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Announcing the 2016 AANS/CNS National Neurotrauma Symposium Joint Meeting

Chair's Welcome

Neurosurgeons and Neurotrauma: Standing Front and Center

Jamie S. Ullman, MD, FAANS



Jamie S. Ullman, MD,
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The past two years of my tenure as section chair have passed in a blink of an eye, but, in looking back, I feel that we have accomplished a great deal. There is never an end to the work that we, as neurosurgeons, must do to improve the care of our patients, advocate for injury

prevention and to devise innovative ways of treating neurotrauma to achieve the best outcomes possible. Through on-going collaboration and research, we can truly and monumentally affect and minimize the impact of neurotrauma. To do this, we must be up front and in the center of this effort.

There is a disturbing trend towards neurosurgeons abdicating their role in the management of acute traumatic brain injury (TBI), allowing other specialties, such as acute care surgery, to advocate for protocols that exclude neurosurgeons from consulting upon and treating patients with mild traumatic brain injury (mTBI). Gaps in neurosurgery interest will result in many TBI patients coming into the exclusive care of non-experts. General surgery residencies no longer require exposure to clinical neurosurgery, except for what is likely encountered during trauma rotations. The American Association for the Surgery of Trauma (AAST) Acute Care Surgery Fellowship does not include direct neurosurgical experience in its curriculum. With this in mind, the section took a stance against a recent publication in JAMA Surgery advocating a hospital head injury management protocol that permitted acute care surgery to evaluate and treat mild TBI patients

with "trivial" intracranial hemorrhage without the need of neurosurgery input (JAMA Surg. 2016;151(2):199-200). What was not clear in this protocol was how these patients were to be followed up and by whom. It is the position of organized neurosurgery that TBI management is a cooperative effort among the various disciplines, including trauma surgery. Trauma and other neurosurgical emergencies are at the very core of what we do. Our extensive training makes neurosurgery best suited to manage acute TBI because our three-dimensional perceptions go beyond what is presented at face value. It is true that neurosurgeons cannot be in all places at once; we are clearly a comparatively rare commodity. Some of our colleagues, however, have fostered the use of teleradiology and telemedicine to facilitate the management of patients at facilities without neurosurgical services. Such practices can help keep our involvement strong.

In contradistinction, there is an exciting trend toward neurosurgeon's increased interest in neurocritical care. The American Board of Neurological Surgery has developed its first subspecialty certificate in neurocritical care culminating in its inaugural examination in March 2016. With increasing numbers of the Society of Neurological Surgeons Committee on Advanced Subspecialty Training (CAST)-accredited neurocritical care fellowships, we will see more neurosurgeons advancing in this direction.

Sadly many neurosurgeons have long since abdicated their role in the management of concussion. Of mild interest, I recently went on the IMPACT website to see how to train for this now widely-used cognitive test to evaluate concussion, which was partly developed by a neurosurgeon.

The list of providers in my area included no neurosurgeons and was mostly populated by pediatricians, physical therapists and other providers. No doubt, it is important for primary care providers, coaches and the public to recognize signs of concussion, ways to prevent them and be familiar with appropriate treatment and return to activity protocols. Even though a few neurosurgeons have achieved prominence in mTBI research, all neurosurgeons should take the lead and play an active part in educating stakeholders in these aspects of concussion. Sitting at the helm of the National Football League's Head Neck and Spine Committee, our colleagues are currently providing valuable organizational experience in the clinical and investigative evaluation of concussion. They are also standing on the ground in the sidelines to assess potentially injured players during games. This year's American Association of Neurological Surgeons (AANS) Annual Scientific Meeting will devote a portion of the program to the management and treatment of sports-related concussion. ThinkFirst, neurosurgery's own injury-prevention organization, has added concussion education and prevention as a priority. The section's Sports Injury Committee, led by Julian Bailes, MD, FAANS, and Tanvir Choudhri, MD, FAANS, has worked with the AANS and CNS in keeping us in the foreground of mTBI policy and education. From the individual to organized neurosurgery, all of us can be front and center in concussion.

The section holds strong on its commitment to improve trauma care by fostering collaborations with the American College of Surgeons (ACS) Committee on Trauma (COT) and other organizations, such as the Neurocritical Care Society and Brain Trauma Foundation. Through the leadership of Geoffrey Manley, MD, PhD, FAANS, past section chair, a TBI best practices document was developed for the ACS Trauma Quality Improvement Program (TQIP). Additionally, we are involved in international outreach through our new International Committee, chaired by Andres Rubiano, MD. We are pleased to have supported a noble effort, initiated by Indian-American neurosurgeons, to work with government officials to establish guidelines for a neurotrauma care system in India. We are also assisting in educational efforts in Latin America.

Through a strong connection with the Brain Trauma Foundation (BTF), key section members, led by our BTF Committee Chair, Greg Hawryluk, MD, FAANS, have co-authored the new 4th edition of the Guidelines for the Management of Severe Traumatic Brain Injury. After its publication this year, we will work with the BTF on the Living Guidelines Initiative which will provide, at the very least, annual updates. This on-going effort will facilitate the reporting of new evidence to guide practice in a more timely fashion. The section remains involved in reviewing evidence-based guidelines through representation on the AANS/CNS Washington Committee's Joint Guidelines Committee. The Section's Guidelines Committee, chaired by Patti Raksin, MD, FAANS, reviews other consensus documents related to trauma and critical care for the purposes of recommending AANS and Congress of Neurological Surgeons (CNS) endorsement.

