

# ACNS Fall Courses

September 24-25, 2016

Sheraton Music City

Nashville, TN



## Final Program

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## MESSAGE FROM THE PRESIDENT AND COURSE COMMITTEE CO-CHAIRS

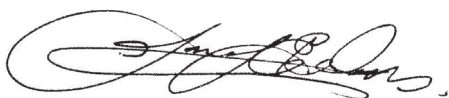
On behalf of the American Clinical Neurophysiology Society (ACNS), it is our pleasure to welcome you to Nashville for the 2016 ACNS Fall Courses. The Fall Courses are led by experts in the field and continue to provide an excellent opportunity for professional growth through education in rapidly-evolving areas of clinical neurophysiology.

The ACNS Course Committee has developed an exceptional program, including parallel courses on Intensive Care Unit Electroencephalography (ICU EEG) Monitoring and Neurophysiologic Intraoperative Monitoring (NIOM). We also think you will find the return of the Epilepsy Surgery and Pediatric EEG morning courses to be beneficial additions to this weekend's program.

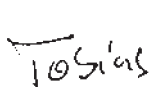
In addition to the courses, please do not hesitate to take advantage of the strong exhibitor presence, be sure to stop by the Exhibit Hall during meals and breaks as well as attend the Welcome Reception on Saturday evening. The Fall Courses also serves as a great opportunity to interact with other colleagues.

On behalf of the ACNS Council and Course Committee, we would like to thank everyone involved in the 2016 Fall Courses for ensuring their continued success. We hope that the courses provide a valuable educational opportunity for all in attendance and wish everyone a safe and enjoyable weekend in Nashville.


Sincerely,



Jonathan C. Edwards, MD, FACNS  
President



Tobias Loddenkemper, MD, FACNS  
Course Committee Co-Chair



Saurabh R. Sinha, MD, PhD, FACNS  
Course Committee Co-Chair

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Dr. Loddenkemper and Dr. Sinha would like to recognize and thank the 2016 Fall Courses Faculty:

### **Intensive Care Unit Electroencephalography (ICU EEG)**

Edilberto Amorim, MD  
Cecil D. Hahn, MD, MPH, FACNS  
Aatif M. Husain, MD, FACNS  
Peter W. Kaplan, MD, FRCP, FACNS  
Suzette M. LaRoche, MD, FACNS  
Tobias Loddenkemper, MD, FACNS  
Marc R. Nuwer, MD, PhD, FACNS  
Patrick L. Purdon, PhD  
Eric S. Rosenthal, MD  
Saurabh R. Sinha, MD, PhD, FACNS  
Tammy Tsuchida, MD, PhD, FACNS  
M. Brandon Westover, MD, PhD

### **Neurophysiologic Intraoperative Monitoring (NIOM)**

Ronald G. Emerson, MD, FACNS  
Gloria Galloway, MD, FACNS  
Aatif M. Husain, MD, FACNS  
Alan D. Legatt, MD, PhD, FACNS  
Jaime R. López, MD, FACNS  
Marc R. Nuwer, MD, PhD, FACNS  
Eva K. Ritzl, MD, FACNS

### **Epilepsy Surgery Update**

Amir M. Arain, MD  
Stephan U. Schuele, MD, MPH, FACNS  
William O. Tatum, IV, DO, FACNS

### **Pediatric EEG Update**

Cecil D. Hahn, MD, MPH, FACNS  
Tobias Loddenkemper, MD, FACNS  
Tammy Tsuchida, MD, PhD, FACNS

# ACNS INFORMATION

## Officers and Council

### President

Jonathan C. Edwards, MD, FACNS  
Medical University of South Carolina

### First Vice President

Stephan U. Schuele, MD, MPH, FACNS  
Northwestern University

### Second Vice President

Tobias Loddenkemper, MD, FACNS  
Children's Hospital Boston

### Secretary

Cecil D. Hahn, MD, MPH, FACNS  
Hospital for Sick Children

### Treasurer

Gloria M. Galloway, MD, FACNS  
Ohio State University Medical Center

### Immediate Past President

William O. Tatum, IV, DO, FACNS  
Mayo Clinic Florida

### Past President

Aatif M. Husain, MD, FACNS  
Duke University Medical Center

### Councilors-at-Large

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Children's Hospital of Philadelphia

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University of Toledo

Richard C. Burgess, MD, PhD, FACNS  
Cleveland Clinic Foundation

Peter W. Kaplan, MD, FRCP, FACNS  
Johns Hopkins Bayview Medical Center

Suzette M. LaRoche, MD, FACNS  
Mission Health

Jaime R. Lopez, MD, FACNS  
Stanford University

Cormac O'Donovan, MD, FACNS  
Wake Forest Baptist Medical Centers

Saurabh R. Sinha, MD, PhD, FACNS  
Duke University Medical Center

### AMA Officer

Marc R. Nuwer, MD, PhD, FACNS  
UCLA Medical Center

### Journal Editor

Aatif M. Husain, MD, FACNS  
Duke University Medical Center

## Course Committee

### Course Committee

Co-Chairs: Tobias Loddenkemper, MD, FACNS  
Saurabh R. Sinha, MD, PhD, FACNS

### Members:

Selim R. Benbadis, MD, FACNS  
Charles Epstein, MD, FACNS  
Cecil D. Hahn, MD, MPH, FACNS  
Susan T. Herman, MD, FACNS  
Lawrence J. Hirsch, MD, FACNS  
Aatif M. Husain, MD, FACNS  
Ruple Laughlin, MD  
Jong Woo Lee, MD, PhD, FACNS  
Jeffrey Liou, DO  
Jaime R. Lopez, MD, FACNS  
Daniel Menkes, MD, FACNS  
Marc R. Nuwer, MD, PhD, FACNS  
Phillip Pearl, MD, FACNS  
Alexander Rotenberg, MD, PhD  
Elayna Rubens, MD, FACNS  
Devon Rubin, MD, FACNS  
Seward Rutkove, MD  
Mark Scher, MD  
Stephan U. Schuele, MD, MPH, FACNS  
Asim Shahid, MD  
Mirela V. Simon, MD, FACNS  
Michael Sperling, MD, FACNS  
Nitin Tandon, MD  
William O. Tatum, IV, DO, FACNS  
Tammy Tsuchida, MD, PhD, FACNS  
M. Brandon Westover, MD, PhD  
Courtney J. Wusthoff, MD, FACNS

### Ex-Officio:

Meriem Bensalem-Owen, MD, FACNS  
Jeffrey Britton, MD  
Frank W. Drislane, MD, FACNS  
Gloria M. Galloway, MD, FACNS

## Continuing Medical Education (CME) Committee

Chair: Gloria Galloway, MD, FACNS

### Members:

Nicholas S. Abend, MD, FACNS  
Vinita J. Acharya, MD  
Meriem Bensalem-Owen, MD, FACNS  
Rohit Das, MD, FACNS  
Frank W. Drislane, MD, FACNS  
Charles M. Epstein, MD, FACNS  
Evan J. Fertig, MD  
Susan T. Herman, MD, FACNS  
Pongkiat Kankirawatana, MD, FACNS  
Jong Woo Lee, MD, PhD, FACNS  
Tobias Loddenkemper, MD, FACNS  
Dipakkumar Pandya, MD  
Mirela V. Simon, MD, FACNS  
Saurabh R. Sinha, MD, PhD, FACNS  
Christa Swisher, MD

