

AMERICAN CLINICAL NEUROPHYSIOLOGY SOCIETY

W E L C O M E

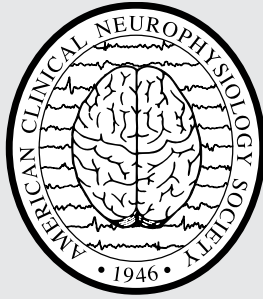
*2019 Annual Meeting & Courses*

FEBRUARY 6-10, 2019 ✦ CAESARS PALACE ✦ LAS VEGAS, NEVADA



✦ *Final Program*

*www.acns.org*



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# ACNS INFORMATION

## Officers and Council

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### President

Tobias Loddenkemper, MD, FACNS  
Children's Hospital Boston

### 1st Vice President

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

### 2nd Vice President

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

### Secretary

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Mission Health

### Treasurer

Jaime R. Lopez, MD, FACNS  
Stanford University

### Immediate Past President

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

### Past President

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

### Councilors-at-Large

Imran I. Ali, MD, FACNS  
University of Toledo

Meriem Bensalem-Owen, MD, FACNS  
University of Kentucky

Giridhar P. Kalamangalam, MD, DPhil, FACNS  
University of Texas

Jong Woo Lee, MD, PhD, FACNS  
Brigham & Women's Hospital

Daniel L. Menkes, MD, FACNS  
William Beaumont Hospital

Devon I. Rubin, MD, FACNS  
May Clinic

Sarah E. Schmitt, MD, FACNS  
Medical University of South Carolina

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

### AMA Delegate

Marc R. Nuwer, MD, PhD, FACNS  
UCLA

### Journal Editor

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

## About the American Clinical Neurophysiology Society (ACNS)

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ACNS' mission is to serve patients and society by empowering members to advance the science, practice and profession of clinical neurophysiology. This mission serves to fulfill the vision to optimize neurologic health through understanding of nervous system function

Founded in 1946 and originally named the American Electroencephalographic Society (AEEGS), ACNS is the major professional organization in the United States devoted to the establishment and maintenance of standards of professional excellence in clinical neurophysiology in the practice of neurology, neurosurgery and psychiatry. ACNS members utilize neurophysiology techniques in the diagnosis and management of patients with disorders of the nervous system and in research examining the function of the nervous system in health and disease.

## Past Presidents

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1947 \*Herbert H. Jasper, MD, PhD

1948 \*Herbert H. Jasper, MD, PhD

1949 \*Frederic A. Gibbs, MD

1950 \*Hallowell Davis, MD

1951 \*Robert Schwab, MD

1952 \*James O'Leary, MD

1953 \*Robert B. Aird, MD

1954 \*Mary A.B. Brazier, DSc

1955 \*A. Earl Walker, MD

1956 \*Reginald G. Bickford, MD

1957 \*John R. Knott, PhD

1958 \*Robert S. Dow, MD

1959 \*W. Theodore Liberson, MD

1960 \*Arthur A. Ward, Jr., MD

1961 \*Jerome K. Merlis, MD

1962 \*Charles E. Henry, PhD

1963 \*Cosimo Ajmone-Marsan, MD

1964 \*Peter Kellaway, PhD

1965 \*Donald B. Lindsley, PhD

1966 \*David D. Daly, MD

1967 Kenneth A. Kooi, MD

1968 Gian-Emilio Chatrian, MD

1969 Robert J. Ellingson, PhD, MD

1970 Donald W. Klass, MD

1971 \*Daniel Silverman, MD

1972 Eli S. Goldensohn, MD

1973 \*Richard D. Walter, MD

1974 Janice R. Stevens, MD

1975 Ernst A. Rodin, MD

1976 \*John S. Barlow, MD

1977 \*Fernando Torres, MD

1978 \*Frank Morrell, MD

1979 \*Pierre Gloor, MD, PhD

1980 Richard N. Harner, MD

1981 Jack D. Grabow, MD

1982 Roger Q. Cracco, MD

1983 Cesare T. Lombroso, MD

1984 Robert J. Gummit, MD

1985 Andrew J. Gabor, MD, PhD

1986 Juhn A. Wada, MD,

1987 Frank W. Sharbrough, MD,

1988 Joan B. Cracco, MD, FACNS

1989 Barry R. Tharp, MD,

1990 Timothy A. Pedley, MD, FACNS

1991 Ernst Niedermeyer, MD, FACNS

1992 Barbara F. Westmoreland, MD, FACNS

1993 Jerome Engel, MD, PhD, FACNS

1994 Marc R. Nuwer, MD, PhD, FACNS

1995 Michael J. Aminoff, MD, FACNS

1996 John S. Ebersole, MD, FACNS

1997 Solomon L. Moshé, MD, FACNS

1998 Warren T. Blume, MD, FACNS

1999 C. William Erwin, MD, FACNS

2000 Michael R. Sperling, MD, FACNS

2001 Eli M. Mizrahi, MD, FACNS

2002 Bruce J. Fisch, MD, FACNS

2003 Charles M. Epstein, MD, FACNS

2004 Donald L. Schomer, MD, FACNS

2005 Ronald G. Emerson, MD, FACNS

2006 Richard P. Brenner, MD, FACNS

2007 Mark A. Ross, MD, FACNS

2008 Alan D. Legatt, MD, PhD, FACNS

2009 Gareth J. Parry, MD, FACNS

2010 Peter W. Kaplan, MB, FRCP, FACNS

2011 Douglas R. Nordli, Jr., MD, FACNS

2012 Susan T. Herman, MD, FACNS

2013 Frank W. Drislane, MD, FACNS

2014 Aatif M. Husain, MD, FACNS

2015 William O. Tatum, IV, DO, FACNS

2016 Jonathan C. Edwards, MD, MBA, FACNS

2017 Stephen U. Schuele, MD, MPH, FACNS

\* Deceased

# ACNS INFORMATION

## Course Committee

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### Co-Chairs

Frank W. Drislane, MD, FACNS  
Beth Israel Deaconess Medical Center

Courtney J. Wusthoff, MD, FACNS  
Stanford University

### Members

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

Giridhar P. Kalamangalam, MD, DPhil, FACNS  
University of Florida

Leslie H. Lee, MD, FACNS  
Stanford University Medical Center

Tobias Loddenkemper, MD, FACNS  
Children's Hospital Boston

Jaime R. Lopez, MD, FACNS  
Stanford University

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

M. Brandon Westover, MD, PhD, FACNS  
Massachusetts General Hospital

### Ex-Officio

Jeffrey Britton, MD, FACNS  
Mayo Clinic

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

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

Tammy Tsuchida, MD, PhD, FACNS  
Children's National Medical Center

## Continuing Medical Education (CME) Committee

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### Co-Chairs

Meriem Bensalem-Owen, MD, FACNS  
University of Kentucky

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

### Members

Amy Crepeau, MD  
Mayo Clinic

Charles M. Epstein, MD, FACNS  
Emory University School of Medicine

Evan J. Fertig, MD  
Providence Brain and Spine Institute

Elizabeth Gerard, MD, FACNS  
Northwestern University

Hiba A. Haider, MD  
Emory University

Abeer J. Hani, MD  
Lebanese American University

Susan T. Herman, MD, FACNS  
Beth Israel Deaconess Medical Center

Monica Islam, MD  
Nationwide Children's Hospital

Pongkiat Kankirawatana, MD, FACNS  
Children's of Alabama- UAB

Fawad A. Khan, MD  
Ochsner Health System

Ammar Kheder, MD  
Penn Epilepsy Center

Jong Woo Lee, MD, PhD, FACNS  
Brigham & Women's Hospital

Joel Oster, MD  
Tufts University

Dipakkumar P. Pandya, MD  
Hunterdon Neurology

Jun T. Park, MD, FAES  
Case Western Reserve University

Karl Erwin Sanzenbacher, MD, MS, FACNS  
Eastern Maine Medical Center

Mirela V. Simon, MD, MSc, FACNS  
Massachusetts General Hospital

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

Fahd Sultan, MD  
University of Oklahoma Health Sciences Center

Christa Swisher, MD  
Duke University Medical Center

Shanti Thirumalai, MD, FACNS  
University of Michigan

### Ex-Officio

Nicholas S. Abend, MD, MSCE, FACNS  
Children's Hospital of Philadelphia

Frank W. Drislane, MD, FACNS  
Beth Israel Deaconess Medical Center

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

Tammy Tsuchida, MD, PhD, FACNS  
Children's National Medical Center

Courtney J. Wusthoff, MD, FACNS  
Stanford University

# ACNS INFORMATION

## Program Committee

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### Co-Chairs

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

Tammy Tsuchida, MD, PhD, FACNS  
Children's National Medical Center

### Members

Nicholas S. Abend, MD, MSCE, FACNS  
Children's Hospital of Philadelphia

William J. Bosl, MD, PhD  
University of San Francisco

Richard C. Burgess, MD, PhD, FACNS  
Cleveland Clinic Epilepsy Center

Bernard Allan Cohen, PhD, FACNS, FASNM  
Neurological Monitoring Associates, LLC

Elliot Dimberg, MD, FACNS  
Mayo Clinic

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

Ronald Emerson, MD, FACNS  
Hospital for Special Surgery / Weill Cornell Med Ctr

William B. Gallentine, DO, FACNS  
Stanford University

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

Mark Hallett, MD, FACNS  
National Institutes of Health

Abeer J. Hani, MD  
Lebanese American University

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

Akio Ikeda, MD, PhD, FACNS  
Kyoto University Graduate School of Medicine

Giridhar P. Kalamangalam, MD, DPhil, FACNS  
University of Florida

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

Ioannis Karakis, MD, PhD, MSc  
Emory University

Suzette M. LaRoche, MD, FACNS  
Mission Health

Ruple S. Laughlin, MD  
Mayo Clinic

Jong Woo Lee, MD, PhD, FACNS  
Brigham & Women's Hospital

Leslie Lee, MD, FACNS  
Stanford University Medical Center

Jaime R. Lopez, MD, FACNS  
Stanford University

Faye McNall, MEd, REEGT  
ASET - The Neurodiagnostic Society

Daniela N. Minecan, MD, FACNS, FAES  
University of Michigan Health System

Heidi M. Munger Clary, MD, MPH  
Wake Forest University

Marcus C. Ng, MD, FRCPC, CSCN(EEG)  
University of Manitoba

Noor Pirzada, MD  
University of Toledo

Eva K. Ritzl, MD, FACNS  
Johns Hopkins University

Alexander Rotenberg, MD, PhD  
Children's Hospital Boston

Devon I. Rubin, MD, FACNS  
Mayo Clinic

Arnold J. Sansevere Jr., MD  
Boston Children's Hospital

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

Raj D. Sheth, MD, FAAN, FACNS  
Mayo Clinic / Nemours Clinic-Florida

William O. Tatum, DO, FACNS  
Mayo Clinic Florida

Martin Veilleux, MD, FACNS  
Montreal Neurological Hospital

M. Brandon Westover, MD, PhD, FACNS  
Massachusetts General Hospital

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Meriem Bensalem-Owen, MD, FACNS  
University of Kentucky

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Beth Israel Deaconess Medical Center

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

Courtney J. Wusthoff, MD, FACNS  
Stanford University

# GENERAL MEETING INFORMATION

## Registration Desk

**Location:** Bacchus Registration Desk, Promenade Level

### Hours:

Tuesday, February 5:	4:00 – 6:00 pm
Wednesday, February 6:	8:00 am – 5:00 pm
Thursday February 7:	6:00 am – 5:00 pm
Friday, February 8:	6:00 am – 5:00 pm
Saturday, February 9:	7:00 am – 5:00 pm
Sunday, February 10:	7:30 – 10:00 am

## Mobile App

Download the 2019 ACNS Annual Meeting & Courses mobile app! Available for download in app stores for all mobile devices and tablets. Create your own schedule, search exhibitors, find local information, and more in the mobile app! See page 6 for download instructions.

## Internet

Wireless internet access is available to Annual Meeting & Courses delegates throughout the meeting space. To access the internet, use the following network credentials: **Network: ACNS2019, Password: ACNS2019**

## Business Meeting

The ACNS Annual Business Meeting will be held in Florentine I-II, from 7:00-7:30 pm on Saturday, February 9, 2019. This meeting is open to all attendees, but only ACNS members may vote.

## Poster Sessions

Authors will be present during poster tours between 12:15 – 1:30 pm on Friday, February 8 and 7:00 – 8:00 am on Saturday, February 9 for discussion.

ACNS is not responsible for posters remaining on boards after presentation hours. Poster abstracts will be published in the *Journal of Clinical Neurophysiology*.

## Exhibits

Those attending the Annual Meeting are encouraged to visit the Exhibit Hall located in the Roman Ballroom. All meals and coffee breaks on Friday, February 8 and Saturday, February 9 will be held in the Exhibit Hall. Exhibit Hall hours are listed below:

### Friday, February 8, 2019

12:15 – 4:00 pm	Exhibit Hall Open
7:00 – 8:30pm	Welcome Reception

### Saturday, February 9, 2019

7:00 – 1:30 pm	Exhibit Hall Open
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More information and a complete exhibitor listing may be found on p. 37.

## ACNS Meeting Safety & Responsibility Policy

The American Clinical Neurophysiology Society (ACNS) is committed to providing a safe, productive, and welcoming environment for all meeting participants and ACNS/EDI staff. All participants, including, but not limited to, attendees, speakers, volunteers, exhibitors, ACNS/EDI staff, service providers, and others are expected to abide by this Meeting Safety & Responsibility Policy. This Policy applies to all ACNS meeting-related events, including those sponsored by organizations other than ACNS but held in conjunction with ACNS events, in public or private facilities.

### Responsible Drinking

At most ACNS networking events both alcoholic and non-alcoholic beverages are served. ACNS expects participants at our events to drink responsibly. ACNS and Meeting host event staff have the right to deny service to participants for any reason, and may require a participant to leave the event.

### Personal Safety and Security

ACNS works diligently to provide a safe and secure environment at its meetings and events by working with venue staff to make sure meeting participants are safe. We ask that all attendees report any questionable or concerning activity to ACNS/EDI staff so that they can take immediate action. No concern is too small, if you see something, say something.

- Be aware of your surroundings at all times.
- Use the buddy system when walking to and from the event venue, networking event locations during early or late hours.
- Don't wear your meeting badge on the street. Take it off as soon as you leave the building/venue.
- Don't carry a lot of cash or credit cards. Leave these items in your hotel room safe.
- Don't leave personal property unattended anywhere, anytime.

If it is an emergency or if you need immediate assistance, you should ask any ACNS/EDI staff member or the on-site security personnel to help you.

### Unacceptable Behavior

- Harassment, intimidation, or discrimination in any form.
- Physical or verbal abuse of any attendee, speaker, volunteer, exhibitor, ACNS/EDI staff member, service provider, or other meeting guest.
- Examples of unacceptable behavior include, but are not limited to, verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, national origin, inappropriate use of nudity and/or sexual images in public spaces or in presentations, or threatening or stalking any attendee, speaker, volunteer, exhibitor, ACNS/EDI staff member, service provider, or other meeting guest.
- Disruption of presentations at sessions, in the exhibit hall, or at other events organized by ACNS at the meeting venue, hotels, or other ACNS-contracted facilities.

ACNS has zero-tolerance for any form of discrimination or harassment, including but not limited to sexual harassment by participants or our staff at our meetings. If you experience harassment or hear of any incidents of unacceptable behavior, ACNS asks that you inform the ACNS President or ACNS Executive Director Megan M. Hille, CMP, CAE (mhille@acns.org) so that we can take the appropriate action.

## GENERAL MEETING INFORMATION

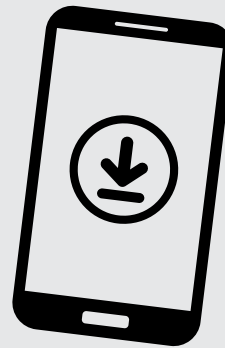
ACNS reserves the right to take any action deemed necessary and appropriate, including immediate removal from the meeting without warning or refund, in response to any incident of unacceptable behavior, and ACNS reserves the right to prohibit attendance at any future meeting.

### DOWNLOAD THE 2019 ANNUAL MEETING APP!

Create a personalized schedule, search exhibitors, get real-time push notifications and MORE!

#### GET THE APP

1. Download the 'CrowdCompass Attendee Hub' app to your device (available in any app store);
2. Once downloaded, open the app and search for "2019 ACNS Meeting & Courses"
3. Click the "Download" button to download the event app;
4. Login by tapping on the 3 horizontal lines in the top left corner of the screen, then tapping on the "Login for more features!"
5. Enter your first and last name to search the invited attendee list and be taken to a verification code page. If you are not on the list, enter your email address.
6. Check your email for your code, then enter the code and click 'Verify' to login.



### DON'T BE A JOKER – PLAY ACNS POKER!

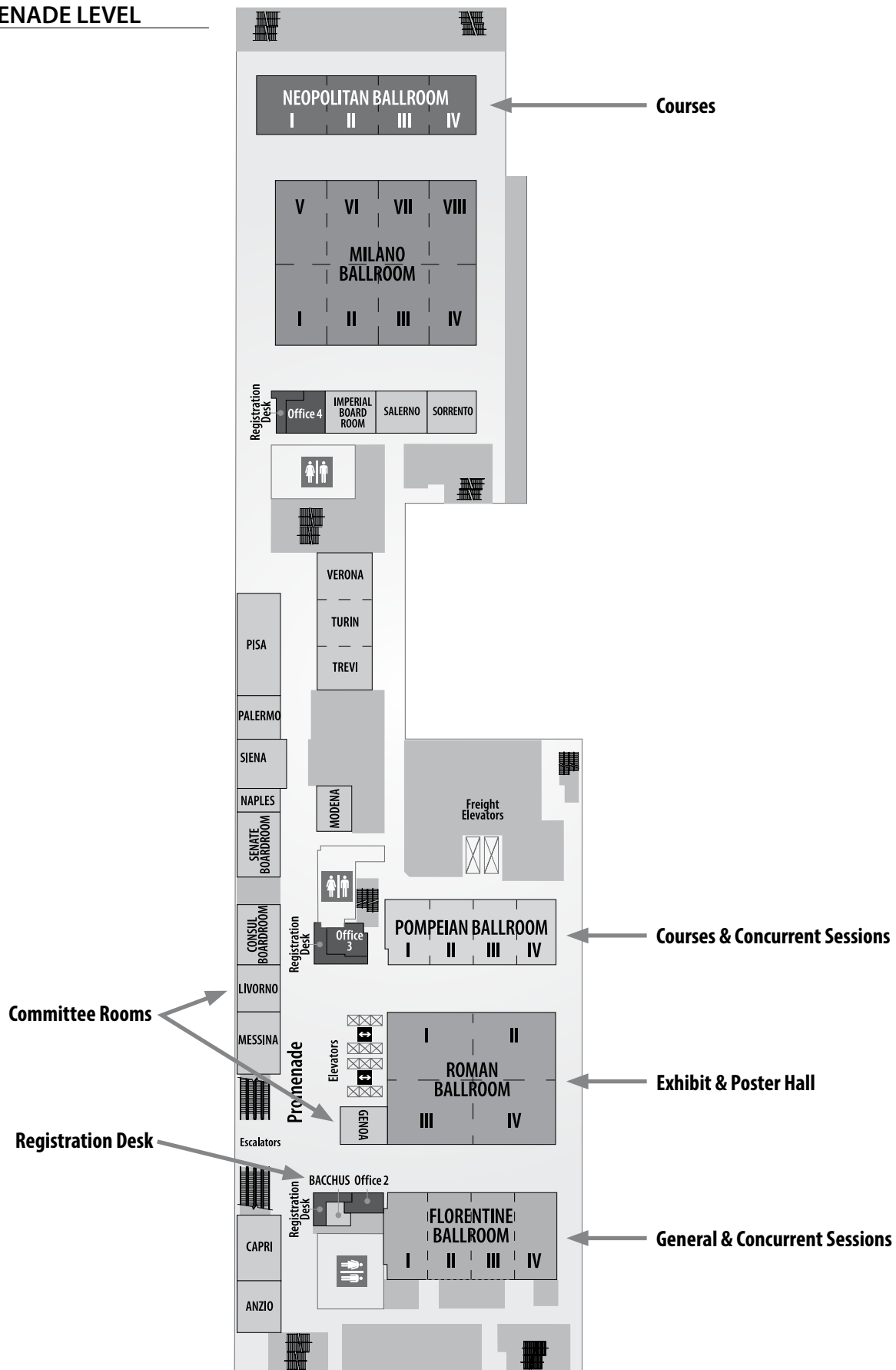
- Each attendee will receive a single playing card with your registration materials.
- Visit the Exhibit Hall to collect additional cards from exhibitors then put together your best poker hand from the cards you collected.
- Post a photo of your hand to the Annual Meeting mobile app.
- At the close of the exhibit hall on Saturday, February 9, ACNS staff will "call" and the attendees with the best hands win prizes!