Knowing the importance of neurosurgery to trauma centers throughout the United States, neurosurgeons are steadfast in their

commitment to uphold the vigorous requirements set forth by the ACS COT. The section also has the duty to provide CME credit to help fulfill the ACS educational requirements. Our Education Committee, chaired by David Okonkwo, MD, PhD, FAANS, and Annual Meeting Subcommittee Chair, Craig Rabb, MD, FAANS, have provided meaningful trauma-related content for the CNS and AANS annual meetings. In addition, we have solidified our relationship with the National Neurotrauma Society (NNS) and look forward to collaborating with them on the 2016 annual meeting to be held June 26-29 in Lexington, KY. Devised by our superb Scientific Program Subcommittee, chaired by Uzma Samadani, MD, PhD, FAANS, the section's annual symposium on June 26, 2016, promises to provide stimulating discussion and important updates. We encourage all of our members to attend this session in addition to other sessions offered at the NNS meeting which has endeavored to provide translational content of interest to clinicians. Attendance at the NNS/JSNTCC meeting could easily provide a neurosurgeon with more than the required 16 annual CME credits (www.neurotraumasociety.org). Additionally, we are happy to announce our partnership with the International Neurotrauma Society (INTS) and the NNS for the biennial meeting of the INTS in Toronto August 11-16, 2018 (<http://ints2014.com>).

The section has also had a long-standing commitment to resident research by offering the Depuy Synthes Awards for craniofacial and spinal injury. In addition, Codman has supported a yearly neurotrauma fellowship that funds a top-selected research proposal culminating in a presentation at the AANS one year later. Our first Ethicon Resident Research Awards were presented to outstanding projects in spine and head injury presented at the 2015 NNS meeting. Our Awards Committee, led by Eve Tsai, MD, PhD, FAANS, has tirelessly pursued the maintenance and expansion of our awards and lectureship offerings. We are thankful to our industry contributors, which also include Integra and AO Spine, for their commitment to neurotrauma research and education. We are sad to announce that Depuy Synthes will no longer be able to support its award after 2016. However, we are partnering with ThinkFirst to establish the new ThinkFirst Resident Injury Prevention Award, which will be given to qualified abstracts accepted for oral presentation at the AANS and CNS annual meetings.

In addition to our research support, the section, with industry support, continues to offer three outstanding lectureships: the Charles Tator Honorary Lectureship on Spinal Injury Research and the J. Douglas Miller and Anthony Marmarou Memorial Lectureships. Recent honorees have included Charles Tator, MD, PhD, MA, FAANS(L); Raj Narayan, MD, FAANS; Ross Bullock, MD, PhD; Peter Hutchinson, MD, FRCS; Nino Stocchetti; Barth Green, MD, FAANS(L); Susan Harkema, PhD; and Jamshid Ghajar, MD, PhD, FAANS. We can continue to support neurotrauma research, lectureships and other initiatives through the generosity of our membership. Recently, through the hard work of our membership chair, Martina Stippler, MD, FAANS, the section sent out requests for contribution, either through a direct contribution to the section or through the Neurosurgery Research and Education

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Foundation's (NREF) Honor Your Neurosurgical Mentor Fund. A fund has now been established to honor Dr. Tator. There is abundant room for all members to honor a colleague, mentor or ourselves by funding research awards and lectureship through these mechanisms. Interested members should contact Karen Yoshikawa at the AANS membership office. (kny@aans.org)

As my tenure as chair comes to a close, I want to take some time to thank the current officers and voting members: Daniel Michael, MD, PhD, FAANS; Julian Bailes, MD, FAANS; Geoffrey Manley, MD, PhD, FAANS; Sharon Webb, MD, FAANS; and Rocco Armonda, MD, FAANS, for their dedication and wisdom. Special mention must go to our Special Advisor Michael Fehlings, MD, PhD, FAANS for his counsel, encouragement and providing opportunities for involvement. We congratulate our past chairs Alex Valadka, MD, FAANS, for attaining the position of AANS President for 2016-17, and Shelly Timmons, MD, PhD, FAANS, for her appointment as the Chair of the AANS/CNS Washington Committee. The section is fortunate to have an Executive Committee of more than 30 hard-working individuals, many of whom are

in the early phases of their career. I want to personally thank all of them for contributing much of their time and effort in the past two years. I hope their participation continues for years to come. We encourage everyone interested in assisting and leading our efforts to join. As of May 2, 2016, Daniel Michael, MD, PhD, FAANS will take the reins as chair, with Dr. Bailes serving as chair-elect, and Dr. Okonkwo as secretary/treasurer. We congratulate Dr. Raksin and Odette Harris, MD, MPH, FAANS, for their elections as members-at-large. Each of these individuals has a wealth of experience in clinical management, research and leadership that will continue to strengthen the section and its scope.

The AANS/CNS Section on Neurotrauma and Critical Care exists to advise, advocate and educate regarding issues pertaining to its title. We want to help reinforce and restore neurosurgery's position at the forefront of all neurotrauma management, from concussion to severe TBI, from spinal column injury to spinal cord injury. Our unique and intensive training makes us most suitable for this task, granting each and every one of us leadership in this endeavor—so let us all stand front and center for neurotrauma.

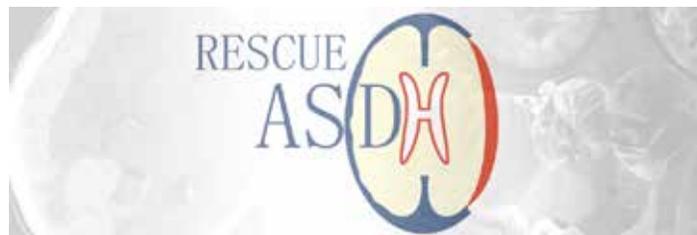
RESCUE-ASDH TRIAL

Domenic Esposito, MD, FAANS & Domenic Esposito II, MD

Traumatic brain injury (TBI) is a well-documented and important global public health problem. It has been estimated that 10 million TBIs that require hospitalization occur worldwide per year (1). The U.S. is a large contributor to this problem. TBI is the leading cause of death and disability in the U.S. At least 1.7 million TBIs occur in the U.S. per year, with 1.4 million emergency room (ER) visits, 275,000 hospitalizations and 52,000 deaths (2). It has been estimated that the lifetime costs of TBI in the U.S. total an estimated \$60 billion annually (3).

