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By Regina Patrick, RPSGT, RST

Pediatric Sleep Problems
By Joseph Anderson, RPFT, CRT-NPS, RPSGT, RST, CCSH

The Unique Sleep Needs of Women
Interview by Alexa Schlosser

At the AAST 2019 Annual Meeting, Sept. 6-8 in St. Louis, Andrea Ramberg, RPSGT, CCSH, and Alex Perkins presented on a panel focused on women and sleep. Azzz spoke with Ramberg and Perkins on the topics of their panel, and their remarks are published here.
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A₂Zzz is published quarterly by AAST.
Greetings fellow sleep professionals. Let me introduce myself. I am Melinda Trimble, president of AAST, and that’s not something I take lightly. I am very privileged to be a member of this board and this organization. I have seen many changes in sleep and healthcare over the 30-plus years that I have been in sleep medicine — some good, and some not so good, for the RPSGT. Many of the world’s largest healthcare brands underwent major changes over the last few years in response to rapid advances in technology, the unstable insurance market and the merging of healthcare brands, and AAST has also had to change and adapt to this changing world.

Over the last two years, we have moved to a new management company and are working to rebrand our organization to meet the needs of our expanding membership. We are working to expand our strong base of talented people and investing in technology to deliver educational solutions for our membership. Given the number of responsibilities we have to juggle each day, joining a professional organization is unlikely to be at the top of your priorities list. That said, I would like to take a few minutes to speak to the value of being a member of AAST, your professional organization.

When you join AAST, you deepen your existing healthcare relationships and can make new contacts through the organization. You can take a more active role at meetings and work on committees that are working to expand our educational base and to establish our professional standing in the field. The new and lasting ties you build with other professionals in our organization with like-minded interests and concerns are invaluable to your personal and professional growth. I can speak to that personally, as some of the most valued friendships I have today have been forged over the years of working with other members of AAST. I owe so much of my personal and professional growth to working alongside these amazing people.

Being a member of your professional organization is a great resume builder for the new sleep graduate with limited work experience. Many employers seek and find value in employees who are active or who serve on committees and boards of their professional organization.

The mission of AAST is to be the go-to source to meet the educational, legislative and professional needs of our membership. We strive to keep the membership updated on the rapidly changing healthcare environment. Over the next two years, I look forward to meeting, and potentially working with, each of you. I would love to hear from you if you have any comments or concerns. 😍

Sweet dreams!

Melinda Trimble
From the Editor

Continuing to Expand Our Horizons

By Rita Brooks, MEd, RPSGT, REEG/EPT, FAAST

The AAST annual meeting, in St. Louis this year, is behind us now. There was significant interest in the wide range of educational opportunities provided, and in the full day CCSH education program held prior to the meeting. The CCSH education program was specifically developed for those interested in qualifying to sit for the CCSH credential examination under a new eligibility pathway for the RPSGT who has recertified at least once. Both programs provided the latest information on a variety of topics to support the profession as we continue to work on defining who we are and expanding our roles as sleep professionals. The new AAST CCSH education program provides another pathway for those interested in expanding their education, skills and competencies as the field rapidly grows and evolves. Clinical education roles and specialty roles in physician practices and hospital based inpatient programs are moving into the mainstream, and there are many new opportunities for well-educated sleep technologists. Continued learning remains essential. This focus is evident in the A2Zzz offerings this quarter.

This issue of A2Zzz offers a wide range of articles providing education that complements these new roles, which I believe will only continue to expand. Regina Patrick’s article on Schwann cells presents new research exploring the possibility that vibration related to snoring, common in OSA, may cause neuronal injury to the upper airway muscles. The Trends column in this issue explores the sleep navigator role, both the big picture and the in-the-trenches view from those employed in these roles. An interview with Andrea Ramberg and Alex Perkins discusses the special needs of women as it relates to sleep, and Laura Linley’s Compliance Corner focuses on service behaviors both in and outside of the sleep laboratory and their role in educating patients, families and caregivers. These topics and more provide opportunity for continued learning that assists us to grow and expand our horizons as well as our skills.

An extensive review of pediatric sleep disorders provides excellent information for the sleep technologist performing polysomnography in pediatric patients, and especially for those providing education for this population. A2Zzz strives to include information that is applicable to the night technologist caring for more complicated patients, which certainly includes pediatric patients, as well as information applicable to the sleep educator and those in other new and exciting roles.

As our horizons continue to expand, we intend to keep you in the forefront and provide new and exciting information to help you grow and develop in your profession.

Wishing you all a happy healthy holiday season!

Rita

We intend to keep you in the forefront and provide new and exciting information to help you.

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AAST members who read A2Zzz and claim their credits online by the deadline can earn 2.00 AAST Continuing Education Credits (CECs) per issue, for up to 8.00 AAST CECs per year. AAST CECs are accepted by the Board of Registered Polysomnographic Technologists (BRPT) and the American Board of Sleep Medicine (ABSM).

To earn AAST CECs, carefully read the four designated CEC articles listed below and claim your credits online. You must go online to claim your credits by the deadline of Feb. 13, 2020.

After the successful completion of this educational activity, your certificates will be available in the My CEC Portal acknowledging the credits earned.

COST

The A2Zzz continuing education credit offering is an exclusive learning opportunity for AAST members only and is a free benefit of membership.

STATEMENT OF APPROVAL

This activity has been planned and implemented by the AAST Board of Directors to meet the educational needs of sleep technologists. AAST CECs are accepted by the Board of Registered Polysomnographic Technologists (BRPT) and the American Board of Sleep Medicine (ABSM). Individuals should only claim credit for the articles that they actually read and evaluate for this educational activity.

STATEMENT OF EDUCATIONAL PURPOSE & OVERALL EDUCATIONAL OBJECTIVES

A2Zzz provides current sleep-related information that is relevant to sleep technologists. The magazine also informs readers about recent and upcoming activities of the AAST. CEC articles should benefit readers in their practice of sleep technology or in their management and administration of a sleep disorders center.

READERS OF A2Zzz SHOULD BE ABLE TO DO THE FOLLOWING:

- Analyze articles for information that improves their understanding of sleep, sleep disorders, sleep studies and treatment options
- Interpret this information to determine how it relates to the practice of sleep technology
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The Unique Sleep Needs of Women

Objective: After reviewing this article, readers should be able to identify the ways women present symptoms of sleep disorders, how pregnancy affects sleep, and how sleep care professionals can better cater to women with sleep disorders.