# CAESARS PALACE FLOORPLAN

## PROMENADE LEVEL





## NEARBY RESTAURANTS

### Fast-Casual Options

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#### American

##### Therapy

518 East Fremont St  
702.912.1622

##### Shake Shack

3790 S Las Vegas Blvd  
725.222.6730

##### In-N-Out Burger

2900 W Sahara Ave  
800.786.1000

##### Farmer Boys

2341 N. Las Vegas Blvd  
702.675.7555

#### Mexican/Southwestern

##### Del Taco

3785 S Las Vegas Blvd  
702.838.3600

##### Taco Bell Cantina

3717 S Las Vegas Blvd  
702.272.2422

#### Italian

##### Maggiano's Little Italy

3200 S Las Vegas Blvd  
702.732.2550

##### Pizza Rock

201 North Third Street  
702.385.0838

### Fine Dining Options

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#### American

##### Sage

Aria Resort & Casino  
3730 S Las Vegas Blvd  
702.590.9520

##### Top of the World

Stratosphere Tower, 106<sup>th</sup> Floor  
2000 S Las Vegas Blvd  
702.380.7777

##### Honey Salt

1031 S Rampart Blvd  
702.445.6100

##### Yard House

Red Rock Casino Resort & Spa  
11011 W Charleston Blvd  
702.363.9273

#### Steakhouse

##### Jean-Georges Steakhouse

Aria Resort & Casino  
3730 S Las Vegas Blvd  
702.590.8660

#### Asian

##### Wing Lei

Wynn Las Vegas  
3131 S Las Vegas Blvd  
702.770.3388

##### Nobu

Caesars Palace Hotel  
3570 S Las Vegas Blvd  
702.785.6628

##### Raku

5030 W. Spring Mountain Rd #2  
702.367.3511

##### Mizumi

Wynn Las Vegas  
3131 S Las Vegas Blvd  
702.770.3320

#### Italian

##### Lago

Bellagio Hotel  
3600 S Las Vegas Blvd  
866.259.7111

##### Rivea

Delano Las Vegas  
3940 S Las Vegas Blvd  
877.632.5400

##### Sinatra

Encore  
3131 S Las Vegas Blvd  
702.770.5320

#### Latin American

##### CHICA

The Venetian  
3355 S Las Vegas Blvd #106  
702.805.8472

##### Mesa Grill

Caesars Palace  
3570 S Las Vegas Blvd  
702.731.7731

##### Bandito

325 Hughes Center Dr. Suite 100  
702.213.6876

# CONTINUING MEDICAL EDUCATION (CME) INFORMATION

## Educational Mission Statement

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### 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.

### 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.

### 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

Several emerging areas of clinical neurophysiology have significant practice gaps in which the opportunities for training and mentoring fall short of the need for experienced and trained neurologists. Intraoperative monitoring, intensive care unit EEG monitoring, Video and Quantitative EEG and invasive evaluation for epilepsy surgery with Stereo EEG are growing areas of clinical neurophysiology with few practicing neurologists having adequate training in these techniques. Adult and pediatric physicians as well as neurodiagnostic technologists with competence in these areas are in great demand. Without additional specialized training, neurologists will not be competent to conduct these types of monitoring.

#### 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, advanced EMG procedures) are performed at low volume at many centers and a forum for review and hands-on interpretation are essential to improve and 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 ACNS Annual Meeting & Courses are designed to provide a solid review of the fundamentals and the latest scientific advances in both “central” and “peripheral” clinical neurophysiology. Presentations at the Annual Meeting & Courses are given by leading experts in the field and have value for health care professionals who utilize clinical neurophysiology. Sessions include symposia, workshops, courses and Special Interest Groups, featuring didactic lectures, expert panels, debates and interactive formats. Poster presentations at the Annual Meeting highlight the latest work conducted at clinical neurophysiology centers around the country.

## Annual Courses Learning Objectives

At the end of the Annual Courses, the participant will be able to:

1. Describe the indications for use of clinical neurophysiology techniques in diagnosis of disorders of the nervous system;
2. Incorporate new neurophysiology procedures and technological advances into his/her own clinical practice; and
3. Perform and interpret a broad range of clinical neurophysiology procedures, and integrate the results of these tests into comprehensive patient management plans.

## Annual Meeting Learning Objectives

At the end of the Annual Meeting, the participant will be able to:

1. Discuss recent advances in electroencephalography, evoked potentials, magnetoencephalography, electromyography, nerve conduction studies, intraoperative monitoring, polysomnography, and other clinical neurophysiology techniques; and
2. Apply advances in clinical neurophysiology techniques to improve the diagnosis of neurologic disorders.

## Accreditation Statement

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

## Credit Designation

ACNS designates the Annual Meeting for a maximum 18.75 *AMA PRA Category I Credit(s)*<sup>TM</sup>. Physicians should claim only credit commensurate with the extent of their participation in the activity.

ACNS designates the Annual Courses for the maximum number of *AMA PRA Category 1 Credit(s)*<sup>TM</sup>.

### Epilepsy Surgery/Invasive EEG Course Part I

6.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Neurophysiologic Intraoperative Monitoring (NIOM) Part I

6.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

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

6.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Video-EEG Part I

2 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Advanced EEG Techniques

1.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### EMG/Peripheral Nervous System

5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### EMG Demo

2 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Epilepsy Surgery/Invasive EEG Course Part II

1.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Neurophysiologic Intraoperative Monitoring (NIOM) Part II

6.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

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

3 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Autonomic Neurophysiology

1.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### 5th Annual CNP Program Director's Symposium

2 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Basic EEG

3 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Video-EEG Part II

1.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Evoked Potentials

1.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Neonatal EEG

1.5 *AMA PRA Category I Credit(s)*<sup>TM</sup>

### Neuromodulation/Stimulation

3 *AMA PRA Category I Credit(s)*<sup>TM</sup>

## Certificate of Attendance & CME Certificate

CME certificates will be available to pre-registered delegates immediately upon the close of the meeting at [www.acns.org](http://www.acns.org). Delegates who registered on-site will receive an email with further information within 3 weeks of the end of the meeting.

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 the ID# listed at the top of their Annual Meeting & Courses confirmation form (included in this packet). The system will then ask delegates to indicate which sessions they attended, to complete evaluation forms for each of those 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.

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 April 1, 2019.

# CONFLICT OF INTEREST DISCLOSURES

## 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 Relevant Relationships" has been indicated below. To request additional information, contact the ACNS Executive office at [info@acns.org](mailto:info@acns.org).

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

Nicholas S. Abend, MD, MSCE, FACNS	Children's Hospital of Philadelphia	Planner, Speaker, Reviewer	FC: Demos (g); NIH (a); PCORI (a)
Vinita J. Acharya, MD, FAES	Penn State Hershey Medical Center	Planner	Sunovian (d)
Pegah Afra, MD, FACNS	Weill Cornell Medicine	Planner	LivaNova (a); UCB (a, d); GW Pharma (e); Sunovian (d)
Susan D. Agostini, REEG/EPT,CLTM,FASET	Mayo Clinic Arizona	Speaker	No Relationships
Abdullah al Sawaf, MBBS	SIU Medicine	Planner	No Relationships
Andreas D. Alexopoulos, MD, MPH	The Cleveland Clinic Foundation	Speaker	No Relationships
Imran I. Ali, MD, FACNS	University of Toledo	Planner	No Relationships
Edilberto Amorim, MD	Massachusetts General Hospital	Speaker	No Relationships
Michael Aminoff, MD	University of California (SFO)	Speaker	Oxford University Press (g: royalties)
Kanika Arora, MD	Greenville Health System	Planner	No Relationships
Ravindra Arya, MD	Cincinnati Children's Hospital Medical Center	Speaker	No Relationships
Eishi Asano, MD, PhD	Wayne State University	Speaker	No Relationships
Angela Aziz Donnelly, MD	Emory University	Speaker	No Relationships
Abbas Babajani-Feremi	The University of Tennessee Health Science Center	Speaker	No Relationships
Anto Bagic, MD, PhD, FAES, FACNS	University of Pittsburgh Medical School	Speaker	No Relationships
Antoaneta Balabanov, MD	Rush University Medical Center	Planner	SK Life Science (e); Nutricia (e)
Ram Balu	University of Pennsylvania	Speaker	No Relationships
Paul E. Barkhaus, MD	Medical College of Wisconsin Affiliated Hospitals Program	Speaker	No Relationships
Carolina Barnett-Tapia	University of Toronto	Speaker	CSL (d); Octapharma (a); UBC (b)
Meriem Bensalem-Owen, MD, FACNS	University of Kentucky	Planner, Speaker, Reviewer	Greenwich Biosciences (a); Neuronpace (a); Sunovion (a)
Siddharth Biswal	Georgia Institute of Technology	Speaker	No Relationships
Jane Boggs, MD	Wake Forest University	Planner	See addendum
Leonardo Bonilha, MD, PhD	Medical University of South Carolina	Speaker	Philips, Inc. (a)
William J. Bosl, PhD	University of San Francisco	Planner	No Relationships
Jeffrey Britton, MD, FACNS	Mayo Clinic	Planner, Speaker, Reviewer	No Relationships
Gordon Buchanan	University of Iowa	Speaker	No Relationships
David Burdette, MD, FACNS	Michigan State University College of Human Medicine	Speaker	No Relationships
Richard C. Burgess	Cleveland Clinic	Planner, Speaker	No Relationships
Christopher Butson	University of Utah	Speaker	NeuraModix (b)
Lidia Cabanes-Martinez, MD	Hospital Ramon Y Cajal, Madrid	Speaker	No Relationships
Jessica L. Carpenter, MD	Children's National Medical Center	Speaker	No Relationships
Patrick Chauvel, MD	Cleveland Clinic Foundation	Speaker	No Relationships
Thomas Chelimsky	Medical College of Wisconsin	Speaker	PainStakers, LLC (f)
Catherine J. Chu, MD	Massachusetts General Hospital, Harvard Medical School	Speaker	Alliance of Familt Companies (b); Biogen (b); SleepMed/DigiTrace (b)
Ana Carolina Coan, MD, PhD	Department of Neurology / Universidade de Campinas - UNICAMP	Speaker	No Relationships
Bernard Allen Cohen, PhD, FACNS, FASNMM	Neurological Monitoring Associates, LLC	Planner	No Relationships
Amy Crepeau, MD	Mayo Clinic	Reviewer	No Relationships
Nathan Crone, MD	Johns Hopkins University School of Medicine	Speaker	No Relationships
Vedran Deletis	University of Split medical school	Speaker	No Relationships

## CONFLICT OF INTEREST DISCLOSURES, CONTINUED

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

Monica Dhakar, MD, MS	Emory University	Speaker	See addendum
Priya Dhawan	Mayo Clinic Arizona	Speaker	No Relationships
Elliot Dimberg, MD, FACNS	Mayo Clinic	Planner, Reviewer	No Relationships
Frank W. Drislane, MD, FACNS	Beth Israel Deaconess Medical Center	Planner, Reviewer	No Relationships
Francois Dubeau, MD	McGill University	Speaker	No Relationships
Jonathan Edwards, MD, FACNS	Medical University of South Carolina		No Relationships
Dawn Eliashiv, MD, FACNS	UCLA	Speaker	Eisai Pharmaceuticals (d); LivaNova (d); Neuropace (d); Sunovion (d); UCB Pharmaceuticals (d)
Ronald Emerson, MD, FACNS	Hospital for Special Surgery / Weill Cornell Med Ctr	Planner, Speaker, Reviewer	Amgen (c); Bristol Myers Squibb (c); Eli Lilly & Company (c); General Electric (c); Ice Neurosystems, Inc (c); Johnson & Johnson, Inc. (c); Neuropace (c); Pfizer (c); Quality Care Properties (c); Reach Bionics (c); Thermo Fisher Scientific (c)
Charles M. Epstein, MD, FACNS	Emory University	Planner, Speaker	Neuronetics, Inc (d)
Andres Fernandez, MD	Thomas Jefferson University	Planner	No Relationships
Guadalupe Fernandez-Baca Vaca, MD	University Hospitals, Cleveland and Case Western Reserve University	Speaker	No Relationships
Evan J. Fertig, MD	Providence Brain and Spine Institute	Planner	No Relationships
Anteneh M. Feyissa, MD	Mayo Clinic	Planner	No Relationships
Breanne Fisher	Ann & Robert H. Lurie Children's Hospital of Chicago	Speaker	No Relationships
Nancy Foldvary-Schaefer, DO, MS	Cleveland Clinic	Speaker	No Relationships
Brandon Foreman, MD, FACNS	University of Cincinnati Health	Speaker	UCB Pharmaceuticals (d)
Birgit Fauscher	McGill University	Speaker	Eisai Inc. (e); UCB Pharmaceuticals(d, e)
France W. Fung, MD	Children's Hospital of Philadelphia	Speaker	No Relationships
William B. Galletine, DO, FACNS	Stanford University	Planner	No Relationships
Gloria M. Galloway, MD, MBA, FACNS	Stanford University	Planner, Speaker, Reviewer	No Relationships
Elizabeth Gerard, MD, FACNS	Northwestern University	Speaker, Reviewer	Sunovion Pharmaceuticals, Inc. (a)
Gena R. Ghearing, MD, FACNS	Univeristy of Iowa	Planner	No Relationships
Emily J. Gilmore, MD	Yale School of Medicine	Speaker	No Relationships
Andres A. Gonzalez, MD, MMM, FAAN, FACNS	University of Southern California	Speaker	No Relationships
Brent Goodman, MD	Mayo Clinic Arizona	Speaker	No Relationships
Jean Gotman, PhD, FACNS	Montreal Neurological Institute	Speaker	Precis (e)
Daniel Graf, MD	Geisinger Medical Center	Planner	No Relationships
Madeleine M. Grigg-Damberger, MD, FACNS	University of New Mexico	Speaker	Up to Date wrote article on Special Considerations for Polysomnography in Children (g)
Robert E. Gross, MD, PhD	Emory	Speaker	Abbott (b); Boston Scientific (a, b); Medtronic (a, b); Monteris(b); Neuropace (a, b); Nia Therapeutics (c, f)
Aysegul Gunduz, PhD	University of Florida	Speaker	See addendum
Jorge E. Gutierrez, MD, MSc	Universidad del Valle	Speaker	No Relationships
Cecil D. Hahn, MD, MPH, FACNS	The Hospital for Sick Children	Planner, Speaker	No Relationships
Hiba A. Haider, MD	Emory University School of Medicine	Speaker	No Relationships
Andrea Hakimi, DO, FACNS, FAES	Greenville Health System	Planner, Speaker	No Relationships
Jonathan J. Halford, MD, FACNS	Medical University of South Carolina	Speaker	No Relationships
Mark Hallett, MD, FACNS	National Institutes of Health	Planner, Speaker	Brainsway (e, g)
Abeer J. Hani, MD	Lebanese American University	Planner, Reviewer	No Relationships
Carlos Otto Heise, MD	"University of São Paulo EMG lab at the Neurology Department."		No Relationships
Susan T. Herman, MD, FACNS	Beth Israel Deaconess Medical Center	Speaker, Reviewer	Pfizer (a); UCB Pharmaceuticals (a); Epilepsy Therapy Development Project (a)
Max J. Hilz	University of Erlangen-Nuremberg, Dept. of Neurology, Erlangen, Germany	Speaker	Alnylam (a); Bayer Health Care Germany (a, d);Novartis Germany (a); Sanofi-Genzyme (a, b, e)
Lawrence J. Hirsch, MD, FACNS	Yale	Speaker	Medtronic (b); Neuropace (f); Wiley (g)
E. Matthew Hoffman	Mayo Clinic	Speaker	No Relationships
Manisha G. Holmes, MD	NYU Langone	Planner	No Relationships
Alexandra Hovaguimian, MD	Beth Israel Deaconess Medical Center	Speaker	No Relationships
Atif M. Husain, MD, FACNS	Duke University Medical Center	Planner, Speaker	AAN (f); ACNS (f); Demos Publishing (f); Eisai Pharmaceuticals (b, e); Jazz Pharmaceuticals (b); Marinus Pharmaceuticals (b, e); Springer Publishers (g); Wolters Kluwer (g)

# CONFLICT OF INTEREST DISCLOSURES, CONTINUED

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

Akio Ikeda, MD, PhD, FACNS	Kyoto University Graduate School of Medicine	Planner, Speaker	Eisai Company, (a); GlaxoSmithKline K.K (a); NIHON KOHDEN CORPORATION (a); Otsuka Pharmaceutical Co (a); UCB Japan Co (a)
Monica Islam, MD	Nationwide Children's Hospital	Reviewer	No Relationships
Jin Jing	Nanyang Technical University (NTU)	Speaker	No Relationships
Barbara C. Jobst, MD, FACNS	Dartmouth Geisel School of Medicine	Speaker	Center for Disease Control and Prevention (CDC) (a); Defense Advanced Research Projects Agency (DARPA) (a); Diamond Foundation (a); Eisai Inc. (a); Medtronic (a); National Science Foundation (a); Neuropace (a); Sunovion (a)
Jonathan C. Edwards, MD, MBA, FACNS	Medical University of South Carolina	Planner, Speaker, Reviewer	No Relationships
Giridhar P. Kalamangalam, MD, DPhil, FACNS	University of Florida	Planner, Speaker	No Relationships
Padmaja Kandula, MD	Weill Medical College	Speaker	No Relationships
Pongkiat Kankirawatana, MD, FACNS	Children's of Atlanta - UAB	Reviewer	No Relationships
Kiran Kanth, MD	Mayo Clinic Rochester	Speaker	No Relationships
Peter W. Kaplan, MD, FRCP, FACNS	Johns Hopkins Bayview Medical Center	Planner, Speaker	Cadwell (b)
Ioannis Karakis, MD, PhD, MSc	Emory University	Planner, Speaker	No Relationships
Steven Karceski	Cornell	Speaker	LivaNova (d); Neuropace (d); UCB Pharmaceuticals (b)
Hans Katzberg	University of Toronto	Speaker	Akcea (b); Alexion (b); Amazentis (b); CSL Behring (a, b, e); Flexpharma (b, e); Grifols (a, b, e); Octapharma (a, b, g); Pfizer (e); Shire (b); Terumo (b, e)
Jeffrey Kennedy, MD, FACNS	University of California, Davis	Planner	
Fawad A. Khan, MD	Oschner Medical Center	Reviewer	Engage Therapeutics (a); Sage Therapeutics (a)
Ammar Kheder, MD	Penn Epilepsy Center	Reviewer	No Relationships
Paulo Andre T. Kimaid, MD, PhD	LAC-Brazil, Head of the Intraoperative Neuromonitoring division of the discipline of Neurosurgery at the Federal University of São Paulo (UNIFESP).	Speaker	Kandel (Neurosoft Brazil) (d); Medtronic (b, d); Surgical Line (Inomed Brazil) (b, d)
Robert Knowlton, MD	UCSF Medical Center	Speaker	See addendum
Cory Kogelschatz	Intermountain Neurosciences Institute	Speaker	No Relationships
Nuria Lacuey Lecumberri, MD	Case Western Reserve University	Speaker	No Relationships
Suzette M. LaRoche, MD, FACNS	Mission Health, Asheville NC	Planner, Speaker	Brain Sentinel (e); Demos Publishing (g)
Ruple S. Laughlin, MD	Mayo Clinic Rochester	Planner, Speaker	No Relationships
Jong Woo Lee, MD, PhD, FACNS	Brigham & Women's Hospital	Planner, Speaker, Reviewer	Advance Medical (f); NINDS (a); SleepMed/DigiTrace (f)
Leslie Lee, MD, FACNS	Stanford University Medical Center	Planner, Speaker	No Relationships
Alan D. Legatt, MD, PhD, FACNS	Montefiore Medical Center	Speaker	Demos Publishing (g)
Samden Lhato, MD	Case Western Reserve University	Speaker	No Relationships
Jeffrey Liou, MD	Harvard Medical School	Speaker	No Relationships
Lynn Liu, MD, FACNS	University of Rochester School of Medicine	Planner	Spouse: SK LifeScience (f); UCB (f)
Tobias Loddenkemper, MD, FACNS	Boston Children's Hospital	Planner, Speaker, Reviewer	Lundbeck(a); Eisai (a); Upsher-Smith (a); Mallinckrodt (a); Sage (a); Pfizer (a); Zogenix (g); Amzell (g); Upsher-Smith (g); Eisai (g); Advanced Medical (g); Device Loans (g)
Zachary London, MD	University of Michigan	Speaker	No Relationships
Jaime R. Lopez, MD, FACNS	Stanford University School of Medicine	Planner, Speaker	No Relationships
Matthew W. Luedke, MD	Duke University Health System, Department of Neurology	Speaker	Biogen (a); Eisai Pharmaceuticals (a, b); UCB Pharmaceuticals (a)
Brian Lundstrom, MD, PhD	Mayo Clinic	Speaker	No Relationships
Rayaz Malik	Division of Cardiovascular Sciences, University of Manchester,	Speaker	No Relationships
David Mao, MD	New York Presbyterian Cornell	Speaker	No Relationships
Shavonne Massey, MD	The Children's Hospital of Philadelphia	Speaker	No Relationships
Faye McNall, MEd, REEGT	ASET - The Neurodiagnostic Society	Planner	No Relationships
Daniel L. Menkes, MD, FACNS	Beaumont Health System	Planner	CMTE (c); Daniel L Menkes (b); US Air Force (b)
Yara Mikhaeil-Demo, MD	Northwestern Univerisity	Planner	No Relationships
Nicholas Milano	Medical University of South Carolina	Speaker	Biogen (a); Roche (a)
Daniela N. Minecan, MD, FACNS, FAES	University of Michigan Health System	Planner	No Relationships
Eli M. Mizrahi, MD, FACNS	Baylor College of Medicine	Speaker	Demos Publishing (g: Royalties); Eisai (b)
Lilit Mnatsakanyan, MD	University of California Irvine	Planner	No Relationships
Pradeep Modur, MD, MS, FACNS	University of Texas, Austin	Speaker	No Relationships
Chris Moore, MD	Portsmouth Hospitals NHS Trust	Speaker	Moore Medical Ltd (c, f)

