## Inside

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message from the Chair</td>
<td>2</td>
</tr>
<tr>
<td>Childhood Sleep Disorders and Development</td>
<td>3</td>
</tr>
<tr>
<td>Circadian Rhythms</td>
<td>8</td>
</tr>
<tr>
<td>Insomnia</td>
<td>13</td>
</tr>
<tr>
<td>Movement Disorders</td>
<td>18</td>
</tr>
<tr>
<td>Narcolepsy</td>
<td>20</td>
</tr>
<tr>
<td>Parasomnias</td>
<td>22</td>
</tr>
<tr>
<td>Sleep Deprivation</td>
<td>25</td>
</tr>
<tr>
<td>Sleep Related Breathing Disorders</td>
<td>27</td>
</tr>
</tbody>
</table>

**Disclaimer**

No part of this publication may be reproduced without the permission of the American Academy of Sleep Medicine (AASM). The statements and opinions contained in editorials and articles in this newsletter are solely those of the authors and not of the AASM or of its officers, members or employees. The Editor and Managing Editor of the Membership Sections Newsletter, the AASM and its officers, members and employees disclaim all responsibility for any injury to persons or property resulting from any ideas, products or services referred to in articles in this publication.
Message from the Chair

It is both a privilege and a pleasure to act as the chair of the Membership Sections Committee! I am excited to share the fifth issue of the American Academy of Sleep Medicine (AASM) Membership Sections’ newsletter as we gear up for SLEEP 2014, the 28th Annual Meeting of the Associated Professional Sleep Societies, LLC (APSS), in Minneapolis, MN. Your section committees have not only submitted exciting updates on their specialty, but have included their section meeting agendas, which will take place during the annual meeting. Our sections are dedicated to representing your interests to the AASM Board of Directors and fostering discussions among our members to promote AASM’s mission to advance sleep health, education, policy, and research. As always, I invite you to visit our discussion forums to offer suggestions and ideas about how we can build on the momentum of the past year to create an even more accessible and innovative forum for our members.

There are many ways to stay involved and impact your section, including partaking in abstract and session proposals and voting in elections. We also welcome suggestions about the newsletter content or format, and want to know what you are interested in hearing about. The landscape of sleep medicine is ever changing, and the steering committees are here to service the educational and practical needs of our diverse membership. We ask that you stay involved and invested, and contact us directly with your feedback: AASMsections@aasmnet.org.

Christine Won, MD, MS.
Childhood Sleep Disorders and Development

Agenda: Childhood Sleep Disorders & Development Section Meeting

Minneapolis Convention Center
Monday, June 2, 2014 (5:15pm – 6:15pm)

I. Call to Order
   • Dr. D’Andrea (Chair)

II. General Business – (5 minutes)
   • Introduction of 2013-2014 CSDD Section Steering Committee
   • Call for Volunteers: 2014-2015 CSDD Steering Committee

III. Clinical Practice Guideline Suggestions – (5 minutes)

IV. Section Investigator Award Presentation – (15 minutes)
   • Sleep Dependent Memory Consolidation in Children with Autism Spectrum Disorders
     – Kiran Maski – Boston Children’s Hospital

V. Other Business/ Discussion
   • Data Blitz: Highlights of emerging pediatric research – (20 minutes)
   • Pediatric Sleep Studies: New Coding & Reimbursement Issues – (15 minutes)
     – Dr. Gary Montgomery

VI. Adjournment

Pediatric Educational Activities at the SLEEP 2014 Annual Meeting
Compiled by Sejal Jain, MD

Saturday, May 31st
Postgraduate Courses
C01: Year-In-Review 2014
8:00am – 5:00pm

Co-chairs: Charles Atwood, MD; and Kenneth Wright Jr., PhD

Faculty: David Dinges, PhD; Anne Germain, PhD; Mark Opp, PhD; Carol Rosen, MD; Thomas Scammell, MD; Michael Silber, MBChB; and Jamie Zeitzer, PhD
C03: Pediatric Sleep Medicine Clinical Challenges: Who, What, When, How and Why
8:00am – 12:00pm

Co-chairs: Madeleine Grigg-Damberger, MD; and Sanjeev Kothare, MD
Faculty: Eliot Katz, MD; and Judith Owens, MD

C06: Pediatric Behavioral Sleep Medicine
1:00pm – 5:00pm

Chair: Sarah Honaker, PhD
Faculty: Kristin Avis, PhD; Valerie Crabtree, PhD; and Lisa Meltzer, PhD

C07: RLS Treatment Developments: Expanded Medication Choices and Advances in Treatment for Pregnancy and Pediatric RLS
1:00pm – 5:00pm

Chair: Richard Allen, PhD
Faculty: Mark Buchfuhrer, MD; Christopher Earley, PhD; and Daniel Picchietti, MD

Sunday, June 1st
Postgraduate Courses

C09: 2014 State of the Art for Clinical Practitioners
8:00am – 5:00pm

Co-chairs: Charlene Gamaldo, MD; and Phyllis Zee, MD, PhD
Faculty: Alon Avidan, MD, MPH; Nancy Collop, MD; Douglas Kirsch, MD; Shalini Paruthi, MD; David Plante, MD; Rachel Salas, MD; and Michael Silber, MBChB

C12: Update on Pediatric Guidelines: Surveillance, Evaluation and Management of Sleep Disorders in Specific Pediatric Populations
8:00am – 12:00pm

Co-chairs: Louella Amos, MD; and Beth Malow, MD
Faculty: Julie Baughn, MD; and Nanci Yuan, MD

C14: Diagnosis and Treatment of Circadian Rhythm Sleep-Wake Disorders
1:00pm – 5:00pm

Chair: R. Robert Auger, MD
Faculty: Helen Burgess, PhD; Katherine Sharkey, MD, PhD; and James Wyatt, PhD

Oral Presentation

O02: Novel Insights into Pediatric Sleep Disorders
3:15pm – 5:15pm

Objective: Discuss novel findings on the risk, treatment and functional outcomes of disordered sleep in the pediatric population.

Symposia

S04: Substrates, Mechanisms and Neurodevelopment of Sleep Regulation
3:15pm – 5:15pm

Co-chairs: Thomas Kilduff, PhD; and Salome Kurth, PhD
Faculty: Chiara Cirelli, MD, PhD; and Jared Saletin

Monday, June 2nd
Plenary Session

101: Sleep and the Price of Plasticity
8:00am – 10:00am

Giulio Tononi, MD, PhD

Hari Bandla, MD

Hari Bandla, MD is starting his second year as a member of the Childhood Sleep Disorders and Development Section. He is an Associate Professor at the University of Chicago and Chief of the Division of Pediatric Sleep Medicine. He specializes in the comprehensive management of sleep disorders in children and infants, with a special interest in the treatment of children needing home ventilation. Also an active physician scientist, Dr. Bandla’s research has focused on pediatric sleep disorders associated with other health conditions, including obesity, cystic fibrosis and gastroesophageal reflux disease (GERD).

Beth Malow, MD

Beth Malow, MD is starting her second year as a member of the Childhood Sleep Disorders and Development Section. She is a Professor of Neurology and Pediatrics in Cognitive Childhood Development at Vanderbilt University School of Medicine, where she directs the Sleep Division. Her research has emphasized the interface of sleep and epilepsy, autism, and related disorders of neurodevelopment. She also serves as Associate Director of the Vanderbilt Clinical Research Center, Director of the Vanderbilt Sleep Core, and principal investigator for the Vanderbilt site of the NeuroNEXT Network (NINDS Network of Excellence in Neuroscience Clinical Trials) and the Autism Speaks Autism Treatment Network. She has led federally-funded treatment trials of melatonin for sleep in children with autism as well as behavioral sleep education in this population.

Nanci Yuan, MD

Nanci Yuan, MD is also starting her second year as a member of the Childhood Sleep Disorders and Development Section. She is an Associate Professor at Lucile Packard Children’s Hospital at Stanford where she is the Medical Director for their Pediatric Sleep Center. Her research interests are concentrated on the pulmonary complications due to neuromuscular disease, cerebral palsy/ hypertonicity, scoliosis, and sleep disorders in the pediatric population.
**Workshop**

**W01: RLS in Childhood, Migraine and Growing Pains: Close Relationship or Casual Association?**
10:30am – 12:30pm

**Co-chairs:** Oliviero Bruni, MD; and Daniel Picchetti, MD

**Faculty:** Rosalia Silvestri, MD; and Arthur Walters, MD

**Meet the Professor**

**M06: Nighttime Settling Difficulties in Children: Physiological Insights**
12:30pm – 1:30pm

Monique LeBourgeois, PhD

**Discussion Group**

**D03: Options for Treatment of Obstructive Sleep Apnea in Children and Improving Positive Airway Pressure Compliance**
3:00pm – 5:00pm

**Co-chairs:** Dawn Dore-Stites, PhD; and Fauziya Hassan, MD

**Faculty:** Richard Conley, DMD; Sean Edwards, DDS, MD; Carole Marcus, MBChB; Ron Mitchell, MD; and Susan Redline, MD, MPH

**Oral Presentation**

**O10: Development, Aging and the Sleeping Brain**
3:00pm – 5:00pm

**Objective:** Discuss the most recent findings on the relationship between sleep and brain development in animal and human models.