Axonal Degeneration in Soft Palate Nerves May Contribute to Obstructive Sleep Apnea

Objective: After reviewing this article, readers should understand how axonal degeneration in the nerves of the soft palate of snorers may contribute to OSA episodes.

Pediatric Sleep Problems

Objective: After reviewing this article, readers should understand developmentally appropriate diagnostic and treatment approaches available for common pediatric sleep problems.

Today’s Trends in Sleep Technology: From Broad Strokes to Finer Points of the Sleep Navigator Role

Objective: After reviewing this article, readers should be able to explain what a sleep navigator is and the preoperative and postoperative functions of the role.
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The Unique Sleep Needs of WOMEN

An interview with AAST Annual Meeting panelists.

Interview by Alexa Schlosser
In what ways do women present symptoms of sleep disorders, and how does that differ from men?

**Ramberg:** Women complain more of unrested sleep, insomnia, headache, anxiety, depression, restless legs, nightmares, palpitations or fatigue. Women also are noted to score lower on the Epworth Sleepiness Scale (ESS) despite feeling the same levels of fatigue as men. This is possibly due to a different threshold of sleepiness and/or women complain differently than men do.

Women have a greater clustering of events in REM. Women have much less severe events in NREM sleep, hence the diagnosis of overall milder OSA. REM OSA is disproportionately more common in women than men. Supine OSA is disproportionately more common in men than women.

Women underreport snoring due to being embarrassed, and bed partners are less likely to notice. Women go to physician’s offices alone and do not have their partner to speak up about symptoms they aren’t even aware of. Women often fall asleep after their bed partners.

**Perkins:** Pregnancy involves huge changes in a woman’s anatomy and physiology, many of which can have an impact on sleep. Many of these normal changes such as musculoskeletal and joint pain, nocturia, gastroesophageal reflux and mood disturbances can all serve to impact on sleep quality. But on top of this, many women develop sleep disorders during pregnancy, too. Sleep-disordered breathing becomes much more common during pregnancy compared to other women of childbearing age. An elevated diaphragm and trachea makes the upper airway more crowded, and increases in blood volume tend to cause upper airway edema and further narrowing. As well as this, dynamic factors such as an increased respiratory drive as a result of increased oxygen consumption tends to cause more negative pressures within the upper airway. General sleep disturbance or sleep deprivation may also play a part in affecting respiratory loop-gain, as well as upper airway collapsibility. It’s not just sleep-disordered breathing that can be a problem for pregnant women; restless legs syndrome and insomnia are also much more common.

What are the unique sleep needs of women who aren’t necessarily pregnant?

**Ramberg:** Women may be more likely to have insomnia than men because women experience unique hormonal changes that can cause insomnia symptoms. These include hormonal changes during the menstrual cycle, especially in the days leading up to their period when many women report problems going to sleep and staying asleep. This is especially common in women who have premenstrual dysphoric disorder (PMDD), or a more severe type of premenstrual syndrome (PMS). Perimenopause and menopause, with hot flashes and night sweats, can also disturb sleep.

What is unique about a woman’s approach to their health?

**Ramberg:** Women are the caretakers of everyone around them. They juggle work, being a mom and wife, and often are the ones who manage most of the household tasks such as cleaning and keeping up with the family’s schedule. If a woman gets sick, there is a lot that suffers around her, which can lead to women putting themselves last on the list when it comes to their health. This leads to delayed health visits and a belief they can soldier on when, in reality, they are suffering just as much, if not more, than the ones they take such good care of around them. The worry felt over maintaining the balance of work-home life is exhausting and often leads to
insomnia. Sixty percent of women do not get the recommended seven to nine hours of sleep a night due to all their responsibilities.

**How can sleep care professionals better cater to women with sleep disorders? What should clinicians be doing?**

**Ramberg:** Increased awareness of atypical symptoms, low threshold to test middle-aged women with obesity and development of female-specific questionnaires may help identify women at risk.

As sleep-care professionals, we need to be aware of the different ways in which women present with problems with their sleep. Understanding the socioeconomic reasons why women may be delaying or underplaying their need for help is huge. The caretaker mentality takes on so much for those around them. How can we find a way to break through that barrier to help them understand that when they take care of themselves, they are helping everyone around them? Studies show that when women do better, their babies and children do better, reaping the benefits of improved maternal health, better nutrition, safer housing and early education.

We need to learn to dig a little deeper when it comes to the unique needs of women's sleep and identify female-specific questionnaires that test with a higher specificity to women.

**Perkins:** Historically, healthcare systems and researchers have been poor at recognizing and responding to sleep problems in women. Thankfully, this seems to be changing, and there are a few things that we can do to redress the imbalance. Models of care that consider “burden of treatment” try to understand how individuals draw on their own resources in order to comply with diagnostic or therapeutic interventions. This includes things like their spare time, financial resources, as well as emotional resilience and social networks. This is different for every individual, but we know that women typically earn less, spend more time doing housework, as well as more time looking after children and relatives, even when they work full-time. As healthcare professionals, we need to think about what we can do to minimize the demands we make upon women, particularly those who are vulnerable, or from marginalized communities.

As healthcare professionals, we need to think about what we can do to minimize the demands we make upon women, particularly those who are vulnerable, or from marginalized communities. Even though we all care about patient well-being, the systems that we work within often fail to take an individual’s capacity into account. And let’s face it: When we’re busy and stressed, we sometimes fail to do this as professionals too. It’s easy to get frustrated with “difficult” or “noncompliant” patients, but we need to remember that, for many reasons, they may not be well resourced.

In many parts of the world, there is a growing movement to include service users in the way healthcare services are designed and organized. Sometimes simple changes can make big differences to service users and can make services more efficient, not less. Where practical, sleep centers should consider including service users in decisions about equipment, booking and communication mechanisms, outcome measures and service feedback.

To learn more about women’s unique sleep needs, check out this guide.