## Executive Office

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info@acns.org



## Executive Director

Megan M. Hille, CAE, CMP  
mhille@acns.org

## Meetings and Membership Manager

Laura Konop  
lkonop@acns.org

## Not an ACNS Member? Join Now!

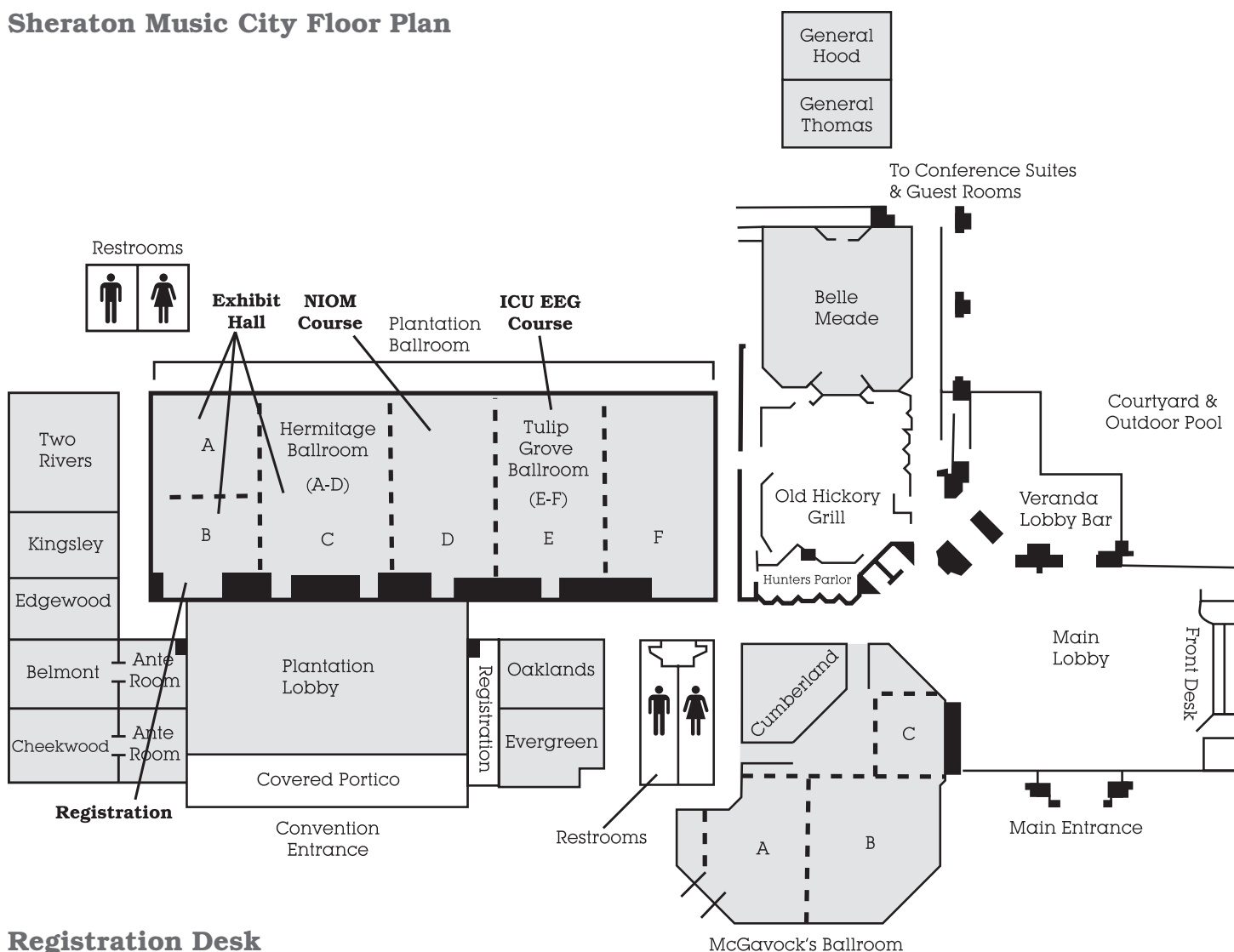
The benefits of joining are endless but here are just a few:

- Reduced fees for the Annual Meeting & Courses and In-Service Examination.
- Reduced dues for members in training and first-year practitioners.
- Access to the *Journal of Clinical Neurophysiology*.
- Access to the Online Member Directory.

Please visit the ACNS website, [www.acns.org](http://www.acns.org), for more information and ways to join!

# GENERAL MEETING INFORMATION

## Sheraton Music City Floor Plan



### Registration Desk

Location: Hermitage Foyer, Lobby Level

Hours: Friday, September 23 4:00 – 7:00pm  
 Saturday, September 24 6:00am – 5:00pm  
 Sunday, September 25 6:00am – 4:00pm

### Business Center

The Sheraton Music City has a business center available for all hotel guests. Services include copying and printing. The Business Center is located in the lobby across from the Front Desk.

### Wireless Internet

The ACNS will not be providing WiFi access to attendees. It is recommended to print any course materials ahead of arrival to the Fall Courses.

### Photography and Recording Policy

Photography or video or audio recording of sessions, materials presented in sessions, or exhibits without written permission from ACNS is strictly prohibited. Please note that photographs and video taken by or on behalf of ACNS of event activities and attendees shall be the property of ACNS.

### Meals

The following meals will be provided to Fall Courses delegates:

**Saturday, September 24, 2016** (Hermitage ABC; Lobby Level)

Breakfast: 7:00 – 9:00am  
 Lunch: 12:00 – 1:00pm  
 Reception: 5:00 – 6:00pm (hors d'oeuvres and cash bar)

**Sunday, September 25, 2016** (Hermitage Foyer; Lobby Level)

Breakfast: 7:00 – 9:00am

Beverages will also be provided during scheduled breaks on Saturday and Sunday.

## GENERAL MEETING INFORMATION

### Nearby Restaurants

The following list of dining options require a short cab ride from the Sheraton Music City. Please refer to this list for lunch options on Sunday, September 25. Additional restaurants located downtown are listed below. Old Hickory grill is also located at the hotel in the lobby area for lunch on Sunday.

Restaurant	Type	Price Range	Address/Distance from Sheraton Music City
Old Hickory Grill	Southern	\$\$	On-site
Backyard Burgers	American	\$	2744 Elm Hill Pike (1.5 miles)
Darfon's Restaurant & Lounge	American	\$\$	2810 Elm Hill Pike (1.6 miles)
Ellendale's	Southern	\$\$	2739 Old Elm Hill Pike (1.5 miles)
La Parilla Fresh Mexican Grill	Tex Mex	\$	2615 Elm Hill Pike (1.0 mile)
Panera Bread	Bakery/Café	\$	620 Royal Pkwy. (1.5 miles)

### Downtown Restaurants

The hotel offers a \$10.00 roundtrip shuttle to downtown Nashville through a 3rd party transportation company. Please inquire at Front Desk for reservations. Please refer to this list for dinner options both days. These locations will be too far for a lunch option on Sunday, September 25.