Severe TBI is of the most interest when it comes to evaluating surgical treatment options to treat the injury. Decompressive craniectomy for treatment following a severe TBI has long been an option but has varying popularity amongst neurosurgeons across the world as well as inconsistent data in the literature. This procedure is commonly compared to craniotomy. The advantage of decompressive craniectomy is that the bone flap is left out following the procedure allowing for better control of brain swelling in the acute period with later replacement of the flap or alternative cranial reconstruction (cranioplasty). The advantage of craniotomy is that the bone flap is replaced at the end of the procedure so a second operation is not required; however, this may not control brain swelling in some patients.

The DECRA study (2011) out of Australia, New Zealand and the United Arab Emirates compared decompressive craniectomy plus standard care versus standard care alone in severe TBI patients with refractory raised intracranial pressure (ICP) (4). This study



suggested that decompressive craniectomy may not be indicated because while it succeeded in lowering ICP, it was also associated with a significantly worse outcome at six months. The study has been criticized for multiple reasons, including but not limited to the extended period of recruitment, the paucity of procedures performed per institution and the flawed premise of the original question. However, there have been multiple smaller, non-randomized studies that have suggested the efficacy of this procedure in the treatment of severe TBI with uncontrolled intracranial hypertension. The University of Cambridge is currently analyzing data for its recently concluded Randomized Evaluation of Surgery with Craniectomy for Uncontrollable Elevation of Intracranial Pressure (RESCUEicp) study on this subject (5). This is an international multi-center randomized trial comparing decompressive craniectomy with optimal medical management in severe TBI patients with raised and refractory ICP.

A second area of great interest is the use of decompressive

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craniectomy for evacuation of an acute subdural hematoma (ASDH) following TBI. ASDH is present in up to 1/3 of patients with severe TBI [6]. Historically, ASDH is associated with a high mortality rate (40-60 percent) and functional recovery at only 19-45 percent. Additionally, almost 2/3 of patients with severe TBI undergoing emergency cranial surgery have an ASDH evacuated during the procedure (7). A survey study of European neurosurgeons out of the University of Cambridge published in 2013 showed that 41 percent of respondents used primary decompressive craniectomy when evacuating a traumatic ASDH less than 25 percent of the time and almost 1/3 used it in more than 50 percent of such cases (8). They also showed that a higher number of surgeons in the 'Other European Countries' group used primary decompressive craniectomy in ASDH cases compared to the 'United Kingdom (U.K.)/Irish' group. They theorized that the difference was not due to differences in trauma care systems or the epidemiology of TBI within Europe but rather represents a lack of high quality evidence regarding the use of primary decompressive craniectomy or ASDH evacuation.

The Brain Trauma Foundation published a systematic review in 2006 and concluded that research into the role of decompressive craniectomy versus craniotomy in ASDH was a key issue for future investigation as they found zero prospective randomized studies. Currently, the highest level of evidence for the use on decompressive craniectomy is class III retrospective studies. Five-year pilot data from the University of Cambridge showed the 56 percent of patients with ASDH in that group were treated with decompressive craniectomy (9). In this retrospective cohort comparison study, 91 patients underwent surgery for ASDH. The standardized morbidity ratio was lower in patients who underwent decompressive craniectomy (0.75; 95 percent CI 0.51-1.07) compared to those who were treated with craniotomy (0.90; 95 percent CI 0.57-1.35). The 95 percent confidence intervals overlap so a statistically significant difference cannot be claimed, but this study certainly showed a trend towards better outcomes following decompressive craniectomy compared to craniotomy in this small retrospective cohort. This is part of the rationale behind Dr. Peter Hutchinson, professor of neurosurgery and NIHR research professor at the University of Cambridge, beginning a second study titled Randomized Evaluation of Surgery with Craniectomy for patients Undergoing Evacuation of Acute Sub-Dural Hematoma (RESCUE-ASDH).

The aim of the RESCUE-ASDH study is to perform a multi-center, pragmatic, parallel group randomized trial in order to compare the clinical and cost-effectiveness of decompressive craniectomy versus craniotomy for the management of adult head-injured patients undergoing evacuation of an acute subdural hematoma. This study has already begun in the U.K. and currently has approximately 90 patients enrolled. The appropriate paperwork for this study has been completed for its use outside of the U.K., and the North American arm of the study has been approved. At this time, approximately five centers in North America are in the process of completing applications for entrance into the study with the hope that 15 centers will eventually be enrolled.

The study design is straight-forward. Adult head-injured patients

(>16 years old) arriving to the ER with an acute subdural hematoma on computed tomography (CT) scan which is determined by the admitting neurosurgeon to require evacuation with a large bone flap (size >11 cm) either by a craniotomy or craniectomy, may be enrolled in the study. The patients will be taken to the operating room (OR) per standard procedure for intervention of the acute subdural hematomas, and while in the OR, the patient will undergo a trauma skin flap and standard removal of their acute subdural hematoma. Following removal of the subdural hematoma, the patient will be randomized into one of two groups.

Randomization will be accomplished over the telephone with a provided number that will be monitored at all times. The randomization process will be simple and straightforward. There will also be the possibility of randomization over the Internet in some countries. The first group will be the decompressive craniectomy group in which the bone flap will not be replaced. The second group will be the craniotomy group in which the bone flap will be replaced. Patients who have significant brain swelling will be excluded from the randomized study if the bone flap cannot be safely replaced; however, they will still be followed and enrolled in an observational cohort study to look at their eventual outcomes. The observational cohort demographics of these patients are felt to be extremely important in the final analysis of the study.

