

CURRENTS

News Magazine of the Neurocritical Care Society

Volume 10, No. 2



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Note From the Editor



Colleagues:

I want to welcome you to the second issue of *Currents* for 2015, the official quarterly news magazine of the NCS. The summer issue of *Currents* is typically focused on developments in the upcoming NCS Annual Meeting and this year is no exception. We feature several articles that serve as a preview for the changes and enhancements to this year's meeting in Scottsdale, Arizona.

I also want to keep NCS members informed about the other media-related activities of the NCS Communications Committee. One of the main goals of the committee has been to improve the NCS website. With that goal in mind, committee members and the NCS executive office recently completed a lengthy evaluation process to find a new Association Management Software and Content Management System for our website and membership directory. After creating a Request for Proposal, the committee reviewed proposals from eight different vendors. Committee members then ranked each of the proposals to narrow the field down to three potential vendors.

Over the last three months, the Communications Committee along with the NCS officers reviewed product demonstrations from the three finalist vendors and chose the best fit for the needs of our society. I am very pleased to announce that we unanimously selected JL Systems to provide our new Association Management Software and Content Management System.

Changing to a new vendor will include improvements to the content and look of the website, improved internet security features, and a much needed overhaul of our member database. These improvements will make the content of the website more customizable for different user types. It will also improve integration between the website and external platforms that support *Currents*, ENLS, and NCS OnDemand. With this customization, it will become more important to log in when visiting the NCS website because custom content may only be available for specific member types.

Over the next six months, members should expect to hear a lot more about upcoming changes to the website. One of the functionalities I am most excited about will be the ability to archive and catalog *Currents* such that members can easily search for content in back issues, like that NCS salary survey everyone is always trying to find.

In addition to changes to the NCS website, we are also announcing the publication of the first book from the NCS Educational Products Committee. As Claude Hemphill and Alejandro Rabinstein describe in their article, the NCS is now a publisher and *The Practice of Neurocritical Care* text book is now available on-line through the NCS OnDemand portal and at internet book stores like iTunes and Amazon. Go buy a copy today.

Also debuting this month on NCS OnDemand is the long planned Brain Death Toolkit. This module includes a series of educational articles, videos, and manuscripts that focus on educating the public and other medical providers about the process of brain death declaration. It also includes sample brain death policies that hospitals can use as a template for updating their own policies and procedures related to brain death declaration. This project resulted from a lot of work by the NCS Brain Death Subcommittee and it represents a timely and much needed educational tool in these days of confusion and misinformation about brain death.

I hope you enjoy this issue. As always, if you have suggestions on improving *Currents* or want to contribute, please email me at mkoenig95@gmail.com. I'm also on the lookout for future *Currents* cover artwork, so send me artwork that you would like to see proudly displayed on an upcoming issue.

On the Cover: The cover art for this issue was submitted by **Huy Tran, MD**, a neurointensivist at the University of New Mexico and co-chair of the NCS Communications Committee. The photo was taken at the Bosque Del Apache National Wildlife Refuge in New Mexico. "From October to January, the sandhill cranes and snow geese come to rest at dusk in the ponds of the Bosque Del Apache in New Mexico. There, they spend the night until morning when they start taking off sporadically shortly after sunrise until suddenly, by some unknown trigger, they start to take off all at once in mass exodus as if reaching an action potential. It is quite a magnificent sight to see. In keeping with the Southwestern theme and the Annual Meeting location in Arizona, I thought this would be appropriate material for the NCS newsletter cover art," says Dr. Tran.

Cheers,

Matthew Koenig, MD, FNCS
Editor-in-Chief



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Presidential Term at Midpoint: Some Reflections

By Romergrzyko Geocadin, MD, FNCS

Matt Koenig just reminded me to send in my article for the President's Column for *Currents*. So what do I write now? With a little bit of reflection, I realize that I just passed the midpoint of my term as NCS president. Then I realize there have been a lot of exciting stories to tell.

The start of the term was stressful in many ways. NCS has been very successful since its founding. As I was coming in from the vice president to the president role, I told myself that I did not want to be the first to drop the ball. But as the excitement of the Annual Meeting was kicking in Seattle, I suddenly fell acutely ill and needed to be hospitalized. I missed the last three days of the meeting. There was some doubt about whether I could continue as president.

This is where the tight bonds and amazing work ethic of the NCS leadership shone the brightest. Since we have solidified the officers as a leadership group, it was not hard for them to continue the key tasks while I was recovering. While I "laid low" for a month, the day-to-day leadership was taken over by the vice president and the officer group. Soon after, I personally "regrouped" and – together with the NCS leadership – focused on the crucial components that continue to make the NCS successful. Here are some reflections at the midpoint of this term.

The people: NCS members are used to adversity. NCS members love challenges. NCS members love to innovate. NCS members are enthusiastic. They live in the ICU where "nothing is simple" and they deal with "life and death" issues all the time. Making an organization successful has to be a cake walk, right? Well, not really... The trick is how to harness all these energies into effective projects. We needed to have better communication and coordination.

One of the first things we did was to organize regular meetings not only with the officers, Board of Directors, and Executive Council but also with all the committee chairs. Once we clarified the strategic plans with each committee leader, our task was to provide them with resources, empower the committee co-chairs, and get out of their way as they completed their tasks.

We now have a monthly conference call and the progress of each committee is shared with all the committee chairs. In this way, we make everyone aware of what is happening in the society. It is with joy that I let you know that all the committees are now successfully achieving their targets. The committees are the engines of the society. The details of the committee accomplishments are provided in my monthly updates.

Working for the mission: As a young organization, we have to start planning activities that are financially beneficial to the society. This is the only way we can sustain ourselves and keep the mission going. At the start of this term, we had to make some serious strategic decisions about which projects to fund, and which projects have to wait or be eliminated. Projects cannot move on enthusiasm alone; we needed a cogent financial plan for each project. We are planning traditional and not-so-traditional ways to contain our spending and generate funds.

Many of us extended our volunteerism by donating our services (i.e. honoraria) to the society. We have started a membership fund-raising campaign. We are also gearing up to organize a philanthropic arm for the society. We have restructured our fund raising strategy that focused not only on the Annual Meeting but on engaging sponsors in year-round activities. This is starting to gain support with several large sponsors engaging us in activities that will generate educational products such as webinars.

We have also developed the on-line portal for NCS educational products. But also key is the momentum that ENLS is gaining nationally and internationally. We are in the process of improving our website and membership directory which will serve as the backbone of the e-commerce that will serve as an engine for our future revenues.

Meaningful partnership with our executive staff: As the society grew, we exceeded the previously defined support structure in our executive office/association management company (AMC). In an effort to accommodate our rapid growth, we tried a model that provided for hourly rates. With the hourly model, our cost for staff support expanded beyond our yearly projections. Something had to change. We needed to restructure the way we worked with our executive staff and we needed to restructure our association management company (AMC) payment structure.

Drastic changes were undertaken at every level and every activity of the NCS. After a careful review and planning with the NCS leadership and key senior members, we successfully renegotiated our rates and restructured our support package with our AMC leadership. Since then, a positive tone in the collaborative work of members and executive staff has been palpable.

Now that we are a little past the midpoint of this term (but still with four months to go), momentum has been generated. A lot of great things are still going to happen. Let's keep up the great work, NCS!

Highlights from the NCS Annual Meeting Schedule and Advance Program Announcements

By Ed Manno, MD



The NCS Annual Meeting preparations are in full swing. Our advance brochure has been mailed out to you. With this year's theme of "Back to the Future," we'll be using some new and old features from past Annual Meetings. We're bringing back traditional posters but will also be highlighting the top voted abstracts as e-posters.

This year, there will also be a thematic review of the most significant articles of the last thirteen years from the major scientific journals in our field (since the start of NCS), followed by a discussion of what areas of research should be emphasized over the next thirteen years. As always, we have great workshops planned.

In addition to exciting scientific sessions, we're encouraging everyone to take advantage of the wonderful resort amenities and surrounding activities offered at this year's location. Bring your t-shirts and sunglasses and leave your suits at home! Below are some highlights to look forward to in Scottsdale, AZ.

The Annual Meeting will be held October 7-10, 2015. The plenary keynote speaker on October 10 will be Alfredo Quiñones-Hinojosa, MD, a dynamic neurosurgeon from Johns Hopkins Hospital.

We are currently still open for submission of scientific abstracts. The deadline for abstracts is Wednesday, June 24. [Read more](#) about the abstract submission process on the Annual Meeting page of the NCS website.

On **Tuesday, October 6**, the Practice Update, Career Research and Future Leaders sessions will be held with an outdoor welcome reception in the evening. The inaugural meeting for a Working Group on Neurocritical Care Informatics (www.SmartNeuroICU.org) will also be formed to assemble a team and create a think tank to address issues of creating an open, scalable, standards-based, information infrastructure for neurocritical care. Other possible courses under consideration may include some talks on billing and coding and an evening course on media training. The welcome reception will start at 5:30 PM.

On **Wednesday, October 7**, get a jump start on the meeting by participating in the Second Annual 5K Fun Run or by attending an in-depth breakfast symposium sponsored by Zoll Medical Corporation, or a lunch symposium sponsored by CSL Behring. Opening sessions of the meeting will focus on the Clear IVH trial results, moving right into our keynote address. Each afternoon of the program, beginning on Wednesday, we will feature concurrent sessions on translational science of coma analysis, pharmacy and guideline presentations, and workshops.

On **Thursday, October 8**, we will feature the presentation of the final results from the PRINCE Study, a lively debate among the top minds in our field, and an exciting session on acute neurology and mobile stroke units. Attend a lunch symposium sponsored by Bard Medical before embarking on an education-filled afternoon. Afternoon sessions will include a joint session with the Society of Neurointerventional Surgery along with a concurrent session

on the neurocritical care aspects of special populations and the presentation of two additional guidelines. Evening will take us to the foothills of the McDowell Mountains for an authentic desert cookout featuring regional food and themed music and games. Western-style hats and boots are highly encouraged – but strictly optional.

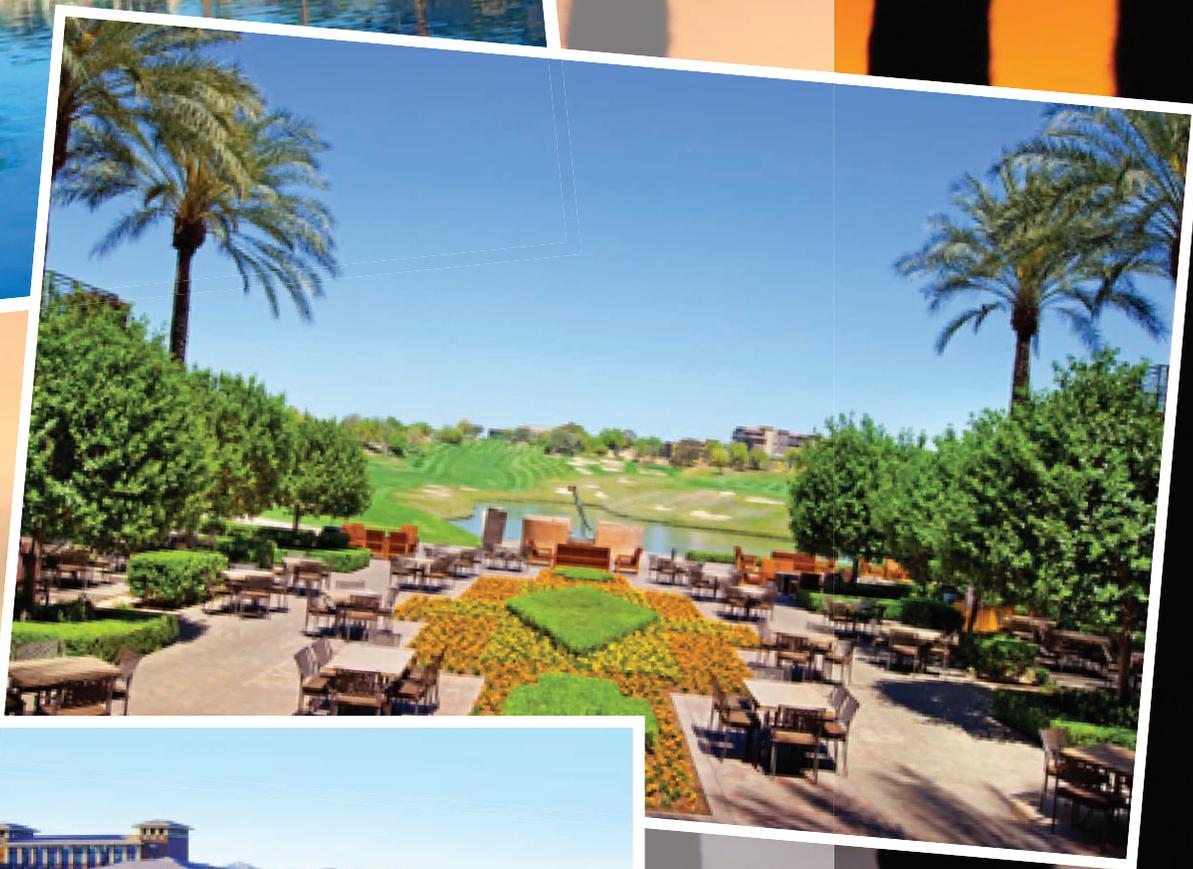
On **Friday, October 9**, morning sessions will provide an update on the Eurotherm Trial. In addition, the results of the GAMES trial will also be presented. We will also welcome back American Medical Research and the Medtronic Foundation as they host their second NCS lunch symposium. The afternoon will include a highly anticipated nursing session on early mobilization in the ICU, a concurrent session on pediatric neurocritical care, and a joint session with the Society of Neuroanesthesia and Critical Care.

On **Saturday, October 10**, immediately following the ENLS recertification and Train the Trainer courses, join us on a different type of course for the Fund A Fellow Golf Tournament for Research! A net portion of tournament proceeds will be donated to the NCS Fund A Fellow campaign which will support the new annual NCS Research Training Fellowship grant. So bring your clubs (or rent them!) for a little friendly competition and fun. We promise beautiful Arizona sunshine and a beverage reception to follow.

