4th Annual Meeting of the American Delirium Society

*Delirium: From Molecules to Clinical Implementation*
Scientific Presentations

Scientific Session #1: Risk Factors and Pathogenesis of Delirium

“Decreased Functional Connectivity and Loss of Small World Topology in the EEG of Postoperative Patients with Delirium”
Arjen J. Slooter, MD, PhD; Arendina van der Kooi, MSc; Edwin van Dellen, MD, PhD; Francina Klijn, MD; Huiberdina L. Koek, MD, PhD; Marc Buijsrogge, MD, PhD; Tianne Numan, MSc; Cornelis Stam, MD, PhD

Loss of alpha band functional connectivity and more random functional networks characterize the EEG during delirium. These findings may explain why information processing is less efficient in delirium.

“Delirium Risk Factors in Older Emergency Department Patients”
Jin H. Han, MD, MSc; Amanda Wilson, MD; Donna Jones, EMT; John F. Schnelle, PhD; Robert S. Dittus, MD, MPH; E. Wesley Ely, MD, MPH

Older ED patients with poorer functional status at higher odds for delirium. The relationship between severity of illness and delirium, however, is modified by the presence of dementia demonstrating the important interplay between patient vulnerability to and precipitating factors for delirium.

“Development and Validation of Daily Acute Brain Dysfunction Prediction Model in the Intensive Care Unit”
Eduard E. Vasilevskis, MD, Pratik Pandharipande, MD, MSCI, Matthew Shotwell, PhD, Timothy Girard, MD, MSCI, Ayumi Shintani, MPH, PhD and E. Wesley Ely, MD, MPH

A dynamic transition model successfully predicts cognitive states for each ICU day while simultaneously accounting for ICU discharge and death. Future applications of the daily acute brain dysfunction prediction model should confirm its validity and assess its value in cognitive outcome surveillance.
Scientific Presentations

Scientific Session #1: Risk Factors and Pathogenesis of Delirium (cont)

“Does Apolipoprotein E Genotype Increase Risk of Postoperative Delirium?”
Sarinnapha Vasunilashorn, PhD; Long Ngo, PhD; Sharon Inouye, MD, MPH; Edward Marcantonio, MD, SM.

Our findings indicate that ApoE genotype does not confer risk or protection in the development of postoperative delirium. Thus in the non-demented older surgical population, an important risk factor for AD does not affect risk of delirium.

“Benzodiazepine Administration and the Association with Delirium in the ICU: A Prospective Cohort Study”
I.J. Zaal, MD; J.W. Devlin, PharmD; A.W. van der Kooi, MSc; P.M.C. Klein Klouwenberg, MD, PharmD; M. Hazelbag, MSc; David Ong, MD, PharmD; Rolf Groenwold, MD, PhD; Arjen Slooter, MD, PhD

BZ use appears not to be a risk factor for transitioning to delirium when administered as boluses. Although when BZs are administered continuously the risk for becoming delirious the next day increases, this increase is far smaller than that suggested in prior studies and its clinical relevance remains unknown.

“Subtypes of Delirium during Critical Illness as Predictors of Long-Term Cognitive Impairment.”
TD Girard, PP Pandharipande, JC Jackson, A Morandi, JL Thompson, AK Shintani, GR Bernard, RS Dittus, and EW Ely for the BRAIN-ICU Study Investigators

Whether diagnosed in the setting of sepsis, hypoxia, or sedation, duration of delirium independently predicts long-term cognitive impairment after critical illness. Future studies are needed to determine if mechanisms of cognitive impairment differ in various subtypes of delirium.
Scientific Presentation #2: Delirium Assessment and Outcomes

“Duration of Subsyndromal Delirium, Institutionalization, Mortality and Cognitive Impairment Following Critical Illness”
NE Brummel, PP Pandharipande, TD Girard, JC Jackson, JL Thompson, R Chandrasekhar, CG Hughes, AJ Graves and EW Ely

SSD is pervasive among critically ill patients and its duration independently predictive of institutionalization. Our mortality findings corroborate those from a prior ICU population, but stand in contrast to those in non-ICU populations, where SSD predicts long-term cognitive impairment.