ALEXA SCHLOSSER is the editor of A₂Zzz magazine.
Axonal Degeneration in Soft Palate Nerves May Contribute to Obstructive Sleep Apnea

By Regina Patrick, RPSGT, RST

Obstructive sleep apnea (OSA), the intermittent cessation of breathing during sleep, occurs when the upper airway tissues (e.g., tonsils, fatty tissue) repeatedly collapse into the upper airway and partially or fully block airflow. The collapsibility of the upper airway in people with OSA is believed to occur because the upper airway muscles relax excessively during sleep, which allows structures supported by the muscles to collapse into the upper airway. Some research indicates that altered neuronal activation may contribute to the reduced tone of the upper airway muscles.\(^1\)\(^-\)\(^4\) Much of this research has focused on innervation of dilator muscles such as the genioglossus muscle (which forms the bulk of the tongue). However, another structure that contributes to obstruction is the soft palate. In recent years, scientists have begun examining whether neuronal injury in the soft palate muscles could contribute to OSA.

People with OSA often have an elongated uvula, a structure that extends like a pendulum from the soft palate just above the tongue at the back of the throat. The soft palate muscles consist of the uvular muscle (which raises the uvula), the levator veli palatini muscle (which raises the soft palate) and the tensor veli palatini muscle (which aids in raising the soft palate). Whether the elongated uvula results from muscle injury due to stretching of the uvular muscle during OSA episodes or results from abnormal neuronal activation is unclear.

During the obstructive phase of an OSA episode, the impeded airflow decreases the amount of oxygen in the blood. As a consequence, a person makes increasingly strong efforts to breathe. When the oxygen level falls to a certain point, the respiratory center in the brain triggers a brief arousal, during which the upper airway muscle tone is restored and a person is able to take some deep, quick breaths to restore the blood oxygen level. During this brief arousal, snoring may occur because the rapid airflow through the upper airway causes soft tissues to flutter, much like the flutter that occurs when air escapes rapidly from a small opening in a balloon. In studies of animal models of OSA and human snorers, the upper airway tissues show signs of damage such as inflammation (e.g., swelling, redness, increased levels of inflammatory substances such as tumor necrosis factor, and increased levels of inflammatory cells).\(^5\)\(^-\)\(^7\) These changes are believed to result from vibration of the upper airway tissues. Whether the vibration occurring with OSA episodes could also damage the axons of nerves that supply the upper airway muscles has been of recent focus.\(^7\)

An indirect way to assess axonal injury or loss is by examining Schwann cells. Schwann cells (named after German physiologist Theodor Schwann, who discovered them in 1939) are involved in nerve growth, nerve repair and nerve impulse conduction. A Schwann cell can be myelinating or nonmyelinating. Within a peripheral nerve, which contains several nerve fibers (i.e., axons), a myelinating Schwann cell spirals around one axon while producing layers of myelin around the axon. Myelin enhances the velocity at which nerve impulses travel through an axon. An axon can have several Schwann cells along its length. A nonmyelinating Schwann cell does not spiral around an axon. It instead envelops several axons within a nerve. When a Schwann cell is damaged, it can stop producing myelin and become unable to participate in nerve growth and nerve repair.

Factors that can damage Schwann cells are impaired immune function, exposure to toxic chemicals, injury to the axon and mechanical factors such as vibration. Some research indicates that the amount of damage to the myelin sheath is directly correlated with the duration of vibration exposure. For example, in a study by John Davis and colleagues,\(^8\) the researchers exposed rats to vibration for four hours daily for seven days (i.e., short-term) or 14 days (i.e., long-term). To induce vibration, the rats were placed in a restraint tube on a stationary platform. Their tails were taped to a vibrating stage. The control rats were restrained similarly but without vibration. The platform was vibrated at a rate of 60 vertical oscillations per second. After undergoing vibration treatment for seven or 14 days, the rats were allowed a recovery time of zero days, 30 days or 60 days before tissue from their
tail was retrieved and examined under a light microscope.

In the experimental group, the severity of myelinated nerve damage increased as the vibration exposure time increased. At recovery day zero, both groups had nerve damage. At recovery day 30, the seven-day group had signs of recovery, but the 14-day group did not. At recovery day 60, the seven-day group showed a near-complete recovery, but the 14-day group still had significant damage. Long-term vibration caused greater damage from which recovery appeared to be limited (i.e., some damage may be permanent).

The focus of the Davis study was on the effect of vibration on a limb rather than the upper airway. However, if upper airway tissue is damaged because of upper airway tissue vibration in snorers and in people diagnosed with OSA, then the loss of Schwann cells or other alterations in Schwann cells in upper airway tissues would be expected. Research with this focus in humans has indicated that the association between upper airway tissue vibration in OSA and neuronal injury may be true.

In a 2015 cadaveric study, de Carlo and colleagues analyzed tissue derived from the walls of the oropharynx and hypopharynx of individuals with and without OSA. The tissue samples contained the whole thickness of the pharyngeal walls (i.e., mucosa, muscle tissue). They used immunohistochemical methods (i.e., the use of antibody-antigen reactions and chemicals such as dyes to detect cell structures) to detect axons and Schwann cells, and to detect two proteins — ASIC2 and TRPV4 — on mechanosensory nerve cells, which are stimulated by mechanical stimuli such as stretch, motion and vibration. They found that, compared to the individuals without OSA, individuals with OSA had a significantly lower density of nerve fibers in the muscle layer. The ASIC2 and TRPV4 proteins were expressed in the axons of mechanosensory cells in the muscular layer of the pharyngeal tissues of individuals without OSA but were virtually absent in individuals with OSA. Based on these findings, De Carlo concluded that neurological alterations may contribute to pathological upper airway activity in people with OSA.

A team of Swedish researchers, headed by Farhan Shah, recently demonstrated Schwann cell death and axonal degeneration in the nerves supplying muscles of the soft palate of snorers and patients with OSA. The researchers also examined whether nerve injury in the upper airway of snorers and people with OSA would be associated with the severity of sleep apnea. They compared patients, who had undergone palatal surgery for snoring, with healthy nonsnoring individuals (i.e., the controls). Tissue samples from the base of the uvula were obtained from all participants. The samples were examined using morphologic and immunohistochemical methods. Compared to the controls, the patients with snoring or OSA had a significantly lower density of axons, a lower percentage of Schwann cells, and a larger percentage of circular myelinating Schwann cells without central axons, which indicates axonal loss. In addition, the low density of axons was significantly correlated with the severity of apnea. Patients with snoring or OSA more frequently had evidence of regenerating axons (based on the increased level of growth-associated protein 43, which is associated with neuronal growth) than did the controls (11.3% ± 4.2% vs. 4.8% ± 2.4%). Shah suggests that nerve injury is caused by traumatic snoring vibrations and tissue stretch that occur during OSA episodes. The association between tissue vibration and neuronal injury in the soft palate and other upper airway muscles is an interesting finding and needs further study. More information may provide new avenues for OSA treatment. For example, more research may help scientists determine whether vibration of the upper airway tissues during OSA episodes causes neuronal damage in soft palate muscles and other muscles of the upper airway or whether some other unknown factor actually causes the damage, which then leads to OSA. If the latter, then detecting and/or treating this factor could potentially improve OSA treatment. For now, research continues on investigating the association between vibration-induced nerve damage of the upper airway muscles in people with OSA.