Further exclusion criteria includes bilateral acute subdural hematomas requiring evacuation, uncorrected coagulopathy, bilateral unresponsive pupil ≥ 5 mm and/or brainstem injury on CT, previous enrollment in the RESCUE-ASDH study or a pre-existing physical or mental disability or a severe co-morbidity which would lead to a poor outcome regardless of the randomization. On the other side of the spectrum, patients who have extremely flaccid brains following removal of their subdural hematomas may also be excluded from the study as replacing the bone flap in these patients would be medically contraindicated.

Post-operatively, these patients will be followed in the intensive care unit (ICU). A small amount of data collection is required during their ICU stay including ICP measurements, therapy intensity levels and length of stay. Following the patient's transfer out of the ICU to a neurosurgical floor or rehabilitation facility, a document is compiled noting the patient's clinical status, including quality of life (EQ-5D), discharge destination and total length of stay. Also, serious adverse events or any surgical complications will be recorded. Patient follow-up will occur at six and 12 months for the Extended Glasgow Scale, quality of life and economic evaluation. All patients returning to the operating room within two weeks after randomization as well as the incidence of hydrocephalus (requiring shunt insertion) will be trended. It is the hope of the authors that there will be minimal clerical work for the enrolled centers in regards to data collection and management.

The primary objective of the study is to detect an 8 percent absolute difference in the rate of favorable outcome at one year between decompressive craniectomy (43 percent) and craniotomy (35 percent) with a power of 80 percent and a two-sided signif-

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icance of 5 percent. This corresponds to an 8 percent treatment effect as retrospective studies have suggested a favorable outcome in 35 percent of patients undergoing evacuation of ASDH. The secondary objectives include: (1) compare the long-term clinical effectiveness of decompressive craniectomy versus craniotomy (one year follow-up period), (2) compare the adverse events and surgical complications between the two arms and (3) undertake a detailed economic evaluation.

According to the University of Cambridge statisticians, a sample size of 990 patients is needed to establish statistical significance. To achieve this number of patients, the study will be international and multi-centered, including Australia, Canada, Italy, Norway, Singapore, Spain and the U.S. The target recruitment rate for each site is 10 patients per year.

The North American contingent of this study hopes to enroll approximately fifteen centers for a period of approximately three years. The North American arm of this study is somewhat different from the study in the U.K. in that the issue of waiver of consent and/or familial consent for entrance into the study will be handled on an institutional level rather than a countrywide basis. Site visits will be performed at each of the centers to explain the details of the study.

This RESCUE-ASDH multi-center, randomized controlled trial has the potential to provide invaluable data and conclusions in the field of TBI and ASDH. The success of the trial is dependent on multiple centers enrolling in this study for sample size as well as generalizability purposes. The North American arm of the study hopes to be a valuable addition to this important trial.

*This author has been enlisted to provide coordination for the North American arm of the study.

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Burnout Syndrome

According to a recent national study, work-related burnout is a pervasive problem among physicians—and it is worsening across all specialties. Physician burnout experts at the American Medical Association (AMA) and the Mayo Clinic conducted a survey of 6,880 physicians to “evaluate the prevalence of burnout and physicians’ satisfaction with work-life balance compared to the general U.S. population relative to 2011 and 2014.” At the time of that study, “approximately 45 percent of U.S. physicians met criteria for burnout,” the study authors wrote. When a follow-up survey was conducted in 2014, 54.4 percent of physicians reported at least one sign of burnout. Physicians also reported lower rates of satisfaction with work-life balance in 2014 compared to a similar sample of physicians in 2011.¹

According to research, the burnout rate for neurosurgeons tends to range between 30 and 38 percent. Burnout affects the physician, his or her colleagues and family members. In addition, unhealthy and counterproductive behaviors can certainly affect patient care⁽²⁾.

What Is Burnout

Normore and Erbe identified three dimensions of burnout, which include exhaustion, inefficacy and cynicism.³ Murphy et al. defined burnout as a form of stress that occurs in the context of social relations. Most discussions about burnout focus primarily on the exhaustion experience. Exhaustion might cause people to distance themselves from work emotionally and cognitively in the hope of coping with work overload. This can also be termed as depersonalization, as one ignores the qualities that make work engaging and unique. Feeling discouraged leads to a cynical attitude or indifference (cognitive distancing). Distancing remains one of the immediate core reactions to exhaustion. Inefficacy is more complex than cynicism and exhaustion because it deals with aspects of reduced personal accomplishment. Emotional drain from work-related factors can therefore hinder one’s effectiveness.

Signs and Symptoms of Burnout

The signs and symptoms of burnout can be categorized into four sections: physical, psychological, occupational, and social effects. Physical symptoms can be fatigue, headaches, sleeplessness, physical and emotional exhaustion, hypertension, weight loss, and myocardial infarction. Psychological symptoms include irritability, anxiety, low morale, boredom, depression, frustration, or even addiction to drugs and alcohol.⁴ Occupational symptoms are adverse and may include depersonalization in relationships with patients and colleagues, job turnover, cynicism, emotional exhaustion, deterioration, decrease in quality and quantity of health care and perceived ineffectiveness. In the social category, one may experience marital or relationship difficulties.

The Maslach Burnout Inventory (MBI) was developed by Maslach and Jackson and was designed to measure the hypothesized burnout syndrome. MBI is a scale to assess numerous aspects of experienced burnout syndrome in professionals. The subscales



that emerge from the data analysis include personal accomplishment, depersonalization, and emotional exhaustion. A PDF of the scale can be downloaded at the AANS/CNS Section on Neurotrauma website: <http://www.neurotraumasection.org>.

