



Advances and Controversies in Neurotrauma and Neurocritical care



January 27, 2018 - January 28, 2018
Hershey, PA, USA

Rapid advances in technology are impacting the surgical management of neurotrauma and neurocritical care management, particularly in Traumatic Brain Injury (TBI) and spinal cord injuries. As evolutions in critical care management and sophistication of monitoring technologies become more and more complex, practicing neurosurgeons must maintain up-to-date skills, knowledge and judgement for increasingly complex treatment and management approaches. This course is designed to provide participants with state-of-the-art information on the latest advances and treatment techniques for managing patients with traumatic brain and spinal cord injuries. Experts in the field will discuss the role of advanced monitoring, trends in decompressive craniectomy, and current guidelines for managing spinal cord injuries.

Target Audience:

This course is designed primarily for practicing neurosurgeons. Neurosurgical advanced practitioners and those in related fields (e.g., trauma surgeons) who treat injuries to the nervous system will also find the course beneficial.

Practicing neurosurgeons who require ongoing trauma-specific Category I CME credits, or wishing to add knowledge and medical judgment tips to day-to-day practice will be served by the course.

Course space is limited, so early registration is encouraged.

A small number of participation slots will be reserved for neurosurgical residents and fellows.

Event Summary

Tuition:

Level Name: Participant - Neuro
Pricing Tier: Attending
Tuition: \$450.00

Level Name: Participant - Neuro
Pricing Tier: Resident
Tuition: \$0.00

Course Prerequisite(s):

No Prerequisites

Venue:

Hotel Hershey
100 Hotel Road
Hershey, Pennsylvania, USA
Phone Number: 717-533-3311

Please Note: This course is available to physicians only.

Language(s):

English

Directly Provided by:



AO North America

Professional Level Prerequisite(s):

- Residency Year 1
- Residency Year 2
- Residency Year 3
- Residency Year 4
- Residency Year 5
- Residency Year 6
- Residency Year 7
- Residency Year 8
- Attending
- Fellow

CME

Continuing Education Credit: AMA



AO North America is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

AONA has been resurveyed by the Accreditation Council for Continuing Medical Education (ACCME) and awarded Accreditation with Commendation.

Below Wording CMF Only- Continuing Education Dental Credit Statement

As an Accreditation Council for Continuing Medical Education (ACCME) accredited provider, AO North America meets the definition of a constituent or component organization of the AMA and thereby meets most state dental board requirements of an approved sponsor of continuing education. This course is focused on clinical issues in oral-maxillofacial surgery that are relevant to the treatment and care of dental patients. Most states accept AMA constituents as approved sponsors for continuing dental education credit. If you have questions, your state dental board can confirm eligibility of this course.

- **Designation Statement** - AO North America designates this live educational activity for a maximum of 0.00 **AMA PRA Category 1 Credits™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

The Continuing Medical Education (CME) mission of AO North America (AONA®) is to provide comprehensive multidisciplinary needs based education to surgeons, fellows, and residents in the specialties of orthopedic, hand, craniomaxillofacial, spine, neurosurgery, and veterinary surgery in the areas of trauma (i.e., operative reduction and fixation), degenerative disorders, deformities, tumors, and reconstruction.

Expected results of AONA's CME activities for surgeons, fellows, and residents are to:

- Increase their knowledge base and surgical skill level
- Improve competence by applying advances of knowledge in patient care in the areas of trauma, degenerative disorders, deformities, tumors, and reconstructive surgical techniques
- Address practice performance gaps by improving management of aspects of traumatic injuries and musculoskeletal disorders (i.e., pre-operative planning to post-operative care)

This course meets the requirements of the ABNS for Part II of Maintenance of Certification: Lifelong Learning and Self-Assessment.

This course meets the CME external trauma and neurosurgery related requirements of the American College of Surgeons, Committee on Trauma (ACS COT).

Target Audience

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Practicing neurosurgeons who require ongoing trauma-specific Category I CME credits, or wishing to add knowledge and medical judgment tips to day-to-day practice will be served by the course.