---

**Tuesday, June 3rd**

**Workshop**

**W03: Positive Airway Pressure Therapy in Children: Reflecting on Experience and Developing Best Practices**
10:20am – 12:20pm

**Chair:** Darius Loghmanee, MD

**Faculty:** Rakesh Bhattacharjee, MD, RPSGT; Brigitte Fauroux, MD, PhD; Manisha Witmans, MD; and Lisa Wolfe, MD

**Oral Presentation**

**O15: Sleep and Behavior in Children and Adolescents**
10:20am – 12:20pm

**Objective:** Discuss manifestations and consequences of poor sleep health in childhood and adolescence.

**Meet the Professor**

**M21: How to Evaluate and Manage Excessive Daytime Sleepiness in Childhood**
12:30pm – 1:30pm

Ann Halbower, MD

---

**Wednesday, June 4th**

**Invited Lecturer**

**I10: Sleep and Pediatric Chronic Pain: Innovative Approaches to Assessment and Treatment**
9:05am – 10:05am

Tonya Palermo, PhD

**Symposia**

**S18: Sleep in Children with Chronic Health Conditions: Challenges and Opportunities**
10:20am – 12:20pm

**Chair:** Penny Corkum, PhD

**Faculty:** Valerie Crabtree, PhD; Lisa Meltzer, PhD; and Tonya Palermo, PhD

**Meet the Professor**

**M21: How to Evaluate and Manage Excessive Daytime Sleepiness in Childhood**
12:30pm – 1:30pm

Suresh Kotagal, MBBS

**Workshop**

**W07: Hypersomnia and Narcolepsy in the Pediatric Population**
2:45pm – 4:45pm

**Co-chairs:** Sejal Jain, MD; and Narong Simakajornboon, MD

**Faculty:** Suresh Kotagal, MBBS; and Emmanuel Mignot, MD, PhD

---

**Invited Lecturer**

**I07: Molecular Genetics of Sleep**
1:30pm – 2:30pm

Mehdi Tafti, PhD
Periodic Breathing – an illustrative example of ontogeny of respiration

Dr. Hari Bandla, MD, MRCP

1. What is Periodic Breathing?

Breathing instability is common in newborn infants, and such instability is characterized by runs of central apneas lasting for few seconds. Periodic breathing is an expression of this ontogeny of respiration and is characterized by a cyclic pattern in which brief central apneas alternate with a small number of normal breaths.

2. How do you score Periodic Breathing?

Score Periodic Breathing if there are > (greater than) 3 episodes of central apnea lasting > (greater than) 3 seconds, separated by no more than 20 seconds of normal breathing (2012 AASM scoring manual version 2.0). Central apneas that occur within a run of periodic breathing should be scored as individual apneas (Fig. 1). Please note that desaturations are not necessary for scoring Periodic Breathing.

3. What is the prevalence of Periodic Breathing?

Premature infants have a higher propensity for respiratory instability, and such vulnerability improves with increasing gestational age and increasing postnatal age. The prevalence of periodic breathing is inversely related to gestational age, with close to 100% prevalence in infants weighing < (less than) 1000 grams at birth. There is age-dependent appearance and disappearance of period breathing. While periodic breathing is rarely seen in the first few days after birth, it reaches its peak in the first few weeks of life. There is a subsequent decrease in periodic breathing with maturity such that it occurs for 3% of total sleep time at 2 months of age and less than 1% of total sleep time at 5 months of age.
4. What are the mechanisms for Periodic Breathing?
Periodic breathing is a peripheral chemoreceptor-driven event. Periodic breathing is rarely seen at 2 days of life, when peripheral chemoreceptor drive is inactive. Partial pressure of O2 changes from 25mmHg as a fetus to 50Hg in the first few breaths of extra uterine life, rising to 70mmHg in the first few hours of life. Consequently, this relative “excess” of oxygen renders the carotid bodies insensitive to oxygen changes until they are reset. “Resetting” of peripheral chemoreceptors occurs in the first weeks of life, achieving their usual hypoxic responsiveness. Periodic breathing is related to pCO2 levels and its relationship to apneic threshold. Reduction in pCO2 levels below a certain point causes apnea during sleep, and this level is termed the apneic threshold. The heightened sensitivity of peripheral chemoreceptors to hypoxia leads to unstable ventilation, resulting in decreasing pCO2 levels below the apneic threshold. Apneic threshold in newborn infants is only 1-2mm below the eupneic pCO2 level, thus making them vulnerable to periodic breathing. Another mechanism that contributes to periodic breathing includes low lung volumes.

5. What is the effect of sleep on Periodic Breathing?
Periodic breathing occurs predominantly in sleep, and periodic breathing is present in both quiet and active sleep; however, the variability in breathing pattern is state dependent. Thus, when periodic breathing occurs during quiet sleep, it is very regular with length of breathing and apneic periods remaining relatively constant. When periodic breathing occurs during active sleep, the pattern of periodic breathing is less regular and the apneas can be of longer duration.

6. What are the consequences of Periodic Breathing?
Periodic breathing has been considered to be a benign breathing pattern in premature infants. More recent data demonstrates that significant desaturations maybe associated with apneic pauses and in some premature infants, periodic breathing frequently precedes longer apneic pauses. There is concern that an excessive amount of periodic breathing with associated intermittent hypoxemia due to frequent O2 desaturations can have neurocognitive morbidity, probably related to hypoperfusion and reperfusion mechanisms within the brain.

5. What are the treatment options for Periodic Breathing?
Usually no treatment is necessary and periodic breathing resolves spontaneously with maturity. However, a subset of infants develop an excessive amount of periodic breathing associated with repetitive desaturations and slowing of heart rate. Supplemental oxygen with concentrations as low as FiO2 0.25-0.30 has been shown to stabilize breathing patterns with resolution of periodic breathing and hypoxemia (Fig. 2).

Further reading:
Circadian Rhythms

Steering Committee Profiles

Katherine M. Sharkey, MD, PhD (Chair)
Katherine M. Sharkey, MD, PhD, FAASM, is an assistant professor of Medicine and Psychiatry & Human Behavior at the Warren Alpert Medical School of Brown University. Dr. Sharkey is Medical Director of the University Medicine Sleep Center and Associate Director of the Sleep for Science Research Laboratory of Brown University. Dr. Sharkey’s current research on sleep and genetic risks for postpartum depression is supported by a K23 Mentored Patient-Oriented Research Career Development Award from the National Institute of Mental Health. In 2011, she was awarded the Christian Guilleminault World Association of Sleep Medicine Award for Sleep Research.

Tina Burke, PhD (Vice-Chair)
Dr. Burke is adjunct faculty in the department of Science and Technology at FRCC-Westminster. She received a BA with Honors in Psychology from Kent State University in Kent, OH, a MS in Integrative Physiology and a PhD in Integrative Physiology and Neuroscience from the University of Colorado at Boulder. Dr. Burke’s research is aimed at developing

Agenda: Circadian Rhythms Section Meeting

Minneapolis Convention Center
Tuesday, June 3, 2014 (5:15pm – 6:15pm)

I. Call to Order
   • Dr. Katherine Sharkey, MD, PhD (Chair)

II. General Business – (5 minutes)
   • Introduction of 2013-2014 Circadian Rhythms Section Steering Committee
   • Call for Volunteers: 2014-2015 Circadian Rhythms Steering Committee

III. Clinical Practice Guideline Suggestions – (5 minutes)

IV. Section Investigator Award Presentation – (15 minutes)
   • Cerebral Small Vessel Disease And Actigraphically Measured Circadian Rhythm And Sleep: A Population-Based Study
     – Lisette Zuurbier – Erasmus University Medical Center

V. Other Business/ Discussion
   • Data Blitz – (25 minutes)
   • Open Discussion for Membership – (10 minutes)

VI. Adjournment

It’s about that time…don’t miss these circadian rhythm sessions at SLEEP 2014!

Compiled By Cathy Goldstein, MD

Sunday, June 1st
Postgraduate Course
C14: Diagnosis and Treatment of Circadian Rhythm Sleep-Wake Disorders
1:00pm – 5:00pm

This is a half-day postgraduate course chaired by Dr. Robert Auger. In this session, leaders in the field will use real life cases to demonstrate ICSD-3 diagnostic criteria, utility of available diagnostic tools, and evidence-based treatment.

Monday, June 2nd
Symposia
S07: Circadian Rhythms, Sleep, and Metabolism
10:30am – 12:30pm

This general session will be chaired by Frank Scheer, PhD and will detail the relationship between circadian timing and sleep, and energy intake and expenditure.
AASM Membership Sections Newsletter  ■  Issue #5

Brown Bag Report Session

R01: Challenging Cases
12:30pm – 1:30pm
This Brown Bag Case Report session will highlight the clinical challenges and comorbidities contributing to circadian rhythm sleep-wake disorders.

Oral Presentation

O09: Chronobiology and Brain Function
1:45pm – 2:45pm
This oral presentation session will present cutting edge research on the impact of circadian disruption on cognition.

Tuesday, June 3rd
Invited Lecturer

I05: How Molecular Genetics Can Tell Us How We Wake Up and Why We Sleep
8:00am – 9:00am
Join invited lecturer Dr. Ravi Allada for this session, where he will explore the role of genetics in both sleep homeostasis and the circadian timing of sleep and wake.

Oral Presentation

O13: Circadian Entrainment, Disruption and Physiological Effects of Light
10:20am – 12:20pm
In this session, investigators will present data relating to circadian misalignment seen in DSPD and the effects of light.

Clinical Workshop

W05: Occupational Sleep Medicine
2:45pm – 4:45pm
This clinical workshop is chaired by Dr. Stefanos Kales. In this session, experts in the area of shift work will discuss the homeostatic and circadian contributions to occupational sleepiness and fatigue, and discuss intervention strategies.

Wednesday, June 4th
Symposia

S16: A Perfect Time for Chronomedicine
8:00am – 10:00am
A panel of circadian rhythm experts will discuss the role of timing in general health and illness and how chronomedicine may be integrated into health care.

Oral Presentation

O29: Circadian Misalignment and Circadian Sleep-Wake Disorders
1:30pm – 2:30pm
This presentation will review research of circadian misalignment both in healthy individuals and in those with circadian rhythm sleep-wake disorders.

Bench-to-Bedside Integrated Session

B04: Shining a Light on Sleep, Metabolism and Body Weight
2:45pm – 4:45pm
Attend this Bench to Bedside session to learn about the effect of light and light alterations on sleep, metabolism, and weight in animals.

