TABLE OF CONTENTS

SNACC NEWS

Message from the President ............................................ 2
Call for Abstracts .......................................................... 3
Editor’s Corner ............................................................... 3
2014 Annual Meeting Wrap Up ........................................... 4
Welcome New Members .................................................. 6
An Interview with Michael Stentz, MD FAER Resident Scholar ............................................ 7
A Message from the Foundation for Anesthesia Education and Research (FAER) .................. 7
Research Priorities in Neuroanesthesia and Neurosciences .............................................. 8
Education Corner ........................................................... 11
Transcranial Doppler (TCD) Monitoring for Carotid Endarterectomy ................................ 12
2014 SNACC Distinguished Service Award .......................................... 15
In Memoriam: James R. Harp, MD .................................. 15
ASA House of Delegates Proceedings .................................. 16
New SNACC App Introduced ........................................... 16
Thank You to Our Supporters .......................................... 17
SNACC Newsletter Schedule .......................................... 17
Plan Now for the 43rd Annual Meeting ................................ 18

Donate to the William L. Young Neuroscience Research Award

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President’s Message

Deborah J. Culley, MD
SNACC President

Thank you to all who attended SNACC’s 42nd Annual Meeting! This year’s Annual Meeting had over 300 in attendance and it is always a highlight of the organization’s year and this year was no exception.

In addition to the Friday program, there were a number of workshops on Thursday afternoon. The Emergency Neurologic Life Support (ENLS) Workshop was moderated by Drs. Michael “Luke” James, Ines P. Koerner and Abhijit V. Lele. Dr. Jeff Pasternak moderated the Mentoring Workshop with presentations by Drs. William Lanier, Stacie Deiner, Eric Heyer, and Matthew Chan that were followed by round table discussions. The Neuromonitoring Workshop was moderated by Drs. Antoun Koht, Deepak Sharma, and Tod Sloan with lectures by Drs. Antoun Koht, Linda Aglio, Leslie Jameson, Daniel Janik, John McAuliffe, Tod Sloan, and Deepak Sharma. The Basic Science Symposium was moderated by Dr. George Mashour and included lectures by Drs. Max Kelz, Alex Proekt, Ken Solt on the “Neuroscience Issues in Emergence from Anesthesia.” The program on Thursday concluded with the Annual Dinner Symposium, also moderated by Dr. George Mashour on an “Introduction to EEG and Anesthesia” with lectures by Drs. Emery N. Brown and Gerhard Schneider.

Dr. Andrew Kofke created an outstanding program this year including the first Maurice Albin Keynote Lecture. Dr. Dalton Deitrich delivered this inaugural lecture on the topic of “Spinal Cord Injury: Hypothermia, Stem Cells and Other Advances,” a career interest of Dr. Albin. Dr. James Hecker moderated the first mini-symposium on the topic of “Personalized Medicine” with presentations by Drs. James Hecker, Joshua Denny and Kirk Hogan. The second mini-symposium was a Joint Session with the Neurocritical Care Society on “Intraoperative Catastrophes.” It was moderated by Drs. Michael “Luke” James, Ines P. Koerner, and Abhijit V. Lele with presentations by Drs. Andrea Orfanakis, Rolf A. Schlichter and Myles D. Boone. The day was completed with a session on two perspectives on the topic of “Anesthesia in the Neurointerventional Suite.” Dr. Pekka O. Talke moderated this session with presentations by Drs. David L. McDonagh and Kristine A. Blackham. A wine and cheese reception followed.

I would like to send a special thanks to Dr. Kristin Engelhard who tirelessly served as the President of SNACC and oversaw the 42nd Annual Meeting along with Dr. Martin Smith, who served as Immediate Past President. They have diligently worked to guide our society to a place where it is in a good position to meet the mission of the society, which is to advance the art and science of the care of the neurologically impaired patient. I would also like to extend a special thank you and gratitude to Dr. Rafi Avitsian who served as a devoted member of SNACC’s Board of Directors for the previous six years and as Chair of the education committee.

This year was one marked by many important milestones, including the development of the SNACC App, that can be used to keep the members up to date on important things that are going on in the society, the use of an electronic voting system...
to elect new members to the Board of Directors, and an online opportunity to donate and support FAER Scholars attending SNACC’s Annual Meeting.

If you are interested in using the SNACC App, it can be downloaded from iTunes, Google Play or Blackberry World. The App is free, but remember to refresh it each time you use it by clicking on the update button as shown on the previous page.

I would like to welcome the following new members to the Board of Directors; Drs. William Armstead, Chanannait Paisansathan, Dhanesh Gupta, and Michael “Luke” James. Dr. Jeffrey J. Pasternak was elected Secretary/Treasurer. It is the strength, experience and wisdom of these members that will ensure that SNACC maintains its presence as a preeminent neuroanesthesia society internationally.

In addition to the Annual Meeting, SNACC continues to work at establishing the William L. Young Research Award and has a number of ongoing initiatives including frequent updates in the “SNACC Bibliography,” plus multiple educational opportunities such as the creation of fellowship programs, “Chat with the Author” and “Article of the Month.” In addition, the SNACC website houses two SNACC consensus statements. The first is on the “Anesthetic Management of Endovascular Treatment for Acute Ischemic Stroke” and the second on the “Perioperative Care of Patients at High Risk for Stroke during or after Non-Cardiac, Non-Neurologic Surgery.” As you can see from these accomplishments, SNACC is a vital and alive organization. We encourage you to get involved by contributing and participating in our SNACC community.

**CALL FOR ABSTRACTS**

Abstracts will be accepted for the **SNACC 43rd Annual Meeting**

**Monday, March 30, 2015**

**through**

**Monday, May 11, 2015**

Please plan to contribute your abstract during that time.