Restaurant	Type	Price Range	Address/Distance from Sheraton Music City
Acme Feed & Seed	American/ Eclectic	\$	101 Broadway (7.1 miles)
Hard Rock Cafe	American	\$\$	100 Broadway (7.1 miles)
Honky Tonk Central	American	\$\$	329 Broadway (7.6 miles)
Ichiban Japanese Restaurant	Japanese	\$\$	109 2nd Avenue N (6.5 miles)
Jack's Bar-B-Que	Barbecue	\$\$	416 Broadway (8.4 miles)
Margaritaville	Seafood/ Caribbean	\$\$	322 Broadway (7.2 miles)
Merchant's Restaurant	American/ Southern	\$\$\$	401 Broadway (6.7 miles)
Palm Restaurant	Steakhouse/ Seafood	\$\$\$	140 5th Avenue S (6.5 miles)
Prime 108	Seafood	\$\$\$	1001 Broadway (8.0 miles)
Rock Bottom Brewery	American	\$\$	111 Broadway (7.1 miles)
Rodizio Grill the Brazilian Steakhouse	Steakhouse	\$\$	166 2nd Avenue N (6.6 miles)
The Stillery	Southern	\$\$	113 2nd Avenue N (6.5 miles)

# CONTINUING MEDICAL EDUCATION (CME) INFORMATION

## Purpose

The American Clinical Neurophysiology Society (ACNS) is a professional association dedicated to fostering excellence in clinical neurophysiology and furthering the understanding of central and peripheral nervous system function in health and disease through education, research, and the provision of a forum for discussion and interaction.

## Content

ACNS is committed to providing continuing medical education to its members and others interested in clinical neurophysiology. Educational objectives include 1) Reviewing current knowledge of clinical neurophysiology including: electroencephalography, evoked potentials, electromyography, nerve conduction studies, intraoperative monitoring, polysomnography and other sleep technology, quantitative neurophysiological methods, magnetoencephalography, sleep disorders, epilepsy, neuromuscular disorders, brain stimulation, brain-computer interfacing, and related areas; and 2) Informing course and meeting attendees of recent technological developments and their implications for clinical practice.

## Expected Result

Attendees will improve competence in clinical neurophysiology procedures and incorporate new technological advancements into their practice.

## Gaps and Needs

In compliance with the Updated Accreditation Criteria of the Accreditation Council for Continuing Medical Education (ACCME), the Continuing Medical Education Committee of the ACNS has identified “professional practice gaps.” Definition: A “professional practice gap” is the difference between what a health professional is doing or accomplishing compared to what is achievable on the basis of current professional knowledge.

The following professional practice gaps and educational needs were identified by a combined effort of the Program, Course and CME Committees.

### Gap 1. Emerging Areas of Practice

Neurophysiologic intraoperative monitoring (NIOM) and intensive care unit EEG monitoring (ICU EEG) are new and rapidly evolving areas of clinical neurophysiology. Few practicing neurologists have adequate training in these techniques, and physicians with competence in these areas are in great demand. Educational activities should cover both basic methodologies for those practitioners new to ICU EEG and NIOM, and innovative techniques.

### Gap 2. General Practice of Clinical Neurophysiology

Clinical neurophysiology procedures are performed by a large proportion of practicing US neurologists, many of whom have little or no formal training in clinical neurophysiology. Many clinical neurophysiology procedures (e.g. evoked potentials, invasive EEG) are performed at low volume at most centers, and a forum for review and hands-on interpretation are essential to maintain competence in these areas.

Several specific topics with significant gaps between current practice and ideal practice have been identified via review of the literature, review of clinical neurophysiology fellowship curricula, and surveys of ACNS members and Annual Meeting attendees.

These include:

- Peripheral neurophysiology, Pediatric EMG, critical illness related neurophysiology, and muscle ultrasound
- Basic EEG: Identification of normal variants, identification of artifacts, clinical correlation
- Pediatric EEG, especially neonatal EEG
- Digital EEG processing, e.g. quantitative EEG and trends for use in the intensive care unit, source localization, coregistration with neuroimaging, etc.
- Full band EEG, Ultrafast and ultraslow EEG
- NIOM: Motor evoked potentials, guidelines and standards of care for NIOM (e.g. indications, cost effectiveness)
- Evoked potentials: Current role of short- and long-latency EPs
- Video-EEG monitoring, especially invasive EEG
- Sleep, Use of new scoring system, implications for patient care

## Changes in Behavior/Practice

It is intended that, as a result of attending the meeting and/or courses, physician attendees will be able to identify changes in competence or performance that are desirable. Definitions: “Competence” is knowing how to do something. “Performance” is what the physician would do in practice, if given the opportunity.

## Evaluation

The updated ACCME accreditation criteria are designed to integrate with the new requirements for maintenance of certification (for more information see [www.ABPN.org](http://www.ABPN.org)). Physicians are expected to perform self-assessments of their practice, but the ACNS, as an organization accredited by the ACCME, is expected to measure how its educational activities assist physicians in this activity. Thus, there are new questions in the evaluation form. These questions address your intended changes in competence or performance. In a few months, we will contact all physician meeting attendees to ask you if you actually HAVE experienced changes in competence or performance. Your responses, now and in the future, will assist us and ultimately you in determining educational activities that are most useful to you.

# CONTINUING MEDICAL EDUCATION (CME) INFORMATION

## Meeting Description

The Society's educational activities are directed to clinical neurophysiologists, neurologists, psychiatrists, physiatrists, neurosurgeons, trainees in these disciplines and other physicians and researchers who utilize clinical neurophysiologic techniques and knowledge in the diagnosis and management of patients with disorders of the peripheral and central nervous system.

The 2016 Fall Courses are designed around two of the rapidly-evolving areas of clinical neurophysiology, Neurological Intraoperative Monitoring (NIOM) and Intensive Care Unit EEG Monitoring (ICU EEG). Educational activities will cover both basic methodologies for those practitioners new to NIOM and ICU EEG, and innovative techniques. Returning to the Fall Courses in 2016 are morning courses covering two additional topics, Epilepsy Surgery and Pediatric EEG.

## Target Audience

The Society's educational activities are directed to clinical neurophysiologists, neurologists, psychiatrists, physiatrists, neurosurgeons, trainees in these disciplines and other physicians and researchers who utilize clinical neurophysiological techniques and knowledge in the diagnosis and management of patients with disorders of the nervous system.

## Learning Objectives

### Intensive Care Unit EEG Monitoring (ICU EEG)

At the conclusion of this course, participants should be able to:

1. Describe common indications for CEEG in the ICU setting in neonates, children, and adults;
2. Interpret EEG patterns encountered in the ICU, including seizures, periodic patterns and other background patterns and other background patterns important for prognosis and management;
3. Utilize quantitative EEG methods to identify long-term trends, screen for seizures rapidly, and to detect signs of ischemia;
4. Describe the value and limitations of routine EEG and continuous EEG monitoring to predict neurologic outcomes in hypoxic ischemic encephalopathy;
5. Identify the specific EEG patterns induced by different anesthetics used in general anesthesia and in the ICU;
6. Select appropriate equipment for ICU-EEG monitoring, including networking and data storage options;
7. Determine optimal staffing, data review, and reporting practices.