“Preventing ICU Subsyndromal Delirium Conversion to Delirium with Low Dose IV Haloperidol: A Double-Blind, Placebo-Controlled Pilot Study”
Nada S. Al-Qadheeb, PharmD; Yoanna Skrobik, MD; Greg Schumaker, MD; Manuel Pacheco, MD; Russel Roberts, PharmD; Robin Ruthazer, PharmD; John W Devlin, PharmD

The results from this randomized, double-blind, placebo-controlled, pilot study suggest that prophylactic haloperidol may not prevent delirium in mechanically-ventilated, critically ill adults with subsyndromal delirium and who are at high risk for developing delirium.

“Parecoxib Supplemental Morphine Analgesia Decreases the Incidence of Postoperative Delirium in Elderly Patients after Joint Replacement Surgery: A Randomized Control Trial”
Dong-Xin Wang, MD, PhD; Dong-Liang Mu, MD; Da-Zhi Zhang, MD; Geng Wang, MD; Chun-Jing Li, MD

When administered as an adjuvant drug to intravenous morphine analgesia, parecoxib significantly decreased the incidence of delirium and attenuated cognitive decline in elderly patients after total joint arthroplasty.
Scientific Presentations

Scientific Presentation #2: Delirium Assessment and Outcomes (cont)

“Detection and Prevention of Delirium Among Home-Dwelling Older Adults After Recent Hospitalization or Acute Illness: A Randomized Controlled Pilot Study”
H. Verloo, C. Goulet, D. Morin, A. von Gunten

Nursing intervention strategy to detect/prevent delirium appears to be effective but a larger clinical study is needed to confirm these preliminary findings.

“Co-occurrence of and Remission from General Anxiety, Depression, and Post Traumatic Stress Disorder Symptoms after Acute Lung Injury: A 2-year Longitudinal Study”
O. Joseph Bienvenu, MD, PhD; Elizabeth Colantuoni, PhD; Pedro A. Mendez-Tellez, MD; Carl Shanboltz, MD; Cheryl R. Dennison-Himmelfarb, RN, PhD; Peter J. Pronovost, MD, PhD; Dale M. Needham, MD, PhD

All survivors experience a full spectrum of co-occurring and persistent mental health symptoms. Better physical functioning prospectively predicted improved mental health.

“Can there be a diagnostic test for delirium superimposed on dementia?”

SSD is pervasive among critically ill patients and its duration independently predictive of institutionalization. Our mortality findings corroborate those from a prior ICU population, but stand in contrast to those in non-ICU populations, where SSD predicts long-term cognitive impairment.
ADS Plenary Session Summary

Plenary Session #1: Delirium Research: Policy and Advocacy to Bedside Implementation

“Research in the Time of Big Data-Benefits to the Use of Common Measures”
Molly V. Wagster PhD—National Institute on Aging
This session described projects sponsored by the National Institute of Health which address brain health and function. These include The Cognitive and Emotional Health Project: The Healthy Brain, the NIH Blueprint for Neuroscience Research, NIH Toolbox, and the Human Connectome Project. Efforts to standardize data collection, measurement and reporting were stressed in order to promote the sharing of information that can be used to advance population health. Participants were challenged to apply these principles to research involving the study of delirium.

“Advocating for Dementia and Delirium Research in Europe”
Alasdair MacLullich MB ChB MRCP PhD- University of Edinburgh
This presentation described the evolution of the Scottish Delirium Association and its partnership with the Scottish government, resulting in a national delirium program. Dr. MacLullich shared the components of the program, which include the 4AT Delirium Test (delirium screening tool) and the TIME delirium care bundle. Patient and family educational materials and community efforts were described. Outcomes of increased delirium detection were achieved. This innovative model can serve as an incentive for other countries to create partnerships between clinicians and government to forge health care policy that supports the advancement of delirium care for citizens around the world.

