

CURRENTS

News Magazine of the Neurocritical Care Society

Volume 10, No. 4

IN THIS ISSUE:

Note from the Editor.....	P. 2
By Matthew Koenig, MD	
President's Column.....	P. 3
By Ed Manno, MD	
New NCS PACT Committee	P. 4
By David McDonagh, MD	
NCS Website Remodel Coming Soon.....	P. 5
By Matthew Koenig, MD	
Pharmacy Podcast Series Launches	P. 6-7
By Theresa Human, PharmD	
NCS Research Training Fellowship.....	P. 8-9
By Claude Hemphill, MD	
NCS Annual Meeting Photo Spread.....	P. 10-11
NCS Golf Tournament at Annual Meeting	P. 12
By William Knight, MD	
First NCS International Soccer Match.....	P. 13
By Hani Murad, MD	
Neurocritical Care Taxonomy Code	P. 14
By Sarah Livesay, DNP	
Neurocritical Care News Briefs.....	P. 15
By Jose Suarez, MD	
NCS Resident and Fellow Task Force	P. 16
By Saef Izzy, MD	
Nurses Wear Stethoscopes	P. 17
By Michael Rogers, RN	
Deferoxamine Clinical Trial Reboot	P. 18
By Robert Kowalski, MD	
New German Brain Death Guidelines	P. 19
By Katja Wartenberg, MD	
Ethics Case: Autonomy and Beneficence	P. 20
By Thomas Lawson, ACNP	
NCS Pharmacy Section Updates.....	P. 21
By Amber Castle, PharmD	
Journal Watch.....	P. 22-23
By Chad Miller, MD	
Tech Corner: FRESH Score app.....	P. 24
By Susanne Muehlschlegel, MD	
Coming Up in Neurocritical Care	P. 25
By Eelco Wijdicks, MD	
New Parkland Hospital Neuro ICU	P. 26-27
By Michael Rubin, MD	
NCS International Partner Program.....	P. 28-29
New NCS Publications and Products.....	P. 30-31
Classified Section	P. 32-33

CURRENTS

Quarterly News Magazine
of the
Neurocritical Care Society

December, 2015
Volume 10 - Number 4

Editor-in-Chief

Matthew Koenig, MD
Honolulu, HI

Editorial Board

Romergrzyko Geocadin, MD
Baltimore, MD

Robert Kowalski, MD
Denver, CO

JoAnn Taie
Minneapolis, MN

Susanne Muehlschlegel, MD
Boston, MA

J.J. Baumann, RN
Stanford, CA

Kimberly Levasseur-Franklin,
PharmD
New Haven, CT

Katja Wartenberg, MD
Halle, Germany

Jose Suarez, MD
Houston, TX

Michael Rubin, MD
Dallas, TX

Tamer Abdelhak, MD
Springfield, IL

Sarah Livesay, DNP, RN
Chicago, IL

Eelco Wijdicks, MD, PhD
Rochester, MN

Saef Izzy, MD
Boston, MA

Note From the Editor



Colleagues:

I want to welcome you to the final issue of *Currents* for 2015, the official quarterly news magazine of the NCS. I hope everybody had a blast and learned a lot at the NCS Annual Meeting in Scottsdale. I had the honor of serving on the Annual Meeting Planning Committee this year so, at the risk of sounding like I'm congratulating myself, I have to say that the scientific content and plenary sessions at this year's meeting were fantastic.

The NCS should be especially proud of being able to present the results of two significant clinical trials – EuroTherm and GAMES – in advance of publication. It was a major coup for our society to hear the results of the EuroTherm trial – which was a large international, multi-center clinical trial testing the efficacy and safety of early hypothermia for intracranial hypertension after traumatic brain injury – in advance of its publication this month in the *New England Journal of Medicine*.

For those of you who were unable to attend the Annual Meeting this year or had to make painful decisions between concurrent sessions, don't forget that various sessions were recorded and are now available on the NCS OnDemand portal on the website. For a modest fee, NCS members and non-members can purchase access to many of the recorded talks and slides.

If you haven't checked out the NCS OnDemand portal in a little while, go take a look because there is an ever-increasing amount of material available for free or for purchase. Another great new addition to NCS OnDemand is the new pharmacology podcast series PONS. Check out the articles about PONS in this issue of *Currents* discussing the new educational podcasts on a variety of topics related to pharmacotherapy of neurocritical care illnesses. These podcasts will be free for a limited time.

In addition to the OnDemand portal, the NCS is continuing to advance our footprint in on-line, on-demand education through the recent launch of Emergency Neurological Life Support (ENLS) version 2.0. The new version contains updated content in every section as well as new sections focusing on pediatric neurocritical care, pharmacotherapy, and neurocritical care for first responders. I have to confess that I am currently overdue for my two-year renewal of ENLS recertification so I am looking forward to checking out the new content. I'm sure I am not alone in that category.

For those of you looking for an intensive, in-person ENLS experience, consider registering for the one-day, on-site ENLS course at the 2016 Annual Congress of the Society of Critical Care Medicine in February. Check out the advertisement in this issue of *Currents* for additional details.

The other big news from NCS communications and the Annual Meeting is the release of three new NCS guidelines. Guidelines on prophylaxis against venous thrombosis in neurological and neurosurgical patients, management of external ventricular drains, and use of platelet function testing in endovascular neurointerventional procedures all debuted at the meeting and will be published in upcoming editions of the *Neurocritical Care* journal.

I had a lot of fun editing this issue of *Currents*, especially picking out all the photographs for articles and the Annual Meeting photo spread. This year, we had a professional photographer at the meeting which resulted in a treasure trove of awesome photos of our members learning, networking, presenting, and having fun.

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 NCS Executive Director JoAnn Taie. JoAnn says, "the photo was taken in late October in front of a family cabin located at the Eshquagama Country Club on Lake Eshquagama (which means "the last water" in Chippewa (Ojibwe)) in Gilbert, Minnesota. I had returned to the cabin after finishing up what is sure to be the last game of fall golf before the snow flies when I noted the spectacular sunset. To get a better glimpse, I went to the front of the cabin and snapped the picture with my camera phone." To see the location, check out the website <http://www.eshquagama.com/>.

Cheers,



Matthew Koenig, MD, FNCS
Editor-in-Chief



NCS Leadership 2015-2016

Officers

Ed Manno, MD, president
 Michel Torbey, MD, vice president
 Gretchen Brophy, PharmD, treasurer
 Jose Suarez, MD, secretary
 Romergrgyko Geocadin, MD,
 immediate past president

Board of Directors

Mary Kay Bader, MSN, CNS
 Neeraj Badjatia, MD
 Julian Bösel, MD
 Marion Buckwalter, MD, PhD
 Guadalupe Castillo-Abrego, MD
 Sherry Chou, MD
 W. David Freeman, MD
 Jennifer Frontera, MD
 David Greer, MD
 Theresa Human, PharmD
 Sarah Livesay DNP, RN
 Chad Miller, MD
 Susanne Muehlschlegel, MD
 Paul Nyquist, MD
 Kristine O'Phelan, MD
 DaiWai Olson, PhD, RN
 Denise Rhoney, PharmD
 Fred Rincon, MD
 David Seder, MD
 Kevin Sheth, MD
 Lori Shutter, MD
 Wendy Wright, MD

Executive Director

JoAnn Taie

Editor-in-Chief, Neurocritical Care

Eelco Wijndicks, MD, PhD

Neurocritical Care Society

5841 Cedar Lake Road, Suite 204
 Minneapolis, MN 55416
 Phone: (952) 646-2034
 Fax: (952) 545-6073
 Website: www.neurocriticalcare.org
 Email: info@neurocriticalcare.org



Looking Forward to an Exciting Year after the Annual Meeting

By Ed Manno, MD, FNCS

Wow!! What a year and what a meeting!

Many of you have heard me say that planning the NCS Annual Meeting is like planning a five-day wedding. You just hope that people show up and behave and that there are no major catastrophes. It is in large part a leap of faith.

In retrospect, I probably did not need to be so worried. The staff was fantastic and nearly everything went off without a glitch. Special thanks to Kayla Stidger and all of the NCS staff whose professionalism again shone through. However, what really makes the meeting is the enthusiasm of the attendees. I continue to be amazed of how the society continues to grow and thrive almost entirely on the passion of its members.

Not only was the meeting a success academically and from an educational standpoint, but it was a huge amount of fun. The feedback thus far has been overwhelmingly positive. In addition, we were able to raise a significant proportion of the money for the Fund-A-Fellow campaign for the Neurocritical Care Research Training Fellowship this year. This is a process we hope to always continue.

In keeping with the theme of the meeting, it is now time to move forward and to look to the future. Financially, the NCS had an excellent year and we are on firm financial ground. This will allow us to continue to explore new ways to expand our mission.

ENLS also had a great year and I believe it is poised to dramatically take off. We appear to be currently limited by the number of trainers. So please take the train-the-trainer course and help us expand our educational mission. My own experience teaching a course has already begun to show dividends with some of the attendee's planning to teach additional local courses.

The NCS continues to grow internationally. The requests for ENLS, educational products, and joining us as a partner society are increasing at a rapid pace. We are continuing to develop global partners in South America, Asia, and the Middle East.

To allow us to keep up with our expansion, we will need to revamp some of our basic infrastructure. I would like to thank NCS past-president Romer Geocadin for doing an exceptional job last year at a lot of the necessary "behind the scenes" type of work that will make my job easier as we move forward.

This year, we are working on a major upgrade to our website and membership directory that will give us a new face to the world and do a better job of the needed daily tasks of the society. Stay tuned for these changes as I hope it will also allow us to be more facile in our daily communications.

We hope to be developing some new initiatives over the next year for which I will keep you informed. When we started this society a number of years ago, I really thought we were going to be a group of friends sharing ideas in a church basement. The membership continues to amaze me with their talent, insight, and initiative. I cannot tell you how personally excited I am to be leading such a fantastic group! Let's have a great year.

New NCS Committee on Program Accreditation, Physician Certification & Fellowship Training—PACT

By David McDonagh, MD



Romer Geocadin, NCS Past-President, asked me earlier this year to formally organize a committee to focus on issues related to fellowship training and physician certification. We decided to call this new committee NCS PACT (NCS Committee on Program Accreditation, Physician Certification & Fellowship Training—PACT).

To give you some background, I have had the opportunity and privilege for many years now to serve as the point person for the Neurocritical Care Fellowship Directors across the United States. I also organized the yearly Fellowship Directors' Corner at the Annual Meeting. I am proud to say that our group of fellowship directors, with the extraordinary support of senior leaders in the society such as Wade Smith and our Past Presidents (Tom Bleck, Michael Diringer, Cherylee Chang, Stephan Mayer, Gene Sung, and Claude Hemphill), accomplished some significant tasks.

We entered the San Francisco Match, and proceeded to charm, coerce, and cajole our more reluctant colleagues into joining the fray. Subsequently, at the behest of our fellows, we adopted the Central Application Service (via SF Match) to streamline the application process. We kept (and still keep) the communication lines open with group e-mails to the fellowship directors –from anyone in the group – when a question or issue arises. This forum has been used to compare institutional policies, funding mechanisms for fellowships, and a number of other topics.

Moving forward, NCS PACT will tackle issues of concern relating to: 1) training of neurocritical care fellows, including curriculum & procedural competencies; 2) issues related to the yearly fellowship application and matching system (i.e., the San Francisco Match & Central Application Service); 3) accreditation of fellowship programs; and 4) initial and ongoing maintenance of certification in Neurocritical Care for individual physicians.

I will serve as the inaugural committee chair, and the committee will consist of the following members: Anise Ardelt, Raj Dhar, Stephen Figueroa, Anna Finley, M. Luke James, Avi Kumar, Nerissa Ko, Matthew Maas, Bart Nathan, Kristy O'Phelan, Adrian Puttgen, and Krishna Rajajee. Please note that NCS-PACT member Matthew Maas, with the help of Mona Kumar, now leads the Fellowship Directors' Corner at the Annual Meeting and the group e-mail forum remains alive and well.

Our new committee met for the first time in Scottsdale at the NCS Annual Meeting in October 2015. We have set an agenda for the upcoming year and will do our best to stay on track. Our top priority over the next 12 months is to work to improve the visibility and access to information about Neurocritical Care Fellowship Training, especially for non-neurology applicants. Enhancing the section on fellowship training on our society website will be integral to this goal and the website will be undergoing a planned overhaul in the spring of 2016.

Jennifer Kim, Chief Resident in Neurology at Massachusetts General Hospital, has formed an NCS Resident Fellow Task Force, at the request of NCS Past-President Romer Geocadin and current NCS President Ed Manno. This task force will be in open communication with the NCS PACT Committee so we can work in a collaborative fashion.

The second NCS PACT initiative that I want to share with the society membership is a comprehensive survey on the 'state of the field.' This will be distributed to neurocritical care program directors in early 2016 to get up to date information on institutional training requirements, rotations, procedural competencies, and funding mechanisms. These data will be a critical foundation on which to base decisions regarding future directions in neurocritical care training.

Please feel free to e-mail me at david.mcdonagh@utsouthwestern.edu with any questions or ideas.

David McDonagh, MD is Vice Chair for Clinical Neurosciences in the Department of Anesthesiology and Director of the Division of Neurological Anesthesiology at Zale Lipshy University Hospital at UT Southwestern. He is chair of the PACT Committee and an invited guest writer for Currents.