References

REGINA PATRICK, RPSGT, RST, has been in the sleep field for more than 20 years and works as a sleep technologist at the Wolverine Sleep Disorders Center in Tecumseh, Michigan.
There are differences between adult sleep apnea and pediatric sleep apnea. Adults usually have daytime sleepiness, while children are more likely to have behavioral problems. The underlying cause in adults is often obesity; in children, the most common underlying condition is enlargement of the adenoids and tonsils. However, obesity also plays a role in children. Other underlying factors can be craniofacial anomalies and neuromuscular disorders.

Pediatric sleep disorders increasingly interfere with daily patient and family functioning. Interest in and treatment of sleep disturbances in youth continues to grow, but research lags. One survey indicated that pediatricians were more likely to prescribe antidepressant medications for insomnia than psychiatrists. Further investigation is needed to develop fact-based diagnosis and treatment of pediatric sleep disorders.

The consequences of untreated sleep problems may include significant emotional, behavioral and cognitive dysfunction. The magnitude of these events is inversely proportional to the child's overall ability to adapt and develop in spite of the sleep disturbance. Sleep regulation remains a critical part of health for youths. Elevated rates of sleep problems exist among children and adolescents with neurodevelopmental, non-psychiatric medical conditions and psychiatric disorders.

Factors such as increased societal demands, academic pressures, family-related stressors (e.g., parental discord) and onset of puberty heighten the risk of sleep problems in adolescents.

**Diagnosis**

Early diagnosis and treatment are important to prevent complications that can impact children’s growth, cognitive development and behavior.

Pediatric sleep disorders require careful and extended evaluations that include interviewing the parents, child and teachers, as well as assigning and reviewing sleep diaries. Parents should be encouraged to record their child’s sleep-wake habits over a 24-hour period using sleep diaries for at least two continuous weeks prior to the initial visit. This can be useful to support the reported sleep-related complaints as well as guide routine history taking. Sleep diaries also assist in detecting day-to-day variability in sleep patterns that can often be missed during routine history and physical exams.

Current evidence indicates that chronically disrupted sleep in children and adolescents can lead to problems in cognitive functioning, such as attention, learning and memory. Behavioral interventions, especially in young children, have been shown to produce clinically significant improvements. This is of particular importance given the relative lack of data regarding use of pharmacological interventions for sleep difficulties in children.

Graphic diaries appear to be more helpful in understanding sleep-wake cycles in pediatric patients rather than descriptive data. An example of a graphic sleep diary can be found on the sleep education website endorsed by the American Academy of Sleep Medicine (AASM) and it is available for free download. A simple acronym like BEARS4 — which stands for bedtime resistance/sleep onset delay; excessive daytime sleepiness; awakenings at night; regularity, patterns and duration of sleep; and snoring and other symptoms — can be useful during initial screening of a child’s sleep difficulties.

Self-report sleep questionnaires, such as the School Sleep Habits Survey and Children’s Sleep Habits Questionnaire (CSHQ) are useful to screen for more specific sleep disorders in target populations, such as adolescents and school-aged children. The Sleep Disturbance Scale for Children (SDSC) is a useful, 26-item parent questionnaire that was developed for children and adolescents to screen for primary sleep disorders such as obstructive sleep apnea.
Obtaining a detailed and accurate history followed by a physical exam, including screening for developmental delays and cognitive dysfunction, appears to be a cornerstone for diagnosing pediatric sleep complaints. It is equally important to involve family members in the clinical interview to understand the potential causes of sleep disturbances, because children and adolescents often do not recognize events that can disturb sleep. For example, they are usually not aware of snoring or leg movements that occur during sleep. Patients are unaware if they get deep and restful sleep. They may be sleeping but not getting “good” sleep.

The physical exam may provide clues to treatable medical causes. Diagnostic tests are available but difficult to access in some communities. Many sleep problems in children can be improved with instruction on sleep hygiene and the importance of sleep to health and behavior. Medical causes of sleep problems are rare but often benefit from treatment and therefore warrant attention during any evaluation.

At one time, elementary school children went to bed easily and woke up early, naturally, without alarms. Now their sleep is disrupted by TV, computer games, texting and other digital distractions. Sleep deprivation is often the primary cause now of inattention, school failure, poor peer relations and obesity. Medical causes of sleep problems are often overlooked in children because of their difficulty in reporting symptoms.

Primary sleep disorders, such as obstructive sleep apnea (OSA) and restless legs syndrome (RLS), in children have been shown to be associated with excessive daytime sleepiness, impaired attentional capacity and memory, behavioral issues and attention deficit hyperactivity disorder (ADHD).

Pediatric OSA is a sleep disorder in which a child’s breathing is completely or partially blocked, often repeatedly, during sleep. This is caused by narrowing or blockage of the upper airway during sleep. These breathing disturbances often result in brief arousals from sleep, which can interfere with obtaining good quality sleep. Therefore, screening for daytime impairments is important in children suspected of having obstructive sleep apnea (OSA).

While bedtime difficulties and frequent night time awakenings are seen during infancy and early childhood, sleep difficulties due to insufficient sleep hygiene or circadian rhythm disorders tend to be more prominent in adolescence. Sleep problems in children and adolescents can complicate other underlying medical condition, such as obesity and asthma, and psychological problems, such as depression, anxiety and substance abuse.

**Common Sleep Disorders in Children and Adolescents**

**Sleep-Related Breathing Disorders**

Sleep-related breathing disorders includes habitual snoring at its least severe form and OSA at its most severe form. In children and adolescents, concern for symptoms (e.g., snoring) suggestive of underlying SRBD, such as OSA, needs further examination of possible symptoms, including witnessed pauses in breathing, chronic morning headaches, dry mouth/throat, nighttime bed wetting, early morning thirst, feelings of grogginess or fatigue upon awakening, history of chronic ear infections, recent weight gain and chronic mouth breathing.