Prevention

Burnout can be prevented by identifying symptoms and developing and implementing an intervention strategy to improve the well-being of health care providers. Self-awareness is important to break out of the spiral that burnout can create. Here are some serious signs, or red flags, that indicate someone is at risk of developing burnout:

1. Stress: Even with a high tolerance for stress, physicians who are exposed to a high-stress environment are 15 times more likely to burn out.
2. Exceptionally hectic practice: Caring for patients in a high-stress environment leads to burnout. Changing the working conditions can make all the difference.
3. Disagreement with leadership: This important sign is based on whether or not a physician shares the values with those leading an organization. Shared values can motivate workers; not sharing values can decrease overall commitment.
4. Emotions: Specialists who encounter many end-of-life scenarios can have their emotional reserves drained, leading to compassion fatigue.
5. Interference with family life: Spending quality time with loved ones helps physicians perform better. Work-life interference is one of the most common predictors of burnout among physicians.
6. Lack of control: Increasing demands at work, lack of control over the work schedule and free time lead to and signal burnout. Having the flexibility to meet the needs of one’s family is important.

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7. Self-neglect: Neglecting one's self Can be a sign of burnout; physicians must be reminded that one of the keys of altruism is self-care.

What Can be Done?

Practicing self-care can prevent burnout. A neurosurgeon who cares for himself or herself will ensure that he or she lives a lifestyle that is healthy. This includes incorporating exercise, a balanced diet, and adequate sleep. Physicians should learn to accept support from others; those around them can easily identify when physicians' behaviors are changing negatively (Cooper & Ratele, 2014).

Healthier workplace practices should be created. Reducing the work load while still taking control can be beneficial. Identifying the main workplace stressors through the support of stronger teams and having time to interact with colleagues, especially at lunch hours, can be a good way to refresh one's mind. Seeking the support of co-workers when one initially identifies the signs and symptoms can help in early treatment.

Physicians can increase work engagements by working in ways that emphasize their strengths. This is especially important because disengagement from work is considered to be part of the burnout process. There should be positive engagements in work, including dedication and enjoyment. Working in the area of one's strength contributes to a greater sense of psychological well-being.

Conclusion

Burnout remains a major problem for various health care professionals, including neurosurgeons. Next to diabetes and cardiovascular disease, burnout is among the most frequent illnesses occurring in working professionals. As neurosurgeons pursue the task of making people with serious health problems better, they are also faced with a stream of overwhelming illnesses that have dire consequences on their patients' lives.

Burnout sets in with small and subtle steps then becomes a major problem that results in neurosurgeons being unable to perform the tasks requires. They also develop certain behaviors that are contrary to their profession. Burnout causes isolation and disengagement from interpersonal contacts and families. The various signs and symptoms should not be taken lightly and should be addressed. Prevention is the best cure!

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Dear Supporters for Trauma Section:

The Neurosurgery Research and Education Foundation (NREF) plays a very valuable role in both the education and the research of neurosurgery.

NREF is a not-for-profit, 501 (c)(3) organization created in 1980 by the American Association of Neurological Surgeons (AANS) to support research and educational efforts in neurosurgery. The NREF is dedicated to providing education to neurosurgeons at all stages of their careers, as well as funding research into new and existing neurosurgical treatments, in order to identify links between best practices and improved outcomes in patient care.

Through voluntary public donations, corporate support and donations from allied groups, the NREF supports endeavors that truly impact lives. Donations can be designated to specific areas of education or research.

Please support the AANS/CNS Section on Neurotrauma & Critical Care with a donation. Your contribution will support research efforts, lectureships and outreach. Visit the NREF website (www.NREF.org), click on donate, then select education then trauma. Every donation makes a difference for neurosurgery and those it serves.

Cathy M. Powers, CAE
Chief Development Officer

Leadership: Aligning Brain and Body

By Madeline McNeely

When I entered the working world in my early 20s, I saw stressed out leaders all around me. In the non-profit sector, where I worked at the time, organizational leaders had to fundraise, market their organizations and prove their program models worked to solve the social issues most near and dear to their hearts. Many organizational leaders just wanted to do the program-related work they loved and not the administration and infrastructure duties necessary to support their organizations. There seemed to be a conflict between what they had to do to keep their organizations afloat and the style they needed to cultivate to be impactful social leaders and solve society's most pressing issues. This perceived conflict did not appeal to me, and for a number of reasons, I chose to pursue and develop a very different career.

First, I immersed myself into the performing arts and modern dance. For about eight years, I balanced my work as a management and leadership consultant and trainer with my desire to develop my skills as a dancer and performing artist. I got my MEd in Dance Education. There came a time in my mid-30s when I realized these seemingly disparate parts of myself (organizational development, management consultant, artist and spiritual healing practitioner) needed to be knit together. I saw the limitations of training and consulting to inspire lasting behavior change in my clients and their organizational systems. My years of studying the body, yoga and many therapeutic modalities gave me insights into what drives human motivation and resistance. It was the desire to apply what I knew about the mind, body and spirit into organizational systems and leadership development that inspired my journey to become an executive leadership and career coach, in addition to maintaining my consulting, facilitation and training work.

I continued to see qualities and ways of being missing in many leaders. They were burned out or imbalanced in a way that undermined their success. I knew I could create the conditions to support people to change their habits. Coaching is a deliberate process where leadership transformation becomes possible through a shift in mind, heart set and behavior change. Coaching requires a client to align their values with who they are being and their actions.

Approaching professional and personal challenges from a holistic orientation has always made sense to me. I have been drawn to a myriad of alternative ways to heal the body, mind and spirit besides what our western traditions offer us. I have lived and studied in both east and west Africa. Living in Kenya and Senegal still shapes my professional orientation and world view in ways which are unique and different from most Americans. Understanding that there is no one way to solve a problem enables me to support clients in a myriad of ways, addressing many different kinds of professional challenges. As we say in my line of work "the soft stuff is the hard stuff." As someone who coaches a wide range of clients from doctors, surgeons in particular, CEOs and former gang members, it is my job to help people cultivate muscles to think outside the box



and behave in different, more effective ways.

Success lives in three dimensions: results, process and relationships. And when we lose sight of one dimension, it often comes back to bite or sabotage us in some way professionally. Who we are being and the impact we have on others and our environment have as much to do with our success as the results we produce.

