Agenda
Childhood Sleep Disorders & Development Section Meeting
Monday, June 13, 2011 5:15pm – 7:15pm
Minneapolis Convention Center - Room 205D

I. Introduction of CSDD Steering Committee and Section Update – Oliviero Bruni, MD - Chair 5:15PM

II. 2011 Section Investigator Award Presentation 5:25PM
   • Alyssa Anne Cairns, PhD, RPSGT
     *Changes in the Awakening Cortisol Response (ACR) as Children Transition from Preschool to Kindergarten*

III. Update on Respiratory Indications for Polysomnography in Children
   • Merrill Wise, MD
     *Executive Summary of Respiratory Indications for Polysomnography in Children: An Evidence-based Review 5:45PM*
     • Timothy Morgenthaler, MD
       *Practice Parameters for the Respiratory Indications for Polysomnography in Children 6:05PM*

IV. Development of Educational Brochures 6:25PM
   • Sleep In School – Reut Gruber, PhD
   • Pediatric Restless Legs Syndrome – Narong Simakajornboon, MD

V. AASM Board of Directors Update 6:35PM
   • Merrill Wise, MD

VI. Open Floor for Attendees 6:45PM

VII. Other Business

VIII. Adjournment
Introduction of CSDD Steering Committee and Section Update

1. **Activities and mission of the CSDD section**
   The purpose and mission of the CSDD Section is to promote the field of pediatric sleep medicine both within and outside of the AASM organization. During the Membership section meetings we discussed about the improvement of communication between section members and AASM Board.

2. **Pediatric Section Membership**
   In the CSDD section there are currently 435 members.

3. **Pediatric Sleep Medicine presence at the Sleep 2011**
   The pediatric sleep presence and involvement in the Sleep 2011 meeting is presented in the table with the comparison of pediatric presence in the last 5 years. A detailed overview of abstracts, oral presentations, Poster Symposia, Symposia, Invited Lectures, Meet the Professor sessions, Post-Graduate Courses, Trainee Symposia and AASM award related to pediatrics will be presented.

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<tr>
<th>Year</th>
<th>Location</th>
<th>PED Abstracts</th>
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<td>2011</td>
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<td>2010</td>
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4. **Section initiatives**
   **Educational Materials:**
   - Sleep In School - Dr. Gruber
   - Pediatric RLS - Dr. Simakajornboon

   **A-STEP Pediatric Module:**
   The CSDD steering committee agreed to participate in the development of a pediatric based A-STEP Self Study Module. The difference in this module than the Pediatric Module already available is that this new module would be more extensive and be geared towards sleep technologists who primarily focus on pediatric sleep studies.

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**2011 Section Investigator Award Presentation**

**CHANGES IN THE AWAKENING CORTISOL RESPONSE (ACR) AS CHILDREN TRANSITION FROM PRESCHOOL TO KINDERGARTEN. Cairns A, LeBourgeois, Harsh J**

**Introduction:** The start of kindergarten (K) is the first major life transition for many children due to parental separation and increases in academic and social demands. In an earlier paper, we presented that Napping (N) and Non-Napping children (NN; per caregiver report at baseline) lost equal amounts of sleep (~3 hours over the week per actigraphy) as they transitioned to all-day K where napping was reduced or eliminated; however NN lost nocturnal sleep and N lost diurnal sleep. The current analyses focus on endocrine changes (ACR) in the same cohort. Very little is known about the ACR during childhood. Research in adults suggests that the ACR is associated with a variety of psychological and health variables including sleep.

**Methods:** Data were collected from 34 children (44% female) recruited from the community. Caregivers collected saliva at 0, 15, and 30 minutes post wake on one day at each of the following: the summer prior to K, within two weeks of K, and after one month of K. Accuracy of wake saliva sampling was confirmed by comparing actigraphically-assessed wake time with caregiver-reported sampling time. Dynamic (increase) of the ACR was computed using area under the curve (AUC) increase and % change. Overall cortisol production post wake was calculated using AUC ground. Participants were excluded if they did not have complete sleep or cortisol data (n = 4).