Course space is limited, so early registration is encouraged.

A small number of participation slots will be reserved for neurosurgical residents and fellows.

Learner Objectives

Upon completion, participants should be able to:

- Define the nuances in prognostication after TBI
- Refresh knowledge of cerebral physiology after TBI
- Consider various physiological derangements as measured by advanced neuromonitoring in tailoring critical care management of TBI patients
- Apply the principles of surgical management of craniofacial fractures and traumatic cerebrospinal fluid leak
- Discuss nuances in complication avoidance and management of decompressive craniectomy
- Describe the challenges of providing care to TBI patients in resource-challenged environments
- Explain the underlying rationale for reversal of antithrombotic agents in the presence of traumatic intracranial hemorrhage, use of various sedation agents in TBI ICU patients, and clearance of cervical spine in comatose patients
- Evaluate the advances in neuroimaging, rehabilitation strategies, and research in TBI and spinal cord injury (SCI)
- Discuss management strategies for peripheral nerve and blunt vascular injuries
- Discuss management strategies for challenging spinal column injuries based upon anatomical considerations
- Refresh knowledge on current management strategies for SCI and understand controversies based upon evidence basis

Faculty



Timmons, Shelly - Co-Chairperson

MD, PhD, FACS, FAANS
Professor of Neurosurgery
Vice Chair for Administration
Director of Neurotrauma
Penn State University Milton S. Hershey Medical Center
Hershey, PA

**Zacko, Chris - Co-Chairperson**

MS, MD
Associate Professor
Director of Neurocritical Care
Vice Chair for Quality
Co-Director of Penn State Spinal Cord Injury Center
Penn State Hershey Medical Center
Penn State Health
Hershey, PA

**Adelson, P. David - Lecturer**

MD, FACS, FAAP, FAANS
Director, Barrow Neurological Institute at Phoenix Children's Hospital
Chief, Pediatric Neurosurgery
Diane and Bruce Halle Endowed Chair for Pediatric Neurosciences
Professor and Chief Neurological Surgery, Department of Child Health, University of Arizona College of Medicine-Phoenix
Professor, Mayo Clinic
Adjunct Professor Ira A. Fulton School of Biological and Health Systems Engineering Arizona State University
Phoenix, AZ

Dr. P. David Adelson, is a nationally and internationally recognized expert in neural injury and surgical treatment of epilepsy particularly in the area of pediatric traumatic brain injury/ neurocritical care, the acute clinical management of injured children as well as neural recovery and plasticity of the developing brain and peripheral nerve following injury. He was recently awarded the highly coveted Herbert Olivecrona Medal, considered by some to be the "Nobel Prize of Neurosurgery", by the Karolinska Institute in Stockholm, Sweden. Dr. Adelson is the first pediatric neurosurgeon to win this award and was chosen for his vast clinical and research contributions to the field of pediatric neurosurgery and pediatric neuroscience research. He continues to be involved in basic translational science laboratory as well as clinical research programs funded extramurally through the NIH, NSF, Arizona Biomedical Commission, and others in the areas of pediatric acquired neural injury including traumatic brain injury, neurocritical care, epilepsy, and peripheral nerve injury. He has authored more than 205 publications in refereed journals, 40 book chapters, and edited ten books including the well regarded "Principles and Practice of Pediatric Neurosurgery," the authoritative textbook in the field of pediatric neurosurgery. Dr. Adelson also is prominent in promoting national and international education lecturing on numerous topics in pediatric neurosurgery and neuroscience having given over 350 presentations throughout the United States and the world.