### Neurophysiologic Intraoperative Monitoring (NIOM)

At the conclusion of this course, participants should be able to:

1. Explain the appropriate methods and setting for a variety of NIOM techniques commonly utilized;
2. Identify appropriate methods and setting for a variety of NIOM techniques uncommonly utilized;
3. Discuss NIOM case presentations including interpretation of neurophysiologic data;
4. Discuss some of the technical challenges in performing and interpreting NIOM;
5. Identify updated information on NIOM practices.

## Epilepsy Surgery Update

At the conclusion of this course, participants should be able to:

1. Discuss concepts and approach to Stereo-EEG;
2. Discuss several approaches to minimally invasive epilepsy surgery;
3. Describe principles of different stimulation techniques in the treatment of epilepsy and choose the appropriate intervention for individual patients.

## Pediatric EEG Update

At the conclusion of this course, participants should be able to:

1. Apply an organized approach to the interpretation of neonatal EEG recordings;
2. Identify the cardinal clinical and EEG features of neonatal seizures and epilepsy;
3. Identify the cardinal clinical and EEG features of pediatric seizures and epilepsy.

## Accreditation Statement

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the sponsorship of ACNS. ACNS is accredited by the ACCME to provide continuing medical education for physicians.

## Credit Designation

ACNS designates the Fall Courses for the maximum number of *AMA PRA Category 1 Credit(s)*<sup>™</sup> and ASET CEUs indicated below. Physicians should claim only credit commensurate with the extent of their participation in the activity.

Intensive Care Unit EEG Monitoring (ICU EEG): 10 *AMA PRA Category 1 Credits*<sup>™</sup>  
Neurologic Intraoperative Monitoring (NIOM): 12.5 *AMA PRA Category 1 Credits*<sup>™</sup>  
Epilepsy Surgery: 1.5 *AMA PRA Category 1 Credits*<sup>™</sup>  
Pediatric EEG: 1.5 *AMA PRA Category 1 Credits*<sup>™</sup>

## ASET CEU Statement

ASET – The Neurodiagnostic Society has granted ASET Continuing Education (ACE) credits as follows for this program. Such crediting, should not be construed by program participants as an endorsement of any type of instruments or supplies mentioned or involved in these presentations.

Intensive Care Unit EEG Monitoring (ICU EEG) – 12 ASET-CEUs  
Neurophysiologic Intraoperative Monitoring (NIOM) – 12 ASET-CEUs  
Epilepsy Surgery Update – 1.5 ASET CEUs  
Pediatric Surgery Updated – 1.5 ASET CEUs

Upon completion of the event attendees should follow the below instructions to claim their ASET-CEU credits:

- Print and sign your name on the ASET-CEUs Attendance Roster at the end of the program in order to receive ASET-CEUs. If you arrive late or need to leave the program early (by 30 minutes or more), write the time in the far right column. Your program director will determine the number of credit hours you might be eligible to receive.
- You will also be asked to complete a program evaluation form following the meeting. The evaluation forms are a very important part of the ASET-CEUs process.
- A transcript of your ASET-CEUs hours will be sent to you upon request. If you would like to receive your transcript, please complete the ASET-CEUs Transcript form and mail or fax to the address at the bottom of this page. ASET-CEUs transcripts are free for members and \$25.00 for non-members.

## CONTINUING MEDICAL EDUCATION (CME) INFORMATION

### Policy on Financial Disclosures

It is the policy of ACNS to ensure balance, independence, objectivity and scientific rigor in all its individually sponsored or jointly sponsored educational programs. In order to comply with the ACCME's Updated Standards for Commercial Support, ACNS requires that anyone who is in a position to control the content of an educational activity discloses all relevant financial relationships with any commercial interest pertaining to the content of the presentation. Should it be determined that a conflict of interest exists as a result of a financial relationship of a planner of the CME activity, the planner must recuse himself or herself from the planning for that activity or relevant portion of that activity. All presentations for which the presenter disclosed a potential conflict of interest are peer reviewed by two members of the ACNS CME Committee with no relationships. If bias is found, the presenter is asked to make changes to the presentation and it is re-reviewed for bias before final approval. Refusal to disclose a conflict or the inability to resolve an identified conflict precludes participation in the CME activity. Complete conflict of interest disclosure information is printed in the final program for the activity. A learner may request additional information regarding the nature of a planner or speaker's disclosure if "No Relationships" has been indicated below. To request additional information, contact the ACNS Executive office at [info@acns.org](mailto:info@acns.org).

### Conflict of Interest Disclosures

Key: a. Grants/Research Support; b. Consultant; c. Stock/Shareholder (self-managed); d. Speaker's Bureau; e. Advisory Board or Panel; f. Salary, Contractual Services; g. Other Financial or Material Support (royalties, patents, etc.)

Council		
Nicholas S. Abend, MD, FACNS	Children's Hospital of Philadelphia	Demos Medical Publishing (g); Marinus (b); NIH (a); Sage (b)
Imran I. Ali, MD, FACNS	University of Toledo	No Relationships
Richard C. Burgess, MD, PhD, FACNS	Cleveland Clinic Foundation	No Relationships
Jonathan C. Edwards, MD, FACNS	Medical University of South Carolina	No Relationships
Gloria Galloway, MD, FACNS	Ohio State University Medical Center	Cambridge University Press (g); Demos Publishing (g)
Cecil D. Hahn, MD, MPH, FACNS	Hospital for Sick Children-Neurology	No Relationships
Aatif M. Husain, MD, FACNS	Duke University Medical Center	CMEducation (g); Continuing Education, Inc (g); Demos Publisher (g); Jazz Pharma (b); Marinus Pharma (b); Sage Pharmaceuticals (e); UCB Pharma (e)
Peter W. Kaplan, MD, FRCP, FACNS	Johns Hopkins Bayview Medical Center	Demos Publications (g); Lundbeck (b)
Suzette M. LaRoche, MD, FACNS	Mission Health	Demos Publishing (g)
Tobias Loddenkemper, MD, FACNS	Children's Hospital Boston	AAN (g); AES (a, g); Acorda (a); ACNS (g); CURE (a); Eisai (a); Epilepsy Foundation of America (a); Epilepsy Research Fund (a); Epilepsy Therapy Project (a); HHV-6 Foundation (a); Lundbeck (a); PCORI (a); Pediatric Epilepsy Research Foundation (a); Pfizer (a); Upsher-Smith (a, b); Zogenix (b)
Jaime R. Lopez, MD, FACNS	Stanford University	No Relationships
Cormac O'Donovan, MD, FACNS	Wake Forest Baptist Medical Center	Quintiles (g); Sage Therapeutics (a); Upsher Smith (a)
Marc R. Nuwer, MD, PhD, FACNS	University of California, Los Angeles	Corticare (c); Sleep Med (f)
Stephan U. Schuele, MD, MPH, FACNS	Northwestern University-Neurology	Danny Did Foundation (a); Eisai (d); NIH (a); Sunovion (d)
Saurabh R. Sinha, MD, PhD, FACNS	Duke University Medical Center	Cadwell, Inc. (e); Cyberonics Inc. (a, b); Monteris, Inc. (b); UCB Pharmaceuticals (a); Upsher Smith Laboratories (a)
William O. Tatum, IV, DO, FACNS	Mayo Clinic - Florida	No Relationships
Course Committee (if not listed above)		
Selim R. Benbadis, MD, FACNS	University of South Florida	Cyberonics (b); Eisai (b); GSK (b); Sunovion (b); UCB (b)
Charles M. Epstein, MD, FACNS	Emory University School of Medicine	Neuronetics, Inc (g)
Susan T. Herman, MD, FACNS	Beth Israel Deaconess Medical Center	Acorda Therapeutics (a); Epilepsy Therapy Development Project (a); Neuropace, Inc. (a); Sage Therapeutics (a)
Lawrence J. Hirsch, MD, FACNS	Yale University	Altas of EEG in Critical Care, Wiley (g); Eisai (a); GlaxoSmithKline (b); Lundbeck (a, b); medlink (g); Neuropace (b); Sunovion (a); UCB-Pharma (a); Upsher-Smith (a, b); UpToDate Neurology (g)
Ruple Laughlin, MD	Mayo Clinic	No Relationships
Jong Woo Lee, MD, PhD, FACNS	Brigham & Women's Hospital	Advance Medical (b); DigiTrace, Inc (f); Duke Clinical Research Institute (a); Sunovion Inc (a); UCB, Inc (a)