I am impressed by the clients I have who always knew they wanted to be a surgeon and then became a surgeon or architect or any number of career choices. There are many gifts that come with this kind of professional certainty. The universe responds well when we give out clear messages about what we want and who we want to be. As I navigated the first decade of my career, it was not clear to me what I wanted to do or who I was supposed to be. Some of us struggle with life-purpose questions early on and others not till we are older. I experienced a lot of growing pains in my teens and 20s. As I made my way through the maze of young adulthood, I learned a lot of different ways to recover my center. Recovering my center was a theme in these years. It is life-long work, too, but it was particularly acute early on professionally.

From these life experiences, I learned that if we want to do work that is most meaningful over the course of our life time and sustain the path, we have got to pace ourselves. There are times an intense response is necessary and timed when patience and detachment are more appropriate. Knowing when you need which kind of energetic response is key to sustainable success. Also, we need to size up challenges so we can build confidence and success one step at a time. This is true in any kind of training for mastery. Becoming a surgeon does not happen overnight. You know better than I the painstaking steps you each took to get to this point in your career.

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We also need to slow down and reflect when something has not gone the way we want. If a surgery goes awry, what steps are in place for you to understand the mistakes that led to a death or a patient's complication openly with yourself and with your team. Hopefully you have your own inquiry process as well as a systems approach at your institution when this happens. When we can name behaviors that contribute to breakdowns and identify alternative behaviors that support us to produce desired results, then we are more likely to be able to repeat the success we seek. This process can be stressful for those who are used to succeeding or for those with whom life has unfolded relatively easily. However, when we are faced with a challenge that we cannot solve easily, it causes stress, anxiety and defensiveness in our physical system.

When we are stressed and feel under pressure, we instinctually lead from the limbic 'lizard' brain.

We know that cortisol flushes the systems at higher levels when we're stressed and anxious. Too much cortisol over a long period of time depresses our immune system. With this phenomenon in place, our capacity to be big picture thinkers, generate innovative solutions and collaborate successfully with others is compromised. This is where my work benefits others. As someone who has studied many different recovery and healing modalities, I know how to intervene using emotional, physical, spiritual or mental strategies to interrupt a breakdown a client is experiencing. This can happen instantaneously and it also requires practice.

For example, a client of mine (a surgeon) is in a new leadership role at her hospital, she has designed a strategic plan for how to improve surgical patient outcomes and must enroll the surgery department and other key clinical stakeholders. She is one of the few surgeons who also has her MBA and is interested in developing herself as an administrative leader. We spent time developing her strategic plan and how she would communicate it across departments. She practiced speaking in a way that inspires and enrolls others to her vision very much the way Kouzes and Posner write

about in *The Leadership Challenge*. Most importantly, she learned to center under pressure. Shifting her body posture and extending her muscles so testosterone could flow more easily through her body when she's performing an act of leadership was key to her success. However, this work took practice, but the results were positive. Colleagues and the hospital president have taken note of her vision and leadership. She has inspired colleagues to follow her vision and new strategies. This has meant changing some their habits so that surgery outcomes for patients can improve. We all know behavior change doesn't come easily, especially when you've been used to being the 'expert.' However with the right support and alignment, it's not as difficult as one might imagine.

When we are centered, we can access and lead from the neo-cortex; the part of the brain that generates our capacity to innovate, collaborate and be big picture thinkers. We cannot change our habits through the mind alone. The way we sit and stand affects the way we think and speak. Increasingly neuroscientists and social psychologists are proving this. Watch [Amy Cuddy's Ted Talk](#) for some interesting research about how body language shapes who you are. It is with this perspective grounded in science that at [Conditioning Leaders](#) we bring the body front and center into our leadership development programs.

Throughout our careers, we need to stop and assess what support we need so we can be our best selves personally and professionally. If you are tired, burned out, frustrated by lack of professional advancement opportunities, annoyed with colleagues or your support staff, it might be time to intervene and hire a professional coach. It is often our attitude, perspective and scarce thinking patterns that undermine who we want to be and how we cultivate positive change, not our ability to master technical skills that matters most for long term success and fulfillment.

If you are interested in learning how our leadership development programs can support you, we would be happy to explore how one-on-one coaching might make a difference. We can also come and lead a workshop for your staff or department. I can be reached at madeline@conditioningleaders.com or www.conditioningleaders.com.

Announcing the 2016 AANS/CNS National Neurotrauma Symposium Joint Meeting

Come and get your Trauma CME (up to 35 credits) in the beautiful horse and bourbon countryside of Kentucky!

June 26-28, 2016

Lexington, Ky.

Scientific Sessions: Lexington Convention Center

Online Hotel Reservations & Registration will open in January 2016 - Book through the NNS website for special rates! <https://www.nationalneurotraumasociety.org/symposium/symposium-current/>

Abstract submission opens Jan. 1, 2016, and closes April 1, 2016. All accepted abstracts will be published electronically in the Journal of Neurotrauma issue immediately prior to the conference.

AANS/CNS Section on Neurotrauma and Critical Care Sponsored Sessions Sunday, June 26

8:30-10 a.m. THE UNSTABLE SPINE

Management of Occipital-cervical Dislocations and C1-2 Fractures

Christopher Shaffrey, MD, FAANS – University of Virginia

Dr. Shaffrey is a professor of neurological surgery and director of the Neurosurgery Spine Division at the University of Virginia. He has an active research interest in spinal surgery, particularly in numerous multicenter outcome research studies of pediatric and adult scoliosis, spinal trauma and tumors involving the spinal column.

Reduction of the Difficult Thoraco-lumbar Fracture

Catherine Miller, MD – University of Minnesota

Dr. Miller is a chief neurosurgery resident at the University of Minnesota. She has participated in numerous research projects involving functional outcome after acute spinal cord injury and the use of navigation for spinal surgery.