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Ana Lucila Moreira, MD	"Neurologist, Clinical Neurophysiologist and Neurosonologist; CENEC - Clinical Neurophysiology, Campinas - Brazil; President - Brazilian Society of Clinical Neurophysiology"	Speaker	Medtronic (d)
Heidi M. Munger Clary, MD, MPH	Wake Forest University	Planner	No Relationships
Iryna Muzyka, MD, FACNS	Mayo Clinic AZ	Speaker	No Relationships
Ahsan Moosa Naduvil Valappil, MD	Cleveland Clinic Neurological Institute / Epilepsy Center	Speaker	No Relationships
Christopher S. Nance, MD	University of Iowa	Speaker	No Relationships
Maromi Nei, MD	Thomas Jefferson University	Speaker	No Relationships
Marcus C. Ng, MD, FRCPC, CSCN(EEG)	University of Manitoba	Planner, Speaker,	No Relationships
Dang K. Nguyen, MD, PhD, FRSC	CHUM	Speaker	Eisai Inc (e ); UCB Canada (a, d, e)
Viet Nguyen, MD, PhD, FRSC	Stanford University	Speaker	No Relationships
William Nobis, MD	Vanderbilt University	Speaker	No Relationships
Jonathan A. Norton, PhD	University of Saskatchewan	Speaker	No Relationships
Peter Novak	Brigham and Women's Hospital	Speaker	No Relationships
Mark R. Nuwer, MD, PhD, FACNS	UCLA	Planner, Speaker, Reviewer	Corticare (c )
Cormac O'Donovan, MD, FACNS	Wake Forest University	Speaker	No Relationships
Joel Oster, MD	Tufts University	Reviewer	No Relationships
Eric Padilla	Ann & Robert H. Lurie Children's Hospital of Chicago	Speaker	No Relationships
Jose A. Padin-Rosado, MD, FACNS	University of New Mexico	Planner	No Relationships
Dipakkumar P. Pandya, MD	Hunterdon Neurology	Planner	No Relationships
Jun T. Park, MD, FAES	Case Western Reserve Univ; Rainbow Babies & Children's	Reviewer, Speaker	No Relationships
Kyung-Seok Park, MD	Seoul National University Bundang Hospital	Speaker	No Relationships
Jay S. Pathmanathan, MD, PhD	University of Pennsylvania	Speaker	UNEEG (b, e)
Milena Pavlova	Brigham & Women's Hospital / Harvard Medical School	Speaker	Biomobie (a); Lundbeck (a)
Phillip Pearl, MD, FACNS	Boston Children's Hospital	Speaker	No Relationships
Giovanni Pellegrino, MD	Montreal Neurological Institute and Hospital	Speaker	No Relationships
Elia M. Pestana Knight, MD, FACNS	Cleveland Clinic Foundation	Speaker	No Relationships
Jurriaan M. Peters, MD, PhD	Boston Children's Hospital, Harvard Medical School	Speaker	Philips, Inc. (a, b)
Noor Pirzada, MD	University of Toledo	Planner	See addendum
Stefan Rampp, MD	Universitätsklinikum Erlangen,	Speaker	No Relationships
Carlos Rangel	Universidad del Bosque	Speaker	See addendum
Claus Reinsberger, MD, PhD, FACNS	Paderborn University	Speaker	ACNS (f); Federal Institute of Sports Sciences (Germany) (a); German Soccer Association (b); IOC (Germany) (b); SleepMed/DigiTrace (b); Westfalen Foundation (Germany) (a)
George Richerson, MD	Iowa University Carver College of Medicine	Speaker	No Relationships
Rosario Maria S. Riel-Romero, MD	Louisiana State University	Planner	UCB (a); Esai (a)
Anthony L. Ritaccio, MD	Albany Medical Center	Speaker	g.tec (Guger Technologies): (e, g)
Eva K. Ritzl, MD, FACNS	Johns Hopkins University	Planner, Speaker	No Relationships
Erika Rivera	Children's Hospital of México Federico Gómez in the department of neurosurgery	Speaker	No Relationships
Andres Rodriguez Ruiz, MD	Emory University School of Medicine	Speaker	No Relationships
Steven Roper, MD	Lillian S. Wells Department of Neurosurgery at the University of Florida	Speaker	Medtronic (b)
Eric S. Rosenthal, MD	Massachusetts General Hospital	Speaker	No Relationships
Alexander Rotenberg, MD, PhD	Boston Children's Hospital	Planner, Speaker	Cavion (e); CRE Medical (a); Neuroelectrics (a); Neuromotion(c, e); Roche (a, e); Sage Therapeutics(a); Takeda (a)
John Rothwell, PhD	University College London	Speaker	No Relationships
Elayna Rubens, MD, FACNS	Memorial Sloan Kettering Cancer Center	Speaker	No Relationships
Devon I. Rubin, MD, FACNS	Mayo Clinic	Planner, Speaker	No Relationships
Justin Sanchez, MD	DARPA Defense Advanced Research Projects Agency	Speaker	No Relationships
Daniel San-Juan	NATIONAL INSTITUTE OF NEUROLOGY AND NEUROSURGERY	Speaker	No Relationships



## CONFLICT OF INTEREST DISCLOSURES, CONTINUED

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

Arnold J. Sansevere, MD	Boston Children's Hospital	Planner	No Relationships
Karl E. Sanzenbacher, MD, MS, FACNS	Eastern Maine Medical Center	Reviewer	See addendum
Hussaina Y. Saria, MD	UNM	Planner	No Relationships
Rani Sarkis, MD, MSc	Brigham and Women's Hospital	Planner	See addendum
Sarah E. Schmitt, MD, FACNS	Medical University of South Carolina	Planner, Speaker	Sage Therapeutics (e); American Academy of Neurology (d)
Stephan U. Schuele, MD, MPH, FACNS	Northwestern University Feinberg School of Medicine	Planner, Speaker	Eisai Inc. (d); SK Life Science (b); Sunovion (d)
Olga Selioutski, DO, FACNS	University of Rochester	Speaker	ACNS (g); AES (g); Genesee Community College, Polysomnographic (PSG) Technology Program (f); Malcolm Baldrige National Quality Award (g); OMED/ACONP (f); Sage Therapeutics, Inc (a); Sunovion Pharmaceuticals, Inc. (a); UCB Biopharma SPRL (a); Upsher Smith Laboratories, Inc. (a)
Asim Shahid, MD	Case Western Reserev Univ.; Rainbow Babies & Children's	Speaker	Eisai Pharmaceuticals (d)
Raj D. Sheth, MD, FAAN, FACNS	Mayo Clinic/Nemours Clinic Florida	Planner	No Relationships
Parastou Shilian, DO, FACNS	University of Southern California	Speaker	No Relationships
Mirela V. Simon, MD, MSc, FACNS	Massachusetts General Hospital	Reviewer, Speaker	Demos Publishing (g)
Saurabh R. Sinha, MD, PhD, FACNS	Duke University Medical Center	Planner, Reviewer	Basilea Inc. (e); Cadwell Inc. (b); Eisai Inc. (a); UCB Pharmaceuticals (a, b)
Christopher Skidmore, MD	Thomas Jefferson University	Speaker	Neuropace (b)
Stanley Skinner, MD, FACNS	Abbott Northwestern Hospital	Speaker	Medtronic (g)
Elson Lee So, MD, FACNS	Mayo Clinic School of Medicine and Science	Speaker	No Relationships
Francisco Soto, MD	Las Condes Clinic	Speaker	No Relationships
William C. Stacey, MD, PhD	University of Michigan	Speaker	Natus Neuroscience (g. licensing)
Fahd Sultan, MD	University of Oklahoma College of Medicine	Reviewer	No Relationships
Haoqi Sun, PhD	Harvard Medical School, Massachusetts General Hospital	Speaker	No Relationships
Jimeng Sun	Georgia Institute of Technology	Speaker	No Relationships
Christa Swisher, MD	Duke University Medical Center	Reviewer, Speaker	StimLabs (c)
Andrea Szelenyi	Ludwig maximillan universitat -medical school	Speaker	Inomed Germany (e); Integra, France (d)
Nitin Tandon, MD	Memorial Hermann Health System	Speaker	No Relationships
Adriana S. Tanner, MD	Mercy Health Saint Mary's	Planner	Eisai Co. (d)
William O. Tatum, DO, FACNS	Mayo Clinic	Planner, Speaker	Demos Publishing (g); Elsevier (g)
Armando Tello, MD, PhD	"Head of Clinical Neurophysiology Department Hospital Espanol Mexico City LAC-Mexico"	Speaker	No Relationships
Jessica W. Templer, MD	Northwestern University Feinberg School of Medicine	Speaker	No Relationships
Parthasarathy Thirumala, MD, FACNS	University of Pittsburgh Medical Center	Speaker	No Relationships
Shanti Thirumalai, MD, FACNS	Morristown Medical Center	Reviewer	See addendum
Tammy Tsuchida, MD, PhD, FACNS	Children's National Medical Center	Planner, Speaker, Reviewer	No Relationships
Michel van Putten, MD, PhD	University of Twente	Speaker	Clinical Science Systems (b)
Martin Veilleux, MD, FACNS	Montreal Neurological Hospital	Planner	No Relationships
Janice Walbert, MS, CAE, FACNS	ABRET Neurodiagnostic Credentialing & Accreditation; American Board of Clinical Neurophysiology	Speaker	No Relationships
Daniel Weber, DO	St. Louis University	Planner	No Relationships
M. Brandon Westover, MD, PhD, FACNS	Harvard Medical School, Massachusetts General Hospital	Planner, Speaker, Reviewer	No Relationships
Kathy Wolfe	University of New Mexico Sleep Disorders Center	Speaker	No Relationships
Lily C. Wong-Kisiel, MD	Mayo Clinic	Speaker	No Relationships
Greg Worrell, MD	Mayo Clinic	Speaker	NeuroOne (c, e); Cadence Neuroscience (c, e)
Joyce Y. Wu, MD	UCLA	Speaker	GW Pharmaceuticals (d, e); Novartis Pharmaceuticals (a, d, e)
Courtney J. Wusthoff, MD, FACNS	Stanford University	Planner, Speaker	Ceribell (b); Persyst (b)
Sushma Yerram, MBBS	University of Rochester School of Medicine	Planner	No Relationships
Seung-Schick Yoo	Brigham and Women's Hospital	Speaker	No Relationships
Sahar F. Zafar, MBBS	Massachusetts General Hospital	Speaker	No Relationships
Alejandro Zavala, MD	Hospital Fundación Clínica Medica Sur	Speaker	No Relationships
Andrew James Zillgitt, DO	Beaumont Health System	Speaker	Eisai Pharmaceuticals (d); Lundbeck (d); UCB Pharmaceuticals (d)

## SUPPORT ACKNOWLEDGEMENT

ACNS gratefully acknowledges the following companies for their support of the 2019 Annual Meeting & Courses:

### Bronze Level

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Brain Sentinel Diagnostic Services, LLC  
Cadwell Industries  
Ceribell

Empatica  
Persyst Development Corporation  
Smart Monitor

### Bronze Level Exhibitors

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American Board of Clinical Neurophysiology  
American Board of Psychiatry and Neurology  
ASET - The Neurodiagnostic Society  
Aquestive Therapeutics  
Compumedics Neuroscan  
Demos Medical Publishing  
EncephaloDynamics  
Global Organization of Health Educators  
Greenwich Biosciences  
Holberg EEG  
Micromed  
Medtronic  
Memory MD  
Moberg ICU Solutions  
Natus Neuro

Neuralynx, Inc  
Neuromonitoring Technologies  
Neuropace  
Neurotech, LLC  
Nihon Kohden America, Inc  
Philips Neuro  
Rendr Labs  
RhythmLink International, LLC  
Ricoh Company, LTD  
Rosman Search, Inc  
Signal Gear, Inc  
Specialty Care  
Spes Medica USA  
Sunovion Pharmaceuticals  
Wolters Kluwer  
Zeto Inc.

## NETWORKING & SOCIAL EVENTS

### Welcome Reception

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Friday, February 8, 2019

7:00-8:30 pm

Location: Roman Ballroom

Dr. Tobias Loddenkemper, MD, FACNS formally invites all Annual Meeting Delegates to attend the ACNS Welcome Reception on Friday, February 8, from 7:00-8:30pm in the Exhibit Hall.

### New Member Meet & Greet

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Friday, February 8, 2019

12:30-1:30pm

Location: Messina

ACNS members who have joined the Society in the past year are invited and encouraged to attend the New Member Meet and Greet on Friday, February 8 from 12:30-1:30pm in conference room Messina. ACNS leaders will be in attendance to welcome you to the Society and to discuss all the benefits ACNS membership has to offer.

### Professional Development Mentoring Program

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If you signed up for the ACNS Professional Development Mentoring Program, there will be a designated meeting area in the common areas on Friday and Saturday during breaks and lunches. Please look for the designated tables as a place to meet up!

### International Attendee Breakfast

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Saturday, February 9, 2019

7:00-8:00am

Location: Messina

A breakfast will be held Saturday morning for all international Annual Meeting attendees.

## ANNUAL COURSES • OVERVIEW

<b>WEDNESDAY, FEBRUARY 6, 2019</b>		
9:00am-5:00pm	<b>Neurophysiologic Intraoperative Monitoring (NIOM) Part I</b>	Neoplitan I-II
9:00am-5:00pm	<b>Epilepsy Surgery/Invasive EEG Course Part I</b>	Pompeian I-II
9:00am-5:00pm	<b>Intensive Care Unit EEG Monitoring (ICU EEG) Part I</b>	Neopolitan III-IV
<b>THURSDAY, FEBRUARY 7, 2019</b>		
7:00-8:30am	<b>Epilepsy Surgery/Invasive EEG Course Part II: SEEG</b>	Pompeian I-II
7:00-8:30am	<b>Evoked Potentials</b>	Neopolitan I-II
7:00-8:30am	<b>Advanced EEG Techniques</b>	Neopolitan III-IV
9:00am-12:00pm	<b>Intensive Care Unit EEG Monitoring (ICU EEG) Part II</b>	Neopolitan III-IV
9:00am-5:00pm	<b>Neurophysiologic Intraoperative Monitoring (NIOM) Part II</b>	Neopolitan I-II
9:00am-3:00pm	<b>EMG/Peripheral Nervous System</b>	Pompeian I-II
3:00-5:00pm	<b>EMG Demo</b>	Pompeian I-II
11:30am-2:00pm	<b>5th Annual CNP Director's Symposium</b>	Pompeian III
1:30-3:00pm	<b>Autonomic Neurophysiology</b>	Neopolitan III-IV
3:00-5:00pm	<b>Video EEG Cases Part I</b>	Pompeian III
<b>FRIDAY, FEBRUARY 8, 2019</b>		
7:00-8:30am	<b>Neonatal EEG Workshop</b>	Messina
8:30-10:00am	<b>Video EEG Cases Part II</b>	Pompeian III-IV
7:00-10:00am	<b>Neuromodulation/Stimulation in Human Brain</b>	Florentine III
7:00-10:00am	<b>Basic EEG Pompeian I-II</b>	Pompeian I-II

## ANNUAL MEETING • OVERVIEW

<b>FRIDAY, FEBRUARY 8, 2019</b>		
7:00-10:00am	<b>Women's Leadership Symposium</b>	Florentine IV
10:00-10:30am	<b>Coffee Break</b>	
10:30am-12:15pm	<b>Opening General Session: President's Lecture and Gloor Award Presentation and Lecture</b>	Florentine I-II
1:30-3:30pm	<b>Concurrent Sessions</b>	
	The Business Side of Clinical Neurophysiology	Pompeian III-IV
	Current and Future Clinical Practice of High Density EEG and Electrical Source Imaging in Epilepsy	Pompeian I-II
	Multimodality Monitoring in the EMU	Florentine I-II
	Critical Care ECoG: How to Integrate It into Your Practice	Florentine IV
	Beyond QEEG: Artificial Intelligence in Clinical Neurophysiology	Florentine III
3:30-4:00pm	<b>Coffee Break - Visit Exhibitors in Exhibit Hall</b>	Roman Ballroom
4:00-5:30pm	<b>Concurrent Sessions</b>	
	Brachial Plexopathies - Improving Your Diagnostic Skills	Florentine III
	Brain-Computer Interface: The Dawn of a New Era for Patients with Neurological and Motor Deficits	Pompeian I-II
	Clinical Neurophysiology Resident and Fellow Special Interest Group Case Presentations	Florentine IV
5:30-5:45pm	<b>Walking Break</b>	
5:45-7:00pm	<b>Neurophys Bowl</b>	Florentine I-II
7:00-8:30pm	<b>Welcome Reception</b>	Roman Ballroom

