

# 15<sup>TH</sup> ANNUAL SAFAR SYMPOSIUM MAY 22<sup>ND</sup>-23<sup>RD</sup>

**PEDIATRIC NEUROANESTHESIA, NEUROCRITICAL  
CARE, RESUSCITATION AND REHABILITATION:  
ALL ROADS LEAD TO THE CNS**

**IMPROVING PEDIATRIC PATIENT SAFETY  
THROUGH SIMULATION**



Peter & Eva Safar Lecturer:  
Donna M. Ferriero, MD, MSc

"The Vulnerable Newborn Brain:  
Lessons from Neuroimaging"



**SAFAR CENTER FOR  
RESUSCITATION RESEARCH**  
UNIVERSITY OF PITTSBURGH

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# 15<sup>th</sup> Annual Safar Symposium

May 22, 2017

**Rangos Research Auditorium, 3<sup>rd</sup> floor,  
Children's Hospital of Pittsburgh of UPMC**

- 7:30                      Registration
- 8:00 – 11:45      PEDIATRIC NEUROANESTHESIA,  
NEUROCRITICAL CARE, RESUSCITATION AND  
REHABILITATION: ALL ROADS LEAD TO THE  
CNS**
- Moderators:**    **C. Edward Dixon, PhD**  
Neurotrauma Chair in Neurosurgery  
Vice Chair of Research  
Director, Brain Trauma Research Center  
Professor of Neurological Surgery  
University of Pittsburgh
- Dennis Simon, MD**  
Assistant Professor, Critical Care Medicine  
Director, Neurocritical Care Service  
Associate Director, Pediatric Critical Care Fellowship  
Training Program  
Children's Hospital of Pittsburgh of UPMC
- 8:00 – 8:15      Opening Comments**  
**Patrick M. Kochanek, MD, MCCM**  
Grenvik Professor and Vice Chair, Department of Critical  
Care Medicine, Director, Safar Center for Resuscitation  
Research, University of Pittsburgh School of Medicine
- 8:15 – 8:40      Michael J. Bell, MD**  
Professor, Pediatrics  
Chief, Pediatric Critical Care Medicine, Children's National  
Medical Center, Washington, DC  
***The Approaches and Decisions for Acute Pediatric TBI  
(ADAPT) Trial – Lessons Learned So Far***
- 8:40 – 8:45      Discussion**

8:45 – 9:10	<b>Brad Kurowski, MD, MS</b> Associate Professor Director, Brain Injury Rehabilitation Program Division of Physical Medicine and Rehabilitation Cincinnati Children's Hospital Medical Center Department of Pediatrics and Neurology and Rehabilitation Medicine, University of Cincinnati College of Medicine <i><b>Pediatric Traumatic Brain Injury – Beyond Acute Care</b></i>	11:00 – 11:25	<b>Chris Horvat, MD</b> T-32 Postdoctoral Scholar, Safar Center for Resuscitation Research; Clinical Instructor, Pediatric Critical Care Medicine, Children's Hospital of Pittsburgh of UPMC <i><b>Leveraging Electronic Health Record Data to Reshape and Personalize Pediatric Neurocritical Care</b></i>
9:10 – 9:15	Discussion	11:25 – 11:30	Discussion
9:15 – 9:40	<b>Richard J. Levy, MD, FAAP</b> Vice Chair for Pediatric Laboratory Research Department of Anesthesiology Professor of Anesthesiology and Pediatrics Columbia University Medical Center <i><b>Anesthesia-induced Neurotoxicity: Mechanism Looking for a Disease or Public Health Issue?</b></i>	11:30 – 11:45	<b>Nancy Caroline Award Presentation and Morning Session Closing Remarks</b> <b>Patrick M. Kochanek, MD, MCCM</b>
9:40 – 9:45	Discussion	11:45 – 12:00	BREAK
9:45 – 10:00	BREAK	12:00 – 1:00	37 <sup>th</sup> Peter & Eva Safar Annual Lectureship in Medical Sciences and Humanities <b>Donna M. Ferriero, MD, MSc</b> W.H. & Marie Wattis Distinguished Professor & Chair, Department of Pediatrics; Physician-in-Chief UCSF Benioff Children's Hospital, San Francisco, CA <i><b>The Vulnerable Newborn Brain: Lessons from Neuroimaging</b></i>
10:00 – 10:25	<b>Mioara D. Manole, MD</b> Director, Basic and Translational Research, Division of Pediatric Emergency Medicine, Children's Hospital of Pittsburgh of UPMC Associate Professor of Pediatric, University of Pittsburgh School of Medicine <i><b>Cerebral Blood Flow –Shining a New Light on an Old Target in Cerebral Resuscitation</b></i>	1:00 – 1:45	Reception
10:25 – 10:30	Discussion		
10:30 – 10:55	<b>Travis C. Jackson, PhD</b> Research Assistant Professor, Department of Critical Care Medicine; Associate Director, Cell Signaling, Safar Center for Resuscitation Research, University of Pittsburgh School of Medicine <i><b>RBM3, Hypothermia and Cerebral Resuscitation – Why Age Might Matter</b></i>		
10:55 – 11:00	Discussion		