The association between SRBD and ADHD is well documented. The association of SRBD with low academic performance, behavioral disorders and learning difficulties has been shown in these studies. Treatment has shown improvement in ADHD following the treatment of SRBD, providing additional evidence into this bidirectional relationship.

Enlarged tonsils is a common cause of SRBD in children. An exam finding tonsil enlargement is sometimes absent in children with suspected SRBD, but other characteristics, such as a nasal septal deviation or high-arched palate, can predispose a child to a SRBD. If nasal polyps or other nasal/oral obstruction is suspected, a consultation with an ENT may be needed. It is also important to note that children with disorders such as Down syndrome or Prader-Willi syndrome with craniofacial abnormalities, including midface hypoplasia, may also have a SRBD.

Other risk factors associated with SRBD include obesity (high BMI, large waist circumference), chronic sinus problems, recurrent wheezing, nasal allergies or a family history of OSA. If a child is suspected of having a SRBD, they should be referred for an overnight polysomnogram (PSG). A PSG can measure apneas (cessation in airflow with effort) or hypopneas (reduction in airflow) and is used to determine the apnea-hypopnea index (AHI), which is the total number of apneas and hypopneas per hour of sleep. In adults, an AHI 5 to 15 is considered mild, 16-29 is considered moderate and 30 or higher is considered severe. In pediatric patients, most sleep specialists consider an AHI above 1.5 abnormal and an AHI of 5 or higher as significantly abnormal.

In many circumstances, adenotonsillectomy (AT) is considered the treatment of choice once moderate-to-severe AHI is documented on initial polysomnography. Symptom alleviation in SRBD after AT has been shown to be as high as 83%. However, persistent symptoms are often seen in patients who are obese or have craniofacial abnormalities. A PSG may be repeated a few months after AT to reevaluate the severity of persistent SRBD.

**Sleep-Related Movement Disorders**

Sleep-related movement disorders in children include sleep myoclonus of infancy, rhythmic movement disorder, periodic limb movement disorder (PLMD) and RLS. Sleep
myoclonus of infancy is typically associated with clusters of jerks that involve the whole body or limbs and are usually considered to be benign and gradually disappear after six months of age.

In rhythmic movement disorder (RMD), a child exhibits repetitive and stereotyped motor behaviors involving large muscle groups that are mostly sleep related. RMD can also be associated with daytime impairment and/or associated with self-inflicted bodily injuries. Nocturnal seizures may mimic REM sleep behavior disorder. However, these behaviors are more stereotyped. Symptoms in young individuals are usually an indication of narcolepsy or medication-induced REM sleep behavior disorder. Symptoms in young women are more likely to be caused by narcolepsy.

Diagnosis can be made using video PSG and treatment includes ensuring safety of the child during sleep. RMD should gradually resolve by 5 years of age. Symptoms beyond 5 years of age can be seen in children with developmental disorders. Treatment with medications such as clonazepam has been shown to be useful in severe cases of RMD.

Periodic limb movements in sleep (PLMS) are brief jerks (movements) during sleep occurring over a period of time, more commonly in the legs than the arms. Patients are usually unaware of these symptoms. If sleep disruption due to PLMS is documented on a PSG and PLMS cannot be explained by any other underlying sleep disorder, then such movements may be considered PLMD.

RLS in childhood is diagnosed using the same criteria that is used in adults and is usually supported by other features, such as family history and/or PLMS on polysomnography. Some RLS symptoms include: 1) A “need” to move the legs, 2) the “need” to move begins or worsens when lying down or sitting, 3) the “need” to move is sometimes relieved by movement, and 4) the “need” to move is worse in the evening or night or only occurs at night. Sleep-onset (the length of time it takes to fall asleep) delay can be a common occurrence in children with underlying RLS.

Behavioral treatment options for RLS and associated sleep disturbances in children and adolescents include enforcing strict routines for bedtime and wakeup time, reducing environmental stimulation prior to bedtime (e.g., limiting TV and cellphones) and encouraging daily physical exercise.

**Childhood Insomnia**

Insomnia in children is defined as repeated difficulty falling asleep or reduction in total duration of sleep or quality of sleep that occurs during appropriate times with appropriate opportunity for sleep and results in daytime impairment. The ICSD-3 includes behavioral insomnia of childhood (BIC) as a chronic insomnia disorder. It is characterized by bedtime refusal or resistance to falling asleep, delayed start of sleep and/or prolonged nighttime waking.

BIC is often related to inappropriate sleep associations or inadequate limit setting. With limit-setting issues, the child delays bedtime by refusing to go to bed, and the parent has a hard time setting limits and allows the child to stay up past their bedtime.

With inappropriate sleep-onset association, the child may have difficulty falling asleep independently and may associate falling asleep with certain signals or activity such as: 1) feeding from a bottle, being rocked or watching television; 2) going to a certain place like a couch or the parent’s bed; or 3) the presence of the parent. These circumstances become required signals for the child to initiate or re-initiate sleep.

The diagnosis of pediatric insomnia is almost always multifactorial (encompassing data from multiple indicators). Assessment should include screening for presence of developmental disorders; functional impairments at school and home; and any associated burden on the parents. It is also important to screen for presence of OSA or RLS, as these may be possible causes of insomnia.

It is important to consider whether the delay in sleep onset and/or inability to stay asleep are due to inconsistent sleep or napping schedules. For example, parents may have the children napping outside of a child’s developmental need; in other words, naps might no longer be appropriate. This may lead to difficulty regulating the child’s sleep-wake schedule.

The same issues relate to teenagers. A variable sleep schedule, later bedtimes and early school start times may be associated with inappropriate napping. Adolescents who regularly take long naps will likely take even longer to fall asleep at bedtime, further disrupting the sleep-wake cycle.

Behavioral interventions should be the first line of treatment for pediatric insomnia (possibly in conjunction with medications). These interventions aim to help initiate/maintain sleep resulting in increased total sleep time and improved sleep quality.

The American Academy of Sleep Medicine (AASM) found that behavioral interventions produce reliable and lasting improvements in bedtime problems both in infants and young children. Sleep problems in children younger than age 5 improved in 94% of the 54 studies reviewed, and over 80% of children benefited from treatment, with most improvements continuing for three to six months. The key for success is parental consistency in implementing the proper sleep-management techniques. Some techniques may need to be tailored to the parent and child and take into account issues such as room-sharing, parental skills, siblings and parental stress.