# ANNUAL MEETING • PROGRAM OVERVIEW

## Saturday, February 9, 2019

8:00-9:30am	<b>Concurrent Sessions</b>	
	Decision Making with Neurostimulation	Pompeian III-IV
	Of Dreams and Spells - The Neurophysiological Tools of REM Sleep & Epilepsy	Pompeian I-II
	Mapping Human Language Networks with Intracranial EEG Spectra	Florentine I-II
	Joint ACNS/Mexican Clinical Neurophysiology Symposium: Intraoperative Neurophysiologic Monitoring in Special Situations	Florentine III
	Mastering Semi-Quantitative Motor Unit Potential Analysis Skills in 90 Minutes!	Florentine IV
9:30-10:00am	<b>Coffee Break - Visit Exhibits and Poster Viewing</b>	Roman Ballroom
10:00-11:00am	<b>General Session: Travel Award Presentation and Jasper Award Presentation and Lecture</b>	Florentine I-II
11:00-11:15am	<b>Walking Break</b>	
11:15am-12:45pm	<b>Concurrent Sessions</b>	
	Can Clinical Neurophysiology Improve the Recovery from Sports Induced Injuries?	Pompeian I-II
	Joint ACNS/British Clinical Society Symposium: The Diagnostic Challenge of Small Fibre Neuropathy	Florentine III
	Wide-band EEG for Epilepsy: Established Tools or Research Topic	Florentine I-II
11:15am-1:00pm	The Motor Evoked Potential: Fundamentals and Clinical Applications. A High-Level Scientific Symposium.	Pompeian III-IV
	Spanish Symposium: Uso Clinico de Monitoreo Intraoperatorio/Clinical Use of Intraoperative Monitoring	Florentine IV
12:45-2:00pm	<b>Lunch - Visit Exhibits and Poster Viewing</b>	
2:00-3:30pm	<b>Concurrent Sessions</b>	
	Joint ACNS/IFCN Latin American Chapter Symposium: Beyond Traditional Monitoring During Spine Surgery	Pompeian III-IV
	Are MEG Practitioners Fulfilling Your Expectations?	Pompeian I-II
	Electrophysiologic Assessment of Weakness in the ICU	Florentine III
	Setting Up for Success in Long-Term Monitoring	Florentine IV
3:30-3:45pm	<b>Walking Break</b>	
3:45-5:15pm	<b>Concurrent Sessions</b>	
	Brainstem and Supratentorial Surgery Monitoring, New Developments and Current Understanding	Florentine III
	Advanced Autonomic Testing	Florentine IV
	SEEG Planning Based on Presurgical Evidence - Illustrative Case Discussions, Interactive.	Pompeian I-II
	Advances in Continuous EEG in Targeted Temperature Management	Pompeian III-IV
5:15-5:30pm	<b>Walking Break</b>	
5:30-7:00pm	<b>General Session: Research Highlights &amp; Schwab Award Presentation &amp; Lecture</b>	Florentine I-II
7:00-7:30pm	<b>Annual Business Meeting</b>	Florentine I-II

## SUNDAY, FEBRUARY 10, 2019

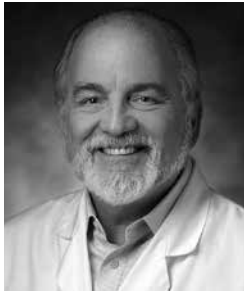
8:00-9:30am	<b>Concurrent Sessions</b>	
	Functional Brain Mapping Using Invasive Electrodes	Florentine I-II
	Advances in the Neurophysiologic Assessment of Neuromuscular Junction Disorders	Florentine IV
	Night Moves: Common and Uncommon Parasomnias Clinical Neurophysiologists Need to Know	Florentine III
10:00-11:30am	<b>Concurrent Sessions</b>	
	Joint ACNS/Colombian Association of Electrodiagnostic Medicine Symposium: Peripheral Nerve Trauma: From the ER to the OR	Florentine III
	Epileptic Spasms and Hypsarrhythmia: Lessons from Modern Techniques	Florentine IV
	Noninvasive Brain Stimulation	Florentine I-II

## AWARD RECIPIENTS & LECTURES

Friday, February 8, 2019

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### 2019 Pierre Gloor Award Lecture



#### **"A Clinical Neurophysiology Journey from Switzerland to Baltimore"**

Peter W. Kaplan, MD, FRCP, FACNS

The Gloor Award is presented annually for outstanding current contributions to clinical neurophysiology research. Dr. Peter Kaplan will be recognized and will deliver the 2019 Gloor Address on Friday, February 8, 2019.

Dr. Kaplan grew up in Geneva, Switzerland. He went to the University of London, England for Medicine Endocrinology Research. He then served his Resident Etranger at the College of Medicine, Paris, France before beginning his residency at Duke University and serving his Fellowship Career at Johns Hopkins University School of Medicine, Baltimore. Dr. Kaplan is Professor of Neurology at Johns Hopkins University School of Medicine.

Saturday, February 9, 2019

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### 2019 Robert S. Schwab Award Lecture



#### **"What's in an Idea?"**

Michael J. Aminoff, MD

The Schwab Award is presented annually to an individual who has made significant contributions in the area of clinical neurophysiology. Dr. Aminoff will be recognized and will deliver the 2019 Schwab Lecture on Saturday, February 9, 2019.

Dr. Michael Aminoff is a clinical neurologist and neurophysiologist, clinical investigator, university professor, author, and editor with a special interest in medical history. He was born and educated in England, graduating from University College London in 1962 and as a physician from University College Hospital Medical School in 1965. He subsequently trained in neurology and neurophysiology at The National Hospital (Queen Square) in London, and in 1974 moved to UCSF where he has been Professor of Neurology since 1982. He was Director of the Clinical Neurophysiology Laboratories at UCSF until 2004, when he became Executive Vice Chair of the department of neurology. He also directs the UCSF Parkinson's Disease Clinic and Research Center, a National Parkinson Foundation Center of Excellence.

### 2019 Herbert H. Jasper Award Lecture



#### **"Developing Tools for Neurophysiology"**

Jean Gotman, PhD, FACNS

The Jasper Award is presented annually to an individual who has made a lifetime of outstanding contributions to the field of clinical neurophysiology. Dr. Gotman will be recognized and will deliver the 2019 Jasper Lecture on Saturday, February 9, 2019.

Dr. Gotman received an engineering degree from the University of Paris and a PhD in Neuroscience from McGill University in Montreal. He pioneered the automatic detection of spikes and seizures during long-term EEG monitoring and made his methods widely available through Stellate, a company he created in 1986, which developed and sold all over the world equipment and software for EEG, epilepsy monitoring and polysomnography.

Dr. Gotman has published over 300 peer-reviewed papers and 40 chapters. His research interests include analysis of the EEG, mechanisms of epileptogenesis, seizure generation and spread in humans, High Frequency Oscillations and functional imaging in the diagnosis and study of epilepsy. He received the Research Recognition Award from the American Epilepsy Society, the Pierre Gloor Award of the American Clinical Neurophysiology Society, the Penfield Award of the Canadian League against Epilepsy, was named Ambassador for Epilepsy by the International League against Epilepsy, and gave the Lennox-Lombroso lecture at the American Epilepsy Society.

# PROGRAM AGENDA • ANNUAL COURSES

Wednesday, February 6, 2019

9:00am-5:00pm

## 603: Neurophysiologic Intraoperative Monitoring (NIOM) Part I

Co-Directors: Aatif M. Husain, MD, FACNS and Mirela V. Simon, MD, MSc, FACNS

Location: Neopolitan I-II

Learning Objectives:

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

1. Design a comprehensive monitoring plan for individual patients, including multimodality intraoperative monitoring techniques (e.g. recordings of sensory and motor evoked potentials, EEG, EMG, and spinal reflex activity) to monitor segments of the nervous system at risk during surgery;
2. Recognize changes in intraoperative neurophysiologic tests which indicate damage to neural structures, and distinguish these from common technical artifacts;
3. Communicate effectively normal and abnormal results to the surgical team, and incorporate results into clinical recommendations that may alter the surgical technique to avoid, limit or reverse injury to neural structures;
4. Apply knowledge about effects of anesthesia on NIOM and designing optimal anesthetic strategies for effective monitoring.
5. Understand the medico-legal, billing and regulatory aspects in NIOM

Agenda:

9:00am	Welcome and Introductions
9:05am	SEP Monitoring <i>Parthasarathy Thirumala, MD, FACNS</i>
9:45am	MEP Monitoring <i>Francisco Soto, MD</i>
10:25am	Break
10:40am	BAEP Monitoring <i>Alan D. Legatt, MD, PhD, FACNS</i>
11:20am	EEG Monitoring <i>Olga Seliouski, DO, FACNS</i>
12:00pm	Discussion
12:15pm	Lunch (not provided. See pg. 9 for nearby restaurants)
1:15pm	EMG Monitoring <i>Gloria M. Galloway, MD, MBA, FACNS</i>
1:55pm	Anesthesia and IONM <i>Iryna Muzyka, MD, FACNS</i>
2:35pm	Troubleshooting: Technical and Non-Technical Issues <i>Stanley Skinner, MD, FACNS</i>
3:15pm	Break
3:30pm	Medicolegal Issues <i>Jaime R. Lopez, MD, FACNS</i>
4:10pm	Billing Issues <i>Marc R. Nuwer, MD, PhD, FACNS</i>
4:50pm	Discussion

9:00am-5:00pm

## 601: Epilepsy Surgery/Invasive EEG Course Part I

Co-Directors: Stephan U. Schuele, MD, MPH, FACNS and Giridhar P. Kalamangalam, MD, DPhil, FACNS

Location: Pompeian I-II

Learning Objectives:

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

Agenda:

9:00	Introduction and Overview <i>Giridhar P. Kalamangalam, MD, DPhil, FACNS</i>
9:05am	Noninvasive and Invasive Evaluations <i>Chris Skidmore, MD</i>
9:40am	Epileptogenic Zone Defined by Invasive EEG <i>Patrick Chauvel, MD</i>
10:15am	Break
10:30am	Intracranial EEG: Physiologic and Abnormal Patterns <i>Birgit Fauscher, MD, PhD</i>
11:00am	Temporal Lobe <i>Giridhar P. Kalamangalam, MD, DPhil, FACNS</i>
11:30am	Extratemporal Lobe <i>Stephan U. Schuele, MD, MPH, FACNS</i>
12:00pm	Lunch (not provided. See pg. 9 for nearby restaurants)
1:00pm	Role of Source Imaging <i>Richard C. Burgess, MD, PhD, FACNS</i>
1:30pm	HFO and Epilepsy Surgery <i>Joyce Y. Wu, MD</i>
2:00pm	PMG and PVNH <i>Francois Dubeau, MD</i>
2:30pm	Insular Epilepsy <i>DK Nguyen, MD, PhD, FRSC</i>
3:00pm	Break
3:15pm	Epilepsy Surgery: Implantation and Resection <i>Steven N. Roper, MD</i>
3:45pm	Laserablation: Outcome <i>Robert E. Gross, MD, PhD</i>
4:15pm	Indication for RNS and DBS <i>Lawrence J. Hirsch, MD, FACNS</i>

# PROGRAM AGENDA • ANNUAL COURSES

Wednesday, February 6, 2019 (continued...)

9:00am-5:00pm

## 602: Intensive Care Unit EEG Monitoring (ICU EEG) Part I

Co-Directors: Jong Woo Lee, MD, PhD, FACNS & Courtney J. Wusthoff, MD, FACNS

Location: Neopolitan III-IV

### Learning Objectives:

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

1. Discuss current guidelines and evaluate various practice models for ICU EEG monitoring to improve patient care for both adults and children;
2. Apply the standard ACNS terminology to ICU EEG recordings, to improve standardization of ICU EEG reports and communication between providers;
3. Recognize controversial EEG patterns in ICU patients with altered mental status, and formulate a rational plan for treatment based on these EEG patterns; and
4. Use QEEG to efficiently enhance ICU EEG interpretation.

### Agenda:

9:00am	Overview of ICU EEG Monitoring in Neonates, Children and Adults <i>Nicholas S. Abend, MD, MSCE, FACNS</i>
9:40am	Guidelines and Logistics of ICU EEG Monitoring <i>Susan T. Herman, MD, FACNS</i>
10:10am	Break
10:30am	cEEG Interpretation: Background, Reactivity, Artifacts, and ACNS Terminology <i>Lawrence J. Hirsch, MD, FACNS</i>
11:00am	cEEG Interpretation: The Ictal-Interictal Continuum <i>Suzette LaRoche, MD, FACNS</i>
11:30am	Finances, Billing and Coding <i>Marc R. Nuwer, MD, PhD, FACNS</i>
12:00pm	Lunch
1:00pm	Treatment of Nonconvulsive Seizures and Status Epilepticus <i>Sarah Schmitt, MD, FACNS</i>
1:30pm	EEG of NORSE, FIRES, and Autoimmune Disorders <i>Olga Taraschenko, MD, PhD</i>
2:00pm	ICU EEG Reading Session: Adult Cases <i>Elizabeth Gerard, MD, FACNS and Andres Rodriguez-Ruiz, MD</i>
2:30pm	cEEG Interpretation: Neonates <i>Tammy Tsuchida, MD, PhD, FACNS</i>
2:50pm	Break
3:10pm	ICU EEG Reading Session: Neonatal and Pediatric Cases <i>Jessica L. Carpenter, MD and Catherine J. Chu, MD</i>
3:40pm	EEG in Toxic Metabolic Encephalopathy <i>Peter W. Kaplan, MD, FRCP, FACNS</i>
4:10pm	CEEG of Anoxic Brain Injury and Targeted Temperature Management <i>Michel van Putten, MD, PhD</i>
4:50pm	Panel Discussion



# PROGRAM AGENDA • ANNUAL COURSES

Thursday, February 7, 2019

## 7:00-8:30am

### 703: Epilepsy Surgery/Invasive EEG Course Part II: SEEG

Co-Directors: *Stephan U. Schuele, MD, MPH, FACNS* and *Giridhar P. Kalamangalam, MD, DPhil, FACNS*

Location: Pompeian I-II

#### Learning Objectives:

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

1. Explain the fundamental principles of intracranial EEG recordings;
2. List the principles underlying Stereo EEG including patient selection and targeting electrode placement;
3. Explain with stimulation for functional mapping and seizure induction; and
4. Discuss the principles of stereotactic surgical implantation, pitfalls and complications.

#### Agenda:

7:00am	Intracranial EEG: Physics and Physiology: <i>Jean Gotman, PhD, FACNS</i>
7:25am	Planning Placements <i>Giridhar P. Kalamangalam, MD, DPhil, FACNS</i>
7:45am	Data Interpretation and Mapping <i>Stephan U. Schuele, MD, MPH, FACNS</i>
8:05am	Surgical Aspects and Resection Strategy <i>Nitin Tandon, MD</i>
8:25am	Panel Discussion

## 7:00-8:30am

### 701: Evoked Potentials

Co-Directors: *Elayna O. Rubens, MD, FACNS*, and *Viet Nguyen, MD, FACNS*

Location: Neopolitan I-II

#### Learning Objectives:

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

1. Identify the components of visual, somatosensory, and brainstem auditory evoked potentials;
2. Classify an evoked potential study as normal versus abnormal; and
3. Provide an anatomical localization of the dysfunction when the evoked potential study is abnormal.

#### Agenda:

7:00am	Brainstem Auditory Evoked Potentials (BAEPs) <i>Alan D. Legatt, MD, PhD, FACNS</i>
7:30am	Visual Evoked Potentials (VEPs) <i>Elayna O. Rubens, MD, FACNS</i>
8:00am	Somatosensory Evoked Potentials (SEPs) <i>Viet Nguyen, MD, FACNS</i>

## 7:00-8:30am

### 702: Advanced EEG Techniques

Director: *Susan T. Herman, MD, FACNS*

Location: Neopolitan III-IV

#### Learning Objectives:

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

1. Understand the clinical utility of HFOs and high density EEG in patients with epilepsy.
2. Record and analyze HFOs to localize the epileptogenic zone in patients undergoing invasive EEG monitoring.
3. Determine hardware and software needs to perform high density EEG and ESI, and utilize these techniques for noninvasive localization of the epileptogenic zone from scalp EEG.

#### Agenda:

7:00 am	How to Record and Analyze High Frequency Oscillations in Intracranial EEG <i>William C. Stacey, MD, PhD</i>
7:45 am	Setting up Your Lab for High Density EEG and Electrical Source Imaging (ESI) <i>Susan T. Herman, MD</i>

## 9:00am-12:00pm

### 711: Intensive Care Unit EEG Monitoring (ICU EEG) Part II

Co-Directors: *Jong Woo Lee, MD, PhD, FACNS* & *Courtney J. Wusthoff, MD, FACNS*

Location: Neopolitan III-IV

#### Learning Objectives:

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

1. Discuss current guidelines and evaluate various practice models for ICU EEG monitoring to improve patient care for both adults and children;
2. Apply the standard ACNS terminology to ICU EEG recordings, to improve standardization of ICU EEG reports and communication between providers;
3. Recognize controversial EEG patterns in ICU patients with altered mental status, and formulate a rational plan for treatment based on these EEG patterns; and
4. Use QEEG to efficiently enhance ICU EEG interpretation.

#### Agenda:

9:00am	Quantitative EEG: Theory and Tools <i>Hiba A. Haider, MD</i>
9:30am	Quantitative EEG for Seizure Detection <i>Cecil D. Hahn, MD, MPH, FACNS</i>
10:00am	Quantitative EEG for Ischemia Detection <i>M. Brandon Westover, MD, PhD, FACNS</i>
10:50am	Multimodal Monitoring in Acute Brain Injury <i>Eric S. Rosenthal, MD</i>
11:30am	QEEG Cases <i>Emily J. Gilmore, MD and Sahar F. Zafar, MBBS</i>

# PROGRAM AGENDA • ANNUAL COURSES

Thursday, February 7, 2019 (continued...)

## 9:00am-5:00pm

### 712: Neurophysiologic Intraoperative Monitoring (NIOM) Part II

Co-Directors: *Aatif M. Husain, MD, FACNS* and *Mirela V. Simon, MD, MSc, FACNS*

Location: Neopolitan I-II

#### Learning Objectives:

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

1. Apply knowledge of advanced NIOM techniques, such as D wave and corticobulbar MEP recordings, brain, spinal cord and brainstem mapping and other techniques to their practice;
2. Design a monitoring paradigm for brachial plexus surgeries;
3. Understand the NIOM changes that might occur during cerebrovascular procedures.
4. Appreciate the technique, challenges and clinical applications of VEP monitoring.
5. Understand the specifics of IOM in lower spinal column surgery.

#### Agenda:

9:00am	Welcome and Introductions
9:05am	VEP Monitoring <i>Aatif M. Husain, MD, FACNS</i>
9:45am	Monitoring for Brachial Plexus and Nerve Repair Surgery <i>Jorge E. Gutierrez, MD, MSc</i>
10:25am	Break
10:40am	Monitoring for Spinal Cord Tumor Surgery <i>Eva K. Ritzl, MD, FACNS</i>
11:20am	Monitoring for Lower Spinal Column Surgery <i>Paulo Andre Kimaid, MD, PhD</i>
12:00pm	Discussion
12:15pm	Lunch (not provided. See pg. 9 for nearby restaurants)
1:15pm	Monitoring of Corticobulbar MEP and Brainstem Reflexes <i>Kyung-Seok Park, MD</i>
1:55pm	Cranial Nerve Monitoring <i>Jaime R. Lopez, MD, FACNS</i>
2:35pm	Monitoring for Vascular Surgery <i>Leslie H. Lee, MD, FACNS</i>
3:15pm	Break
3:30pm	Sensorimotor Mapping and Monitoring for Supratentorial Tumors <i>Mirela V. Simon, MD, MSc, FACNS</i>
4:10pm	Language Mapping and Electrocochicography <i>Ioannis Karakis, MD, PhD, MSc</i>
4:50pm	Discussion

## 9:00am-3:00pm

### 713: EMG/Peripheral Nervous System

Co-Directors: *Devon I. Rubin, MD, FACNS* and *Ruple S. Laughlin, MD*

Location: Pompeian I-II

#### Learning Objectives:

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

1. Understand the basic concepts of nerve conduction studies, the abnormalities that occur in different types of disorders, and the pitfalls that may occur during the performance of the studies;
2. Recognize normal and abnormal spontaneous and voluntary EMG waveforms and understand the significance of abnormal findings;
3. Understand the EDX techniques and approaches used to evaluate patients with carpal tunnel syndrome and ulnar neuropathies;
4. Determine an appropriate EDX approach to patients with radiculopathies and understand the limitations of EDX testing;
5. Recognize the EDX features of peripheral neuropathies; and
6. Understand the types of EDX changes that occur in myopathies.

