Welcome
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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Children’s Hospital Boston

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Hospital for Sick Children

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Past President
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Medical University of South Carolina

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University of Texas

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Brigham & Women’s Hospital

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William Beaumont Hospital

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May Clinic

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University of South Carolina

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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)

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

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. Gumnit, MD
1985 Andrew J. Gabor, MD, PhD
1986 John 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 Niedermeier, 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

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

Monica Islam, MD
Nationwide Children’s Hospital

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

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

Jeffrey Britton, MD, FACNS
Mayo Clinic

Tobias Loddenkemper, MD, FACNS
Children’s Hospital Boston

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

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Stanford University

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

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

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

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

Continuing Medical Education (CME) Committee

Co-Chairs
Meriem Bensalem-Owen, MD, FACNS
University of Kentucky

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

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Beth Israel Deaconess Medical Center

Monica Islam, MD
Nationwide Children’s Hospital

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Saurabh R. Sinha, MD, PhD, FACNS
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Pongkiat Kankirawatana, MD, FACNS
Children’s of Alabama- UAB

Fahd Sultan, MD
University of Oklahoma Health Sciences Center

Tobias Loddenkemper, MD, FACNS
Children’s Hospital Boston

Christa Swisher, MD
Duke University Medical Center

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Stanford University

Stephan U. Schuele, MD, MPH, FACNS
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University of Michigan

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Eastern Maine Medical Center

Courtney J. Wusthoff, MD, FACNS
Stanford University

Mirela V. Simon, MD, MSc, FACNS
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ACNS INFORMATION

Program Committee

Co-Chairs
Saurabh R. Sinha, MD, PhD, FACNS
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Tammy Tsuchida, MD, PhD, FACNS
Children’s National Medical Center

Members
Nicholas S. Abend, MD, MSCE, FACNS
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William J. Bosl, MD, PhD
University of San Francisco
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Cleveland Clinic Epilepsy Center
Bernard Allan Cohen, PhD, FACNS, FASNM
Neurological Monitoring Associates, LLC
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Medical University of South Carolina
Ronald Emerson, MD, FACNS
Hospital for Special Surgery / Weill Cornel Med Ctr
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The Hospital for Sick Children
Mark Hallett, MD, FACNS
National Institutes of Health
Abeer J. Hani, MD
Lebanese American University
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Ioannis Karakis, MD, PhD, MSc
Emory University
Suzette M. LaRoche, MD, FACNS
Mission Health
Ruple S. Laughlin, MD
Mayo Clinic
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Brigham & Women’s Hospital
Leslie Lee, MD, FACNS
Stanford University Medical Center
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Stanford University
Faye McNall, MEd, REEGT
ASET - The Neurodiagnostic Society
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Heidi M. Munger Clary, MD, MPH
Wake Forest University
Marcus C. Ng, MD, FRCP, CSCN(EEG)
University of Manitoba
Noor Pirzada, MD
University of Toledo
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Johns Hopkins University
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Mayo Clinic
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Boston Children’s Hospital
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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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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 – 8:30 pm  Welcome Reception

- **Saturday, February 9, 2019**
  - 7:00 – 1:30 pm  Exhibit Hall Open

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!
### NEARBY RESTAURANTS

#### Fast-Casual Options

<table>
<thead>
<tr>
<th>Category</th>
<th>Restaurant</th>
<th>Address</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>American</strong></td>
<td>Therapy</td>
<td>518 East Fremont St</td>
<td>702.912.1622</td>
</tr>
<tr>
<td></td>
<td>Shake Shack</td>
<td>3790 S Las Vegas Blvd</td>
<td>725.222.6730</td>
</tr>
<tr>
<td></td>
<td>In-N-Out Burger</td>
<td>2900 W Sahara Ave</td>
<td>800.786.1000</td>
</tr>
<tr>
<td></td>
<td>Former Boys</td>
<td>2341 N. Las Vegas Blvd</td>
<td>702.675.7555</td>
</tr>
<tr>
<td><strong>Mexican/Southwestern</strong></td>
<td>Del Taco</td>
<td>3785 S Las Vegas Blvd</td>
<td>702.838.3600</td>
</tr>
<tr>
<td></td>
<td>Taco Bell Cantina</td>
<td>3717 S Las Vegas Blvd</td>
<td>702.272.2422</td>
</tr>
<tr>
<td><strong>Italian</strong></td>
<td>Maggiano’s Little Italy</td>
<td>3200 S Las Vegas Blvd</td>
<td>702.732.2550</td>
</tr>
<tr>
<td></td>
<td>Pizza Rock</td>
<td>201 North Third Street</td>
<td>702.385.0838</td>
</tr>
<tr>
<td><strong>Mexican/Southwestern</strong></td>
<td>Del Taco</td>
<td>3785 S Las Vegas Blvd</td>
<td>702.838.3600</td>
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#### Fine Dining Options

<table>
<thead>
<tr>
<th>Category</th>
<th>Restaurant</th>
<th>Address</th>
<th>Phone</th>
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</thead>
<tbody>
<tr>
<td><strong>American</strong></td>
<td>Sage</td>
<td>Aria Resort &amp; Casino</td>
<td>702.590.9520</td>
</tr>
<tr>
<td></td>
<td>Top of the World</td>
<td>Stratosphere Tower, 106th Floor</td>
<td>702.380.7777</td>
</tr>
<tr>
<td></td>
<td>Honey Salt</td>
<td>1031 S Rampart Blvd</td>
<td>702.445.6100</td>
</tr>
<tr>
<td></td>
<td>Yard House</td>
<td>Red Rock Casino Resort &amp; Spa</td>
<td>702.363.9273</td>
</tr>
<tr>
<td><strong>Steakhouse</strong></td>
<td>Jean-Georges Steakhouse</td>
<td>Aria Resort &amp; Casino</td>
<td>702.590.8660</td>
</tr>
<tr>
<td></td>
<td>Lago</td>
<td>Bellagio Hotel</td>
<td>866.259.7111</td>
</tr>
<tr>
<td></td>
<td>Rivea</td>
<td>Delano Las Vegas</td>
<td>877.632.5400</td>
</tr>
<tr>
<td><strong>Asian</strong></td>
<td>Wing Lei</td>
<td>Wynn Las Vegas</td>
<td>702.805.8472</td>
</tr>
<tr>
<td></td>
<td>Raku</td>
<td>Caesars Palace</td>
<td>702.731.7731</td>
</tr>
<tr>
<td></td>
<td>Mizumi</td>
<td>Wynn Las Vegas</td>
<td>702.770.3320</td>
</tr>
<tr>
<td><strong>Latin American</strong></td>
<td>CHICA</td>
<td>The Venetian</td>
<td>3355 S Las Vegas Blvd #106</td>
</tr>
<tr>
<td></td>
<td>Bandito</td>
<td>325 Hughes Center Dr. Suite 100</td>
<td>702.213.6876</td>
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#### Italian

<table>
<thead>
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<th>Category</th>
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<td>Bellagio Hotel</td>
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<tr>
<td><strong>Latin American</strong></td>
<td>CHICA</td>
<td>The Venetian</td>
<td>3355 S Las Vegas Blvd #106</td>
</tr>
<tr>
<td></td>
<td>Bandito</td>
<td>325 Hughes Center Dr. Suite 100</td>
<td>702.213.6876</td>
</tr>
</tbody>
</table>
CONTINUING MEDICAL EDUCATION (CME) INFORMATION

Educational Mission Statement

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). 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.
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 Education (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 1 Credit(s)™. 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)™.