Speaking of beverages, a scotch tasting receptions will be offered on both Wednesday and Friday nights. Be sure to register for the scotch tasting because pre-registration is required.

Poster receptions and recognition events will take place each evening of the meeting, Wednesday through Friday.





The NCS Unveils New OnDemand Products and Debuts as a Publishing House

By J. Claude Hemphill III, MD and Alejandro Rabinstein, MD



J. Claude Hemphill III, MD



Alejandro Rabinstein, MD

The NCS has been hard at work behind the scenes to bring its members cutting edge educational products that advance the field of neurocritical care. We've started out strong in 2015 with the launch of two exciting new products: the Brain Death Toolkit and the Practice of Neurocritical Care textbook. Visit [NCS OnDemand](#) to view these and other educational offerings published by the NCS.

Brain Death Toolkit

The guidelines associated with brain death have become more rigorous over time and the NCS believes education surrounding brain death should keep pace with that effort. Spearheaded by the NCS Brain Death Task Force, the creation of the Brain Death Toolkit aims to do just that: provide resources that assist in the understanding of brain death, both conceptually and in practice.

Our goal in creating this complimentary publication was to present a straightforward, easily accessible set of tools for use by anyone

who may be involved in the determination of brain death. It contains access to multiple educational offerings, including instructional videos, webinars, and web-based courses. The Brain Death Toolkit is available free of charge and is publically accessible through the NCS website.

Spend some time exploring the diversity of resources in this toolkit. Check out the sample brain death policy and checklist which can serve as a template for adoption at individual institutions and hospitals. Read articles that explain the pitfalls and challenges in brain death determination. Get your questions answered with our FAQ's for medical practitioners and the general public.

We hope you find this [toolkit](#) to be a helpful resource, and that it enables clinicians to accurately and appropriately determine brain death with confidence and proficiency.

The Practice of Neurocritical Care

The NCS is proud to announce the release of the first NCS-published, multi-authored textbook, *The Practice of Neurocritical Care by the Neurocritical Care Society*. This book represents a new approach to medical textbooks and is authored and published exclusively by physician, nursing, and pharmacy leaders in the field who represent the NCS.

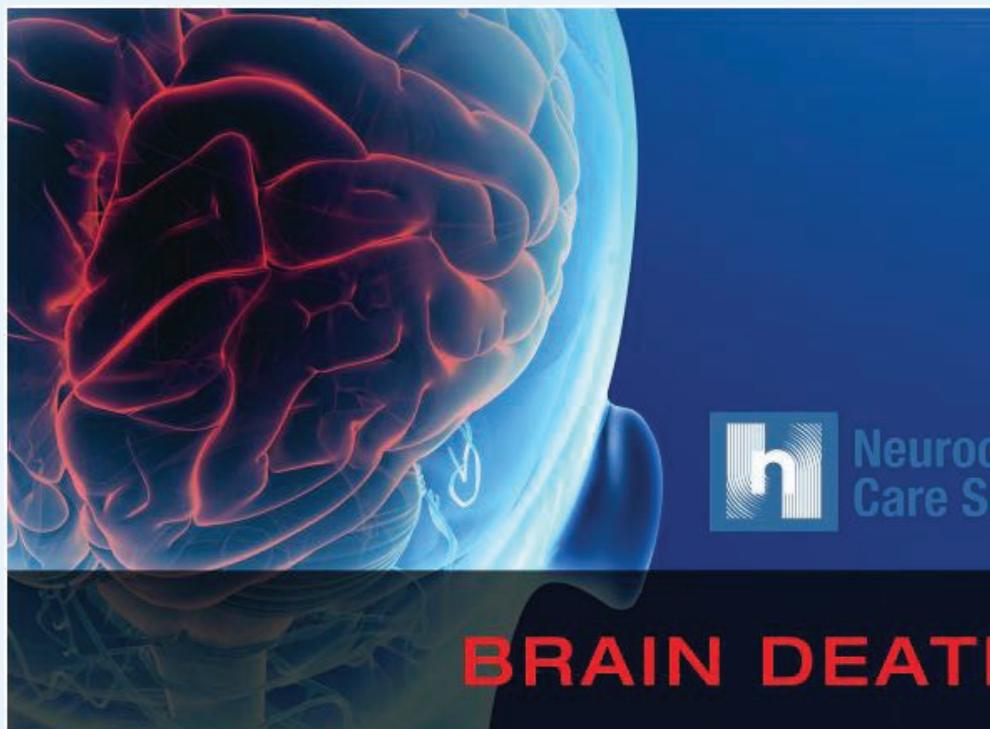
Many of the topics included in this book have been discussed at prior NCS Annual Meetings. Each of the 25 chapters begins with a clinical

case. At the end of each chapter, readers are presented with ten or more multiple-choice questions and answers. The book also features 99 Tables and 41 Figures.

Who would benefit by investing in this book? Individuals seeking preparation material for the neurocritical care certification examination or for the neurocritical care portion of the boards for neurology, neurosurgery, or other critical care specialties would benefit. Beyond these individuals, the NCS also believes it is valuable to any practitioner interested in a current update on neurocritical care from experts in the field.

There are a variety of ways this book can be viewed. Add it to your institutional or personal library by purchasing print copies of the 577-page soft cover version. If you desire the portability of an electronic version, download the ebook at iTunes, Amazon, Barnes & Noble, and NCS OnDemand. Learn more about the book and all purchase options on [NCS OnDemand](#).

A big part of the purpose of the NCS becoming its own publisher is so that we can retain revenues from the book and use them for NCS projects such as our Research Fellowship Grant, rather than have them retained by a professional publishing house. We hope NCS members will choose to buy their own copies of the book and maybe some for other colleagues and trainees. It is for a very good cause. It is worth noting that both Amazon and Apple take substantial royalties for their distribution networks. All proceeds from orders through the NCS OnDemand portal of the generic ePub, which works on essentially all e-readers except for Kindle, and the print version go entirely to the NCS.



Publish Your Next Book with NCS

The future of NCS products can be found within the talent and expertise of our members. Have you authored a book, but haven't published it yet? Do you have an exciting idea for a future publication that would benefit the field of neurocritical care?

The NCS is now a publishing house. The advantage of the NCS becoming its own publisher is the ability to retain revenue from publications for use on NCS projects. We encourage you to consider publishing your next book with us!

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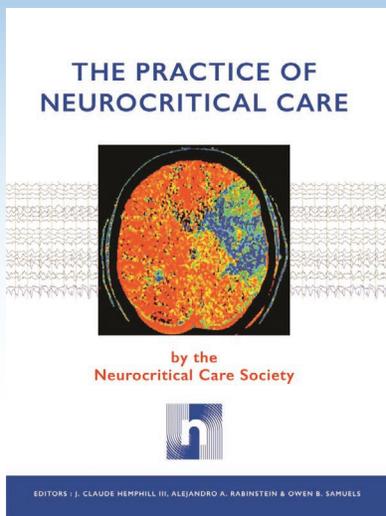
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Neurocritical Care in the Resource Limited Setting of Nepal

By Gentle Sunder Shrestha, MD



The recent catastrophic earthquake of 7.8 magnitude that struck Nepal on April 25, 2015 imposed a major humanitarian crisis with over 8,500 deaths and over 14,000 injuries. The weak healthcare system and the limited resources were easily overwhelmed by the major disaster. Much of the brunt of major disaster victims was managed by a few referral hospitals in the major cities. Services were extended beyond the usual boundaries

of emergency rooms and ICUs and beyond the usual times of functioning of operating rooms.

A significant number of trauma victims had neurological injuries. Relief and rescue operations were facilitated by extensive involvement of government and relief organizations across the boundaries of nations and continents. Various national and international groups and organizations are involved in fundraising and donations. The need of proper disaster preparedness and effective training is underscored. Collaborations with international organizations and societies have strengthened the fight against this natural disaster.

Nepal is a small South Asian nation with an estimated population of 27.8 million. As per the World Bank data, it is classified as a low income nation with a gross national income (GNI) per capita of US \$730 in the year 2013. The health care system of the nation is adversely affected by a high rate of poverty, illiteracy, and challenging geography.

There are about 500 ICU beds across the country, but most of them are not well equipped. The majority of them are mixed ICUs run as open units. The Nepalese Society of Critical Care Medicine (NSCCM) was founded in 2010 to promote the development of critical care in Nepal.

The NSCCM plans to collaborate with the Ministry of Health of Nepal to develop ICUs at district, zonal, and tertiary level hospitals. The Nepal Critical Care Development Foundation (NCCDF) was formed as a non-profit organization to improve the status of critical care medicine in Nepal. One of the major barriers to the development of critical care medicine has been the lack of trained manpower. A few tertiary level teaching hospitals have started three-year postgraduate programs in critical care medicine, but they are not expected to meet the demand for intensivists in the country. Interested clinicians continue to go abroad to get training. Short duration, competency-based training in critical care medicine is required to address the needs.

The country faces a major burden of neurocritical illness like traumatic brain injury, stroke, epilepsy, and infectious diseases like meningitis, encephalitis, and cerebral malaria. Neurocritical care is at the stage of infancy in Nepal. There are only a few dedicated Neuro ICUs in the country. The Neuro ICUs are being run as open or semi-closed units by neurosurgeons, neurologists, and anesthesiologists. The Neuro ICUs do not meet the significant disease burden. Therefore, the majority of neurologically ill patients are managed in general ICUs.

Management is often suboptimal due to constrained resources, limited ability, and availability of invasive monitoring and lack of trained neurointensivists and full time intensivists. Invasive monitoring such as intracranial pressure monitoring is available only in a few centers. Neuroradiological diagnostic facilities are also limited. Due to lack of public awareness, poor referral systems, challenging geography of the country, and the lack

of effective patient transport systems, critically ill neurologic patients either do not reach the few centers with provision of neurocritical care or they reach those centers late.

The system for management of patients with stroke is poorly developed despite a significant burden of disease. Nepal lacks dedicated stroke units. Thrombolytic therapy is administered rarely, only in some centers due

in part to the expenses for the drugs. Most of the patients are managed conservatively.

Nepal has only a limited number of certified neurosurgeons. To date, there are only about 45 certified neurosurgeons in the country. Only four tertiary level centers offer the post-MS, MCh training course in Neurosurgery. The Nepalese Society of Neuro Surgeons (NESON) was established in 2008 to promote neurosurgical services in the country. Similarly, there are only about a dozen certified neurologists in the country. Three centers run postgraduate training courses in Neurology. Just this past year, the Nepalese Academy of Neurology was formed to enhance the care of patients with neurological illness. Critical care nursing training for Neuro ICU nurses is being conducted by Annapurna Neurological Institute & Allied Sciences to enhance the nursing care of neurological critically ill patients.

Outcome research has demonstrated reduced mortality, improved outcome, and reduced length of stay if patients with traumatic brain injury and hemorrhagic stroke are managed in dedicated Neuro ICUs by neurointensivists. Considering the significant burden of neurological critical illness in Nepal, it is about time



to develop neurocritical care in Nepal. Training programs in neurocritical care are essential to produce neurointensivists and to enhance the care of critically ill neurological patients.

NSCCM has recently partnered with the NCS. With the generous support of the NCS, the Emergency Neurological Life Support (ENLS) course was conducted for the first time in Nepal on February 21, 2015. It was also the first course conducted in Asia. The landmark course was conducted with Dr. Alberto Goffi and Dr. Victoria McCredie as course directors and Dr. Antonio Bellini and me as course trainers. The course was attended by 34 doctors encompassing various specialties that are actively involved in dealing with neurological emergencies in daily practice.

The course was a valuable means to update healthcare professionals dealing with these neurological emergencies in their daily practice. Due to various challenges and a unique disease spectrum, the standard guidelines and recommendations designed for developed nations may not be applicable in the resource limited settings. Modified guidelines and protocols (as suggested for patients with septic shock) considering the availability of local resources, disease spectrum, and existing evidence may help to enhance the quality of care and patient outcome in resource limited settings.

Gentle Shrestha, MD, FACC, EDIC, FCCP is a neurointensivist and anesthesiologist at Tribhuvan University Teaching Hospital in Kathmandu, Nepal. He is a member of the NCS and invited guest writer for Currents.



Contribute to the Nepal Disaster Relief:

The NCS Executive Committee has authorized a donation on behalf of the society to the earthquake relief efforts in Nepal, and we are providing information about ways in which individual NCS members can also contribute to the Nepal Disaster Relief.

The World Federation of Societies of Intensive and Critical Care Medicine (WFSICCM) has invited the NCS to join global relief efforts in Nepal. Individual financial donations can be made by visiting <http://justgive.org> and select "Help Nepal Earthquake Victims." This link will bring you to a page featuring many different organizations who are accepting contributions and includes a short description of what type of relief they are providing.

Thank you for your support of our friends and colleagues in Nepal. We will continue to be in contact with our partner society in Nepal as they move through the challenging months ahead.

Romergryko Geocadin, MD, FNCS
President, Neurocritical Care Society

Ethical Considerations in Post-Mortem Sperm Retrieval in Brain Dead Patients

By Salvador Cruz-Flores, MD, MPH and Michael Rubin, MD



Salvador Cruz-Flores, MD, MPH



Michael Rubin, MD

Case: A 35-year old man has a severe closed head injury resulting in progressive deterioration in neurological function despite best medical management such that brain death is expected. The patient is a designated organ donor on his driver's license. His family members are strong proponents of organ donation and discuss their desire to facilitate organ donation with the treatment team. In addition, they request posthumous sperm retrieval as part of the organ procurement process. The patient's sister stated that she had asked her brother (the patient) to be a sperm donor as she is married to another woman and the couple was planning on conceiving. The patient's family was very supportive of this request.

In the patient's location, there are no current state, local, or federal laws regarding posthumous sperm retrieval. The hospital and organ procurement organization have no formal policies regarding posthumous sperm retrieval and prior requests for posthumous sperm retrieval were handled on a case-by-case basis through an emergency ethics consultation. Prior requests were denied due to a lack of documentation that the patient would have authorized sperm retrieval.

Question: In this scenario, is it ethical to proceed with posthumous sperm retrieval based on the family's assertion that the patient would have authorized it? If not, why does the burden of proof differ from posthumous procurement of other tissues? Can the sperm retrieval process and the ensuring ovum fertilization be considered separate actions from an ethical standpoint?