Coming Soon: New NCS Website and Membership Directory Platform

By Matthew Koenig, MD, FNCS and Tessa Wegenke



Matthew Koenig,
MD, FNCS



Tessa Wegenke

One of the main goals of the NCS Officers and Executive Office this year is to upgrade the NCS website and membership directory. The NCS last updated the website and membership directory platform about four years ago. For a variety of reasons, maintaining the website, ensuring internet security, and – most of all – maintaining an accurate and efficient membership directory have been challenging and the society has learned some hard lessons.

With that goal in mind, the NCS completed a lengthy evaluation process to find a new Association Management Software and Content Management System for our website and membership directory over the last year. As a result of this process, we selected JL Systems as our new vendor for the website, communications, and member directory.

Over the next few months, members should expect to hear a lot more about upcoming changes to the website. JL Systems is currently in the process of transferring over the existing website and membership directory to the new platform. We anticipate the go-live date for the new system will be in the early spring of 2016. When the new system launches, members will be asked to update their detailed member profile which will contain a number of specific fields related to your NCS membership category. In some ways, this will be like re-applying to the society.

This process is necessary for several reasons which ultimately result in a benefit to the NCS members. First, under the old membership platform, many members have redundant and inaccurate membership listings. This results in duplicate mailings, missed emails, inaccurate membership dues reminders and meeting attendance records, and a lot of inefficient, manual workarounds on the part of the Executive Office. For this reason, we will need to establish unique identifiers for every member so we can maintain a consistent record for our members when they change email addresses, jobs, member types, etc. In addition, with the auxiliary demographical information that will be required, the NCS will be able to provide a more accurate and in-depth member directory which is one of the biggest benefits to its members.

The second major reason to update the member profile is to ascertain member's preferences in terms of which communications you will receive from the society. This will allow members to opt in or out of receiving email communications from the society, such as Member Surveys, the monthly President's Update, and notices for new products, promotions, and society publications. The new membership platform will allow the society to customize the type of email communications we send to specific members, thereby addressing the concerns of members who felt they had been receiving too many emails from the NCS.



The new website platform will also make the content of the website itself more customizable for different member types. This means that different member categories will be able to access different content and functionalities within the NCS website. For example, a nurse member may have access to content and chat rooms that are relevant to nurses. A member of an NCS committee will have access to the committee minutes or private chat rooms specific for that committee. With this customization, it will become very important to log in when visiting the NCS website because custom content may only be available for specific member types.

Another new feature of the website will be the ability to customize subscriptions to various categories, topics, and threads of conversation within on-line chat rooms. Although the previous website platform had a chat room functionality, it never became successful because members would have to specifically go looking for topics that people were discussing. Some committees have used email listservs as an alternative to chat rooms, but they result in a lot of emails with the inability to select which topics to follow and not follow. The new website will address both of these problems by allowing members to select specific topics to follow and an option to receive comments on these topics by email – either as a weekly summary email or an email of each comment.

Another advantage of a better integrated website and membership directory is that it will allow members to keep track of their own activities within the society, such as dues payments, on-line courses completed in the NCS OnDemand section, ENLS, and eligibility for programs like FNCS.

Last but not least in terms of functionality, any publications or manuscripts posted on the NCS website will now be searchable. For those of you who have been trying to find the salary survey or other articles of interest, you will be able to search for them with ease.

In addition to the new functionalities on the website, we are also in the process of creating a fresh new look for the website. Although the redesign is still a work in progress, we selected a template for the landing page created by NCS graphic designer Abe Raguindin. Check out the template in the graphic accompanying this article.

Stay tuned for more information about the new website and other exciting improvements coming soon.

Matthew Koenig, MD, FNCS is Chair of the NCS Communications Committee and Tessa Wegenke is the Administrative & Communications Coordinator for the NCS.

PONS ... There's Got to Be a Drug For That!

By Theresa Human, PharmD, BCPS, FNCS



We are happy to announce the official launch of the Pharmacotherapy Of Neurocritical care Series, otherwise cleverly named PONS. This curriculum based podcast series will be an enduring program to provide neurocritical care pharmacotherapy education to all disciplines.

These podcasts will cover both neurocritical care core topics as well as controversial topics that will be valued by clinicians caring for patients in the Neuro ICU. New and interesting topics will be added regularly throughout the year and be presented by experts in the field.

There are numerous ways the PONS can be utilized. This educational tool can be used to update or refresh primary providers on a topic or can be accessed monthly to facilitate topic discussions among rotating trainees. The target audience includes all disciplines, members and non-members, interested in furthering their neuropharmacotherapy knowledge.

Most podcasts will be pre-recorded sessions that can be found on the NCS OnDemand platform. Each session will vary in length from 20-60 minutes. Live webinars are planned to be held during times of exciting releases, including the upcoming release of several NCS Guidelines.

Live webinars will allow participants the opportunity to interact during the session. Live webinars will also be archived on the NCS OnDemand platform for retrieval by those unable to attend the live presentation or those who want to review the content.

Each podcast will contain an annotated reference library. This reference list will include both references referred to in the presentation as well as additional recommended readings. We are excited to begin this educational series with core neurocritical care topics which include *Osmotic Therapy*, *Hyponatremia*, *Status Epilepticus*, and *Blood Pressure Control after Intracerebral Hemorrhage*.

Each session will remain available as long as the information presented remains accurate. We encourage you to participate now as this educational tool is free for a limited time and will be available in the future for purchase.

Share this information with all of your colleagues that would enjoy the educational benefits this podcast series will provide.

Follow the link below to enjoy hours of neuropharmacotherapy fun!
www.pathlms.com/ncs-ondemand/courses/1622

CME for all disciplines will be available in the spring!

Theresa Human, PharmD is a clinical pharmacist in the neurocritical care unit at Washington University Barnes-Jewish Hospital in St. Louis, Missouri. She is a member of the NCS Pharmacy Committee and an invited guest writer for Currents.



Pharmacotherapy of Neurocritical Care Series (PONS)

PONS Series

What is PONS?

PONS is a curriculum based eLearning series comprised of various Neuropharmacotherapy topics presented by experts in the field of neurocritical care. PONS utilizes recordings, live webinars and podcasts to bring content to life. This series can be used to update or refresh primary providers on the topic, or be used to facilitate topic discussions among trainees. Each session includes a library of annotated references used during the presentation.

TOPICS

- Osmotic Therapy for Elevated Intracranial Pressure
- Hyponatremia
- Status Epilepticus
- Acute Blood Pressure Management after Intracranial Hemorrhage

COMING SOON!

- Acute Reversal of Anticoagulation in Life Threatening Bleeding
- Venous Thromboembolism Prophylaxis

6 New Topics Added Annually!

Audience

Who should take advantage of this program? PONS targets a wide range of disciplines including physicians, nurses, pharmacists and more. The target audience includes individuals practicing in all medical disciplines, particularly those who want to further their neuropharmacotherapy knowledge. Continuing Education for physicians, nurses and pharmacists will be incorporated in the near future. This series is complimentary for a limited time.

Complimentary access available for a limited time at NCS OnDemand!

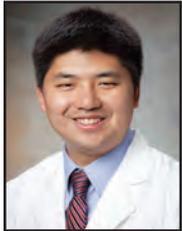
www.pathlms.com/ncs-ondemand/courses/1622

Q&A with Inaugural NCS Research Training Fellowship Recipient Dave Hwang

By J. Claude Hemphill III, MD, MAS, FNCS and David Hwang, MD, FNCS



J. Claude Hemphill III, MD, MAS, FNCS



David Hwang, MD, FNCS

CH: Why did you decide to apply for the NCS Research Training Fellowship award?

DH: My research interest is in optimizing how we work with the families of our sickest patients, particularly when making goals-of-care decisions. A big part of applying for grants is simply finding foundations that are interested in your topic! The field that I'm interested in is important but isn't really the best "fit" for training grants explicitly geared towards translational science or "traditional" patient-oriented research. When I heard that the NCS was starting its own career development award program, I knew I had to try to apply—goals-of-care decision making is undeniably a big part of neurocritical care practice, and the "fit" seemed promising.

Tell us briefly about your project.

My project addresses the following question: can the groups of surrogates in the U.S. who are making goals-of-care decisions for incapacitated intracerebral hemorrhage (ICH) patients with an uncertain prognosis

be reliably divided into distinct groups based on their decision-making priorities? If we can characterize specific like-minded groups of ICH surrogate decision makers based on their decisional priorities, we will have specific target groups for which to design high-yield future interventions aimed at improving goals-of-care decision making.

To do this, we will be interviewing surrogate decision makers in the Yale Neuro ICU as well as national experts in ICU shared decision-making to come up with a comprehensive list of decision-making factors that surrogates consider in such situations for ICH patients. We will create a survey that puts the respondent in the hypothetical scenario of making a decision regarding tracheostomy and feeding tube placement versus comfort care for an intubated ICH patient with an uncertain prognosis. The survey will present lists of possible decision-making factors that respondents will be asked to prioritize. We will administer the survey to a very large sample representative of the general U.S. population and analyze the data using a technique known as latent class analysis to discover like-minded groups, which we can target for future decision support development.

The NCS Research Training Fellowship award is only for one year. How is this going to make a difference in your research career?

I am currently fortunate to be in the midst of a two-year research career development award from the American Brain Foundation for a similar project—looking at how surrogates prioritize decision-making factors when faced with goals-of-care decisions for ICH patients who are felt to have certain long-term poor prognosis (i.e., prolonged unconsciousness). As we all know though, it's very common in the Neuro ICU for prognosis for ICH patients to be murkier—for example, possible long-term functional dependence, but unclear degree of cognitive recovery. The year of the project funded by the NCS will allow me to study how prognosis affects surrogate priorities and will hopefully put me in a better position to create and test future decision support tools.

Have you participated in any of the other prior NCS research efforts, including mentoring, Annual Meeting workshops, or Neurocritical Care Research Network?

I have! The year before I applied for the NCS Research Training Fellowship, I participated in the Research Career Development Session that happens every year right before the NCS Annual Meeting. I also attended the last Neurocritical Care Research Network (NCRN) Meeting in Houston and was able to give an oral presentation of my proposal to attendees. I think some of Bill Coplin's comments after my presentation are permanently seared into my memory! But in all seriousness, that opportunity was incredibly useful for helping me put the actual grant proposal together.

What advice do you have for fellows who want an academic career including independent research?

Claude, I've clearly got a ways to go before becoming independent! But perhaps one piece of advice I'd give is for fellows to try seeking mentorship outside of one's own department and even institution if it makes sense for your interests. My primary mentor for this project is Dr. Liana Fraenkel, a Professor at Yale whose clinical expertise is rheumatology, but whose research expertise is scientific approaches to shared decision-making. My co-mentor for this project is the chief of my division here at Yale, Dr. Kevin Sheth. Liana and Kevin helped put me in touch with a couple of key advisors for my research who, despite not being at Yale, have been totally indispensable—Dr. Robert Holloway, who chaired the writing committee for the recent AHA/ASA Guidelines for Palliative Care and Stroke, and Dr. Doug White, who has built an independently funded academic career studying ICU surrogate decision-making.

Any thoughts on what the NCS can do to further prepare trainees for research careers?

Honestly, I would just say—please keep funding these early career opportunities! At the end of the day, the money itself for trainees and junior faculty is simply critical. It is awesome that the NCS community has such a focus on research career development for junior members. As someone who is just starting out, I have felt incredibly supported.



David Hwang, MD accepting the Research Training Fellowship award from Claude Hemphill, MD at the NCS Annual Meeting.

NCS Announces Second Neurocritical Care Research Training Fellowship

By J. Claude Hemphill III, MD, MAS, FNCS



The NCS announced the first recipient of the Neurocritical Care Research Training Fellowship at the Annual Meeting in Scottsdale. Congratulations to David Hwang, MD from Yale School of Medicine who was the recipient of the inaugural fellowship award (see accompanying Q&A in this edition of *Currents*).

The NCS would like to announce that applications are now being accepted for the 2017 Research Training Fellowship with **letters of intent due by January 1, 2016**. Please see below for more specific details regarding eligibility, submission requirements, and dates.

This training fellowship is open to physicians, nurses, pharmacists, and other neurocritical care providers. The program was envisioned due to the high demand for clinical services, struggle for departmental support, and difficulty establishing mentorship relationships for young practitioners that make the pursuit of research careers difficult. The direct goal of this program is to foster the development of close mentorship ties, protection of research time, pursuit of research training, and generation of preliminary data necessary to apply for additional scientist development training grants.

This program is aimed at promising applicants who are seeking a career in clinical or translational research in neurocritical care and ultimately wish to become independent investigators. Unlike longer training programs, this program is focused on identifying a single year that will allow the time and support to compete effectively for longer training opportunities. It is expected that at the end of the project, the trainee will be in the process of submitting applications for national, peer-reviewed funding mechanisms to continue research training.

The NCS has the stated mission to foster clinical, experimental, and outcomes research focused on developing innovative and cost-effective medical and surgical interventions for acute neurological disorders. Although any research pertaining to acute central nervous system injuries or critical care will be considered, special weight will be given to projects that relate directly to issues important to patients with neurological critical illness.

Eligibility

1) For the purpose of this fellowship, research is defined as patient-oriented research conducted with human subjects, or translational research specifically designed to develop treatments or enhance diagnosis of neurocritical care illnesses. These areas of research include epidemiologic or behavioral studies, clinical trials, studies of disease mechanisms, the development of new technologies, and health services and outcomes research.

2) The applicant must be an NCS member in good standing (regardless of nationality or country of residency) interested in an academic career with independent research funding. The award is available for members in all disciplines (physicians, nurses, pharmacists, PhD researchers, etc.) but is meant for early career individuals (within five years of completion of terminal degree or training). For physicians, this is best suited to add a supplemental year to fellowship training before entering the first academic position. For other applicants, this award may be used to remove clinical responsibilities for an existing position.