**Editor’s Corner**

Reza Gorji, MD

Editor

Welcome to the last issue of the SNACC newsletter for 2014! The 42nd SNACC Annual Meeting was held in New Orleans, LA on October 9-10, 2014. It was a great gathering of specialists in neuroanesthesia, neurocritical care and related fields. The overall impression that I received from the attendees was that the Annual Meeting was interesting, intellectual, very stimulating and well attended, with over 300 registrants. Multiple workshops were offered including a new ENLS workshop, which I took myself and got certified in. SNACC continues its march towards digitalization with a brand new App offered this year for the Android and Apple devices. The SNACC Mobile Meeting Guide was also new this year and all digital posters were available for viewing on the guide in advance of the meeting and continue to be available on the SNACC website. Attendees were encouraged to ask questions and leave comments about a particular poster on the Mobile Meeting Guide. The new App brings all this information to one place in one platform. Information about members, the newsletter, meetings, as well as photos are all conveniently placed on the opening page of the SNACC App. As well as being interactive, never before has so much information been available to the participants.

I hope you enjoy this issue of the newsletter. Contributions are always welcome from all members. Many of you have come forward and contributed to this issue and your participation is greatly appreciated.

Thank you for being a member of SNACC!

**PLAN NOW TO ATTEND!**

**SNACC 43rd Annual Meeting**

**October 22-23, 2015**

Manchester Grand Hyatt Hotel
San Diego, CA
The 42nd Annual Meeting of the Society for Neuroscience in Anesthesiology and Critical Care (SNACC) was held at the New Orleans Sheraton Hotel in New Orleans, Louisiana on October 9-10, 2014. Three hundred three individuals from all over the world were in attendance.

The meeting started with four simultaneous and diverse sessions on Thursday afternoon: an Emergency Neurologic Life Support Workshop, a Mentoring Session, a Neuromonitoring Workshop, and a Basic Science Symposium.

The Emergency Neurologic Life Support Workshop was organized and moderated by Drs. Ines Koerner, Michael “Luke” James, and Abhijit Lele. This popular workshop was filled to capacity and was sponsored by the Neurocritical Care Society. It is designed to review the critical management of 13 key neurologic emergencies including, stroke, traumatic brain injury, and herniation. Attendees learned about checklist, critical management steps and communication skills designed to improve patient care and outcome in the first few hours following a neurologic emergency. Attendees had the option to take the certification test in Emergency Neurologic Life Support at the end of the session.

The Mentoring Session was organized and moderated by Dr. Jeffrey Pasternak. This session was geared toward residents, fellows and newer staff physicians and was designed to provide advice on how to start and conduct a clinical research project. Immediately prior to the session, a lunch allowed for an informal opportunity for attendees to meet the presenters and the SNACC Board of Directors. During the formal session, Dr. William Lanier discussed mentorship and developing an idea for a project, Dr. Stacie Deiner addressed study design, Dr. Eric Heyer discussed funding a project, and Dr. Matthew Chan provided attendees with advice on how to carry a project through to completion.

Drs. Antoun Koht, Deepak Sharma, and Tod Sloan led the Neuromonitoring Workshop. A series of lectures formally reviewed the basic concepts of neuromonitoring, including evoked potentials, electromyography, transcranial Doppler sonography, and anesthetic considerations during procedures employing these techniques. The session then followed with an opportunity to practice monitoring techniques and a discussion of applications for each modality, including how to troubleshoot problems and address limitations. Similar to prior years, the neuromonitoring session was well attended and very successful.

Thursday afternoon also included a Basic Science Symposium, organized and moderated by Dr. George Mashour. This highly attended session focused on basic neuroscience concepts pertaining to emergence from the state of general anesthesia. Dr. Max Kelz opened the session with a discussion of the neurobiology of emergence from anesthesia. Dr. Alex Proekt focused on anesthetic state transitions and Dr. Ken Solt addressed the role that dopamine and dopaminergic pathways play in emergence from anesthesia. This session concluded with a lively discussion.

On Friday, October 10, the events kicked off with a welcome 2014 Annual Meeting Wrap Up

Jeffrey J. Pasternak, MD
SNACC Secretary/Treasurer

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address by Dr. Kristin Engelhard. Dr. W. Andrew Kofke introduced the First Annual Maurice Albin Keynote Address. This lecturership had been instituted to honor Dr. Maurice Albin for his many contributions not only to SNACC but also for innovation, mentorship, education, and research in perioperative neuroscience. Although Dr. Albin was unable to attend this lecture, he sent a video message to address the audience.

Dr. W. Dalton Dietrich had the honor of delivering the first Maurice Albin Keynote Lecture. Discussing the Miami Project to Cure Paralysis, Dr. Dietrich reviewed not only protective strategies, but also novel reparative and rehabilitative treatments for patients with spinal cord injury. He also shared that the U.S. Food and Drug Administration recently approved Schwann cell technology for the treatment of spinal cord injury.

Dr. James Hecker moderated the First Mini Symposium of the day on Personalized Medicine. Giving the first lecture of the symposium himself, Dr. Hecker provided an overview of genomics and how it applies not just to the broad practice of anesthesiology but specifically to the field of perioperative neuroscience. Dr. Joshua Denny then discussed how the DNA Biobank at Vanderbilt University Medical Center has been used to identify both genotypic and phenotypic associations with specific disease states. Wrapping up the session, Dr. Kirk Hogan provided some insight into the problems, pitfalls, and limitations inherent in using genomics to individualize patient care.

Overall, 101 abstracts were accepted to be presented as posters during the morning and afternoon walk-around poster sessions. Forty-two posters were submitted by international investigators, fifty-five by U.S. investigators, and seven were from U.S./International collaboration. For the second year, SNACC used an electronic format for its formal moderated sessions. Attendees had the ability to access the full electronic posters not only on any large monitor at the meeting site but also via the Mobile Meeting Guide, a link available in the SNACC internet homepage, and the SNACC App. Attendees also had the option to leave electronic comments or questions for any poster author. As always, the poster session provided an opportunity to learn about cutting edge perioperative neuroscience research, make important collaborations, and exchange ideas.