“Delirium in a Hospital System”
Geoge E. Taffet MD- Baylor College of Medicine
This funded CMS Innovative Care Program at The Methodist Hospital in Houston, Texas was described in great detail. The structure includes an interdisciplinary approach for patients at risk for or experiencing delirium during hospitalization. This model involves staff nurses, providers, pharmacists, nurse navigators and volunteers and extends across hospitalization to home. Delirium screening and specific interventions are yielding preliminary promising results demonstrating improved patient outcomes with cost efficiency.
This session described various perspectives of delirium pathophysiology that may contribute to the overall understanding of acute brain dysfunction. The role of endothelial dysfunction in the cerebral blood flow, imaging results on delirium outcomes and the potential for biomarkers to categorize delirium pathology was discussed.

“Using Biomarkers to Subtype Brain Disease Heterogeneity: The Case of Dementia”
Constantine G. Lyketsos MD, MHS – John Hopkins University School of Medicine
Dr. Lyketsos described the expression of the various biomarkers in dementia and subtypes of Alzheimer’s disease. These include genetic amyloid over production, ApoE4 (anti-amyloid), pro-inflammatory substances (measurable in blood with PIE), neuronal starvation (insulin) and vascular .... Also the potential role for neurogenesis using deep brain stimulation was discussed.

“Neural Basis of Delirium: Insight from Anatomical and Functional Neuroimaging”
Robert D. Stevens, MD --Johns Hopkins University School of Medicine
Dr. Stevens described the association between white matter disease documented with MRI and development of delirium in cardiovascular surgery patients. He noted the delirium development following cardiac surgery had positive correlation with severity of white matter disease. What needs to be determine is if preoperative MRI can help determine patients at risk for Delirium. Also increased choline/cre... ratio (indication of white matter dysfunction) correlates with delirium.

“Blood Brain Barrier in Delirium”
Christopher Hughes MD – Vanderbilt University School of Medicine
Dr. Hughes described how increased blood brain barrier permeability and endothelial dysfunction due to inflammation facilitates cytokine induced astrocyte injury and tissue damage resulting in delirium. What needs to be determined is if the white matter disease is acute and not chronic and if it is associated with atrophy in prolonged delirium.
Cheryl Misak DPhil – University of Toronto

Dr Misak delivered a thought provoking, heartfelt narrative of her personal delirium experience as a critically ill patient in the ICU setting. In a detailed fashion, Dr Misak described her journey as an ICU patient, sharing personal stories that readily demonstrated how frightening delirium can be when it occurs. She described the delusions as the most disturbing thing that haunted her, far more frightening than the real clinical illness. She noted the difference a visit from her ICU nurse made to the medical/surgical unit she was transferred to, decreasing her anxiety. She stressed the need for supportive care both during and after the ICU admission identifying care transitions as an opportunity for improvement in the care continuum.
ADS Workshop Summary

“An Innovative Approach to Delirium Management”
Clay R. Angel MD & Kristen B. Brooks MD—Kaiser Permanente

Dr. Clay Angel & Dr. Kristen Brooks presented a comprehensive team approach that emphasizes consistent best practices in delirium care supported by a hospitalist and psychiatrist partnership. Through more effective use of relevant protocols, order sets and medications, as well as comprehensive staff education, the patient care experience was improved and achieved a 23% reduction in average length of stay for patients with diagnosis of delirium, which translates to an estimated $2.4M annual savings in direct hospital expense. Most significant about this presentation was the heartfelt and transparent presentation by Dr. Clay Angel who spoke to his role in causing delirium in a beloved patient. His exposure of his “aha” moment caused the audience to realize that there are ways to influence and change provider behavior to reflect best practices for delirium care. There were many concrete ideas and suggestions for creating a “bundled care” model that helps all health care personnel to the right and best thing for the patient experiencing delirium.

ADS Roundtable Discussion Summary

“Delirium Measurement”
Rakesh C. Arora MD PhD FRCSC FACS - University of Manitoba
Alasdair MacLullich MB ChB MRCP PhD - University of Edinburgh
Edward R. Marcantonio MD SM - Harvard Medical School
Karin J. Neufeld MD MPH - Johns Hopkins University School of Medicine

This session engaged the audience to view video case vignettes of patients demonstrating a range of cognitive and behavioral presentations. Participants were asked to complete a delirium screen based upon the information provided. Lively discussion ensued amongst all present at the session, with frequent differences of opinion as to the scoring of the presentation. This session demonstrated the complexity of delirium assessment even when using a standardized tool as the basis of measurement.
ADS Symposium Session Summary

Symposium Session #1: Diagnosing and Managing Delirium in Challenging Populations
The diagnosis and management of delirium is challenging in populations where baseline mental status assessment is impaired.