Award

The fellowship will be awarded to one applicant for one post-graduate year. Although applicants in training may apply, the award year is not to be used during years of training. \$70,000 of support for the applicant, including salary and research +10% indirect cost to the institution, will be awarded. The award is not intended to cover all the costs for the fellowship year. It is expected that the sponsoring institution contributes time and additional research/salary support.

Supplementation of the stipend with other grants or by the sponsoring institution is permissible, but fellows may not accept other fellowships, similar awards, or have another source of support for more than 50% of their salary. The stipend cannot be used to support clinical fellowship, graduate school, or residency training. Funding initiation is flexible to begin from January 1, 2016 to July 1, 2016 depending on the applicant's situation.

The requirements for the fellowship include:

- An identified mentor who is an established investigator with independent funding.
- Protected research time by the applicant's department of at least 75%.
- Career training/development program with specific goals
- Identified research project
- Clear evidence of institutional support to cover salary gap and research costs.

Application Process

Applicants are asked to submit a two-page letter of intent by January 1, 2016. The letter should include:

1. A description of the applicant's goals for a research career and their qualifications for beginning training in research.
2. A concise description of the project and a strategy for completing the proposed project.
3. Identification of a mentor(s) including mention of the mentor's qualifications and area of expertise. A description of how the mentor's expertise will tie into the project should be included if the mentor's area of research is dissimilar from the project. Mentors can be located at any institution as long as a clear mentorship plan is outlined.
4. A strategy for transitioning this work to a longer training grant opportunity.

A letter of support (one page) from the applicant's department chair expressing support for the terms of fellowship should accompany the applicant's letter-of-intent.

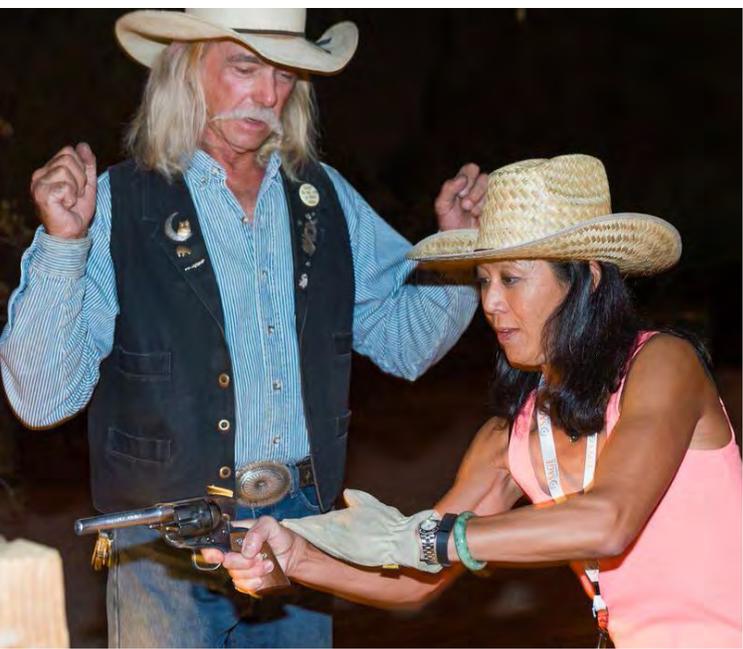
Evaluation and Selection

Letters of intent will be reviewed by the Research Task Force to select applicants who will be invited to submit a full proposal.

Deadline and Address

Letters of intent and supporting letters must be received by midnight (CST) on January 1, 2016. Notification to prospective applicants to submit a full proposal will be on or before February 1, 2016. Final funding decisions and notifications will be announced at the 2016 Neurocritical Care Annual Meeting. All letters must be submitted to the NCS [via webform](#) or by mail at 5841 Cedar Lake Road S, Suite 204, Minneapolis, MN 55416.

Questions? Contact members of NCS's Research Task Force: Jose Suarez, MD (jisuarez@bcm.edu), J. Javier Provencio, MD (jp3b@virginia.edu), Michael Diringier, MD (diringerm@neuro.wustl.edu), Susanne Muehlschlegel, MD, MPH (Susanne@muehlsch.de), or J. Claude Hemphill III, MD (chemphill@sfg.ucsf.edu).





NCS Fund-a-Fellow Golf Tournament for Research

By William A. Knight IV, MD, FNCS, FACEP



During the 12th NCS Annual Meeting in Seattle, many members were already looking forward to the sunny resort layout that Scottsdale would offer. With visions of desert golf looming like an oasis in the cool, fall Seattle weather, the NCS Fund-A-Fellow Golf Tournament for Research was born. What better way to cap off the 13th NCS Annual Meeting than with a golf tournament with a society driven cause?

A Golf Taskforce was formed, comprised of Claude Hemphill, Bill Knight, Arash Afshinnik, Ed Manno, and Lizzie Larson. A fundraising goal of \$10,000 was set with all proceeds to benefit the Fund-A-Fellow for Research campaign.

The first annual NCS Fund-A-Fellow Golf Tournament for Research, held on the Saturday following the Annual Meeting, was a rousing success. Teams were grouped randomly by the Golf Task Force to encourage networking. The weather was perfect and the course was in great shape! We had 24 golfers participate in a best-ball scramble in teams of four at the Westin Kierland Resort.

Each golfer would tee off, and the teams would select the best ball to hit from next. Each team would hit from that spot until the ball was in the hole. Some teams hit more than others... Tournament participants received a nametag for their golf bags, resort logo golf balls, and a divot tool as well as personalized scorecards and golf carts.

The golfers gathered after the tournament with several players from the NCS Soccer Friendly for a picturesque sunset patio reception and award ceremony.

First place with a score of 67 (five under par) went to Gretchen Brophy, Jason Makii, Hitoshi Kobata, and Christopher Junker. Second and third places were a tie with a score of 68. Second place was awarded to the team with the better score on the course's toughest hole and with a par. Second place went to Jordan Bonomo, Bill Knight, Ryan Arnold, and As'ad Ehtisham. Third place was awarded to Claude Hemphill, Ed Manno, Gary Bernardini, and Werner Hacke.

The long drive of the day went to Peter Andrews with a monster bomb, and the closest to the pin was awarded to Gary Bernardini who edged out Jordan Bonomo's "fringe" shot. Sadly, there was one casualty with Ed Manno's right ankle (or several ligaments) lost on the front nine in what could only have been a gopher hole.

Thanks to the NCS Golf Task Force, the entire outing was a blast, as well as a financial success. \$2300 was raised from the player's entry fees and an additional \$4500 was raised in hole sponsorships from various individuals and institutions. Special thanks to Sage Therapeutics for a \$5000 sponsorship of the outing. The task force's fundraising goal of \$10,000 was surpassed with the total of \$11,800! This money will be donated directly to the NCS Fund-A-Fellow Research campaign.

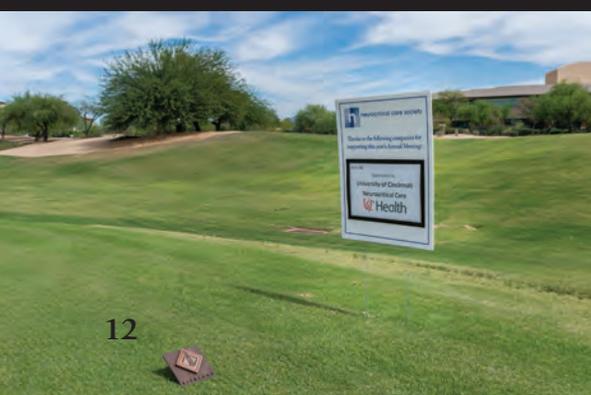
Special thanks to Lizzie Larson from the NCS Executive Office for the detailed organization of this tournament. It would not have happened without her!

William Knight, MD is a neurointensivist at the University of Cincinnati and an invited guest writer for Currents.

Golfers

Peter Andrews
Ryan Arnold (Sage Therapeutics)
Neeraj Badjatia
James Bartscher
Gary Bernardini
Jordan Bonomo
Gretchen Brophy
Cyrus Dastur
As'ad Ehtisham
Diana Greene-Chandos
Daryl Gress
Werner Hacke
Joseph Haymore

Claude Hemphill
Christopher Junker
Stephen Kanes (SAGE Therapeutics)
Bill Knight
Hitoshi Kobata
Aaron Lackamp
Jason Makii
Ed Manno
Eric Rosenthal
Wade Smith
Michel Torbey



First Unofficial NCS Annual Meeting Soccer (Fútbol) Match Scores a Victory in Scottsdale

By Hani Murad, MD and Pravin George, MD



Hani Murad, MD



Pravin George, MD

This year's NCS Annual Meeting in Scottsdale, Arizona was very successful and exciting. Not only did it bring the latest results of important recent studies in the field, but it also incorporated the first-ever multi-national unofficial soccer match where the NCS-U.S. took on the NCS-International.

It was a bright and beautiful Saturday afternoon following the intense international conference. All competitors were transported to the soccer field just a few miles away from the Scottsdale Westin-Kierland resort. Despite the hot weather, the energy level was high. The players only needed about a ten-second warm-up before taking positions on the field. The professional Croatian referee blew the first whistle and the battle started.

The U.S. team, captained by Dave Seder, started off very strong with experienced players such as Kevin Sheth and Javier Provencio moving the ball tactfully and attacking from all directions. Playing both long and short passes, it did not take them long before Teresa May scored their first goal.

The international team, captained by Julian Bösel from World Cup country Germany, seemed to be confused in the beginning, but they got their act together quickly. Skillful Pedro Kurtz from Brazil and Han Jeong from Korea charged the defensive line which jumpstarted their offense to start the counterattack. Susanne Muehlschlegel led the offensive and kept the pressure with German endurance and discipline until the Internationals scored and rallied to a tie.

Both teams used highly technical and sophisticated tactics. All the give and go, man-to-man marking, shielding, and skillful dribbling would have left Lionel Messi and Cristiano Ronaldo in total astonishment if they were watching (surprisingly they weren't)! All the players fought fiercely, going in for slide tackles and jumping and heading to score, not caring at all about any head trauma or brain injury.

The game kept on going with both teams changing their strategies in the second half. The Internationals had new hopes when key U.S. player Kevin Sheth was sent off after a red card and had to go directly to the airport. There were several missed chances

on both sides and the ever-changing goalkeepers did an amazing job defending their goals in crucial moments.

Pravin George and Hani Murad from the NCS U.S. team felt the challenge of their opponents until the end of the game. Despite the tired feet, dehydration, and hyperthermia, the pace remained fast and the players kept running with the ball. The end of the game became, in the words of Japanese player Yasuhiro Kuroda from the NCS International team, "a real nail biter!" The referee eventually blew the final whistle announcing the victory of the U.S. NCS team 9-7.

With all the competitiveness, the atmosphere was full of energy, fun, jokes, and laughs. It was a great way to close out the NCS Annual Meeting and everyone felt this to be a critical ignition to add more exhaustive action to the NCS meetings. The international team promised revenge next year at the Gaylord National Harbor in Maryland. You and your friends can be part of this soon-to-be tradition of the Annual Meeting! Just make sure to bring your cleats and shorts.

See you next year in Maryland!

Hani Murad, MD and Pravin George, MD are invited guest writers for *Currents*.



NCS Advocacy Committee Seeks Neurocritical Care Taxonomy Code

By Sarah Livesay, DNP, FNCS and Tamer Abdelhak, MD



Sarah Livesay, DNP, FNCS



Tamer Abdelhak, MD

With sponsorship from the American Academy of Neurology and support from the United Council for Neurologic Subspecialties (UCNS) and the Society for Neuroscience in Anesthesiology and Critical Care (SNACC), the NCS Advocacy Committee has petitioned the National Uniform Claim Committee (NUCC) for a Healthcare Provider Taxonomy Code for neurocritical care under the neurology specialty.

The taxonomy code is associated with a provider's National Provider Index (NPI) number and designates the provider's medical subspecialty. Many other specialties – including anesthesiology, pulmonology, and

surgery – already have a critical care taxonomy code. The addition of a neurology subspecialty code for neurocritical care will allow for similar subspecialty acknowledgement.

While this designation is not expected to impact inpatient professional fee billing greatly, critical care designation may be important as future billing and reimbursement is re-aligned under the Affordable Care Act (ACA). In particular, the code may be helpful in obtaining reimbursement for a patient seen as an inpatient by a neurocritical care provider who was seen within the last 90 days by a neurology provider of the same specialty, even if for a different problem altogether.

The taxonomy code request is currently under review by the National Uniform Claim Committee and we are hopeful for a successful application.