Robert Auger, MD

Robert Auger, MD is an Assistant Professor of Medicine and Psychiatry within the Mayo Clinic College of Medicine and is also a consultant within the Mayo Center for Sleep Medicine and the Department of Psychiatry and Psychology (Rochester, MN). He received his Doctor of Medicine from the University of Minnesota in Minneapolis in 1999. This was followed by a medical internship and psychiatry residency at Johns Hopkins Hospital in Baltimore, MD (completed in 2003), and a Sleep Medicine Fellowship at the Mayo Clinic, completed in 2004. Dr. Auger joined the Mayo staff subsequently, and spends essentially all of his clinical time within the Mayo Center for Sleep Medicine. Dr. Auger's research interests focus on clinical sleep medicine, with a specific interest in delayed sleep phase disorder (DSPD), engendered by his unique experiences with adolescents.

Cathy Goldstein, MD

Dr. Goldstein is an Assistant Professor of Neurology at University of Michigan Health System. She received her Doctor of Medicine from the Medical College of Georgia and went on to complete a Neurology Residency at the University of Colorado School of Medicine. This was followed by Sleep Medicine Fellowship at Northwestern University. After completing her fellowship, Dr. Goldstein went on to practice sleep medicine at NorthShore University Health System and recently joined the Sleep Disorders Center at the University of Michigan Health System to pursue her academic and teaching aspirations which, focus on circadian rhythms.

See you in Minneapolis!
**Top 10 Circadian Papers of 2013**

The Circadian Rhythms Section Steering Committee combed the literature to identify the most compelling circadian papers of 2013. The synopses below describe cutting-edge science and the potential implication of these exciting findings.

**Clinical Trials**

*A randomized controlled trial with bright light and melatonin for the treatment of delayed sleep phase disorder: effects on subjective and objective sleepiness and cognitive function.*


This study investigated the short- and long-term effects of bright light and melatonin treatment (in conjunction with gradually advancing rise times) on subjective/objective sleepiness and cognitive function among adolescents/young adults with delayed sleep phase disorder (DSPD). Despite the fact that DSPD is most common during this age period, there are few studies that are comprised of such participants. All treatment conditions investigated were essentially equally effective in improving most studied outcomes, although long-term treatment with light/melatonin increased some of the positive effects seen after two weeks. Despite the various limitations (and many strengths) associated with the study, it represents a positive step towards production of data that can be readily incorporated into the clinical environment. (RRA)

**Etiology, Mechanisms, and Consequences of Circadian Rhythm Sleep-Wake Disorders**

*Non-24-Hour Disorder in Blind Individuals Revisited: Variability and the Influence of Environmental Time Cues.*


In a group of patients with non-24 hour disorder, circadian phase (as measured by melatonin onset) was found to drift in a variable pattern with significance within and between subject differences. The rate of drift of melatonin onset was slowest when melatonin onset was 2000 to 0800 and fastest when melatonin onset was 0800 to 2000. Some subjects demonstrated long durations with no drift at all. These findings highlight the ability of non-photic zeitgebers to modulate circadian phase in a variable fashion, demonstrate the principle of relative coordination, and show that individuals with non-24 hour disorder may become transiently entrained. (CG)

*The endogenous circadian temperature period length (tau) in delayed sleep phase disorder compared to good sleepers.*


This is the first case series to describe an abnormally long tau as a potential mechanism behind delayed sleep phase disorder (DSPD). The findings provide a potential explanation for difficulties that such patients have with phase advancing to a more conventional sleep time (and also may explain frequent relapse following treatment). The outcome should spur further chronobiological/behavioral research and related clinical treatment applications. (RRA)

**The impact of circadian misalignment on athletic performance in professional football players.**


When west coast football teams play east coast teams they may be at a circadian advantage during evening games. As physical performance peaks in the late afternoon and west coast teams operate at an endogenous time 3 hours earlier than their competitors, they are closer to the circadian peak of performance when playing an 8PM start time game on the east coast. This hypothesis was tested by a 40 year review of all games played on the east coast matching a west coast team with the home team. West coast teams beat the point spread in 70 evening games as compared to east coast teams, who beat the point spread in only 36 evening games. No difference was found when games were played during the day which supports the hypothesis that circadian timing of performance contributes to the superior showing by west coast teams. (CG)

**Basic Human Research**

*Evening ambient light exposure can reduce circadian phase advances to morning light independent of sleep deprivation.*


Previous studies have found that short sleep episodes reduce phase advances; however, the mechanisms of these reductions
Combination of light and melatonin time cues for phase advancing the human circadian clock.

The findings from this study indicate that the combination of bright light exposure in the early morning and exogenous melatonin in the evening provide the greatest phase shift (advance) treatment response. The results of the study will hopefully encourage other large trials in field settings (i.e., outside of the controlled laboratory), such that the results can be directly applied to the clinical setting. (RRA)

Circadian phase and its relationship to nighttime sleep in toddlers.

This study measured circadian phase position and phase angle between dim light melatonin onset (DLMO) and sleep in 45 healthy toddlers aged 30 to 36 months. Average DLMO was 1929 ± 0051 h, average bedtime was 2015 ± 0036 h, and average sleep onset time was 2043 ± 0043 h. DLMO time was correlated significantly with bedtime, sleep onset time, and wake time. Large inter-individual variability was observed among participants. This study is the first to describe the fundamental properties of the circadian system in 2-3 year old children, including timing of melatonin onset and its relationship to nighttime sleep. Thus, this study represents a major advance in our understanding of developmental aspects of circadian rhythms in healthy children. These normative data will also be helpful for interpreting data in young patients presenting with circadian rhythm sleep-wake disorders. (KMS)

Genetics and Molecular Clocks
Homeostatic and circadian contribution to EEG and molecular state variables of sleep regulation.

A growing body of evidence suggests a bidirectional relationship between circadian clock genes and sleep homeostasis, with the homeostatic regulation of sleep affected by and affecting clock genes. Curie and colleagues investigated this relationship by evaluating clock gene expression during 6 hour episodes of sleep deprivation at different times of day in different strains of mice. In addition, the homeostatic sleep markers, delta power and Homer 1a expression, were also evaluated at different times of day. Their findings showed that mRNA levels of the clock gene Per2 increased and clock controlled gene Dbp decreased with sleep deprivation, except when sleep deprivation was conducted at ZT 12-18, thus demonstrating sleep-wake and time dependent factors. Homer 1a increased with sleep deprivation independent of timing. Additionally, EEG delta power increased as expected with sleep deprivation, but did demonstrate modulation by time of day. These findings underline the interaction between objective measures originally thought to reflect circadian or homeostatic control of sleep exclusively. (CG)

In vitro circadian period is associated with circadian/sleep preference.

This study compared the period (tau) of in vitro circadian rhythms measured with clock gene expression patterns in fibroblasts from skin biopsy samples, with tau measured under a strict FD protocol and circadian/sleeps parameters measured with questionnaires, sleep diaries, and actigraphy in a real-world setting. In vitro period length was correlated significantly with habitual sleep time, preferred sleep time, and chronotype - but not with in vivo period length. This study contributes to our understanding of the links between behavioral and cellular rhythms, and further our understanding of measurement of peripheral clocks. Endogenous period length (tau) may contribute to circadian rhythm sleep-wake disorders. Measurement of endogenous period length in humans is labor intensive; however, it requires that the patients be studied in free-running or forced desynchrony conditions. A more convenient and accessible method for measuring period length in humans could advance our understanding of how period length contributes to circadian rhythm sleep-wake disorders. (KMS)
**Effects of insufficient sleep on circadian rhythmicity and expression amplitude of the human blood transcriptome.**


Insufficient sleep and irregular sleep-wake patterns (including circadian misalignment) are associated with numerous negative health outcomes. Nevertheless, little is known about the impact of sleep disturbance on the clock gene system that likely plays a mechanistic role in these poor health outcomes. Furthermore, the transcription products of these genes could serve as peripheral biomarkers of disease risk. In this study, RNA expression was measured in healthy adults after a week of 8.5 hours of sleep per day and a then again after a week where sleep was restricted to 5.7 hours of sleep per day. Over 700 genes were up-or down-regulated after insufficient sleep, and the circadian rhythms of gene expression were blunted in more than 1000 genes. Affected gene systems included genes known to play a role in metabolism and oxidative stress. This paper sets the stage for future work in understanding mechanisms and markers of circadian rhythm and sleep disruption's effects on health. (KMS)
Insomnia

Agenda: Insomnia Section Meeting

Minneapolis Convention Center
Tuesday, June 3, 2014 (5:15pm – 6:15pm)

I. Call to Order
   • Dr. Conroy (Chair)

II. General Business – (5 minutes)
   • Introduction of 2013-2014 Insomnia Section Steering Committee
   • Call for Volunteers: 2014-2015 Insomnia Steering Committee

III. Clinical Practice Guideline Suggestions – (5 minutes)

IV. Section Investigator Award Presentation – (15 minutes)
   • A Randomized Controlled Trial of Mindfulness Meditation for Chronic Insomnia: Long-Term Outcomes
     – Jason Ong, PhD – Rush University Medical Center

V. Other Business/Discussion
   • Running an Insomnia Practice – (20 minutes)
     – Drs. Zarrouf and Chen
       a. Best billing practices
       b. How the ACA affects our patients
       c. Guiding patients through self-help for insomnia
   • Open Discussion – (15 minutes)

VI. Adjournment

Incorporating an Insomnia Treatment Program into your Clinical Practice

Busy sleep professionals often don’t have the time or resources to manage insomnia patients the way they would like. Given the limited availability of behavioral sleep medicine specialists, many clinics do not have the luxury of referring patients for these services. In this newsletter, we identify some of the advantages and disadvantages that sleep medicine specialists may encounter when attempting to incorporate this service into their practice. We hope that more clinicians will consider addressing insomnia in their practice, as adequately addressing insomnia early may reduce the risk of psychiatric disorders in the future (Breslau et al. 1996; Johnson et al. 2006; Roberts and Duong 2013; Pigeon et al. 2012).
of Pennsylvania for his post-doctoral fellowship. He completed his neurology residency and clinical neurophysiology fellowship, including sleep medicine training in Georgetown University. He is a board certified neurologist, neurophysiologist, and sleep medicine specialist. He is currently working as co-director of integrative neurology in St. Agnes Hospital.