## The 37<sup>th</sup> Peter and Eva Safar Annual Lectureship in Medical Sciences and Humanities

Guest Speaker: **Donna M. Ferriero, MD, MSc**  
W.H. & Marie Wattis Distinguished Professor &  
Chair, Department of Pediatrics; Physician-in-Chief  
UCSF Benioff Children's Hospital, San Francisco,  
CA

Topic: The Vulnerable Newborn Brain: Lessons from  
Neuroimaging



**Donna Ferriero, MD MSc** is the W. H. and Marie Wattis Distinguished Professor of Pediatrics and Chair of the Department of Pediatrics and Physician-in-Chief of the UCSF Benioff Children's Hospital. She is also a Professor of Neurology and a member of the Biomedical Sciences Graduate Program. Dr.

Ferriero is Director of the Neonatal Brain Disorder Laboratories and co-director of the Newborn Brain Research Institute at UCSF. Her laboratory has been critical in defining the relationship of selectively vulnerable populations of neural cells during maturation-dependent injury. She received the UCSF Chancellor's Award for the Advancement of Women and the Maureen Andrew Mentor Award from the Society for Pediatric Research. She is Past-President of the Child Neurology Society the American Pediatric Society. She is the recipient of the 2000 Sydney Carter Award for excellence and leadership in Child Neurology, and was elected to the Institute of Medicine of the National Academy of Sciences in 2005. She received the Royer Award for Excellence in Academic Neurology in 2007 and the Willis Lecture for outstanding contributions to stroke research in 2010. She was elected to the Association of American Physicians in 2011 and to the American Academy of Arts and Sciences in 2013.

## Multi-Departmental Trainees' Research Day May 22, 2017

**Rangos Research Auditorium, 3<sup>rd</sup> floor,  
Children's Hospital of Pittsburgh of UPMC**

1:00 – 1:45	Registration and Poster Setup
2:00 – 2:05	<b>Opening Comments</b> <b>Patrick M. Kochanek, MD, MSc</b> Grenvik Professor and Vice Chair, Dept. Critical Care Medicine; Director, Safar Center for Resuscitation Research
2:05 – 3:20	Poster Session
3:20 – 3:30	BREAK
3:30 – 4:45	Oral Presentations
<b>Moderators:</b>	<b>Clifton Callaway, MD, PhD</b> Professor & Executive Vice Chair. Emergency Medicine, UPMC
	<b>Yan Xu, PhD</b> Professor & Vice Chair for Basic Sciences, Dept. of Anesthesiology, Univ. of Pittsburgh School of Medicine

### Department of Anesthesiology

**Joel Aldo Caporoso, PhD**

*Two-Plate Thermal Preference Test of Novel Glycine Receptor Specific Analgesics in Mus musculus*

### Department of Critical Care Medicine

**Elizabeth M. Kenny, BS**

*Suppression of Ferroptosis through Lipoxigenase Inhibition Confers Neuroprotection following Traumatic Brain Injury*

### Department of Emergency Medicine

**Harmony Yourish, BS**

*The Effect of Neurological Status and Maintenance Cooling Method on Time Spent Outside of Targeted Temperature Range and Magnitude of Deviation from the Target Temperature in Post-Cardiac Arrest Patients*