#### Agenda:

9:00am	Nerve Conduction Studies: Basics and Pitfalls <i>Ruple S. Laughlin, MD</i>
9:45am	EMG Waveform Examples: Spontaneous and Basic Motor Unit Potentials <i>Devon I. Rubin, MD, FACNS</i>
10:45am	EDX Approach to CTS and Ulnar Neuropathies <i>Cory Kogelschatz, MD</i>
11:30am	EDX Approach to Radiculopathies <i>Paul Barkhaus, MD</i>
1:15pm	EDX Approach to Peripheral Neuropathies <i>Zachary London, MD</i>
2:00pm	EDX Approach to Myopathies <i>Priya Dhawan, MD</i>

## 3:00-5:00pm

### 742: EMG Demo

Co-Directors: *Devon I. Rubin, MD, FACNS* and *Ruple S. Laughlin, MD*

Location: Pompeian I-II

#### Learning Objectives:

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

1. Perform specific common and uncommon NCS;
2. Recognize and correct technical problems that may occur during the performance of NCS

#### Agenda:

3:00pm	NCS Demonstration: Common, Uncommon, and Pitfalls <i>Devon I. Rubin, MD, FACNS</i> and <i>Ruple S. Laughlin, MD</i>
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# PROGRAM AGENDA • ANNUAL COURSES

Thursday, February 7, 2019 (continued...)

## 11:30am-2:00pm

### 721: 5th Annual CNP Director's Symposium

Director: Jeffrey Britton, MD, FACNS

Location: Pompeian III

#### Learning Objectives:

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

1. Discuss of methods used to enhance fellowship curriculum of neurophysiology and instrumentation principles;
2. Explain methods to enhance teaching and application of evoked potentials and IOM in fellowship curriculum;
3. Apply recent changes in ACGME core requirements affecting fellowship training programs;
4. Complete a ACGME Self-Study.

#### Agenda:

11:30am	Lunch
12:00pm	Introduction <i>Jeffrey Britton, MD, FACNS</i>
12:05pm	Closing Gaps Identified in ACNS Inservice Exam: Neurophysiology and Instrumentation <i>Brian Lundstrom, MD, PhD</i>
12:30pm	IOM and Evoked Potentials <i>Matt Hoffmann, DO, PhD</i>
1:00pm	ACGME Revised Core Requirements <i>Padmaja Kandula, MD</i>
1:30pm	ACGME Self-Study <i>Lily Wong-Kiesel, MD</i>

## 1:30-3:00pm

### 731: Autonomic Neurophysiology

Co-Directors: Claus Reinsberger, MD, PhD, FACNS and Jeffrey Liou, DO

Location: Neopolitan III-IV

#### Learning Objectives:

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

1. Recognize the clinical features and patterns on autonomic testing in systemic and primary neurological disorders affecting central and peripheral autonomic pathways with their underlying anatomy and physiology; and
2. Discuss an approach to the diagnostic evaluation and management of disorders of the autonomic nervous system.

#### Agenda:

1:30pm	Introduction, Anatomy and Physiology of the Autonomic Nervous System <i>Claus Reinsberger, MD, PhD, FACNS</i>
1:45pm	Autonomic Testing <i>Jeffrey Liou, DO</i>
2:10pm	Neurological Disorders with Central Autonomic Failure <i>Alexandra Hovaguimian, MD</i>
2:35pm	Peripheral Autonomic Failure <i>Peter Novak, MD, PhD</i>

## 3:00-5:00pm

### 741: Video EEG Cases Part I

Co-Directors: William O. Tatum IV, DO, FACNS and Phillip Pearl, MD, FACNS

Location: Pompeian III

#### Learning Objectives:

Upon completion the participant will take away an appreciation for the predictive value of scalp-based video-EEG in patients with seizures.

1. How to use invasive EEG to predict the surgical outcome based upon data obtained during video-EEG monitoring; and
2. Apply information from the lecture to appropriately localize the epileptogenic zone using video-EEG in pediatric patients.

#### Agenda:

3:00pm	Predicting the Epileptogenic Zone Using Scalp-based VEM <i>William O. Tatum IV, DO, FACNS</i>
3:35pm	Predicting the Epileptogenic Zone with Intracranial VEM <i>Greg Worrell, MD</i>
4:15pm	Localizing the Epileptogenic Zone in Pediatric Patients with VEM <i>Phillip Pearl, MD, FACNS</i>
4:50pm	Discussion

# PROGRAM AGENDA • ANNUAL COURSES

Friday, February 8, 2019

## 7:00-8:30am

### 804: Neonatal EEG Workshop

Director: *Shavonne Massey, MD, MSCE*

Location: Messina

#### Learning Objectives:

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

1. List the challenges of developing a classification scheme for neonatal seizures and recognize the seizure types detailed in the new ILAE neonatal seizure classification;
2. Explain the importance of neonatal seizures and implication on acute and chronic outcomes;
3. Discuss avenues of neonatal seizure quantification that extend beyond the traditional metrics of seizure burden and determine which method(s) would result in maximal seizure quantification;
4. Identify common normal and abnormal neonatal EEG background patterns and discuss the prognostic significance; and
5. Describe methods that can be implemented within and across institutions to decrease inter-rater variability in neonatal EEG interpretation.

#### Agenda:

7:00am	Evolution of the Classification of Neonatal Seizures <i>Eli Mizrahi, MD, FACNS</i>
7:30am	Neonatal Seizure Quantification: Novel Methods to Address a Common Dilemma <i>Eli Mizrahi, MD, FACNS</i>
8:00am	Standardizing Neonatal EEG Background Interpretation: Addressing Issues of Inter-Rater Agreement <i>Shavonne Massey, MD, MSCE</i>

## 8:30-10:00am

### 805: Video EEG Cases Part II

Co-Directors: *William O. Tatum IV, DO, FACNS and Phillip Pearl, MD, FACNS*

Location: Pompeian III-IV

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

1. Evaluate the appropriateness of an adequate history as it relates to the care of patients with epilepsy and seizure mimics;
2. Recognize the variety of clinical features seen in patients with focal and generalized seizures and epilepsy syndromes; and
3. Demonstrate learning in the clinical approach to managing patients with seizures and spells.

#### Agenda:

8:30am	Video-EEG Cases: Pearl and Pitfalls in Adults <i>William O. Tatum IV, DO, FACNS</i>
9:00am	The Unclassified Patients <i>Stephan U. Schuele, MD, MPH, FACNS</i>
9:30am	Mystery Pediatric Cases <i>Phillip Pearl, MD, FACNS</i>

## 7:00-10:00am

### 802: Neuromodulation/Stimulation in Human Brain

Director: *Greg Worrell, MD*

Location: Florentine III

#### Learning Objectives:

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

1. Understand currently available direct brain stimulation devices for epilepsy.
2. Learn the physics of brain stimulation.
3. Understand the clinical evidence for brain stimulation for epilepsy.

#### Agenda:

7:00am	Introduction: Direct Electrical Stimulation of Brain <i>Greg Worrell, MD</i>
7:45am	Modeling Brain Stimulation <i>Christopher R. Butson, PhD</i>
8:30am	Responsive Neurostimulation (RNS) <i>Barbara Jobst, MD</i>
9:15am	Deep Brain and Cortical Stimulation <i>Brian Lundstrom, MD, PhD</i>

## 7:00-10:00am

### 801: Basic EEG

Co-Directors: *Ionnis Karakis, MD, PhD, MSc and Jay S. Pathmanathan, MD, PhD*

Location: Pompeian I-II

#### Learning Objectives:

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

1. Explain the basics in electroencephalography (EEG);
2. Describe the fundamental tenets of signal generation, technical considerations of signal acquisition, types of EEG recordings and reporting standards; and
3. Demonstrate both non epileptiform and epileptiform abnormalities and their relationship with underlying neurologic disorders.

#### Agenda:

7:00am	Normal Adult EEG <i>Jay S. Pathmanathan, MD, PhD</i>
7:30am	Normal Neonatal and Pediatric EEG <i>Nicholas Abend, MD, MSCE, FACNS</i>
8:00am	Normal EEG Variants <i>Ioannis Karakis, MD, PhD, MSc</i>
8:30am	Artifacts <i>Jeffrey Britton, MD, FACNS</i>
9:00am	Non Epileptiform Abnormalities <i>M. Brandon Westover, MD, PhD, FACNS</i>
9:30am	Epileptiform Abnormalities <i>Andreas Alexopoulos, MD, MPH</i>

# PROGRAM AGENDA • ANNUAL MEETING

Friday, February 8, 2019 (continued...)

## 7:00-10:00am

### 803: Women's Leadership Symposium

Director: Gloria M. Galloway, MD, MBA, FACNS

Location: Florentine IV

#### Learning Objectives:

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

1. Discuss the current issues involved in gender disparity in leadership and career advancement;
2. Describe measures that can be utilized to overcome or work through challenges encountered in female career advancement; and
3. Increase their personal involvement and engagement in committees and task forces and seek out mentoring opportunities to shape the strategy and future of ACNS for everyone.

#### Agenda:

7:00am	Defining the Problem of Gender Disparity in Medicine: What Does the Data Reveal <i>Gloria M. Galloway, MD, MBA, FACNS</i>
7:30am	Recruitment and Retention of Female Faculty: What are the Challenges and What Opportunities are Available? <i>Susan T. Herman, MD, FACNS</i>
8:00am	Why Does Gender Research Matter? <i>Sarah E. Schmitt, MD, FACNS</i>
8:30am	Helping Women Find a Voice: Recommendations for Moving Forward <i>Suzette M. LaRoche, MD, FACNS</i>
9:00am	Panel Discussion

## 10:00-10:30am - Coffee Break

## 10:30am-12:15pm - Opening General Session

Location: Florentine I-II

10:30am	Welcome and Introduction of ACNS President <i>Saurabh R. Sinha, MD, PhD, FACNS</i>
10:40am	ACNS Presidential Lecture: Pediatric Status Epilepticus <i>Tobias Loddenkemper, MD, FACNS</i>
11:25am	Gloor Award Presentation <i>Saurabh R. Sinha, MD, PhD, FACNS</i>
11:30am	Gloor Award Lecture: A Clinical Neurophysiology Journey from Switzerland to Baltimore <i>Peter W. Kaplan, MD, FRCP, FACNS</i>

## 12:15-1:30pm - Lunch

### Visit Exhibits

Location: Roman Ballroom

### Poster Tours

Location: Roman Ballroom

## 1:30-3:30pm - Concurrent Sessions

### 815: The Business Side of Clinical Neurophysiology

Session Director: Suzette M. LaRoche, MD, FACNS

Location: Pompeian III-IV

#### Learning Objectives:

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

1. Discuss the key aspects of successful EEG monitoring program development;
2. Implement quality improvement processes that are relevant to their own neurophysiology/ EEG monitoring labs; and
3. Recognize symptoms of physician/ provider/ technologist burnout.

#### Agenda:

1:30pm	I've Just Been Asked to Serve as Medical Director- Now What Do I Do? <i>Suzette M. LaRoche, MD, FACNS</i>
1:40pm	Building a Comprehensive EEG Monitoring Program <i>Dave Burdette, MD, FACNS</i>
2:20pm	Quality Improvement, Accreditation and Board Certification <i>Matt W. Luedke, MD</i>
2:45pm	Work Life Balance: Preventing Provider and Technologist Burnout <i>Cormac O'Donovan, MD, FACNS</i>
3:15pm	Panel Discussion

### 814: Current and Future Clinical Practice of High Density EEG and Electrical Source Imaging in Epilepsy

Session Director: Susan T. Herman, MD, FACNS

Location: Pompeian I-II

#### Learning Objectives:

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

1. Describe the indications, methods, and potential limitations for HD EEG acquisition and electrical source imaging.
2. Identify patients in whom HD EEG and ESI may aid in localization of the epileptogenic zone.
3. Incorporate the results of HD EEG and source localization techniques into epilepsy presurgical evaluations.

#### Agenda:

1:30pm	Opportunities for Presurgical Localization Using HD-EEG Source Localization <i>Robert Knowlton, MD</i>
2:00 pm	Methods for HD EEG ESI and Lesion-Constrained ESI <i>Jurriaan Peters, MD, PhD</i>
2:30pm	Identification and Significance of Spike Ripple Events in Scalp HD EEG <i>Catherine J. Chu, MD</i>
3:00pm	Beyond the Spike: HD EEG to Map Epileptic Networks and Eloquent Cortex <i>Leonardo Bonilha, MD, PhD</i>

# PROGRAM AGENDA • ANNUAL MEETING

Friday, February 8, 2019 (continued...)

## 914: Multimodality Monitoring in the EMU

Session Co-Directors: *Stephan U. Schuele, MD, MPH, FACNS* and *Sam Lhatoo, MD*

Location: Florentine I-II

### Learning Objectives:

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

1. Explain how seizures may impact cardiorespiratory function.
2. Discuss the technical challenges to obtain high quality recordings.
3. Discuss brain structures that underpin seizure-related cardio-respiratory dysfunction.

### Agenda:

1:30pm	Introduction
1:35pm	Peri-ictal Respiratory Dysfunction: Insights from the EMU <i>Nuria Lacuey, MD</i>
1:55pm	Respiratory Function Monitoring: Insights from the Lab <i>George Richerson, MD</i>
2:15pm	Electrocardiographic Monitoring <i>Maromi Nei, MD</i>
2:35pm	Non-Invasive Blood Pressure Monitoring <i>Sam Lhatoo, MD</i>
2:55pm	Mapping of Cardiorespiratory Function with Brain Stimulation <i>William Nobis, MD</i>

## 813: Critical Care ECoG: How to Integrate It into Your Practice

Session Co-Directors: *Christa Swisher, MD* and *Sahar F. Zafar, MBBS*

Location: Florentine IV

### Learning Objectives:

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

1. Define evidence, rationale and indications for critical care ECoG;
2. Describe the resources needed for establishing critical care ECoG monitoring and how to incorporate it into a critical care EEG monitoring service; and
3. Describe the role of critical care ECoG as a dynamic brain monitor and how to integrate critical care ECoG findings with ICU EEG and multimodality monitoring.

### Agenda:

1:30pm	Critical Care ECoG: History, Rationale and Evidence <i>Emily Gilmore, MD</i>
2:00pm	How to Start an ICU ECoG Monitoring Program <i>Ramini Balu, MD, PhD</i>
2:30pm	ECoG Untangled: Integrating ECoG with Other Multimodality Monitoring <i>Brandon Foreman, MD, FACNS</i>
3:00pm	ICU Clinical Case Scenarios: How ECoG Adds to Patient Care <i>Eric Rosenthal, MD</i>

## 812: Beyond QEEG: Artificial Intelligence in Clinical Neurophysiology

Session Co-Directors: *Haoqi Sun, PhD* and *M. Brandon Westover, MD, PhD, FACNS*

Location: Florentine III

### Learning Objectives:

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

1. Compare the strengths and weakness of traditional techniques versus newer artificial intelligence techniques in QEEG;
2. Evaluate claims from the research and commercial domains about AI algorithms; and
3. Evaluate possible ways of using AI technology in their own institutions.

### Agenda:

1:30pm	Introduction <i>M. Brandon Westover, MD, PhD, FACNS</i>
1:35pm	Standards and Validation of AI Algorithms <i>Jonathan J. Halford, MD, FACNS</i>
1:50pm	Annotating Large Datasets for AI Applications <i>Jing Jin, PhD</i>
2:05pm	AI for Sedation Monitoring: Monitoring ICU Sedation and Delirium Using Deep Neural Networks <i>Haoqi Sun, PhD</i>
2:20pm	AI for Predicting Outcome of Coma Following Cardiac Arrest <i>Michel van Putten, MD, PhD</i>
2:35pm	Sleep Changes Systematically Over the Course of a Lifetime <i>M. Brandon Westover, MD, PhD, FACNS</i>
2:50pm	AI for Analysis of Sleep <i>Jimeng Sun, MD</i>
3:05pm	“Routine EEGs” are a Central Part of the Medical Evaluation for Patients with Neurological Disorders <i>Siddharth Biswal, MD</i>
3:15pm	Panel Discussion

## 3:30-4:00pm - Coffee Break in Exhibit Hall

Location: Roman Ballroom



# PROGRAM AGENDA • ANNUAL MEETING

Friday, February 8, 2019 (continued...)

## 4:00-5:30pm - Concurrent Sessions

### 821: Brachial Plexopathies - Improving Your Diagnostic Skills

Session Director: Ana Lucila Moreira, MD

Location: Florentine III

#### Learning Objectives:

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

1. Describe how to examine baby with Brachial Plexopathy;
2. Select tests to address information that matters to the surgeon; and
3. Conduct a complete examination in a patient with brachial plexus lesion.

#### Agenda:

- 4:00pm What a Close Relationship with the Surgeon Teaches You  
*Carlos Otto Heise, MD, PhD*
- 4:30pm ENMG Techniques for Evaluation of Brachial Plexopathy  
*Devon I. Rubin, MD, FACNS*
- 5:00pm Ultrasound Imaging of Brachial Plexus  
*Ana Lucila Moreira, MD*

### 822: Brain-Computer Interface: The Dawn of a New Era for Patients with Neurological and Motor Deficits

Session Director: Meriem Bensalem-Owen, MD, FACNS

Location: Pompeian I-II

#### Learning Objectives:

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

1. Describe the principle of BCI systems;
2. Discuss recent advances and challenges of BCI technology; and
3. Demonstrate the impact of BC systems on patients' quality of life.

#### Agenda:

- 4:00pm Introduction - BCI: A Revolution in Clinical Neurophysiology  
*Meriem Bensalem-Owen, MD, FACNS*
- 4:15pm BCI using ECoG Activity  
*Aysegul Gunduz, PhD*
- 4:45pm DARPA and Innovations in Neural Interface Technology  
*Justin Sanchez, PhD*
- 5:15pm Panel Discussion

## Don't Miss the 2019 Neurophys Bowl — Friday, February 8, 5:45 – 7:00pm

This "edutainment" session is a game-show style competition where teams rush to answer questions from CNP literature.

The competition is fierce (but friendly!) and the winning team will be deemed to have the smartest clinical neurophysiologists!



### 823: Clinical Neurophysiology Resident and Fellow Special Interest Group Case Presentations

Session Director: Andrea Hakimi, DO, FACNS, FAES

Location: Florentine IV

#### Learning Objectives:

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

1. Describe selected clinical neurophysiology cases or quality improvement projects completed by trainees;
2. Engage in an informal discussion of the selected cases or projects; and
3. Discuss his or her opinion regarding different approaches to each case or project with emphasis on learning points.

#### Agenda:

- 4:00pm SIG Introduction  
*Andrea Hakimi, DO, FACNS, FAES*
- 4:05pm Two Men with Intermittent Weakness  
*Angela Aziz Donnelly, MD*
- 4:25pm Dialectic EEGs: A Unique Teaching Model through Congruency of Expert Opinions  
*Sushma Yerram, MBBS*
- 4:45pm The Michael Jordan of Epilepsy: A Story of a Boy's Dream to Play Basketball  
*Kiran Kanth, MD*
- 5:05pm Intraoperative Monitoring-Preserving Motor Function and Detection of Seizures  
*David Mao, MD*
- 5:25pm Discussion

## 5:30-5:45pm - Walking Break

## 5:45-7:00pm - General Session

Location: Florentine I-II

Directors: Saurabh R. Sinha, MD, PhD, FACNS and Tammy Tsuchida, MD, PhD, FACNS

- 5:45pm Cosimo Ajmone-Marsan Award Presentation  
*Aatif M. Husain, MD, FACNS presenting to Elisa Baldin, MD, MSc*
- 5:50pm Neurophys Bowl  
*Directors: Saurabh R. Sinha, MD, PhD, FACNS and Tammy Tsuchida, MD, PhD, FACNS*

## 7:00-8:30pm - Welcome Reception

Location: Roman Ballroom

Join us at the official Welcome Reception of the 2019 Annual Meeting. Connect with colleagues, meet other attendees, view posters, and visit exhibit booths on the opening day of Annual Meeting sessions.



# PROGRAM AGENDA • ANNUAL MEETING

Saturday, February 9, 2019

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## 7:00-8:00am - Continental Breakfast and Poster Tours

Location: Roman Ballroom

## 7:00-8:00am - International Attendee Breakfast

Location: Messina

## 8:00-9:30am - Concurrent Sessions

### 905: Decision Making with Neurostimulation

Session Director: Dawn Eliashiv, MD, FACNS

Location: Pompeian III-IV

#### Learning Objectives:

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

1. Utilize neurostimulation in the management of patients with medically refractory epilepsy;
2. Differentiate which modality of neurostimulation is most appropriate to each patient; and
3. Program neurostimulator devices.

