carefully to examine the weight of the evidence.

**Table 1. Suggested Indications for the Use of Methylprednisolone in Acute Spinal Cord Injury**

Clinical Scenario	Strength of Evidence	Level of Recommendation
Acute nonpenetrating SCI (< 3 hours following injury)	Class II (RCT with negative primary analysis; benefits limited to subgroup analysis)	MPSS should be given as per NASCIS II protocol: 30 mg/kg i.v. loading dose within the first hour followed by 5.4 mg/kg/hr i.v. over the next 23 hours
Acute nonpenetrating SCI (> 3 hours, but < 8 hours following injury)	Class II (RCT with negative primary analysis; benefits limited to subgroup analysis)	MPSS should be given as per NASCIS II protocol: 30 mg/kg i.v. loading dose within the first hour followed by 48 hour infusion of 5.4 mg/kg/hr
Acute nonpenetrating SCI (> 8 hours following injury)	Class I (RCT shows a lack of an effect; potentially deleterious)	MPSS should not be administered (standard)
Acute penetrating SCI	Class III (Lack of an effect; increased wound complications)	MPSS is not recommended (option)

i.v. = intravenous; MPSS = methylprednisolone sodium succinate; NASCIS = National Acute Spinal Cord Injury Study; RCT = Randomized clinical trial; SCI = Spinal cord injury

Modified with permission from: Fehlings MG (2001) Editorial: Recommendations Regarding the Use of Methylprednisolone in Acute Spinal Cord Injury: Making Sense Out of the Controversy. *Spine*;26(Suppl 24):S56-S57.



American Association of Neurological Surgeons

# Application for Membership

## AANS/CNS Section on Neurotrauma and Critical Care



**Eligibility:** Members of the AANS and/or CNS who are actively interested in Neurotrauma.

*Note: Adjunct Membership is available to non-neurosurgeons who are not members of the AANS or CNS. Please contact 847-566-AANS, ext. 508, for more information.*

### I. Biographical:

(A) Name: \_\_\_\_\_

(B) Home Address: \_\_\_\_\_

(C) Office Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

(D) E-Mail: \_\_\_\_\_

### II. Category of Membership Requested:

Active       Associate       International       Resident\*

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

### III. Membership, Certification and Practice:

(A) Are you certified by the American Board of Neurological Surgery?       Yes       No

(B) For Resident Applicants-Expected Residency Completion Date (month/year) \_\_\_\_\_

(C) 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. American Association of Neurological Surgeons?       Yes       No

5. Congress of Neurological Surgeons?       Yes       No

(D) I would like to support **ThinkFirst** with my donation of



\$50.00 (Recommended)       Other amount \$ \_\_\_\_\_

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Signature of Applicant

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Date

**Please return completed application with your membership fee of \$50 and any donations to:  
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## AANS/CNS Section on Neurotrauma and Critical Care

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Rolling Meadows, Illinois 60008-3852



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### From the Chair *continued from front page*

already exist de facto in some areas. In other parts of the country, however, neurosurgeons are frustrated by requirements that they accept emergency transfers when they are on call for hospitals that are not equipped to deal with trauma and other emergencies. Directing such patients to appropriately staffed and equipped emergency centers makes sense to us, but other specialists protest that we will quickly overwhelm their hospitals with all manner of neurosurgical emergencies: intracerebral hemorrhages, spine and spinal cord injuries, shunt failures, cranial and spinal abscesses, etc.

These are just a few of the issues that we will have on our plate during the CNS meeting in Boston. Meeting highlights, noted on page 2, include Don Becker's inaugural Integra Foundation Lecture—"Neurotrauma: A 30-Year Perspective"—on Monday. Also, on Wednesday Dom Esposito and Bill Coplin will debate the question of whether placement of cerebral monitors and supervision of traumatic brain injury care should be restricted to neurosurgeons. This newsletter contains summaries of their presentations as well as brief overviews put together by Ross Bullock and Michael Fehlings on the status of steroids in brain and spinal cord injury.

Neurosurgical emergencies continue to impact all of our practices. The questions and issues surrounding the delivery of neurosurgical emergency care seem to get more complicated all the time. We look forward to seeing you in Boston and to hearing about the problems you face and about any solutions that you may have found. ■