For older children, behavioral strategies and providing sleep hygiene education is particularly important. Muscle relaxation, stimulus control and cognitive behavioral therapy techniques, such as increasing positive thinking, thought stopping and journaling “worries” at bedtime, are often recommended.

**Parasomnias**

Parasomnias are defined as undesirable physical events or experiences that occur while falling asleep, within sleep or during arousals from sleep. Parasomnias result in disruption of an existing state of sleep. Most parasomnias affect otherwise healthy youth and commonly subside over the course of adolescence. They are classified as either REM parasomnias or non-REM parasomnias depending on the stages (type) of sleep at the time of occurrence.

Non-REM parasomnias (also termed arousal disorders) involve simple or complex behaviors as a consequence of arousal problems.
from slow-wave sleep (N3, delta or deep sleep), usually in the first half of the night. They are associated with confusion and amnesia to an event.

Confusional arousals, sleep terrors and sleep walking (somnambulism) are non-REM parasomnias. Confusional arousals tend to occur immediately after falling asleep. This seems to be more common in early childhood and usually resolves itself by the age of 5.

Sleep terrors are often associated with crying (consoling usually delays recovery from the event) and physical activity. Sleep terrors occur in the first few hours of sleep. Nightmares involve vivid recall, whereas sleep terrors generally have amnesia of the event. Sleep terrors are generally mild during childhood; however, more severe forms may require behavioral interventions such as scheduled awakenings and treatment with medications like clonazepam.

Sleep walking is a NREM parasomnia that can include complex behaviors, such as walking while still sleeping. Chronic sleep deprivation (reduced sleep) has been shown to increase the frequency of sleep walking. It’s important to maintain proper sleep hygiene to help prevent sleep walking. It is also important to know that certain conditions (e.g., Tourette’s syndrome and migraines) may be associated with increased likelihood of sleep walking.

Parasomnias have been shown to sometimes be preceded by an undiagnosed SRBD, such as OSA. Therefore, children who have recurring parasomnias should be screened for the presence of a SRBD. Treatment usually starts with behavioral management (e.g., scheduled awakenings, sleep hygiene and avoiding sleep deprivation).

Arousal disorders are sometimes mistakenly grouped under the common entity nightmares. It is important to note this distinction because nightmares are considered to be a REM sleep-related parasomnia and can involve a different management strategy altogether. The distinction can be diagnosed by PSG.

Nightmares are arousals from “dream” sleep (REM stage). Nightmares generally have no associated amnesia or confusion when the child is awakened. Nightmares usually diminish by the age of 6. Repeated occurrences of extended, unpleasant and well-remembered dreams often occur during the second half of sleep and are defined as a nightmare disorder. When awakened, the individual is rapidly alert and oriented.

In some cases, fear of nightmares may cause some children to be afraid to try to sleep because of the association between past nightmares and sleep. This can lead to insomnia. Parental reassurance to the child may be helpful.

Other REM parasomnias, such as REM behavior disorder and recurrent isolated sleep paralysis (RISP), are rare in childhood. Other parasomnias also include sleep enuresis (wetting the bed while sleeping), sleep related hallucinations, exploding head syndrome and parasomnias due to a medical disorder, medication or substance and are not related to any specific stage of sleep. Sleep enuresis is common in children, while the other disorders listed are rare in children. Sleep talking or somniloquy is usually idiopathic but can be associated with RBD or disorders of arousal such as confusional arousals.

Sleep enuresis is defined as involuntary urination during sleep at least twice per week in children at least 5 years of age. It is usually classified as either primary or secondary. Primary is when the child has never been consistently dry at night. However, if the child has experienced at least six months of dryness during sleep and then begins bedwetting again, the condition is referred to as secondary enuresis.

Secondary enuresis can occur from recent psychological stressors or undiagnosed medical illnesses, such as diabetes, epilepsy, urinary tract infections, hyperthyroidism and OSA. Restricting evening intake of fluids, limiting caffeine intake, establishing a bedtime toileting schedule and positive reinforcements with rewards can be beneficial.

Diagnostic evaluation using an overnight polysomnogram is rarely needed to diagnose parasomnias unless initial clinical evaluation is needed for the “type” of parasomnia and if the child is engaging in dangerous sleep behaviors.

Circadian Rhythm Sleep Disorders

Delayed sleep phase syndrome (DSPS) is the most common circadian rhythm disorder seen in adolescents and is characterized by a shift in sleep onset to later times of the night. Children with DSPS have difficulty falling asleep at the scheduled bedtime and are unable to wake spontaneously at the desired wake time in the morning. This results in delayed bedtime later that night, delayed sleep-onset, reduced sleep duration, chronic sleep deprivation and excessive daytime sleepiness (EDS). Most children with
DSPS can sleep into late mornings or early afternoon if given the opportunity.

Some teenagers voluntarily delay their bedtime as a means to avoid school (intentional sleep-phase delay) and should be screened for underlying reasons that prompt such behaviors (e.g., exposure to school-related bullying, academic pressures, undiagnosed learning disabilities or worsening ADHD).

Behavioral interventions, such as maintaining a consistent sleep-wake schedule seven days a week, are the mainstay of treatment.

**Idiopathic Hypersomnolence Disorders**

Idiopathic hypersonomnolence is characterized by recurrent episodes of excessive daytime sleepiness or prolonged nighttime sleep. It is the need to sleep despite already obtaining adequate sleep and having at least one of the following symptoms:

- Recurrent periods of sleep or naps within the same day
- A prolonged sleep of more than nine hours per day that is not refreshing
- Difficulty being fully awake after abrupt awakening

Those with idiopathic hypersonolence tend to fall asleep quickly and have good sleep efficiency (>90%). However, even with adequate and successful sleep, they awake with sleep drunkenness and appear confused or combative, and naps are not refreshing despite lasting more than one hour. The disorder often begins in late adolescence (17-24 years of age).

PSG findings include normal-to-prolonged sleep duration, short sleep onset (<eight minutes), normal-to-increased sleep continuity, and normal levels of rapid eye movement (REM) sleep but increased amounts of deep (slow-wave) sleep. During MSLT naps REM may be present but in idiopathic hypersonolence REM is not seen more than twice.

**Narcolepsy**

Narcolepsy is categorized as Type I (with cataplexy) and Type II (without cataplexy). Pediatric narcolepsy is defined as recurrent periods of an irresistible need to sleep, lapsing into sleep or multiple naps that occur within the same day. In these pediatric patients, excessive daytime sleepiness (EDS) is the most common first symptom. In children, paradoxical hyperactivity is common; symptom onset peaks around 15 years of age.