Fahd A. Zarrouf, MD
Dr. Zarrouf completed his medical training and psychiatry residency at Damascus University/ Medical School Hospitals in Damascus, Syria. He then completed a combined internal medicine and psychiatry residency at West Virginia University/ Charleston Area Medical Center- Charleston, WV. He completed a Sleep Medicine Fellowship at the Cleveland Clinic Foundation in Cleveland, OH. He is currently working as an Assistant Professor of Medicine-MUSC, at AnMed Health, Anderson, SC. He is Chief of Psychiatric Service and Medical Director of Transcranial Magnetic Stimulation Center in Internal Medicine, Psychiatry, and Behavioral Medicine at the Lung & Sleep Center.

Mary Rose, PsyD
Dr. Rose was awarded her PsyD from the Virginia Consortium Program in Clinical Psychology (Old Dominion University, Eastern Virginia Medical School, William & Mary and Norfolk State University). She completed her internship at the University of Texas Medical Branch; a fellowship in Behavioral Medicine at UTMB and Shriner’s Burns Hospital, as well as a fellowship in Sleep Medicine at the Michael E DeBakey VAMC in Houston. She is a Clinical Psychologist and an Assistant Professor in the Department of Medicine, Pulmonary, Critical Care and Sleep Section at Baylor College of Medicine. She is also affiliated with the VAMC Sleep Disorders Center, and MD Anderson Cancer Center. She has a private sleep clinic in Houston, and is the Clinical Director of American Sleep Medicine in Webster,TX. She has been involved in the sleep field for over 20 years, and holds subspecialty credentialing by the American Academy of Sleep Medicine in Behavioral Sleep Medicine. She works with both adults and pediatric patients. She has published abstracts, peer reviewed journal articles, and book chapters in the field of sleep disorders medicine, as well as in the area of psychosocial outcomes in medically ill patients.

Rebecca Q. Scott, PhD
Dr. Scott completed her undergraduate degree at Notre Dame College in Manchester, NH. She then completed her PhD in Health Psychology at Yeshiva University/Albert Einstein School of Medicine in New York. She also completed her clinical work in sleep disorders medicine at The Sleep Disorders Center, Columbia Presbyterian Medical Center in New York City. She currently works as a sleep disorders specialist at New York Sleep Institute.

Obstacles of Implementing an Insomnia Clinic
Insomnia treatment is often complex and requires skills in psychology, pathology, and general sleep medicine. There may be what seems like insurmountable obstacles for the overall sleep practice, the clinicians treating the disorder, and for the patient. Some of these obstacles are discussed below.

First, the obstacles faced by sleep practices that treat insomnia include time management, an increasing number of patients in need of this service, an aging population with insomnia complaints, drug abuse/misuse by many patients, and a lack of reimbursement or resources for management.

Second, the obstacles faced by clinicians and allied health professionals include lacking the time to meet the needs of insomnia patients, a limited knowledge of behavioral sleep medicine and different interventions to treat insomnia and comorbidities, and difficulties in receiving reimbursement for many of the services. Insomnia can also be co-morbid with other medical and mental problems. Because of this, treating insomnia may mean evaluating and discussing other comorbidities (e.g. effect of depression on insomnia), which may be time-consuming. Finally, there may be certain reservations, such that patients are coming to the clinic to “self-medicate” instead of sincerely seeking help for their condition.

Third, there are at least four obstacles facing the patient. The first is time limitation; most patients cannot make the time in their busy schedules for multiple and frequent visits to receive cognitive behavioral treatment for their insomnia. The second is cost limitation; treating insomnia may be costly and may not be covered completely by insurance. The third obstacle is the chronicity of their symptoms - before finally visiting a sleep clinic, many insomnia patients report that they have tried almost “every sleep agent out there”. This particular belief may lead to increased negative expectations regarding further treatments. The fourth and final obstacle is perception. Many patients think that a “sleep clinic” primarily treats sleep apnea, which may lead them to seek treatment for their insomnia with their primary care physician or psychiatrist.

Overcoming the Obstacles: How to Incorporate Insomnia into your Practice
It is well established that treating insomnia - even in the context of medical (e.g. Pigeon et al 2012; Martinez et al 2013) and psychiatric disorders (Manber et al. 2008) - can decrease the symptoms of the comorbid disorder. Due to this, treating insomnia may aid in the therapy of other disorders, such as CPAP compliance (Pihl et al. 2013). Our recommendations to overcome the obstacles above include the following:
1. Preparation: Be sure your intake questionnaire includes questions that evaluate possible insomnia and some of the comorbidities; severity questionnaires may also be helpful in following up progress. Some examples include: The Insomnia Severity Index (Bastien et al. 2001), PROMIS “Sleep Disturbance Index, or PROMIS” Sleep Related Impairment(Yu et al. 2012; Arnedt 2012).

2. Build referral systems and test them; this may include psychiatrists, gynecologists (treating hormonal imbalance sometimes improves insomnia), primary care physicians and others.

3. Consider dedicating one clinic day to treat only insomnia patients. New patient visits may be longer in duration on this day to ensure adequate assessment.

4. Keep information about who might be certified in behavioral sleep medicine in your area on hand. See http://www.behavioralsleep.org/FindSpecialist.aspx for an example.

5. Resources: In the absence of a clinician to whom the patient can be referred, there are websites to help with different psychiatric problems (mostly anxiety and mood), as well as websites to help with sleep hygiene and basic insomnia treatment recommendations.

**Online Insomnia Treatments**

For practitioners without access to skilled clinicians who are certified in Behavioral Sleep Medicine, online delivery of CBT-I may be an effective alternative approach. The number of studies supporting the value of online interventions for insomnia, particularly over the last year, has increased significantly. For more information on online treatment for insomnia, check out the following resources:

**Free Websites**

- Sleepeducation.org - [http://www.sleepeducation.org/](http://www.sleepeducation.org/)
- National Sleep Foundation - [http://www.sleepfoundation.org/](http://www.sleepfoundation.org/)

**Sites that Charge**

- SHuti - [http://shuti.me/](http://shuti.me/)

**Free App**

- The VA's CBTi coach

---

**SLEEP 2014 Annual Meeting**

**May 31 – June 4 | Minneapolis, MN**

We hope you will consider checking out the following courses, lunch sessions, and general sessions focused on insomnia!

**Saturday, May 31st**

**Postgraduate Courses**

C01: Year-In-Review 2014  
8:00am – 5:00pm

C02: Trends in Sleep Medicine  
8:00am – 5:00pm

**Sunday, June 1st**

**Postgraduate Course**

C11: It is Not Just About Treating Insomnia Anymore: Expanding the Reach of Behavioral Sleep Medicine Across Disorders and Provider Types  
8:00am – 5:00pm

**Monday, June 2nd**

**Meet the Professor**

M08: Successes and Challenges in Disseminating Behavioral Treatments of Insomnia  
12:30pm – 1:30pm  
Anne Germain, PhD

**Oral Presentation**

D02: International Implementation of an Internet Intervention for Insomnia  
3:00pm – 5:00pm

**Tuesday, June 3rd**

**Meet the Professor**

M10: Fatal Familial Insomnia- Prion Disease: Past, Present and Future  
12:30pm – 1:30pm  
William Jet Broughton, MD
Bench-to-Bedside Integrated Session
B02: Exercise as a Behavioral Sleep Medicine Intervention
8:00am – 10:00am

Oral Presentation
O20: Insomnia Treatment
2:45pm – 4:45pm

Wednesday, June 4th

Symposia
S15: Insomnia Subtypes: The Mind, the Brain and the Body
8:00am – 10:00am

Oral Presentation
O24: Insomnia: Co-morbid Associations
10:20am – 12:20pm

Meet the Professor
M17: Treatment Updates on Insomnia
12:30pm – 1:30pm
Andrew Krystal, MD

Oral Presentation
O31: Insomnia: Modifying Factors
2:45pm – 4:45pm

Newsletter References
Arndt, J. (2012). PROMIS of improved tools for assessing sleep and wake function: Commentary on “Development of short forms from the PROMIS sleep disturbance and sleep-related impairment item banks”. Behavioral Sleep Medicine, 10, 25-27.


Steering Committee Profiles

Mauro Manconi, MD, PhD (Chair)
Dr. Manconi is the Head of the Service at the Sleep and Epilepsy Centre of the Neurocenter of Southern Switzerland, Lugano, Switzerland. He is currently involved in clinical and basic research in the sleep field, with particular interest in sleep related motor disorders.

Denise Sharon, MD, PhD (Vice Chair)
Dr. Sharon completed her medical training at Sackler School of Medicine in Tel Aviv, followed by a psychiatry residency in Israel and a PhD in psychology from Temple University. She is board certified in sleep medicine and has been practicing in Louisiana for over 15 years. She is the clinical director of Comprehensive Sleep and Research Center and of Advanced Sleep Center and is an assistant professor at the Tulane University School of Medicine in New Orleans where she initiated the fellowship in sleep medicine. Her clinical focus is the diagnosis and treatment of sleep disorders in adults and children. Her research interests are the diagnosis and treatment of RLS, various treatments for sleep disorders and treatment compliance.