Comment: Posthumous sperm retrieval (PSR) was first reported in 1980 and while it is an uncommon situation, requests have increased over time, pressing the question of whether it is ethically permissible [1]. The ethical analysis requires consideration of the stakeholders that, in this case, include the patient, the patient's sister and her wife, the patient's parents, the potential child from the pregnancy, and the physicians and healthcare team. At the core of this request is the autonomy of the dying and incapacitated patient who is unable to provide consent [1,2].

Without statute guiding this process, some institutions have created their own policies as guidelines. Cornell University's guidelines for PSR specify four areas of consideration: a) issues of consent, b) medical contraindications, c) resource availability, and d) waiting time period prior to conception. Furthermore, the guidelines stipulate that consent can only be provided by the wife of the deceased, the death must be sudden and from no communicable diseases, and retrieval must occur within 24 hours of death [3]. In this case, following the Cornell University guidelines would result in turning down this family's request considering that the patient is not married.

However, the case poses a higher level of contextual complexity that the Cornell University guidelines fail to cover. More broadly, would posthumous reproduction promote or interfere with important human goals for the patient? What is the evidence that supports the notion that PSR promotes or interferes with this patient's human goals? Who can provide that evidence and speak on behalf of the patient's best interests? In addition, there are implications regarding respect for the dead, the welfare of the child, and the autonomy of the physician.

The neurological condition of this patient and the absence of a written statement of consent call for substituted judgement and implied judgement and implied or presumed consent which require an analysis of this patient's values and human goals [2]. In the absence of a spouse, this patient's parents would assume such responsibility. The case, as described, establishes that the patient's sister had spoken with him about her and her wife's intentions to become pregnant and that he was agreeable to become a sperm donor.

While no written confirmation or witnesses are described, some weight ought to be given to the fact that his family and, presumably, his parents as surrogate decision makers endorse and support the request. The implication of this support is that his parents have knowledge of the patient's actions or values that indicate the patient's approval.

It could be argued that the patient's family in general and the patient's sister specifically may have a conflict of interest as potential beneficiaries of this decision and, as such, it would invalidate the claim of the patient's willingness to donate sperm. Some authors have argued that proceeding with PSR with the family's consent represents a conflict of interest given their position as direct beneficiaries of such a decision.



For this reason, a higher burden of proof of the patient's approval such as written or spouse consent is often required as illustrated by Cornell's guidelines.

This process is in stark contrast with the standard of consent for organ transplantation in which the beneficiary is a third party not involved in the consent for donation process [3,4]. Yet, the family's consensus on the matter is the strongest argument indicating the patient's values and goals.

An analysis of the attitudes of Americans with regards PSR showed that most Americans support PSR [3]. The preference of the deceased's parents, the patient's marital status, and the patient's likely or stated wishes increased the acceptance of PSR [3]. The relatively low invasiveness of the procedure and the consent of surrogates balance the concern that the procedure will "violate" the respect for the dead [2]. Some authors have argued about the welfare of the child. The case as presented does not provide evidence that the child's welfare would be affected or limited given the presence of a family nucleus that is supportive [4].

In this case, there is no evidence of physician or healthcare team opposition given that there is no hospital policy no law that presented restrictions to the request. Other important issues that would require some analysis include the terms of the sperm storage and how legal paternity would be decided. The Uniform Parentage Act adopted by some states established that the deceased would be presumed to be the father of the child provided that the birth occurred within 300 days of the man's death. If the birth occurs after 300 days in those states or if it occurs in states without statutes addressing posthumous conception, then the law provides no basis for presuming that the deceased is the legal father [2].

Summary: To the extent that there is family consensus in the matter and the parental endorsement and presumed consent (indicating the patient's values) to the procedure can be demonstrated, it would seem that the patient's sister's request for PSR can be honored and ethically acceptable.

References:

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2. Strong C, Gingrich JR, Kutteh WH. Ethics of postmortem sperm retrieval. *Human Reproduction* 2000;15(4):739-745
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Salvador Cruz-Flores, MD, MPH is Professor and Chair of Neurology at Texas Tech University Health Sciences Center in El Paso, Texas. Michael Rubin, MD is Assistant Professor of Neurology at UT Southwestern Medical Center in Dallas, Texas. They are members of the NCS Ethics Committee.

Call for Nominations to the NCS Board of Directors

By J. Claude Hemphill, MD, FNCS Chair, NCS Nominating Committee



The NCS is now accepting nominations for seven at-large seats on the Board of Directors for a four-year term. Nominate yourself or another individual for these open positions. All members in good standing from all membership types are eligible to serve on the Board of Directors. The deadline for nominations is Friday, June 26, 2015.

The NCS Nominating Committee will review all nominations and will prepare a list of candidates to be voted on by the membership in a primary election. Following that election, the Nominating Committee will then prepare a slate and position statements of two candidates for each seat to be presented to the membership for a final vote.

Half of the final candidates will be based on the top votes. The remaining half will be selected by the Nominating Committee taking into consideration the number of votes, profile of those already serving on the Board, and other factors as deemed important by the Nominating Committee. No additional candidates may be added at this point in the process.

The names of all at-large candidates will be presented to the membership as an aggregate via an email ballot which will include the names of the candidates and their statements. Those receiving the most votes from the membership will become directors. In the event of a tie for the last at-large position, the Executive Committee will vote among those tied by secret ballot.

The new Board members will be announced at the 2015 NCS Annual Meeting in Scottsdale, Arizona on Wednesday, October 7, 2015. Please find a list of the current Officers and Board Members and their terms listed to the right.

Current NCS Board Member	Term
Neeraj Badjatia, MD, MSc	13-17
Gretchen Brophy, PharmD, BCPS	11-15
Jan Claassen, MD	11-15
Sherry Chou, MD, MSc	13-17
William M. Coplin, MD	10-14
Michael Diring, MD	10-14
David Greer, MD	13-17
Christiana E. Hall, MD	10-14
Joshua Levine, MD	10-14
Geoffrey Ling, MD, PhD	11-15
Sarah Livesay, DNP, RN, ACNP, CNS-A	12-16
Susanne Muehlschlegel, MD, MPH	13-17
DaiWai Olson, PhD, RN	12-16
J. Javier Provencio, MD	11-15
Denise Rhoney, PharmD	08-16
David Seder, MD, FCCP	13-17
Wade Smith, MD	10-14
Jose Suarez, MD	11-15
Panayiotis Varelas, MD, PhD	11-15
Paul M. Vespa, MD	11-15
Katja Wartenberg, MD	10-14
Wendy Wright, MD	08-16
Susan Yeager, MS, RN, ACNP	11-15

UCNS Neurocritical Care Certification Exam to be Held in December

By John Kohring, Executive Director, United Council for Neurologic Subspecialties

This is a reminder that there will be a UCNS Neurocritical Care certification examination during the week of December 7-11, 2015. This is the first examination after the expiration of the Neurocritical Care practice track. This examination is open to: 1) graduates of UCNS-accredited Neurocritical Care fellowships, 2) those applying under the Faculty Diplomate pathway, and 3) those who did not pass a prior examination.

Complete information regarding this examination can be found at <http://www.ucns.org/go/subspecialty/neurocritical/certification>.

The deadline for submitting applications to sit for this examination is July 15, 2015.

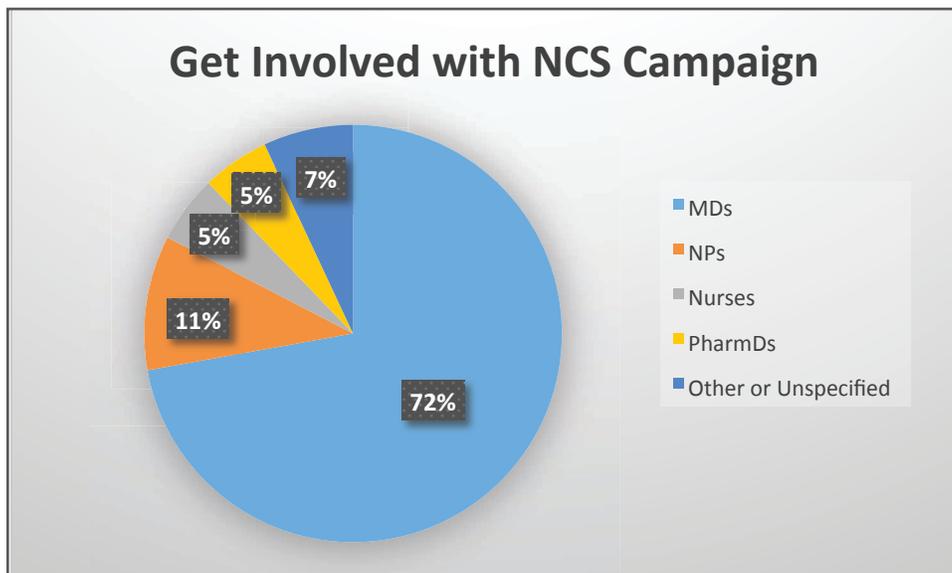
News Front

By Gretchen Brophy, PharmD, BCPS, FNCS



Summer is finally here! I hope you have planned a great vacation for you and your family. Vacations are a great time to refresh and rejuvenate, so make it a priority and enjoy it while you can. Summer also means it's time for our residents and fellows to move on to their new careers in neurocritical care. We wish them all the best and hope that they will continue to be involved in the NCS for years to come.

I would like to sincerely thank all of those who participated in the NCS's recent "Get Involved with NCS!" campaign. This year's campaign was a great success, and we were overwhelmed by the insightful feedback and support from our members. Overall, we received 115 multidisciplinary members who responded to our call for volunteers (see Table).



We are now in the process of analyzing and forwarding the data to the appropriate committees and leadership. For those of you who expressed interest in participating on specific committees, the process for committee appointments begins in July. However, if there is an immediate need for your assistance, you may be contacted before then.

Each committee chair has established a rotation schedule for their current roster to ensure a balanced representation on the committee. The chairs will also be reviewing participation of other committee members to ensure that all members are still available to participate. The committee chairs will send their recommended replacements to the NCS president for final approval. It is our goal that no one member serves on more than two NCS committees. Committee members will serve four-year terms and chairs will serve two-year terms. All committee appointments officially begin at the NCS Annual Meeting.

If you missed your chance to sign up for the Get Involved campaign, no worries, you can still help in many ways. We are always looking for volunteers and value each and every one's input in achieving the mission of the NCS. Please contact our NCS staff at info@neurocriticalcare.com and let us know how you would like contribute your time.

This year the "Get Involved with NCS!" campaign questionnaire was more than a survey—it was a way for our members to speak directly to the NCS leaders and share their thoughts, concerns, and interests with us. We heard you and now we will work even harder to help our society grow and transform with your input in mind. Again, we want to send a heartfelt thank you to all that participated.

On another note, we need your selfie videos! The NCS Membership Committee would like to request your help with creating video vignettes to post on our website. We are creating a collage of testimonials from our members stating why NCS is important to them. If you have time to contribute, please create a video answering one or more of the following questions:

1. Why did you join the NCS? Why is now the best time to join the NCS?
2. What do you value most about attending the NCS Annual Meeting?
3. How do you benefit from the networking opportunities available through the NCS?
4. What is the most valuable perk of being an NCS member?
5. How does belonging to the NCS improve your knowledge base and help you care for your patients?
6. As the NCS is multidisciplinary, what are the benefits of collaborating with other specialties?
7. Why choose the NCS over other professional societies? What makes the NCS special?
8. What does being a member of the NCS mean to you? How has it helped you?
9. How did you learn about the NCS and what were the factors that led you to join?
10. What do you find exciting about the NCS?
11. What would you like the NCS to become?
12. What potential does the NCS have as it grows?
13. How can the NCS support and promote career ambitions or professional development now and in the future?

After you complete your video, please send it to info@neurocriticalcare.com. We are also encouraging neurocritical care teams to submit videos of their ICUs and how the NCS has helped them improve the care to their patients.

Once again, congrats to all of our members who are moving up and moving on to new careers in neurocritical care. We look forward to your continued contributions to NCS.

Tips for Fellows Starting the Neurointensivist Job Search

By Saef Izzy, MD



As the next recruitment season for neurointensivists is approaching, learning about the recruitment process, the best time to submit job applications, and how to get in touch with Neuro ICU directors are all key questions in the mind of many of my co-fellows who are applying this year. To find more answers, I reached out to and interviewed Neuro ICU directors who recently interviewed fellows for faculty positions to present their

perspectives regarding the recruitment process. I also interviewed two senior fellows who already signed their contracts to share their experiences.

I hope this article assists neurocritical care fellow in learning about the recruitment process. My take home points are that now is about the time to start thinking about what path you would like to pursue (academia or private practice). In the next few months, start communicating with ICU directors. Remember everything is negotiable, the job is partly about what is described by the chair or ICU director but also about what we want to make of our career.



Dr. Halinder Mangat, Director of Cornell Neurocritical Care Unit

"One of the toughest tasks after a rigorous two-year fellowship is to land a 'fantastic job', which can be a bit of a challenge. I recommend fellows identify the most important determinants in their careers and personal lives (being close to a spouse, getting an early investigator NIH grant, etc.). Based on this most important criterion, one should contact as many directors as possible (in the region or academic area of interest) at

least one year ahead of the fellowship completion date. The NCS Annual Meeting offers a perfect venue and timing for preliminary discussions.

It is critical to understand the needs of the group in addition to identifying one's own needs and desires. Increasingly, academic centers are trying to groom junior faculty for research careers with the aim of successfully getting extramural funding. Therefore, protected time can (and must) be provided. While research tops the list in most academic centers, education, global health, quality improvement, etc. are other available opportunities. Finally, the interview process should not be a stressful and intimidating process, considering that the group members will shortly be colleagues.



Dr. Andrew Naidech, Director of Northwestern University Neurocritical Care Unit

"[I found out about job availabilities through the] NCS website, communicating with faculty at other institutions, and emailing the ICU directors. All of these are good options, but be sure to use your faculty not only for their knowledge, but their connections and their advice on which programs are the best fit for your career. This is still a

field with two degrees of separation, and most everyone knows (or knows of) nearly everyone else.