Nocturnal sleep PSG shows REM sleep latency to be less than or equal to 15 minutes or a multiple sleep latency test (MSLT) shows a mean sleep onset of less than or equal to eight minutes with two or more of these naps showing a sleep-onset REM period. There is no normative MSLT data for children less than age 6.

REM and non-REM sleep mechanisms can be disrupted in youths with narcolepsy. REM-associated sleep phenomena intrude into the awakened state. Sleep attacks (failing sleep), cataplexy (abrupt atony precipitated by strong emotions), and hypnagogic and hypnopompic hallucinations (experienced as dreamlike events immediately before sleep onset or awakening) are also characteristic of narcolepsy.

Narcolepsy triggered by streptococcus infections, H1N1 influenza and H1N1 vaccinations has been reported. Narcolepsy can be diagnosed even when secondary to infections, trauma or tumor, such as in Whipple disease.

**Breathing-Related Sleep Disorders**

The International Classification of Sleep Disorders identifies many types of sleep-related breathing disorders. Among them are OSA, central sleep apnea (CSA) and sleep-related hypoventilation. This simplification is to facilitate the recognition of these sleep problems and referral for further evaluation of the child.

**Obstructive Sleep Apnea (OSA)**

OSA is sometimes poorly understood. Obesity is now recognized as one of leading risk factors for increasing rates of OSA in both the pediatric and adult populations. Snoring is common in OSA, but some children with OSA have no snoring. Certain medical conditions such as Prader-Willi syndrome or trisomy 21 (Down syndrome) increase the risk for OSA because of midline deformities such as macroGLOSSIA, microGNATHIA and mid-face hypoplasia.

OSA is confirmed through a PSG study and is defined as at least five obstructive apneas or hypopneas per hour (AHI) of sleep. Research criteria used to identify children with OSA is less stringent, setting the threshold of hypopneas at one to five events per hour.

**Central Sleep Apnea (CSA)**

CSA is caused by a variability in respiratory effort that results in repeated episodes of apneas during sleep. Central sleep apnea and obstructive sleep apnea can coexist. Central sleep apnea is defined as five or more central apneas per hour (AHI) of sleep with air flow and no respiratory effort on a PSG.

There are several subtypes that can be diagnosed including: primary central sleep apnea and Cheyne-Stokes breathing. Primary, previously known as idiopathic (unknown origin) CSA is characterized by variability in respiratory effort without evidence of any airway obstruction.

Cheyne-Stokes breathing is a pattern of periodic crescendo-decrescendo (waxing and waning) variations in tidal volume (air inhaled and exhaled) of at least five events (AHI) per hour, accompanied by frequent arousals or awakenings. This type of breathing can occur in infants and children, however is also often associated with heart failure, stroke or renal failure.

**Sleep-Related Hypoventilation**

There are several sleep-related hypoventilation disorders. Idiopathic central alveolar hypoventilation and obesity hypoventilation syndrome are the variants most commonly seen in the pediatric patient. In sleep-related hypoventilation, the PSG shows times of decreased tidal volume (air inhaled and exhaled) associated with increased levels of carbon dioxide measured by a CO₂ monitor during the PSG. Individuals with sleep-related hypoventilation may have insomnia, daytime sleepiness and/or headaches when awakening from sleep. This disorder can coexist with OSA and CSA. Some causes of sleep-related hypoventilation include neuromuscular disorders and childhood obesity.
Circadian Sleep Disorders

A circadian clock in our brain (anterior hypothalamus) influences our wakefulness or alertness phases. This circadian clock potentiates the sleep-wake cycle. A free-running human sleep-wake cycle is 25 hours; however, the cycle in the environment we live in results in a 24-hour cycle. This hour difference often shifts to one side of the cycle or the other. There is an increasing prevalence during adolescence, which may be related to physiological and behavioral factors.

In pediatric patients with circadian sleep disorders, these opposite phases may represent a poor ability to compensate resulting in sleep loss and failure to adequately synchronize sleep-wake behaviors. This can make it difficult to adapt to environmental demands, such as school. This is frequently observed in adolescents with delayed sleep phase syndrome. They may exhibit a delay in the timing of sleep onset of more than two hours. Some children may be hyposensitive to evening light, which delays sleep onset. Others are hyposensitive to morning light and do not respond to the phase-advancing effects of morning light.

Epidemiology

Surveys report that 20-25% of youths have some type of a sleep problem. The following are commonly reported in children age 2 to 15 years:

- Nightmares (30%) are more common in younger children.
- Sleepwalking with at least more than one episode occurs in 25-30% of youths and is most common in children aged 3-10 years.
- Insomnia occurs in 23% of youths.
- Enuresis rates decrease from 8% in children aged 4 years to 4% in children aged 10 years.
- Bruxism is reported in 10% of youths and may occur in people of any age.
- Sleep rocking or head banging is reported in 5% of youths, with head banging being common in infants and in children aged 9 months to 12 years.
- OSA is the most common reason for sleep laboratory referral and affects an estimated 1-4% of children.

A2Zzz

Race-Related Demographics

Specific racial risk factors may predispose certain individuals to a sleep disorder. African Americans that have narcolepsy more often have narcolepsy without cataplexy or with atypical cataplexy. They may also be more prone to having advanced sleep phase-type sleep disorder because of having a shorter circadian period than whites. Asian Americans may be at increased risk of OSA despite having low body mass index (BMI).

Sex-Related Demographics

Sex differences in sleep-wake disorders may be associated with sex roles and/or hormonal changes. Insomnia is more common in women. In assessing narcolepsy, female children and adults may report fatigue instead of sleepiness and also underreport snoring. During NREM sleep arousal disorders, women are more likely to have eating behaviors. During childhood, sleepwalking occurs more often in women, but sleep terrors are more common in men. In contrast, in adulthood, sleepwalking occurs more often in men, but the sex ratio for sleep terrors is even. Adult women report having nightmares more often than men.

RLS is more common in women without diagnostic differences. OSA is, in contrast, more common in men.

Prognosis

Learning difficulties, emotional lability, attention deficits, disruptive behaviors, social and school impairments, family dysfunction, low self-esteem, depression, anxiety, cognitive dysfunction hyperactivity, irritability and memory impairment represent common comorbidities of sleep disorders in children. OSA may lead to core pulmonale, pulmonary hypertension, right-sided heart failure, growth retardation and failure to thrive.