Epilepsy Surgery/Invasive EEG Course Part I
6.5 AMA PRA Category 1 Credit(s)™

Neurophysiologic Intraoperative Monitoring (NIOM) Part I
6.5 AMA PRA Category 1 Credit(s)™

Intensive Care Unit EEG Monitoring (ICU EEG) Part I
6.5 AMA PRA Category 1 Credit(s)™

Autonomic Neurophysiology
1.5 AMA PRA Category 1 Credit(s)™

5th Annual CNP Program Director’s Symposium
2 AMA PRA Category 1 Credit(s)™

Basic EEG
3 AMA PRA Category 1 Credit(s)™

Video-EEG Part I
2 AMA PRA Category 1 Credit(s)™

Advanced EEG Techniques
1.5 AMA PRA Category 1 Credit(s)™

EMG/Peripheral Nervous System
5 AMA PRA Category 1 Credit(s)™

EMG Demo
2 AMA PRA Category 1 Credit(s)™

Epilepsy Surgery/Invasive EEG Course Part II
1.5 AMA PRA Category 1 Credit(s)™

Neurophysiologic Intraoperative Monitoring (NIOM) Part II
6.5 AMA PRA Category 1 Credit(s)™

Intensive Care Unit EEG Monitoring (ICU EEG) Part II
3 AMA PRA Category 1 Credit(s)™

Autonomic Neurophysiology
1.5 AMA PRA Category 1 Credit(s)™

Neonatal EEG
1.5 AMA PRA Category 1 Credit(s)™

Neuromodulation/Stimulation
3 AMA PRA Category 1 Credit(s)™

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. 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 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 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.

- 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

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<th>Name</th>
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<th>Position</th>
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<tbody>
<tr>
<td>Nicholas S. Abend, MD, MSCE, FACNS</td>
<td>Children's Hospital of Philadelphia</td>
<td>Planner, Speaker, Reviewer</td>
<td>FC: Demos (g); NIH (a); PCORI (a)</td>
</tr>
<tr>
<td>Vinita J. Acharya, MD, FAES</td>
<td>Penn State Hershey Medical Center</td>
<td>Planner</td>
<td>Sunovian (d)</td>
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<tr>
<td>Pegah Afra, MD, FACNS</td>
<td>Weill Cornell Medicine</td>
<td>Planner</td>
<td>LivaNova (a); UCB (a, d); GW Pharma (e); Sunovian (d)</td>
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<tr>
<td>Susan D. Agostini, REEG/EPT,CLTM,FASET</td>
<td>Mayo Clinic Arizona</td>
<td>Speaker</td>
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<tr>
<td>Abdullah al Sawaf, MBBS, MBBS</td>
<td>SIU Medicine</td>
<td>Planner</td>
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<tr>
<td>Andreas D. Alexopoulos, MD, MPH</td>
<td>The Cleveland Clinic Foundation</td>
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<tr>
<td>Imran M. Ali, MD, FACNS</td>
<td>University of Toledo</td>
<td>Planner</td>
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<tr>
<td>Edilberto Amorim, MD</td>
<td>Massachusetts General Hospital</td>
<td>Speaker</td>
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<tr>
<td>Michael Aminoff, MD</td>
<td>University of California (SFO)</td>
<td>Speaker</td>
<td>Oxford University Press (g: royalties)</td>
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<tr>
<td>Kanika Arora, MD</td>
<td>Greenville Health System</td>
<td>Planner</td>
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<tr>
<td>Ravindra Arya, MD</td>
<td>Cincinnati Children’s Hospital Medical Center</td>
<td>Speaker</td>
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<tr>
<td>Eishi Asano, MD, PhD</td>
<td>Wayne State University</td>
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<td>Angela Aziz Donnelly, MD</td>
<td>Emory University</td>
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<tr>
<td>Abbas Babajani-Feremi</td>
<td>The University of Tennessee Health Science Center</td>
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<tr>
<td>Anto Bagic, MD, PhD, FAES, FACNS</td>
<td>University of Pittsburgh Medical School</td>
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<tr>
<td>Antoaneta Babanov, MD</td>
<td>Rush University Medical Center</td>
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<td>SR Life Science (e); Nutricia (e)</td>
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<tr>
<td>Ram Balu</td>
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<tr>
<td>Paul E. Barkhaus, MD</td>
<td>Medical College of Wisconsin Affiliated Hospitals Program</td>
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<tr>
<td>Carolina Barnett-Tapia, MD</td>
<td>University of Toronto</td>
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<td>CSL (d); Octapharma (a); UBC (b)</td>
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<tr>
<td>Meriem Bensalem-Owen, MD, FACNS</td>
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<td>Siddharth Biswal</td>
<td>Georgia Institute of Technology</td>
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<td>Jane Boggs, MD</td>
<td>Wake Forest University</td>
<td>Planner</td>
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<td>Leonardo Bonilha, MD, PhD</td>
<td>Medical University of South Carolina</td>
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<td>William J. Bost, PhD</td>
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<tr>
<td>Jeffrey Britton, MD, FACNS</td>
<td>Mayo Clinic</td>
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<td>Gordon Buchanan</td>
<td>University of Iowa</td>
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<tr>
<td>David Burdette, MD, FACNS</td>
<td>Michigan State University College of Human Medicine</td>
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<tr>
<td>Richard C. Burgess</td>
<td>Cleveland Clinic</td>
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<td>Christopher Butson</td>
<td>University of Utah</td>
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<td>Lidia Cabanes-Martinez, MD</td>
<td>Hospital Ramon Y Cajal, Madrid</td>
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<td>Jessica L. Carpenter, MD</td>
<td>Children's National Medical Center</td>
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<td>Patrick Chauvel, MD</td>
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<td>Thomas Chelimsky</td>
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<tr>
<td>Catherine J. Chu, MD</td>
<td>Massachusetts General Hospital, Harvard Medical School</td>
<td>Speaker</td>
<td>Alliance of Familt Companies (b); Biogen (b); SleepMed/DigiTrace (b)</td>
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<tr>
<td>Ana Carolina Coan, MD, PhD</td>
<td>Department of Neurology / Universidade de Campinas - UNICAMP</td>
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<tr>
<td>Bernard Allen Cohen, PhD, FACNS, FASNM</td>
<td>Neurological Monitoring Associates, LLC</td>
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<td>Amy Crepeau, MD</td>
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<td>Nathan Crone, MD</td>
<td>Johns Hopkins University School of Medicine</td>
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<tr>
<td>Vedran Deletis</td>
<td>University of Split medical school</td>
<td>Speaker</td>
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### CONFLICT OF INTEREST DISCLOSURES, CONTINUED