You should start thinking during the spring at the end of your first year. Offers are often finalized by the winter. The ICU director often isn't the person who makes hiring decisions, rather, the head of a department or a center, so find out whom to approach. Chairs will often have specific agendas for grant funding or productivity, and will hire accordingly. If you fill an uncovered clinical niche, be sure to highlight how you can help their program. If you have a specific research interest or track record, show how it will help that program grow. Finally, whatever happens, keep your chin up and smile. Your life is likely to get better in a hurry come July next year."



Dr. Kiwon Lee, Director of the Neuroscience ICU at University of Texas Health Science Center in Houston

"ICU faculty positions are often in flux – some people get irresistible offers elsewhere, some people cannot stand their boss, etc. People leave. There may be an opening even in centers that are known to be "full." Even if they are "full," if you are such a strong candidate, they may even create a position. The tip is to keep an eye on the centers that are expanding aggressively and increasing

their beds. Even if they are not posting a job, believe me they need more people.

Research achievements always help but, in most centers, it is not the most important factor. Even in the research oriented institutions, you are not expected to have independent funding yet. We care about the potential. Will this person ever get a grant? Is this person saying he or she wants to do research just to impress us? As such, if you are an amazing researcher but incompetent clinically, your chance is close to zero except maybe for very few centers looking strictly for a lab person.

You do not want to look or sound like a lazy person. This is a red flag for the employers. Yes, you want to have some protected time to do certain academic activities, but try not to give the impression of reluctance to work hard. Often times, the ICU directors may not be able to give you exactly how many weeks of clinical duty. The moment you care about 40% versus 45%, it is again a red flag for the employers. So be flexible."



Shouri Lahiri, MD, neurocritical care fellow at New York Presbyterian Columbia and Cornell Medical Center

"Although it is difficult to compare to prior years, my overall impression of the job market is that it is still relatively good. There were openings at major academic institutions including big cities such as New York, Boston, and Los Angeles and, of course, many private practice positions. I came across job openings from my program director, other faculty members, and the NCS website. I think it is essential

to decide what type of position one wants and to begin to communicate professional and personal needs even prior to physically interviewing somewhere. This will help focus your attention and time on the positions that are best suited to your needs. It is very different from finding a training position where there are generally fewer variables that one needs to consider partly because most aspects of the position are non-negotiable. I found it helpful to discuss aspects of contract negotiation with mentors and highly recommend this."



Xuemei Cai, MD, neurocritical care fellow at MGH/ BWH Harvard Medical School

"I started looking for a job my first year of fellowship because my spouse is in the medical field and we were essentially looking for a job in the same city. I asked the faculty at my program for help in identifying contact people in different cities. I looked at both academic programs (met with chairs and ICU directors) and also private practice programs. I utilized the NCS website as well as a

physician recruiting firm (Rosman, who I interviewed on the phone with and decided they were an additional resource worth considering). While location was probably the single most important factor for me, I was also interested in clinical service details: how big the ICU was, who worked in the day-to-day patient care of the ICU, as well as how much research time there would be and opportunities for mentorship and formal clinical research training (masters in clinical science, MPH, etc). In the end, I chose an academic position with a two-year clinical research training fellowship through industry. My advice is be flexible and be honest with yourself on what is important to you."

What are Our Priorities for Training Neurocritical Care Physicians?

By Saef Izzy, MD

Please complete this anonymous five-minute education survey:
<https://redcap.partners.org/redcap/surveys/?s=zKEbBipchF>

Participants will be entered into an **Apple Watch raffle**. Instructions for the raffle will be provided upon survey completion.

Your participation is highly valued. Please kindly distribute the survey link to your nursing and physician colleagues (staff, fellows, and residents).

Thank you,
 Abigail S. Cohen (MGH)
 Dr. Stephen Figueroa (UTSW)
 Dr. Christiana Hall (UTSW)
 Dr. Saef Izzy (MGH/BWH)
 Dr. Monisha Kumar (Penn)
 Dr. David McDonagh (UTSW)
 Dr. Eric Rosenthal (MGH)
 Dr. Lori Shutter (UPMC)
 Dr. Paul Vespa (UCLA)



ANNUAL MEETING 5K FUN RUN AND ONE MILE FUN WALK FOR NCS RESEARCH

By Jennifer Robinson, APRN and Susanne Muehlschlegel, MD



Jennifer Robinson,
APRN

Calling all walkers and runners! After a successful inaugural 5k Fun Run and One Mile Fun Walk in Seattle, we are pleased to announce the 2nd annual running of the charity event to benefit the NCS Research Fund. The 1st running was very popular and received rave reviews. In addition, over \$2,600 was raised last year for the research fund. Thank you! This year, we would like to increase this amount by \$1,000. You can help us by participating and by recruiting friends and family to run or walk as well.



Susan
Muehlschlegel,
MD

The run/walk will kick off the start of the first day of the conference. The Scottsdale course promises to be flat, fast, and scenic, and it is located on-site at the conference hotel, the Westin Kierland Resort & Spa. No transportation will be necessary as the start and finish of this loop course is just outside your hotel room. Both the 5k and one mile courses explore a beautiful golf course. The race will end early enough for runners and walkers to attend the first morning session.

All proceeds will go directly to the NCS Research Fund intended to sponsor the NCS Research Training Fellowship, to be given out for the first time this year. Please register with your Annual Meeting registration to guarantee your spot. Like last year, advanced registration is highly recommended as only a limited number of bibs will be available for on-site registration. Family members can attend as well. This year, we are encouraging registration of teams, so ask your colleagues from your institution or ICU to run as a team.

Whether you are an avid runner, a casual stroller, or even a first-time-ever participant, this is the event for you! What better way to kick off the Annual Meeting? Please join us for a great way to explore Scottsdale, embark on a unique networking opportunity, burn some calories, and raise money for a great cause.

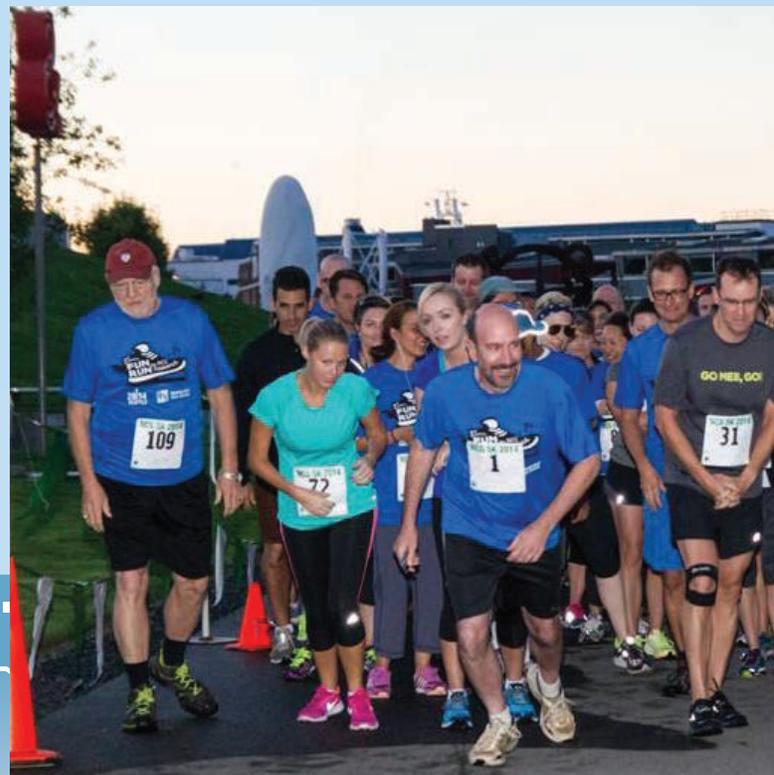
Bring your running shoes and join us at the starting line. T-shirts will be available for all advance registrants.

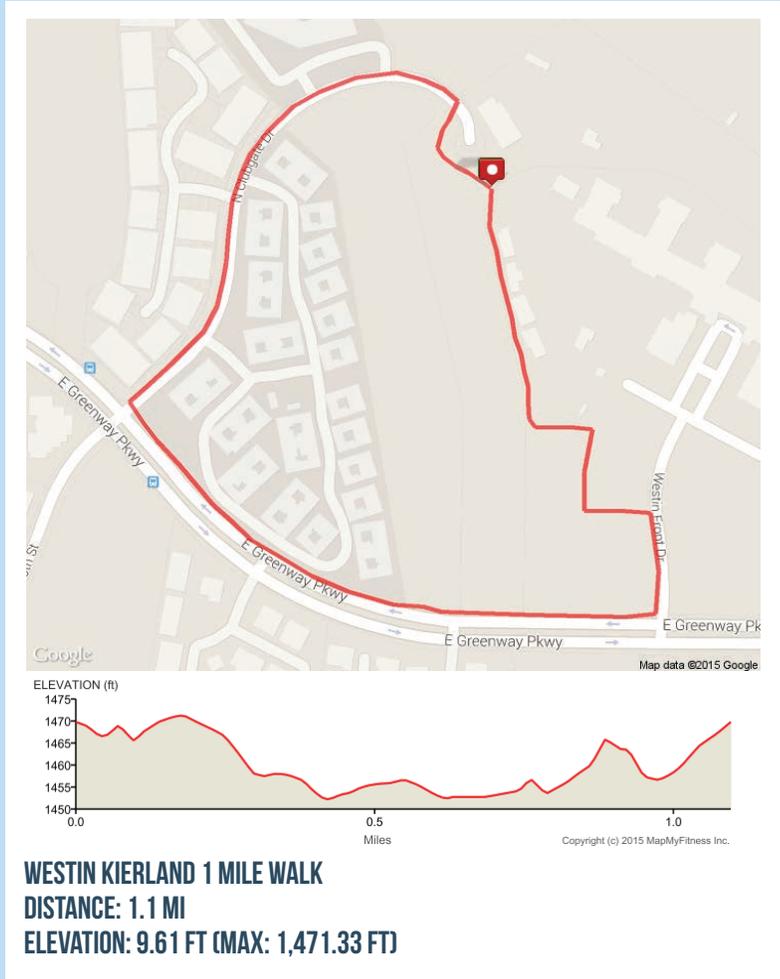
Details:

Wednesday, October 7th

6:30 AM start (please arrive by 6:15 AM for an on-time start and stretching)

Walkers will start immediately after the runners
Register on-line with your Annual Meeting registration
Family and guests are encouraged to participate
Fee is \$45 per person





NCS Fund a Fellow Campaign Supports Research Training Fellowship

By J. Claude Hemphill III, MD



Fund a Fellow is our program where NCS members can make a difference through member contributions and support for the NCS Research Training Fellowship. Since we started at the Annual Meeting banquet in Philadelphia with our t-shirt auction, we have raised over \$30,000 through the Fun Run, t-shirt and karaoke auctions, and giving during membership renewal towards our research mission.

But we need everyone's help. Our goal is to use member-based giving to fund at least one NCS Research Training Fellowship each year. As you know, the request for application for the first award is out and applications are being prepared. This one-year award for a total of \$77,000 (\$70,000 in direct funding plus 10% indirect costs) will be awarded in 2016.

There are many ways that you can contribute:

- 1) Go to this Research Fund Donations page on the NCS website and donate directly to the Fund a Fellow drive. We will report regularly on progress with a list of donors and a graphic showing our progress. If we exceed our

goal, the funds will be rolled over into the next year's Fund a Fellow campaign; or better yet, let's raise enough so that we can award two in 2017!

- 2) Contribute during your annual membership renewal.
- 3) Participate in the NCS Annual Meeting Fund a Fellow Golf Tournament, Fun Run, or fundraising auction.

Contributions are recognized in four different donation levels:

- NCS Ledge Seekers: \$1-\$99
- NCS Mountain Climbers: \$100-\$499
- NCS Peak Performers: \$500-\$999
- NCS Summit Viewers: \$1,000 & over

We will be announcing our first NCS Research Training Fellowship Award recipient at the 2015 NCS Annual Meeting in Scottsdale. Your participation in Fund a Fellow will ensure their success.

Donate Today.

The Fund-A-Fellow Campaign is to help raise money for the NCS Research Training Fellowship.

Choose your Donation Level:

	NCS Ledge Seekers (\$1 to \$99)
	NCS Mountain Climbers (\$100 to \$499)
	NCS Peak Performers (\$500 to \$999)
	NCS Summit Viewers (over \$1,000)

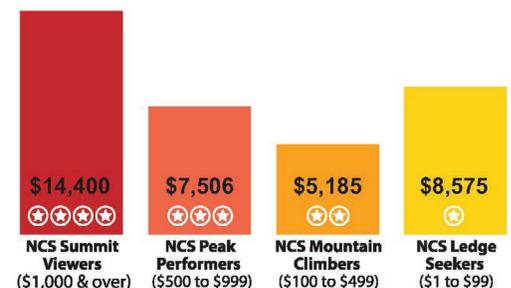
DONATE



CURRENT TOTAL:

\$35,466

Break Down by Donation Levels:



Highlights of the Annual Meeting Program for Nurses and Advance Practice Providers

By Jennifer Robinson, APRN



For the 2015 NCS Annual Meeting in Scottsdale, Arizona, we are excited to continue to showcase talents of our diverse nursing group. The myriad nurses of NCS provide neurocritical care in numerous areas: bedside, teaching, education, leadership, and research to name just a few. Nurse members of both the NCS Nursing Committee and Annual Meeting Planning Committee are excited to announce another year of programming at the upcoming meeting that is relevant and current for all of our many nurse members.

Nurses will be speaking on the podium during the main plenary session, our annual networking breakfast corner, in workshops, and an "Early Mobilization" session. W. Lee Titsworth will join nurse members Mary Kay Bader and Kate Klein in a ninety minute session to discuss their research on early mobilization in the Neuro ICU and how to implement such an important activity in your ICU.

We will review the correlation with early mobility and ICU length of stay, hospital acquired infections, restraint days, etc. You will also learn the best advice of a seasoned nurse expert on the pitfalls and challenges of early mobilization in your ICU. The session will be interesting and intriguing for a wide audience and designed to improve patient care at your institution.

Mark your calendar for October 10 at 7 AM – coffee will be served! This will be the annual nursing breakfast corner. This event is well attended and receives rave reviews each year as it provides time to share ideas and knowledge. This year's theme is "Family Centered Care: Best Practice and New Ideas". We will have a variety of speakers to share what family-centered care means to them, how to foster this important concept, and the perspective from a family member.