### Department of Neurological Surgery

**Shaun W. Carlson, PhD**

*Synaptic Formation of Alpha Synuclein Aggregates Acutely Following Experimental Traumatic Brain Injury*

### Department of Physical Medicine & Rehabilitation

**Anna Iouchmanov**

*Detrimental Effects of Traumatic Brain Injury on Attentional Set-Shifting Behavior in Female Rats*

4:45 – 5:15	Judges Meeting
5:15 – 5:30	<b><u>Awards Presentation</u></b>

# 15<sup>th</sup> Annual Safar Symposium

May 23, 2017

**WISER, 230 McKee Place, Suite 300**

8:00 – 8:30	Registration	9:45 – 10:10	<b>Ashley Keilman, MD</b> Pediatric Emergency Medicine Fellow, Children’s Hospital of Pittsburgh of UPMC <i>The Impact of In-Situ Simulation on Provider Knowledge Retention for Pediatric Sepsis Management</i>
8:30 – 11:30	<b>IMPROVING PEDIATRIC PATIENT SAFETY THROUGH SIMULATION</b>	10:10 – 10:15	Discussion
<b>Moderators:</b>	<b>Deborah Farkas, PhD</b> Director, Educational Development, Winter Institute for Simulation, Education and Research (WISER), University of Pittsburgh  <b>John M. O’Donnell, CRNA, MSN, DrPh</b> Professor and Chair, Department of Nurse Anesthesia Director, Nurse Anesthesia Program, University of Pittsburgh School of Nursing, Associate Director, WISER	10:15 – 10:40	<b>Candace Hipple, MSN, CRNA</b> Nurse Anesthetist, Department of Anesthesiology, Children’s Hospital of Pittsburgh of UPMC and <b>Aleena Rorapough, SRNA, BSN</b> Student in the Master of Nurse Anesthesia program, University of Pittsburgh <i>Side of the Simulation Coin</i>
8:30 – 8:55	<b>Marc Auerbach, MD, MSci</b> Associate Professor of Pediatrics and Emergency Medicine, Director, Pediatric Simulation, Yale University School of Medicine <i>Maximizing the Impact of Simulation-based Research on Patient Outcomes through Collaboration</i>	10:40 – 10:45	Discussion
8:55 – 9:00	Discussion	10:45 – 11:10	<b>John M. O’Donnell, CRNA, MSN, DrPh</b> Professor and Chair, Department of Nurse Anesthesia Director, Nurse Anesthesia Program University of Pittsburgh School of Nursing Associate Director, Winter Institute for Simulation, Education and Research (WISER) <i>Enabling Research in Simulation Education Through Process and Technologies</i>
9:00 – 9:25	<b>Melinda Fiedor Hamilton, MD, MSc, FAHA</b> Associate Professor of Critical Care Medicine & Pediatrics Director, Pediatric Critical Care Med. Fellowship Program Children’s Hospital of Pittsburgh of UPMC Director, Pediatric Simulation Children’s Hospital of Pittsburgh Simulation Center and Peter M. Winter Institute for Simulation, Education, and Research (WISER) <i>Pediatric Critical Care Communication Course – Utilizing Simulation for Difficult Conversations</i>	11:10 – 11:15	Discussion
9:25 – 9:30	Discussion	10:45 – 11:00	Closing Comments
9:30 – 9:45	BREAK	11:00	Adjournment



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## May 22, 2017

### Pediatric Neuroanesthesia, Neurocritical Care, Resuscitation and Rehabilitation: All Roads Lead to the CNS



**Dr. Michael J. Bell** is Professor of Pediatrics and Chief of Pediatric Critical Care Medicine at Children's National Medical Center, Washington, DC. Dr. Bell is a nationally recognized leader in the fields of pediatric neurocritical care and pediatric neurotrauma. Among his many accomplishments, he is the Principal Investigator of the highly acclaimed Approaches and Decisions for Acute Pediatric TBI (ADAPT) Trial – which represents the first

comparative effectiveness trial in the field of severe traumatic brain injury in children. The ADAPT trial, funded by NINDS, completed enrollment of 1,000 infants and children with severe traumatic brain injury ahead of schedule and is now in the analysis phase. Dr. Bell has a long track record of funding from the NIH, including developing and/or participating in most of the highest impact studies in the field of pediatric TBI in the past decade. He also has an extensive publication record in the peer-reviewed literature and has contributed to many of the major textbooks in the field on the topics of both TBI and neurocritical care. Dr. Bell was also one of the authors of the most recent edition of the Guidelines for the Management of Severe Brain Injury in Children.