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<td>Monica Dhakar, MD, MS</td>
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<td>Priya Bhawan</td>
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<td>Francois Dubeau, MD</td>
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<td>Dawn Elashiv, MD, FACNS</td>
<td>UCLA</td>
<td>Speaker</td>
<td>Eisai Pharmaceuticals (d); LivaNova (d); Neuropace (d); Sunovion (d); UCB Pharmaceuticals (d)</td>
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<td>Ronald Emerson, MD, FACNS</td>
<td>Hospital for Special Surgery / Weill Cornell Med Ctr</td>
<td>Planner, Reviewer</td>
<td>Amgen (c); Bristol Myers Squibb (c); Eli Lilly &amp; Company (c); General Electric (c); Ice Neurosystems, Inc (c); Johnson &amp; Johnson, Inc. (c); Neuropace (c); Pfizer (c); Quality Care Properties (c); Reach Bionics (c); Thermo Fisher Scientific (c)</td>
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<td>Andres Fernandez, MD</td>
<td>Thomas Jefferson University</td>
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<tr>
<td>Guadalupe Fernandez-Baca Vaca, MD</td>
<td>University Hospitals, Cleveland and Case Western Reserve University</td>
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<td>Evan J. Fertig, MD</td>
<td>Providence Brain and Spine Institute</td>
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<td>Anteneh M. Feyissa, MD</td>
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<td>Breanne Fisher</td>
<td>Ann &amp; Robert H. Lurie Children's Hospital of Chicago</td>
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<td>Nancy Foldvary-Schafer, DO, MS</td>
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<td>William B. Gaillatine, DO, FACNS</td>
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<tr>
<td>Gloria M. Galloway, MD, MBA, FACNS</td>
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<td>Elizabeth Gerard, MD, FACNS</td>
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<td>Gena R. Shearing, MD, MBA</td>
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<td>Emily J. Gilmore, MD</td>
<td>Yale School of Medicine</td>
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<td>Jean Gotman, PhD, FACNS</td>
<td>Montreal Neurological Institute</td>
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<td>Daniel Graf, MD</td>
<td>Geisinger Medical Center</td>
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<tr>
<td>Madeleine M. Grigg-Damberger, MD</td>
<td>University of New Mexico</td>
<td>Speaker</td>
<td>Up to Date wrote article on Special Considerations for Polysomnography in Children (g)</td>
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<td>Robert E. Gross, MD, PhD</td>
<td>Emory</td>
<td>Speaker</td>
<td>Abbott (b); Boston Scientific (a, b); Medtronic (a, b); Monteris(b); Neur- opace (a, b); Nia Therapeutics (c, f)</td>
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<td>Aysegul Gunduz, PhD</td>
<td>University of Florida</td>
<td>Speaker</td>
<td>See addendum</td>
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<td>Jorge E. Gutierrez, MD, MSc</td>
<td>Universidad del Valle</td>
<td>Speaker</td>
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<tr>
<td>Cecil D. Hahn, MD, MPH, FACNS</td>
<td>The Hospital for Sick Children</td>
<td>Planner, Speaker</td>
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<td>Hiba A. Haider, MD</td>
<td>Emory University School of Medicine</td>
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<td>Greenville Health System</td>
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<td>Jonathan J. Halford, MD, FACNS</td>
<td>Medical University of South Carolina</td>
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<tr>
<td>Mark Hallett, MD, FACNS</td>
<td>National Institutes of Health</td>
<td>Planner, Speaker</td>
<td>Brainway (e, g)</td>
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<td>Abbeer J. Hani, MD</td>
<td>Lebanese American University</td>
<td>Planner, Reviewer</td>
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<tr>
<td>Carlos Otto Heise, MD</td>
<td>&quot;University of São Paulo EMG lab at the Neurology Department.&quot;</td>
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<tr>
<td>Susan T. Herman, MD, FACNS</td>
<td>Beth Israel Deaconess Medical Center</td>
<td>Speaker, Reviewer</td>
<td>Pfizer (a); UCB Pharmaceuticals (a); Epilepsy Therapy Development Project (a)</td>
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<td>Max J. Hilz</td>
<td>University of Erlangen-Nuremberg, Dept. of Neurology, Erlangen, Germany</td>
<td>Speaker</td>
<td>Afinylam (a); Bayer Health Care Germany (a, d); Novartis Germany (a); Sanofi-Genzyme (a, b, e)</td>
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<td>Lawrence J. Hirsch, MD, FACNS</td>
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<td>E. Matthew Hoffman</td>
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<td>Manisha G. Holmes, MD</td>
<td>NYU Langone</td>
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<tr>
<td>Alexandra Hovaguimian, MD</td>
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<td>Aatif M. Husain, MD, FACNS</td>
<td>Duke University Medical Center</td>
<td>Planner, Speaker</td>
<td>AAN (f); ACNS (f); Demos Publishing (f); Eisai Pharmaceuticals (b, e); Jazz Pharmaceuticals (b); Marinus Pharmaceuticals (b, e); Springer Publishers (g); Wolters Kluwer (g)</td>
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## CONFLICT OF INTEREST DISCLOSURES, CONTINUED

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<tr>
<td>Akio Ikeda, MD, PhD, FACNS</td>
<td>Kyoto University Graduate School of Medicine</td>
<td>Planner, Speaker</td>
<td>Eisai Company (a); GlaxoSmithKline K.K (a); NIHON KOHDEN CORPORATION (a); Otsuka Pharmaceutical Co (a); UCB Japan Co (a)</td>
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<td>Monica Islam, MD</td>
<td>Nationwide Children's Hospital</td>
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<td>Jin Jing</td>
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<td>Barbara C. Jobjt, MD, FACNS</td>
<td>Dartmouth Geisel School of Medicine</td>
<td>Speaker</td>
<td>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); Neuronpace (a); Sunovion (a)</td>
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<td>Padmaja Kandula, MD</td>
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### Relationships