We will have time for sharing of ideas and a question and answer session. Expect an interactive and engaging breakfast corner experience! Throughout the meeting, there will be plentiful networking opportunities with fellow nurses. Note, some of these might be at the "Shoot Out" to take place on the evening of October 10. The annual banquet this year will be a cowboy and cowgirl themed "desert cookout" complete with outdoor activities such as a shoot-out and calf roping.

The workshops are still in the planning phase, but we can announce an advanced practice provider workshop that focuses on all aspects of the role. All are welcome to attend this workshop. Keep a look out for more info on the nursing workshops as speakers will be determined in June.

Mark your calendars to join us for the NCS Annual Meeting, October 7-9. Plan to attend the Early Mobilization Session on Friday, October 9 from 2-3:30 PM. The nursing breakfast corner will be on the morning of Thursday, October 10. The resort and conference are family friendly, so please bring your family and enjoy some beautiful and warm weather. We look forward to seeing you.

Jennifer Robinson, APRN is a Neuroscience Nurse Practitioner at Yale New Haven Hospital and member of the NCS Nursing Committee.



New Neurocritical Care Stories of Hope Offer Resource for Patients and Families on the NCS Website

By Sarah Livesay, DNP and Tamer Abdelhak, MD



Sarah Livesay, DNP

The NCS Stories of Hope detail the lived experience and recovery of patients who received care in the Neuro ICU. They are to remind caregivers, patients, and families that, while a stay in the ICU can be devastating and life changing, there is hope for recovery and life after illness. These stories, two of which are provided below, will be available on the NCS website under the Patient Resources heading.



Tamer Abdelhak, MD

Please share these stories with other caregivers and patients in your Neuro ICU as beacons of hope in the journey of recovery. If you know of anyone who would like to submit a Story of Hope, please direct the inquiry or story to us at info@neurocriticalcare.org.

Alex Baldwin's Story of Hope

I was a 21-year-old college student with one year left to graduate when an accident changed my life forever. On October 21, 2008, I was struck by a motor vehicle resulting in a severe head trauma and multiple life threatening injuries including multiple skull fractures, blood accumulation between the skull and the brain (subdural hematomas), blood around the brain tissue (subarachnoid hemorrhages), and extensive brain tissue bruising (contusions) and swelling.

My road to recovery was long and I was admitted to the University of Massachusetts (UMass) Neurological Intensive Care Unit. I can't say that I remember much over the month of my ICU stay but I am very grateful to everyone who was involved in my care and rooted for me. The initial treatment consisted of removing portions of skull bones on both sides to relieve pressure of the underlying brain (craniectomy). Electrodes were placed within the brain tissue to monitor my intracranial pressure and guide the medical treatment. My hospital stay was complicated by respiratory failure, pneumonia, high blood pressure, high blood sugar, inflammation of the peripheral veins and severe confusion and agitation, just to name a few.

I was having difficulty breathing on my own and required continuous machine support through a tracheostomy tube (breathing tube inserted through the neck to the lungs). Because of the prolonged hospital stay, I was weak, malnourished, and had difficulty swallowing therefore a feeding tube through the stomach wall (PEG tube) had to be placed to provide me with my daily caloric requirements.

By the time I was medically stable enough for discharge, I continued to need breathing and feeding tubes and obtained intense physical, occupational and speech training and rehabilitation. After beating the odds and overcoming multiple complications, I was finally discharged to an inpatient rehabilitation facility over a month later on November 24, only to face my biggest challenge yet. During my five months of inpatient rehabilitation, I had to learn how to walk, talk and function again. My biggest enemy was time, as minutes, hours and days seemed longer than they actually were. I powered through every

day thanks to the unconditional support of my family and friends. I was discharged from rehab in April of 2009 and continued outpatient rehab throughout the summer.

The turning point, the day I put the accident behind me and started seeing life positively again, was the day I earned back my driver's license. After a year of hiatus, I returned to college and got my degree in Communications Media – Video Productions, an achievement I am extremely proud of. One of my proudest moments was when the Lieutenant Governor of New Jersey, Kim Gadagno, announced to the whole crew: "This is the hardest working man in the room," recognizing my hard work.

Today, I live a normal life. I live independently and enjoy playing sports with my friends regularly. Overcoming this long uphill struggle made me a better man, more responsible, focused, driven, thoughtful and caring. I am stronger than ever. My journey was truly a blessing in disguise.

If I had one message to send to any traumatic brain injury patient or their family, it would be a quote that came from my best friend that he said to me when I was trying to overcome my own mind and I made into a necklace that I wear just below my tracheotomy scar every day to this day that says "do work." Do work and you will overcome any obstacle that stands in your way throughout your rehabilitation. Get up and do work.

Kristine S.'s Story of Hope

It happened so quickly that I don't even remember how it happened or what happened. All that I know is the story of my survival, my family's resilience, and our strong faith in our faithful God. I am learning more and more each day about my incredible journey.

It was one day around Christmas, 2012. I had left work feeling lousy, like I was coming down with something. The next morning, I had fever, back pain and a severe headache. My family took me to a local hospital. I was confused and disoriented. The initial tests showed that I might have an infection and CT scans of my brain and stomach were normal. I was admitted to the hospital and was started on antibiotics. On that same night, my nurse noted that my pupils were not the same size and not reacting to light. Another CT scan of my brain was done and showed swelling and brain herniation.

I was intubated and air-lifted by a helicopter to the Neurological Intensive Care Unit at UMass Hospital in Worcester, Massachusetts where I arrived already in a comatose condition. Another brain CT scan showed progression of the swelling and herniation blocking the drainage of the spinal fluid (CSF) from my brain. It also showed signs indicating a severe infection in my brain called meningoencephalitis. A neurosurgeon placed an EVD (external ventricular drain) to help drain the CSF and decrease the pressure in my head. I had already been started on antibiotics to fight the infection and other medications to decrease the swelling and prevent seizures from occurring.

Despite all that, the pressure in my head kept rising and I was started on therapeutic hypothermia (my core body temperature was decreased to around 33° C) in an attempt to decrease the

pressure, but it too didn't work. My doctors didn't give up on me and my body didn't give up. The Neuro ICU physicians induced a deep coma using phenobarbital which eventually helped control the rising pressure in my head.

The infection affected all of my systems. My blood pressure was dropping and I was on vasopressors to support it. In addition, I developed a blood clot in my arm and I was on blood thinners to prevent progression. Fluids accumulated around my lungs causing pleural effusion and the doctors removed it with a procedure. After a month in the ICU, an MRI of my brain was done showing strokes in some parts of my brain and it also showed infection surrounding the front of my brain. The neurosurgery team took me to the operating room and evacuated that infection, and they also took a biopsy of my brain which showed necrosis and dead tissue.

By that time I had spent almost a month and a half comatose in the Neuro ICU, and my body had gone through a very rough journey. I started to improve and became more stable. The phenobarbital had already been discontinued. I was started on amantadine, a medication to enhance my wakefulness, and slowly I was waking up. They placed a tracheostomy tube and successfully weaned me off the ventilator. I also had a stomach tube (PEG) placed for feeding and medications. By the end of my stay in the Neuro ICU, I was able to move my arms and legs, but I wasn't yet able to talk or communicate verbally.

Throughout my stay in Worcester, my family was there all along and I had a steady presence of praying friends. My room was always full of times of prayer, singing worship songs and hymns that I knew.

The Neuro ICU team had done an incredible job getting me through those challenging times. In February, 2013, I was transferred to Spaulding Rehabilitation Center where I spent six months regaining my strength and other skills. Just as incredible as the skills of the Neuro ICU team at UMass, were the skills of

the staff at Spaulding. They explained all of the phases that I would go through. They discovered that I could read. They had me walking and swimming which I always loved. A volunteer music therapist started working with me to sing "Amazing Grace." Although speech was a struggle having aphasia, I was soon singing the words to familiar hymns. My family and praying friends were visiting every day, engaging me with trips to the aquarium, singing around the piano. There were many ups and downs. Our family and friends became "family" with all who cared for me, just as in Worcester.

My family was protecting my six year old son from seeing me. They were fearful how I would respond if I saw him. I still was not speaking or responding consistently to yes or no questions. By the time Easter was there, they felt I had progressed enough that it wouldn't be too traumatic for my son to see me. On Easter Sunday, they brought him over, and when I saw him I cried, reached out to him and said his first and middle name – the first clear words I had spoken after my injury. My family feels the Lord gave them an Easter miracle. Since then, began the self-awareness that everyone was praying for.

Eventually, I came back home to my family on July 9, 2013. I was back to my church and my activities. Over the past year and half, I have made significant recovery. I started singing again on the worship team choir at my church. I took up rowing on the Connecticut River. I am knitting again. I go bowling regularly with my family and friends. I participate in a center for people with "acquired brain injury." I still enjoy singing "Amazing Grace" and John Denver's "Grandma's Feather Bed" as much as I ever have. My journey of recovery continues. I still have much to learn anew.

I hope my story will inspire many of you whose loved ones have sustained a brain injury to trust in God and believe that survival is possible and recovery can be achieved. I thank all of the Neuro ICU care providers who devote their lives to help people make such a survival and recovery a possibility.



Alex Baldwin at work



Kristine S. (left)



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EUROPEAN TRIAL EVALUATES REMOTE ISCHEMIC PRECONDITIONING IN ANEURYSM TREATMENT

By Robert Kowalski, MD



An Austrian neurosurgical group has begun a trial of applying mild restriction to blood flow in an upper extremity, or remote ischemic preconditioning, to evaluate impact on outcome in patients with unruptured aneurysms treated with surgical or endovascular repair. The study, Remote Ischemic Preconditioning for Intracranial Aneurysm Treatment (RIPAT), is testing a hypothesis that ischemic brain injury related to

cerebral aneurysm repair procedures can be avoided by triggering a protective systemic response through mild, benign ischemia induced elsewhere in the body.

The technique, which has been employed in the past several years with some success for prevention of ischemic heart injury during cardiovascular surgical procedures such as arterial stenting, has only recently been applied in cerebrovascular disease.

"Remote ischemic preconditioning (RIPC) involves the administration of a subcritical ischemic stimulus to one organ with the goal of protecting another (remote) organ from subsequent ischemia," said Martin Ortler, MD, MSc, principal investigator of the RIPAT study and a neurosurgeon at the Innsbruck Medical University in Austria. "We hypothesize that pre-interventional RIPC reduces ischemic cerebral tissue damage in patients undergoing elective intracranial aneurysm treatment."

Investigators in the RIPAT study, which began in November 2013, hope to enroll a total of 48 patients with unruptured intracranial aneurysms in the trial, randomized to remote ischemic preconditioning or a sham treatment. For subjects randomized to treatment, a blood pressure cuff is applied to one arm and inflated to 200 mmHg for five minutes, three times, while the patient is under general anesthesia prior to aneurysm repair. For patients assigned to the sham group, the pressure cuff is applied similarly, but inflated to only 10 mmHg. The study includes patients whose aneurysms are microsurgically clipped, and those who undergo endovascular coiling.

"Patients may experience temporary ischemia with both treatment techniques: during temporary artery occlusion of the aneurysm-bearing vessel in microsurgical aneurysm clipping, as well as during vessel occlusion by balloon in endovascular coiling and/or stenting," Prof. Ortler said.

Outcome will be assessed among subjects in the study groups with MRI and neuropsychological testing, as well as the modified Rankin Scale (mRS) and NIH Stroke Scale (NIHSS) at the time of hospital discharge, and at six and 12 months afterward. RIPAT study investigators also are collecting an array of serum biomarkers, including S100B, NSE, GFAP, NSE, MMP9, and microparticles. These markers will be obtained at admission, after ischemic preconditioning, after aneurysm repair and at eight additional time points following the aneurysm clipping or coiling.

"These biomarkers have been shown to correlate with the extent of cerebral ischemia in imaging," said Prof. Ortler. "Microparticles were included in this panel because microparticles are a special study focus of our group and preliminary data from animal studies suggest that microparticles might be the link between peripheral ischemic preconditioning and remote end-organ effects," he said.

Although the mechanism is not yet fully understood, remote ischemic conditioning to an arm or leg is thought to help prevent ischemic injury in distant organs, including the heart and brain, by releasing endogenous anti-inflammatory mediators, and preventing an inflammatory cascade that might normally accompany temporary ischemia in those remote body regions. Previous research demonstrated promising results with this approach in sepsis, transplant surgery, and after myocardial infarction. The remote conditioning has been applied in upper and lower extremities.

More recently, remote conditioning has been utilized in research involving cerebrovascular disease and injury. A group at the University of Arizona applied the technique within one hour of emergency department presentation in traumatic brain injury patients. In a paper published in March, this group reported a significant reduction in serum levels of S-100B and NSE six hours and one day after treatment with remote ischemic conditioning.

Remote preconditioning also has been applied in subarachnoid hemorrhage. A group at the University of Miami in 2010 reported favorable results of a Phase IB safety and feasibility trial of limb preconditioning applied every 24 to 48 hours for 14 days after aneurysm rupture in a group of 33 patients.

"Although prevention of delayed cerebral ischemia after subarachnoid hemorrhage would be one of the major potential applications of RIPC in the field of cerebrovascular disease, this is not our primary goal," Prof. Ortler said. "We rather use the treatment of unruptured intracranial aneurysms as an 'experimental paradigm' in which protection from ischemia is highly desirable and many important variables can be controlled very easily, since the interventions are done electively," said Prof. Ortler.

The potential for use of preconditioning in medicine is broad, Prof. Ortler said. "We think that preconditioning is a simple strategy of nature to prepare our organism for strain. Probably we employ preconditioning mechanisms every day on ourselves and on our patients," he said. "If the concept proves right for brain protection as it has for the protection of other organs, this would open a completely new aspect in the research of ischemia prevention."