“Delirium in the Neurologically Injured Patient”
Andrew M. Naidech MD MSPH—Feinberg School of Medicine, Northwestern University
This session discussed the establishment of a “new baseline” based upon the degree and permanency of the neurological injury.

“Delirium in Infants and Toddlers”
Heidi A. B. Smith MD MSCI FAAP—Vanderbilt University School of Medicine
This presenter described assessment tools used with young children to detect delirium.

“Delirium in Patients with Mental Illness”
Karin J. Neufeld MD MPH—Johns Hopkins University School of Medicine
This presentation reviewed components common to both delirium and mental illness. Insights into focusing upon attention deficit, altered arousal and new cognitive deficits when looking for delirium in this population.

“Delirium in Patients with Dementia”
Phillippe Voyer RN PhD—Universite Laval—Center for Excellence in Aging
The RADAR tool was presented as a strategy to identify delirium in this population.

Symposium Session #2: Near Infrared Spectroscopy Measurement of Cerebral Perfusion and Delirium
This session focused on the perioperative period and examined associations between delirium and cerebral oxygenation, as measured by near infrared spectroscopy.

“Intraoperative Blood Pressure Autoregulation and Post-Operative Delirium”
Charles W. Hohue MD—Johns Hopkins University School of Medicine

“Cerebral Oximetry and Post-Cardiac Surgery Delirium”
Tanya Mailhot RN—Montreal Heart Institute

“The Use of NIRS in the CVICU—University of Manitoba”
Rakesh C. Arora MD PhD FRCSC FACS—University of Manitoba

“Cerebral Oximetry and Delirium in Patients Requiring 1 Lung Ventilation”
Monique L. Roberts BA—Icahn School of Medicine at Mount Sinai
Symposium Session #3: Interdisciplinary Management of Delirium in Palliative Care: Collaboratively Building the Evidence Base

This session presented an overview of current research initiatives and evidence in delirium epidemiology, prevention, recognition, assessment, management and knowledge translation in palliative care settings and populations.

“An Overview of Delirium Research Priorities in Palliative Care”
Peter Lawlor MD MMedSc—University of Ottawa

“Research Relevant to Nursing Practice in Delirium Recognition and Assessment in Palliative Care Inpatient Settings.”
Annmarie Hosie MPCAC BHlthSc(Nurs) - University of Notre Dame Australia

“A Hospital-wide, Multidisciplinary Delirium QI Initiative, Relevant to Screening and Non-Pharmacological Interventions for Elderly Patients.”
Michelle T. Weckmann MD MS—University of Iowa Carver College of Medicine

“Results of a Randomized Controlled Trial pf Pharmacological Interventions for Targeted Delirium Symptoms.”
Meera R. Agar MBBS MPC FRACP FAccPM PhD—University of South Wales

“An Overview of Evidence for Delirium Management in the Last Days of Life.”
Shirley Bush MBBS DRCOG DCH MRCGP Dip Pall Med FAccPM—University of Ottawa
ADS Symposium Session Summary

Symposium #4:
Delirium 201: Advanced Course on Delirium Management

This forum emphasized collaborative / multidisciplinary “Non-Pharmacological and Pharmacological interventions for managing a patient with delirium.”

“Non-Pharmacological Approaches”
Joseph H. Flaherty MD – Saint Louis University School of Medicine
Dr. Flaherty and his helpers provided evidence based strategies demonstrating the impact of personal approach on non-pharmacological management of delirium. In this session, video case vignettes on bedside application of “Tolerate, Anticipate, Don’t Agitate (TA-DA)” were presented and digested with significant audience participation. The “How Tos” for distraction- i.e. patient’s personal interest/s, likes, hobbies and life experiences, as distractors to calm and engage an agitated/delirious patient was delivered.