- **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
### 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

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<th>Name</th>
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<tr>
<td>Ana Lucila Moreira, MD</td>
<td>&quot;Neurologist, Clinical Neurophysiologist and Neurosuronologist; CENEC - Clinical Neurophysiology, Campinas - Brazil; President - Brazilian Society of Clinical Neurophysiology&quot;</td>
<td>Speaker</td>
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<tr>
<td>Heidi M. Munger Clary, MD, MPH</td>
<td>Wake Forest University</td>
<td>Planner</td>
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<td>Iryna Myzyk, MD, FACS</td>
<td>Mayo Clinic AZ</td>
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<tr>
<td>Ahsan Moosa Naduvin Valappil, MD</td>
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<td>Christopher S. Nance, MD</td>
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<td>Maromi Nei, MD</td>
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<td>Marcus C. Ng, MD, FRCP, CScN,EEG</td>
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<td>Jose A. Padin-Rusados, MD, FACS</td>
<td>University of New Mexico</td>
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<tr>
<td>Dipakkumar P. Pandya, MD</td>
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<td>Jun Y. Park, MD, FAES</td>
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<td>Noor Pirzada, MD</td>
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<td>Stefan Rampp, MD</td>
<td>Universitätsklinikum Erlangen,</td>
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<tr>
<td>Carlos Rangel</td>
<td>Universidad del Bosque</td>
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<td>Claus Reinsberger, MD, PhD, FACS</td>
<td>Paderborn University</td>
<td>Speaker</td>
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<td>George Richerson, MD</td>
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<td>Rosario Maria S. Riel-Romeno, MD</td>
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<td>Anthony L. Ritaccio, MD</td>
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<td>g.tec (Guger Technologies): (e, g)</td>
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<td>Eva K. Ritzl, MD, FACS</td>
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<tr>
<td>Erika Rivera</td>
<td>Children’s Hospital of Mexico Federico Gómez in the department of neurosurgery</td>
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<td>Andres Rodriguez Ruiz, MD</td>
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<td>Steven Roper, MD</td>
<td>Lillian S. Wells Department of Neurosurgery at the University of Florida</td>
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<td>Eric S. Rosenthal, MD</td>
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<td>Elayna Rubens, MD, FACS</td>
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<td>Justin Sanchez, MD</td>
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<tr>
<td>Daniel San-Juan</td>
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### CONFLICT OF INTEREST DISCLOSURES, CONTINUED

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<td>Arnold J. Sansevere, MD</td>
<td>Boston Children's Hospital</td>
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<td>Karl E. Sanzenbacher, MD, MS, FACNS</td>
<td>Eastern Maine Medical Center</td>
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<td>Hussaina Y. Sarria, MD</td>
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<td>Rani Sarkis, MD, MSc</td>
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<td>Sarah E. Schmitt, MD, FACNS</td>
<td>Medical University of South Carolina</td>
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<td>Sage Therapeutics (e); American Academy of Neurology (d)</td>
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<td>Stephan U. Schuele, MD, MPH, FACNS</td>
<td>Northwestern University Feinberg School of Medicine</td>
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<td>Eisai Inc. (d); SK Life Science (b); Sunovion (d)</td>
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<td>Olga Seloutskii, DO, FACNS</td>
<td>University of Rochester</td>
<td>Speaker</td>
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<td>Asim Shahid, MD</td>
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<td>Raj D. Sheth, MD, FAAN, FACNS</td>
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<td>Mirela V. Simon, MD, MSc, FACNS</td>
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<td>Saurab R. Sinha, MD, PhD, Phil, FACNS</td>
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<td>Francisco Soto, MD</td>
<td>Las Condes Clinic</td>
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<td>Nita Tandon, MD</td>
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<td>Armando Tello, MD, PhD</td>
<td>&quot;Head of Clinical Neurophysiology Department Hospital Espanol Mexico City LAC-Mexico&quot;</td>
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<td>Jessica W. Templar, MD</td>
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<td>Shanti Thirumala, MD, FACNS</td>
<td>Morristown Medical Center</td>
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<td>Tammy Tuchida, MD, PhD, FACNS</td>
<td>Children's National Medical Center</td>
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<td>Kathy Wolfe</td>
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<td>Lily C. Wong-Kisiel, MD</td>
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<td>Greg Worrell, MD</td>
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<td>NeurOne (c, e); Cadence Neuroscience (c, e)</td>
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<td>Alejandro Zavala, MD</td>
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<td>Beaumont Health System</td>
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SUPPORT ACKNOWLEDGEMENT

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

Bronze Level

- Brain Sentinel Diagnostic Services, LLC
- Cadwell Industries
- Ceribell
- Empatica
- Persyst Development Corporation
- Smart Monitor

Bronze Level Exhibitors

- 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
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- Neuromonitoring Technologies
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- Sunovian Pharmaceuticals
- Wolters Kluwer
- Zeto Inc.

NETWORKING & SOCIAL EVENTS

Welcome Reception
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
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
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
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**

**WEDNESDAY, FEBRUARY 6, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Course</th>
<th>Location</th>
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<tbody>
<tr>
<td>9:00am-5:00pm</td>
<td>Neurophysiologic Intraoperative Monitoring (NIOM) Part I</td>
<td>Neopolitan I-II</td>
</tr>
<tr>
<td>9:00am-5:00pm</td>
<td>Epilepsy Surgery/Invasive EEG Course Part I</td>
<td>Pompeian I-II</td>
</tr>
<tr>
<td>9:00am-5:00pm</td>
<td>Intensive Care Unit EEG Monitoring (ICU EEG) Part I</td>
<td>Neopolitan III-IV</td>
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**THURSDAY, FEBRUARY 7, 2019**