**Brophy, Gretchen - Lecturer**

Pharm.D., FCCM
Professor
Departments of Pharmacotherapy & Outcomes Science and Neurosurgery
Virginia Commonwealth University
Medical College of Virginia Campus
Richmond, VA

Gretchen M. Brophy, PharmD, BCPS, FCCP, FCCM, FNCS is Professor of Pharmacotherapy & Outcomes Sciences and Neurosurgery with Virginia Commonwealth University (VCU) School of Pharmacy, Medical College of Virginia Campus, in Richmond. She is also a Neurocritical Care Clinical Pharmacist at VCU Health. Dr. Brophy received her PharmD from the University of Arizona, College of Pharmacy in Tucson and her postgraduate training includes residencies in Critical Care and Pharmacy Practice at the University of Kentucky Medical Center in Lexington. She is currently the Vice President of the Neurocritical Care Society. Dr. Brophy's research interests include effective treatments strategies for traumatic brain injury and stroke, hemostasis and neurocritical care pharmacotherapy.

**Bullock, Ross - Lecturer**

MD, PhD
co-director, Neurotrauma
University of Miami Miller School of Medicine
Miami, FL

**Harbaugh, Kimberly - Lecturer**

MD
Associate Professor
Chief, Division of Peripheral Nerve Surgery
Department Of Neurosurgery
Penn State Hershey Medical Center
Hershey, PA

**Harbaugh, Robert - Lecturer**

MD
Director, Neuroscience Institute
Distinguished Professor & Chair, Department of Neurosurgery
Professor, Department of Engineering Science & Mechanics
Pennsylvania State University - Milton S. Hershey Medical Center
Hershey, PA 17036, PA

Robert E. Harbaugh obtained his M.D. from the Pennsylvania State University College of Medicine and his general surgery and neurosurgery training at Dartmouth. During his career at Dartmouth, Dr. Harbaugh served as Director of the Cerebrovascular Disease Center, Director of the Neurosurgical Laboratory and as acting Residency Program Director. In 2003 Dr. Harbaugh accepted the position of Professor and Chairman of the Department of Neurosurgery, Neurosurgery Residency Program Director and Professor of Engineering Science and Mechanics at the Pennsylvania State University. He has been promoted to the rank of University Distinguished Professor and appointed as the Director of the Penn State Hershey Neuroscience Institute. In 2013 he was named a Penn State Alumni Fellow, the highest award of the Penn State Alumni Association. He also holds a clinical appointment as Guiding Professor of Neurosurgery at Huanhu Hospital in Tianjin, China. Dr. Harbaugh has been an invited speaker throughout the world. His research interests include clinical trial design, outcomes analysis, quality improvement in neurosurgery and neural engineering. He has edited five books and published more than 400 articles, book chapters and abstracts on various neurosurgical topics. He has served on five editorial boards and obtained continuous research funding from the NIH, NATO, USDA, the Commonwealth of Pennsylvania, industry, foundations and other organizations since 1985. Dr. Harbaugh holds and has held numerous leadership positions in national organizations. He is a Past President of the Society of Neurological Surgeons and the American Association of Neurological Surgeons, former Vice-Chair and Director and presently a member of the advisory board of the American Board of Neurological Surgery and Chairman of the Board of organized neurosurgery's quality improvement and data management company, the Neuropoint Alliance, Inc. Dr. Harbaugh also serves as the current Vice-President of the American Academy of Neurological Surgery, as a member of the National Football League's Head, Neck and Spine Committee, as a member of the Strategic Vision Committee of the Federal Interagency Traumatic Brain Injury Registry (FITBIR) and as a member of the Steering Committee of the National Academy of Medicine's Action Collaborative on Clinician Well-Being and Resilience. He has also served on the Board of Trustees of the Penn State Hershey Medical Center, Lebanon Valley College and the Saint Joan of Arc School. Dr. Harbaugh has five children and is married to Kimberly S. Harbaugh, M.D., who is a neurosurgeon specializing in peripheral nerve surgery.