**Dr. Brad Kurowski**, received his undergraduate and graduate degrees from the University of Massachusetts, Amherst and his medical degree from Case Western Reserve University School of Medicine. Subsequently, Dr. Kurowski completed residency in Physical Medicine and Rehabilitation (PM&R) at the University of Pittsburgh Medical Center and fellowship training in Pediatric Rehabilitation Medicine at Cincinnati Children's Hospital Medical Center (CCHMC) and clinical

research at the University of Cincinnati College of Medicine. Dr. Kurowski is a rehabilitation physician with expertise and American Board of Medical Specialties certification in Brain Injury Medicine and Pediatric Rehabilitation

Medicine. The overall goal of his clinical and research pursuits is to develop individualized management approaches for pediatric brain injury. His research is focused on two broad areas: (1) characterizing a biopsychosocial model of recovery through understanding individual, injury-related, and socio-environmental factors associated with recovery and functioning and (2) optimizing management approaches through understanding the influence of medical and rehabilitation treatments on physiologic and clinical recovery. As a rehabilitation physician, he is interested in how medical, behavioral, physical therapy, and other interventions, individually and in combination, can be used to facilitate short and long-term recovery after brain injury. Dr. Kurowski also participates as a question writer for the American Board of Physical Medicine and Rehabilitation Brain Injury Medicine examination and is a consultant for the Center for Disease Control (CDC) as the lead medical writer for a report to congress on management of pediatric brain injury. Currently, Dr. Kurowski is an associate professor and director of brain injury rehabilitation programs in the Division of Physical Medicine and Rehabilitation at Cincinnati Children's Hospital Medical Center within the Departments of Pediatrics and Neurology and Rehabilitation Medicine at the University of Cincinnati College of Medicine.



**Dr. Richard J. Levy, MD, FAAP** is Professor of Anesthesiology and Pediatrics and Vice Chair for Pediatric Laboratory Research in the Department of Anesthesiology at Columbia University Medical Center. He is board certified in Anesthesiology, Pediatric Anesthesiology, Pediatrics, and Pediatric Critical Care Medicine. Dr. Levy completed his Pediatrics Residency at The Children's Hospital of

Philadelphia (CHOP) and his Anesthesiology Residency at the University of Pennsylvania. Subsequently, he completed fellowships in Pediatric Anesthesia/Cardiac Anesthesia and Pediatric Critical Care Medicine at CHOP. As a trainee on an NIH-Institutional Training Grant (T32) and subsequent PI on an NIH-mentored clinical scientist development award (K08), his initial area of investigation focused on acquired mitochondrial dysfunction in the murine septic heart and his lab identified several novel therapeutic interventions targeting sepsis-induced myocardial depression, resulting in two patent applications. Over the last few years, he has focused his investigation on the effect of different environmental exposures on the developing brain. His lab is interested in the natural process of developmental neuronal apoptosis, the neurotoxic effect of anesthetics, and the anti-apoptotic effects of carbon monoxide. He is currently funded by the NIH/NIGMS with an R01 grant to evaluate the protective effect of sub-clinical carbon monoxide offsetting the pro-apoptotic effect of anesthesia in newborn mice. Dr. Levy is also interested in the gene-environment model of

autism. He is currently evaluating the interaction between carbon monoxide and Fragile X mental retardation protein expression. Using a well-accepted animal model of Fragile X Syndrome, Dr. Levy is researching the potential for carbon monoxide exposure to elicit the autistic phenotype in genetically predisposed mice. Related to this work, he has received funding from FRAXA to develop a novel, clinically relevant therapy to treat Fragile X and is currently funded by the NIEHS Center for Environmental Health in Northern Manhattan. He has published over 60 original manuscripts, is an associate editor for *Survey of Anesthesiology*, and regular reviewer for *Critical Care Medicine*, *Anesthesia & Analgesia*, the *World Journal for Pediatric and Congenital Heart Surgery*, and the *American Journal of Physiology*. Dr. Levy has also served as an *ad hoc* reviewer for *Science*, *Nature Medicine*, *Nature Reviews Cardiology*, and *PLOS One*. In addition, he is a member of the Society of Pediatric Anesthesiology Grant Review Committee and is a grant reviewer for the FAER Medical Student Year Long Fellowship program.