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<thead>
<tr>
<th>Time</th>
<th>Course</th>
<th>Location</th>
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<tbody>
<tr>
<td>7:00-8:30am</td>
<td>Epilepsy Surgery/Invasive EEG Course Part II: SEEG</td>
<td>Pompeian I-II</td>
</tr>
<tr>
<td>7:00-8:30am</td>
<td>Evoked Potentials</td>
<td>Neopolitan I-II</td>
</tr>
<tr>
<td>7:00-8:30am</td>
<td>Advanced EEG Techniques</td>
<td>Neopolitan III-IV</td>
</tr>
<tr>
<td>9:00am-12:00pm</td>
<td>Intensive Care Unit EEG Monitoring (ICU EEG) Part II</td>
<td>Neopolitan III-IV</td>
</tr>
<tr>
<td>9:00am-5:00pm</td>
<td>Neurophysiologic Intraoperative Monitoring (NIOM) Part II</td>
<td>Neopolitan I-II</td>
</tr>
<tr>
<td>9:00am-3:00pm</td>
<td>EMG/Peripheral Nervous System</td>
<td>Pompeian I-II</td>
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<tr>
<td>3:00-5:00pm</td>
<td>EMG Demo</td>
<td>Pompeian I-II</td>
</tr>
<tr>
<td>11:30am-2:00pm</td>
<td>5th Annual CNP Director’s Symposium</td>
<td>Pompeian III</td>
</tr>
<tr>
<td>1:30-3:00pm</td>
<td>Autonomic Neurophysiology</td>
<td>Neopolitan III-IV</td>
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<tr>
<td>3:00-5:00pm</td>
<td>Video EEG Cases Part I</td>
<td>Pompeian III</td>
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</tbody>
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**FRIDAY, FEBRUARY 8, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Course</th>
<th>Location</th>
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<tbody>
<tr>
<td>7:00-10:00am</td>
<td>Neonatal EEG Workshop</td>
<td>Messina</td>
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<tr>
<td>7:00-10:00am</td>
<td>Video EEG Cases Part II</td>
<td>Pompeian III-IV</td>
</tr>
<tr>
<td>7:00-10:00am</td>
<td>Neuromodulation/Stimulation in Human Brain</td>
<td>Florentine III</td>
</tr>
<tr>
<td>7:00-10:00am</td>
<td>Basic EEG Pompeian I-II</td>
<td>Pompeian I-II</td>
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**ANNUAL MEETING - OVERVIEW**

**FRIDAY, FEBRUARY 8, 2019**

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

**Saturday, February 9, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Concurrent Sessions</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:00-9:30am</td>
<td><strong>Concurrent Sessions</strong></td>
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<tr>
<td></td>
<td>Decision Making with Neurostimulation</td>
<td>Pompeian III-IV</td>
</tr>
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<td></td>
<td>Of Dreams and Spells - The Neurophysiological Tools of REM Sleep &amp; Epilepsy</td>
<td>Pompeian I-II</td>
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<td></td>
<td>Mapping Human Language Networks with Intracranial EEG Spectra</td>
<td>Florentine I-II</td>
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<td></td>
<td>Joint ACNS/Mexican Clinical Neurophysiology Symposium: Intraoperative Neurophysiologic Monitoring in Special Situations</td>
<td>Florentine III</td>
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<tr>
<td></td>
<td>Mastering Semi-Quantitative Motor Unit Potential Analysis Skills in 90 Minutes!</td>
<td>Florentine IV</td>
</tr>
<tr>
<td>9:30-10:00am</td>
<td><strong>Coffee Break - Visit Exhibits and Poster Viewing</strong></td>
<td>Roman Ballroom</td>
</tr>
<tr>
<td>10:00-11:00am</td>
<td><strong>General Session: Travel Award Presentation and Jasper Award Presentation and Lecture</strong></td>
<td>Florentine I-II</td>
</tr>
<tr>
<td>11:00-11:15am</td>
<td><strong>Walking Break</strong></td>
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<tr>
<td>11:15am-12:45pm</td>
<td><strong>Concurrent Sessions</strong></td>
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<td></td>
<td>Can Clinical Neurophysiology Improve the Recovery from Sports Induced Injuries?</td>
<td>Pompeian I-II</td>
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<td>Joint ACNS/British Clinical Society Symposium: The Diagnostic Challenge of Small Fibre Neuropathy</td>
<td>Florentine III</td>
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<td></td>
<td>Wide-band EEG for Epilepsy: Established Tools or Research Topic</td>
<td>Florentine I-II</td>
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<td></td>
<td>Spanish Symposium: Uso Clinico de Monitoreo Intraoperatorio/Clinical Use of Intraoperative Monitoring</td>
<td>Florentine IV</td>
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<tr>
<td>12:45-2:00pm</td>
<td><strong>Lunch - Visit Exhibits and Poster Viewing</strong></td>
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<tr>
<td>2:00-3:30pm</td>
<td><strong>Concurrent Sessions</strong></td>
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<td></td>
<td>Joint ACNS/IFCN Latin American Chapter Symposium: Beyond Traditional Monitoring During Spine Surgery</td>
<td>Pompeian III-IV</td>
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<td></td>
<td>Are MEG Practitioners Fulfilling Your Expectations?</td>
<td>Pompeian I-II</td>
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<td>Electrophysiologic Assessment of Weakness in the ICU</td>
<td>Florentine III</td>
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<td>Setting Up for Success in Long-Term Monitoring</td>
<td>Florentine IV</td>
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<tr>
<td>3:30-3:45pm</td>
<td><strong>Walking Break</strong></td>
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<tr>
<td>3:45-5:15pm</td>
<td><strong>Concurrent Sessions</strong></td>
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<td></td>
<td>Brainstem and Supratentorial Surgery Monitoring, New Developments and Current Understanding</td>
<td>Florentine III</td>
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<td>Advanced Autonomic Testing</td>
<td>Florentine IV</td>
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<td>SEEG Planning Based on Presurgical Evidence - Illustrative Case Discussions, Interactive.</td>
<td>Pompeian I-II</td>
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<td></td>
<td>Advances in Continuous EEG in Targeted Temperature Management</td>
<td>Pompeian III-IV</td>
</tr>
<tr>
<td>5:15-5:30pm</td>
<td><strong>Walking Break</strong></td>
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<tr>
<td>5:30-7:00pm</td>
<td><strong>General Session: Research Highlights &amp; Schwab Award Presentation &amp; Lecture</strong></td>
<td>Florentine I-II</td>
</tr>
<tr>
<td>7:00-7:30pm</td>
<td><strong>Annual Business Meeting</strong></td>
<td>Florentine I-II</td>
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**SUNDAY, FEBRUARY 10, 2019**