“Pharmacological Management of Delirium”
José R. Maldonado MD, FAPM, FACFE – Stanford University School of Medicine
Dr. Maldonado in this captivating presentation analyzed the multiple physiological processes involved in the development of delirium. He explained the “neurotransmitter hypothesis” for a basic pathoetiological model of delirium—how dysfunctional neurotransmission (changes in concentration or receptor sensitivity) may be responsible for the different symptoms and clinical presentations of delirium “Network Disconnectivity”. The role of alcohol in dysfunctional neurotransmission and the evidence support for non-benzodiazepine alternatives (gabapentin, valproic acid, clonidine, guanfacine, dexmedetomidine) for alcohol withdrawal symptoms was presented. This passionately delivered session was capped with a detailed review of available and best evidence for pharmacological treatment of delirium.
ADS Poster Session
Conference participants shared their ideas and projects related to delirium prevention and treatment
And the Poster Winners are...

**Student Winner**
Laura Max, BA and Andrew LaFlam, BS-Johns Hopkins University School of Medicine
“Impaired Olfaction and Risk for Delirium or Cognitive Decline After Cardiac Surgery”

**International Winner**
Fumiko Ishimitsu, PhD, RN-Department of Meiji University, Japan
“Preventative Light Therapy for Postoperative Delirium Using Nursing Intervention: A Randomized Controlled Trial”

**National Winner**
Nimish Acharya, PhD and Eric Goldwaser BS-New Jersey Institute for Successful Aging, Rowan University School of Osteopathic Medicine NJ.
“Breakdown of the Blood-Brain Barrier by Anesthetics: Possible Role in Post-Surgical Delirium”
Preconference Workshop 1
Delirium 101: Introduction to Delirium
This energetic pre-con covered all of the basics and then some. Topics included epidemiology, key features of delirium, DSM-5 criteria and subtypes, morbidity and mortality, predisposing and precipitating factors (José R. Maldonado MD FAPM FACFE), delirium pathophysiology and neurobiology of delirium (Alasdair MacLullich MB ChB MRCP PhD), diagnosing delirium, diagnostic tools, mental status as a vital sign, delirium vs. dementia vs. depression (James L. Rudolph MD MS), delirium from a nursing perspective (Joyce Parks MSN RN-BC PMHCNS-BC), a demonstration of delirium screening, using the CAM-S as an example (Joseph H. Flaherty, MD), an overview of delirium assessment and screening, including the 4AT, analysis of the DSM-5 and delirium assessment guideline discussion (Alasdair MacLullich MB ChB MRCP PhD).

Preconference Workshop 2
ICU Delirium: An Old Syndrome with New Solutions
Another dynamic workshop that “mobilized” all participants, with Dale M. Needham FCA MD PhD at the helm, this pre-con covered the patient’s perspective of delirium in the ICU (Cheryl Misak DPhil), epidemiology and consequences of ICU delirium (Timothy D. Girard MD MSCI), the Society of Critical Care Medicine’s 2013 Guidelines on Pain, Agitation, and Delirium in the ICU (Babar A. Khan MD MS), practical tips for delirium screening in the ICU (Nathan E. Brummel MD MS MSCI), Delirium and its Relationship with Post-ICU Long-Term Cognitive Impairment (Timothy D. Girard MD MSCI), Improving Sleep in the ICU to Reduce Delirium (Biren Kamdar MD MBA and Lauren M. King RN), Implementing the “ABCDE” Bundle to Reduce ICU Delirium (Leanne M. Boehm MSN RN ACNS-BC), and Implementing Early Mobilization in the ICU to Reduce Delirium (Jennifer M. Zanni PT DScPT).
Thanks to everyone who attended the 4th Annual Meeting of the ADS!!!!!
And hope to see you next year

Save the Date

American Delirium Society
5th Annual Meeting
Embassy Suites Hotel and Grand Historic Venue
Baltimore, Maryland
May 31—June 2, 2015

https://www.americandeliriumsociety.org/