National Uniform Claim Committee

Home Announcements NUCC Structure Calendar 1500 Claim Form Code Sets Resources

- Undersea and Hyperbaric Medicine - 2083P0011X [definition]
- Psychiatry & Neurology -
 - Addiction Medicine - 2084A0401X [definition]
 - Addiction Psychiatry - 2084P0802X [definition]
 - Behavioral Neurology & Neuropsychiatry - 2084B0040X [definition]
 - Child & Adolescent Psychiatry - 2084P0804X [definition]
 - Clinical Neurophysiology - 2084N0600X [definition]
 - Diagnostic Neuroimaging - 2084D0003X [definition]
 - Forensic Psychiatry - 2084F0202X [definition]
 - Geriatric Psychiatry - 2084P0805X [definition]
 - Hospice and Palliative Medicine - 2084H0002X [definition]
 - Neurodevelopmental Disabilities - 2084P0005X [definition]
 - Neurology - 2084N0400X [definition]
 - Neurology with Special Qualifications in Child Neurology - 2084N0402X [definition]
 - Neuromuscular Medicine - 2084N0008X [definition]
 - Obesity Medicine - 2084B0002X [definition]
 - Pain Medicine - 2084P2900X [definition]
 - Psychiatry - 2084P0800X [definition]
 - Psychosomatic Medicine - 2084P0015X [definition]
 - Sleep Medicine - 2084S0012X [definition]
 - Sports Medicine - 2084S0010X [definition]
 - Vascular Neurology - 2084V0102X [definition]
- Pain Medicine -
 - Interventional Pain Medicine - 208VP0014X [definition]
 - Pain Medicine - 208VP0000X [definition]
- Radiology -
 - Body Imaging - 2085B0100X [definition]
 - Diagnostic Neuroimaging - 2085D0003X [definition]
 - Diagnostic Radiology - 2085R0202X [definition]
 - Diagnostic Ultrasound - 2085U0001X [definition]
 - Hospice and Palliative Medicine - 2085H0002X [definition]
 - Neuroradiology - 2085N0700X [definition]
 - Nuclear Radiology - 2085N0904X [definition]
 - Pediatric Radiology - 2085P0229X [definition]
 - Radiation Oncology - 2085R0001X [definition]
 - Radiological Physics - 2085R0205X [definition]
 - Therapeutic Radiology - 2085R0203X [definition]
 - Vascular & Interventional Radiology - 2085R0204X [definition]

Status Active
Code 2084N0400X
Type Level III Area of Specialization
Neurology
 A Neurologist specializes in the diagnosis and treatment of diseases or impaired function of the brain, spinal cord, peripheral nerves, muscles, autonomic nervous system, and blood vessels that relate to these structures.
Source: The American Board of Psychiatry and Neurology, Inc. [1/1/2007: new definition]

The Motorcycle Diaries of Neurocritical Care in Latin America

By Jose Suarez, MD, FNCS



It is a pleasure for me to write this column for the first time as NCS Secretary. I will be reporting on the amazing journey that several NCS officers have undertaken in the past several months across Latin America. Even though none of us travelled by motorcycle, I am using the title in a metaphorical sense to emphasize the transformative power of this journey for some of us who travelled to this beautiful land for the first time.

In addition, this journey (albeit still in progress and far from complete) served as reaffirmation of our longstanding friendship with our wonderful friends and colleagues and acknowledgment of the great work they are doing to promote neurocritical care in Latin America. We have travelled far and wide and have covered over 35,000 air miles. These trips represent to us a genuine and captivating picture of neurocritical care in Latin America.

There is no doubt in our minds that neurocritical care has matured in Latin America and that there is enormous interest to partner with the NCS. This breathtaking experience highlights the importance for the NCS to become the global organization

that all multi-professional neurocritical care practitioners should identify with and belong to. This is already very clear to me.



ENLS in Panama: Gene Sung, Gloria Rodriguez-Vega, Jose Suarez, Guadalupe Castillo, Cynthia Ocegueda Pacheco (from left)

We have now taught the ENLS course in Colombia, Mexico, Panama, and Puerto Rico. In addition, we have participated in several international, national, and regional meetings including the following: Colombian Critical Care Congress (Asociacion Colombiana de Medicina Critica y Cuidado Intensivo - AMCI); Sociedad Chilena de Medicina Intensiva - SOCHIMI); International Meeting in Neuromonitoring and Intensive Care (Latin American Brain Injury Consortium -LABIC); Asociacion Panamena de Medicina Critica y Terapia Intensiva; Sociedad Argentina de Terapia Intensiva (SATI); International Neurocritical Care Symposium (YACHAY, Ecuador); 2015 National Critical Care Week (Colegio Mejicano de Medicina Critica); 2015 World Congress of Neurology... and the list keeps growing!



LABIC Meeting: Jose Moretti, Gene Sung, Jorge Paranhos, Jose Antonio Carmona, J Claude Hemphill III, Walter Videtta, Luis Castillo, Jose Suarez, Jorge Mejia-Mantilla, Juan Diego Ciro, Maria Chumbe, Corina Puppo, Carla Rynkowski (from left)



Downtime in Santiago, Chile: J. Claude Hemphill III, Jose Suarez, Jose Moretti, and Gene Sung (from left)



International Neurocritical Care Symposium, Ecuador: Nelson Maldonado and Jose Suarez (from left)



National Critical Care Week in Guadalajara, Mexico: Romer Geocadin (center) at a panel discussion



Downtime in Santiago, Chile: Jose Suarez and Carlos Romero (Vice President SOCHIMI)

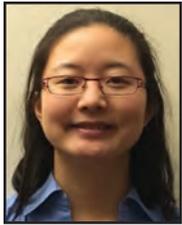
Resident and Fellow Task Force: Updates about the First NCS Meeting

By Saef Izzy, MD and Jennifer Kim, MD, PhD



Saef Izzy, MD

It's such an exciting time to see the NCS strategic and rapid growth in different aspects, and it's the time for all our members, including residents and fellows, to get involved in NCS activities. The Resident and Fellow Task Force was started by the NCS in 2015 as a new committee aimed to engage residents in the society's activities and get them more involved in the decision-making process.



Jennifer Kim, MD, PhD

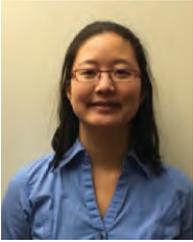
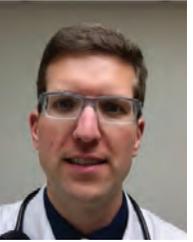
In this edition of *Currents*, I interviewed Jennifer Kim, the chair of the new Resident and Fellow Task Force to tell us more about their first inaugural meeting that took place at the 2015 NCS Annual Meeting in Scottsdale, Arizona.

SI: Before we talk about the meeting, the readers are probably curious about how the residents and fellows get selected to be members of the Resident and Fellow Task Force?

JK: Our initial criteria were based upon reviewing a short paragraph submitted about why the applicant was interested in joining the Resident and Fellow Task Force. We also wanted to select a broad group of members from different parts of the country, at different stages of training, and with different interests to represent many viewpoints. We received many competitive applications but, unfortunately, we had to select ten members only. Our plan is always to engage all our residents and fellows in our activities and get them involved in the NCS.

Who are the Resident and Fellow Task Force members?

We are very excited to introduce our first group of elected task force members.

<p>Yasmin Ali, MD: Duke University Hospital PGY 5</p> 	<p>Marin Darsie, MD: UNC-Chapel Hill PGY 5</p> 	<p>Jennifer Kim, MD, PhD: MGH-Brigham & Women's PGY 4</p> 	<p>Tobias Kulik, MD: Washington University PGY 6</p> 	<p>Deepa Malaiyandi, MD: University of Pittsburgh PGY 6</p> 	<p>Chitra Sivasankar, MD: Jackson Memorial Hospital PGY 5</p> 
<p>Sherri Braksick, MD: Mayo Clinic PGY 5</p> 	<p>Christian Hernandez, MD: Rush University Medical Center PGY 4</p> 	<p>Jonathan Kleinman, MD: UCLA PGY 4</p> 	<p>Winnie Lau, MD: Stanford University PGY 4</p> 	<p>Sirisha Sanamandra, MD: Yale New Haven Hospital PGY 3</p> 	<p>Anand Venkatraman, MD: University of Alabama at Birmingham PGY 3</p> 

Could you tell us more about the meeting and its major highlights?

Everyone was incredibly enthusiastic and full of great ideas to tackle during our first year of the task force, which took place in beautiful and sunny Arizona. During this meeting, we discussed multiple goals that we wanted to achieve in the upcoming years. Since it is a new task force, we decided to focus on three main objectives.

The first was to develop a mentorship and networking program for trainees. We would like to join efforts with the critical care section of the American Academy of Neurology to develop a combined mentorship program. Our goal is to develop a method by which to gather mentor volunteers and match interested trainees appropriately. We hope to have mentor program gatherings at both the NCS and AAN national meetings, with the hope to grow our efforts to other society meetings.

Our second goal is to strengthen our relationship with other national societies and increase our presence at their meetings. We would like to collaborate with the NCS Membership Committee to ensure a way to encourage trainees to join the NCS by advertising at booths at other national meetings. We will work with these other societies to develop forums and gatherings in which we can reach residents who may not have exposure to neurocritical care and inform them about our field and the NCS.

Finally, we'd like to discuss the possibility of starting a resident/fellow section of the *Neurocritical Care* journal and develop other board review resources. We look forward to working with all members of the NCS and increasing the resident and fellow involvement in the NCS!

The Stethoscope Drop Heard 'Round the World

by Michael Rogers, BSN, RN, CCRN



We are nurses. It is both our job title and what we do in our line of work: we *nurse* our patients back to health. We nurture, aid, care for, tend to, and watch over our patients and their families. The very name of our occupation describes what we do so it should not be surprising that many nurses' identities are strongly tied to their work. We quietly carry out our humble yet vital tasks and rarely find ourselves in the limelight until someone

realizes how extraordinary our everyday actions can be.

Kelley Johnson, a nurse herself, had one of these realizations while caring for a patient on an evening shift. When she entered the 2016 Miss America Pageant held this September, Johnson decided she would perform a monologue about her realization for the talent portion of the competition. Despite her supporters urging her not to perform the monologue and opt for a different talent (she also plays piano), Johnson stalwartly asserted that nursing *is* her talent.

Johnson donned her scrubs and her stethoscope that she wears every shift, and delivered her monologue. America listened to a story about "Joe," a man suffering from Alzheimer's disease, and how Johnson helped him realize that he is so much more than *just* his disease, as he helped her realize that she is so much more than "*just* a nurse." It was a beautiful moment for Johnson and resonated with nurses everywhere.

Johnson's touching account connected with so many viewers that the video of her performance quickly spread on social media and news outlets, garnering more than six million views. Though she did not win the competition (she finished as the second runner up), Kelley Johnson accomplished something even more amazing: in rediscovering the meaning of her own work, she helped every person watching understand the importance of nursing and our passion of helping our patients.

Well, almost every person. Following the competition, Michelle Collins, a co-host on *The View*, remarked that Johnson simply "read her emails out loud" during the talent portion. Collins' equally ill-informed colleague, Joy Behar, delivered the final sucker punch when she asked why Johnson was wearing "a doctor's stethoscope," as nurses everywhere figuratively and literally clutched their own stethoscopes in horror.

Kelley Johnson had inspired nurses with her vulnerability, her story of kindness, and remarkable human connection that comes with caring for someone at their absolute worst. It was an empowering moment for nursing as we repeated the mantra, "we are not *just* nurses." When the co-hosts of *The View* spoke, their words might as well have been, "you *are* just nurses." Johnson rekindled a fire in the hearts of nurses everywhere and *The View* threw gasoline on it.

The response was immediate and fierce. Nurses took to social media, posting photos of themselves wearing scrubs and stethoscopes with pride. The wildfire spread in the form of hashtags (#nursesmatter, #nursesunited, #nursesunite, #mytalentisnursing, #notjustanurse, and #nursesrock), creating a relevant and identifiable movement in support of nursing. And it was not only nurses. Doctors, therapists, nurses' aides, patients, administrators, and members of the interdisciplinary team chimed in with photos, first-hand accounts, and simple statements of support. Even advertisers pulled funding from *The View*.

What started as flippant comments rooted in deep misunderstanding turned into an incredible platform for education, awareness, and reaffirmation. *The View* invited Kellie Bryant, DNP and Larry Slater, PhD, RN from the NYU College of Nursing to discuss the education and role of nursing. While Slater stated that he could not speak for more than three million nurses currently licensed in the U.S., he did eloquently explain why Collins' and Behar's comments lead to such outrage.

Collins' and Behar's comments are symptoms of a greater public misunderstanding. While one incident is not enough to fill that knowledge gap, it served as an excellent start to increase awareness of the expansive scope of practice and dynamic nature of nursing. Nurses work in a variety of environments: hospitals, clinics, politics, law, education. Nurses can have associate, bachelors, and doctoral degrees. Nurses can come from myriad backgrounds, each one called to nursing for his or her own reason. I hope Kelley Johnson inspires the women and men touched by her story to join what is considered one of the most trusted and ethical professions.

This all began with a story about a connection between a nurse and her patient. These stories help one get through difficult shifts and are important to celebrate. In this spirit, I want to share a story of my own.

Back in 2013, I cared for a woman in the ICU who suffered a subarachnoid hemorrhage. The injury left her aphasic, restless, and inconsolable since she was unable to communicate effectively. I spent most of my shift at her bedside, talking to her and her husband about the disease process and what to expect but mostly holding her hand. The day was a struggle for all three of us. I did not see her again until two years later when she had a shunt revision. I saw her roll down the hallway from the OR and into her room on the unit.

She was not assigned to me but I helped her get settled into her room. I took her hand in mine and said, "You may not remember me but I took care of you the last time you were here on the unit." Her eyes remained closed but tears started to form at the corners as she replied with clear speech, "Michael?" At this point, it was difficult to manage a "yes" so I squeezed her hand in affirmation.

We are the voice our patients recognize after two years. We are nurses. We wear stethoscopes.

Michael Rogers, BSN, RN, CCRN is a neurocritical care nurse at the UT Southwestern Medical Center Neuroscience ICU. He is an invited guest writer for Currents.



Redesigned Trial of Deferoxamine for Intracerebral Hemorrhage Proceeding with Reduced Dose

By Robert Kowalski, MD



An ambitious, NIH-funded study of the effects of the chelating agent deferoxamine mesylate on outcomes in intracerebral hemorrhage (ICH) was halted in 2013 after several episodes of acute respiratory distress syndrome (ARDS) were observed. The trial has been re-launched and is proceeding with lower dosing and new stopping rules in place for adverse respiratory events.