**Dr. Mioara Manole** is Associate Professor of Pediatric Emergency Medicine at Children's Hospital of Pittsburgh and Associate Director of the Safar Center for Resuscitation Research. She completed a clinical fellowship in Pediatric Emergency Medicine at the University of Pittsburgh in 2006 and a research fellowship in Neurointensive Care and Resuscitation Research at the Safar Center for Resuscitation Research in 2008. Her long term career goal is to reduce secondary neuronal injury and improve outcome after pediatric cardiac arrest by using dual neuronal and vascular targeted therapies. Her NIH-funded laboratory studies neurovascular dysregulation after global ischemia in a developmental rat model, using the novel techniques of *in vivo* multiphoton microscopy, optical imaging, and arterial spin labeling magnetic resonance imaging. Using this model, her laboratory showed for the first time that cerebral blood flow disturbances after pediatric cardiac arrest are region-specific, with cortical hypoperfusion and subcortical hyperemia. Her laboratory detailed the alterations in cortical microvascular perfusion post-CA and described *in vivo* the capillary no-reflow phenomenon. Dr. Manole's work is published in various specialty journals, including *Journal of Cerebral Blood Flow and Metabolism*, *Pediatric Research*, *Academic Emergency Medicine*, and *Microvascular Research*.



**Dr. Travis C. Jackson** is Research Assistant Professor in Department of Critical Care Medicine at University of Pittsburgh, and Associate Director, Cell Signaling, at Safar Center for Resuscitation Research (SCRR). He completed his undergraduate work in neuroscience at University of Pittsburgh in 2005. He then earned his doctorate in biomedical science in 2010 from Department of Neuroscience at University of Florida in Gainesville. Returning to Pittsburgh, he completed his postdoctoral work at Safar Center.

Dr. Jackson's laboratory specializes in molecular (e.g. lentivirus and transgenic KO mice) as well as pharmacological tools to elucidate novel cell death signaling mechanisms contributing to neuropathology after a brain injury. His work utilizes both *in vitro* and *in vivo* models of traumatic brain injury (TBI). A chief focus of his current research is to elucidate the functional consequence of changes in the levels of RNA binding motif (RBM) proteins after injury; RBMs are master regulators of RNA homeostasis in the brain. Dr. Jackson is currently investigating RBM3, which is a major cold shock protein in mammals and mediates hypothermia induced neuroprotection. He is also investigating RBM5, which is a novel pro-death protein in brain that promotes neuronal death by altering gene expression as well as exon splicing. Dr. Jackson is currently funded by the American Heart Association and by the National Institutes of Health.



**Dr. Chris Horvat** is originally from Ontario, Canada. He earned his undergraduate and medical degrees at the University of North Carolina at Chapel Hill, then moved west to Seattle, WA, for residency in General Pediatrics. Dr. Horvat completed a fellowship in Pediatric Critical Care Medicine at the Children's Hospital of Pittsburgh of UPMC, where he served as Chief Fellow. He is currently a T-32 fellow at the Safar Center. His research interests include evaluation of pharmacogenomics-based sedation strategies and electronic predictors of impending deterioration.