## CONTINUING MEDICAL EDUCATION (CME) INFORMATION

Jeffrey Liou, DO	Harvard Medical School	No Relationships
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Alexander Rotenberg, MD, PhD	Children's Hospital Boston	Brainsway Inc. (a); Eisai Co. Ltd. (a); Neuroelectronics Inc. (a); Neuro'motion Inc. (c); NeuroRex Inc. (e)
Elayna Rubens, MD, FACNS	Memorial Sloan Kettering Cancer Center	No Relationships
Devon Rubin, MD, FACNS	Mayo Clinic – Florida	AANEM (g); AAN (g)
Seward Rutkove, MD	Beth Israel Deaconess Medical Center	Biogen (b); GlaxoSmithKline (b); Merck (b); Skulpt, Inc. (c)
Mark Scher, MD	Rainbow Babies and Children's Hospital	No Relationships
Asim Shahid, MD	University Hospitals, Rainbow Babies and Children's Hospital	No Relationships
Mirela V. Simon, MD, FACNS	Massachusetts General Hospital	Demos Medical Publishing (g)
Michael Sperling, MD, FACNS	Thomas Jefferson University	Accorda (a); Brain Sentinel (a); Eisai (a); Glaxo (a); Marinus (a); Medscape (b); Medtronic (a, b); Neurelis (a); Pfizer (a); SK Life Sciences (a); Sunovion (a); UCB Pharma (a); Upsher Smith (a)
Nitin Tandon, MD	University of Texas Health Center	No Relationships
Tammy Tsuchida, MD, PhD, FACNS	Children's National Health System	No Relationships
M. Brandon Westover, MD, PhD	Massachusetts General Hospital	No Relationships
Courtney J. Wusthoff, MD	Stanford University	No Relationships
CME Committee (if not listed above)		
Vinita J. Acharya, MD	Penn State Hershey Medical Center	Lundbeck (e); Sunovion (d); UCB (d)
Meriem Bensalem-Owen, MD, FACNS	University of Kentucky	Eisai (a); GW Pharmaceutical (a); NeuroPace (a); SAGE Pharmaceutical (a); Sunovion (a); UCB (a)
Rohit Das, MD, FACNS	Indiana University School of Medicine	Cyberonics (d)
Frank W. Drislane, MD, FACNS	Beth Israel Deaconess Medical Center	LWW (g); UpToDate (g)
Evan J. Fertig, MD	Northeast Regional Epilepsy Group	Portland Inter-Hospital Physician Association (a); SAGE Pharma (a)
Pongkiat Kankirawatana, MD, FACNS	Children's of Alabama – UAB	No Relationships
Dipakkumar Pandya, MD	Hunterdon Neurology	Sunovion (d)
Christa Swisher, MD	Duke University Medical Center	No Relationships
Course Faculty (if not listed above)		
Edilberto Amorim, MD	Massachusetts General Hospital	No Relationships
Amir M. Arain, MD	Vanderbilt University	No Relationships
Ronald Emerson, MD, FACNS	Hospital for Special Surgery	Allergan (c); Amgen (c); Bristol Myers Squibb (c); Calumet (c); Dow Chemical (c); Eli Lilly (c); Express Scripts (c); General Electric (c); Johnson & Johnson (c); Persyst (b); Reach Bionics (c); Teva Pharm (c); Thermo Fisher Scientific (c)
Alan D. Legatt, MD, PhD, FACNS	Montefiore Medical Center	Several companies that market health care goods or services; none of them are related to the subject of my presentation (c)
Patrick L. Purdon, PhD	Massachusetts General Hospital	Masimo Corporation (d)
Eva K. Ritzl, MD, FACNS	Johns Hopkins University	InVivo Therapeutics Corporation (b)
Eric S. Rosenthal, MD	Massachusetts General Hospital	GLG Consultation (b); Solstice Healthcare (b)
Executive Office Staff		
Megan M. Hille, CMP, CAE	ACNS	No Relationships
Laura Konop	ACNS	No Relationships
Dinice Mader	ACNS	No Relationships

## CONTINUING MEDICAL EDUCATION (CME) INFORMATION

### Certificate of Attendance

Certificates of Attendance and CME certificates will be available to pre-registered delegates at the conclusion of each day for that day's scheduled courses. Please visit the ACNS Website (<http://www.acns.org/meetings/fall-courses/2016-fall-courses/cme-information>) to claim your certificate. Delegates who registered on-site will be able to obtain a CME certificate at [www.acns.org](http://www.acns.org) starting October 24, 2016.

Delegates are REQUIRED to complete session evaluations to obtain a CME Certificate or Certificate of Attendance. Delegates should log on to the website listed above and enter their last name and their ACNS ID# listed at the top of their Fall Courses confirmation form, included in their registration packet.

The system will then ask delegates to indicate which sessions they attended, complete evaluation forms for their registered sessions, and then will generate a PDF certificate which may be printed or saved to the delegate's computer. Session attendance and evaluation information are saved in the database, and certificates may be accessed again in the event the certificate is lost or another copy is required. Delegates will only be able to claim CME Certificates and Certificates of Attendance to the courses they are registered for.

Please note that certificates will not be mailed or emailed after the meeting. The online certificate program is the only source for this documentation. Please contact ACNS at [info@acns.org](mailto:info@acns.org) for any questions. ACNS asks that all CME certificates be claimed no later than December 31, 2016.