**Results:** The ACR was evident in this sample of children and had significant linear η² = .71 and quadratic η²= .73 trends. On average, cortisol rose 69.2% fifteen minutes (p<.001) and 76.5% thirty minutes (p<.001) post wake. Average waking, 15, and 30 minute cortisol values were (μg/dl +/- SD) 7.9 +/- 1.9, 13.3 +/- 3.3, and 13.8 +/- 4.2,
respectively. A dampened ACR dynamic (AUC increase) was observed after the start of K; $\eta^2=.10$. Overall cortisol production (AUC ground) was reduced for NN as they transitioned to K; $\eta^2 = .23$.

**Conclusion:** ACR values in this sample of children were similar to those found in adults (typically ~50-75% increase post wake). A dampened ACR with the transition to kindergarten may indicate less biological preparedness during waking hours as a function of sleep loss and/or circadian misalignment. The finding that NN had a reduction in overall cortisol production may implicate the importance of nocturnal sleep in overall morning cortisol production. These exploratory findings on sleep/endocrine changes at the start of school indicate the need for further research.

**Update on Respiratory Indications for Polysomnography in Children**

*Paper presented by Dr. Wise*

Wise MS; Nichols CD; Grigg-Damberger MM; Marcus CL; Witmans MB; Kirk VG; D’Andrea LA; Hoban TF. Executive Summary of respiratory indications for polysomnography in children: an evidence-based review. *SLEEP* 2011;34(3):389-398

**Objective:** This comprehensive, evidence-based review provides a systematic analysis of the literature regarding the validity, reliability, and clinical utility of polysomnography for characterizing breathing during sleep in children. Findings serve as the foundation of practice parameters regarding respiratory indications for polysomnography in children.

**Methods:** A task force of content experts performed a systematic review of the relevant literature and graded the evidence using a standardized grading system. Two hundred forty-three evidentiary papers were reviewed, summarized, and graded. The analysis addressed the operating characteristics of polysomnography as a diagnostic procedure in children and identified strengths and limitations of polysomnography for evaluation of respiratory function during sleep.

**Results:** The analysis documents strong face validity and content validity, moderately strong convergent validity when comparing respiratory findings with a variety of relevant independent measures, moderate-to-strong test-retest validity, and limited data supporting discriminant validity for characterizing breathing during sleep in children. The analysis documents moderate-to-strong test-retest reliability and interscorer reliability based on limited data. The data indicate particularly strong clinical utility in children with suspected sleep related breathing disorders and obesity, evolving metabolic syndrome, neurological, neurodevelopmental, or genetic disorders, and children with craniofacial syndromes. Specific consideration was given to clinical utility of polysomnography prior to adenotonsillectomy (AT) for confirmation of obstructive sleep apnea syndrome. The most relevant findings include: (1) recognition that clinical history and examination are often poor predictors of respiratory polygraphic findings, (2) preoperative polysomnography is helpful in predicting risk for perioperative complications, and (3) preoperative polysomnography is often helpful in predicting persistence of obstructive sleep apnea syndrome in patients after AT. No prospective studies were identified that address whether clinical outcome following AT for treatment of obstructive sleep apnea is improved in association with routine performance of polysomnography before surgery in otherwise healthy children. A small group of papers confirm the clinical utility of polysomnography for initiation and titration of positive airway pressure support.

**Conclusions:** Pediatric polysomnography shows validity, reliability, and clinical utility that is commensurate with most other routinely employed diagnostic clinical tools or procedures. Findings indicate that the “gold standard” for diagnosis of sleep related breathing disorders in children is not polysomnography alone, but rather the skillful integration of clinical and polygraphic findings by a knowledgeable sleep specialist. Future developments will provide more sophisticated methods for data collection and analysis, but integration of polysomnographic findings with the clinical evaluation will represent the fundamental diagnostic challenge for the sleep specialist.

*Paper presented by Dr. Morgenthaler*

Aurora RN; Zak RS; Karippot A; Lamm CI; Morgenthaler TI; Auerbach SH; Bista SR; Casey KR; Chowdhuri S; Kristo DA; Ramar K. Practice parameters for the respiratory indications for polysomnography in children. *SLEEP* 2011;34(3):379-388.