Dr. Daniel Cole, the President Elect of the American Society of Anesthesiologists (ASA), opened the business lunch with a discussion of the strong relationship between SNACC and the ASA. Dr. Martin Smith, chair of the SNACC Nomination Committee, discussed the new electronic voting process for the election of SNACC officers. Electronic voting was conducted in the summer of 2014 to allow the new members of the Board of Directors to attend the fall 2014 meeting of the Board of Directors. Members elected to new positions were Dr. Jeffrey Pasternak to the role of Secretary/Treasurer and Drs. William Armstead, Dhanesh Gupta, Michael “Luke” James, and Channanait Paisansathan to the roles of Directors-at-Large. Dr. 2014 Michenfelder New Investigator Award Winner

Left to right: Drs. Junji Egawa and Dhanesh Gupta.
Ehab Farag presented the five Resident Travel Awards to Drs. Yuka Akasaki, Junji Egawa, Mizuko Ikeda, Anne Sebastiani, and Semra Senpolat. These individuals had the highest scoring abstracts among trainees. The SNACC Distinguished Service Award was presented to Dr. William Lanier for his contributions and dedication to not only SNACC but also to the field and practice of perioperative neuroscience. After the exchange of the gavel, Dr. Deborah Culley, the new president of SNACC, addressed the audience and shared her vision for the society. The business lunch closed with the presentation of the Michenfelder New Investigator Award by Dr. Dhanesh Gupta. The 2014 winner of the Michenfelder Award was Dr. Junji Egawa from the University of California San Diego for his project “Neuron Targeted Caveolin-1 Remodels Hippocampal Neurons and Enhances Hippocampal Plasticity and Function.”

Mini Symposium Two was entitled Intraoperative Catastrophes, co-sponsored by the Neurocritical Care Society, and moderated by Drs. Michael “Luke” James, Ines Koerner, and Abhijit Lele. Speakers addressed three potentially disastrous clinical quandaries. Dr. Andrea Orfanakis discussed management of massive bleeding during major spine surgery complicated by transfusion-related acute lung injury. Dr. Rolf Schlichter presented a case of massive venous air embolism, resulting in cardiac arrest, in a patient in the sitting position. Dr. Myles Boone then discussed the management of a trauma patient with multiple orthopedic injuries and an epidural hematoma requiring evacuation.

Following the afternoon walk around poster session, Dr. Pekka Talke moderated the final formal session – a discussion of patient management issues in the neurointerventional suite. Dr. David McDonagh, an anesthesiologist, presented concerns and issues encountered during the management of anesthesia for patients requiring various neuroradiologic interventional procedures. Dr. Kristine Blackham, an interventional neuroradiologist, discussed various procedural issues such as painful events for patients during procedures, situations when general anesthesia can be helpful or may prevent rapid neurologic assessment, and time points where patient movement can be either tolerated or dangerous.

The day closed with a wine and cheese reception and time for the SNACC Special Interest Groups to meet. We look forward to seeing everyone again for the 43rd Annual SNACC Meeting on October 22-23, 2015, at the Manchester Grand Hyatt Hotel in San Diego, California.

Welcome New Members

**Active**

Wilson T. Chimbira, MB, ChB, FRCA  ..........Ann Arbor, MI
Andrew Hudson, MD, PhD  ..................Los Angeles, CA
Elaine Kilmin, MD  .................................Philadelphia, PA
Daniel O’Neill, MD  ..............................Manhasset, NY
Brian McClure, MD  .............................New Orleans, LA
John B. Sampson, MD  ......................Havre de Grace, MD
Cinthia Tirado, MD  ............................Sacramento, CA

**International**

M. Paul Burt, MD  .................................Canberra, Australia
Arief Cahyadi, MD  ...............................Jakarta Pusat, Indonesia
Jason Chu, MBChB, FANZCA  ...............London, ON, Canada
Nazaruddin Umar, PhD  .................MedanSumatera Utara, Indonesia
Babak Babakhani, MD  ..........Hannover Niesersachsen, Germany
Cynthia Henderson, MD  .....................Vancouver, BC, Canada
Kyeong T. Min, MD  ...........................Seoul, South Korea

**Fellow**

Xenia I. Borbely, MD  ..............................Seattle, WA
Kenneth M. Fomberstein, MD  ..........New Haven, CT
Vijay Krishnamurthy, MD  ................Seattle, WA
Pratik V. Patel, MD  ..............................Boston, MA
Mohamed Abdeldayem, MD  ...........Chicago, IL
Lisa M. Adiutori, DO  ...............................Chicago, IL
Sara M. Aljohani, MD  .........................New York, NY
Desiree Ekundayo, MD  ........................Chicago, IL
Babak Kaeby-Kashy, MD  ......................Chicago, IL
Miguel Plaza-Lloret, MD  .....................Chicago, IL
Phillip E. Vlisides, MD  ........................Plymouth, MI

**Resident**

Stuart Cleland, MBBS  ..................Woking, Surrey, United Kingdom
Shailendra Kumar, MD  ..................New Delhi, India
Ross Martini, MD  ..............................Portland, OR
Nitasha Mishra, MD  .........................New Delhi, India
Stuart Nicholson, MBBS  ..................London, United Kingdom
Mobolaji O. Olurinde, MD, PhD  ....Hummelstown, PA
Benjamin Yost, MD  ..........................Bossier City, LA
Carlos Fiandeiro, MD  ..........................London, United Kingdom
An Interview with Michael Stentz, MD
FAER Resident Scholar

Chanannait Paisansathan, MD
Chair, Scientific Affairs Committee

Every year FAER invites ACGME-accredited anesthesiology programs to select an academically promising CA-2 resident to participate in the FAER Resident Scholar Program. FAER provides educational grants of $1000 to support travel and expenses for these residents to attend the annual ASA meeting and subspecialty society meetings. This year we had 12 resident scholars join us for the SNACC Annual Meeting in New Orleans. These talented residents were assisted financially by donations from SNACC members. Laurel Moore, SNACC Communications Committee Chair, caught up with Michael Stentz, MD, a CA-2 resident who represented the University of Michigan as a FAER Scholar this year.

What is your educational background?

I received my undergraduate education at Case Western Reserve University, where I double-majored in Biology and Classics. I completed medical school at the University of Michigan, where I also earned a master’s degree in Clinical Research. I’ve completed an internship and my residency at University of Michigan and I am currently applying to critical care fellowship programs.

What are your academic interests?

I’m interested in long-term outcomes in critically ill patients and factors affecting goals-of-care decision making. My current research is focused on predictors of long-term outcomes at the time of ICU discharge.

What did you personally find to be the most interesting or relevant portions of our annual SNACC meeting?