# 15<sup>th</sup> Annual Safar Symposium

May 23, 2017

## IMPROVING PEDIATRIC PATIENT SAFETY THROUGH SIMULATION



**Dr. Marc Auerbach** is an Associate Professor of Pediatric and Emergency Medicine at Yale School of Medicine. His research involves using technology and innovative techniques, such as simulation, to improve the quality and safety of care through work at the levels of: individual providers, teams of providers, and teams of providers working within complex systems. Three major themes include 1) the creation of effective simulation- based training interventions, 2) the use of simulation as an investigative methodology, 3) improving the quality of pediatric trauma and resuscitative care outside of children's hospitals. Specific areas of focus in Marc's work include pediatric procedural training and pediatric resuscitation (trauma/medical). He is the co-PI on the CT EMSC State Partnership Grant, the Director of Pediatric Simulation at Yale Center for Medical Simulation and the Associate Medical Director of Trauma at Yale New Haven Children's Hospital. Marc is the immediate past chair of INSPIRE (International Network for Simulation-based Pediatric Innovation Research and Education), the largest simulation based research network in the world. He has held numerous local and regional leadership positions. His national leadership positions include the board of the International Pediatric Simulation Society, chairing the Pediatric Academic Society's Special Interest Group on Simulation-Based Research, chairing the Pediatric Trauma Society Guidelines Committee and the multiple roles in the Society for Simulation in Healthcare.



**Dr. Melinda Fiedor Hamilton** has been at Children's Hospital of Pittsburgh of UPMC since 2000, first as a pediatric critical care medicine trainee and now as an Associate Professor of Critical Care Medicine and Pediatrics. She is the director of the Pediatric Simulation Center of Children's Hospital of Pittsburgh of UPMC since its opening in 2005, and in addition she is also an associate director at the Peter M. Winter Institute for Simulation, Education, and Research (WISER). Dr. Hamilton received a master's degree in medical education from the University of Pittsburgh in 2005, and has been involved

with education and simulation research via the Educators in Pediatric Intensive Care (EPIC) and Improving Pediatric Acute Care through Simulation (ImPACTS) networks. In addition, she is a volunteer committee member of the American Heart Association Education, Pediatric, and Education and Scientific Program committees for nearly 10 years, helping to create AHA curricula and products. Dr. Hamilton is the program director for the Pediatric Critical Care Medicine Fellowship Program and is interested in graduate medical education faculty and trainee development. Finally, Dr. Hamilton is the director for the Children's Hospital of Pittsburgh of UPMC in house crisis response team.



**Dr. Ashley Keilman** is a Pediatric Emergency Medicine Fellow at the Children's Hospital of Pittsburgh of UPMC. She developed her interest in simulation as an educational and clinical research tool during her residency at Seattle Children's Hospital. As a fellow she has developed a simulation facilitation and debriefing curriculum for her co-fellows, conducts simulation sessions for trainees rotating through the Emergency Department, assists with pediatric simulation courses for residents at WISER and is involved in an outreach effort to use simulation as a tool to partner with community referral hospitals in Western Pennsylvania.



**Candace Hipple, MSN, CRNA** graduated with her Bachelor of Science in Nursing from Bloomsburg University. She then worked in the Pediatric ICU for three years at Children's Hospital of Pittsburgh before completing her Master's Degree in Nurse Anesthesia from the University of Pittsburgh in December 2012. She has worked at Children's Hospital of Pittsburgh for the last 4.5 years and loves caring for the pediatric population. She is the clinical co-coordinator for the University of Pittsburgh's Nurse Anesthesia program and assists in the pediatric WISER simulation for the Student Nurse Anesthetists as part of this role. She enjoys cooking, gardening, and traveling with her husband, Ryan.





***Aleena Rorapaugh, SRNA, BSN*** is a student in the Master of Nurse Anesthesia Program at the University of Pittsburgh, scheduled to graduate in December 2017. She has a B.A. in history obtained in 2008 from Wittenberg University. Afterwards, she joined Teach for America and taught elementary school in Houston, TX. She then attended Johns Hopkins University where she graduated with a B.S. in nursing

as part of their accelerated program in 2012. Following her graduation, she worked as a registered nurse in the medical surgical intensive care unit at Pinnacle Health Harrisburg Hospital where she was a member of their education committee and co-chair of their Nurse Practice Council. In her free time she enjoys reading and traveling the world and recently returned from a clinical rotation in Siem Reap Cambodia at Angkor Hospital for Children.