Martin Ortler, MD, MSc

Valproic Acid Therapeutic Drug Monitoring: Freedom from Total Serum Concentrations

By David Hensler, PharmD and Kimberly Levasseur-Franklin, PharmD, BCPS



David Hensler,
PharmD



Kimberly
Levasseur-
Franklin,
PharmD, BCPS

Valproic acid is a broad-spectrum anticonvulsant drug with a narrow therapeutic index. Therapeutic drug monitoring is recommended for patients receiving valproic acid to optimize anticonvulsant efficacy and minimize adverse effects. Interpretation of total serum valproic acid levels in the critically ill population may be complicated by the drug's complex protein binding characteristics.

Serum valproic acid is highly protein bound, with reported free fractions typically ranging from 5 to 10%. Valproic acid displays variable protein binding, however, with higher free fractions anticipated in patients with advanced age, renal impairment, or hypoalbuminemia. Serum albumin concentrations less than 3.5 g/dL predict discordance between free and total valproic acid levels, with free fractions increasing linearly with the severity of hypoalbuminemia.

Higher free fractions are also typically anticipated when total valproic acid levels exceed 75 µg/mL. Co-administration of other highly protein bound drugs (e.g. phenytoin)

may displace valproic acid from albumin binding sites and further complicate valproic acid therapeutic drug monitoring.

Total serum valproic acid levels are routinely monitored in clinical practice, while free valproic acid is responsible for the drug's pharmacologic effects. Total serum valproic acid concentrations of 50-100 µg/mL have been associated with anticonvulsant efficacy and patient tolerance. Though not widely utilized, free serum valproic acid concentrations of 5-15 µg/mL have been targeted in clinical practice.

Discordance between total and free serum valproic acid levels has been reported previously. Hospitalized patients may be at greatest risk for elevated free serum valproic acid levels, particularly in the setting of hypoalbuminemia, which occurs frequently in critically ill patients. Valproic acid free fractions exceeding 50% may be observed in these patient populations, limiting the usefulness of total serum valproic acid levels.

The relationship between total and free serum valproic acid concentrations is variable and heavily dependent upon protein binding. While total serum valproic acid levels have traditionally been used for valproic acid therapeutic drug monitoring, free serum valproic acid levels may better predict pharmacologic effects. Measurement of free serum valproic acid levels should be considered in critically ill patients with serum albumin concentrations less than 3.5 g/dL.

This practice is particularly relevant for patients with subtherapeutic total valproic acid levels, despite aggressive valproic acid dosing (i.e. >60 mg/kg/day). When possible, measurement of free serum valproic acid levels should be considered to help guide dosing in these critically ill patient populations. Utilizing free valproic acid levels in this patient population may help better guide clinicians as to when continued valproic acid dose titration is worthwhile versus adding another antiepileptic to accomplish the specified treatment goal.

For further reading on discordance between total and free serum valproic acid levels, please see "Comparison of free fraction serum valproic acid concentrations between inpatients and outpatients" by H. Gibbs and colleagues (*Am J Health-Syst Pharm* 2015;72:121-126).

David Hensler, PharmD is a PGY2 critical care pharmacy resident at Midwestern University. Kimberly Levasseur-Franklin, PharmD is a critical care pharmacist in the Neuro ICU at Northwestern Memorial Hospital in Chicago and a member of the NCS Pharmacy Committee. They are invited guest writers for *Currents*.



Journal Watch

By Susanne Muehlschlegel, MD, MPH and Chad Miller, MD



Susanne Muehlschlegel, MD, MPH



Chad Miller, MD

Long-term outcome after warfarin-associated ICH and timing, degree of INR reversal, blood pressure and resumption of warfarin in a large German multi-center cohort

Kuramatsu JB, Gerner ST, Schellinger PD, et al. *JAMA* 2015;313:824-836

In this large retrospective cohort study of warfarin-associated intracerebral hemorrhage (wICH) from 19 university-affiliated hospitals in Germany, the authors sought to study the relationship between anticoagulation reversal and systolic blood pressure (SBP) with hematoma enlargement. In addition, the association of oral anticoagulant (OAC) resumption with incidence of hemorrhagic and ischemic complications with functional outcomes one year later was examined. Between 2006 and 2010, 1176 patients were included in a three-tiered analysis: hematoma enlargement analysis (n=853 who underwent INR reversal and had follow-up CT), long-term outcome analysis (n=1083 with one-year follow-up data) and OAC resumption analysis (n=719 with one-year follow-up, of which n=566 had atrial fibrillation).

Data were obtained through retrospective abstraction of the medical records. Long-term follow-up was performed using mailed questionnaires, as well as telephone interviews as necessary. In cases of missing contact information, a local registry office inquiry was conducted to complete outcome assessments. Cross-checking of centralized data with local stroke registries and rehab facility reports was performed to improve data integrity. Functional outcome using the modified Rankin Scale (mRS) was dichotomized to favorable (mRS 0-3) and unfavorable (mRS 4-6) and analyzed at discharge, 3- and 12-months. Hematoma enlargement was defined as >33% increase from initial to follow-up CT. INR reversal consisted of prothrombin complex concentrates (PCCs), FFP, antithrombin, and IV vitamin K, alone or in combination, but without a specific protocol.

OAC included exclusively vitamin K antagonists, as the newer anticoagulants had not been approved yet in Germany. Any new ischemic and hemorrhagic (intra- and extracranial) complications within one year requiring hospitalization were recorded. Statistical analyses were rigid, including controlling for confounders in multivariable models or propensity score matching, ROC analysis to determine optimal cut-off points for INR values, timing of INR reversal, and SBP values, and Bonferroni correction for multiple comparisons. Hematoma enlargement occurred in 36% with a median increase of 14 cc (from a median volume of 13 cc), and secondary IVH in 24.8%.

Adjusted models revealed three modifiable predictors of hematoma enlargement: longer time until initiation of INR reversal (RR 1.56, 95% CI 1.14-2.13), extent of INR reversal (RR 2.29, 95% CI 1.28-4.1), and SBP at 4 hours (RR 1.01, 95% CI 1.002-1.014). Additional predictors included deep ICH location and history of coronary artery disease. Analyses for "optimal" timing and extent of INR reversal revealed that INR<1.3 within 4 hours of admission was associated with the lowest rate of hematoma enlargement. Multivariable analyses of SBP revealed that SBP <160 at 4 hours after admission significantly decreased hematoma enlargement rates. Adding SBP <160 at 4 hours to INR <1.3 within 4 hours of admission was associated with the largest reduction in the frequency of hematoma enlargement (18.1%

in patients fulfilling all three criteria vs. 44.2%) and in-hospital mortality (all three criteria 13.5% vs. 20.7%).

OAC were resumed in 23.9% of patients, with the highest rate among patients with mechanical valves (68%) and rates in atrial fibrillation being 19.4%, with a median time to resumption of 31 days (IQR 18-65). Ischemic complications occurred more often without OAC resumption (15% vs. 5.2%, p<0.01), while rates of hemorrhagic complications were not significantly different (OAC 8.1% vs. no OAC 6.6%, p=0.48). The authors chose to restrict further analyses to the largest subgroup (atrial fibrillation). Within this subgroup, OAC resumption had significantly decreased mortality (8.2% vs. 37.5%, p<0.01) and less ischemic complications (5.5% vs. 14.9%, p=0.008), without a statistically significant difference in recurrent ICH. Cox-regression analysis revealed a significantly decreased hazard ratio for long-term mortality of 0.26 (95% CI 0.125-0.534; p<0.001).

This very large retrospective study provides several very important insights despite the limitations from its retrospective nature. For the first time, "optimal" INR, SBP, and timing cut-offs for wICH were determined in a powerful cohort. Rates of hematoma enlargement were smallest in patients with INR reversed to <1.3 within 4 hours of admission and SBP <160 at 4 hours. OAC resumption decreases ischemic complications and mortality, without increasing hemorrhagic complications. While confirmation of these findings should be ideally confirmed in a trial, it is unlikely that any trial is going to be sufficiently powered to show such effects.

Despite the study being retrospective, the authors applied rigorous data extraction rules, and, most importantly, long-term follow-up. In turn, however, because follow-up was obtained mostly by self-reported questionnaires, follow-up data may be erroneous. Furthermore, "optimal" timing reflects time since admission, but not time from symptom onset, which was not collected. This, however, would have most likely biased the data towards the null. SBP was not collected or analyzed continuously, but only in 4-hour increments, which did not allow the analysis of BP fluctuations between observations.

The most interesting data presented relate to the effects of OAC resumption on hemorrhagic and ischemic complications, as it is the first rigorous study to provide data to support resumption of OAC in patients with atrial fibrillation. The authors unfortunately do not clearly state why they chose to restrict the mortality analysis to patients with atrial fibrillation alone. One may argue that the authors desired a "clean" dataset with similar risk factors for ischemic complications. It would be important to understand hemorrhagic risks and mortality with the newer anticoagulants now available on the market.

Normothermia Improves Cerebral Metabolism after TBI

Chmayssani M, Stein NR, McArthur DL, et al. *Neurocrit Care* 2015;22:265-272

This single center retrospective study of severe traumatic brain injury (TBI) patients sought to explore the impact of standard vs. aggressive targeted temperature management (TTM) upon metabolic crisis, as measured by cerebral microdialysis (CMD). Patients were considered for study analysis if they presented to UCLA Reagan Medical Center within 96 hours of trauma and possessed a Glasgow Coma Scale (GCS) ≤8 or 9-12 with evidence of traumatic intracranial hemorrhage. Subjects were also required to be viable with adequate systemic resuscitation and intracranial

pressure (ICP) control as determined by injury severity scoring systems, jugular bulb saturations, and clinical assessment.

Standard fever management (STAN) was implemented for all patients demonstrating fever ($T > 38^{\circ}\text{C}$ two or more times within a 24-hour period) and included acetaminophen, ibuprofen, and surface cooling blankets. Patients with refractory fever with treated with an aggressive intravascular cooling catheter (AGG) with continuous feedback loop monitoring set at a target of 36.5°C . Cerebral microdialysis probes were placed in normal appearing frontal white matter (mean insertion time = 33 hours) and metabolic crisis (MC) was defined as cerebral hypoglycemia (glucose $< 0.8\text{ mmol/L}$) with elevated lactate:pyruvate ratio (LPR) (LPR > 25). Both cohorts (STAN, AGG) were managed with identical treatment goals including ICP $< 20\text{ mmHg}$, cerebral perfusion pressure $> 60\text{ mmHg}$, serologic blood glucose $80\text{--}140\text{ mg/dL}$, and continuous EEG surveillance.

Fifty-two subjects in the STAN group were compared to 10 subjects in the AGG group. The STAN group was older (50.41 ± 17.36 vs. 37.9 ± 12.45 years, $p=0.034$) and had higher GCS (8.04 ± 4.12 vs. 4.60 ± 3.44 , $p=0.016$). Mean core temperature was significantly lower in the AGG group (37.40 ± 0.79 vs. 36.76 ± 1.16 , $p<0.001$) as was percent time with temperature $< 37.5^{\circ}\text{C}$ (39.28 ± 19.53 vs. $30.25 \pm 30.25 \pm 24.98$, $p<0.001$). The AGG cohort spent a lower portion of time in MC (32.17 ± 27.25 vs. 22.60 ± 20.45 , $p<0.001$). ICP was similar between the two groups (STAN 13.5 ± 3.37 vs. AGG 14.15 ± 3.50 , $p=0.584$). When the AGG group was compared pre- and post-catheter placement, temperature (37.62 ± 0.34 vs. $36.69 \pm 0.90^{\circ}\text{C}$,

$p=0.004$) and percent time in MC (41.95 ± 27.74 vs. 8.35 ± 9.78 , $p=0.002$) were both lower after catheter placement. In a multivariate analysis of contributors to MC, temperature and ICP were identified as the most significant contributors to biochemical improvement.

Data are plentiful regarding the adverse impact of fever upon the neurologically injured brain. Neurocritical care units routinely devote a significant amount of effort and resources toward fever control based on the assumption of clinical efficacy. Nonetheless, questions have persisted whether fever was a marker of injury severity or a modifiable component and potential therapeutic target for improving outcomes. The impact of relatively modest TTM upon metabolic crisis after TBI shown in this study suggests that there may be potential clinical benefit to this management strategy. Interestingly, the benefit of TTM was apparent with relatively minor alterations in temperature and with well-controlled ICP.

Considering the hemodynamic characterization of the patients, definition of MC, and response of pyruvate concentrations to cooling, the benefit of TTM likely resulted from reduction of inflammation or effects on mitochondrial metabolism as opposed to reduction of ischemic events. It should be noted that the study does not represent an effort to compare treatment between two similar patient groups. Rather, treatment in the AGG group resulted only from failure of conservative measures in the STAN cohort. The study was not powered to demonstrate clinical benefit, but adds to the growing literature that suggests that neuro-centric and patient-specific care may improve patient outcomes.

Critical Care Educational On-Line Modules at American Thoracic Society

By Susanne Muehlschlegel, MD, MPH

After several articles about medically relevant apps, I would like to draw your attention to free clinical education available on-line from the Critical Care Section of the American Thoracic Society (ATS), an international society of pulmonary-critical care providers. On their webpage, under the "Professionals" section, the content is available by clicking on "Critical Care" and then "Clinical Education." Here, one finds a plethora of clinical tools and teaching modules.

"Clinical Cases" contains 13 general surgical and critical care cases (including one neurocritical care case), with clinical information, radiological and pathological images, and one multiple-choice question per case. Unfortunately, the answers to the questions are not provided on-line. The next tab, "Hemodynamic Monitoring," contains a series of lectures by Michael Pinsky, an expert on hemodynamics, recorded as part of the University of Pittsburgh Multidisciplinary Critical Care Fellowship Curriculum. Clicking on one of the links results in a download of MP4 videos, which are quite large (15-40MB).

"Interpretation of ABGs" includes a six-step process that teaches complete interpretation of ABGs and includes summary tables after each step. "Mechanical Ventilation" includes an overview, as well as waveform interpretation and analysis, all in the form of downloadable Powerpoint presentations. I can highly recommend the slides on the latter, as they contain very helpful graphics and images and discuss different waveforms on various ventilators.

"Procedures" includes bulleted summaries with images on "fiberoptic intubation," "endotracheal intubation via direct laryngoscopy," and "bronchoalveolar lavage,"

each followed by three quiz questions as well as links to the New England Journal of Medicine Procedure Videos library. Unfortunately, upon submitting the answers to the quiz questions, I encountered a dead link.