Minimally Invasive Management of Spine Fractures

Zachary Smith, MD – Northwestern Medical Faculty Foundation

Dr. Smith is an associate professor of neurosurgery at Northwestern. He has a specific interest in minimally invasive spinal techniques for adult degenerative spinal disease, spinal tumors, trauma and spinal column deformity.

10-10:30 a.m. Coffee Break

10:30 a.m.–12 p.m. THE SEVERELY INJURED BRAIN

Brain Tissue Oxygenation – What have we learned from BOOST2?

Ramon Diaz-Arrastia, MD – Uniformed Services University

Dr. Diaz-Arrastia is a professor of neurology at Uniformed Services University of the Health Sciences and director of clinical research at the Center for Neuroscience and Regenerative Medicine. His

research interests are focused in the area of understanding the molecular, cellular and tissue level mechanisms of secondary neuronal injury and neuroregeneration.

Severe TBI Guidelines

Jamie Ullman, MD, FAANS – North Shore University Hospital

Dr. Ullman is an associate professor of neurosurgery at Hofstra North Shore-LIJ School of Medicine. She is the current chairperson for the AANS/CNS Neurotrauma Section and has contributed significant research in the neurotrauma field.

Light Therapy for TBI

Rajiv Gupta, MD, PhD – Massachusetts General Hospital

Dr. Gupta is an associate professor in radiology at Harvard Medical School and the director of Advanced X-ray Imaging Sciences (AXIS) Center. His research and clinical interests are in neuro and cardiac radiology with a focus on development and clinical applications of ultra-high resolution CT.

12–1 p.m. Free Time/Lunch

1–2:30 p.m. RESTORING FUNCTION AFTER SCI

Nerve Transfer

Wilson Z. Ray, MD, FAANS – Washington University at St. Louis

Dr. Ray is an assistant professor of neurosurgery at Washington University. His areas of interest include spine surgery, spinal cord injury, nerve transfers, brachial plexus tumors and spinal cord tumors.

Paired Magnetic and Electrical Stimulation for Cervical SCI

Noam Harel, MD – Mount Sinai Hospital

Dr. Harel is an assistant professor of neurology and rehabilitation medicine at Mount Sinai Hospital. His primary interests are in treatment and rehabilitation of spinal cord injury (SCI), amyotrophic lateral sclerosis (ALS), traumatic brain injury and stroke.

Stem Cells and SCI

Ann Parr, MD, PhD, FAANS – University of Minnesota

Dr. Parr is an assistant professor of neurosurgery and director of spinal neurosurgery at the University of Minnesota. Her research currently centers around transplanting neural stem cells grown from a patient's own skin into the injured spinal cord. She is inter-

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ested in examining mechanisms of functional recovery using techniques such as histology and immunohistochemistry, cell tracking through magnetic resonance imaging and animal modeling.

2:30–3 p.m. Coffee Break

3–4:30 p.m. ADVANCES IN TBI

Are we ever going to have a TBI Clinical Trial that Succeeds?

Uzma Samadani, MD, PhD, FAANS – University of Minnesota

Dr. Samadani is an associate professor of neurosurgery at the University of Minnesota. Her primary research interest is diagnosis, classification and treatment of TBI. An additional research interest of hers focuses on the relationship between trauma, brain atrophy and risk factors for hemorrhage.

Return to Work and Play after Concussion/TBI

Tanvir Choudhri, MD, FAANS – Mount Sinai Hospital

Dr. Choudhri is an associate professor of neurosurgery at Mount Sinai Hospital and is co-director of the Neurosurgery Spine Program. His clinical interests include cervical spine disorders/surgery, minimally invasive spine surgery, intradural spine tumor surgery and sports neurosurgery, including concussion management.

Can Technology Save Us? The Biomechanics of Concussion Prevention

Kristy Arbogast, MD – Children's Hospital of Philadelphia

Dr. Arbogast is the co-scientific director and director of engineering for the Center for Injury Research and Prevention at The Children's Hospital of Philadelphia and a research associate professor of pediatrics at the University of Pennsylvania. She is an internationally recognized expert on pediatric injury biomechanics, injury causation and the effectiveness of safety products for children.

Other Featured Topics:

Biological mechanisms of TBI

SCI and TBI clinical trial design

Pediatric spinal cord injury

Systemic consequences in patients with SCI

Radiographic-pathologic correlations in TBI

For the complete program, please visit: <http://www.nationalneurotraumasociety.org/symposium/scientific-program/>.

Things to Do While in Lexington

Lexington is the heart of the Bluegrass Region of Kentucky and is home to legendary horses and world famous bourbons. While in Lexington, plan to spend some time exploring some of the many attractions in the city and surrounding areas. However you like to spend your time, Lexington has something to offer for everyone.

Wining and Dining

Lexington's cuisine is a proud mix of the traditional and imagi-

native, artisanal and approachable, Southern and cosmopolitan. Passionate and hospitable chefs, entrepreneurs, brewers, distillers and vintners are leading a wonderful culinary movement with an emphasis on local and fresh ingredients. Restaurant recommendations from a local include Tony's Steakhouse, Portofino, Merrick Inn, Dudley's, Table Three Ten, Middle Kitchen Bar, National Provisions, Cole's, Enoteca and Blue Heron.

The Birthplace of Bourbon

Almost all bourbon, approximately 95 percent, is produced in Kentucky. Five historic distilleries in the Lexington area have regular tours, each with their own personality. Enjoy the aromas and witness first-hand the time-honored traditions involved in making America's only native spirit. Discover even more distilleries by doing the Kentucky Bourbon Trail.