Agenda: Movement Disorders Section Meeting

Minneapolis Convention Center
Tuesday, June 3, 2014 (5:15pm – 6:15pm)

I. Call to Order
   • Mauro Manconi, MD, PhD (Chair)

II. General Business – (5 minutes)
   • Introduction of 2013-2014 Movement Disorders Steering Committee
   • Call for Volunteers: 2014-2015 Movement Disorders Committee

III. Clinical Practice Guideline Suggestions – (5 minutes)

IV. Section Investigator Award Presentation – (15 minutes)
   • Effect of Serotonin on Periodic Limb Movements in Sleep: A Cross-sectional Study
     – Kyoung Bin Im, MD, MS – University of Iowa

V. Other Business/ Discussion
   • Quality metrics – (5 minutes)
     – Dr. Lynne Marie Trotti, MD
   • Update on Standards of Practice – (5 minutes)
     – Dr. Lynne Marie Trotti, MD
   • Update on ICSD and Scoring criteria on SRMD – (5 minutes)
     – Dr. Denise Sharon, MD, PhD
   • 2013 Article of the Year: Sleep Related Movement Disorders – (5 minutes)
     – Dr. Brian Koo, MD
   • SLEEP 2015 Proposals – (15 minutes)
     – Mauro Manconi, MD, PhD

VI. Adjournment
   • Mauro Manconi, MD, PhD

The majority of the Movement Disorders Section Committee’s work in the past months has been dedicated to defining the agenda for the upcoming Movement Disorders Section Meeting that will held at the 28th Annual Meeting of the Associated Professional Sleep Societies, LLC (SLEEP 2014) at the Minneapolis Convention Center, and in elaborating session proposals to discuss. Moreover, in the past year, a formal proposal to establish a task force to revise the criteria for respiratory-related leg movements was proposed by the committee and is under evaluation.

We are glad to inform you that the SLEEP 2014 agenda includes two sessions from our section members. The first is a postgraduate course consisting of a theoretical and video-poly-
somnographic practical session focused on sleep related motor disorders (SRMD), including REM behavior disorder. Participants will receive the basic knowledge to record, recognize, score and interpret frequent SRMD such as PLM, bruxism and RBD, as well as the less frequent disorders such as propriospinal myoclonus, neck myoclonus, muscular cramps and rhythmic movement disorders. This proposal aims to expand the interest of the audience to reach beyond restless legs syndrome (RLS), which is also one of the established goals of the section committee this term.

**Saturday, May 31st**

**Postgraduate Course**

C04: Video-Polysomnographic Evaluation (Diagnosis and Scoring) of Sleep Related Movement Disorders  
8:00am – 12:00pm

The second proposal is a clinical workshop focused on the still-unsolved problem of the augmentation phenomena in restless legs syndrome (RLS). Augmentation is a severe drug-related exacerbation of symptoms, occurring in the setting of long-term dopaminergic treatment for RLS and representing the main reason of late dopamine-agonists discontinuation. This remains one of the most recurrent challenges in clinical practice and is still largely misunderstood. This session will also provide practical clinical guidelines to recognize and manage augmentation.

**Monday, June 2nd**

**Clinical Workshop**

W02: More is Less and Less is More: Augmentation Phenomena in Restless Legs Syndrome  
3:00pm – 5:00pm

One of our goals for the Movement Disorders Section Meeting is to increase the number of attendees. This annual, formal meeting is highly important for its members and represents a unique occasion to share knowledge and opinions on movement disorders among experts in this field, as well as the opportunity to discuss specific topics of interest and to propose discussion topics for future meetings. Our meeting is scheduled for Tuesday, June 3rd from 5:15pm – 6:15pm CT. The Movement Disorders section committee members for the new term will be presented and will be followed by a call for volunteers for the 2014-2015 Steering Committee. We encourage people interested to apply to the call. Afterward, a brief update on the following topics will be discussed:

- New ICSD and scoring criteria on Movement Disorders
- Standards of Practice update for sleep centers
- Quality metrics for Movement Disorders

Following these discussions, the winner of the Movement Disorders Section Investigator Award will be announced, and he/she will provide a brief presentation of the award-winning abstract. A second award will then be given to the best original article published in 2013 in the two AASM-affiliated journals, SLEEP and the Journal of Clinical Sleep Medicine (JCSM). The final part of the meeting will address topics to be proposed for SLEEP 2015.

The section meeting is a wonderful opportunity to meet others with similar interests, circulate ideas, knowledge and suggestions on the interesting field of sleep-related movement disorders, and to become involved in the latest developments within this very important section of the AASM. We strongly encourage all section members to join our meeting and to contribute enthusiastically to the debate.
Steering Committee Profiles

Richard P Knudsen, MD (Chair)
Dr. Knudsen is dually Fellowship trained in Pediatric Neurology and Advanced Clinical Neurophysiology. He is with the University of California Davis, Sacramento, CA in the Department of Neurology. His primary interests are in pediatric sleep medicine and epileptology. He is especially invested in the central hypersomnias and the nocturnally activated epilepsy syndromes. He is published regarding Hypersomnias and is invited to speak internationally regarding Narcolepsy.

Vyes Dauvilliers, MD, PhD (Vice Chair)
Dr. Dauvilliers Professor of Neurology and Physiology, and Head of the clinical and research activity of the sleep laboratory at the University of Montpellier, France since 2005. He obtained his MD in neurology in 2000 (Montpellier) and his PhD in neurosciences in 2004 (Montpellier). He has been involved in several international projects on sleep disorders with the Department of Sleep at the Montreal University Hospital-Canada (Professor J. Montplaisir) and with the Department of Genetic at the Geneva University Hospital-Switzerland (Professor M. Tafti). Since 2007,

For members planning to attend the upcoming APSS SLEEP 2014 Minneapolis, MN sessions, this guide map focuses explicitly on the subject of narcolepsy and will help steer you towards the related sessions, courses and posters available at the meeting. This guide map is intended to aid those devoted to gleaning knowledge concerning this particular topic, and its breakthrough updates, in the right direction while attending SLEEP 2014.

Agenda: Narcolepsy Section Meeting

Minneapolis Convention Center
Tuesday, June 3, 2014 (5:15pm – 6:15pm)

I. Call to Order
   • Dr. Knudsen (Chair)

II. General Business – (5 minutes)
   • Introduction of 2013-2014 Narcolepsy Section Steering Committee
   • Call for Volunteers: 2014-2015 Narcolepsy Steering Committee

III. Clinical Practice Guideline Suggestions – (5 minutes)

IV. Section Investigator Award Presentation – (15 minutes)
   • The Utility Of The Sustained Sleep Latency On Polysomnography (PSG) And The Multiple Sleep Latency Test (MSLT) In The Diagnosis Of Patients With Hypersomnolence Of Central Origin
     – Carmela Gonzales, MD - University Hospitals, Case Medical Center

V. Other Business/ Discussion – (35 minutes)
   • Analyses of Worst Case Scenarios – Can Databases guarantee Quality Assurance and Benchmark Comparisons?
     – Dr. Ipsiroglu
   • Misdiagnoses/mismanagement of diagnostically unfulfilled "pseudo" NWC/NWOC
     – Dr. Hoffman
   • Late discoveries in the pharmacotherapy for NWC/NWOC
     – Dr. Dauvilliers
   • Update regarding the neuroimmunology of NWC/NWOC
     – Dr. Knudsen

VI. Adjournment
Tuesday, June 3rd

Meet the Professor

M14: Treatment of Narcolepsy
12:30pm – 1:30pm
Thomas Scammell, MD

Narcolepsy Section Meeting
5:15pm – 6:15pm

Richard P. Knudsen, MD (Updates in the neuroimmunology of narcolepsy); Yves Dauvilliers, MD, PhD (Recent major discoveries in the pharmacotherapy for narcolepsy); Alan Hoffman, MD, PhD (Comorbid anxiety/mood disorders in Narcolepsy, Rx – related as a confounder); and Carmela Gonzales, MD (Young Investigator Award: The utility of the sustained sleep latency on PSG and the MSLT in the diagnosis of patients with hypersomnia of central origin)

Wednesday, June 4th

Symposia

S17: What is Cataplexy?
8:00am – 10:00am

Meet the Professor

M21: How to Evaluate and Manage EDS in Childhood
12:30pm – 1:30pm
Suresh Kotagal, MBBS

Oral Presentation

027: Narcolepsy and Hypersomnias Related Psychiatric Disease
1:30pm – 2:30pm

Clinical Workshop

W07: Hypersomnia and Narcolepsy in the Pediatric Population
2:45pm – 4:45pm

The second portion of our contribution centers on a major breakthrough in the field of narcolepsy research. Vigorous commendation is sent out to Dr. Emmanuel Mignot, Director, Sleep Sciences and Medicine, Stanford University, for his recent discovery of the locus of the epitope (autoantigen) toward induction-onset autoimmune narcolepsy. This scientific breakthrough will likely lead to an ‘in vitro’ test, which will enable clinicians to earlier and more accurately detect dysimmune narcolepsy, with the added benefit of swifter immunomodulatory intervention and consequent sparing of the depth of profound, chronic disease.

For AASM members interested in reviewing the actual reference, please refer to:


http://stm.sciencemag.org/content/5/216/216ra176.full.pdf?sid=769b592b-4eb8-4b42-be80-b9ee3b6c6db8

Richard P Knudsen, MD
Chair, Narcolepsy

Pr Dauvilliers is a member of the scientific board of the French Sleep Medicine and Research Society, a member of the European Sleep Research Society, International REM sleep behaviour study group, and more recently of the American Academy of Sleep Medicine. He is the Director of the Sleep Disorders Centre, Department of Neurology, Gui de Chauliac Hospital, Montpellier since 2005, a member of the Clinical Research Department, University Hospital, Montpellier since 2000, associate coordinator of the Gui-de-Chauliac University Hospital, Montpellier-France, since 2012 and Member of the Editorial Board of Sleep Medicine and Sleep.