#### Agenda:

8:00 am	Future of Neurostimulation <i>Dawn Eliashiv, MD, FACNS</i>
8:30am	Responsive Neurostimulation What We Learn from Chronic Recordings <i>Lawrence J. Hirsch, MD, FACNS</i>
8:50am	VNS Novel Strategies <i>Steve Karceski, MD</i>
9:10am	DBS Approval at Last <i>Robert E. Gross, MD, PhD</i>

### 904: Of Dreams and Spells - The Neurophysiological Tools of REM Sleep & Epilepsy

Session Director: Marcus C. Ng, MD, FRCPC, CSCN(EEG)

Location: Pompeian I-II

#### Learning Objectives:

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

1. Understand the basic neurophysiology and polysomnographic characteristics of REM sleep;
2. Discuss the role of EEG and quantitative EEG in the evaluation of REM sleep in epilepsy; and
3. Recognize the potential importance of REM sleep neurophysiology in the Sudden Unexpected Deaths of Epilepsy (SUDEP).

#### Agenda:

8:00am	Physiology and Polysomnography of REM Sleep <i>Milena Pavlova, MD</i>
8:30am	EEG and Quantitative EEG of REM Sleep in Epilepsy <i>Marcus C. Ng, MD, FRCPC, CSCN(EEG)</i>
9:00am	Neurophysiology of REM Sleep and SUDEP in Epilepsy <i>Gordon Buchanan, MD, PhD</i>

# PROGRAM AGENDA • ANNUAL MEETING

Saturday, February 9, 2019 (continued...)

## 902: Mapping Human Language Networks with Intracranial EEG Spectra

Session Director: Ravindra Arya, MD

Location: Florentine I-II

### Learning Objectives:

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

1. Describe emerging methods for mapping dynamics and connectivity of human language networks with intracranial EEG spectra in children and adults;
2. Describe developmental aspects of human language networks through information theoretic analysis of intracranial EEG signals; and
3. Describe integration of intracranial EEG spectral power changes with other brain mapping modalities to optimize surgical outcomes.

### Agenda:

- |        |  |
|--------|--|
| 8:00am | Introduction<br><i>Ravindra Arya, MD, DM</i>   |
| 8:05am | Spatiotemporal Mapping of Language Networks at the Bedside with Intracranial EEG in Adults<br><i>Nathan E. Crone, MD</i> |
| 8:25am | 3D and 4D Mapping of Speech and Language in Children with Epilepsy<br><i>Eishi Asano, MD, PhD</i>                        |
| 8:45am | Development of Information Sharing in Human Language Neocortex<br><i>Ravindra Arya, MD</i>                               |
| 9:05am | Multimodal Prediction of Post-Operative Language Outcomes<br><i>Abbas Babajani-Feremi, PhD</i>                           |

## 901: Joint ACNS/Mexican Clinical Neurophysiology Symposium: Intraoperative Neurophysiologic Monitoring in Special Situations

Session Director: Daniel San Juan Orta, MD, FACNS

Location: Florentine III

### Learning Objectives:

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

1. Discuss the technical and clinical challenges when performing IOM in these patients;
2. Review the clinical data available for the use of IOM in patients with neuromuscular diseases and in "extreme" age groups;
3. Describe useful strategies to improve the quality of IOM in these groups; and
4. Identify research areas where using IOM may improve patient outcomes in these high-risk groups.

### Agenda:

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|--------|---|
| 8:00am | IOM in Neuromuscular Diseases<br><i>Jaime R. López, MD, FACNS</i> |
| 8:30am | IOM in Neonates<br><i>Erika Rivera, MD</i>                        |
| 9:00am | IOM in Elderly<br><i>Daniel San-Juan, MD</i>                      |

## 903: Mastering Semi-Quantitative Motor Unit Potential Analysis Skills in 90 Minutes!

Session Director: Devon I. Rubin, MD, FACNS

Location: Florentine IV

### Learning Objectives:

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

1. Describe the skills needed to improve EMG waveform recognition;
2. Demonstrate improved auditory recognition of MUP firing rate, and recruitment assessment, and
3. Demonstrate improved accuracy in recognition of motor unit potential stability, phases, and duration.

### Agenda:

- |        |   |
|--------|---|
| 8:00am | Overview of Skills of Semi-Quantitation<br><i>Devon I. Rubin, MD, FACNS</i> |
| 8:30am | Assessment of MUP Recruitment<br><i>Devon I. Rubin, MD, FACNS</i>           |
| 9:00am | Recognizing MUP Morphologic Changes<br><i>Devon I. Rubin, MD, FACNS</i>     |

## 9:30-10:00am - Coffee Break in Exhibit Hall

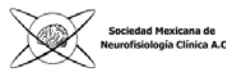
Location: Roman Ballroom

## 10:00-11:00am - General Session

Location: Florentine I-II

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|---------|--|
| 10:00am | Young Investigator Travel Award Recognition<br><i>Tammy Tsuchida, MD, PhD, FACNS</i>         |
| 10:15am | Jasper Award Presentation<br><i>Stephan U. Schuele, MD, MPH, FACNS</i>                       |
| 10:20am | Jasper Award Lecture: Developing Tools for Neurophysiology<br><i>Jean Gotman, PhD, FACNS</i> |

## 11:00-11:15am - Walking Break



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# PROGRAM AGENDA • ANNUAL MEETING

Saturday, February 9, 2019 (continued...)

## 11:15am-12:45pm - Concurrent Sessions

### 922: Can Clinical Neurophysiology Improve the Recovery from Sports Induced Injuries?

Session Co-Directors: Jonathan C. Edwards, MD, MBA, FACNS and Claus Reinsberger, MD, PhD, FACNS

Location: Pompeian I-II

#### Learning Objectives:

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

1. Discuss the evidence of devices utilizing neurophysiological signals in the recovery from concussion
2. Describe the role of the vestibular and the autonomic system in the recovery from sports related concussion
3. Explain the role of sleep to enhance the recovery from concussion

#### Agenda:

- |         |  |
|---------|--|
| 11:15am | Neurophysiological Assessment Tools to Enhance Recovery After Concussion: Between Theory and Evidence<br><i>Nicholas Jerome Milano, MD</i>       |
| 11:45am | New Ways to Approach Recovery After Concussion: Focus on the Vestibular and Autonomic Nervous System<br><i>Claus Reinsberger, MD, PhD, FACNS</i> |
| 12:15pm | The Role of Sleep in Recovery from Neurological Injuries and its Relevance to Sports Medicine<br><i>Madeleine M. Grigg-Damberger, MD, FACNS</i>  |

### 911: Joint ACNS/British Clinical Neurophysiology Society Symposium: The Diagnostic Challenge of Small Fibre Neuropathy

Session Director: Christopher Moore, MB, BS, PhD, FRCP

Location: Florentine III

#### Learning Objectives:

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

1. Discuss etiology and clinical presentation of acquired and hereditary small fiber neuropathy;
2. Recognize the value and weaknesses of nerve conduction studies in small fiber neuropathy; and
3. Describe new techniques and their role in evaluating small fiber neuropathy.

#### Agenda:

- |         |  |
|---------|--|
| 11:15am | Clinical Features of Acquired Small Fiber Neuropathy<br><i>Rayaz Malik, MB, ChB, PhD</i>               |
| 11:45am | Neurophysiological Evaluation of Small Fiber Neuropathy<br><i>Christopher Moore, MB, BS, PhD, FRCP</i> |
| 12:15pm | A Clinical Approach to Small Fibre Neuropathy<br><i>Taylor Harrison, MD</i>                            |

### 1003: Wide-band EEG for Epilepsy: Established Tool or Research Topic

Session Director: Akio Ikeda, MD, PhD, FACNS

Location: Florentine I-II

#### Learning Objectives:

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

1. Upon the discussion of this matter in invasive EEG, MEG and scalp-EEG, we could fill the gap of the knowledge and promote clinical application and clinical research in wide-band EEG.
2. Upon the discussion of this matter in invasive EEG, MEG and scalp-EEG, we could fill the gap of the knowledge and promote clinical application and clinical research in wide-band EEG.
3. Upon the discussion of this matter in invasive EEG, MEG and scalp-EEG, we could fill the gap of the knowledge and promote clinical application and clinical research in wide-band EEG.

#### Agenda:

- |         |  |
|---------|--|
| 11:15am | HFO is the Established Tool or Still Research Topic?<br><i>Jean Gotman, PhD</i>                  |
| 11:35am | DC Shifts are the Established Tool or Still Research Topic?<br><i>Akio Ikeda, MD, PhD, FACNS</i> |
| 11:55am | Current Situation for MEG Application<br><i>Stefan Rampp, MD</i>                                 |
| 12:15pm | Scalp-Recorded, Wide-Band EEG<br><i>Pradeep Modur, MD, MS</i>                                    |

### 811: The Motor Evoked Potential: Fundamentals and Clinical Applications. A High-Level Scientific Symposium.

Session Director: Jonathan A. Norton, PhD

Location: Pompeian III-IV

*\*This session will end at 1:00pm.*

#### Learning Objectives:

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

1. Describe the sites of activation of the MEP for both TMS and TES;
2. Describe a relationship between MEP and function; and
3. List two uses of the MEP outside the operating room.

#### Agenda:

- |         |  |
|---------|--|
| 11:15am | Setting the Stage: The Potential of the MEP and Its Challenges.<br><i>Jonathan A. Norton, PhD</i>  |
| 11:30am | Activation of the Motor Pathway: How, What and Why?<br><i>John Rothwell, PhD</i>   |
| 12:00pm | Clinical Application of MEPs and Where Should TMS Fit in Clinical Neurophysiology?<br><i>Mark Hallett, MD, FACNS</i>                     |
| 12:30pm | Alarmed by Alarm Criteria? Developing a Scientifically Based Approach to MEPs in the Clinical Setting.<br><i>Jonathan A. Norton, PhD</i> |

# PROGRAM AGENDA • ANNUAL MEETING

Saturday, February 9, 2019 (continued...)

## 918: Spanish Symposium: Uso Clínico de Monitoreo Intraoperatorio/ Clinical Use of Intraoperative Monitoring

Note: This session will be presented in Spanish

Session Co-Directors: Jaime R. Lopez, MD, FACNS and Andres A. Gonzalez, MD, MMM, FACNS

Location: Florentine IV

### Learning Objectives:

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

1. Discuss the basic principles of Neurophysiologic Intraoperative monitoring;
2. Recognize clinical procedures and findings on Neuromonitoring of spinal column surgery; and
3. Recognize clinical procedures and findings on Neuromonitoring of cerebrovascular procedures.

### Agenda:

- 11:15am Principios Basicos de Monitoreo Intra-Operatorio/Basic Principles of NIOM  
*Alejandro Zavala, MD*
- 11:45am Monitoreo Neurofisiologico de Cirugia de la Columna/  
Neuromonitoring of Spinal Column Surgery  
*Lidia Cabanes-Martinez, MD*
- 12:15pm Monitoreo Neurofisiologico Para Procedimientos y Cirugias  
Cerebrovasculares/Neuromonitoring of Cerebrovascular Procedures  
*Jaime R. Lopez, MD, FACNS*

## 12:45-2:00pm - Lunch in Exhibit Hall

Location: Roman Ballroom

## 1:00-2:00pm - Learning Lab - "Wearable Seizure Detection"

Moderated by Lawrence J. Hirsch, MD, FACNS

Location: Pisa/Palermo

See p. 44 for complete information

## 2:00-3:30pm - Concurrent Sessions

### 913: Joint ACNS/IFCN Latin American Chapter Symposium: Beyond Traditional Monitoring During Spine Surgery

Session Co-Directors: Andres A. Gonzalez, MD, MMM, FAAN,  
FACNS

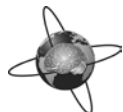
and Paulo Andre T. Kimaid, MD, PhD

Location: Pompeian III-IV

### Learning Objectives:

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

1. Understand the use of motor evoked potentials during spine surgery;
2. Recognized the diagnostic value of MEPs when monitoring different neural structures; and
3. Understand the techniques utilized for monitoring neural structures during transpoas approach.



### Agenda:

- 2:00pm MEPs for Lumbar Spine Surgery: Advantages and Pitfalls  
*Armando Tello, MD, PhD*
- 2:30pm MEPs for Tumors of the Lower Spine and Conus  
*Jorge Gutiérrez, MD, MS*
- 3:00pm MEPs for Nerve Root Monitoring  
*Parastou Shilian, DO, FACNS*

## 921: Are MEG Practitioners Fulfilling Your Expectations?

Session Director: Anto Bagic, MD, PhD, FAES, FACNS

Location: Pompeian I-II

### Learning Objectives:

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

1. Recognize the prevailing patterns of the current MEG use in presurgical evaluation of patients with epilepsy in the NAEC-accredited epilepsy centers;
2. Describe the key evidence-supported indications for MEG in presurgical evaluation of patients with epilepsy; and
3. Discuss appropriate expectations from a MEG report that supports clinical care effectively.

### Agenda:

- 2:00pm Thus Spoke the NAEC Centers' Directors. . .  
*Anto Bagic, MD, PhD, FACNS*
- 2:30pm Evidence-Supported MEG Indications in Epilepsy  
*Andrew Zillgitt, DO*
- 3:00pm This is What You Should Expect from a MEG Report  
*Richard C. Burgess, MD, PhD, FACNS*

## 923: Electrophysiologic Assessment of Weakness in the ICU

Session Director: Ruple S. Laughlin, MD

Location: Florentine III

### Learning Objectives:

1. Identify electrophysiological methods to distinguish causes of neuromuscular respiratory weakness;
2. Define clinical risk factors and describe electrophysiological findings supporting critical illness myopathy; and
3. Describe clinical characteristics and electrophysiological findings in critical illness neuropathy.

### Agenda:

- 2:00pm Electrophysiological Testing Approach for Respiratory Failure in the ICU  
*Ruple S. Laughlin, MD*
- 2:30pm Critical Illness Myopathy: Clinical and Electrophysiological Findings  
*Brent Goodman, MD*
- 3:00pm Critical Illness Neuropathy: Clinical and Electrophysiological Features  
*Christopher S. Nance, MD*

# PROGRAM AGENDA • ANNUAL MEETING

Saturday, February 9, 2019 (continued...)

## 924: Setting Up for Success in Long-Term Monitoring

Session Director: Faye McNall, MEd, REEGT

Location: Florentine IV

### Learning Objectives:

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

1. Demonstrate awareness of ABRET credentials and LTMA lab accreditation with an understanding of process involved, and list benefits of obtaining accreditation;
2. Create effective staffing models to maximize skills of technical staff and build an effective epilepsy team; and
3. Describe the use of technologies to enhance communication and efficient operation of the LTM unit, and discuss alternate care model to reduce costs.

### Agenda:

- 2:00pm The Value of ABRET Credentials & LAB-LTM accreditation  
*Janice Walbert, MS, CAE, FACNS*
- 2:30pm Expanding the Role of the Neurodiagnostic Technologist in the Long-Term Monitoring Unit  
*Susan Agostini, R. EEG/EP T., CLTM, FASET*
- 3:00pm New Initiatives in Long-Term Monitoring  
*Erik Padilla, R. EEG/EPT., CNIM, CLTM, MBA*

## 3:30-3:45pm - Walking Break

## 3:45-5:15pm - Concurrent Sessions

### 933: Brainstem and Supratentorial Surgery Monitoring, New Developments and Current Understanding

Session Director: Sedat Ulkatan, MD

Location: Florentine III

### Learning Objectives:

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

1. Explain brainstem reflexes utility in brainstem surgery, correct implementation in their practice;
2. Interpret complex brain surgeries;
3. Explain the physiology of cortical and subcortical stimulation; and
4. Conduct monitoring in complex neurosurgical operations.

### Agenda:

- 3:45pm Brainstem and Spinal Cord Reflexes, Neurophysiology and IOM Perspective.  
*Vedran Deletis, MD, PhD*
- 4:45pm Supra Tentorial Brain Tumor Surgery: IOM Update- What is New?  
*Andrea Szelenyi MD, PhD*

## 931: Advanced Autonomic Testing

Session Director: Peter Novak, MD, PhD

Location: Florentine IV

### Learning Objectives:

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

1. Perform and interpret basic autonomic testing - including deep breathing, Valsalva maneuver and tilt test;
2. Describe the value of autonomic testing combined with cerebral blood flow and skin biopsies for assessment of small fibers; and
3. Grade autonomic abnormalities, autonomic failure, autonomic overactivity, orthostatic intolerance and severity of small fiber neuropathy.

### Agenda:

- 3:45pm Autonomic Testing  
*Thomas Chelimsky, MD*
- 4:15pm Central Dysautonomia, MD  
*Max J. Hilz, MD*
- 4:45pm Quantitative Evaluations of Autonomic Failure, Overactivity and Severity Small Fiber Neuropathy  
*Peter Novak, MD, PhD*

## 934: SEEG Planning Based on Presurgical Evidence - Illustrative Case Discussions, Interactive.

Session Director: Jun T. Park, MD, FAES

Location: Pompeian I-II

### Learning Objectives:

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

1. Describe the concepts of SEEG;
2. Describe the indications of SEEG in adults and children; and
3. Apply the technique in selected patients with drug resistant focal epilepsy to confirm or disprove the hypothesis of epileptogenic zone.

### Agenda:

- 3:45pm Guiding Principles in the Use of SEEG  
*Jun T. Park, MD, FAES*
- 4:05pm Illustrative Cases: Pediatric  
*Elia M. Pestana-Knight, MD, FACNS*
- 4:25pm Illustrative Cases: Adult  
*Guadalupe Fernandez Baca-Vaca, MD*
- 4:45pm Illustrative Cases: Adult/Pediatric  
*Asim Shahid, MD*

# PROGRAM AGENDA • ANNUAL MEETING

Saturday, February 9, 2019 (continued...)

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## 932: Advances in Continuous EEG in Targeted Temperature Management

Session Co-Directors: *Edilberto Amorim, MD and Jong Woo Lee, MD, PhD, FACNS*

Location: Pompeian III-IV

### Learning Objectives:

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

1. Discuss the use of machine learning, particularly deep learning and convolutional neural networks, in analyzing cEEG from patients undergoing TTM;
2. Discuss ERP and its role in coma prognostication in TTM;
3. Assess electrographic-imaging correlates of patients undergoing TTM; and
4. Explain how to combine continuous EEG findings with neuroimaging studies, particularly MRI studies, to guide withdrawal of life-sustaining therapy decisions.

### Agenda:

- 3:45pm Machine Learning of Continuous EEG Data  
*Michel Van Putten, MD, PhD*
- 4:15pm ERP in Anoxic Brain Injury  
*Edilberto Amorim, MD*
- 4:45pm cEEG, MRI, and Other Biomarkers of Anoxic Brain Injury After TTM  
*Jong Woo Lee, MD, PhD, FACNS*

## 5:15-5:30pm - Walking Break

## 5:30-7:00pm - General Session

Location: Florentine I-II

- 5:30pm Ernst Rodin Fellowship Award Presentation  
*Aatif M. Husain, MD, FACNS*
- 5:35pm Research Highlights Program  
The Research Highlights Program is designed to present the best of the best in research in various Clinical Neurophysiology fields.
- EEG Features for Outcome Prediction After Cardiac Arrest in Children  
*France W. Fung, MD*
- Risk Factors for Electroencephalographic Seizures in Neonates Following Surgery with Cardiopulmonary Bypass: A Multicenter Study  
*Nicholas S. Abend, MD*
- Effects of MRI acoustic noise on brain activity and connectivity measured with magnetoencephalography (MEG)  
*Giovanni Pellegrino, MD*
- 6:15pm Schwab Award Presentation  
*Devon I. Rubin, MD, FACNS*
- 6:20pm Schwab Award Lecture: What's in an Idea?  
*Michael J. Aminoff, MD*

## 7:00-7:30pm - Annual Business Meeting

Location: Florentine I-II



# PROGRAM AGENDA • ANNUAL MEETING

Sunday, February 10, 2019

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## 8:00-9:30am - Concurrent Sessions

### 912: Functional Brain Mapping Using Invasive Electrodes

Session Co-Directors: William O. Tatum IV, DO, FACNS and Stephan U. Schuele, MD, MPH, FACNS

Location: Florentine I-II

#### Learning Objectives:

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

1. Discuss the differences in stimulation parameters for ECS involving grids and depth electrodes in the extraoperative setting and handheld stimulators in the operating room;
2. Discuss the rationale and technique for the various approaches; and
3. Explain the potential need for a standardized approach to mapping.