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## PROGRAM AGENDA

### Morning Courses - 7:30 – 9:00am

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#### Saturday, September 24

6:45 – 7:45am Breakfast – Hermitage Ballroom Foyer; Lobby Level

#### Epilepsy Surgery Update

Location: Tulip Grove Ballroom E; Lobby Level

Course Co-Directors: *Stephan U. Schuele, MD, MPH, FACNS* & *William O. Tatum, DO, FACNS*

#### Agenda:

- |        |  |
|--------|--|
| 7:30am | Intracranial EEG Using Stereo-EEG<br><i>Stephan U. Schuele, MD, MPH, FACNS</i>             |
| 7:55am | Discussion   |
| 8:00am | Stereotactic Minimally Invasive Epilepsy Surgery<br><i>William O. Tatum, IV, DO, FACNS</i> |
| 8:25am | Discussion   |
| 8:30am | Neurostimulation: Choices and Challenges<br><i>Amir M. Arain, MD</i>                       |
| 8:55am | Discussion   |
| 9:00am | Adjourn  |

#### Sunday, September 27

6:45 – 7:45am Breakfast – Hermitage Ballroom Foyer; Lobby Level

#### Pediatric EEG Update

Location: Tulip Grove Ballroom E; Lobby Level

Course Co-Directors: *Cecil D. Hahn, MD, MPH, FACNS* & *Tobias Loddenkemper, MD, FACNS*

#### Agenda:

- |        |  |
|--------|--|
| 7:30am | Introduction to Neonatal EEG<br><i>Cecil D. Hahn, MD, MPH, FACNS</i>                   |
| 7:55am | Discussion   |
| 8:00am | Neonatal Epilepsy - Clinical and EEG Features<br><i>Tammy Tsuchida, MD, PhD, FACNS</i> |
| 8:25am | Discussion   |
| 8:30am | Pediatric Epilepsy - Clinical and EEG Feature<br><i>Tobias Loddenkemper, MD, FACNS</i> |
| 8:55am | Discussion   |
| 9:00am | Adjourn  |

# PROGRAM AGENDA

## TWO-DAY COURSES

**Saturday, September 24 & Sunday, September 25 (9:15am – 5:00pm)**

Intensive Care Unit EEG Monitoring (ICU EEG)

Location: Tulip Grove Ballroom E; Lobby Level

Course Co-Directors: *Tammy Tsuchida, MD, PhD, FACNS* & *M. Brandon Westover, MD, PhD*

### Agenda:

#### Saturday, September 24

8:15 - 9:15am	Breakfast Hermitage ABC; Lobby Level
9:15am	Introductory Remarks and Overview <i>M. Brandon Westover, MD, PhD</i>
9:25am	Seizures: Utility of CEEG for Detection – Adults <i>Saurabh R. Sinha, MD, PhD, FACNS</i>
9:55am	Seizures: Utility for CEEG Detection – Pediatric/Neonate <i>Cecil D. Hahn, MD, MPH, FACNS</i>
10:25am	Seizures: Terminology for Rhythmic and Periodic Patterns <i>Suzette LaRoche, MD, FACNS</i>
10:55am	Coffee Break & Visit Exhibits Hermitage ABC; Lobby Level
11:10am	Seizures: Mechanisms & Influence on Outcome <i>Tobias Loddenkemper, MD, FACNS</i>
11:40am	Seizures: Impact of Treatment on Outcome: Risk-Benefit Calculus <i>Aatif M. Husain, MD, FACNS</i>
12:10pm	Lunch & Visit Exhibits Hermitage ABC; Lobby Level
1:10pm	Seizures: Management in Neonates & Children <i>Tobias Loddenkemper, MD, FACNS</i>
1:40pm	Seizures: Management in Adults <i>Aatif M. Husain, MD, FACNS</i>
2:10pm	Seizures: Management of Refractory & Super-Refractory SE <i>Eric S. Rosenthal, MD</i>
2:40pm	Coffee Break & Visit Exhibits Hermitage ABC; Lobby Level
2:55pm	HIE: Prognosis in Adults <i>Peter W. Kaplan, MD, FRCP, FACNS</i>
3:25pm	HIE: Prognosis in Children & Neonates <i>Tammy Tsuchida, MD, PhD, FACNS</i>
3:55pm	HIE: Emerging Quantitative Approaches to Prognosis <i>Edilberto Amorim, MD</i>
4:25pm	Case Presentations
5:00pm	Adjourn
5:00-6:00pm	Welcome Reception Hermitage ABC; Lobby Level

#### Sunday, September 25

8:15 - 9:15am	Breakfast Hermitage Foyer; Lobby Level
9:15am	QEEG: Overview of Available Tools & Uses <i>Saurabh R. Sinha, MD, PhD, FACNS</i>
9:45am	QEEG: Theory of Spectrograms <i>Patrick L. Purdon, PhD</i> <i>M. Brandon Westover, MD, PhD</i>
10:15am	QEEG: Seizure Recognition Tutorial <i>Edilberto Amorim, MD</i>
10:45am	Coffee Break Hermitage Foyer; Lobby Level
11:00am	Multimodal & Invasive Monitoring <i>Eric S. Rosenthal, MD</i>
11:30am	QEEG: Ischemia Detection <i>M. Brandon Westover, MD, PhD</i>
12:00pm	Lunch (delegates on their own for lunch see p.3 for a list of nearby restaurants)
1:00pm	EEG in Toxic/Metabolic Encephalopathy (Delirium): Adults <i>Peter W. Kaplan, MD, FRCP, FACNS</i>
1:30pm	EEG & aEEG in Encephalopathy: Neonatal/Pediatric <i>Tammy Tsuchida, MD, PhD, FACNS</i>
2:00pm	EEG in General Anesthesia <i>Patrick L. Purdon, PhD</i>
2:30pm	Coffee Break Hermitage Foyer; Lobby Level
2:45pm	EEG in ICU Sedation Monitoring <i>M. Brandon Westover, MD, PhD</i>
3:45pm	Staffing, Personnel, Workflow & Logistics <i>Cecil D. Hahn, MD, MPH, FACNS</i>
3:45pm	Billing & Coding <i>Marc R. Nuwer, MD, PhD, FACNS</i>
4:15pm	ICU EEG Guidelines <i>Suzette LaRoche, MD, FACNS</i>
4:45pm	Discussion
5:00pm	Adjourn

# PROGRAM AGENDA

## TWO-DAY COURSES

**Saturday, September 24 & Sunday, September 25 (9:15am – 5:00pm)**

Neurophysiologic Intraoperative Monitoring (NIOM)

Location: Hermitage Ballroom D; Lobby Level

Course Co-Directors: *Gloria Galloway, MD, FACNS* & *Marc R. Nuwer, MD, PhD, FACNS*

### Agenda:

#### Saturday, September 24

8:15 - 9:15am	Breakfast Hermitage ABC Foyer; Lobby Level
9:15am	Welcome <i>Marc R. Nuwer, MD, PhD, FACNS</i>
9:20am	SEP <i>Aatif M. Husain, MD, FACNS</i>
10:05am	MEP <i>Ronald G. Emerson, MD, FACNS</i>
10:50am	Coffee Break & Visit Exhibits Hermitage ABC; Lobby Level
11:10am	BAER <i>Alan D. Legatt, MD, PhD, FACNS</i>
11:55am	Lunch & Visit Exhibits Hermitage ABC; Lobby Level
1:00pm	Endovascular NIOM <i>Jaime R. López, MD, FACNS</i>
1:45pm	Electrocorticography <i>Marc R. Nuwer, MD, PhD, FACNS</i>
2:30pm	Coffee Break & Visit Exhibits Hermitage ABC; Lobby Level
2:45pm	Cranial Nerve Mapping and Monitoring <i>Jaime R. López, MD, FACNS</i>
4:20pm	CP Angle Surgery/Microvascular Decompression <i>Alan D. Legatt, MD, PhD, FACNS</i>
5:00pm	Adjourn
5:00-6:00pm	Welcome Reception Hermitage ABC; Lobby Level