**Harrop, James - Lecturer**

MD
Professor
Division Director, Spine and Peripheral Nerve Surgery
Departments of Neurological and Orthopedic Surgery
Jefferson Medical College
Philadelphia, PA

Dr. Harrop is Professor of Neurological and Orthopedic Surgery at the Sidney Kimmel Medical College of Thomas Jefferson University. He is the Director of the Neurosurgery Department Spine and Peripheral Nerve Surgery Program and Co-Chief of the TJHU Spine Service. In addition he is the Neurosurgical director of the Delaware Valley Model SCI Center which is designated as one of the nation's 13 Model Spinal Cord Injury Centers by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). He completed his neurosurgical residency at Thomas Jefferson University Hospital, of which 6-month was a designated rotation in pediatric neurosurgery at the Children's Hospital of Philadelphia. He also completed a combined neurosurgical and orthopedic spine fellowship at the Cleveland Clinic in 2002. Dr Harrop's actively involved in academic research and has over 290 peer-reviewed publications and over 150 chapters on spinal disorders. As well as his research is funded through numerous agencies including NIH, DOD, PICORI. He is actively involved in numerous organizations and projects within the CNS and has served as the director of the Publications, and Simulation committees. Jim and his wife, Elyse, enjoy traveling with their two children Matthew and Casey.

**Jallo, Jack - Lecturer**

MD, PhD
Department of Neurosurgery
Thomas Jefferson University
Philadelphia, PA

**Le Roux, Peter - Lecturer**

MD, MBBCh, FACS
Professor
Department of Neurosurgery
Thomas Jefferson University
Philadelphia, PA

**Manley, Geoffrey - Lecturer**

MD, PhD
Professor and Vice-Chairman of Neurological Surgery
Chief of Neurosurgery, San Francisco Gen. Hospital
Co-Director, UCSF Brain & Spinal Injury Center
San Francisco, CA

**Okonkwo, David - Lecturer**

MD, PhD
Professor and Executive Vice Chair
Department of Neurological Surgery
University of Pittsburgh
Pittsburgh, PA

**Park, Haejoe - Lecturer**

MD, MA
Assistant Professor
Department of Neurosurgery
Penn State Milton S. Hershey Medical Center
Hershey, PA

**Rubiano, Andres - Lecturer**

MD, PhD Candidate
Professor
Neurosciences & Neurosurgery
Director of Neurotrauma Research
Neurosciences Institute
El Bosque University
Bogota, COL

Neurotrauma and Critical Care Neurosurgeon, Director of Neurotrauma Research, El Bosque University, Bogotá (Colombia).

**Schiff, Steven - Lecturer**

MD, PhD
Brush Chair Professor of Engineering
Director, Center for Neural Engineering
Departments of Neurosurgery, Engineering Science and Mechanics, and Physics
Penn State University
University Park, PA

Steven J. Schiff, Brush Chair Professor of Engineering and Director of the Penn State Center for Neural Engineering, is a faculty member in the Departments of Neurosurgery, Engineering Science and Mechanics, and Physics. A Pediatric Neurosurgeon with particular interests in Epilepsy, Hydrocephalus, Sustainable Health Engineering and Global Health, he holds an S.B. degree from MIT, and a Ph.D. in Physiology and M.D. from Duke University School of Medicine. His book, *Neural Control Engineering*, was published by the MIT Press in 2012. Dr. Schiff has been listed in the *Consumer's Research Council of America's* guides to top physicians and surgeons, serves on the editorial boards of multiple journals, and is a Fellow of the American Physical Society, American College of Surgeons, American Association of Neurological Surgeons, American Epilepsy Society, and the American Association for the Advancement of Science. In 2015 he received the NIH Director's Pioneer Award.