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

**Friday, February 8, 2019**

**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. 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**

**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
        Parthasarathy Thirumala, MD, FACNS
9:45am  MEP Monitoring
        Francisco Soto, MD
10:25am Break
10:40am  BAEP Monitoring
        Alan D. Legatt, MD, PhD, FACNS
11:20am  EEG Monitoring
        Olga Selioutski, DO, FACNS
12:00pm Discussion
12:15pm Lunch (not provided. See pg. 9 for nearby restaurants)
1:15pm  EMG Monitoring
        Gloria M. Galloway, MD, MBA, FACNS
1:55pm  Anesthesia and IONM
        Iryna Muzyka, MD, FACNS
2:35pm  Troubleshooting: Technical and Non-Technical Issues
        Stanley Skinner, MD, FACNS
3:15pm Break
3:30pm  Medicolegal Issues
        Jaime R. Lopez, MD, FACNS
4:10pm  Billing Issues
        Marc R. Nuwer, MD, PhD, FACNS
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
       Giridhar P. Kalamangalam, MD, DPhil, FACNS
9:05am  Noninvasive and Invasive Evaluations
       Chris Skidmore, MD
9:40am  Epileptogenic Zone Defined by Invasive EEG
       Patrick Chauvel, MD
10:15am Break
10:30am  Intracranial EEG: Physiologic and Abnormal Patterns
       Birgit Frauscher, MD, PhD
11:00am Temporal Lobe
       Giridhar P. Kalamangalam, MD, DPhil, FACNS
11:30am Extratemporal Lobe
       Stephan U. Schuele, MD, MPH, FACNS
12:00pm Lunch (not provided. See pg. 9 for nearby restaurants)
1:00pm  Role of Source Imaging
       Richard C. Burgess, MD, PhD, FACNS
1:30pm  HFO and Epilepsy Surgery
       Joyce Y. Wu, MD
2:00pm  PMG and PVNH
       Francois Dubau, MD
2:30pm  Insular Epilepsy
       DK Nguyen, MD, PhD, FRSC
3:00pm Break
3:15pm  Epilepsy Surgery: Implantation and Resection
       Steven N. Roper, MD
3:45pm  Laserablation: Outcome
       Robert E. Gross, MD, PhD
4:15pm  Indication for RNS and DBS
       Lawrence J. Hirsch, MD, FACNS
Wednesday, February 6, 2019 (continued...)

**PROGRAM AGENDA • ANNUAL COURSES**

**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  
*Nicholas S. Abend, MD, MSCE, FACNS*

9:40am  Guidelines and Logistics of ICU EEG Monitoring  
*Susan T. Herman, MD, FACNS*

10:10am Break

10:30am  cEEG Interpretation: Background, Reactivity, Artifacts, and ACNS Terminology  
*Lawrence J. Hirsch, MD, FACNS*

11:00am  cEEG Interpretation: The Ictal-Interictal Continuum  
*Suzette LaRoche, MD, FACNS*

11:30am  Finances, Billing and Coding  
*Marc R. Nuwer, MD, PhD, FACNS*

12:00pm  Lunch

1:00pm  Treatment of Nonculvulsive Seizures and Status Epilepticus  
*Sarah Schmitt, MD, FACNS*

1:30pm  EEG of NORSE, FIRES, and Autoimmune Disorders  
*Olga Taraschenko, MD, PhD*

2:00pm  ICU EEG Reading Session: Adult Cases  
*Elizabeth Gerard, MD, FACNS and Andres Rodriguez-Ruiz, MD*

2:30pm  cEEG Interpretation: Neonates  
*Tammy Tsuchida, MD, PhD, FACNS*

2:50pm  Break

3:10pm  ICU EEG Reading Session: Neonatal and Pediatric Cases  
*Jessica L. Carpenter, MD and Catherine J. Chu, MD*

3:40pm  EEG in Toxic Metabolic Encephalopathy  
*Peter W. Kaplan, MD, FRCP, FACNS*

4:10pm  CEEG of Anoxic Brain Injury and Targeted Temperature Management  
*Michel van Putten, MD, PhD*

4:50pm  Panel Discussion
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: Jean Gotman, PhD, FACNS
7:25am  Planning Placements Giridhar P. Kalamangalam, MD, DPhil, FACNS
7:45am  Data Interpretation and Mapping Stephan U. Schuele, MD, MPH, FACNS
8:05am  Surgical Aspects and Resection Strategy Nitin Tandon, MD
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) Alan D. Legatt, MD, PhD, FACNS
7:30am Visual Evoked Potentials (VEPs) Elayna O. Rubens, MD, FACNS
8:00am Somatosensory Evoked Potentials (SEP) viet Nguyen, MD, FACNS

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 William C. Stacey, MD, PhD
7:45 am Setting up Your Lab for High Density EEG and Electrical Source Imaging (ESI) Susan T. Herman, MD

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 Hiba A. Haider, MD
9:30am Quantitative EEG for Seizure Detection Cecil D. Hahn, MD, MPH, FACNS
10:00am Quantitative EEG for Ischemia Detection M. Brandon Westover, MD, PhD, FACNS
10:50am Multimodal Monitoring in Acute Brain Injury Eric S. Rosenthal, MD
11:30am QEEG Cases Emily J. Gilmore, MD and Sahar F. Zafar, MBBS
## 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 Introduction
- **9:05am** VEP Monitoring  
  *Aatif M. Husain, MD, FACNS*
- **9:45am** Monitoring for Brachial Plexus and Nerve Repair Surgery  
  *Jorge E. Gutierrez, MD, MSc*
- **10:25am** Break
- **10:40am** Monitoring for Spinal Cord Tumor Surgery  
  *Eva K. Ritzl, MD, FACNS*
- **11:20am** Monitoring for Lower Spinal Column Surgery  
  *Paulo Andre Kimaid, MD, PhD*
- **12:00pm** Discussion
- **12:15pm** Lunch (not provided. See pg. 9 for nearby restaurants)
- **1:15pm** Monitoring of Corticobulbar MEP and Brainstem Reflexes  
  *Kyung-Seok Park, MD*
- **1:55pm** Cranial Nerve Monitoring  
  *Jaime R. Lopez, MD, FACNS*
- **2:35pm** Monitoring for Vascular Surgery  
  *Leslie H. Lee, MD, FACNS*
- **3:15pm** Break
- **3:30pm** Sensorimotor Mapping and Monitoring for Supratentorial Tumors  
  *Mirela V. Simon, MD, MSc, FACNS*
- **4:10pm** Language Mapping and Electrocoorticography  
  *Ioannis Karakis, MD, PhD, MSc*
- **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  
  *Ruple S. Laughlin, MD*
- **9:45am** EMG Waveform Examples: Spontaneous and Basic Motor Unit Potentials  
  *Devon I. Rubin, MD, FACNS*
- **10:45am** EDX Approach to CTS and Ulnar Neuropathies  
  *Cory Kogelschatz, MD*
- **11:30am** EDX Approach to Radiculopathies  
  *Paul Barkhaus, MD*
- **1:15pm** EDX Approach to Peripheral Neuropathies  
  *Zachary London, MD*
- **2:00pm** EDX Approach to Myopathies  
  *Priya Dhawan, MD*
- **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  
  *Devon I. Rubin, MD, FACNS and Ruple S. Laughlin, MD*
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
          Jeffrey Britton, MD, FACNS
12:05pm  Closing Gaps Identified in ACNS Inservice Exam: Neurophysiology and Instrumentation
          Brian Lundstrom, MD, PhD
12:30pm  IOM and Evoked Potentials
          Matt Hoffmann, DO, PhD
1:00pm   ACGME Revised Core Requirements
          Padmaja Kandula, MD
1:30pm   ACGME Self-Study
          Lily Wong-Kisiel, MD