Alan Hoffman, MD

Dr. Hoffman is a Vancouver Island-based Sleep Disorders Consultant, and Medical Director of Med-Sleep Vancouver Island (including the Nanaimo Sleep Clinic), and a consultant Sleep Respirologist at MedSleep Calgary and the Northern Alberta Sleep Clinic, with a background in Internal Medicine, Critical Care and Chest Medicine. He is a frequent lecturer on a variety of sleep medicine related topics, is a Medical Surveyor for the Diagnostic Accreditation Program of BC, and an Adjunct Professor at Thompson Rivers University in Kamloops. He has practiced in many locales including the USA, Middle East and the UK, as well as in several Provinces. He started out in the late 1960’s as a hospital based respiratory therapist, then became a biochemist, eventually running his own lipid biochemistry and mass spectroscopy laboratory at the National Institutes of Health in Bethesda, as a Fogarty Visiting Scientist. His clinical practice and focus now is devoted to the science and medicine of sleep disorders. He lives with his wife in Maple Bay in the Cowichan valley, where they have a photography studio, custom picture framing workshop and art gallery.
Parasomnias

Agenda: Parasomnias Section Meeting
Minneapolis Convention Center
Monday, June 2, 2014 (5:15pm – 6:15pm)

I. Call to Order
   • Dr. Avidan (Chair)
II. General Business – (5 minutes)
   • Introduction of 2013-2014 Parasomnias Section Steering Committee
     – Introduction of Dr. Aleksandar Videnovic, MD (2014-2015 Chair)
   • Call for Volunteers: 2014-2015 Parasomnias Steering Committee
III. Clinical Practice Guideline Suggestions – (5 minutes)
IV. Section Investigator Award Presentation – (15 minutes)
   • Effects Of Deep Brain Stimulation On Sleep In Parkinson’s Disease
     – Sean Rotolo, MD – UNC Healthcare
V. Other Business/ Discussion – (35 minutes)
   • ICSD-3 Parasomnias Updates
     – Michel Bornemann
VI. Adjournment

AASM Parasomnias Steering Committee Bulletin
International Classification of Sleep Disorder- 3rd Edition (ICSD-3)

ICSD-3 UPDATE ON PARASOMNIAS

ICSD-3 Parasomnias Task Force Team:
   Michel A. Cramer Bornemann, MD- Minneapolis/Saint Paul, MN
   Carlos Schenck, MD- Minneapolis/Saint Paul, MN
   Mark Pressman, PhD- Philadelphia, PA
   Gerald Rosen, MD- ICSD-3 Pediatrics Liaison- Minneapolis/Saint Paul, MN
   Mark Mahowald, MD- DSM-5 Parasomnias Liaison- Minneapolis/Saint Paul, MN

The International Classification of Sleep Disorders is the primary diagnostic, epidemiological and coding resource for clinicians and researchers in Somnology and Sleep Medicine. The recently published International Classification of Sleep Disorders- 3rd edition (ICSD-3) was produced by the American Academy of Sleep Medicine (AASM) Parasomnias have long been defined in previous editions of the ICSD as undesirable physical events or experiences that occur during entry into sleep, within sleep, or during arousals from sleep. Though this definition
remains unchanged, thereby maintaining the foundation for essential characteristics which distinguish it from the other sleep disorders, it provides only a limited scope in which to best understand the broad continuum of expressions attributed to parasomnias. The ICSD-3 attempts to elaborate upon our understanding of parasomnias from one primarily consisting of an arguably disparate set of clinical characteristics to one that is based firmly upon the unifying neuroscientific paradigm of state dissociation.

The concept that sleep and wakefulness are not invariably mutually exclusive states, and that the various state-determining variables of wakefulness, NREM sleep and REM sleep may occur simultaneously or oscillate rapidly is the key to understanding primary parasomnias. Recent advances in neurophysiology, coupled with sophisticated neurodiagnostic imaging modalities, now reveal that the three states are modulated by a host of influences including the degree of aminergic and cholinergic neurochemical bias, CNS activation and the degree of endogenous vs. exogenous input. Under normal physiologic conditions, which include homeostatic drive and circadian rhythmicity, the process of state declaration is maintained in a stable and predictable fashion throughout a 24 hour period. However, as the components of sleep frequently dissociate and oscillate, sleep and wake may be rendered into a state that is not yet fully declared, thereby finding itself in an unstable temporary condition-or state dissociation. Thus, sleep and wake, as well as its associated features of consciousness and unconsciousness, are not dichotomous states as they occur on a spectrum and are considered evanescent. The primary parasomnias are clinical phenomena that appear as the brain becomes reorganized across states, and therefore are particularly apt to occur during transitions between states. The admixture of wakefulness and NREM sleep explains the disorders of arousal-confusional arousals, somnambulism and sleep terrors. The admixture of wakefulness and REM sleep explains cataplexy, sleep paralysis, hypnagogic hallucinations, lucid dreaming and the persistence of motor activity during REM sleep (REM Sleep Behavior Disorder). The paradigm of state dissociation allows for the understanding of unusual - if not bizarre - human behaviors and/or experiences that previously had defied explanation. This paradigm sets a platform which invites rigorous scientific inquiry, allowing for the development of testable hypotheses which can be verified if true… and falsified if false. As reflected by the inclusion of references by Allan Hobson and Tassinari et al., advances in Somnology and Cognitive Neuroscience continue to supplant long-held popular beliefs that Dream Enactment Behaviors are the consequence of “wish fulfillment” or attempts at inner conflict resolution that had been hidden by formidable psychic censorship.

Given that admixtures of wakefulness with either NREM sleep or REM sleep often result in a distinctive array of patterns of motor expression along with alterations in consciousness, an attempt was made in the ICSD-3 to further delineate those parasomnias, which arise from NREM sleep to those from REM sleep. This reorganization is most apparent in the section dedicated to NREM-related parasomnias. Here, confusional arousals, sleepwalking, and sleep terrors are no longer a collection of separate conditions; instead, they are seen as arising from a similar platform and explicitly organized as subsets under the unified heading of disorders of arousal (DOA). Despite the appreciation of the unitary nature of disorders of arousal, these conditions will retain their unique ICD-9 and ICD-10 coding to facilitate appropriate documentation and medical recording keeping. The formal designation of sleep-related abnormal sexual behaviors,
Ramadevi Gourineni, MD
Dr. Gourineni is a Neurologist and specialist in the field of Sleep Medicine. She obtained her medical degree from Kurnool Medical School in Andhra Pradesh, India. Her Neurology training was completed at the University of Illinois, Chicago, IL. She also completed 2 fellowships. The first one was in EEG and Sleep at Loyola University, Maywood, IL and the second was in Sleep Medicine at Northwestern University, Chicago, IL. She worked for two years at Loyola University as an Assistant Professor in Neurology. She is currently an Associate Professor in Neurology at Northwestern Feinberg School of Medicine. Her clinical practice is in Sleep Medicine and she is the Director of the Insomnia Program at the Northwestern Sleep Disorders Center.

Erik K. St. Louis, MD
Dr. St. Louis is Head of the Section of Sleep Neurology, Associate Professor of Neurology, Mayo Clinic College of Medicine, and Consultant in Neurology and Medicine at Mayo Clinic Rochester. He previously co-directed the Marshfield Clinic and University of Iowa Comprehensive Epilepsy Programs for ten years. He was educated at St. Olaf College, the Medical College of Wisconsin, Mayo Clinic Rochester, and The University of Iowa. He is board certified by the American Boards of Psychiatry and Neurology (Adult Neurology, with additional Certifications in Sleep and Clinical Neurophysiology), Sleep Medicine, and Clinical Neurophysiology (EEG/Epilepsy Monitoring). He was renamed in 2013 to the Best Doctors in America, selected as a Fellow of the American Academy of Neurology, and serves on the ABRET Board of Directors and AAN Continuum and Frontiers in Epilepsy Editorial Boards.

often referred to in the popular media as “Sexsomnia” or “Sleep Sex”, as a well-recognized clinical or pathologic subtype of DOA should facilitate the acceptance of this condition in the courtroom arena, particularly within the prosecutorial realm which often views this condition with great skepticism. Sleep-related eating disorder (SRED) in many ways may likewise be considered to be a clinical or pathologic subtype of DOA; however, SRED has many distinctive features - such as its association with restless legs syndrome and greater potential to retain awareness - that diverge from those of DOA. Along with greater understanding in terms of essential features, demographics, predisposing and precipitating factors and clinical course, the importance of SRED is reflected in the presentation of its own diagnostic criteria and is situated under its own heading in ICSD-3 - between sections of NREM-related and REM-related parasomnias.

A significant change within the ICSD-3 parasomnias section is the transfer of catathrenia to the sleep-related breathing disorder section. Since ICSD-2, continued research has revealed that catathrenia has more in common with sleep disordered breathing and does not appear to mechanistically fit within the state dissociation paradigm. Similarly, enuresis, a rather poorly understood condition, also appears to not adhere to the state dissociation paradigm. However, enuresis was retained within the parasomnias section given its overall clinical significance and that it conforms to the conventional definition as an “undesirable physical event or experience within sleep”. Last but not least, it has long been held that alcohol has been identified as a potential trigger for sleepwalking. More recent evidence-based reviews have found no compelling relationship between alcohol and DOA. This undoubtedly will have significant diagnostic, management, and forensic implications. It is now explicitly stated in the ICSD-3 that “Disorders of Arousal should not be diagnosed in the presence of alcohol intoxication” as the behavior of the alcohol-intoxicated individual may superficially mimic that of a sleepwalker.

In view of (1) the large number of neural networks, neurotransmitters, and other state-determining substances that must be recruited synchronously for full state declaration, and (2) the frequent transitions among states during the wake/sleep cycle, it is not surprising that errors in state declaration can occur as frequently as they do. The ICSD-3 reflects this growing fund of knowledge in parasomnias as demonstrated by notable refinements in diagnostic criteria, clinical updates, and bibliographic revisions to DOA, REM sleep behavior disorder (RBD), and nightmare disorder. The parasomnias section of the ICSD-3 aims to enhance our understanding of these conditions through the state dissociation paradigm, provide current and up-to-date clinical information as well as guidance, and set standards for on-going and future research.