***John O'Donnell, CRNA, MSN, DrPh*** has been active in healthcare education for more than 25 years and has mentored students from undergraduate through post-graduate education. He is a member of the graduate faculty of the University of Pittsburgh and since 1994 has been involved in education and research in the area of use of simulation educational methodologies. Dr. O'Donnell continues to teach and practice in this area. He serves as the Associate Director of the

Winter Institute for Simulation Education and Research (WISER) and is Professor and Chair of the Department of Nurse Anesthesia at the University of Pittsburgh.

## UPMC Center for Continuing Education in the Health Sciences

### Program Overview

The Safar Symposium is a two-day multi-departmental research conference held jointly by the Safar Center for Resuscitation Research and the Peter M. Winter Institute for Simulation Education and Research (WISER) in the University of Pittsburgh School of Medicine. The 1<sup>st</sup> day, and only CME accredited of the Symposium will feature a block of lectures titled *Pediatric Neuroanesthesia, Neurocritical Care, Resuscitation and Rehabilitation: All Roads Lead to the CNS* presented by national authorities. The Peter & Eva Safar Annual Lectureship in Medical Sciences and Humanities will follow at noon, presented by Donna M. Ferriero, MD, MSc, the W. H. and Marie Wattis Distinguished Professor of Pediatrics and Chair of the Department of Pediatrics and Physician-in-Chief of the UCSF Benioff Children's Hospital. The 1<sup>st</sup> day of the Symposium will close with the Multi-departmental Trainees' Research Day, with poster and oral presentations by trainees from the Departments of Anesthesiology, Critical Care Medicine, Emergency Medicine, Neurological Surgery, and Physical Medicine and Rehabilitation.

### Learning Objectives

1. To identify novel clinical trial designs for the field of pediatric neurocritical care.
2. To understand the current approach to rehabilitation of infants and children with acute brain injury.
3. To recognize the potential neurodevelopmental consequences of anesthetics and sedatives in the ICU.
4. To become familiar with new approaches to improve cerebral perfusion after acute brain injury.
5. To understand the molecular effects of targeted temperature management in infants and children.
6. To recognize the emerging role of big data in understanding and optimizing pediatric neurocritical care.
7. To learn about the current status of neonatal neurocritical care.

### Target Audience

The target audience is clinical practitioners in the fields of Critical Care Medicine, Anesthesiology, Physical Medicine and Rehabilitation, Neurosurgery, Neurology, Emergency Medicine, Surgery, Trauma Specialists. In addition, the program is relevant to allied care givers such as nurses, respiratory therapists, and pharmacists.

### CME Accreditation and Designation Statement

The University of Pittsburgh School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The University of Pittsburgh School of Medicine designates this live activity for a maximum of 4.5 **AMA PRA Category 1 Credits™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Other health care professionals are awarded 0.4 continuing education units (CEU's) which are equal to 4.5 contact hours.

### Disclaimer Statement

The information presented at this CME program represents the views and opinions of the individual presenters, and does not constitute the opinion or endorsement of, or promotion by, the UPMC Center for Continuing Education in the Health Sciences, UPMC / University of Pittsburgh Medical Center or Affiliates and University of Pittsburgh School of Medicine. Reasonable efforts have been taken intending for educational subject matter to be presented in a balanced, unbiased fashion and in compliance with regulatory requirements. However, each program attendee must always use his/her own personal and professional judgment when considering further application of this information, particularly as it may relate to patient diagnostic or treatment decisions including, without limitation, FDA-approved uses and any off-label uses.

### Faculty Disclosure:

All individuals in a position to control the content of this education activity including members of the planning committee, speakers, presenters, authors, and/or content reviewers have disclosed all relevant financial relationships with any proprietary entity producing, marketing, re-selling, or distributing health care goods or services, used on, or consumed by, patients.

The following relevant financial relationships were disclosed:

Michael Bell, MD, disclosed that he has research support from NIH Grant: NIH NS 081841.

Travis C. Jackson, PhD, disclosed that he has research support from NIH grant: R21NS098057, and that he has put in PCT Patent Application # 62/164,205.

Paul E. Phrampus, MD, has disclosed that he is a Consultant-Principle at Pittsburgh Simulation Strategies, LLC.

No other planners, members of the planning committee, speakers, presenters, authors, content reviewers and/or anyone else in a position to control the content of this education activity have relevant financial relationships to disclose.