The re-designed trial, started in October 2014, aims to enroll 294 patients with spontaneous ICH, randomized to intravenously infused deferoxamine for three consecutive days, or to placebo. Outcome will be assessed at 90 days using the modified Rankin Scale (mRS), with a good functional outcome defined as mRS of 0-2.

The dose of deferoxamine is 32 mg/kg/day in the new study, now called the Intracerebral Hemorrhage DEFeroxamine Trial (iDEF).

“Our goals remain the same, to show that it is not futile to move deferoxamine forward into phase three testing as a treatment for ICH and to confirm that treatment with IV deferoxamine at a dose of 32 mg/kg/day for three days is safe and well tolerated by ICH patients,” said Magdy Selim, MD, PhD, Associate Professor of Neurology at the Harvard Medical School and principal investigator of the trial.

The iDEF trial now has 34 participating sites in the U.S. and Canada, with a target enrollment completion in October 2017. Enrollment in iDEF began in November 2014, after the revised protocol was approved by the FDA, Health Canada, and local IRBs. To-date 86 patients have been recruited in the iDEF study.

“Our safety data from the first two interim analyses in iDEF suggest that this duration of treatment with the current dose (32 mg/kg/day) seems to be well tolerated,” Dr. Selim said.

The initial Phase II futility trial, titled High-Dose Deferoxamine in Intracerebral Hemorrhage (HI-DEF), was designed with IV infusion of deferoxamine at 62 mg/kg/day for five consecutive days.

Enrollment in HI-DEF began in March 2013 and was suspended by the study Data Safety Monitoring Board (DSMB) in October 2013 after five of 42 patients experienced ARDS, and three patients died. Two of the three deaths were believed to be related to ARDS, Dr. Selim said.

“ARDS is a known complication of both ICH and treatment with prolonged infusions of high doses of deferoxamine. So, it was not easy to figure out if the observed increase was related to ICH itself or deferoxamine,” Dr. Selim said.

“We used a high dose of deferoxamine (62 mg/kg/day, the maximum tolerated dose that we identified in our small phase I trial) for five days. We suspected that this high dose and long duration of treatment likely contributed to the increased pulmonary toxicity of the drug,” he said.

Deferoxamine is an iron-chelating agent, which is thought to interact with hemoglobin-degradation products in ICH and may improve outcomes in this hemorrhage type by reduction of perihematoma edema, and other possible mechanisms.

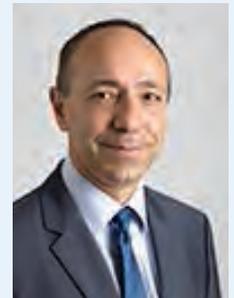
As a result of the DSMB review of the initial phase II trial, several changes were incorporated into the new study design, including a shorter duration of drug infusion, an extended follow up to six months, and stopping rules when ARDS is observed at several enrollment time points. Additional precautions were taken to exclude patients at high risk for developing ARDS from the trial, Dr. Selim said.

As with the earlier HI-DEF trial, the revised iDEF study is based at the Beth Israel Deaconess Medical Center in Boston with statistical and project management support from the Medical University of South Carolina. The iDef Trial is supported by the National Institute of Neurological Disorders and Stroke under a U01 funding mechanism. Phase I was supported by R01 grant funding.

The early phase II study provided important guidance for ongoing work with deferoxamine in the patient population with intracerebral hemorrhages, Dr. Selim said.

“The 62 mg/kg/day dose that we used in HI-DEF was chosen because it was the maximum-tolerated dose in our phase I trial. We obviously did not realize the potential pulmonary toxicity of this dose in phase I because only six patients received this high dose in this study, and thought that the higher the dose the better the response,” Dr. Selim said.

“The important lesson here is that more is not always better as we learned from HI-DEF,” Dr. Selim said.



Magdy H. Selim, MD, PhD

Comparison of Initial and Revised Futility Trials of Deferoxamine for Intracerebral Hemorrhage

	HI-DEF	iDEF
Title	High-Dose Deferoxamine in Intracerebral Hemorrhage	Intracerebral Hemorrhage DEFeroxamine Trial
Trial design	Early Phase II, futility	Early Phase II, futility
Study timing	Enrollment started March 2013 Enrollment suspended October 2013 Enrollment terminated February 2014	Amended protocol May 2014 Enrollment started November 2014 Target enrollment end 2017
Sample size	324 spontaneous ICH	294 spontaneous ICH
Active Drug Dose	62 mg/kg/day, IV infusion	32 mg/kg/day, IV infusion
Drug Duration	5 consecutive days	3 consecutive days
Follow up	3 months	6 months
New stopping rules		5 ARDS in first 40 subjects 10 ARDS during subjects 41-80 12 ARDS during subjects 81-120 Significant difference in ARDS between groups at 40, 80, 120 subject enrollment points

Implementation of the New Guideline for the Determination of Brain Death in Germany

By Katja Wartenberg, MD

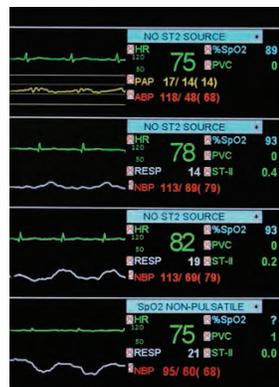


Following a recommendation of the scientific forum, the German Medical Board (Bundesärztekammer) approved a new regulation for the determination of death and of the final, irreversible loss of cortical, brain stem, and cerebellar function on March 30, 2015.

The most important and impacting changes include:

- The term "brain death" is replaced by irreversible loss of cerebral function.
- The determination of irreversible loss of cerebral function can only be executed by two board certified physicians with experience in management of intensive care patients with acute severe brain injury. At least one physician has to be board certified in Neurology or Neurosurgery, for patients <18 years in pediatrics or neuropsychiatry. All are required to be able to diagnose, execute, and interpret the results of the applied additional diagnostic tools.
- The approved additional diagnostic tools include EEG, auditory and somatosensory evoked potentials, transcranial Doppler ultrasonography, SPECT, CT angiography, or cerebral angiography. All assessments of cerebral blood flow require a mean arterial pressure (MAP) of greater than 60 mm Hg and two examinations after a time interval of 30 minutes.
- The hospitals that employ qualifying physicians for the determination of irreversible loss of brain function are required to provide quality assurance in a standard operating procedure and to participate in quality control registries.
- The clinical examination includes the confirmation of unresponsiveness, dilated and fixed pupils, bilateral loss of the oculocephalic or vestibuloocular reflexes, bilateral loss of corneal reflexes, loss of reactions/reflexes to painful stimuli in the supply area of the trigeminal nerve and in other areas, loss of the pharyngeal and tracheal reflexes as well as loss of respiratory function. If all those items cannot be evaluated during clinical examination, an additional diagnostic tool is applied.
- The apnea test requires a baseline pCO₂ of 35-45 mmHg (4.7-6 kPa) measured with temperature correction.
- The protocol for documentation of irreversible loss of brain function has extended and now encompasses documentation of the qualification of the examining physician through the respective board certification and experience.

CT angiography is now approved as a diagnostic test to document the absence of cerebral circulation which is easier to obtain than a SPECT scan.



However, the requirements for the qualification of physicians raise the threshold for all non-academic and smaller hospitals to be able to diagnose patients with irreversible loss of brain function, especially during off-hours and weekends. The German Organ Donation Organization provides a registry of at least one qualified physician, usually board-certified in Neurology and Neurocritical Care, per state who can be contacted to evaluate patients in hospitals without a qualified physician.

Now a second qualified physician is required. Other questions



are: When is someone qualified? How many determinations of irreversible loss of brain function are necessary and should be documented to consider someone qualified enough? Should the training be part of the residency in Neurology and Neurosurgery or the fellowship in Neurocritical Care? How do we provide quality control outside of centers with neurocritical care providers?

The German societies for Neurology (DGN) and NeuroIntensive Care and Emergency Medicine (DGNI) are currently working on a curriculum including e-learning, courses, and training offered during the yearly meetings and during neurocritical care workshops such as the IGNITE summer school.



Compromising Between Autonomy and Beneficence

By Thomas Lawson, MS, RN, ACNP-BC



Consider the following case: A 30 year old man with six months of dysphagia and a 60 pound weight loss was presumptively diagnosed with a brainstem glioma by MRI. He was admitted to the neuro-oncology service for evaluation of hypoxia. He was transferred to the Neuro ICU due to concern for airway protection and electively intubated. A tracheostomy and PEG tube were subsequently placed.

He retained alertness, cognition, and sensorimotor function of his extremities, but had severe bulbar dysfunction. Adequate enteral feeding was administered via his PEG tube and he required mechanical ventilation due to central hypoventilation and carbon dioxide retention, necessitating his stay in an ICU.

The nursing staff discovered that visitors were bringing in food, candy, and chewing gum at the patient's request. He was hiding these items on his person and attempting to eat and chew despite his severe dysphagia resulting in several courses of aspiration pneumonia. On these occasions, bronchoscopy was performed to retrieve the food and gum from his airway. The patient and his family were repeatedly counseled to avoid anything by mouth and provided with supporting physiologic rationale for this recommendation.

The care team pointed out to the patient the discrepancy between his stated desire to continue aggressive treatment with curative goals and his actions that were contrary to his statements. Since he did not have uncomfortable choking symptoms while aspirating, he was compassionately offered the option of palliative treatment including the option to eat for taste with the forewarned understanding that it would likely result in death due to hypoxic respiratory failure from aspiration pneumonia.

He declined this option citing his desire to get better and go home. Staff were frustrated by their obligation to try to help the patient when he seemed to be repeatedly sabotaging their efforts by harming himself. In an attempt to resolve the patient's cognitive dissonance, he was counseled numerous times with varying approaches to link his behavior with subsequent outcomes.

An ethical dilemma emerged during this patient's prolonged hospitalization between his right to autonomy and beneficence. He claimed to understand both his inability to swallow safely due to the brainstem lesion and the dangers of aspirating. A multidisciplinary group including the Neuro ICU, psychiatry, and ethics consultants came together to evaluate options. The team determined that the patient possessed decision-making capacity.

Ultimately a compromise was reached which involved limited and supervised palliative tasting in which the patient was allowed to chew some food then spit. This partially mitigated some of the aspiration risk and partially satisfied the patient's desire to eat: a compassionate compromise. He was eventually discharged to a facility, then to home. Retrospectively analyzed from a utilitarian standpoint, this approach worked.

If one could imagine an *ideal* ethical dilemma, the conflicting principles would easily prioritize themselves, presenting a viable solution. Complex situations such as this case however require the time-consuming hard work of hashing out which root principle should dominate or, in this case, create a compromise. If a win-win solution was readily available, there would be no dilemma. Practitioners may consider negotiating a suite of solutions with the lowest risk for violating the conflicting principles.

When analyzing conflicts between autonomy and beneficence there is debate as to which principle should generally win out. To exercise autonomy, a patient must be adequately informed. The concept of autonomy includes self-direction, creating a life plan, reasoning about that plan, and acting on that plan. But illness alters these plans. In particular reasoning can be affected by distraction from pain, anticipation of death, and fear, even if decision-making capacity is retained.

Healthcare providers are bound to beneficence—it is the driving force behind our careers. Both parties, the provider and the patient, are moral agents and the values of both deserve respect. In some cases of autonomy versus beneficence, resolution may occur through severing the relationship. Severance proves more difficult in a critical care setting than, for example, a case involving medication adherence in an outpatient setting.

In a society defined by individualism and moral pluralism, no prescriptive solution can be imposed—only analysis, clarification, and negotiation. This does not imply the practitioner must endorse moral relativism. And while the healthcare providers *are* moral agents, caution must be exercised not to impose the values of the care team upon unwitting patients or their surrogates.

Thomas Lawson, MS, RN, ACNP-BC is a neurocritical care nurse practitioner at The Ohio State University Wexner Medical Center and a member of the NCS Ethics Committee. He is an invited guest writer for Currents.

Neurocritical Care Society Pharmacy Committee Year in Review

By Amber Castle, PharmD, BCPS



This has been an incredible year for our team filled with many successes! Currently, we have over 80 pharmacist members in the NCS. Neurocritical care pharmacists were well represented throughout the conference with over a dozen posters, numerous award recipients, presentations in the main conference sessions, and the best attendance to date at the Pharmacotherapy Workshop.

Thank you to all the Pharmacy Committee members that have served this past year for your service and dedication. We would like to welcome the incoming Pharmacy Committee members: Jen Bushwitz, Katleen Chester, Aaron Cook, Olabisi Falana, Haley Gibbs, Kristy Greene, Jimmi Hatton, Theresa Human, Morgan Jones, Kimberly Levasseur-Franklin, Chris Morrison, Jeff Mucksavage, Mehrnaz Pajoumand, Nicholas Panos, and Andrea Passarelli. Amber Castle is the committee chair with Eljim Tesoro serving as co-chair.

Pharmacotherapy of Neurocritical Care Series (PONS)

Perhaps the greatest achievement this year is the launch of the Pharmacotherapy of Neurocritical Care Series (PONS) led by outgoing section chair Theresa Human. This on-demand webinar series currently offers three core pharmacotherapy topics with regular new releases scheduled throughout the year. The PONS series is a wonderful tool to teach clinicians to care for this unique patient population and enhance the educational mission of the NCS.

NCS Annual Meeting

Over 40 pharmacist members attended the Annual Meeting in Scottsdale, AZ this year. Eljim Tesoro, Haley Gibbs, and Shaun Rowe did an outstanding job serving on the Annual Meeting Planning Committee.