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
        Claus Reinsberger, MD, PhD, FACNS
1:45pm  Autonomic Testing
        Jeffrey Liou, DO
2:10pm  Neurological Disorders with Central Autonomic Failure
        Alexandra Hovaguimian, MD
2:35pm  Peripheral Autonomic Failure
        Peter Novak, MD, PhD
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
        William O. Tatum IV, DO, FACNS
3:35pm  Predicting the Epileptogenic Zone with Intracranial VEM
        Greg Worrell, MD
4:15pm  Localizing the Epileptogenic Zone in Pediatric Patients with VEM
        Phillip Pearl, MD, FACNS
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
Eli Mizrahi, MD, FACNS
7:30am Neonatal Seizure Quantification: Novel Methods to Address a Common Dilemma
Eli Mizrahi, MD, FACNS
8:00am Standardizing Neonatal EEG Background Interpretation: Addressing Issues of Inter-Rater Agreement
Shavonne Massey, MD, MSCE

8:30-10:00am

805: Video EEG Cases Part II
Co-Directors: William O. Tatum IV, DO, FACSNS and Phillip Pearl, MD, FACSNS
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
William O. Tatum IV, DO, FACNS
9:00am The Unclassified Patients
Stephan U. Schuele, MD, MPH, FACNS
9:30am Mystery Pediatric Cases
Phillip Pearl, MD, FACNS

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
Greg Worrell, MD
7:45am Modeling Brain Stimulation
Christopher R. Butson, PhD
8:30am Responsive Neurostimulation (RNS)
Barbara Jost, MD
9:15am Deep Brain and Cortical Stimulation
Brian Lundstrom, MD, PhD

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
Jay S. Pathmanathan, MD, PhD
7:30am Normal Neonatal and Pediatric EEG
Nicholas Abend, MD, MSCE, FACSNS
8:00am Normal EEG Variants
Ionnis Karakis, MD, PhD, MSc
8:30am Artifacts
Jeffrey Britton, MD, FACSNS
9:00am Non Epileptiform Abnormalities
M. Brandon Westover, MD, PhD, FACSNS
9:30am Epileptiform Abnormalities
Andreas Alexopoulos, MD, MPH
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
Gloria M. Galloway, MD, MBA, FACNS
7:30am Recruitment and Retention of Female Faculty: What are the Challenges and What Opportunities are Available?
Susan T. Herman, MD, FACNS
8:00am Why Does Gender Research Matter?
Sarah E. Schmitt, MD, FACNS
8:30am Helping Women Find a Voice: Recommendations for Moving Forward
Suzette M. LaRoche, MD, FACNS
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
Saurabh R. Sinha, MD, PhD, FACNS
10:40am ACNS Presidential Lecture: Pediatric Status Epilepticus
Tobias Loddenkemper, MD, FACNS
11:25am Gloor Award Presentation
Saurabh R. Sinha, MD, PhD, FACNS
11:30am Gloor Award Lecture: A Clinical Neurophysiology Journey from Switzerland to Baltimore
Peter W. Kaplan, MD, FRCP, FACNS

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?
Suzette M. LaRoche, MD, FACNS
1:40pm Building a Comprehensive EEG Monitoring Program
Dave Burdette, MD, FACNS
2:00pm Quality Improvement, Accreditation and Board Certification
Matt W. Luedke, MD
2:45pm Work Life Balance: Preventing Provider and Technologist Burnout
Cormac O’Donovan, MD, FACNS
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
Robert Knowlton, MD
2:00 pm Methods for HD EEG ESI and Lesion-Constrained ESI
Jurriaan Peters, MD, PhD
2:30pm Identification and Significance of Spike Ripple Events in Scalp HD EEG
Catherine J. Chu, MD
3:00pm Beyond the Spike: HD EEG to Map Epileptic Networks and Eloquent Cortex
Leonardo Bonilha, MD, PhD
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
       Nuria Lacuey, MD
1:55pm  Respiratory Function Monitoring: Insights from the Lab
       George Richerson, MD
2:15pm  Electrocardiographic Monitoring
       Maromi Nei, MD
2:35pm  Non-Invasive Blood Pressure Monitoring
       Sam Lhatoo, MD
2:55pm  Mapping of Cardiorespiratory Function with Brain Stimulation
       William Nobis, MD

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
       Emily Gilmore, MD
2:00pm  How to Start an ICU ECoG Monitoring Program
       Ramini Balu, MD, PhD
2:30pm  ECoG Untangled: Integrating ECoG with Other Multimodality Monitoring
       Brandon Foreman, MD, FACNS
3:00pm  ICU Clinical Case Scenarios: How ECoG Adds to Patient Care
       Eric Rosenthal, MD

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

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### 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

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**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!

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### 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

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

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
   Milena Pavlova, MD
8:30am EEG and Quantitative EEG of REM Sleep in Epilepsy
   Marcus C. Ng, MD, FRCPC, CSCN(EEG)
9:00am Neurophysiology of REM Sleep and SUDEP in Epilepsy
   Gordon Buchanan, MD, PhD
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  Ravindra Arya, MD, DM
8:05am  Spatiotemporal Mapping of Language Networks at the Bedside with Intracranial EEG in Adults  Nathan E. Crane, MD
8:25am  3D and 4D Mapping of Speech and Language in Children with Epilepsy  Eishi Asano, MD, PhD
8:45am  Development of Information Sharing in Human Language Neocortex  Ravindra Arya, MD
9:05am  Multimodal Prediction of Post-Operative Language Outcomes  Abbas Babajani-Feremi, PhD

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

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  Devon I. Rubin, MD, FACNS
8:30am  Assessment of MUP Recruitment  Devon I. Rubin, MD, FACNS
9:00am  Recognizing MUP Morphologic Changes  Devon I. Rubin, MD, FACNS