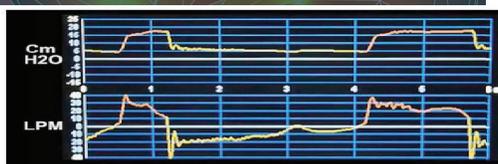
Finally, "Critical Care Quick Hits" contains short cases with images of ventilator waveform abnormalities and ultrasound or echo findings with questions. Answers and a brief discussion are provided. I went through several of these and they are quick and fun to read. In summary, I find these free educational general critical care teaching modules helpful and fun, both for board preparation or refreshing one's general critical care fund of knowledge. Please click on: <http://www.thoracic.org/professionals/clinical-resources/critical-care/clinical-education/> to give it a try.

TECH CORNER

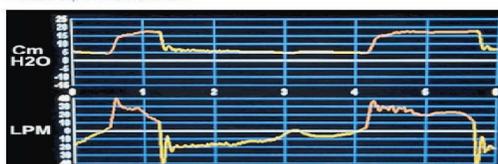
Critical Care

Clinical Education

- > Clinical Cases
- > Hemodynamic Monitoring
- > Interpretation of ABGs
- > Mechanical Ventilation
- > Procedures
- > Quick Hits



A video clip of the waveform



What form of patient ventilator dysynchrony is clearly evident?

1. Delayed expiratory cycling -Prolonged inspiration due to an inappropriately
2. Inspiratory flow starvation (inadequate rise time setting).
3. Ineffective Triggering-Wasted inspiratory efforts.
4. Autotriggering --caused by occasionally cardiac artifacts.

GOOD SAMARITAN HOSPITAL: NEUROCRITICAL CARE AND STROKE EXCELLENCE IN THE SILICON VALLEY

By Audrey Paulson, DNP and Harmeet Sachdev, MD



Audrey Paulson, DNP

Good Samaritan Hospital celebrated its 50-year anniversary of serving the Silicon Valley community in May. As a community hospital, we are a proud facility nestled next to the Santa Cruz Mountains and the Santa Clara Valley in sunny California and have many accomplishments that support this pride. One such accomplishment is our Comprehensive Stroke Center certification awarded by the Joint Commission recognizing our stroke program.



Harmeet Sachdev, MD

In 1996, Good Samaritan Hospital became the first community hospital to give recombinant tissue plasminogen activator (rtPA) in the state of California. This 49-year old gentleman presented with a dense right hemiplegia and the drug had just been approved. During that time, Dr. Sachdev personally went to individuals at the EMS system to educate them that a stroke was as urgent a matter as a heart attack and that they needed to change the transport method to a code three and turn on the sirens and lights for stroke patients.

Already, it was known that educating the public would be the key to improving the lives of those who had suffered a stroke. This education also occurred in the hospital as the medical surgical intensive care unit (MSICU) nurses at Good Samaritan, including myself, were trained to perform the NIHSS with an on-site class and videos provided by the NIH for teaching that class. As a nurse in the MSICU, I had no desire to become a stroke nurse. In the past, my experience in acute rehab was that having a stroke meant "I am sorry, you have had a stroke" and the patient dealt with it.

Times have changed. In 2004, Good Samaritan Hospital was one of the first five hospitals in the nation to receive Primary Stroke Center certification. At that time, our processes were already well ingrained with a stroke coordinator, data collectors, and a research staff. In 2004, Dr. Reza Malek followed by Dr. Arash Padidar joined our team and started providing Neuro Interventional Radiology treatments for our patients. We immediately recognized that this would change stroke care as we know it, similar to the impact that rtPA had with its introduction.

We opened our dedicated 20-bed Neuro ICU in April 2012 and we were the first to be surveyed for Comprehensive Stroke Center certification. We have been active with research over the years and our nurses have spoken at national conferences (AANN, 2014) and have had multiple poster presentations for conferences both nationally and internationally including the NCS (Neurocritical Care Helps Improve Outcomes in the Complex Stroke Patient, Denver 2012) and multiple poster presentations at the International Stroke Conference.

Our stroke team has grown and it is truly a team effort that has allowed us to be able to compete with the academic facilities and provide current up-to-date treatments enabling our patients to have excellent outcomes. This team consists of many specialized physicians: neurosurgeons, neurologists, neurointensivists and others, overseeing the care along with hospital administrators and

directors that are not at the bedside but have an enormous impact on bedside care.

More importantly, this team includes the numerous therapists, CT and MRI and lab techs, transporters, pharmacists and housekeepers that are a part of this wonderful staff here at Good Samaritan Hospital. It is the nurses who are at the bedside caring for the patients and their families during this time of need who are our greatest asset, providing hands-on care. Our stroke patients get state-of-the-art care delivered in their community, near their homes and families, with the goal being to discharge to our acute rehab facility or their home.

Having once thought stroke was a sentence one had to serve, as the nurse practitioner for the comprehensive stroke center, I see the great accomplishments that we have achieved in the arena of stroke care. The commitment by the hospital administration along with Dr. Sachdev's passion for the care of the patients has not diminished over the years. While our academic peers often provide the benchmark that this community hospital must reach to stay in league with the real players, Good Samaritan Hospital has managed not only to play the game, but at times leads the pack with the other well respected stroke centers.

The future of stroke care currently looks bright and promising. At Good Samaritan Hospital, we plan on being part of that future. We are adding an additional bi-plane suite, implementing RAPID software for faster image processing and are dedicated to continue being a part of the fascinating advances occurring in the field of stroke care.

We are developing criteria for our EMS system to implement a two-tiered system that delivers complex stroke patients to comprehensive stroke centers as a county-wide process and will continue to provide the best possible care for our patients. We do this by putting our patients first and knowing that, by doing that, everything else will work itself out.



The Featured Program column seeks to enrich the outlook of NCS members by highlighting programs that are undertaking innovative approaches to the practice of neurocritical care. If you are interested in contributing an article, please contact me at rgeocad1@jhmi.edu. In this issue, we feature the advances in stroke care within a community hospital program at Good Samaritan Hospital in San Jose, CA.

- Romergryko Geocadin, MD, Section Editor





Core stroke team members at Good Samaritan Hospital



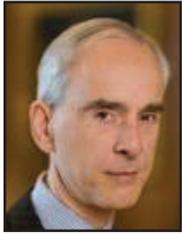
Multidisciplinary stroke team at Good Samaritan Hospital



Good Samaritan Hospital in San Jose, CA

Coming Up in Neurocritical Care

By Eelco F.M. Wijdicks, MD, PhD, FNCS, Editor-in-chief



More than in any other intensive care unit, neurointensivists are confronted with devastating brain injury resulting in comatose patients on a mechanical ventilator. Often, soon after arrival, an initial assessment of futility (or what is now often euphemistically called disproportionate treatment) can be made, particularly if neurosurgery has little to offer. How do we do that, how do we do that with confidence, and how can we best support families oscillating between anguish and wishful thoughts?

I am pleased that the journal *Neurocritical Care* in August will publish several important papers on palliative care, the discussion with family members on patient preferences and surrogate decision making, and a new position statement for health professionals from the NCS on recommendations for the critical care management of devastating brain injury. These papers are accompanied by an editorial by the accomplished neuroethicist and practicing neurologist, James Bernat.

The scientific statement on devastating brain injury is largely a summary of prognostication, psychosocial and ethical management problems, and, for the first time, tackles the definitional problems head on. The paper is authored by Dr. Souter and colleagues and originated from the Department of Anesthesiology & Pain Management and Neurological Surgery, Harborview Medical Center at the University of Washington in Seattle.

The group asked important questions about who should be resuscitated, who should provide consent, what factors identify patients at high mortality risk due to brain injury, what are the needs of family members of patients with devastating brain injury, and how can clinicians effectively meet the needs of family members among many other important questions. Recommendations are provided after an extensive literature review and using GRADE methodology to evaluate the value of the data. Although this paper is preliminary in its assessment, it identifies major gaps in our knowledge when it comes to the best assessment of a patient with a devastating brain injury. This is the first paper and will be followed by another manuscript with more specific details. The paper is one of the important scientific statements that came out of the deliberations of the NCS Guideline Committee.

The same issue will also publish a paper by Dr. Creutzfeldt and colleagues, also from Harborview Medical Center at the University of Washington in Seattle, on prevalence and outcomes of patients who meet palliative care consultation triggers. This study is a retrospective study that looks at commonly identified triggers for palliative care in the medical intensive care unit in order to see if they could identify the prevalence and type of potential palliative care consultations in a neurosciences ICU.

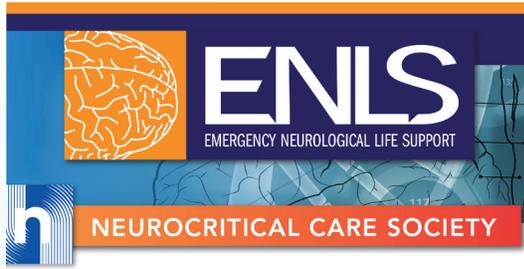
The paper does not provide data on palliative care in the neurointensive care unit but identifies that there are a considerable number of triggers in the neurosciences ICU that suggest palliative care is needed. The paper also identified a need to better define specific triggers for neurological critically ill patients, which would then lead to a better definition of the role of the palliative care consultant in the neurological intensive care unit. Many neurointensivists will ask the question whether a palliative care consultation in the neurological intensive care unit is useful, particularly because most neurointensivists spend an inordinate amount of time with family members and built strong rapport in the overwhelming majority of patients with devastating injury.

The August issue will also include a review article by Dr. Cai and colleagues from the Division of Neurocritical Care and Emergency Neurology, Department of Neurology, Massachusetts General Hospital in Boston that clearly reviews the most important issues on patient preferences, advanced care planning documentation, the definition and circumstances of surrogate decision makers, how to proceed with shared decision making and the role of physicians in that process, as well as the emotional toll on families.

The review paper has an important proposed shared decision making conference structure that can be used as a template for more efficient family discussions. Some of the suggestions may seem common sense to many of us, but, for the first time, there is a clear structure for what is perhaps one of the most important daily tasks of neurointensivists—not to prematurely forego treatments but also not to proceed with indefinite futile therapies. In my opinion, there is still a considerable immaturity in dealing with these important issues.

I hope you will distribute these papers among your colleagues and discuss them in journal clubs. The patients' families expect that from us.





Society of Critical Care Medicine



The Intensive Care Professionals

NEUROCRITICAL CARE SOCIETY PRESENTS:

Emergency Neurological Life Support (ENLS): What to Do in the First Critical Hour of a Neurological Emergency

Saturday, February 20th, 2016 • 8:00 am – 5:00 pm
Orange County Convention Center, Orlando, Florida

Intended Audience

Physicians, Nurses, Pharmacists,
Emergency Medicine Professionals, Health
Professionals Working in the Field of
Neurocritical Care

Registration

**Registration is open and
being handled by the
Neurocritical Care Society.**

www.neurocriticalcare.org/SCCM-ENLS

For questions please contact us at
info2@neurocriticalcare.org or 952-646-2033

Program Overview

Emergency Neurological Life Support (ENLS) is designed to help healthcare professionals improve patient care and outcomes during the most crucial time - the critical first hours of the patient's neurological emergency. ENLS covers a collaborative, multi-disciplinary approach that outlines a consistent set of protocols, practical checklists, decision points, and suggested communication to use during patient management.

Completion of this course and online assessment provides 15 hours of Level 1 CME, ANCC and ACPE credit and two-year ENLS certification.

**To Register for
This Course, Visit:**

www.neurocriticalcare.org/SCCM-ENLS

ENLS Offers:

- Advanced knowledge
- Ability to be current on advancements in treatment
- Topics that are directly relevant to neurocritical care
- Improved patient care

The Goals of ENLS Include:

- Improving the care of patients with neurological emergencies
- Providing protocols that list important steps in managing a patient with a potential neurological emergency
- Attempting to standardize emergency neurological care by consensus of healthcare providers
- Providing education to anyone dealing with neurological emergencies
- Identifying areas where research is needed to improve the care of our patients.

Topics

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Acute Stroke
Airway and Ventilation and Sedation
Coma
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Ischemic Stroke
Meningitis/Encephalitis
Resuscitation following Cardiac Arrest
Spinal Cord Compression
Status Epilepticus
Subarachnoid Hemorrhage
Traumatic Brain Injury
Traumatic Spine Injury

Sub-Topics

Elevated ICP and Herniation
Glasgow Coma Scale (GCS)
Hunt Hess Classification of SAH
World Federation Neurological Scale

"This program is held in conjunction with the Society of Critical Care Medicine's Critical Care Congress. The Society has reviewed the program to ensure its appropriateness for the critical care provider. However, the program is developed and managed by Neurocritical Care Society, an independent nonprofit organization, which is solely responsible for its content and management."

Job Opportunities
(as of June 16th, 2015)

For full details on all available positions including position descriptions, applicant requirements and further contact information, visit our website at <http://www.neurocriticalcare.org/jobs/job-opportunities>.