Woodford Reserve Distillery: (859) 879-1812

Wild Turkey Distillery: (502) 839-2182

Buffalo Trace: (502) 696-5926

Four Roses Distilling Company: (502) 839-3436

Town Branch Distillery: (859) 255-2337

The Wine Revival

Kentucky's wine industry has expanded rapidly from a mere 40 acres of wine grapes to over 72 licensed wineries cultivating over 600 acres. The recent proliferation of vineyards and wineries allows visitors to explore the stunning landscapes of 'horse country' en route to these destinations.

- Black Barn Winery: (859) 552-2525
- Castle Hill Winery: (859) 576-0010
- Christian Mill Vineyard and Winery: (859) 881-5007
- Equus Run Vineyards and Winery: (859) 846-9463
- The First Vineyard: (859) 885-9359
- Grimes Mill Winery: (859) 543-9691
- Jean Farris Winery and Bistro: (859) 263-9463
- Lovers Leap Vineyards: (502) 839-1299
- Talon Winery: (859) 971-3214
- Rising Sons Home Farm Winery: (502) 600-0224
- Wildside Winery: (859) 879-3982

Horse Capital of the World

Beautiful horse farms have been part of the Bluegrass area since the region was first settled. From horse farms to racetracks to museums, this area has everything a horse lover could ask for.

Kentucky Horse Park

This 1,200 acre state park has served as an active horse farm since the 18th century. It includes barns, acres of pastureland, museums, demonstrations, art exhibits, a gift shop and horses. This is the place to get up close and personal to a wide variety of breeds, from miniatures to draft horses. Shows and competitions are scheduled

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throughout the year. It is open seven days a week from 9 a.m.-5 p.m. To find out more, call (800)678-8813 or (859)233-4303.

Horse Farms

The private farms surrounding Lexington are known globally for producing the finest horses. There are three ways to visit a horse farm:

- **Guided Tour:** An itinerary is planned by the tour company to offer an overview of Lexington and its horse farms.
 - **Blue Grass Tours:** (859) 252-5744: Two daily tours (4 hours), minimum of four guests; stops at a local horse farm, Keeneland Race Course and other points of interest
 - **Horse Farm Tours, Inc.:** (859) 268-2906: Two daily tours (3.5 hours); visit two to three horse farms, Keeneland and drives by Calumet
 - **Thoroughbred Heritage Horse Farm Tours:** (859) 260-8687: Two daily tours (three hours); drive by Calumet, Keeneland race track, breeding complex and other points of interests
 - **Unique Horse Farm Tours:** (859) 233-4303: Three daily tours (two to three hours); departs from Kentucky Horse Park to tour historic estates and horse farms
- **Customized Tour:** If you like to travel at your own pace, have specific farms, horses or attractions you would like to see, you can hire a private guide for a custom tour. It is best to call ahead to discuss what you are interested in and possible itineraries.

Blue Grass Tours: (859) 252-5744

Destination Bluegrass: (888) 970-3339

Horses of Kentucky: (859) 277-4625

Kentucky Horse Tours: (859) 312-1124

Kentucky Living History Tours: (859) 293-9367

Lexington Private Tours: (859) 278-9488

Mint Julep Tours: (502) 396-5682

Thoroughbred Heritage Tours: (859) 260-8687

- **Booking your own visit:** A number of farms – from thoroughbred showplaces to smaller facilities – welcome individual tourists, families or small groups. Policies vary from farm to farm, but you must call first.

Lexington Activities

Shopping

Lexington is home to the largest mall in Kentucky, charming boutiques, antique stores and equestrian-themed gift shops. Whether you are a bona fide browsing junkie or just looking for a special souvenir, you will find plenty of interesting shops full of fun and

fantastic stuff. Pack your walking shoes and shop to your hearts content. Fayette Mall is the largest mall in Kentucky and is home to some of the most popular retail stores. The Shops at Lexington Center and The Square are specialty shopping areas connected by pedways in the heart of downtown Lexington. There are many other small boutiques and shops throughout the city.

Golf

Any time of year, golf is an enjoyable experience in the Bluegrass area. The scenery is just as world famous on the 18th fairway as it is on a horse farm (in fact, some courses either adjoin horse farms or offer a farm atmosphere). No matter what brings you to the Lexington area, once you take a look at the excellent selection of public and semi-private courses, you will be glad you brought along your clubs

Kearney Hills Golf Links is a tough and enjoyable Scottish-style links course with large, undulating greens and an abundance of water and bunkers. It hosted the Senior PGA tour from 1990-1997 and has been named the top public course in Kentucky. (859) 253-1981

Griffin Gate Marriott Resort & Golf Club is a semi-private championship course with gentle, rolling hills. It previously hosted a PGA Senior Tour stop and was named one of the top 75 resort courses. (859) 288-6193

Peninsula Golf Resort is a public championship course, intellectually demanding requiring finesse and strategic shot making. It was named one of Top 200 courses in the nation by Golf Digest. (859) 548-5055

Spas

After a long day of sightseeing, shopping or golf, you may need to pamper yourself in one of Lexington's relaxing spas.

- **Griffin Gate Resort Spa:** <http://www.marriott.com/hotels/hotel-information/fitness-spa-services/lexky-griffin-gate-marriott-resort-and-spa>
- **Posh Salon & Spa:** <http://poshsalonandspa.com/about-us>
- **Planet Salon & Spa:** <http://www.planetsalonandspa.com/beaumontservices.html>
- **Euphoria Salon & Spa:** <http://www.euphoriasalon-ky.com/#-services>
- **Joli Salon and Spa:** <http://www.jolidayspa.com>
- **Simply Blue:** <http://www.simplybluesalon.com>

Bluegrass Attractions

The Bluegrass region encompasses 15 counties in the heart of Kentucky. Take the scenic byways to nearby communities and discover significant Civil War sites, vineyards, world famous arts and crafts and stunning natural attractions. Get more info on attractions or additional entertainment options at www.visitLEX.com



AANS/CNS Section on Neurotrauma and Critical Care Committee 2014-2016

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Joint WC: Stacy Quintero-Wolfe, MD, FAANS

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