The pharmacy concurrent session, co-chaired by Haley Gibbs and Eljim Tesoro, featured controversial topics such as the 'Use of Platelet Function Testing in Endovascular Neurosurgery' (presented by Keri Kim), 'Reversal Strategies for Antiplatelet Agents' (presented by Timothy Lassiter), and 'Antiplatelet versus Anticoagulant Therapy in Cervical Artery Dissection' (presented by Katleen Chester).

The Pharmacotherapy Workshop showcased many great speakers including Leslie Hamilton, Henri Vaitkevicius, Karen Berger, Morgan Jones, Olabisi Falana, Jason Makii, Kimberly Levasseur-Franklin, and Eljim Tesoro.

Presidential Citations and Awards

The NCS Presidential Citation is an award that recognizes members of the society who have put forth extraordinary effort. Pharmacy section recipients included Jennifer Bushwitz, Amber Castle, Aaron Cook, Haley Gibbs, Denise Rhoney, and Eljim Tesoro. In addition, this is the first year that the NCS has awarded the Presidential Distinguished Service Award,

which is bestowed based on multiple nominations by committee chairs and senior leadership of the society to members who have shown remarkable support and dedication to the society. Theresa Human was awarded this honor.

We would also like to congratulate all of the 2015 Travel Grant Award recipients including pharmacy section members Kent Owusu, Leslie Hamilton, and Edward Van Matre.

Guideline Development

Pharmacy section members contributed to the development of two guidelines which were presented at the Annual Meeting: Keri Kim and Xi Liu for the 'Thromboprophylaxis of Venous Thrombosis in Adult Patients with a Neurological/Neurosurgical Diagnoses in an Intensive Care Unit,' Shaun Rowe for 'External Ventricular Drain Management,' and Aaron Cook and John Lewin III (who also co-presented) for the 'Reversal of Antithrombotics in Intracranial Hemorrhage.'

Aaron Cook has accepted the role of co-chair for guideline development. In addition, Chris Morrison, Theresa Human, and Judith Jacobi are collaborating with other society members on the upcoming 'Therapeutic Temperature Management' guideline.

ENLS version 2.0

A revised version of ENLS was rolled out during the Annual Meeting which includes pediatric neurocritical care, neurocritical care for early responders, and updated pharmacotherapy information within each chapter. Representing the pharmacy section, Chris Morrison led the effort to incorporate these enhancements. An additional pharmacotherapy chapter was added to this version authored by pharmacy members Gretchen Brophy and Theresa Human.

On behalf of the Pharmacy Leadership Committee of the NCS, I would like to thank everyone for a great year!



NCS Treasurer and Pharmacy Section member Gretchen Brophy, PharmD at the Annual Meeting

Journal Watch

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



Susanne Muehlschlegel, MD, MPH, FNCs



Chad Miller, MD, FNCs

Mannitol use is not associated with differences in outcome in acute intracerebral hemorrhage

Wang X, Arima H, Yang J, et al. *Stroke* 2015;46:2762-2767

There is currently no evidence of a treatment effect of mannitol in acute ICH. In the largest study to date, the authors included 2,526 patients with acute ICH from the INTERACT2 study. This trial randomly assigned hypertensive patients with spontaneous ICH within 6 hours of onset to intensive (SBP<140) or guideline-recommended (SBP <180) therapy. The current study aimed to determine the impact of mannitol use on clinical outcome (death or major disability) at 90 days post-ICH, and tested the hypothesis that mannitol would improve outcomes in patients with more severe ICH. The authors conducted a propensity score (PS) analysis with multivariable adjustment

to reduce imbalances, because there was a significant inconsistency in baseline variables between patients treated with and without mannitol.

To show consistency of the results, various methods of matching and weighting were used to account for the nonrandom allocation of mannitol. Further, pre-specified subgroup analyses, as well as sensitivity analyses were undertaken to show consistency of any associations on outcome. Eleven percent of patients were excluded due to missing outcomes or covariate data. A total of 1,678 patients were PS matched 1:1 (839 mannitol and 839 non-mannitol treated). Before PS matching, mannitol treated patients had higher baseline hematoma volumes (12 vs. 9 ml), were more likely to be admitted to the ICU and receive any surgical intervention, were less likely to have received hemostatic therapy (because they were less likely to have been on warfarin), have pre-existing stroke, heart disease, diabetes, or be on statins or antihypertensives.

PS matching was not successful in eliminating the imbalance in surgical or medical treatments, which is why this was further adjusted for in the multivariable models. Safety analyses revealed significantly fewer serious adverse events over 90 days in the mannitol-treated patients, however it is not clear whether and how this analysis was adjusted for. In the PS and treatment-adjusted analysis, there was no association of mannitol treatment with 90-day outcome (OR 1.02; 95% CI 0.81-1.30; p=0.86). These results were confirmed by various PS analyses. There was also no association with death and major disability separately.

Primary subgroup analyses revealed an association of mannitol and reduced poor outcome in patients with larger (≥ 15 ml) hematomas (OR 0.52; 95% CI 0.35-0.78; p=0.02), but sensitivity analyses using different cutoff points (10 and 20ml) did not confirm this finding. There were also no associations for mannitol use with greater or lesser clinical severity (NIHSS ≥ 15 as cutoff). It was not possible to include "China region" in the PS building, because it was too closely associated with mannitol treatment and outcome, and would have been insensitive as a discriminator of mannitol-related outcomes. Therefore, the cohort was stratified by "China region" vs. "non-China region." Analysis of patients recruited from China showed a similarly neutral association of mannitol and outcome as seen for the whole population, even when stratified by larger vs. smaller ICH (15ml cut-off). However, in non-Chinese patients, use of mannitol was associated with an increased risk of death or major disability.

This largest study to date investigating the impact of mannitol in patients with acute ICH was carefully conducted with a detailed pre-determined PS matching analysis plan utilizing a variety of PS matching techniques and multivariable model building with subgroup and sensitivity analyses that took account of imbalances in baseline and management covariates. Although an apparent benefit of mannitol was found in patients with hematomas larger than 15ml, this was not consistent across other cutoff points, as well as different grades of neurological severity. This suggests that it was most likely a spurious finding, as acknowledged by the authors. The inconsistency of the impact of mannitol between Chinese and non-Chinese patients may have been because of other disease and management factors. This was supported by a lower proportion of poor outcome in Chinese patients with the same baseline modified ICH score as non-Chinese patients. It is certainly possible that the substantial proportion of Chinese patients in the overall cohort may have skewed the results towards neutral based on the fact that mannitol is routinely used for Chinese ICH patients.

In fact, the INTERACT2 study has previously been criticized for its limited racial diversity with a large proportion of subjects recruited from China. The authors mention that there was no evidence of harm with the use of mannitol in terms of renal, cardiac, or neurologic complications from rebound intracranial hypertension. However, it is not clear from the data provided whether this safety analysis was adjusted or not. As in any non-randomized study, additional biases may not have fully been accounted for. These included different treatment approaches in different hospitals and countries, as well as selection biases. Finally, the indication for mannitol administration remains unclear. It was not given for elevated intracranial pressure, because these patients were excluded from the trial.

Hypothermia for ICP control does not result in improved outcomes after TBI

Andrews PJD, Sinclair HL, Rodriguez A, et al. *New Eng J Med* 2015
E-pub before print

This is a multi-center international randomized trial comparing induced hypothermia and standard ICP control measures for patients suffering TBI complicated by intracranial hypertension. Patients were eligible for enrollment if they suffered closed TBI requiring ICP monitoring and experienced ICP >20 mm Hg for 5 minutes despite standard stage 1 treatment measures (CSF drainage, sedation, ventilation control, elevated head of bed, surgical evacuation of mass lesion, and maintenance of cerebral perfusion). Enrollment was required within 10 days of injury and patients were required to have abnormal head CT findings and be expected to survive for at least 24 hours. Study exclusion included pre-randomization use of hypothermia or barbiturates or hypothermic presentation ($T < 34^{\circ}\text{C}$).

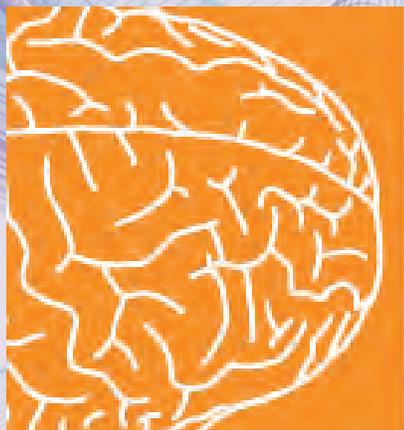
Subjects underwent randomization into induced hypothermia (HYPO) or control (CON) groups, which considered balanced allocation of age, medical center, GCS motor score, time from injury, and pupillary reactivity. Stage 2 ICP lowering interventions included inotropes for CPP maintenance and hyperosmolar therapy. The CON group had stage 2 therapies added as needed. The HYPO cohort had stage 2 interventions only if needed after cooling implementation. Either group was eligible to receive stage 3 interventions for refractory intracranial hypertension as needed (barbiturate sedation or decompressive craniectomy). Primary study outcome was designated as blinded assessment of the Extended Glasgow Outcome Scale (GOS-E) 6 months after injury. Outcomes of death, vegetative state, and severe disability were pooled to represent unacceptable clinical outcomes.

Study protocols were created to guide cooled saline induction, shivering management, and rewarming. HYPO patients were cooled to $32\text{-}35^{\circ}\text{C}$ for 48 hours or longer. The depth and duration of cooling were driven by ICP control. Enrollment was planned for 600 patients. Recruitment was stopped by the study steering committee after concluding that harm was possible and futility was likely. At the time of study cessation, 2,498 patients had been screened and 387 subjects enrolled. Many patients were

excluded from enrollment (41%) due to lack of ICP elevation. The baseline demographic and injury severity characteristics were similar for the 195 HYPO and 192 CON subjects.

Mean daily ICP was similar between the two groups (adjusted mean difference -0.48 ; 95% CI -2.04 to 1.08 , $p=0.55$). The HYPO group had a colder temperature over the first 7 days of treatment (adjusted mean difference -2.14 ; 95% CI -2.34 to 1.94 , $p < 0.001$). Stage 3 therapies were more common in the CON cohort (54.0 vs. 43.8%, $p=$ not provided), though craniectomy rates were similar. Six-month GOS-E had an unfavorable shift for the HYPO group (adjusted odds ratio 1.53; 95% CI 1.02-2.30, $p=0.04$). Favorable GOS-E outcomes (5-8) were seen in 25.7% of HYPO and 36.5% of CON subjects ($p=0.03$). Temperature targets were achieved at least 80% of the time in 64.8% of HYPO ($32\text{-}35^{\circ}\text{C}$) and 68.8% of CON subjects ($>36^{\circ}\text{C}$).

Prior studies evaluating the neuroprotective benefits of severe TBI patients have failed to demonstrate clinical efficacy, but routinely showed improved ICP control. *This large multi-center trial failed to demonstrate improved outcomes with induced hypothermia among a cohort with intracranial hypertension.* It is surprising that minimal difference in ICP control were noted between the CON and HYPO group. This may suggest that stage 2 therapies were routinely successful and that, perhaps, the severity of intracranial hypertension was more modest than noted in previous studies. It may also indicate that any clinical benefit seen in this study would have had to result from neuroprotective rather than ICP lowering properties of cooling. The intensity of treatment for stage 2 interventions were not tracked. Patient temperature in the CON group appears to have been well controlled. A CON arm with rigidly managed fever avoidance may have limited the detection of treatment benefit associated with hypothermia.



ENLS

EMERGENCY NEUROLOGICAL LIFE SUPPORT

FRESH Score App – Functional Recovery after Subarachnoid Hemorrhage

By Susanne Muehlschlegel, MD, MPH, FNCS



At the recent NCS Annual Meeting in Scottsdale, Jens Witsch and colleagues from Columbia University presented their research on the derivation and validation of a functional recovery parsimonious score predicting the 12-month modified Rankin Scale (mRS) after subarachnoid hemorrhage. Derived from 1,619 consecutive, prospectively collected aneurysmal subarachnoid

hemorrhage patients enrolled in the Columbia SAH outcome project (1996-2014), the group presented the FRESH Score (“Functional Recovery Expected after SAH”).

The final score included age (dichotomized at 70 years), presenting Hunt & Hess grade, APACHE II, and rebleed within 48 hours (yes/no). The authors also developed prediction scores for cognitive performance (FRESH Cog Score using Telephone Interview for Cognitive Status) and quality of life (FRESH Quol Score using the Sickness-Impact-Profile) at 12 months. The FRESH Cog Score was adjusted for years of education and the FRESH Quol Score was adjusted for pre-morbid disability using the pre-morbid Glasgow Outcome Scale.

Finally, validation of these scores was conducted on an external cohort of 413 SAH patients from the CONSCIOUS-1 Study. Per the abstract, the area-under-the-curve (AUC) values for the scores were: FRESH Score 0.90, FRESH Cog Score 0.80, and FRESH Quol Score 0.78. External validation of the FRESH Score showed an AUC of 0.73. The other two scores could not be validated due to the lack of corresponding outcome data collected. Unfortunately, at the time of the deadline for this article, the manuscript had not been published yet. We will be on the lookout to understand more detail about the science behind the score, including handling of missing data.

In parallel with the development of the FRESH Score, the authors also built a smart phone app (by Sweta Patel), which is available for free download from the Apple App Store. It is compatible with all Apple products, and requires iOS 8.2 or later. It is currently not available for other smart phone platforms.