Michel A. Cramer Bornemann, MD
Sleep Deprivation

Agenda: Sleep Deprivation Section Meeting
Minneapolis Convention Center
Monday, June 2, 2014 (5:15pm – 6:15pm)

I. Call to Order
   • Dr. Belenky (Chair)

II. General Business – (5 minutes)
   • Introduction of 2013-2014 Sleep Deprivation Section Steering Committee
   • Call for Volunteers: 2014-2015 Sleep Deprivation Steering Committee

III. Clinical Practice Guideline Suggestions – (5 minutes)

IV. Section Investigator Award Presentation – (15 minutes)
   • The Relationship between Sleep Duration and Cardiometabolic Risk Factors Depends on Race/Ethnicity and Whether Risk Factors Were Self-Reported or Objectively-Determined
     – Michael Grandner – University of Pennsylvania

V. Other Business/ Discussion
   • Data Blitz: Highlights of Emerging Sleep Deprivation Research – (15 minutes)
   • Open Discussion – (20 minutes)

VI. Adjournment

Role of Fatigue in the Crash of Asiana Flight 214
Gregory Belenky, MD

On July 6, 2013, Asiana 214 was flying across the Pacific Ocean from Incheon, South Korea to San Francisco, California and crashed on its final approach to the San Francisco International Airport (SFO). The aircraft, a Boeing 777-200ER, was carrying 307 people, including four pilots (three Captains and one First Officer) and twelve flight attendants. According to reports, the weather was very good and the crew was cleared by air traffic control for a visual approach. Though the investigation is still underway, it appears that

Disclaimer
No part of this publication may be reproduced without the permission of the American Academy of Sleep Medicine (AASM). The statements and opinions contained in editorials and articles in this newsletter are solely those of the authors and not of the AASM or of its officers, members or employees. The Editor and Managing Editor of the Membership Sections Newsletter, the AASM and its officers, members and employees disclaim all responsibility for any injury to persons or property resulting from any ideas, products or services referred to in articles in this publication.
Her study of fatigue risk factors in various operational environments informs the development of policy and best-practice guidelines by groups including federal and regional regulators. Dr. James’ published work includes studies of human sleep, circadian physiology and clock gene expression performed in time-isolation environments and under conditions including shift work and jet-lag. Dr. James brings her academic research experience to the development of data-driven approaches to fatigue risk management in work environments including the commercial motor vehicle industry, aviation, rail and commuter transit systems.

Mathias Basner, MD, PhD, MSc
Dr. Basner is an Assistant Professor of Sleep and Chronobiology in Psychiatry at the University of Pennsylvania School of Medicine. Dr. Basner received his degree in Medicine and his Master in Research from the University of Bochum, Germany and Master of Science in Epidemiology from the University of Bielefeld, Germany. Dr. Basner trained at the Institute for Applied Physiology at the University of Bochum and worked as a Research Associate at the German Aerospace Center (DLR), Institute of Aerospace Medicine, Flight Physiology Division from 1999 until 2006 before moving to the United States to pursue his research interests in the neurobehavioral consequences of sleep loss as a Research Associate. He returned to DLR in 2008 to head the Flight Physiology Division for two years. In January 2010, Dr. Basner assumed the position of Assistant Professor of Sleep and Chronobiology in Psychiatry.

Mikhail Bochkarev, MD, PhD
Dr. Bochkarev is starting his second year as a Member of the Sleep Deprivation section. He is an Expert in shift-work projects in ConTerra LLC, Saint-Petersburg, Russia. He coordinates shift-work studies in his past job in the Department of Hospital Therapy, Khanty-Mansiysk State Medical Academy. Dr. Bochkarev’s primary research interests concern the effects of sleep loss on health and performance to shift-workers, and the humans’ adaptation to natural conditions of the Far North.

Abid Malik, MD
Dr. Malik is in charge of one of the inpatient adult Psychiatry units at Orlando Health, together with half of the inpatient Psychiatry intensive level of care unit. In addition, he is the medical director of Orlando Health’s Sleep Disorder Center (South Seminole Site), and runs a weekly sleep clinic. He has a busy outpatient Psychiatry practice, & engages in clinical research. His research interests include the effects of sleep deprivation on Psychiatric disorders such as anxiety and depression, and vice versa.

The aircraft came in too low and too slow and, just as the pilot was calling for a go-around, the landing gear and then the tail of the aircraft hit the sea wall just short of the runway. Three people were killed and twelve critically injured. The flight crew was relatively inexperienced with the visual approach into SFO. The crash appears to have been a result of pilot error.1

Fatigue is the result of the interaction of time awake (sleep loss), time of day (circadian rhythm phase), and workload.2 Fatigue is operationally defined by self-report – “I am tired” – and by degraded cognitive performance. Fatigue is frequently the proximate cause of error, incident and accident. Flight 214 took off from Incheon, South Korea at 17:04 Korea Standard Time (KST) (08:04 Coordinated Universal Time (UTC)). The pilots flew for 10 hours and 24 minutes. Assuming that the pilots’ circadian rhythms were synchronized to KST, the crash occurred at 03:28 KST, in the middle of their window of circadian low (WOCL), with respect to physiological/circadian time. The pilots probably napped in the afternoon the day before and took some inflight sleep over the Pacific Ocean. Nevertheless, the pilots were likely suffering performance degradation from both mild-to-moderate sleep loss and adverse circadian phase (and their interaction) at the time of the attempted landing. For the pilots of Asiana Flight 214, fatigue from sleep loss and adverse circadian phase likely increased the risk of pilot error.

References

1http://en.wikipedia.org/wiki/Asiana_Airlines_Flight_214
Sleep Related Breathing Disorders

Agenda: Sleep Related Breathing Disorders Section Meeting
Minneapolis Convention Center
Monday, June 2, 2014 (5:15pm – 6:15pm)

I. Call to Order
   • Dr. Christine Won (Chair)

II. General Business – (10 minutes)
   • Introduction of 2013-2014 SRBD Section Steering Committee
   • Call for Volunteers: 2014-2015 SRBD Steering Committee

III. Clinical Practice Guideline Suggestions – (5 minutes)

IV. Other Business/ Discussion
   • Teledicine for SRBD – (15 minutes)
     – Ronald Chervin, MD, MS
   • New Sleep Care Paradigm – (15 minutes)

V. Section Investigator Award Presentation – (15 minutes)
   • Effects of Continuous Positive Airway Pressure on Measures of Arterial Stiffness in Obstructive Sleep Apnea: Results of the Sleep Apnea Stress Study Randomized Controlled Trial
     – Hugo Paz y Mar – Cleveland Clinic

VI. Adjournment

Case

A 53-year-old male is referred to the sleep clinic for suspected obstructive sleep apnea hypopnea syndrome (OSAHS) and excessive daytime sleepiness (Epworth score of 15/24). He has loud snoring, witnessed apnea by his wife, awakens himself by snoring/snorting and wakes routinely with a headache and dry mouth in the morning. He also sometimes awakens gasping for air. He dozes off accidentally at his desk during work and has dozed off for a moment while driving, despite a consistent and adequate duration of sleep. He has mild to moderate restless leg sensations in the evening hours. He has no parasomnias or ancillary symptoms to suggest narcolepsy.

Physical exam: BP 115/65, Pulse 94, RR 18, Ht 163.8 cm (5’ 4.5’’), Wt 71.396 kg (157 lb 6.4 oz), SpO2 97%, BMI 26.60 kg/(m^2)

HEENT: Large tongue with scalloping, high arched hard palate, Mallampati Class IV, no tonsils, mild overjet, narrow but patent nasal airway and 17” neck. Neuro, cardiac and pulmonary exams were within normal limits.

PMH: Hypersomnia, snoring, restless leg syndrome, hyperlipidemia, hypertension, GERD
She completed her MD and MPHTM at Tulane University, and her training in Internal Medicine, Pulmonary & Critical Care, and Sleep Medicine at the University of Maryland School of Medicine. Her research interests include ambulatory models of sleep care, health access, peri-operative risk related to sleep disordered breathing, and the relationship between PTSD and sleep apnea. She is a member of the VA Sleep Network steering committee, a group of VA sleep providers working together to promote high quality clinical care, to standardize programmatic processes, and to develop multi-site collaborative sleep research. A self-proclaimed foodie, oenophile, and craft beer enthusiast, her other interests include full and half marathons, yoga, and travel.

Chad Hagen, MD
Dr. Hagen is Director of the Oregon Health and Science University Sleep Disorders Program. He maintains a busy academic sleep clinical practice, teaches residents and sleep medicine fellows while continuing research related to sleep disordered breathing syndrome definition and disease detection.

**Testing:** Ferritin normal at 254 ng/mL
 Split-night polysomnogram did not split to treatment as the AHI calculated using AASM hypopnea rule B (CMS-4%-AHI) was less than 20. The CMS-4%-AHI requires a 4% desaturation for the inclusion of hypopnea. For the entire night, both the CMS-4% AHI and the rate of 4% desaturations per hour were both 1.8. There were no obstructive apnea, no central or mixed apnea and the minimum oxygen saturation of 88%. The apnea hypopnea index calculated using AASM hypopnea rule A was 17 which include hypopnea with either a 3% desaturation or an arousal. PLM index was 38 and PLM index with arousal was 12.

**Question 1**
Based on these results, what most likely caused his apnea, loud snoring, non-restorative sleep, excessive daytime sleepiness, Epworth score of 15, restless leg symptoms, morning headaches, drowsy driving, and dozing off at work?

A. Periodic limb movement disorder  
B. Restless leg syndrome  
C. Obstructive sleep apnea  
D. Narcolepsy  
E. Stress

**Question 2**
What is the most rational first treatment recommendation?

A. Dopamine agonist or gabapentin  
B. Iron replacement  
C. CPAP  
D. Stimulant or alerting medications  
E. Weight loss

**Treatment Course**
Although the AHI-4%-CMS was 1.8, his AHI following AASM hypopnea scoring rules was much higher at 17, indicating significant arousal from sleep due to OSAHS. This amount of OSAHS appeared likely to contribute to his presenting symptoms of witnessed apnea, loud snoring, non-restorative sleep, excessive daytime sleepiness, Epworth score of 15, restless leg symptoms, morning headaches, drowsy driving, and dozing off at work - thus CPAP was initiated. He was never treated with hypnotics, dopamine agonists, gabapentin, iron supplementation, or other sleep related medications at any time over his course of treatment.