#### Agenda:

8:00am	Introduction
8:10am	FBM with Subdural Grids <i>Elsou L. So, MD, FACNS</i>
8:30am	Localization and FBM with SEEG <i>Patrick Chauvel, MD</i>
8:50am	Advanced FBM <i>Antony L. Ritaccio, MD</i>
9:10am	ECOG and FBM <i>Jessica W. Templer, MD</i>

### 1001: Advances in the Neurophysiologic Assessment of Neuromuscular Junction Disorders

Session Director: Hans Katzberg, MD

Location: Florentine IV

#### Learning Objectives:

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

1. Explain the sensitivity and specificity, utility of, variation in technique, and potential pitfalls of repetitive nerve stimulation in assessing neuromuscular junction disorders;
2. Discuss variations in needle electromyographic assessment of neuromuscular junction disorders, including the use of concentric needle and single fiber EMG;
3. Compare emerging neurophysiologic techniques that may be used to identify neuromuscular junction disorders, including ocular myogenic evoked potentials.

#### Agenda:

8:00am	Repetitive Nerve Stimulation: Advances, Techniques, and Limitations <i>Devon I. Rubin, MD, FACNS</i>
8:30am	Update in Single Fiber EMG and Concentric Needle EMG in the Diagnosis of Neuromuscular Junction Disorders <i>Carolina Barnett-Tapia, MD, PhD</i>
9:00am	Advancing Neurophysiologic Techniques in the Evaluation of Neuromuscular Junction Disorders <i>Hans D. Katzberg, MD, MSc, FRCPC</i>

### 1002: Night Moves: Common and Uncommon Parasomnias Clinical Neurophysiologists Need to Know

Session Director: Madeleine M. Grigg-Damberger, MD, FACNS

Location: Florentine III

#### Learning Objectives:

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

1. Recognize clinical and video-PSG features of sleep-related laryngospasm, motor stereotypies, REM sleep-related motor behaviors, faciomanibular myoclonus, and benign neonatal sleep myoclonus in infants and young children;
2. Identify the distinctive motor and EEG patterns associated with NREM arousal parasomnias in adults; and
3. Explain why autoimmune encephalitis in older adults can present as NREM arousal parasomnias and REM behavior disorder.

#### Agenda:

8:00am	Value of Video-Polysomnography, Stereo-EEG and Functional Connectivity to Understand NREM Arousal Disorders in Adults <i>Madeleine M. Grigg-Damberger, MD, FACNS</i>
8:30am	Uncommon Parasomnias in Infants and Children Sometimes Misdiagnosed as Sleep-Related Epilepsy <i>Kathy M. Wolfe, MD</i>
9:00am	Treatable Parasomnias and Sleep-Related Movement Disorders Which Herald Neuropathology in Older Adults <i>Nancy Foldvary-Schaefer, DO</i>



# PROGRAM AGENDA • ANNUAL MEETING

Sunday, February 10, 2019 (continued...)

## 10:00-11:30am - Concurrent Sessions

### 1012: Joint ACNS/Colombian Association of Electrodiagnostic Medicine Symposium: Peripheral Nerve Trauma: From the ER to the OR



Session Director: Jorge E. Gutierrez, MD, MSc

Location: Florentine III

**Learning Objectives:** At the conclusion of this session, participants should be able to:

1. Describe the neuropathological changes after peripheral nerve trauma and correlate the sequence of denervation and reinnervation events with the electrodiagnostic findings and review its potential limitations and pitfalls;
2. Describe the conservative treatment of peripheral nerve injuries, including pain management and rehabilitation strategies; and
3. Describe the surgical strategies used in peripheral nerve trauma and the role of IONM in assessing and treating these disorders.

#### Agenda:

10:00am	Pathophysiology of Peripheral Nerve Injury: Sequence of Events and its Electrodiagnostic Correlation <i>Jorge E. Gutierrez, MD, MSc</i>
10:25am	Rehabilitation and Pain Management of Peripheral Nerve Injuries <i>Carlos Rangel MD, MBa</i>
10:50am	Surgical Strategy and Role of IONM in the Treatment of Peripheral Nerve Trauma <i>Jaime R. Lopez, MD, FACNS</i>
11:15am	Discussion

### 1013: Epileptic Spasms and Hypsarrhythmia: Lessons from Modern Techniques

Session Co-Directors: Ahsan Moosa Naduvil Valappil, MD and Elia M. Pestana Knight, MD, FACNS

Location: Florentine IV

#### Learning Objectives:

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

1. Discuss the contribution of the fMRI and MEG to the pathophysiology, diagnosis and management of patients with epileptic spasms;
2. Identify the contribution of slow and fast frequency oscillations as localization biomarkers of epileptic spasms; and
3. Describe the electro-clinical features of children with epileptic spasms who are candidates for epilepsy surgery.

#### Agenda:

10:00am	fMRI and MEG Contribution to the Pathophysiology, Diagnosis and Management of Epileptic Spasms. <i>Ana Carolina Coan, MD</i>
10:20am	Slow and Fast Frequency Oscillations in Patients with Epileptic Spasms. <i>Eishi Asano, MD, PhD, MS (CRDSA)</i>
10:40am	Surgery Versus No Surgery in Epileptic Spasms: Does the EEG Matter? <i>Ahsan Moosa Naduvil, MD</i>
11:00am	Case Discussion <i>Elia M. Pestana Knight, MD, FACNS</i>

### 1011: Noninvasive Brain Stimulation

Session Director: Alexander Rotenberg, MD, PhD

Location: Florentine I-II

#### Learning Objectives:

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

1. Summarize the basic physiologic principles and potential clinical utility of transcranial magnetic, electrical and ultrasound stimulation;
2. Summarize the available and emerging utility of these techniques in selected disease states; and
3. Understand gaps in knowledge in noninvasive brain stimulation research, and how these can be addressed by clinical and preclinical experiments.

#### Agenda:

10:00am	Noninvasive Brain Stimulation: An Overview <i>Charles Epstein, MD, FACNS</i>
10:20am	Focused Ultrasound Stimulation <i>Seung-Schik Yoo, PhD, MBA</i>
10:40am	Transcranial Electrical Stimulation <i>Alexander Rotenberg, MD, PhD</i>
11:00am	Improving Noninvasive Brain Stimulation by Preclinical Research <i>Alexander Rotenberg, MD, PhD</i>

# EXHIBIT HALL & SPONSORED SESSIONS

Location: Roman Ballroom

## Hours:

**Friday, February 8, 2019**

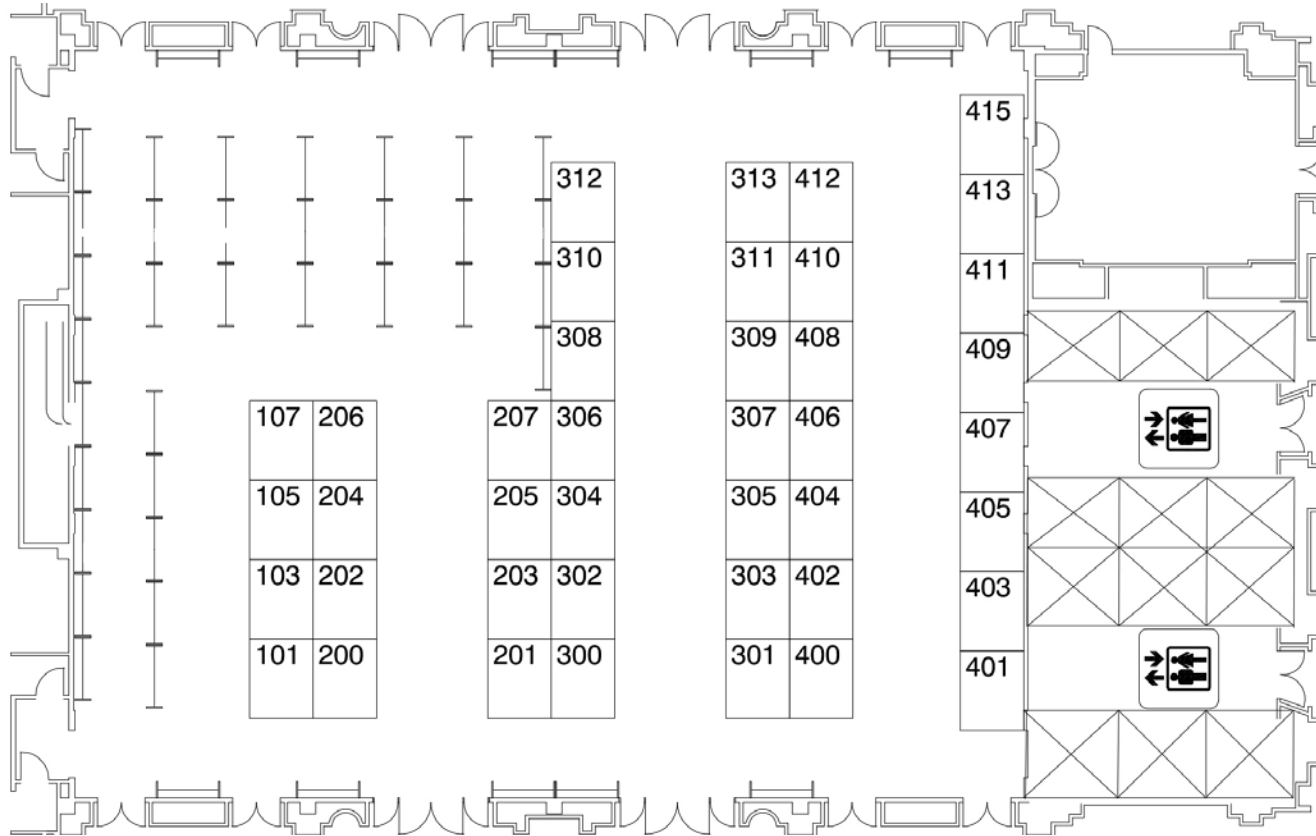
12:15 – 4:00 pm

7:00 – 8:30pm Welcome Reception

**Saturday, February 9, 2019**

7:00 – 1:30 pm

## FLOOR PLAN



EXHIBITOR	BOOTH #
ABRET Table C	Table C
American Board of Clinical Neurophysiology	Table A
American Board of Psychiatry and Neurology	107
Aquestive Therapies	103
ASET- The Neurodiagnostic Society	Table B
Brain Sentinel Diagnostic Services, LLC	301
Cadwell Industries	402
Ceribell	300
Compumedics Neuroscan	101
Corticare	405
Demos Medical Publishing	411
EEG-Now / EncephaloDynamics	311
Empatica	404
Global Organization of Health Educators	Table D
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Intradiagnostics, LLC	407
Medtronic	412
Memory MD	410
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EXHIBITOR	BOOTH #
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Neuralynx, Inc.	306
Neuromonitoring Technologies	413
Neuropace	313
Neurotech, LLC	206
Nihon Kohden America, Inc	202/204
Persyst Development Corporation	308/310
Philips Neuro	201/203
Rendr Labs	307/309
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Ricoh	408
Rosman Search, Inc	400
Signal Gear, Inc	401
Specialty Care	303
Spes Medica USA	200
Sunovion Pharmaceuticals	305
Wolters Kluwer	312
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## EXHIBITORS

### Table A

#### **American Board of Clinical Neurophysiology**

2908 Greenbriar Dr., Suite A  
Springfield, IL 62704  
Phone (217) 726-7980  
Fax (217) 726-7989  
Email: janice@abcn.org  
Website: <http://www.abcn.org/>

The American Board of Clinical Neurophysiology (ABCN) has a long history of promoting excellence in Clinical Neurophysiology and offers examinations with added competency in Epilepsy Monitoring, Neurophysiologic Intraoperative Monitoring, Critical Care EEG, or General Clinical Neurophysiology. International testing is available. Stop by to see the new on-line CNP Self-Assessment program! Coming soon – Pediatric EEG Track.

### Table C

#### **ABRET**

2908 Greenbriar Drive, Suite A  
Springfield, IL 62704  
Phone: (217) 726-7980  
Fax: (217) 726-7989  
Website: <http://abret.org/>

Neurodiagnostic Credentialing & Accreditation offers five credentials for technologists and practitioners (R. EEG T.®, R. EP T.®, CNIM®, CLTM®, CAP®) and a Certificate Program, CMEG®. For labs wanting to demonstrate a commitment to standards and quality, laboratory accreditation programs are available, LAB-EEG, LAB-NIOM, and LAB-LTM.

### #107

#### **American Board of Psychiatry and Neurology**

7 Parkway North  
Deerfield, IL 60015  
Phone: 847.229.6500  
Fax: 847.229.6600  
Website: <https://www.abpn.com/>

The American Board of Psychiatry and Neurology serves the public interest and the professions of psychiatry and neurology by promoting excellence in practice through its certification and maintenance of certification processes.

### #103

#### **Aquestive Therapeutics**

30 Technology Drive Warren, NJ 07059  
Phone: 908 941-1900  
Email: [Info@aquestive.com](mailto:Info@aquestive.com)

Aquestive is the undisputed leader in developing and delivering differentiated drugs on film. Changing the way medicines are developed and delivered can have a positive impact for patients and caregivers seeking better symptom control and management of a condition. Aquestive uses our patented PharmFilm technology to advance medicines and redefine the treatment experience for patients and caregivers.

### Table B

#### **ASET**

With a membership base more than 6,000 strong, ASET – The Neurodiagnostic Society is the largest professional association representing Neurodiagnostics. We are passionate about providing leadership, advocacy, and resources that promote professional excellence, patient safety, and quality care in Neurodiagnostics. Our vision is to ensure that neurologic health and quality of care is improved globally. Learn more about our educational resources, job descriptions, best practices, publications, upcoming events, career center, or shop our online store at [ASET.org](http://ASET.org).

### #301

#### **Brain Sentinel Diagnostic Services, LLC**

8023 Vantage Dr., Suite 216  
San Antonio, TX 78230  
Website: <https://speacsystem.com/>

Brain Sentinel provides physicians with access to objective data that may help patients live with better seizure management. The SPEAC® System delivers months of continuously recorded, analyzed, and reported physiological data to rule-in generalized tonic-clonic seizures and quantify other motor events.

### #402

#### **Cadwell Industries**

909 N. Kellogg Street  
Kennewick, WA 99336 USA  
Phone: 1-800-245-3001  
Email: [info@cadwell.com](mailto:info@cadwell.com)  
Website: <https://www.cadwell.com/>

Cadwell has designed and manufactured neurodiagnostic and neuromonitoring systems in Kennewick, WA, USA since 1979. We combine customer input, employee expertise and USA-made components to serve our customers with thoughtful products, clinical support, technical service, regular software upgrades, and a comprehensive line of electrodes, supplies, and accessories. Our core competencies are EEG, EMG/EP, IONM, Sleep, Data Management, and Neuro Consumables. Our sales managers, support teams, and distributors serve physicians and medical centers worldwide. Cadwell values innovation, product quality, intuitive usability, and outstanding customer support. Cadwell: Helping you help others.

## EXHIBITORS

### #300

#### **Ceribell**

2483 Old Middlefield Way, Suite 120

Mountain View, CA 94043, USA

Technical support: 1-800-763-0183

General inquiries: 1-800-436-0826

Email: EEG@ceribell.com

Website: <https://ceribell.com/index.html>

Ceribell is focused on making electroencephalography (EEG) widely accessible, more efficient, and more cost-effective to improve the diagnosis and treatment of patients at risk for seizures. The Ceribell EEG System can be set up by any healthcare provider in 6 minutes and offers a proprietary Brain Stethoscope function that dramatically simplifies interpretation of EEG results by converting brainwaves to sound so seizures can be detected by listening. Earlier diagnosis and focused treatment for patients with seizures, including non-convulsive seizures that can only be diagnosed with EEG, can significantly lower mortality, secondary brain injury, length of stay, and risk of complications.

### #101

#### **Compumedics Neuroscan**

5015 West WT Harris Blvd, Suite E

Charlotte, NC 28269, USA

Phone: 1-800-814-8890

Website: <https://compumedicsneuroscan.com/>

The Orion LifeSpan magnetoencephalography system from Compumedics Neuroscan is the culmination of a decades-long development, including innovative sensors, sophisticated electronics and the powerful CURRY analysis platform. The company provides proven, trusted technology. A new generation of MEG detectors gives more precise measurement and localization of brain function than ever before. Advanced high-density EEG is collected simultaneously. It is the only MEG optimized for both pediatric and adult patients, with maximum sensitivity at any age. New technology allows 100% recovery of liquid helium with absolutely no downtime, dramatically reducing operating costs. Please visit our booth to learn more.

### #411

#### **Demos Medical Publishing**

Springer Publishing Company

11 West 42nd Street, 15th Floor

New York, NY 10036

Phone: 877-687-7476

Email: [cs@springerpub.com](mailto:cs@springerpub.com)

Website: <https://www.springerpub.com/>

### #311

#### **EEG-Now / EncephaloDynamics**

502 NW 16th Avenue, Suite #3-4

Gainesville, FL 32601

Phone: 855-359-6341

Email: [info@EncephaloDynamics.com](mailto:info@EncephaloDynamics.com)

Website: <https://www.eeg-now.com/>

EncephaloDynamics is proud to present EEG-Now™, the immediate EEG. EEG-Now™ allows any healthcare professional to perform EEGs rapidly at any location at any time without prior training. This provides immediate access to diagnostic technology that is known to be powerful, accurate and inexpensive. EEG-Now allows for 24/7 EEG acquisition even when EEG Technologists are not available, can be rapidly applied for emergency conditions even if patients are uncooperative, can be effortlessly removed and replaced for MRI scanning, and is useful for routine and long-term EEG recordings. #404

### #404

#### **Empatica**

1 Broadway

Cambridge, MA 02142, USA

Website: <https://www.empatica.com/>

Empatica is making waves in healthcare through wearable smartbands that utilize machine learning to unlock the physiology of your health. As an MIT Media Lab spin-off, Empatica uses an intricate combination of biosensors to monitor unique components of sleep, activity and stress.

Epilepsy is the first focus of Empatica's with their Embrace smartband. Embrace is a comfortable smartband with a beautiful, minimalist design. But behind the simple design runs a powerful algorithm that uses multiple physiological sensors to detect seizures. Within seconds of this detection, an alert is sent out via text and phone call to designated caregivers letting them know their loved one might need help. Embrace is instilling peace of mind, and changing the way people living with epilepsy live their lives.

Empatica received FDA clearance for its seizure detection and alerting system in January 2018.

## EXHIBITORS

#409

### Greenwich Biosciences

5750 Fleet Street, Suite 200 Carlsbad, CA 92008

Phone: 760-795-2200

Website: <https://www.greenwichbiosciences.com/>

Greenwich Biosciences is focused on discovering, developing, and commercializing novel therapeutics from its propriety cannabinoid product platform. Our enduring commitment to scientific rigor and exacting pharmaceutical manufacturing standards enables us to bring forward plant-derived cannabinoid prescription medicines for patients. We are the first and only company to pursue and receive FDA approval for a plant-derived cannabinoid therapy that addresses difficult-to-treat conditions with significant unmet needs. It is our passion and purpose to continually seek solutions that transform the lives of those living with rare and severe neurological diseases. For additional information, please visit [www.GreenwichBiosciences.com](http://www.GreenwichBiosciences.com).

### Table D

#### Global Organization of Health Educators

Website: <http://www.globalhealthedu.org/>

Email: [ghwa@who.int](mailto:ghwa@who.int)

#403

### Holberg EEG

Møllendalsveien 65C

5009 Bergen, Norway

Email: [info@holbergeeg.com](mailto:info@holbergeeg.com)

Website: <https://www.holbergeeg.com/>

Holberg EEG has developed a state of the art software for standardized reporting of EEG in close collaboration with the top EEG leaders in the world. (SCORE; Standardized Computer based Organized Reporting of EEG). The solution improves quality of the EEG assessments and facilitates research, innovation, and education. There is a whole chapter dedicated to the SCORE terminology and the SCORE EEG software in the 7th edition of Niedermeyer's Electroencephalography, which is the global reference book on EEG.