Academically, I learned the most from the two “keynote” talks at the SNACC dinner. I not only feel better educated about monitoring the level of consciousness during anesthesia, but I’m excited about seeing where ongoing research will lead us in the near future. On a personal and professional level, I thought that the half-day mentoring and career development session specifically targeted at the FAER scholars was the most enlightening highlight of not just the SNACC meeting, but of the entire ASA meeting. The SNACC mentoring sessions were a wonderful opportunity to meet so many leaders in the field and get their advice and opinions about how to really succeed in the world of academic anesthesia.

A Message from the Foundation for Anesthesia Education and Research (FAER)

Ginger R. Smith
Program Coordinator

This year, the Foundation for Anesthesia Education and Research welcomed 60 residents from all over the country into its Resident Scholar Program. The Resident Scholar program offers these residents the chance to attend the ASA annual meeting, gain exposure to the many facets of the specialty, and learn more about FAER and its mission to advance medicine through anesthesia education and research.

This year, as in other years, FAER was delighted to partner with SNACC to allow the FAER Resident Scholars to attend their annual meetings as well as ASAs. This is the third year SNACC opened their doors to FAER’s Resident Scholars with a record attendance of 19 – up from 11 in 2013 and five in 2012. It is always a highlight for the residents, and 2014 was no exception. Our anonymous survey showed strong satisfaction in the subspecialty meetings. Over half of the residents who participated in the SNACC meetings indicated that it was a valuable and “extremely meaningful” experience.

FAER is grateful to SNACC’s generosity, and hopes to continue this partnership for years to come.
The mission of the SNACC is to advance the art and science of the care of the neurologically impaired patient. The members of SNACC include neuroanesthesiologists, neurointensivists, and neuroscientists who contribute to this mission by providing excellent clinical care to patients with neurological conditions, engaging in clinical and basic research and training the future generations. SNACC members include many well-known researchers with established research labs and research groups who conduct high impact clinical and basic neuroscience research funded by the National Institutes of Health (NIH) and other prestigious grant mechanisms. Moreover, there are numerous other members who present their research regularly at the Annual Meeting and publish their work. The research interests of SNACC members include a wide range of clinical and basic neuroscience. Given the increasingly competitive funding environment and rapidly changing healthcare models, we thought it would be interesting to reach out to some of the prominent leaders within SNACC to find out their opinions about current research priorities in Neuroanesthesia and Neurosciences. We are thankful to these senior SNACC members for taking the time to share with us their views on this topic and we will be publishing these opinion pieces in two parts. In this first part, we present the views of Drs. William L. Lanier, Karen B. Domino and Michael Todd.

William L. Lanier, Jr., MD is a Professor of Anesthesiology at the Mayo Clinic, Rochester. He is also the Editor-in-Chief of the Mayo Clinic Proceedings and has served as the SNACC President (1993-1994). Here are Dr. Lanier's thoughts:

In my opinion, future research in neuroanesthesia and neurosciences particularly from the perspective of the model member of SNACC, who simultaneously performs as a clinician, educator, and investigator – will be dictated by a handful of priorities. These include: 1) limited resources within the healthcare environment, 2) a larger number of individuals (whether patients, clinicians, or investigators) competing for those resources, and 3) an escalating demand that any expenditures (regardless of the “currency”) are accompanied by documentable improvements in outcomes that are attained at a fair price. Consonant with these demands, I believe that our future research initiatives will likely need to focus on either: 1) the description and definition of new disease processes, 2) newly discovered manifestations of known disease processes, 3) disease associations and their shared (or linking) pathomechanisms, 4) new diagnostic techniques, or 5) new or improved therapies. Whether we like it or not, there will be increased pressure to make sure that our advances are generalizable: i.e., discoveries made in one clinical or research domain are relevant and applicable in other domains, either literally or as a concept.

The public will demand that we focus in this direction simply because – from its perspective – our past research has failed to improve the well-being of enough individuals and, when we have found advances, we have too often avoided or failed to demonstrate that they are cost effective. Examples abound as to why the public should have concerns. Contemporary shifts in the diagnosis and treatment of neoplastic diseases, infectious diseases (and their consequences), cardiovascular diseases, musculoskeletal diseases, and others have become more expensive than the population can afford. Further, when scrutiny is applied to the rationale, efficacy, and cost of contemporary and new therapies, it becomes apparent that we clinicians far too seldom know the biological underpinnings of what we are treating and the results and long-term costs of our decision making. These unsustainable practices will affect not only our research and researchers, but also the education of those who will obtain and use the research results. These movements in the focus of neuroanesthesia and neuroscience will by necessity respond to market forces, just as market forces have dictated the new form and application of scientific publishing or – in the wine industry – the vintners’ re-engineering of products to suit customers’ palates, pocket books, and preferences for time-to-access. As in all these examples, those paying for goods and services will want more, and they will want it cheaper and faster. In neuroanesthesia and neuroscience, this likely will mean that those who support us, whether financially or otherwise, will expect evidence of success (e.g., the application of a new discovery) in an intermediate time frame (perhaps three to five years).

It is a truism that contemporary research increasingly requires the input of multiple investigators who bring unique talents and skills. If we investigators in neuroanesthesia and neuroscience
(again, from the perspective of SNACC members) are to succeed, we must have a broad knowledge of the potential resources that can be accessed for our research, and we must be able to communicate effectively to others—in formal and informal verbal presentations, in electronic communications, and in the written word—our vision, what we hope to accomplish, and how we plan to accomplish it. This will require disciplined study on our part, coupled with training programs that expose us to new ideas both within and at the periphery of our specialty areas so that we will have credibility with a broader audience. Further, we investigators will need to be able to instill confidence in others that we are dedicated, diligent, and focused on our mission, and that we will ask for support from others only after we have given them reason to believe that we have good ideas and good solutions for approaching those ideas. Absent this, the talented individuals whom we need for support (virtually all of whom are overextended or consider themselves overextended in the current biomedical environment) will choose to use their time and energy elsewhere.

If we are going to make meaningful advances in neuroanesthesia and neuroscience, our future research, like the best research in other biomedical disciplines, must feel refreshing and innovative, and offer the promise of cost-effective improvement focused on the well-being of patients. I consider it difficult, if not impossible, from the current reference point, to predict which research specifics will succeed and which will fail. However, when we encounter the best of our future research, it will affect us similarly to when we encounter the best of the fine arts: we will recognize that we are in the presence of greatness resulting from someone’s bold, innovative efforts.