**Villanueva, Philip - Lecturer**

MD
Professor, Clinical Neurosurgery
Director, Neurotrauma and Critical Care
Lewis Katz School of Medicine
Temple University Health System
Philadelphia, PA

**Welch, William - Lecturer**

Doctor of Medicine
Professor
Clinical Vice Chair
Department of Neurosurgery
University of Pennsylvania
Pennsylvania Hospital
Philadelphia, PA

Agenda

Day1

Saturday, January 27, 2018 - 06:30 - 17:30 - (includes breaks, travel-time and meals)

Schedule	Title	Moderator	Faculty	Room
07:00 - 08:00	Registration / Breakfast			
08:00 - 09:50	TRAUMATIC BRAIN INJURY			
08:00 - 08:10	Welcome and Introduction to AONeuro		Timmons, S	
08:10 - 08:30	Nuances in Classification and Prognostication in TBI		Manley, G	
08:30 - 08:50	Cerebral Blood Flow and Autoregulation		Le Roux, P	
08:50 - 09:10	Intracranial Pressure and Compliance		Jallo, J	
09:10 - 09:30	Cerebral Perfusion, pBtO2, and Cerebral Ischemia		Bullock, R	
09:30 - 09:50	Comprehensive Neuromonitoring		Manley, G	
09:50 - 10:10	Break and Networking			
10:10 - 12:10	TRAUMATIC BRAIN INJURY (continued)			
10:10 - 10:30	Craniofacial Fracture Management		Villanueva, P	
10:30 - 10:45	Case-Based Discussions		Villanueva, P	
10:45 - 11:05	Cerebrospinal Fluid Leak Management		Rubiano, A	
11:05 - 11:20	Case-Base Discussions		Rubiano, A	
11:20 - 11:50	Surgical Nuances and Complication Prevention in Decompressive Craniectomy		Timmons, S	
11:50 - 12:10	Management of TBI in Latin America		Rubiano, A	
12:10 - 13:00	Lunch and Networking			
13:00 - 15:00	NEUROCRITICAL CARE AND SPECIAL TOPICS IN TBI			
13:00 - 13:20	Neurocritical Care Accreditation and Certification Update		Harbaugh, R	
13:20 - 13:50	Antithrombotic Medications and TBI		Brophy, G	
13:50 - 14:00	Question and Answer / Discussion		Brophy, G	
14:00 - 14:20	Clearance of Cervical Spine in Comatose Patients		Okonkwo, D	
14:20 - 14:30	Question and Answer / Discussion		Okonkwo, D	
14:30 - 14:50	Sedation Agents and Agitation		Park, H	
14:50 - 15:00	Question and Answer / Discussion		Park, H	
15:00 - 15:20	Break and Networking			
15:20 - 17:00	NEUROCRITICAL CARE AND SPECIAL TOPICS IN TBI (continued)			
15:20 - 15:50	Advances in Neuroimaging in TBI		Schiff, S	
15:50 - 16:20	Rehabilitation in TBI		Zacko, C	
16:20 - 16:50	Future of TBI Research		Bullock, R	
16:50 - 17:00	Wrap-Up and Announcements		Timmons, S	
17:00 - 18:00	Reception and Networking			

Day2

Sunday, January 28, 2018 - 07:00 - 12:00 - (includes breaks, travel-time and meals)

Schedule	Title	Moderator	Faculty	Room
07:00 - 08:00	Breakfast			
08:00 - 09:50	SPINAL COLUMN AND SPINAL CORD INJURY, PERIPHERAL NERVE INJURY			
08:00 - 08:10	Welcome and Announcements		Zacko, C	
08:10 - 08:40	Management of Acute Peripheral Nerve Injury		Harbaugh, K	
08:40 - 09:00	Cervical Spinal Column Injury		Harrop, J	
09:00 - 09:15	Case-Based Discussions		Harrop, J	
09:15 - 09:35	Thoracolumbar Column Injury		Welch, W	
09:35 - 09:50	Case-Based Discussions		Welch, W	
09:50 - 10:10	Break and Networking			
10:10 - 12:00	SPINAL COLUMN AND SPINAL CORD INJURY, PERIPHERAL NERVE INJURY (continued)			
10:10 - 10:30	Spinal Cord Injury Management		Jallo, J	
10:30 - 10:45	Case-Based Discussions		Jallo, J	
10:45 - 11:05	Blunt Vascular Injury		Timmons, S	
11:05 - 11:20	Case-Based Discussions		Timmons, S	
11:20 - 11:50	Future of Spinal Cord Injury Research		Okonkwo, D	
11:50 - 12:00	Closing Comments and Adjournment		Zacko, C	
12:00 - 12:00	Boxed Lunches Provided			