9:30-10:00am - Coffee Break in Exhibit Hall
Location: Roman Ballroom
10:00-11:00am - General Session
Location: Florentine I-II
10:00am  Young Investigator Travel Award Recognition  Tammy Tsuchida, MD, PhD, FACNS
10:15am  Jasper Award Presentation  Stephan U. Schuele, MD, MPH, FACNS
10:20am  Jasper Award Lecture: Developing Tools for Neurophysiology  Jean Gotman, PhD, FACNS
10:20am  Jasper Award Lecture: Developing Tools for Neurophysiology  Jean Gotman, PhD, FACNS

11:00-11:15am - Walking Break
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
Nicholas Jerome Milano, MD
11:45am New Ways to Approach Recovery After Concussion: Focus on the Vestibular and Autonomic Nervous System
Claus Reinsberger, MD, PhD, FACNS
12:15pm The Role of Sleep in Recovery from Neurological Injuries and its Relevance to Sports Medicine
Madeleine M. Grigg-Damberger, MD, FACNS

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
Rayaz Malik, MB, ChB, PhD
11:45am Neuropathological Evaluation of Small Fiber Neuropathy
Christopher Moore, MB, BS, PhD, FRCP
12:15pm A Clinical Approach to Small Fibre Neuropathy
Taylor Harrison, MD

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

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.
Jonathan A. Norton, PhD
11:30am Activation of the Motor Pathway: How, What and Why?
John Rothwell, PhD
12:00pm Clinical Application of MEPs and Where Should TMS Fit in Clinical Neurophysiology?
Mark Hallett, MD, FACNS
12:30pm Alarmed by Alarm Criteria? Developing a Scientifically Based Approach to MEPs in the Clinical Setting.
Jonathan A. Norton, PhD
Saturday, February 9, 2019 (continued...)

918: Spanish Symposium: Uso Clinico 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; and
2. Recognized the diagnostic value of MEPs when monitoring different neural structures; and
3. Understand the techniques utilized for monitoring neural structures during transpsoas 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 Bagić, 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
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 LTIM 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/EP T ., 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  

**Agenda:**  
3:45pm  
Brainstem and Spinal Cord Reflexes, Neurophysiology and IOM Perspective  
*Vedran Deletis, MD, PhD*  
4:05pm  
Illustrative Cases: Pediatric  
*Elia M. Pestana-Knight, MD, FACS*

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, FACS*  
4:25pm  
Illustrative Cases: Adult  
*Guadalupe Fernandez Baca-Yaca, MD*  
4:45pm  
Illustrative Cases: Adult/Pediatric  
*Asim Shahid, MD*
PROGRAM AGENDA • ANNUAL MEETING

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

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

8:00-9:30am - Concurrent Sessions

912: Functional Brain Mapping Using Invasive Electrodes
Session Co-Directors: William O. Tatum IV, DO, FACS; and Stephan U. Schuele, MD, MPH, FACS
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 rational 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
Elson L. So, MD, FACS
8:30am Localization and FBM with SEEG
Patrick Chauvel, MD
8:50am Advanced FBM
Antony L. Ritaccio, MD
9:10am ECOG and FBM
Jessica W. Templer, MD

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

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, faciobrachial 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
Madeleine M. Grigg-Damberger, MD, FACNS
8:30am Uncommon Parasomnias in Infants and Children Sometimes Misdiagnosed as Sleep-Related Epilepsy
Kathy M. Wolfe, MD
9:00am Treatable Parasomnias and Sleep-Related Movement Disorders Which Herald Neuropathology in Older Adults
Nancy Foldvary-Schaefer, DO
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
   Jorge E. Gutierrez, MD, MSc
10:25am Rehabilitation and Pain Management of Peripheral Nerve Injuries
   Carlos Rangel MD, MBA
10:50am Surgical Strategy and Role of IONM in the Treatment of Peripheral Nerve Trauma
   Jaime R. Lopez, MD, FACNS
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.
   Ana Carolina Coan, MD
10:20am Slow and Fast Frequency Oscillations in Patients with Epileptic Spasms.
   Eishi Asano, MD, PhD, MS (CRDSA)
10:40am Surgery Versus No Surgery in Epileptic Spasms: Does the EEG Matter?
   Ahsan Moosa Naduvil, MD
11:00am Case Discussion
   Elia M. Pestana Knight, MD, FACNS

1011: Noninvasive Brain Stimulation
Session Director: Alexander Rotenberg, MD, PhD
Location: Florenting 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
   Charles Epstein, MD, FACNS
10:20am Focused Ultrasound Stimulation
   Seung-Schik Yoo, PhD, MBA
10:40am Transcranial Electrical Stimulation
   Alexander Rotenberg, MD, PhD
11:00am Improving Noninvasive Brain Stimulation by Preclinical Research
   Alexander Rotenberg, MD, PhD
EXHIBIT HALL & SPONSORED SESSIONS

Location: Roman Ballroom

Hours:
Friday, February 8, 2019
12:15 - 4:00 pm
7:00 - 8:30 pm  Welcome Reception

Saturday, February 9, 2019
7:00 - 1:30 pm

FLOOR PLAN

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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, Neuropysilologic Intraoperative Monitoring, Critical Care EEG, or General Clinical Neurophysiology. International testing is available. Stop by to see the new online CNP Self-Assessment program! Coming soon – Pediatric EEG Track.

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.

#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
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, IOM, 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.

#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

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.
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
Website: https://www.springerpub.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.

#311
EEG-Now / EncephaloDynamics
502 NW 16th Avenue, Suite #3-4
Gainesville, FL 32601
Phone: 855-359-6341
Email: info@EncephaloDynamics.com
Website: https://www.eeg-now.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 proprietary 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.

#407
IntraDiagnostics, LLC
24 South Weber Street, Suite 200
Colorado Springs, CO 80903 USA
Phone: 844-446-8365, Ext 5
Email: 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.

#403
Holberg EEG
Møllendalsveien 6SC
5009 Bergen, Norway
Email: 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.

#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
Website: 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  
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  

“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  

#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/
#202/204  
**Nihon Kohden America, Inc**  
15353 Barranca Pkwy  
Irvine, CA 92618  
Phone: 949-580-1555  
Email: 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 100,000+ 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
Wolters Kluwer
P.O. Box 1030
2400 BA, Alphen aan den Rijn, The Netherlands
Email: info@wolterskluwer.com
Website: https://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
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

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.

**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.

**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.
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. Additional information about Joe DiMaggio Children’s Hospital can be found at jdch.com.
Save the Date
FEBRUARY 5–9
ACNS 2020
THE ROOSEVELT NEW ORLEANS
New Orleans, Louisiana