Karen B. Domino, MD, MPH is a Professor and Vice Chair for Clinical Research in the Department of Anesthesiology and Pain Medicine, University of Washington, Seattle. She was the Emery A. Rovenstine Lecturer for 2014 at ANESTHESIOLOGY 2014 and has served as the SNACC President (2004-2005). Here are Dr. Domino’s thoughts:

The decade of the BRAIN (Brain Research through Advancing Innovative Neurotechnologies) Initiative has begun! The goal of this Presidential initiative is to accelerate the development of new technologies to increase the understanding of the human brain in health and disease (http://www.braininitiative.nih.gov). Five U.S. federal funding agencies are participating in this effort: the National Institutes of Health (NIH), the National Science Foundation, the Defense Advanced Research Projects Agency, the Food and Drug Administration, and the Intelligence Advanced Research Projects Activity, as well as a number of public/private partnerships. The NIH recently announced $46 million in new grant awards, combining nanoscience, imaging, engineering, and informatics with neuroscience. These initial awards focus on developing new basic science technologies, such as classification of cell types in the brain, tools to analyze neurons and brain circuits, new human brain imaging technologies, new methods for large-scale recording of neuronal activity, and understanding brain circuits.

The BRAIN initiative represents an incredible research opportunity for SNACC members, both in basic understanding of the brain functioning in health and disease, and eventually, in translation into broad clinical practice. Neuroanesthesiologists and neurointensivists offer clinical expertise and insight into human neurologic disease, as well as the ability to provide human subjects and tissue for research. Applications of new large-scale recording technologies and imaging technologies are especially suited to our interests. The NIH Blueprint for Neuroscience Research now offers the Neuroimaging Informatics Tools and Resources Clearinghouse (NITRC), a cloud-based computer environment to help researchers analyze brain imaging data, reducing the time for analysis to less than ten minutes (http://neuroscienceblueprint.nih.gov).

Neuroanesthesia and neurocritical care physicians play an important role in translating research into practice. Funding agencies have increasingly focused upon the translation of basic science discoveries into practice (Figure 2). The first translation phase (T1) involves translation of basic research into clinical research, including tests and clinical interventions. The second translation phase (T2) involves analyses and investigations of whether the new interventions improve health outcomes,

Continued on page 10
which are translated into evidence-based clinical guidelines. The third translation phase (T3) involves dissemination and implementation science to understand the processes involved in the adoption, implementation, and sustainability of the clinical knowledge and guidelines into clinical practice. The fourth translation practice phase (T4) involves evaluation of the effectiveness and cost-effectiveness of the practice in diverse populations in improving population health outcomes. All of these translational areas of research are ripe for investigation by neuroanesthesiologists and neurointensivists.

Investigations of important neurological diseases for our society (e.g., Alzheimer’s disease, Parkinson’s disease, epilepsy, stroke, traumatic brain or spinal cord injury, gliomas, chronic pain, addiction) are most likely to lead to funding. Outcome measures today must go beyond traditional mortality and morbidity measures, to include patient-centered outcomes. The NIH has developed a toolbox of standard measures to assess neurological and behavioral health in clinical studies (http://www.nihtoolbox.org), including measures of executive function, attention, episodic memory, language, processing speed, and working memory. Validated general health (e.g., SF-36) and disease-specific (e.g., epilepsy, stroke, spinal cord, traumatic brain injury, Alzheimer’s disease) quality of life scales are readily available to assess patient-centered outcomes. The Patient-Centered Outcome Research Institute (PCORI) emphasizes patient-centered comparative clinical effectiveness research in order to have broad translation into clinical practice in diverse populations. While neurological diseases (other than pain) are not yet on PCORI’s top five list for funding, treatment of important neurological disorders will undoubtedly be very important in the near future. As neurological specialists, the next decade holds enormous promise for all types of research across the translational continuum!

Michael M. Todd, MD is the Professor and Chair, Department of Anesthesia, University of Iowa Carver College of Medicine, Iowa City, IA. He served as the Editor-in-Chief of Anesthesiology from 1997-2006. Here are Dr. Todd’s thoughts:

I will leave it to others to comment on priorities in the broader world of the neurosciences as they apply to our specialty. My interests are more mundane. I’m still interested in the best care that can be provided to those patients who remain our “bread and butter,” the adult patient undergoing a craniotomy for a tumor or vascular lesion or for cervical spine disease.

I believe that the old debates regarding “the best anesthetic for a patient with a brain tumor” are now resolved, at least with respect to the immediate intraoperative period. It probably doesn’t matter. But after reviewing dozens of papers examining this question, I’m struck by the near total absence of any information regarding the clinical course of these patients beyond the immediate wake-up. In an era when we’re focused on outcomes, this deficit in our long-term knowledge is striking. Does anesthesia matter in this context? Maybe not, but this should be something we know, not something we guess about. Does our approach to ventilation, fluid management and blood pressure management matter? For example, we have literature on the association between postoperative hypertension and hemorrhage, but the causative association is weak, in spite of what we believe and often teach. Nobody knows what our BP targets (if any) should be, and for how long.

A similar argument exists regarding care of patients with cervical spine disease, particularly those with cord compression and/or myelopathy. For decades, we focused on airway management, only to discover that this is NOT an important factor in the outcomes of the great majority of patients (perhaps because we’re so good at managing this issue). But we also know that myelopathic patients are at dramatically increased risk of cord injuries during spine surgery. However, we don’t know how to prevent this. OK, hypotension is probably bad, but what do we need to do to insure perfusion of the cord intraoperatively and postoperatively? Just run a lot of phenylephrine? To what end-point? Is phenylephrine the best choice? Even more practically, who is at risk for postoperative airway and respiratory problems and who is not?