International

Neurocritical Care Specialist—Saudi Arabia
Send CV to: jsamudio@kfmc.med.sa

Arizona

Neuro-Critical Care Nurse Practitioner - Carondelet Neurological Institute at St. Joseph's Hospital
Contact: Tiffany Hoke at tiffany.hoke@carondelet.org

Neurocritical Care Specialist or Stroke Neurologist - John C. Lincoln North Mountain Hospital
Contact: Joan Kilmartin or Dr. Victor Zach

California

Assistant/Associate/Full Professor - UC Davis
Learn more: <https://recruit.ucdavis.edu/apply/JPF00407>

Assistant or Associate Professor, Division and Stroke Center - San Diego - University of San Diego, School of Medicine
Apply online at: <https://apol-recruit.ucsd.edu/apply/JPF00375>

Assistant or Associate Professor, Neurologist—University of California-San Diego
Apply online at: <http://apptrk.com/495160>

Chair, Department of Neurology - Santa Clara Valley Medical Center
Send resume to: roya.rousta@hhs.sccgove.org

Clinical Nurse Specialist - Neuro Critical Care - Sacramento - Kaiser Permanente
Send resume to: Frances.L.Franklin@kp.org

Neurocritical Care Nurse Practitioner/Physician Assistant - The University of CA - San Diego
Learn More: nkaranjia@ucsd.edu or moredmond@ucsd.edu

Neuro-Intensive Care Faculty Positions - The University of CA - San Francisco
Apply online: <https://aprecruit.ucsf.edu/>

Neurointensivist - Mercy Medical Group
Learn more: <http://www.dignityhealth.org/physician-careers>

Neurointensivist - Santa Barbara - The Stroke and Neurovascular Center of Central California
Contact: John Street, Director of Practice and Community Relations at jstreet@snc.md

Neurologist & Stroke Center Director - Santa Clara Valley Medical Center
Send resume to: roya.rousta@hhs.sccgove.org

Neurologists - Mission Viejo - St. Joseph Health System
Send resume to: medical.group.orange@gmail.com

Stroke Neurologist - Mercy Medical Group
Learn more: <http://www.dignityhealth.org/physician-careers>

Surgical Neuro Trauma ICU Nurse Manager - Mission Viejo
Contact: Emiley Padgett

Connecticut

APRN/PA Opportunity - New Haven - Yale - New Haven Hospital, Neuroscience
Apply online at: <http://yalenewhavenhospitalcareers.org/91>

Neurointensivist - New Haven - Yale Medical School & Yale-New Haven Hospital
Send resume to: kevin.sheth@yale.edu and david.greer@yale.edu

Delaware

Neurointensivist - Wilmington - Christiana Care Health System
Send resume to: abird@christianacare.org

District Of Columbia

Neurointensivist - MedStar Washington Hospital Center - MedStar Washington Hospital Center
Send resume to: Brian Lee, MD at brian.g.lee@medstar.net

Florida

BC/BE Neurocritical Care Physicians - Baptist Medical Center
Send resume to: Angelique.Wright@gmcjax.com
Neurocritical Care Intensivist - Florida

Hospital Medical Group
Learn more: Jason.Junker@FLHosp.org

Neurointensivist—Florida Hospital Physicians Group
Send resume to: Dianne.Christian@ahss.org

Neurological Services-Multiple Positions—Baptist Medical Center
Contact: Kathy Baldwin, (904)-202-0557 or Dr. Chen at lochbedracon@aol.com

Vascular Neurologist - Tampa Bay - University of South Florida College of Medicine
Send resume to: Clifton L. Gooch, MD at cgooch@health.usf.edu

Georgia

Assistant or Associate Professors - Augusta - Georgia Regents University
Send resume to: David C. Hess, MD at dhess@gru.edu

Assistant Professor, Neuro-critical Care Division—GRU Medical Center
Send resume to: Dr. Alfredo Garcia and Dr. Subhashini

RN Neuroscience Critical Care
Apply online at: <http://www.wellstarcareers.org/>

Hawaii

Coordinator, Stroke Program (Neuroscience Institute) - Queen's Medical Center
Learn more: <http://www.queens.org/> (job number 111044)

Illinois

Department of Neurological Sciences Chairperson - Rush University
Contact: Courtney Kammer at Courtney_Kammer@rush.edu

Director of Neurocritical Care and Neurointensivist - Springfield - Southern Illinois University School of Medicine
Contact: Sheila Bixler at Sheila@jordanmc.com

Neurocritical Care Specialist - Edward Neurosciences Institute
Learn more: Erin Mumma

Nurse Practitioner for Neurocritical Care Program - Rush University
Learn more: Kimberly Novanty

<p>Physician Assistant or Nurse Practitioner – Neuro/Spine ICU – Northwestern Memorial Healthcare Apply online: https://nmhext.authoria.net/viewjob.html?optlink-view=view-61580&ERFormID=newjoblist&ERFormCode=any</p>	<p>Physician - Neurocritical Care - Grand Rapids - Spectrum Health Butterworth Hospital Contact: Beth Brackenridge at beth.brackenridge@spectrumhealth.org UCNS eligible or certified Neurointensivist—Henry Ford Health System and Henry Ford Hospital Contact: Panayiotis Varelas at Varelas@neuro.hgh.edu</p>	<p>Neurointensivist/Stroke Neurologist – Upstate University Hospital/Upstate Medical University Contact: Julius Gene S. Latorre, MD MPH Neurointensivist - State University of New York at Buffalo - State University of New York at Buffalo Apply online at: HYonas@salud.unm.edu Patient Care - Director, Neuro Critical Care - New York City - New York-Presbyterian Contact: Joshua Klostermeyer at jklstermeyer@besmith.com</p>
<p>Kansas Neurointensivist – University of Kansas Medical Center – Neuroscience Critical Care Contact: Richard Barohn at rbarohn@kumc.edu</p>	<p>Minnesota Neurocritical Care Intensivist – United Hospital Apply online at: www.allinahealth.org/careers - Job Posting Number: 193BR Neurologist – Cambridge Apply online at: www.allinahealth.org/careers</p>	<p>North Carolina Director of Neurocritical Care – Vidant Medical Center Learn more: Amanda Anderson Nurse Practitioner/Physician Assistant – Wake Forest Baptist Medical Center Learn more: Dorothy Jones Medical Director – Novant Health Neurocritical Care Unit Send resume to: ecslagle@novanthealth.org</p>
<p>Louisiana General Neurologist – New Orleans Contact: Dave Duncan at dduncan@enterprisemed.com Neurocritical Care Specialist - New Orleans - Ochsner Neuroscience Institute Send resume to: profrecruiting@ochsner.org</p>	<p>Missouri Critical Care Neurologist - Columbia, MO - University of Missouri – Columbia Send resume to: zhangf@missouri.edu</p>	<p>Ohio Head, Section of Neurological Critical Care – Cleveland Clinic Learn more: http://bit.ly/1GID7t5 Neurocritical Care Nurse Practitioner – Ohio State University Wexner Medical Center Apply online: http://wexnermedical.osu.edu/careers</p>
<p>Maryland Neurocritical Care Nurse Practitioner/Physician Assistant – University of Maryland Medical Center Learn more: Johanna Aparicio or Joseph Haymore or Rachel Hausladen</p>	<p>New Hampshire Vascular/Neurocritical Care Neurologist – Dartmouth-Hitchcock Clinic Send resume to: Timothy G. Lukovits, MD</p>	<p>Pennsylvania Advanced Practice Positions – Neuro and Trauma Send resume to: Meredith.Kirkpatrick@uphs.upenn.edu Assistant or Associate Professor/Neuro-Oncology – Perelman School of Medicine Apply online at: https://www.med.upenn.edu/apps/faculty_ad/index.php/g324/d3899</p>
<p>Massachusetts Neurointensivist – Beth Israel Deaconess Medical Center and Harvard Medical School Send resume to khanafy@bidmc.harvard.edu Neurointensivist – Massachusetts General Hospital Contact: Jonathan Rosand at MGHNeurologySearc@partners.org Nurse Practitioner – Massachusetts General Hospital Apply online: http://www.mghcareers.org/ (job 2268216)</p>	<p>New Jersey Acute Care Surgeon – Nepture – Meridian Health Send resume to: Carol Petite at CPetite@meridianhealth.com Faculty Position/Department of Neurological Surgery - Rutgers University - New Jersey Medical School Send resume to: Charles J. Prestigiacomo, MD, FAANS, FACS at hajartaf@umdnj.edu</p>	<p>New Mexico Neuro Critical Care with Stroke - Albuquerque - The University of New Mexico Health Sciences Center Contact: Howard Yonas, MD at HYonas@salud.unm.edu</p>
<p>Michigan Neurinterventionalist - Detroit - Wayne State University Send resume to: Patti Bekowies at pbekowies@med.wayne.edu</p>	<p>New York Comprehensive Stroke Center – Neurocritical Care – New York Contact: nagee@cejkasearch.com Neurocritical Care Attending - Long Island - The Winthrop University Hospital Neuroscience Institute Send resume to: M. Stecker, MD at MStecker@winthrop.org</p>	<p>Clinical Director of Traumatic Brain Injury – Perelman School of Medicine Apply online at: https://www.med.upenn.edu/apps/faculty_ad/index.php/g324/d3888</p>

Neurocritical Care Neurologist - West Reading - Reading Health System
Apply online at: <http://www.click2apply.net/xvq9xfy>

Neurocritical Care Neurologist - Lehigh Valley Health Network
Send resume to: Pamela Adams

Neurointensivist - Perelman School of Medicine
Apply online at: https://www.med.upenn.edu/apps/faculty_ad/index.php/g324/d3717

Neurointensivist - Philadelphia - University of Pennsylvania
Apply online at: http://www.med.upenn.edu/apps/faculty_ad/

Neurology - Vascular/Stroke Neurologist - West Reading - Reading Health System
Apply online at: <http://www.click2apply.net/ztbj5r7>

Neuro-Oncologist - Perelman School of Medicine
Apply online at: https://www.med.upenn.edu/apps/faculty_ad/index.php/g324/d3216

Nurse Practitioner or Physician Assistant - Hospital of the University of Pennsylvania
Apply online at: <http://www.pennmedicine.org/careers>

South Carolina

Neurointensivist for New NSICU - University of South Carolina School of Medicine and Palmetto Health
Send resume to: Marcia Scarmardo

Texas

Attending Physician - Texas Stroke Institute
Contact: Joshua.hunter@hcahealthcare.com

Interventional Neurologist - Dallas
Contact: dduncan@enterprisemed.com

Neurocritical Care Specialist - El Paso - Texas Tech University Health Sciences Center
Apply online at: <http://jobs.texastech.edu/>

Neurointensivist - Galveston - University of Texas Medical Branch
Send resume to: [John Sealy at anbhardw@utmb.edu](mailto:John.Sealy@utmb.edu)

Neurohospitalist - Abilene - Hendrick Medical Center
Contact: John McMahon at jmcmahon@ehendrick.org

Registered Nurse - Surgical ICU - Methodist Hospital
Apply online at: https://hca.taleo.net/careersection/jobdetail.ftl?job=02531-53826&lang=en&sns_id=gmail

Utah

Neurocritical Care - St. George, UT - Intermountain Healthcare Medical Group
Contact: Deanna Grange

Neurohospitalist - Salt Lake City - Intermountain Healthcare Medical Group
Contact: Intermountain Healthcare, Attn: Wilf Rudert at PhysicianRecruit@imail.org

Vermont

Neurointensivist Opportunity - Fletcher Allen Health Care
Send resume to: jeff.guarnera@themedicusfirm.com

Virginia

Neurohospitalist - Assistant/Associate Professor - Charlottesville - University of Virginia
Apply online at: Job Posting 0611052, <https://jobs.virginia.edu/> or <http://www.click2apply.net/q26xwkm>

Washington

BE/BC Neurologist - Richland - Kadlec Health System
Contact: Julie Chavez at julie.chavez@kadlec.org

Sleep Medicine and Stroke Neurologist - Tacoma
Contact: dduncan@enterprisemed.com

Wisconsin

Neurohospitalist/Acute Care Neurology Physician
Contact: krasselt.lavonne@marshfieldclinic.org

Dynamic Practice Opportunity for Neurology Specialists & Sub Specialists - Milwaukee
Apply online at: <http://www.click2apply.net/3wtmz23>

Fellowship Opportunities (as of June 16th, 2015)

For full details on all available fellowships including descriptions, applicant requirements and further contact information, visit our website at www.neurocriticalcare.org/jobs/fellowship-opportunities.

California

Neurocritical Care Fellowship Program - CPMC
Contact: chencia@sutterhealth.org

Neurocritical Care Fellowship Program - Stanford
Contact: Haihong Nguyen at haihongn@stanford.edu

Colorado

Neurocritical Care Fellowship Program - University of Colorado Denver Dept. of Neurosurgery
Send resume to: krystin.martinez@ucdenver.edu

Connecticut

ICU-EEG Fellowship - New Haven
Contact: Lawrence Hirsch at [Lawrence.hirsch@yale.edu](mailto:l.hirsch@yale.edu)

Yale New Haven Hospital Neurocritical Care Fellowship - New Haven
Contact: Kevin Sheth, MD FAHA at cathy.corso@yale.edu

Illinois

Neurocritical Care Fellowship - Chicago
Contact: Mary Ossowski, MBA at mary_ossowski@rush.edu

Neurocritical Care Fellowship - University of Chicago
Contact: Jeff Frank at jfrank@neurology.bsd.uchicago.edu

Maryland

Neurocritical Care Fellowship - Baltimore (starting 2015 & 2016)
Contact: Neeraj Badjatia, MD MS FCCM at nbadjatia@umm.edu

Michigan

Fellowship Training in Neurocritical Care - University of Michigan, Ann Arbor
Contact: Venkatakrishna Rajajee at venkatak@med.umich.edu

Missouri

Neurocritical care fellowship at
Washington University - St. Louis
Contact: Rajat Dhar, MD at
dharr@wustl.edu

New York

Neurocritical Care Fellowship
Contact: Errol Gordon at
errol.gordon@mountsinai.org
Clinical Fellowships in Neurocritical Care
– New York
Contact: Gregory Kapinos at
kapigreg@gmail.com

Ohio

Neuro ICU Fellowship Program
Contact: Edward Manno at
mannoe@ccf.org
Neurocritical Care Fellowship – Wexner
Medical Center
Contact: Chad Miller at
ChadM.Miller@osumc.edu
Neurocritical Training Position
Contact: Jordan Bonomo at
jordan.bonomo@uc.edu

Pennsylvania

University of Pittsburgh Fellowship
Contact: Beth Bucher at
ccmrecruitment@upmc.edu

Texas

Fellowship – Texas Stroke Institute
Contact: Joshua Hunter at
Joshua.hunter@hcahealthcare.com
Interventional Neurology Fellowship -
Irving
Contact: Dan Iliff at
daniel.iliff@hcahealthcare.com
Neurocritical Care Fellowship - Houston
Contact: Diana Saavedra at
Diana.I.Saavedra@uth.tmc.edu

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FEATURED SPEAKER

Alfredo Quiñones-Hinojosa, MD (Dr. Q), is the Professor of Neurological Surgery and Oncology, Neuroscience, and Cellular and Molecular Medicine at Johns Hopkins. He directs the Brain Tumor and Pituitary Surgery Programs, leads one of the most prominent brain tumor stem cell laboratories in the country, and was named one of the "Brilliant Ten" by Popular Science.



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