#### Sunday, September 25

8:15 - 9:15am	Breakfast Hermitage Foyer; Lobby Level
9:15am	Welcome <i>Gloria Galloway, MD, FACNS</i>
9:20am	SDR Monitoring <i>Gloria Galloway, MD, FACNS</i>
10:05am	Anesthesia Considerations <i>Ronald G. Emerson, MD, FACNS</i>
10:50am	Coffee Break Hermitage Foyer; Lobby Level
11:10am	Billing and Coding <i>Marc R. Nuwer, MD, PhD, FACNS</i>
11:55am	Lunch (delegates on their own for lunch see p.3 for a list of nearby restaurants)
1:00pm	Case Studies in Spine Surgeries <i>Eva K. Ritzl, MD, FACNS</i>
1:45pm	SDR <i>Gloria Galloway, MD, FACNS</i>
2:30pm	Coffee Break Hermitage Foyer; Lobby Level
3:35pm	Tethered Cord <i>Aatif M. Husain, MD, FACNS</i>
4:20pm	Case Studies in D Wave Monitoring <i>Eva K. Ritzl, MD, FACNS</i>
5:00pm	Adjourn

# EXHIBIT HALL INFORMATION

## Exhibit Hall Hours

Saturday, September 24      8:30am - 6:00pm  
Location: Hermitage Ballroom ABC; Lobby Level

ACNS provides exhibit space at scientific meetings for commercial exhibits related to the fields of basic and clinical neurophysiology. The Society makes no attempt to evaluate any aspect of the material exhibited. Noncompliance with guidelines published by the ACNS has not been considered by the Society in allotting commercial space. Hence, acceptance of these commercial exhibits should not be construed as indicated sponsorship or approval of their products by ACNS.

## Exhibit Hall Floor Plan

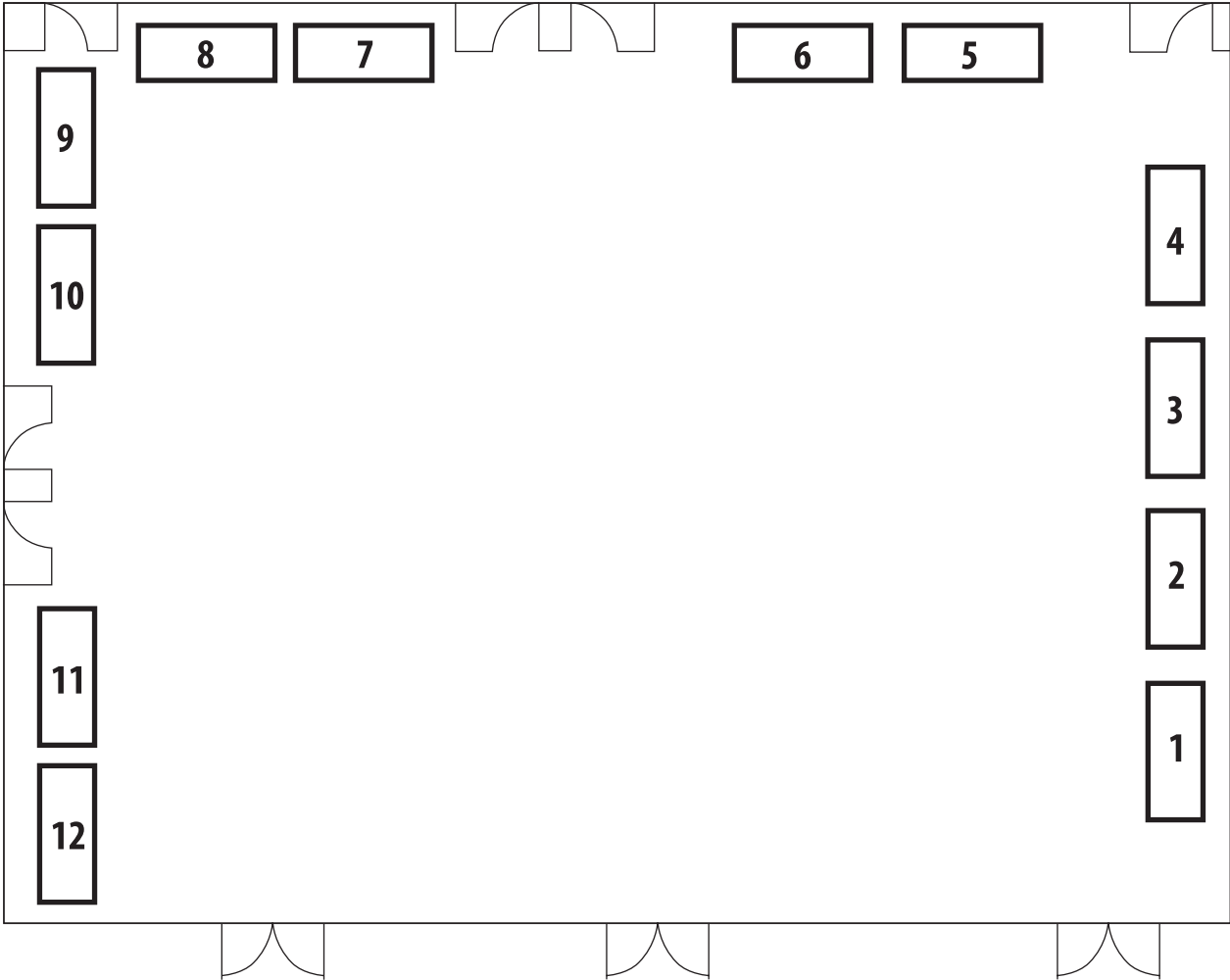


Table #	Exhibitor
4	ABCN/ABRET
1	Cadwell Industries
10	Ideal Health Careers
8	Lifelines Neurodiagnostic Systems, Inc.
2	Natus Neurology
11	NeuroPace
7	Neurotech
6	Persyst Development Corporation
5	Rhythmink International, LLC
9	Signal Gear, LLC
3	Specialty Care

# EXHIBIT HALL INFORMATION

## Exhibit Hall Directory

**TABLE 4**

**ABCN/ABRET**

2509 W. Illes Ave.  
Suite 102  
Springfield, IL 62704  
P: (217) 726-7980  
F: (217) 726-7989  
abcn@att.net  
www.abcn.org

ABRET Neurodiagnostic Credentialing & Accreditation offers five credentials (R. EEG T.®, R. EP T.®, CNIM®, CLTM®, CAP®) and three laboratory accreditation programs, LAB-EEG, LAB-NIOM, and LAB-LTM. Learn more about laboratory accreditation, view resources for technologists and receive assistance in recruiting neurodiagnostic technologists.

The American Board of Clinical Neurophysiology (ABCN) has a 65 year history of promoting excellence in Clinical Neurophysiology and offers examinations with added competency in Epilepsy Monitoring, Neurophysiologic Intraoperative Monitoring and Critical Care EEG. A General Clinical Neurophysiology Track is also available. International testing is available.