I doubt if any organization is going to fund the large randomized trials that would be needed to attack these questions directly, but the implementation of electronic records and our ability to evaluate tens of thousands of cases might help. And some trials could be mounted cheaply. All that is required is the organized cooperation of multiple active centers and neuroanesthesiologists.
Presenters: Shobana Rajan, MD; Robert Baracz CNIM, RGEET; Rafi Avitsian, MD
Cleveland Clinic

**History:** 40-year-old, right-handed woman with large left frontal grade II oligodendrogloma. Patient presented initially with confusion, language problem and seizure.

**Procedure:** Patient underwent left sided awake craniotomy. For the sleep phase, the patient was sedated with propofol 75mcg/kg/min along with dexmedetomidine 0.6mcg/kg/hr. Both infusions were discontinued for the awake phase of the procedure when language testing and motor functions were being evaluated. A grid was placed after dural opening for cortical stimulation.

**Left Hemisphere Mapping**

Stimulation was begun and the following waveforms were noted on EEG.

**Question:** What does the dark portion of the graph represent and what is the appropriate intervention?

**Answer:** The dark portion represents the stimulating artifact and indicates that stimulation has begun. There are repetitive spike discharges indicating seizure activity which could complicate a tumor resection in the eloquent cortex. If not, one must be ready to treat clinical seizures with midazolam followed by propofol, if necessary.
Transcranial Doppler (TCD) Monitoring for Carotid Endarterectomy

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Atherosclerotic disease of the carotid artery is an important cause of stroke. The treatment options for atherosclerotic disease of the extracranial carotid artery include carotid revascularization and the current guidelines provide class I recommendation to support carotid endarterectomy (CEA) in symptomatic patients with > 50% carotid artery stenosis and class IIa recommendation in asymptomatic patients with 70-99% stenosis. However, CEA itself is associated with the risk of stroke. The major perioperative neurological complications of CEA result from: (1) intraoperative ischemia (due to carotid cross clamping), (2) intraoperative and postoperative embolism, (3) postoperative carotid thrombosis and, (4) cerebral hyperperfusion. Carotid cross clamping during CEA can cause cerebral ischemia and the primary goal of neuromonitoring is to guide the need for shunt insertion during the period of cross clamping to carry the blood from the common carotid to the ICA, to maintain cerebral perfusion. While shunting may prevent cerebral hypoperfusion due to cross clamping, the routine use of an intraluminal shunt may increase the risk of perioperative stroke due to embolic events. Therefore, selective shunting guided by indicators of cerebral hypoperfusion during clamping is often advocated. One option for neuromonitoring is having an awake, cooperative patient using loco-regional anesthesia where a decline in neurological function serves as a surrogate for cerebral ischemia and indicates the need for shunting. Unfortunately, it is not a viable option for longer and more complex surgeries and for uncooperative patients. Moreover, since neither technique (general versus regional anesthesia) has been shown to be superior to the other, the choice of anesthetic technique is variable. Consequently, CEA is often performed under general anesthesia necessitating some form of neuromonitoring to detect cerebral ischemia during carotid cross clamping and hence, the need to shunt. Neuromonitoring during CEA may be performed using one or more of the following: electroencephalography (EEG), evoked potentials, cerebral oximetry using near infrared spectroscopy (NIRS), stump pressure and Transcranial Doppler (TCD) ultrasonography and each of these techniques has its own advantages and disadvantages.

While no single monitoring technique has been demonstrated to be superior in avoiding neurological complications during CEA, TCD is able to detect ischemic, hyperemic as well as embolic complications and provides unique advantages for intraoperative and postoperative monitoring. Moreover, it is a continuous, non-invasive, technique and provides real-time, instantaneous information about changes in cerebral blood flow. The report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology provided Type B recommendation (Class II to III evidence) to support the use of TCD during CEA to detect hemodynamic and embolic events that may result in perioperative stroke.

Intraoperative TCD Monitoring

Typically, a 2-MHz pulsed Doppler ultrasound is used to continuously insonate the ipsilateral middle cerebral artery (MCA) maintaining a constant angle of insonation using a probe fixation device (Figure 1). Some providers prefer to monitor bilateral MCAs. It is important that the anesthesia provider ensures that the anesthetic agent and concentration does not change during crucial periods of CEA to avoid interference with interpretation of TCD findings. In addition, changes in the partial pressure of carbon dioxide significantly impact the cerebral blood flow velocity by modulation of cerebrovascular resistance and hence, should be accounted for while interpreting the MCA flow velocity changes. If the MCA insonation is started with the patient awake, the flow velocity monitoring demonstrates an expected decrease after anesthesia is induced. Thereafter, the velocity remains constant or drifts minimally with no decay over time during prolonged anesthesia.

For deciding the need for shunting, the immediate “pre-clamping” mean flow velocity and the percent change following clamping are used. The MCA flow velocity decrease following carotid cross clamping depends on the status of collateral vessels. While the decrease may be little in patients with robust collaterals, in others, a substantial drop in flow velocity or even complete loss of flow may be seen. Various studies have indicated the threshold values for
critical decrease in MCA flow velocity which should trigger shunt insertion.2-9,14 Electroencephalographic findings consistent with cerebral ischemia become evident when cerebral blood flow drops typically below 10ml/100g/min and are consistent with MCA flow velocity of 15cm/sec.11 In the International Transcranial Doppler Collaborators study, cerebral ischemia was considered severe if the MCA mean flow velocity after clamping was 0-15% of the pre-clamp value, mild if 16-40%, and absent if >40%.2 Using the above criteria, it was observed that in patients with persistent ischemia (residual flow velocity 0-15%), the rate of severe stroke was very high and shunting was protective against stroke.2 At the same time, in patients with no ischemia (residual flow velocity >40%), the stroke rate was higher with shunting, although not as high as in the unshunted cases with severe ischemia.2 Similarly, Spencer and colleagues using TCD and stump pressure measurements in 97 CEAs observed that a decrease of up to 60% in MCA flow velocity after carotid clamping was safe and a residual flow velocity of less than 40% of the pre clamp value required shunting.13 Others have recommended shunting at greater drop of MCA flow velocity to less than 30% of the pre clamping values.10,14 In a study of 48 patients undergoing CEA under regional anesthesia, a 48% relative reduction in MCA flow velocity after carotid clamping was found to detect clinical neurologic deterioration with 100% sensitivity and 86% specificity.9 In summary, most data suggest a 40-50% reduction in the ipsilateral MCA flow velocity as indicator for need to shunt during carotid clamping. However, before attributing the decrease in flow velocity to carotid clamping, it should be ensured that the angle of insonation, blood pressure, carbon dioxide levels and anesthetic concentrations are stable. Following shunt insertion, TCD monitoring is helpful in documenting restoration of cerebral perfusion. Augmentation of systemic blood pressure is often needed to maintain adequate blood flow through the shunt. Figure 2 shows ipsilateral MCA flow velocity before and after cross clamping during CEA.