The home screen allows the entry of all data on one single screen. The APACHE II score is part of the FRESH Score, and requires the entry of 11 different laboratory values. In order to avoid a second screen for data entry, the laboratory value fields are quite small, requiring the user to concentrate greatly on the entry of the correct value in the correct field. I can imagine that users with large fingers may find the entry fields to be difficult to tap. While the authors attempted to create a “parsimonious” score, the entry of the required APACHE II values is cumbersome and looking them up takes several minutes, making the app a bit labor intensive.

Once all data has been entered, one clicks “calculate score” and the score value is displayed. One has the option to then click “FRESH Score Interpretation,” which reveals a data table with all possible score values, highlighting the row of the calculated score and percentages of the projected 12-month mRS categories. Once the FRESH Score has been calculated, one has the option of also calculating the FRESH Cog Score and FRESH Quol Score. Both require the entry of one additional variable (years of education and pre-morbid GOS, respectively), and both results are again shown in a data table.

Despite its “crammed” appearance on the screen, I find this app helpful, as it answers the question of “how will my loved one do?” using prognosticators that are available early on. It is also derived from and externally validated in patients admitted and treated within the last 15 years in the era of modern neurocritical care.

Questions remaining are: what role does delayed cerebral ischemia play in terms of cognitive outcomes and why was it not part of the scores? It has been one of the strongest predictors of poor outcome after SAH, so I find it surprising that it did not make it into the score. While we await publication of the manuscript, I commend the authors for creating this useful iPhone app, which will likely add to the rapid dissemination of the score at the bedside.



Verizon LTE 07:16 92%

Age: ≤70 years old >70 years old

Hunt & Hess Grade: 1 2 3 4 5

Apache II phys: (choose the worst values over the past 24 hours for all 11 criteria)

MAP: 65 HR: 89 RR: 20

Temp: 38 WBC: 12 Hct: 34

Na: 134 K: 4 Cr: 110

Aa Gradient: OR PaO₂: 125
(if FiO₂ ≥50%) (if FiO₂ <50%)

Arterial pH: 7.34 OR HCO₃:
(if ABG available) (if no ABG)

Rebleed: No Yes
within 48 hours

Calculate FRESH Score

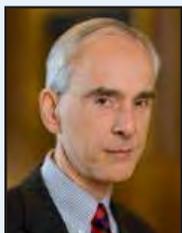
3

Interpretation

FRESHCogScore FRESHQuolScore

Coming Up in Neurocritical Care

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



The year 2016 will open with a bang—three new guidelines published by the NCS in the *Neurocritical Care* journal.

The journal is of course the perfect vehicle for publication of guidelines and scientific statements with several published in the past and easily assessable for subscribers.

When we publish the first issue of 2016,

we will keep the papers open access for a week to facilitate communication and distribution. These new guidelines demand attention because the topics are on common complex decisions and a comprehensive critical review perusing all relevant papers had not been comprehensively addressed before.

These guidelines also demonstrate a continuous advancement in vetting of the literature, consensus building, and writing by the NCS Guidelines Committee. Guidelines are difficult to produce because they must provide fair and reliable recommendations and eventually allow evidence-based decision-making during patient care.

In each of these guidelines, a “committee of experts” was recruited from within the NCS. For each guideline, clinical questions were generated and divided into four components based on the so-called Oxford PICO questions (P: population/patient, I: intervention/indicator, C: comparator/control, and O: outcome).

The committees utilized GRADE methodology to adjudicate the quality of evidence as high, moderate, low, or very low based on their confidence that the estimate of effect was close to the true effect. They generated recommendations only after considering quality of evidence, relative risks and benefits, patient values and preferences, and resource allocation.

The committees faced a common concern: the paucity of evidence. Nonetheless, recommendations could be distilled from a large body of literature sometimes with personal opinion seeping through in conclusions such as “strong recommendation, low quality evidence.”

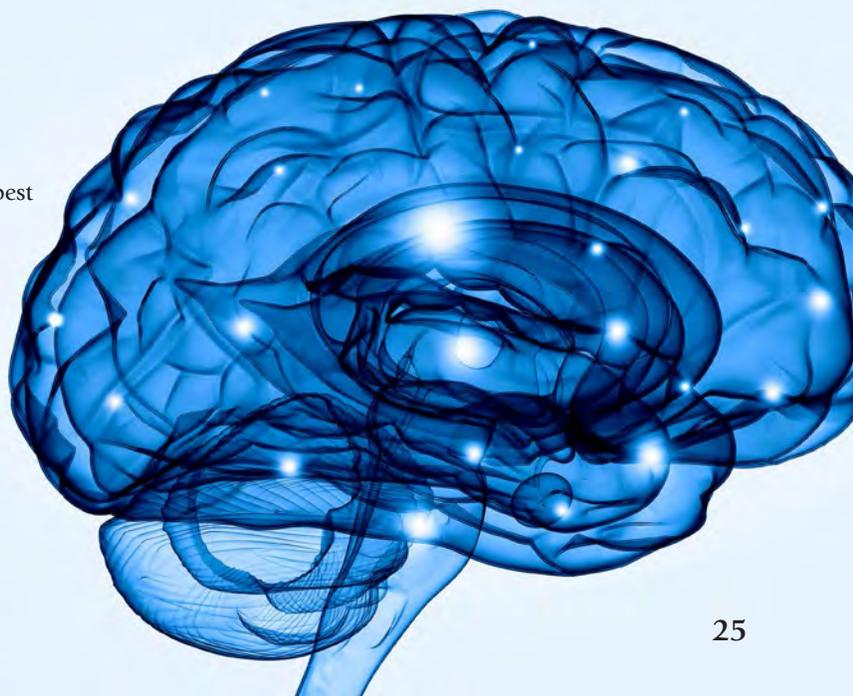
One guideline involves the insertion and management of ventriculostomy drains. There are considerable differences in management between providers and concerns over the rate of complications such as infection, malposition, and hemorrhage. The paper provides statements about thromboembolism prophylaxis, antimicrobial impregnated catheters, and how to best adhere to a bundle of care.

The second guideline involves reversal of anticoagulation in intracranial hemorrhages. In conjunction with the Society of Critical Care Medicine, an international committee with a diverse group of experts provided recommendations for the reversal of warfarin, direct factor Xa antagonists, direct thrombin inhibitors, unfractionated heparin, low molecular weight heparin, thrombolytics, and also antiplatelet agents. Apparently resumption of anticoagulation — a much more nebulous area — will be addressed in a future guideline.

A third guideline is on prophylaxis of venous thrombosis. The goal of this guideline is to provide an evidence-based manuscript to address the appropriate administration of thromboprophylaxis (pharmacological and mechanical prophylaxis) in patients with neurologic illness and thus the paper specifically addresses decisions in patient with ischemic stroke, intracranial and intraventricular hemorrhage, aneurysmal subarachnoid hemorrhage, traumatic brain injury, spinal cord injury, brain tumors, acute neuromuscular disorders, and patients undergoing neurosurgical and neurovascular interventions.

The Institute of Medicine has set standards for trustworthy guidelines. These standards demand the most up-to-date literature, expert consensus, and public input. The standards include establishing transparency, management of conflict of interest, guideline development group composition, clinical practice guideline–systematic review intersection, establishing evidence-based foundations for rating strength of recommendations, articulation of recommendations, external review, and updating (iom.nationalacademies.org).

The membership should be proud of the NCS Guideline Committee for meeting these standards and keeping us informed. It is hard and frustrating work but the end result will impact our practice and certainly for some individualists. Changing practice based on good evidence is the new norm. There is nothing better than that.



State-of-the-Art Neuro ICU Launches at New Parkland Memorial Hospital

By Michael Rubin, MD



Its dimensions and price tag are Texas-sized, comparable in size and cost to the Dallas Cowboys' AT&T Stadium. The massive new Parkland Memorial Hospital in Dallas opened for patient care on Aug. 20, 2015, launching a new chapter in the 121-year history of the legendary hospital. The largest healthcare construction project in the nation, the new medical complex encompasses 2.8 million square feet, has 862 private patient rooms, and cost \$1.326 billion.

One of the busiest hospitals in the U.S., Parkland is also a teaching hospital for The University of Texas Southwestern Medical Center. State-of-the-art technology, evidence-based healing design concepts, and sustainability are hallmarks of the new safety net hospital that replaced the aging 60-year-old hospital. The new Parkland promotes excellence in clinical care, teaching, and research in a technologically-advanced and easily accessible environment. The hospital was designed and built with input from physicians, nurses, and other clinical staff along with patients and a community advisory committee.

All of the neurosciences are housed together on the 16th floor of the massive 17-floor hospital, offering 66 private patient rooms, including 12 rooms dedicated to the Neuro ICU. Step down beds can be easily converted into ICU beds in the case of overflow.

Among the features of the new Neuro ICU:

- Single, private patient rooms, each with large windows and abundant natural light, private bathroom with shower, and a family area with sleep-sofa to encourage family involvement with their loved one's care
- Each ICU room is equipped with ceiling-mounted EVD booms designed to specifications of the Neuro ICU team that can be easily moved out of the way to facilitate care such as placing ventricular drains
- A dedicated CT scanner located on the unit
- On-stage, off-stage model provides comfort for patients as well as efficiency for staff
- Advanced technology includes patient footwall digital display screens in each room
- Nurses and fellows carry special phones allowing secure texting of PHI, eliminating need for time-consuming paging and callback
- Open work areas facilitate staff interactions across disciplines

The neurocritical care group works in close collaboration with nursing leadership and the renowned neurological surgeons of UT Southwestern. Both groups have the same collaborative relationship at the Zale Lipshy University Hospital of UT Southwestern Medical Center. The new Neuro ICU at Parkland Memorial Hospital is staffed by six attending physicians from the UT Southwestern Division of Neurocritical Care within the departments of Neurology & Neurotherapeutics and Neurological Surgery.

Venkatesh Aiyagari, MBBS, DM is the Director of the Division of Neurocritical Care at the UT Southwestern Medical Center and the Medical Director of the Zale Lipshy University Hospital. He received his neurology training at the National Institute of Mental Health and Neurosciences in Bengaluru, India and at New York University and then completed a neurocritical care fellowship at Washington University in St. Louis. He has previously held academic faculty positions at Washington University and at the

University of Illinois at Chicago. His research interests include blood pressure management in stroke, osmotic therapy, and quality improvement in the ICU.

Christiana Hall, MD, FNCS established the UT Southwestern neurocritical care fellowship and garnered its UCNS Certification in 2009. She formerly served on the NCS Board of Directors and is a member of the NCS Research Committee. She is currently the Medical Director of the Parkland Neurocritical Care Unit and now leads our installation into our new free-standing Neuro ICU. She is the PI for recruitment for the 1,400-patient, 60-site SHINE trial of glucose management in acute ischemic stroke (NIH/NINDS U01 NS069498).

David McDonagh, MD is a recent addition to the UT Southwestern group and is vice chair of Anesthesia for Neuroanesthesia in addition to appointments in Neurological Surgery and Neurology & Neurotherapeutics. He attended medical school at Georgetown University and trained at Duke University in neurology, anesthesiology, and neurocritical care where he was fellowship director before taking a position at UT Southwestern.

Michael Rubin, MD, MA trained in neurology at UT Southwestern before moving to St. Louis for his fellowship in neurocritical care at Washington University, where he also took his first academic appointment while concurrently earning a master's degree in Bioethics and Health Policy from Loyola, Chicago. He currently serves as the NCS Ethics Committee co-chair and is Chair of the UT Southwestern Ethics Committee. His research includes brain death, medical futility, and end-of-life decision making.

Stephen Figueroa, MD is a graduate of Saint Louis University Medical School, trained in neurology and neurocritical care at UT Southwestern, and is the current fellowship director of neurocritical care. He has an interest in clinical research in traumatic brain injury and intracranial monitoring, as well as fellow and resident training with previous recognition for excellence in teaching. He is leading our efforts as site PI for the BOOST trial.

Sankalp Gokhale, MD, is an assistant professor in neurology and neurotherapeutics and trained at Beth Israel Deaconess Medical Center/Harvard University as well as Duke University. He is interested in translational acute brain injury research. His research is currently supported by Center for Translational Medicine (NIH KL2) in the Neurorepair lab. In addition, he is PI for a randomized controlled trial evaluating the effect of noninvasive brain stimulation in stroke recovery, supported by the American Heart Association.

Daiwai Olson, PhD, RN, FNCS is a researcher and clinician, Director of the Neuroscience Nursing Research Center, co-chair of the NCS Research Committee, and a member of the NCS Board of Directors. Dr. Olson was recently appointed the editor-in-chief for the Journal of Neuroscience Nursing. He is an integral part of the Division of Neurocritical Care and mentors resident, nursing, and junior attending research.



A Neuro ICU room with its central boon



Physicians and nurses from UT Southwestern and Parkland's Neuro ICU



Join the Global Partners Program

The goal of the Global Partners Program is to enhance communication between all societies of the world interested in Neurocritical Care.

Benefits include:

- **40% Discount** for NCS membership dues exception for countries with World Bank B Classification.
- **Complimentary Exchange** of email member lists to promote society activities/events of mutual interest.
- **Official Recognition** of the partnership posted on the respective websites.
- **Criteria - Global Partners Societies must have:**
 - a clear focus on neurocritical care.
 - a minimum of 25 members.
 - at least five active NCS members for Societies of 50 members or less. If the Society has more than 50 members, then there must be 10 active NCS members.



