



WILLIAM C. DEMENT
SLEEP AND CHRONOBIOLOGY
BEHAVIORAL SCIENCE
RESEARCH APPRENTICESHIP

Retreat Colloquium

18-20 August 2014

Whispering Pines Conference Center
URI Alton Jones Campus, West Greenwich, RI

Summer Sleep Retreat, 2014

Monday	Event	Speaker	Topic
1200	Lunch		
1330		Salvatore P. "Sam" Insana PhD, Young Investigator	The Role of Sleep in Developmental Trajectories of Wellbeing
1430	Break		
1500		Stephen Barry, Dement Fellow	Sleep and Bipolar Disorder
1515		Lindsay Westberg, Dement Fellow	Stressful Situations and Sleep in Children
1530		Katy Thellman, Dement Fellow	Circadian Rhythms and Athletic Performance
1545	Break		
1615		Jess Leonard, Dement Fellow	Sleep and Inflammation

Summer Sleep Retreat, 2014

Monday	Event	Speaker	Topic
1630		Sarah Matthes, Dement Fellow	The Interactions of Sleep and Alzheimer's
1645	Announcements		
1715	Hors d'oeuvres		
1800	Dinner		
1930		William C. Dement, MD, PhD	An Evening with Dr. Dement-- Reminiscences from 60+ Years of Sleep: Science, Medicine, Politics—just ask...
2100	Camp Fire		
2230	Lights Out		

Summer Sleep Retreat, 2014

Tuesday	Event	Speaker	Topic
0930		Jennifer L. "Jenn" Vriend, PhD, Young Investigator	Manipulating Sleep Duration Alters Memory, Attention, and Emotional Functioning in Children
1030	Break		
1100		Marimar Fletcher, Dement Fellow	How Sleep Deprivation Increases the Risk of Diabetes Type II
1115		Logan Fickling, Dement Fellow	Sleep's Role in PTSD
1130		Josh Rubenstein, Dement Fellow	Seizures and Sleep: Epilepsy and Comorbid Sleep Disorders
1200	Lunch		

Summer Sleep Retreat, 2014

Tuesday	Event	Speaker	Topic
1330		Sabra Abbott, MD, PhD, Young Investigator	Evaluating the Pupillary Light Response in Delayed Sleep Phase Disorder
1430	Break		Change into 'Play Clothes'
1445	Walk in the Woods	Assemble in Groups as Instructed	Small Group Conversations about Graduate/Medical School, Careers, etc.
1600	Assemble at Playground	Games!	[Please return from the Walk in the Woods promptly]
1715	Hors d'oeuvres		
1800	Dinner		
1930	Fun Night	Dement Fellows and Others Arrive at 1930	Faculty, Young Investigators, Staff: Assemble in Conference Center at ~ 1915 to Set Up
2130	Camp Fire		
2300	Lights Out		

Summer Sleep Retreat, 2014

Wednesday	Event	Speaker	Topic
0930		Andrew W. McHill, PhD, Young Investigator	Entrainment to the Natural Light-Dark Cycle and the Influence of Circadian Misalignment on Energy Expenditure
1030	Break		
1100		Scot Kelly, Dement Fellow	The Default Mode Network and Its Role in the Sleeping and Dreaming Brain
1115		Emily Davis, Dement Fellow	Co-sleeping in Couples
1130		Ji-Soo Kim, Dement Fellow	Alcohol and Sleep in Children and Adolescents
1145		Mary A. Carskadon, PhD, Program Director	Thanks and Farewell
1200	Lunch		

Summer Sleep Retreat, 2014

Young Investigator Presentations

Salvatore P. Insana, PhD, Medical Science Liaison, NeuroPsych & Pain, U.S. Field Medical Affairs, Teva Pharmaceuticals

The Role of Sleep in Developmental Trajectories of Wellbeing

In this presentation Dr. Insana will describe his career trajectory in sleep medicine research and how he acquired his current position as a Medical Science Liaison for Teva Pharmaceutical's Division of NeuroPsych & Pain. Next, he will present two secondary data analysis projects that he conducted during his recent postdoctoral training at the University of Pittsburgh. In the first study, he will show that pediatric sleep problems are associated with increased odds for late-life insomnia and how those pediatric sleep problems are associated with earlier depression and anxiety onset across the lifespan. In the second study, he will present a structural equation model describing how early-life trauma, mental health, and sleep quality may contribute to medical problems among older adults. These studies demonstrate that the treatment of early-life sleep problems and prevention of early-life adversity may be central to averting developmental trajectories toward sleep and mental health problems across the lifespan.