FIGURE 2
Decrease in the Ipsilateral MCA flow velocity from 54.7 cms before carotid cross clamping to 22.7 cms after cross clamping indicating a 41 percent residual flow velocity and possible need for shunting.

The principal cause of stroke following CEA is embolism from the operative site.15,16 The ability of TCD monitoring to detect microemboli makes it particularly advantageous over other neuromonitoring techniques for CEA. Studies utilizing TCD have demonstrated embolization to occur in more than 80% patients during the course of CEA.14,17,18 Microemboli are characterized by TCD as high-intensity transient signals (HITS, Figure 3) that are unidirectional within the flow velocity spectrum, have a duration <0.3 seconds and intensity >3dB above background velocity spectrum and produce a characteristic “chirping”, “snapping” or “moaning” sound.19 A high intensity transient signal may also be produced by an artifact caused simply by probe movement, electrical stimuli or diathermy and should be differentiated from a microembolus. Bidirectional signatures in the flow velocity waveform are usually produced by artifact although air emboli can sometimes produce similar signatures. The feature of air emboli that makes them grossly distinguishable from particulate emboli is their large dynamic range of around 60 dB compared to the 10-15 dB range for particulate emboli. Most commercially available TCD instruments are “overloaded” by signals of such dynamic range, and hence, air emboli result in signatures that extend outside the normal velocity spectral waveform. This distinction may work for bubbles down to approximately 30 μm in size but not below that. Although investigators have suggested various techniques such as the dual gating method and Wigner spectral analysis to differentiate between air and particulate emboli, the currently available technology is unable to make this distinction with accuracy. However, in general, the very high intensity signatures of air emboli, which typically overload the dynamic range of most TCD machines, generally produce some aliasing. On the other hand, the high intensity signals produced by particulate emboli are well contained within the velocity waveform and are relatively subtle.

FIGURE 3
High Intensity Transient Signals within the TCD flow velocity waveform indicating microemboli.

Multiple investigators have attempted to correlate the number of microemboli detected in a given time period with postoperative neurologic deficits and silent infarction demonstrated on brain
Transcranial Doppler (TCD) Monitoring for Carotid Endarterectomy

Continued from page 13

imaging. In one of the first attempts, Ackerstaff and colleagues noted that microembolism did not result in new morphologic changes in postoperative computed tomography scans, although there was a correlation between more than ten microemboli during dissection to new lesions on postoperative T2-weighted MRI scans.20 Others have noted a microembolization rate of >20/hour to be associated with ischemic changes on MRI.21 In a series of 65 patients where microembolic signals (MES) were detected in 69% of the cases during the first hour postoperatively, with counts ranging from 0 to 212/hr; occurrence of greater than 50 MES/hour in the early postoperative phase was predictive of the development of ipsilateral focal cerebral ischemia.22 In another study of 81 consecutive patients undergoing CEA with TCD monitoring, Levi and colleagues detected postoperative microembolic signals more than 50/hour in eight cases with five of them suffering ischemic neurological deficits in the territory of the insonated MCA, indicating a strong association between early postoperative microembolic signal count greater than 50/hour and the development of early cerebral ischemia.23 The significance of detection of cerebral emboli is often questioned because by the time the emboli are detected, they are already in the cerebral circulation. It has been suggested that surgeons could be guided by the documentation of embolic signals to change their operative technique, with the expectation that a decrease in the rate of microembolism would result in a decline in the perioperative stroke rate. Moreover, postoperative embolic detection is a valuable guide to intervene with heparin or dextran to reduce embolization and the consequences thereof.24,25 In a prospective series of 100 patients who underwent CEA with a six-hour period of postoperative TCD monitoring, Dextran 40 infusion was commenced if ≥25 emboli were detected in any ten-minute period.24 While only five patients developed sustained embolization, in each of these cases, embolization was abolished by Dextran administration, and during the period of this protocol, there was a 0 percent perioperative morbidity and mortality compared to the same group’s previous postoperative thromboembolic stroke rate of three percent.24 Other options to decrease cerebral emboli include combination of clopidogrel or Dextran 40 with dipyridamole/aspirin, with no difference in the influence of different antiplatelet regimens on TCD detected postoperative embolization following CEA.26

Postoperative TCD

Successful cerebral revascularization following CEA is usually indicated by the following TCD findings: (1) Increase in ipsilateral MCA and ACA flow velocities compared to preoperative values, which may often exceed the normal expected values27 (2) Disappearance / relative reduction of the side-to-side difference in flow velocities27,28 (3) Increase in cerebrovascular reserve capacity28 (4) Normalization of reversed flow / increase in flow velocity of the ophthalmic artery.29 Such adaptive changes sometimes take up to two weeks to establish, but may be observed in the immediate postoperative period.

Other postoperative applications of TCD include monitoring for “Cerebral Hyperperfusion Syndrome” and for postoperative thrombosis. A marked increase in cerebral blood flow may occur following CEA in patients with severe carotid stenosis, likely due to impairment of cerebral autoregulation. In some patients, such rebound increase in blood flow may lead to the cerebral hyperperfusion syndrome characterized by ipsilateral headache, hypertension, seizures and cerebral edema / hemorrhage.30-32 Risk factors of this syndrome include long-standing hypertension, high-grade carotid stenosis, poor collateral blood flow, contralateral carotid occlusion, impaired cerebral hemodynamic reserve intraoperative hemodynamic or embolic ischemia, post-operative hypertension, an ipsilateral increase of >175% in peak MCA velocity and/or a ≥100% increase in pulsatility index.31,33,34 Intracerebral hemorrhage is reported to occur in 0.4% to 1.8% of patients after CEA and leads to poor prognosis and increased mortality.30,31,34 Transcranial doppler monitoring may be useful to identify such patients and institute pharmacological measures for blood pressure control. A sustained increase of peak blood flow velocity ≥100% or pulsatility index ≥100% after unclamping should alert about the possible risk of intracerebral hemorrhage,30,35 indicating the need for increased postoperative surveillance and blood pressure control.