JOIN THE
GLOBAL PARTNERS
OF THE NEUROCRITICAL
CARE SOCIETY



www.neurocriticalcare.org



www.neurocriticalcare.org

Join the Neurocritical Care Society

Benefits of the NCS Global Partners membership:

- **Complimentary Subscription** to the Neurocritical Care Journal to stay updated on the latest in neurocritical care around the globe.
- **International Exposure** through particular consideration for publishing in the Neurocritical Care Journal.
- **Special Country-Specific Discounts** for attending the Annual Meeting - the premiere conference for neurocritical care.
- **Gain New Ideas** through NCS' Discussion Forums - networking with leaders in the field addressing the needs and enhancing quality of neurocritical care settings.
- **Complimentary Access** to NCS guidelines providing common practices and protocols while establishing international standards of care.
- **Complimentary Job** and fellowship postings on the NCS website.
- **Advanced Active Involvement** by service on committees and task forces.
- **Collaboration and Support** channels that enhance neurocritical care practice in low resource areas.
- **Access to Specialized Educational and Networking** including:
 - The Emergency Neurological Life Support (ENLS) courses and certification;
 - NCS Research Network; and
 - Platforms for clinical and scientific international exchange.

Neurocritical Care Across the Globe

The Neurocritical Care Society is a multidisciplinary, international organization whose mission is to improve outcomes for patients with life-threatening neurological illnesses worldwide. The NCS is composed of physicians, nurses, nurse practitioners, pharmacists, physician assistants, fellows, residents and students from over 40 countries.

We are a continuously growing society. It is our great interest to increase our Global Partners membership to enhance the clinical and scientific exchange to raise the standards of neurocritical care practice worldwide.



Our mission is to promote:

- Quality Patient Care
- Professional Collaboration
- Research
- Training and Education
- Advocacy



To join the NCS and begin receiving these benefits immediately, visit our website at www.neurocriticalcare.org

NCS 14TH ANNUAL MEETING

Save the Date

2016

GAYLORD
NATIONAL HARBOR

SEPTEMBER 15-18

Gaylord National Resort and Convention Center,
Washington DC



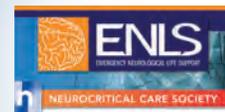
Neurocritical
Care Society

www.neurocriticalcare.org

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



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, CECBEMS and ACPE credit and two-year ENLS certification.

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

Topics

- Acute Non-Traumatic Weakness
- Acute Stroke
- Airway and Ventilation and Sedation
- Coma
- Intracerebral Hemorrhage
- 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."

**To Register for
This Course, Visit:**
www.neurocriticalcare.org/SCCM-ENLS



Check out what's new at NCS OnDemand.

Your online education & training site.

NCS OnDemand is a hub for education and training programs designed to help health care professionals improve outcomes for patients with life-threatening neurological illnesses.

To Access NCS OnDemand, go to:
<https://www.pathlms.com/ncs-ondemand>



 Publications	 Courses & Training	 NCS Annual Meetings	 Virtual Events	 NCS Guidelines	 Family & Patient Resources
<ul style="list-style-type: none"> • Traumatic Brain Injury Guide for Families • The Practice of Neurocritical Care Textbook • Brain Death Toolkit • TTM in Acute Neurologic Injury • Emergency Neurological Life Support iBook 	<ul style="list-style-type: none"> • TTM in Acute Neurologic Injury • Emergency Neurological Life Support 	<ul style="list-style-type: none"> • 2014 Main Programming • 2014 Workshops • 2015 Main Programming • 2015 Workshops 	<ul style="list-style-type: none"> • Webinar: Thermoregulation: Fundamentals for Therapeutic Hypothermia and TTM • Webinar: Under Pressure: Managing Blood Pressure in the Neuro ICU • Podcast: Shivering and TTM: No Need to Sweat it! • Pharmacotherapy of Neurocritical Care Series 	<ul style="list-style-type: none"> • Multimodality Monitoring • Large Hemispheric Infarction • Status Epilepticus • Subarachnoid Hemorrhage 	<ul style="list-style-type: none"> • Traumatic Brain Injury Guide for Families • Stories of Hope • Patient/Family Information and Resource Guide • Patient and Family Support Sites

Publish your next book, course or virtual event with NCS!

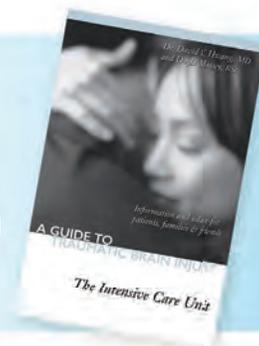


www.neurocriticalcare.org

Two Invaluable Resource Guides for Patients and Families



Not only are the first hours of a patient's neurological emergency critical to the patient, it is a time of fear and anxiety for the families. NCS is proud to announce the release of two publications to assist during this time: *Patient/ Family Information & Resource Guide*, and *A Guide To Traumatic Brain Injury: The Intensive Care Unit*.



Patient/ Family Information & Resource Guide

This guide provides information on the following:

- Overview of the Neurocritical care setting
- Members of the Neurocritical Care Team
- Descriptions of various diseases treated
- Links to valuable patient and family resources

Free download is available for viewing or printing at your institution. You may also purchase color brochures for your waiting rooms and patient packets in sets of 25 brochures for \$40. Available through NCS OnDemand.

A Guide To Traumatic Brain Injury: The Intensive Care Unit

This unique book is intended to help families of patients with severe traumatic brain injury in your neuroscience intensive care unit navigate their personal crises by delivering comprehensive medical, technical, and practical information in a compassionate, empathetic, and reassuring way.

This book is available in print or iBook format and can be purchased on NCS OnDemand for \$10 USD/book + shipping and handling.

"This book is comprehensive, meaningful, informative, and far from being over-whelming. It can be referred to over and over again at any point of the journey. The book has been an inspiration and guiding light of insight." — Family Member, British Columbia

<https://www.pathlms.com/ncs-ondemand>



www.neurocriticalcare.org

Job Opportunities (as of Dec 2, 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>.

Arizona

Neurocritical Care /Stroke Physician - John C. Lincoln North Mountain Hospital

Learn more or Apply: Joan.kilmartin@HonorHealth.com or stopstroke@gmail.com

Neurointensivist - Carondelet Neurological Institute

Learn more: [Leah Shea, Sr. Director, Carondelet Neurological Institute](#)

California

Assistant/Associate/Full Professor –UC Davis, Department of Neurological Surgery

Learn more: <http://ucdmc.ucdavis.edu/academicpersonnel>

Contact: [James E. Boggan, M.D.](#), Professor and Chair of Neurological Surgery

Apply online at: <http://apptrkr.com/495160>

Comprehensive Neurosurgical Advance Practitioner – UCSF Fresno Medical Education Program

Contact: Ian Johnson, MD c/o Diane O'Connor

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

Neurology Physician Assistant Opportunity -- Central California Faculty Medical Group aff. with UCSF
Contact: Willie.Seals@CCFMG.org

Nurse Practitioner – Neuro ICU – Cedars-Sinai

Learn more: <https://www.cedars-sinai.com/apply2jobs.com/>

Stroke Neurologist – Mercy Medical Group

Learn more: <http://www.dignityhealth.org/physician-careers>

Stroke Neurologist - Sutter Medical Group
Contact: develops@sutterhealth.org

Surgical Neuro Trauma ICU Nurse Manager – Mission Viejo
Contact: [Emiley Padgett](#)

UCSF Fresno Neurocritical Care Faculty Position - The UCSF Fresno Medical Education Program

Contact: Arash Afshinnik, MD c/o Diane O'Connor

Connecticut

Neurointensivist - New Haven - Yale Medical School & Yale-New Haven Hospital

Send resume to: kevin.sheth@yale.edu

Delaware

BC/BE Neurointensivist - Christiana Care

Send resume to: vdechant@christianacare.org

Hawaii

RN - Neuro ICU - Queen Emma Tower 4D NeuroScience ICU

Learn more: <http://www.queens.org/> (job number 111281)

Illinois

Advanced Nurse Practitioner – Neuro and Med/Surg ICU - Edward Hospital
Apply online: www.edward.org/workhere

Academic Neurocritical Care Physician (Neurointensivist) - University of Chicago – Dept. of Neurology
Apply online: <https://tinyurl.com/Neurointensivist>

Neurocritical Care Intensivist - Peoria, Illinois - The Illinois Neurological Institute

Send resume to: Rachel Reliford, MPA, FASPR Senior Physician Recruiter Physician Recruitment OSF HealthCare System 1420 West Pioneer Parkway Peoria, IL 61615

Neurocritical Care Specialist – Edward Neurosciences Institute
Learn more: [Erin Mumma](#)

Neurointensivist Opening - Southern Illinois University SOM
Apply online: <https://siumed.hiretouch.com> Ref. no. 2158

Nurse Practitioner for Neurocritical Care Program – Rush University
Learn more: [Kimberly Novanty](#)

Maryland

Clinical Pharmacy Specialist – Neurosciences Critical Care Unit - The Johns Hopkins Hospital
Send resume to: [John Lewin, III, PharmD](#)

Director, Division of Neurosciences Critical Care - Johns Hopkins Medical Institutions

Apply online: accm-jobs@jhmi.edu

New Jersey

Neurointensivist - Hackensack University Medical Center
Send resume to: [Sanjeev Kaul, MD](#)

Neurocritical Care Nurse Residency Program - JFK Medical Center
Send resume to: [Brian Scheets](#)

New York

Assistant/Associate Professor – Neurointensivist - Columbia University - Department of Neurology
Apply online at: <https://academicjobs.columbia.edu/applicants/Central?quickFind=61692>

Neurocritical Care Specialist - Buffalo General Medical Center
Apply online at: <http://www.ubjobs.buffalo.edu/applicants/Central?quickFind=57243>

NeuroIntensivist - Rochester Medical Center/Strong Memorial Hospital
Send resume to: debra_roberts@urmc.rochester.edu

North Carolina

Neurocritical Care Physician - Novant Health Forsyth Medical Center
Send resume to: ecslagle@NovantHealth.org

Neurointensivist – Novant Health PMC, Charlotte, NC
Send resume to: [Emily Slagle](#)

Section Head Critical Care Anesthesiology - Wake Forest Baptist Medical Center
Send resume to: [Dorothy Jones](#)

Ohio

Critical Care Neurologist / Neurointensivist - Cleveland Clinic
Apply online: <http://bit.ly/1UMxj3e>

Faculty Position – Board Eligible/ Certified Neurointensivist - The MetroHealth System
Contact: [Emigda Gabriel](#)

Head, Section of Neurological Critical Care – Cleveland Clinic
Learn more: <http://bit.ly/1GID7t5>

Lead Neurocritical Care Nurse Practitioner - Ohio State University Wexner Medical Center
Apply online: <http://wexnermedical.osu.edu/careers> no. 411164

Pennsylvania

NeuroIntensivist - Assistant/Associate Professor - Thomas Jefferson University
Send resume to:
Jack Jallo, MD, PhD, FACS
Thomas Jefferson University
909 Walnut Street, Third Floor
Philadelphia, PA 19107
ATTN: Janice Longo

Neurologist For Neurocritical Care - Lehigh Valley Health Network
Send resume to:
Pamela.Adams@LVHN.org

South Carolina

Neurointensivist/Neurocritical Care Specialist - Greenville Health System
Send resume to: Kendra Hall,
kbhall@ghs.org

Tennessee

Neuro ICU Nurse Practitioner/Physician Assistant, Critical Care (Night Position) – Vanderbilt
Apply online at: https://vanderbilt.taleo.net/careersection/vu_cs/jobdetail.ftl?job=1508523

Texas

Neurological Critical Care/Stroke - Academic Appointment- Cejka Search
Contact: [Ellie Horgan](mailto:Ellie.Horgan)

NP/PA in Neurocritical Care - University of Texas Health Science Center at San Antonio
Send resume to: beebe@uthscsa.edu

Utah

Neurocritical Care – St. George, UT – Intermountain Healthcare Medical Group
Contact: [Deanna Grange](mailto:Deanna.Grange)

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

Virginia

Neurointensivist/Faculty, Department of Neuroradiology - University of Virginia
Apply online: <http://www.click2apply.net/kqgj59m2k5>

Neurointensivist - Inova Fairfax Hospital
Contact: [Stephanie Woodley](mailto:Stephanie.Woodley)
Send resume to:
jeff.guarnera@themedicusfirm.com

Washington

Neuro-Hospitalist - Virginia Mason Medical Center
Contact: [Nancy Longcoy](mailto:Nancy.Longcoy)

Fellowship Opportunities (as of Dec 2, 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.

Alabama

UAB Neurocritical Care Fellowship
Contact: [Angela Shapshak, MD](mailto:Angela.Shapshak)

California

Neurocritical Care Fellowship Program – CPMC
Contact: chencha@sutterhealth.org

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

Cedar-Sinai Medical Center
Contact: Asma Moheet, Fellowship Director at groupnccfellowship@cshs.org

Colorado

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

Connecticut

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

Illinois

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

Rush University Medical Center
Neurocritical Care Fellowship-Chicago
Contact: [Torrey Boland, MD](mailto:Torrey.Boland)

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

Detroit Medical Center/Wayne State University Neurocritical Care Fellowship
Contact:
[Wazim Mohamed, Assistant Professor](mailto:Wazim.Mohamed)

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

Neurocritical Care Fellowship – Wexner Medical Center
Contact: Chad Miller at
ChadM.Miller@osumc.edu

Oregon

OHSU Neurocritical Care Fellowship
Contact: [Kelsey Cearley](mailto:Kelsey.Cearley)

Texas

Neurocritical Care Fellowship - Houston
Contact: Diana Saavedra at
Diana.I.Saavedra@uth.tmc.edu