Jennifer L. Vriend, PhD, Registered Psychologist (College of Psychologists of Ontario), Queensview Professional Services, Ottawa, Ontario

Manipulating Sleep Duration Alters Memory, Attention, and Emotional Functioning in Children

Daytime consequences of sleep loss have been well documented in adults, but the pediatric literature includes mostly correlational studies. A few studies have manipulated sleep experimentally in school-aged children to examine effects on emotional and cognitive functioning, but more well-controlled, experimental studies are needed. Thirty-two children (8-12 y) wore actigraphs for 3 weeks. During the baseline week, actigraphic data were used to estimate the child's typical daily sleep duration. During the second week, the child was randomly assigned to go to bed either one hour earlier (Extended condition) or one hour later (Restricted condition) than their typical bedtime. Each child then completed the opposite schedule during the third week of the study. After each of the 3 weeks, emotional functioning, memory, and attention were assessed using objective and subjective measures. The sleep manipulation was effective; the children slept significantly longer in the Extended ($M = 9.3$ h, $SD = 0.6$) versus Restricted ($M = 8.1$ h, $SD = 0.7$) condition and children were significantly sleepier in the Restricted condition according to parent, child, and research

Summer Sleep Retreat, 2014

assistant report. Results revealed impaired functioning in the Restricted relative to Extended condition on measures of positive affective response, emotion regulation, memory, and aspects of attention. However, some aspects of emotional functioning and attention were not affected by the sleep manipulation. Results suggest that even a modest degree of cumulative sleep restriction can have negative consequences for children's daytime functioning. Moreover these findings support the need to emphasize the importance of promoting healthy sleep habits for children.

**Sabra M. Abbott, MD, PhD, Assistant Professor of Clinical
Neurology, Department of Neurology, Northwestern University
Medical School**

Evaluating the Pupillary Light Response in Delayed Sleep Phase Disorder

Introduction: Delayed sleep phase disorder (DSPD) is a disorder of sleep timing, where an individual's preferred sleep window is delayed by several hours leading to insomnia and sleepiness. The etiology is unclear, though one possibility is an altered circadian sensitivity to light. Melanopsin containing retinal ganglion cells (ipRGCs) transmit the signal of light to the suprachiasmatic nucleus (SCN) and the function of these cells can be assessed by evaluating the pupillary response to light. The goal of this study was to assess the ipRGC response to light in individuals with DSPD compared to controls.

Methods: Participants with DSPD (n=12) based on International Classification of Sleep Disorders criteria or intermediate type controls (n=12) were recruited. Chronotype was confirmed by questionnaires, actigraphy and clinical history. After five minutes of dark accommodation, pupillary light response was measured using a PLR-200 Pupillometer (Neuroptics Inc, Irvine, CA) using four combinations of light intensity and duration (1 mW for 0.987 sec, 1 mW for 23.141 sec, 180 mW for 0.987 sec, 180 mW for 23.141 sec) each separated by one minute.

Results: There were no significant differences between groups in baseline pupil size or pupillary response to dim light. However in response to bright light pulses the DSPD group exhibited a significant decrease in the maximal constriction velocity (-4.4 ± 1.0 vs. -5.4 ± 0.7 mm/sec, $p=0.04$).

Conclusion: Individuals with DSPD exhibited a significantly different response to bright, but not dim light pulses compared to intermediate type controls. Rods and cones have previously been demonstrated to be more sensitive to short dim light pulses, while ipRGCs are more responsive to prolonged bright light pulses, suggesting the pathophysiology of DSPD may be related to an altered ipRGC response to light.