Hotel And Travel Information

The Venue: The Hotel Hershey and Local Attractions

The Hotel Hershey <http://www.thehotelhershey.com/overview.php> is one of the finest Historic Hotels of America. Known for its refined elegance, signature service, and abundant amenities, The Hotel Hershey is a one-of-a-kind destination. It is situated high atop the town of Hershey and has 276 guest rooms, including 48 cottages, as well as 25,000 square feet of meeting and function space. The 1930s hotel is a recipient of both the Forbes Four-Star Award and the AAA Four-Diamond Award. The Hotel Hershey is also one of The Official Resorts of HersheyPark, which is located on an adjacent property.

Getting There: Planes, Trains, and Automobiles

Planes

The Hershey area is serviced by the Harrisburg International Airport (MDT) <http://www.flyhia.com/> in Middletown, PA, [https://www.google.com/maps/place/Harrisburg+International+Airport+\(MDT\)/@40.1952906,-76.7624576,16z/data=!4m5!3m4!1s0x89c8be20907790df:0x35bf2b1592c226fa8m2!3d40.1942375!4d-76.7576672](https://www.google.com/maps/place/Harrisburg+International+Airport+(MDT)/@40.1952906,-76.7624576,16z/data=!4m5!3m4!1s0x89c8be20907790df:0x35bf2b1592c226fa8m2!3d40.1942375!4d-76.7576672) just 20 minutes from the course venue at the Hotel Hershey.

The following rental car outlets are located at the airport: Alamo, Avis, Enterprise. Taxi cab service to the hotel from the airport is also available.

Direct flights from 12 cities and major airline hubs are available: Philadelphia, Pittsburgh, Washington (Dulles), Chicago, Detroit, Toronto, Boston, Atlanta, Charlotte, Orlando, St. Petersburg, and Punta Gorda.

Trains

Attendees can access the area by train, arriving at the Harrisburg (25 minutes), Middletown (20 minutes) or Elizabethtown stations (25 minutes). Direct train routes are available from the entire eastern seaboard, including convenient access from Philadelphia, Baltimore, Washington, D.C., New Jersey, New York City, Boston, and Pittsburgh, including Amtrak express and local lines via Keystone service to Harrisburg, Middletown, and Elizabethtown, with multiple daily arrivals. https://www.amtrak.com/home?&utm_source=google&utm_medium=cpc&utm_term=amtrak&utm_campaign=Amtrak%7CBrand%7CDC&utm_content=sQoaUr8ay!dc_pcrld_1150656932541&WT.mc_t=Amtrak%7CBrand%7CDC&WT.mc_n=google|amtrak&WT.mc_r=365&buf=999&WT.srch=1&CMP=search_brand

The Middletown train station is an unstaffed open platform with a shelter, and the Elizabethtown station has a station building with waiting room. Open free parking is available at both.

Automobiles

By car, the hotel is easily approached by numerous major thoroughfares, including Interstate 81, Interstate 83, Interstate 76 (Pennsylvania Turnpike), and PA Highways 15 and 283.

Ample free parking is available in open lots immediately adjacent to buildings on the grounds of the Hotel Hershey.

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Off-Label / Experimental Discussions:

Some medical devices used for teaching purposes and/or discussed in AO North America's educational activities may have been cleared by the FDA for specific uses only or may not yet be approved for any purpose. Faculty may discuss off-label, investigational, or experimental uses of products/devices in CME certified educational activities. Faculty have been advised that all recommendations involving clinical medicine in this CME activity are based on evidence that is accepted within the profession of medicine as adequate justification for their indications and contraindications in the care of patients.

All scientific research referred to, reported or used in this CME activity in support or justification of a patient care recommendation conforms to the generally accepted standards of experimental design, data collection and analysis.

Disclaimer:

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Acknowledgment

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