**Background:** There has been marked expansion in the literature and practice of pediatric sleep medicine; however, no recent evidence-based practice parameters have been reported. These practice parameters are the first of 2 papers that assess indications for polysomnography in children. This paper addresses indications for polysomnography in
children with suspected sleep related breathing disorders. These recommendations were reviewed and approved by the Board of Directors of the American Academy of Sleep Medicine.

**Methods:** A systematic review of the literature was performed, and the American Academy of Neurology grading system was used to assess the quality of evidence.

**Recommendations for PSG Use:**

1. Polysomnography in children should be performed and interpreted in accordance with the recommendations of the AASM Manual for the Scoring of Sleep and Associated Events. (Standard)
2. Polysomnography is indicated when the clinical assessment suggests the diagnosis of obstructive sleep apnea syndrome (OSAS) in children. (Standard)
3. Children with mild OSAS preoperatively should have clinical evaluation following adenotonsillectomy to assess for residual symptoms. If there are residual symptoms of OSAS, polysomnography should be performed. (Standard)
4. Polysomnography is indicated following adenotonsillectomy to assess for residual OSAS in children with preoperative evidence for moderate to severe OSAS, obesity, craniofacial anomalies that obstruct the upper airway, and neurologic disorders (e.g., Down syndrome, Prader-Willi syndrome, and myelomeningocele). (Standard)
5. Polysomnography is indicated for positive airway pressure (PAP) titration in children with obstructive sleep apnea syndrome. (Standard)
6. Polysomnography is indicated when the clinical assessment suggests the diagnosis of congenital central alveolar hypoventilation syndrome or sleep related hypoventilation due to neuromuscular disorders or chest wall deformities. It is indicated in selected cases of primary sleep apnea of infancy. (Guideline)
7. Polysomnography is indicated when there is clinical evidence of a sleep related breathing disorder in infants who have experienced an apparent life-threatening event (ALTE). (Guideline)
8. Polysomnography is indicated in children being considered for adenotonsillectomy to treat obstructive sleep apnea syndrome. (Guideline)
9. Follow-up PSG in children on chronic PAP support is indicated to determine whether pressure requirements have changed as a result of the child’s growth and development, if symptoms recur while on PAP, or if additional or alternate treatment is instituted. (Guideline)
10. Polysomnography is indicated after treatment of children for OSAS with rapid maxillary expansion to assess for the level of residual disease and to determine whether additional treatment is necessary. (Option)
11. Children with OSAS treated with an oral appliance should have clinical follow-up and polysomnography to assess response to treatment. (Option)
12. Polysomnography is indicated for noninvasive positive pressure ventilation (NIPPV) titration in children with other sleep related breathing disorders. (Option)
13. Children treated with mechanical ventilation may benefit from periodic evaluation with polysomnography to adjust ventilator settings. (Option)
14. Children treated with tracheostomy for sleep related breathing disorders benefit from polysomnography as part of the evaluation prior to decannulation. These children should be followed clinically after decannulation to assess for recurrence of symptoms of sleep related breathing disorders. (Option)
15. Polysomnography is indicated in the following respiratory disorders only if there is a clinical suspicion for an accompanying sleep related breathing disorder: chronic asthma, cystic fibrosis, pulmonary hypertension, bronchopulmonary dysplasia, or chest wall abnormality such as kyphoscoliosis. (Option)

**Recommendations against PSG Use:**

16. Nap (abbreviated) polysomnography is not recommended for the evaluation of obstructive sleep apnea syndrome in children. (Option)
17. Children considered for treatment with supplemental oxygen do not routinely require polysomnography for management of oxygen therapy. (Option)

**Conclusions:** Current evidence in the field of pediatric sleep medicine indicates that PSG has clinical utility in the diagnosis and management of sleep related breathing disorders. The accurate diagnosis of SRBD in the pediatric population is best accomplished by integration of polysomnographic findings with clinical evaluation.