Summer Sleep Retreat, 2014

Andrew W. McHill, PhD, Postdoctoral Fellow, Division of Sleep and Circadian Disorders, Harvard Medical School and Brigham and Women's Hospital, Boston, MA

Entrainment to the Natural Light-Dark Cycle and the Influence of Circadian Misalignment on Energy Expenditure

With the widespread use of electrical lighting, the timing of many work and social activities can now occur when our circadian biology is not promoting wakefulness (i.e., during the night). This state of desynchrony is associated with increased risk for adverse metabolic health, accidents and injury, and sleep disruption. Yet how much the use of electrical lighting alters our circadian biology, and by which mechanisms circadian misalignment promotes metabolic dysregulation, remain unknown. Therefore we compared circadian phase after habitual electrical lighting exposure and after a week of exposure to only the natural light-dark cycle and campfires while camping during the summer (July, n=8) and winter (December, n=5) in the Rocky Mountains of Colorado. Further, we studied 14 healthy adults in a 6-d simulated shiftwork protocol to quantify changes in metabolic physiology via whole room indirect calorimetry. We found that after exposure to only the natural light-dark cycle, regardless of the season, circadian phase synchronized to solar time. Additionally, we found that a simulated shiftwork schedule decreased total daily energy expenditure, predominately during the daytime sleep episodes. These findings demonstrate how our circadian biology is altered by electrical lighting and by which physiological mechanisms circadian misalignment may lead to weight gain.

Summer Sleep Retreat, 2014

2014 William C. Dement Fellows

Stephen Barry

2014 Graduate, University of Rhode Island

Emily Davis

Rising senior, University of Pennsylvania

Logan Fickling

Rising junior, University of Arizona

Maria Del Mar Fletcher

Rising sophomore, Brown University

Scot Kelly

Graduate, Savannah College of Art and Design
Rising senior, Armstrong Atlantic State University

Ji-Soo Kim

2014 Masters Graduate, Catholic University of South Korea
Rising PhD candidate, University of Arizona

Jessica Leonard

2014 Graduate, Providence College
Rising 1st year, University of New England College of Osteopathic Medicine

Sarah Matthes

Senior, University of North Texas

Joshua Rubinstein

Rising junior, Gettysburg College

Kathryn Thellman

Rising senior, University of Colorado

Lindsay Westberg

Rising senior, Gettysburg College

Summer Sleep Retreat, 2014

Research Apprenticeship Faculty, Staff, & Trainees

APPRENTICESHIP FACULTY

**Alpert Medical School of Brown University,
Department of Psychiatry and Human
Behavior**

Mary A. Carskadon, PhD, Director

David Barker, PhD

Rachel Herz, PhD

John McGeary, PhD

Ron Seifer, PhD

Leila Tarokh, PhD

Eliza Van Reen, PhD

**Alpert Medical School of Brown University,
Department of Medicine**

Katherine M. Sharkey, MD, PhD

**Valencia College, Department of
Communications**

Kathleen Perri, MA

University of North Texas

Brandy Roane, PhD

**Brown University, Department of
Neuroscience**

Christopher Ciarleglio, PhD

Periodic Breathing Foundation

Robert Daly, MBA

RETREAT VISITING FACULTY

Alpert Medical School of Brown University

Christine Acebo, PhD

Thomas F. Anders, MD

Willoughby Britton, PhD

POSTDOCTORAL FELLOWS

Christy Olson, PhD

Jared Saletin, PhD

SLEEP LAB RESEARCH STAFF, E.P. BRADLEY HOSPITAL

Kayla Andrade, Student Research Assistant

Ashten Bartz, Research PSG Technologist

David Bushnell, Sr. Research Assistant

Sharon Driscoll, Research Assistant

Max Elliott, Administrative Secretary

Ellyn Ferriter, Sr. Research PSG
Technologist

Caroline Gredvig-Ardito, Data Manager &
IRB Coordinator

Majid Lanijani, Student Research Assistant

Michelle Loxley, Programmer

Genevieve Ramos, Student Research
Assistant

PERINATAL SLEEP RESEARCH STAFF, RI HOSPITAL

Julie Quattrucci, Research Assistant

Zachary Cohen, Brown Medical Student

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