#407

### IntraDiagnostics, LLC

24 South Weber Street, Suite 200

Colorado Springs, CO 80903 USA

Phone: 844-446-8365, Ext 5

Email: [info@intradiagnostics.com](mailto:info@intradiagnostics.com)

Website: <https://www.intradiagnostics.com/>

IntraDiagnostics is committed to reducing hospital costs and enhancing patient care by providing affordable EEG solutions 24/7/365.

- Our R.EEGTs and CLTMs average over 15 years experience each.
- We are experienced with all EMU and ICU patient populations/Adult/Pediatric/Neonatal
- EEG/cEEG/SEEG/Grid patients.
- We provide flexible monitoring coverage and there is no minimum requirement and no charge when we are not providing coverage.
- We are available with an hour notice or less with no extra charges for nights/weekends/holidays.
- We offer Neurophysiology Specialty Boarded Neurologists for On-Call EEG/cEEG Reading services.
- We can provide cEEG equipment and manage the data in a HIPAA Compliant environment.

#214

### Medtronic

710 Medtronic Parkway

Minneapolis, MN, 55432-5604, USA

Website: <https://www.medtronic.com/us-en/index.html>

A new generation of MEG detectors gives more precise measurement and localization of brain function than ever before. Advanced high-density EEG is collected simultaneously. It is the only MEG optimized for both pediatric and adult patients, with maximum sensitivity at any age. New technology allows 100% recovery of liquid helium with absolutely no downtime, dramatically reducing operating costs.

#410

### Memory MD

205 East 42nd St

New York, NY 10017

Phone: 917-388-1578

Email: [info@brainscientific.com](mailto:info@brainscientific.com)

Website: [www.brainscientific.com](http://www.brainscientific.com)

MemoryMD is a New York-based medical device technology company, combining twenty years of expertise in brain analysis, deep learning, and artificial intelligence. MemoryMD presents new two FDA-cleared devices for EEG tests: NeuroCap™, a disposable EEG headset that is compatible with any encephalograph via the Universal cable, and NeuroEEG™, a portable wireless EEG device that fits in the palm of your hand. NeuroEEG™ is a 16-channel amplifier with quality software.

## EXHIBITORS

**#406**

**Micromed**

via Giotto, 2

31021 Mogliano Veneto

Treviso, Italy

Phone: +39 0415937000

Website: <http://www.micromed.eu/en-us/>

Founded in 1982, Micromed is a medical device company delivering solutions in Neurophysiology to 85 countries worldwide. Partnering with hospitals, sleep labs and research centers on a global scale, Micromed manufactures and markets high quality, cost effective and clinically relevant neurodiagnostic solutions for use on adult and pediatric patients. The Micromed product portfolio includes LTM, Ambulatory and Routine EEG for use in the home, ICU and EMU.

**#105**

**Moberg ICU Solutions**

Phone: 215-283-0860

Email: [info@moberg.com](mailto:info@moberg.com)

Website: <https://www.moberg.com/>

Welcome to the future of Neurocritical Care. The Moberg Component Neuromonitoring System (CNS) is the only comprehensive platform for multimodal monitoring and continuous video EEG for the ICU. It collects and time synchronizes data from over 30 devices (vital signs, brain oxygen, temperature management, etc.) for more meaningful EEG interpretation. The Moberg CNS provides a full array of quantitative EEG trends, compatibility with Persyst, high-frequency EEG, and is also the preferred system for recording spreading depolarizations. It provides a data platform personalized medicine in the ICU. Data can be exported into Capsule, IBM Streams, Matlab, and other third-party software applications.

**#304**

**Natus Neuro**

6701 Koll Center Parkway Suite 120

Pleasanton, CA 94566 USA

Website: [natus.com](http://natus.com)

“Solutions that span the spectrum of neuro care”

Natus Neuro is a global market leader that provides diagnostic, therapeutic and surgical solutions built on a strong heritage in neurodiagnostics, neurocritical care and neurosurgery. Natus Neuro delivers clinician-led products that improve outcomes and enhance care for neuro patients through leading-edge equipment, service, education and supplies.

**#306**

**Neuralynx, Inc.**

105 Commercial Dr.

Bozeman, MT 59715

Website: [www.neuralynx.com](http://www.neuralynx.com)

**#413**

**Neuromonitoring Technologies**

3060 Washington Road/Route 97

Suite 112

Glenwood, Maryland 21738

Phone: 410-489-5655

Website: <http://www.neuromonitoringtech.com/>

Neuromonitoring Technologies delivers Neurotelemetry, continuous “eyes-on” EEG in the EMU & ICU using telemedicine technology. Critical conditions (seizures, ischemia) require rapid recognition for immediate treatment that directly affects the course of an illness and the length of a hospital stay. NMT’s highly experienced, technologists, are mandatory board certified as a R. EEG T. and CLTM. Working alongside the in-house practitioners, we are successful in correlating EEG patterns, cardiovascular and hemodynamic parameters with clinical findings for immediate intervention by the in-house neurologist.

**#313**

**Neuropace**

455 N. Bernardo Avenue

Mountain View, CA 94043

Website: <https://www.neuropace.com>

Phone: 1-866-726-3876

The RNS System is the world’s first and only closed-loop brain-responsive neurostimulation system designed to prevent epileptic seizures at their source. The RNS System treats seizures by continuously monitoring brain waves, detecting unusual activity, and automatically responding with imperceptible electrical pulses before seizures occur. Physicians can program the detection and stimulation parameters of the implanted RNS neurostimulator to personalize therapy for each individual. The RNS® System is an adjunctive therapy for adults with refractory, partial onset seizures with no more than two epileptogenic foci. See important safety information at <http://www.neuropace.com/safety/>

**#206**

**Neurotech, LLC**

900 Highland Corporate Drive

Building #1, Suite #101

Cumberland, RI 02864

Phone: 401-333-3880

Fax: 401-333-3881

Website: <http://www.neurotechusa.com/>

## EXHIBITORS

**#202/204**

**Nihon Kohden America, Inc**

15353 Barranca Pkwy

Irvine, CA 92618

Phone: 949-580-1555

Email: [info@nihonkohden.com](mailto:info@nihonkohden.com)

Website: <https://us.nihonkohden.com/>

Nihon Kohden's Neurology product portfolio includes instrumentation for Epilepsy Monitoring, Electroencephalography, EEG & PSG Ambulatory Recording, Polysomnography, Wireless EEG & PSG, Home Sleep Testing/ PSG, Electromyography, Evoked Potentials, Intra-operative and cEEG ICU monitoring. Nihon Kohden's instrumentation offers the flexibility and expandability needed to meet the changing demands of today's neurodiagnostic field. In the U.S., the company is a trusted source for patient monitoring, sleep assessment, neurology and cardiology instrumentation solutions, and has been recognized for the highest customer satisfaction among U.S. hospitals and health systems for more than 10 consecutive years (MD Buyline). For more information, visit <http://us.nihonkohden.com/>.

**#308/310**

**Persyst Development Corporation**

420 Stevens Avenue Suite 210

Solana Beach, CA 92075

Phone: 858-461-4542

Website: <https://www.persyst.com/>

Persyst is the worldwide leader in EEG software. Our software is used daily by thousands of neurologists at hundreds of hospitals around the world. We have pioneered the use of digital signal processing and neural networks in order to remove artifacts and interpret EEG data.

**#201/203**

**Philips Neuro**

Website: <https://www.usa.philips.com>

Philips Neuro provides a multimodal, non-invasive suite of pre-operative planning and surgical imaging solutions for neurologists and neurophysiologists. Visit our team of engineers and researchers to discuss the current and future clinical practice of high density EEG and electrical source imaging in epilepsy.

**#307/309**

**Rendr Labs**

Website: <https://rendrlabs.com/>

At Rendr Labs we deliver refreshing, empowering medical systems, inspired by the way our users dream to interact with their tools. Imagine EEG Anywhere.

**#400**

**Rosman Search, Inc**

30799 Pinetree Road, Suite #250

Pepper Pike, OH 44124

Phone: 216-906-8188

Website: <http://www.rosmansearch.com/>

RosmanSearch is a Neurosurgery, Neurology and APP recruitment firm. We place quality providers with quality practices nationwide. We are the only search firm with dedicated teams specializing in neuroscience. Our mission is to be the best, the most expert, and the one that is known for quality—every time!

**#415**

**RhythmLink International, LLC**

Phone: 866-633-3754

Website: <http://rhythmlink.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.

Originally founded by neurodiagnostic technicians and engineers in 2002, RhythmLink strives to provide continuous innovation and superior quality in all of its products. RhythmLink celebrated fifteen years in business in July 2017. Based in Columbia, SC, RhythmLink's advancements and improvements in technology, business development and corporate branding have brought national and international recognition. Our mission is to change patient care for the better by connecting patients to machines.

**#408**

**Ricoh**

70 Valley Stream Pkwy

Malvern, PA 19355 USA

Phone: 610-296-8000

Website: <https://www.ricoh-usa.com/en>

**#200**

**Spes Medica USA**

At Spes Medica USA we specialize in affordable, high quality, innovative products for EEG, IONM and EMG. We offer FDA approved MR Conditional electrode systems for cEEG/ICU and LTM/EMU. We also carry a unique collection of disposable IONM stimulation probes. In addition, we offer a premium selection of needle and adhesive electrodes for EMG recording. Visit our booth to see what new and innovative products we have in the pipeline.

## EXHIBITORS

**#401**

**Signal Gear, Inc**

27 Sweetwater Drive  
Prosperity, SC 29127  
Phone: 855-439-4327  
Fax: 800-878-9804  
Website: <http://signalgear.com/index.php>

**#303**

**Specialty Care**

3 Maryland Farms, Suite 200  
Brentwood, TN 37027-5005  
Phone: 800-348-4565  
Website: <http://www.specialtycare.net/>

We hire Neurologists! Physicians and hospitals should always have the best possible means to ensure the most positive patient outcomes, while being able to maintain their own financial health and success. To help our customers achieve this, we are committed to delivering exceptional care outcomes, patient safety, and financial results in more than 1,000 hospitals and health systems, supporting 13,500 physicians during 400,000+ procedures annually. This makes us the market leader in perfusion and intraoperative neuromonitoring, and the industry's choice for autotransfusion, sterile processing consulting, surgical assist, and minimally invasive surgical support.

**#305**

**Sunovion Pharmaceuticals**

84 Waterford Drive Marlborough  
MA 01752 USA  
Phone: 508-481-6700  
Website: <http://www.sunovion.us/#312>

**#312**

**Wolters Kluwer**

P.O. Box 1030  
2400 BA, Alphen aan den Rijn, The Netherlands  
Email: [info@wolterskluwer.com](mailto:info@wolterskluwer.com)  
Website: <https://www.wolterskluwer.com/>

Wolters Kluwer Health is a leading global provider of medical information and point of care solutions for the healthcare industry. Our solutions are designed to help professionals build clinical competency and improve practice so that healthcare organizations can succeed in value-based care delivery models. We offer premier medical, nursing and allied health content; clinical decision support tools; drug information and patient surveillance; structured documentation and coding; healthcare terminology, data management and systems interoperability solutions; precision medical research tools; and continuing medical education solutions. Our leading product solutions include Lippincott (R), Ovid (R), UpToDate (R), and others.

**#205/207**

**Zeto Inc.**

Santa Clara, CA, USA  
Email: [info@zetoinc.com](mailto:info@zetoinc.com)  
Phone: 408-658-0737  
Website: <http://zeto-inc.com/>

Zeto accelerates routine EEG diagnostics. The world's first and only FDA cleared dry EEG headset establishes clinical grade EEG recordings within just a few minutes. The cumbersome and time-consuming preparation and placement of paste and electrodes is now a thing of the past. No mess, no cleanup, no hassle! The Zeto wireless EEG headset empowers all clinical stakeholders to access and interpret EEG records via an intuitive, fast and HIPAA compliant web software that brings EEG to the 21st century. Visit us at our booths #205 and #207, and see your live EEG. We are excited to transform patient experience and dramatically simplify your routine EEG operation.



# PRODUCT THEATER

## Breaking Traditions in the EEG Space

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*Presented by: Ceribell*

Thursday, February 7

12:00-1:00pm – Lunch will be provided

**Location:** Pisa, Palermo

This session is supported and programmed by a single supporting company and will feature presentations on topics and technologies selected by the company. Lunch will be provided by ACNS, and is not reportable according to the Sunshine Act. *CME credits are NOT available for the Product Theaters.*

In this hour, we will present the history of the Ceribell Rapid Response EEG from its invention, and several validation studies, to the latest results of its performance in a multicenter clinical trial involving MGH, UTSW, Rush, UCLA and Wake Forest Medical Centers. Conventional practice of EEG in the last 60 years has relied on the standardized International 10-20 system, in which over half of the electrodes are placed over the midline and parasagittal regions of the brain. This practice has depended on specialized technicians and, traditionally, on large recording rigs. We have followed the same convention both in the emergency stat EEGs to detect non-convulsive seizures and status and also when we are looking for subtle signs of epileptic abnormality to confirm the diagnosis of epilepsy. While the coverage afforded by the 10-20 EEG system is valuable in standardizing EEG recordings across sites, the added value of this traditional approach in neuro emergency settings is highly questionable. Breaking traditions may be necessary if we are to make a significant advancement in the practice of EEG.

# “WEARABLE SEIZURE DETECTION” LEARNING LAB

Saturday, February 9

1:00-2:00pm - Lunch will be provided

Location: Pisa/Palermo

Moderator: Lawrence J. Hirsch, MD, FACNS

This non-CME learning environment creates a curated exhibit experience, organized around a theme within the field of clinical neurophysiology. The lab is a total of one (1) hour, with the first thirty minutes including an introduction to the topic and related products available from companies participating in the lab, putting those products in context as they relate to the theme and field. Following the introduction, the physician leader will assist attendees as they make their way through interactive demonstrations, led by the participating companies. *CME credits are NOT available for the Learning Lab.*

*Participating Companies:*

## **Brain Sentinel**

*Instructor: Luke Whitmire, PhD, Chief Science Officer*

The Brain Sentinel Monitoring and Alerting System (SPEAC System) is the first non-EEG physiological signal-based seizure monitoring system cleared by the FDA (De Novo 2017). The single-channel surface electromyography (sEMG) device continuously records unilaterally at the surface of the biceps brachii at 1,000 Hz. The prescription device may be used in a home or hospital setting, during periods of rest, for extended periods of time (months). sEMG is visually similar to EEG recorded during GTC seizures and has a unique frequency signature. Tonic motor recruitment involves high frequency sEMG while the signal recorded during the clonic phase is mostly composed of low frequency signals. The System also records audio of events; allowing the interpretation of peri-ictal signs of seizure activity. Data provided by the System allows trained Epileptologists to differentiate and quantify the temporal characteristics of GTC seizures. In addition to recording data, the System alarms for sEMG signals that may be associated with GTC seizures. This adjunctive feature is provided to notify designated caregivers when a patient may benefit from intervention. In this Learning Lab we will demonstrate day-to-day use of the SPEAC System and review clinical data captured by the device.

## **Cadwell Industries, Inc**

*Instructor: Marco Moreno, R.EEG T.*

The Apollo Video EEG system exemplifies Cadwell Laboratories' commitment to helping you help others, with wearable devices that are durable, reliable, and simple to operate. The Cadlink Cloud helps you to get results faster by making the patient data available to your pruners and interpreting neurologists as soon as possible.

The Apollo EEG recorder can acquire data for up to 96 hours on two rechargeable Li ion batteries - patients will not need to change batteries during this multi-day recording session. For longer studies the batteries can trickle charge over USB while the patient is sleeping.

With QVM3, Cadwell releases our 3rd generation portable video recorder. Record video with no wires attached. The QVM3 operates for hours on an internal battery, has a built-in IR illuminator, microphone and video screen, so the patient sees exactly what is being recorded.

The Apollo Video EEG system is the hassle-free way that Cadwell helps you help your patients, in the comfort of their own home.

## **Empatica**

Empatica is making waves in healthcare through wearable smartbands that utilize machine learning to unlock the physiology of your health. As an MIT Media Lab spin-off, Empatica uses an intricate combination of biosensors to monitor unique components of sleep, activity and stress.

Epilepsy is the first focus of Empatica's with their Embrace smartband. Embrace is a comfortable smartband with a beautiful, minimalist design. But behind the simple design runs a powerful algorithm that uses multiple physiological sensors to detect seizures. Within seconds of this detection, an alert is sent out via text and phone call to designated caregivers letting them know their loved one might need help. Embrace is instilling peace of mind, and changing the way people living with epilepsy live their lives.

Empatica received FDA clearance for its seizure detection and alerting system in January 2018.

## **Smart Monitor, Inc**

*Instructor: Anoo Nathan, Founder & CEO*

Our Inspyre solution is wearable technology designed for people prone to seizures. It detects repetitive shaking motions and signals a smartphone to send a text and phone call alert. For more severe incidents, it lets a user summon help with the push of a button!

At Smart Monitor, we provide clinically validated solutions that enable timely alerts and the capture of episodic, contextual data for seizures and other CNS disorders. We partner with medical institutions and pharma's to power clinical studies and research initiatives with real-time, secure and reliable data that reduces cost and speeds up time to market.

Join a Leading Children's Hospital in South Florida



### **PEDIATRIC EPILEPSY WITH INTRAOPERATIVE MONITORING OPPORTUNITY**

Joe DiMaggio Children's Hospital is seeking a pediatric neurologist/epileptologist with training in surgical epilepsy to join a team of two pediatric epileptologists and five pediatric neurologists. Candidates should be BE/BC in neurology with special qualification in child neurology and have completed two years of pediatric epilepsy fellowship resulting in board eligibility/certification in clinical neurophysiology, epilepsy or both. Experience in intraoperative monitoring is required as is experience with epilepsy surgery cases. Research initiatives will be fully and actively supported through the Office of Human Research, though this is not a requirement of the position.

This is a full-time employed position with the multispecialty Memorial Physician Group. The position offers competitive benefits and a compensation package that is commensurate with training and experience. Professional malpractice and medical liability are covered under sovereign immunity.

#### **About Joe DiMaggio Children's Hospital**

Joe DiMaggio Children's Hospital opened in 1992 and has grown to be the leading children's hospital in Broward and Palm Beach Counties. With 226 beds, an 84-bed Level II and III NICU, 30-bed PICU and 12-bed intermediate care unit, Joe DiMaggio Children's Hospital combines leading-edge clinical excellence with a child- and family-friendly environment that emphasizes the Power of Play. Joe DiMaggio Children's Hospital offers a comprehensive range of healthcare services – delivered with kindness, dedication and compassion.

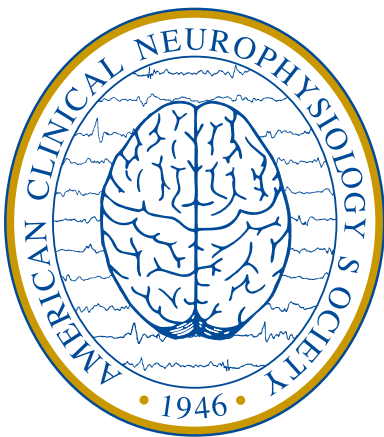
#### **About South Florida**

South Florida offers a dynamic urban/suburban lifestyle with an abundance of cultural and recreational amenities, miles of beautiful beaches, top-rated golf courses, zoos and wildlife refuges, a vibrant arts community, museums and world-class dining. South Florida's high quality of life – including year-round summer weather, exciting multiculturalism and no state income tax – attracts new residents from all over the country and around the world.

*To see full job description and/or to submit your CV for consideration, please visit [memorialphysician.com](http://memorialphysician.com). Additional information about Joe DiMaggio Children's Hospital can be found at [jdch.com](http://jdch.com).*


**LIVE. WORK. PLAY.**  
[memorialphysician.com](http://memorialphysician.com)





*Save the Date*

FEBRUARY 5-9

ACNS  2020

THE ROOSEVELT NEW ORLEANS

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*New Orleans, Louisiana*