In summary, TCD monitoring provides useful information to the providers for perioperative management of CEA. The major limitations of TCD include the inability to detect adequate acoustic windows in select patients and the need for experienced personnel. However, it also offers the unique advantages by providing continuous, real-time information about cerebral perfusion in a non-invasive manner and it is currently the only monitoring technique available to detect cerebral microemboli.

References:
In Memoriam
James R. Harp, MD

David S. Smith, MD

It is with regret that I report the death of James R. Harp, MD who was one of the founders of our society. As extracted from Dr. Maurice Albin's history of SNACC, (J Neurosurgical Anesthesiology, 1997;9 (4): 296-307 and reprinted on the SNACC website) the idea for a Neuroanesthesia Society came from discussions between Dr. Albin and Dr. Thomas Langfitt (then Chair of neurosurgery at the University of Pennsylvania). After talking with Dr. Langfitt, Dr. Harp (then on the anesthesia faculty of the University of Pennsylvania) took it upon himself to develop a list of anesthesiologists and neurosurgeons who might be interested in such a society and helped organize the first meeting of the Neurosurgical Anesthesia Society which met in Philadelphia in 1973. The current Society for Neuroscience in Anesthesiology and Critical Care is the direct linear descendent of the group founded by Dr. Harp and 39 others with an interest in neuroanesthesia and who attended this first meeting.

Here is an excerpt from Dr. Harp's obituary: Dr. Harp was born in Pikeville, Kentucky. After serving in the US Navy he attended medical school and completed his anesthesia residency training at Duke University. Dr. Harp was on the faculty at Duke for one year after which he went into private practice for a year, joining the faculty at the University of Pennsylvania in 1969. He served as chair of the Anesthesia Department at Temple University from 1975-1987. While at Temple University he maintained a laboratory focusing on the study of the effects of anesthetics on brain blood flow and oxygenation. Dr. Harp also did research in the United Kingdom and Sweden.

Representative publications include:
Carlsson C, Smith DS, Keykah M; et al: The Effects of High-Dose Fentanyl on Cerebral-Circulation and Metabolism in Rats. Anesthesiology 1982;57:375-380


2014 SNACC Distinguished Service Award Winner

Left to right: Drs. Ansgar Brambrink, William L. Lanier, Jr. and Michael Todd.

The SNACC Distinguished Service Award was presented to William L. Lanier, Jr., MD in recognition of his outstanding achievements as a Clinician, Scientist and Teacher and for his service to the Society for Neuroscience in Anesthesiology and Critical Care. This award was presented at the SNACC 42nd Annual Meeting on October 10, 2014.
ASA House of Delegates Proceedings
October 2014

Laurel E. Moore, MD
SNACC Alternate Delegate, ASA House of Delegates

The full ASA House of Delegates (HOD) met in New Orleans on Sunday, October 12, 2014 and on Wednesday, October 15, 2014. SNACC, as a subspecialty society, was represented by Jeffrey Pasternak, MD. While the proceedings were too extensive for this newsletter, the following are points that SNACC members may find interesting.

1. J.P. Abenstein, MD was installed as President of the ASA.
2. Daniel Cole, MD (president of SNACC 2001-2002) was installed as President-Elect.
3. HOD approved an updated “Practice Advisory on Anesthetic Care for Magnetic Resonance Imaging” – available soon on the ASA website.
4. HOD also approved an updated “Practice Guidelines for Perioperative Blood Management” – available soon on the ASA website.
5. Henry Rosenberg, MD was supported for the ASA Distinguished Service Award for 2015.
6. There was considerable debate on two topics before the HOD. These were:
   a. Qualifications required for Trauma Anesthesiology Directors for Level I Trauma Centers.
   b. The Committee on Ethics newly developed “Statement on Fatigue”.

For more details, please visit the ASA Governance website: https://www.asahq.org/For-Members/About-ASA/ASA-Governance.aspx

As of this writing the minutes of the HOD proceedings are not posted, but they should be in the near future.

New SNACC App Introduced

Reza Gorji, MD
Editor

The SNACC App is out for iTunes, Blackberry World and Google Play. On the iTunes side of things, the iPhone and iPad version are the same. You can also access the Journal of Neurosurgical Anesthesiology (JNA) on the SNACC App. It has multiple sections each with a plethora of information. Each section is further subdivided into subsections. For example, in the 42nd Annual Meeting sections, one can find the SNACC planning committee, program, syllabus and digital posters. Incredible work and effort has gone into making this App possible for SNACC members and the public. Some sections require users to be SNACC members. If you have not downloaded the free App, feel free to do so at the iTunes App store, Blackberry World or Google Play. Once you get the App, look for the little arrow in the top right corner. Click it and you will get options on update availability as well as auto updating in the future. Some users reported problems with the App’s functionality. There is a section to report these to the developer. No doubt the App will improve in content and usability with future upgrades. For now, it has enough material to keep the user engaged. Have fun!

The SNACC APP is available for free by downloading from the following:
SNACC's newsletter is open to submission by members of SNACC. Please adhere to the following schedule. Submissions do not guarantee publication. We are interested in news and articles of interest from the membership at large. In addition, if you have a question to ask any of the officers of SNACC, you can submit them as well. Due to time and the volume of issues anticipated, not all questions can be answered.

Publication & Submission Deadlines

Spring Issue
Published April 15, 2015
March 15, 2015 - Copy Deadline

Summer Issue
Published June 15, 2015
May 15, 2015 - Copy Deadline

Fall and Pre-Meeting Issue,
Published September 15, 2015
August 15, 2015 - Copy Deadline

Winter Issue
Published December 15, 2015
November 15, 2015 - Copy Deadline

SNACC 42nd Annual Meeting
October 9-10, 2014
Sheraton New Orleans
New Orleans, LA

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SOCIETY FOR NEUROSCIENCE IN ANESTHESIOLOGY AND CRITICAL CARE

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