**TABLE 1**

**Cadwell Industries**

909 N. Kellogg Street  
Kennewick, WA 99336  
P: (509) 735-6481  
F: (509) 783-6503  
info@cadwell.com  
www.cadwell.com

Established. Focused. Global. At Cadwell®, we are passionate about enabling quality, informed outcomes for your patient care. Our neurodiagnostic and neuromonitoring solutions are designed to deliver efficient workflow, quality data, reliable performance and easy reporting wherever and whenever you need it. Our brands include Arc EEG, LTM and ICU cEEG; Sierra® EMG and EP with integrated ultrasound; Cascade® IONM; Easy® PSG and CadLink™ data management. Our global sales and support teams serve physicians and medical centers worldwide. We take pride in combining customer input with our employees' expertise and USA-made components to provide the best solutions in the industry.

**TABLE 10**

**Ideal Health Careers**

3455 Peachtree Road, #500  
Atlanta, GA 30326  
P: (404) 816-9988  
F: (404) 816-5688  
info@idealhealthcareers.com  
www.idealhealthcareers.com

Ideal Health Careers is a professional search firm that develops long-term relationships with our clients in order to help them source, hire, and retain neurodiagnostic talent. Our sole focus is the neurodiagnostic market, which enable us to become key strategic assets for our clients. Would you like to have a pipeline of clinical or managerial talent at your disposal? Please ask how we can help you dominate the battle for talent. Neurologists seeking opportunities are welcome to contact us at any time. We will also have several full-time opportunities for clinical neurophysiology (IOM) fellows in 2015, so please come by our booth for an introduction. [www.idealhealthcareers.com](http://www.idealhealthcareers.com) or 404-816-9988.

**TABLE 8**

**Lifelines Neurodiagnostic Systems, Inc.**

411 Edwardsville Road, Suite A  
Troy, IL 62294  
P: (618) 667-6445  
F: (618) 667-1982

Lifelines Neurodiagnostic Systems is celebrating 15 years as a pioneer in EEG. We implement our mission, Changing Lives Through Neurodiagnostic Innovation, by providing solutions that are easy and efficient for clinicians with innovative solutions like the Jordan EEG BraiNet and eight-channel EEG amplifier. This product enables the clinician to quickly assess the EEG recorded in the ED from a remote internet connection. The Virtual EMU allows a patient to have their long-term video EEG recorded in the comfort of their own home, and the Incereb EEG electrode arrays simplify neonatal EEG monitoring.

**TABLE 2**

**Natus Neurology**

3150 Pleasant View Road  
Middleton, WI 53562  
P: (608) 829-8500  
F: (608) 829-8775  
neurology.marketing@natus.com  
www.natus.com

Natus Neurology is a leading provider of instrumentation for diagnosis and monitoring of neurological conditions: epilepsy, sleep disorders, cerebral vascular disorders and stroke, neuropathies, neuromuscular diseases, myopathies; neurosurgical procedures; neurophysiologic research; and offers a complete line of supplies and accessories for use in settings from private practice to hospital.

## ADVERTISING & GRANT SUPPORT OPPORTUNITIES

**TABLE 11**

**NeuroPace**

455 N. Bernardo Avenue  
Mountain View, CA 94043  
P: (650) 237-2700  
F: (650) 237-2701  
info@neuropace.com  
www.neuropace.com

The RNS® System is an award-winning technology developed and manufactured in Silicon Valley that has been recognized for its innovation. Similar to a pacemaker that monitors and responds to heart rhythms, the RNS System is the world's first and only medical device that can monitor and respond to brain activity. NeuroPace was founded to design, develop, manufacture and market implantable devices for the treatment of neurological disorders with responsive stimulation. The company's initial focus is the treatment of epilepsy, a debilitating neurological disorder affecting approximately 1% of the population worldwide. In addition to treating epilepsy, responsive neurostimulation holds the promise of treating several other disabling medical disorders that impact the quality of life for millions of patients around the world.

**TABLE 7**

**Neurotech**

15285 Watertown Plank Road, Suite 2  
Elm Grove, WI 53122  
P: (262) 754-0898  
F: (262) 754-0897  
info@neurotecheeg.com  
www.neurotecheeg.com

Neurotech is a leading service provider in Monitored Long Term EEGs in patient's homes. Working with both academic and private practice institutions, we have offices in 7 states. Neurotech provides EEG technical services to physicians to enhance their Routine or LTM EEG services. Neurotech is JCAHO accredited and a clinical training site for EEG students with the Institute of Health Services.

**TABLE 6**

**Persyst Development Corporation**

12625 High Bluff Drive  
Suite 213  
San Diego, CA 92130  
P: (858) 461-4542  
F: (858) 461-4531  
sales@persyst.com  
www.persyst.com

Persyst is the world's leading supplier of EEG software for clinical applications. Persyst Seizure Detection, Spike Detection, Trending and Artifact Reduction is integrated and sold by every leading EEG manufacturer. Visit Persyst to see the future of EEG software.

**TABLE 5**

**RhythmLink International, LLC**

1140 First Street South  
Columbia, SC 29209  
P: (803) 252-1222  
F: (803) 252-1111  
sales@rhythmink.com  
www.rhythmink.com

RhythmLink International, LLC© designs, manufactures and distributes medical devices and provides custom packaging, private labeling, custom products and contract manufacturing to its customers. RhythmLink is recognized as a leader within its field at providing the important physical connection between patients and the diagnostic equipment to record or elicit neurophysiologic biopotentials. Our mission and vision is to enhance patient care worldwide by transforming medical device technology. We deliver peace of mind by providing superior products, consistent availability, continuous innovation and the highest level of customer service in the industry without wavering in our commitment to fair pricing.

**TABLE 9**

**Signal Gear, LLC**

27 Sweetwater Drive  
Prosperity, SC 29127  
P: (855) 439-4327  
F: (800) 878-9804  
team@signalgear.com  
www.signalgear.com

SIGNAL GEAR® is a medical device company focused on designing and developing neurodiagnostic accessories. Founded on the premise that passionate, thoughtful study is key to innovation and creativity, we study the scientific literature, the patient and clinical practice. Our goal is to provide the optimal patient product for each specialty, from the clinical office setting to the operating room, by tirelessly testing products in our electrical, mechanical, and clinical test labs. Let us show you advantages of our HOOK Near Field Monitoring Needle Pairs and SNS Urethral Catheter Electrode!

**TABLE 3**

**SpecialtyCare**

3100 West End Ave  
Suite 800  
Nashville, TN 37203  
P: (615) 346-8801  
F: (615) 345-5405  
bashty.teague@specialtycare.net  
www.specialtycare.net

SpecialtyCare is your partner for improved outcomes, patient safety, and financial results. We work with thousands of physicians every day, assisting in the delivery of exceptional care. Our expert clinicians are highly trained, certified, and work as integrated members of your team, dedicated to helping make your operating room as efficient as possible. When you want the certainty of clinical excellence, choose SpecialtyCare.

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## NOTES

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## NOTES

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DATE

ANNUAL MEETING & COURSES



PHOENIX  
2017

FEBRUARY 8-12, 2017  
SHERATON GRAND PHOENIX