**Outcome**
He was observed during titration to have normal sleep and breathing laterally at CPAP of 9 cm H2O, and normal sleep and breathing supine once increased to 11 cm H2O. He took approximately 2 weeks to accommodate to CPAP therapy, and was thereafter compliant and benefiting from treatment with CPAP in auto mode from minimum pressure of 9 to maximum pressure of 11 cm H2O. His average CPAP use was 6 hours 33 minutes per night with greater than 90% of nights > 4 hours. Objectively, flow reductions with arousal at a rate of 17 per hour were reduced to < 5 per hour with CPAP titration and flow changes were reduced to 0.8 per hour as estimated by data download from his CPAP machine. Subjectively, his Epworth score reduced from 15 to 6, he reported resolution of morning headaches, sleep complaints, complete resolution of restless leg sensations, and his wife reported resolution of snoring and pauses in his breathing. He reported significant improvements in ability to stay awake and alert throughout the day, no longer dozed off at work, and had no further incidents of drowsy driving.
Discussion

Limiting hypopnea scoring to only those events with 4% desaturation or greater, without a quantification of sleep disruption arising from sleep apnea, fails to identify the appropriate diagnosis and treatment in this case, Obstructive Sleep Apnea and CPAP respectively. Figure 1 shows conspicuous flow changes on the semi-quantitative nasal pressure signal, clearly precipitating arousal and excessive movements that would be quantified as merely periodic limb movements if hypopnea scoring was by Rule B only. The secondary reflexive limb movements from this patient's OSAHS had a very robust improvement on CPAP (Figure 2). Limiting hypopnea scoring to a less sensitive method (AASM Hypopnea Rule B) leaves no way to quantify that this patient's obvious symptoms of sleep apnea (snoring, witnessed apnea, hypertension, and excessive daytime sleepiness) should be attributed to his sleep apnea. In this scenario, summary data would mislead and imply a primary periodic limb movement disorder. Our lab utilizes the recommends AASM rule A for scoring. We also score rule B hypopnea simultaneously using a slightly different label, which adds little to no extra technologist time and permits calculation of a CMS-4%-AHI (Rule B) in addition to AASM-AHI (Rule A) in order to counsel patients with access to care based on Center for Medicare Services guidelines.

Both higher AHIs and higher rates of Obstructive Sleep Apnea have been reported with AASM hypopnea rule A compared to the CMS-4% hypopnea rule consistent with AASM rule B (Berry 2012, Guilleminault 2009, Ward 2013, Warren 2009). For over 30 years it has been believed that upper airway collapse in Obstructive Sleep Apnea Hypopnea Syndrome has two immediate consequences of fragmented sleep and impaired breathing, though we still have an incomplete understanding of how these immediate consequences translate into downstream effects on health, quality of life, and neuro-cognition. Oxygen desaturations, time spent with desaturation, sleep disruption, autonomic dysregulation, inflammatory responses, platelet activation, and intra-thoracic negative pressure from OSAHS appear to mediate the connections between OSAHS and its numerous associated co-morbidities. We lack a clear understanding of how each of these mediators contribute, though it is likely that some pertain to certain co-morbidities more than others (i.e. time spent in desaturation may be more relevant to heart failure, while disorganization of sleep may be more relevant to certain neurocognitive complaints). Increases in negative intra-thoracic pressure and autonomic perturbation can be caused by events both with and without desaturation. Though inclusion of assessment of autonomic instability and intra-thoracic pressure would be ideal, this underscores the need to analyze polysomnographic data quantifying events resulting in either arousal or desaturation.

References


Paper speed displayed is too fast permit adequate inspection of
EEG arousal, but arousals are 3 seconds or greater and consistent with AASM scoring rule when viewed at slower paper speed. AASM scoring rules indicate 7 obstructive hypopnea causing 7 micro-arousals and four desaturations of 3% or greater in this 6 minute epoch.

AASM hypopnea rule A = “H” Discernible flow reduction of 30% or more with associated consequences of either a desaturation of ≥3% or an arousal

AASM hypopnea rule B = “OH” Discernible flow reduction of 30% or more with associated consequence of a desaturation of 4% or greater requiring 4% desaturation for inclusion of events. Scoring in this 6 minute epoch identifies 2 obstructive hypopnea (labeled OH) causing a desaturation of 4% or greater.

Figure 1: 6 minute sample of stage N1 and N2 supine from diagnostic PSG
(Note the reflexive leg jerk and increased limb EMG activity associated with hyperpnea and arousal at the termination of each obstructive hypopnea.)

Figure 2: 6 minute sample of stage N1 and N2 supine during CPAP titration
(Note stage is same as diagnostic sample but airflow reductions, micro arousal and limb movements are all resolved on CPAP.)
Obstructive Sleep Apnea and the Federal Motor Carrier Safety Administration Commercial Driver Examination

Kathe G. Henke, PhD

The Federal Motor Carrier Safety Administration (FMCSA) develops guidelines and rules for the driver with excessive daytime sleepiness, hypersomnia, and obstructive sleep apnea. The recommendations discussed in this article are based on those from the Medical Expert Panel and the Federal Motor Carrier Safety Advisory Committee. Medical examiners are still bound to use “best practices” when examining a driver. Best practices are those recommended by these committees and are the standard of care at this time.

The FMCSA has implemented a new examiner certification process. This consists of a class on driver certification issues, followed by a certification examination. As of May 2014, only those doctors who have passed the certification exam and been listed in the National Registry of Certified Medical Examiners may legally perform Department of Transportation examinations. This examiner cut-off date has no effect on the Obstructive Sleep Apnea (OSA) guidelines, which are currently active and are outlined below. More information may be found in The Medical Examiner’s Handbook, published by the FMCSA. It can be found on their website here: http://nrcme.fmcsa.dot.gov/mehandbook/part_4_guide_ep.aspx#con-guide.

According to the FMCSA, drivers should be evaluated for symptoms of OSA such as snoring, witnessed apnea, and sleepiness during the daytime. Risk factors for OSA may include small or recessed jaw; small airway; neck size greater than or equal to 17 inches in the male or 15.5 inches in the female; hypertension; type II diabetes; hypothyroidism; BMI greater than 28; aged 42 or greater; family history; male or postmenopausal female; and single-vehicle crash.

Recommended methods of diagnosis include in-laboratory polysomnography, at-home polysomnography or an FDA-approved ambulatory testing device that ensures chain of custody. The driver should be tested while using his or her chronic medications. A home sleep study may underestimate the apnea-hypopnea index (AHI) when compared to an in-laboratory sleep study if the home study does not measure total sleep time. If the clinician believes the AHI is greater than the level reported by the home study, then the clinician should consider recommending an in-laboratory sleep study.

OSA diagnosis precludes unconditional certification; however, a driver with OSA may be conditionally certified if the driver has untreated OSA with an AHI of less than or equal to 20 and the driver does not admit to excessive sleepiness during the day, or if the driver’s OSA is being effectively treated. For drivers with an AHI of greater than 20, or with excessive daytime sleepiness and AHI less than or equal to 20, effective positive airway pressure (PAP) therapy should be established through either titration during in-laboratory polysomnography or through at home auto-titrating PAP machines. The waiting period is one month after initiation of PAP therapy.

A 60-day conditional certification depends on successful and compliant therapy during that one-month waiting period. Minimal acceptable compliance with PAP treatment consists of at least four hours per day on 70% of days. If a driver being treated demonstrates compliance within this 60-day conditional certification period, he may receive an additional 90-day conditional certification. After 90 days, if the driver is still compliant, he may be certified for the balance of the year from the date of his exam. Drivers being treated for sleep apnea should remain symptom-free and agree to continue uninterrupted therapy and undergo yearly objective testing either through monitoring of the PAP machine’s recorded data, multiple sleep latency testing or maintenance of wakefulness testing. A driver with OSA diagnosis may be recertified annually based on demonstrated continued compliance with treatment.

Conditional certification is also considered for the driver who has undergone surgery for OSA and is awaiting postop sleep-test findings. Oropharyngeal surgery, facial bone surgery and tracheostomy may be considered for treatment of some drivers. A driver may be certified if three months have elapsed since surgery, and he or she does not report excessive daytime sleepiness. A repeat sleep study should be considered to test for the presence of ongoing sleep apnea. This driver will need annual recertification. There is limited data regarding compliance and long-term outcomes with dental appliances and these technologies are not approved as qualifying therapy at this time.

Conditional certification is also considered for the driver with a BMI greater than or equal to 35 who is awaiting a sleep study for suspected sleep apnea. This will likely be applicable to a large proportion of drivers. A driver may be conditionally certified for 60 days pending a sleep study.

Persistent or chronic sleep disorders causing excessive daytime sleepiness are disqualifying. Driver-disqualifying sleep-related conditions include untreated symptomatic obstructive sleep apnea; primary alveolar hypoventilation syndrome; narcolepsy; idiopathic central nervous system hypersomnia; and restless leg syndrome (RLS) associated with excessive daytime sleepiness. A driver with excessive daytime somnolence should be temporarily disqualified until the above conditions are ruled out by objective testing. It should
be noted dopamine-agonists for treatment of RLS are not allowed for use while driving by commercial drivers. Also, narcolepsy is disqualifying regardless of treatment because of concerns of uncontrollable excessive daytime somnolence and sleep attacks.

Brief excessive daytime sleepiness is not disqualifying. General considerations when deciding about excessive daytime sleepiness include severity; frequency; presence of warning of attacks; possibility of unwanted sleep during driving; degree of symptomatic relief with treatment; and compliance. A driver should be immediately disqualified if the driver admits to excessive daytime sleepiness during the major wake period while driving, has experienced a motor vehicle accident associated with falling asleep or has been found noncompliant with treatment recommendations.

For more information:

The Medical Examiner’s Handbook, published online by the Federal Motor Carrier Safety Administration

Hartenbaum, N. The Commercial Driver Medical Examination Course Syllabus 2012, produced by the American College of Occupational and Environmental Medicine