The treatment of primary insomnia often is difficult. Associated anxiety is often responsive to psychotherapy. Narcolepsy is a lifelong illness. Cataplexy, hypnagogic hallucinations and sleep paralysis may diminish in frequency over time.

Tonsillectomy and adenoidectomy relieve symptoms in about 70% of pediatric patients with OSA. Continuous Positive Airway Pressure (CPAP) is indicated for children who partially respond to surgery or in whom surgery is contraindicated. A review of other available treatments for OSA in children revealed only a limited evidence to support their use.
The success of therapy for delayed sleep phase syndrome (DSPS) depends to a large extent on the adolescent’s level of motivation. To prevent relapse of DSPS, the new schedule must be rigidly maintained. Most children with parasomnias outgrow this condition when younger than 10. Approximately 88% of all bed-wetting children outgrow this condition by the time they are 13. The prevalence of enuresis in children older than 13 is 2%, which is similar to the prevalence rate in the adult population.

Patient Education

Because human beings spend a third of their time sleeping, it is essential to emphasize the need for good sleep hygiene to children, adolescents and their families. Treatment of any behavioral problems generally will not help unless sleep problems are identified and addressed. “catch-up sleep” is a misconception, as more studies demonstrate the long-term effects of sleep deprivation. Sleep hygiene includes the following:

- Keeping the room quiet, dark, cool and comfortable
- Practicing a simple bedtime ritual that includes voiding
- Limiting time spent in bed
- Not eating or drinking heavily for about three hours before bedtime
- Maintaining the bedroom for sleeping only
- Removing distractions, such as television
- Avoiding medications
- Considering the effect of sleep partners (including pets)
- Maintaining a consistent sleep schedule seven days a week
- Avoiding naps
- Exercising regularly
- Taking a hot bath or drinking something warm before bedtime

Conclusion

Pediatric sleep problems are common and are associated with significant daytime impairments. Pediatric sleep problems might be a primary sleep disorder or a secondary consequence of an underlying medical or psychiatric disorder. They can compromise social, academic and neurobehavioral functioning.

Over the past decade, there has been a growing body of literature with regard to effective diagnostic methods for identifying pediatric sleep disorders and utilization of evidence-based behavioral approaches coupled with rational pharmacotherapy, when needed, for treatment of these disorders. However, there appears to be a rather slow development in awareness regarding childhood sleep difficulties among the general public and healthcare professionals. This review provides brief yet useful information that can be helpful for those involved in pediatric healthcare, which hopefully will increase awareness regarding developmentally appropriate diagnostic and treatment approaches available for common pediatric sleep problems.

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Today’s Trends in Sleep Technology: From Broad Strokes to Finer Points of the Sleep Navigator Role

By Matthew Anastasi, RPSGT, BS, RST

Welcome to the third Trends article, a new A2Zzz department. In case you missed the previous edition, we explored a perspective on how our field has evolved from a trade to a profession to meet the needs of the complex patient and numerous other demands in our modern sleep disorders settings. In this issue, we’ll take a comprehensive look at a critical stage in this professional evolution through the role of the sleep navigator. We’ll take a look from both a bird’s-eye view and from a worm’s-eye view to show an example of how the sleep technology field is expanding in scope to serve more complex patient populations. And as is par for the Trends format, we’ll also share recommendations on how you as a sleep professional can stay ahead of this change.

Sleep Navigator: OSA Management When Life Hangs in the Balance

There is an old saying that “you can’t see the forest for the trees.” Sometimes this can resemble our approach to sleep technology. We can get so caught up in the details, we lose sight of the big picture and our place in it. One of these areas is on the inpatient side in the management of sleep-related breathing disorders (SRBDs). We have always been so focused on our cookie-cutter outpatient diagnosis and treatment that we overlook the real-world consequences that a chronic condition like OSA, for example, can have when patients are sick and hospitalized. Recently, there has been a dramatic increase in both the awareness of the added risks placed on perioperative patients by OSA and the resulting effort to address inpatient management of the disease because of heightened regulatory scrutiny of hospital readmission rates and consequences for unhealthy outcomes from hospital stays. In this edition of Trends, we will look at the role of the sleep navigator from two different perspectives: the thousand-foot view of a sleep navigator who oversees a large health system or hospitals not in close proximity, and the in-the-trenches role that takes place on the ground, typically in more local settings, that enables face-to-face interventions with patients.

For a high-level approach to the role of sleep navigator, we interviewed sources that oversee the management of OSA throughout large health systems or in locations that are separated by a great distance to get their perspective. For a ground-level view, we have input from sleep navigators who are embedded in their individual hospitals, which gives them the ability to conduct OSA management at a more granular level.

What Is a Sleep Navigator?

Navigators have been guiding patients through the healthcare system for some time. They assist patients with everything along the clinical pathway, including issues with insurance, medication management, appointments, etc. But in order to guide and coordinate services for patients with sleep–disordered breathing disorders, the sleep navigator will typically meet sleep competencies at the level of a sleep technologist or clinical sleep health educator. Patients are guided through the continuum of care, whether through oversight by trained healthcare providers (the thousand-foot role) or by those providing the care directly to patients (in the trenches) in conjunction with physicians and members of the sleep center team.

Flagging OSA Patients = Safer Surgical Procedures

The perioperative time represents the highest risk for patients with OSA because of the adverse effects of anesthesia, narcotics and sedatives (Wolfe, 2016). This means that identifying and treating at-risk OSA patients preoperatively can set them up for safer surgical procedures whether their OSA treatment is underway; or, in cases where a presumptive diagnosis must be made, an anesthetic plan can be tailored to the presumed diagnosis, and PAP therapy can be initiated postoperatively, if necessary (Chung, 2011). For all sleep navigator programs, the earlier that high-risk patients can be flagged, the better. The earliest opportunities are at inpatient admission using an EMR/EHR trigger...
performed about a week before surgery.

preoperative testing, which is typically met. For patients preparing for surgery, screening is performed preferably at preoperative testing, which is typically performed about a week before surgery.

Preoperative Workflow in the Trenches:
In this approach, the sleep navigator receives a trigger directly, which prompts a visit to the patient on the floor. The sleep navigator writes a summary report based on medical history, patient interview, screening tools and physical examination, and includes a recommendation for a physician order for a sleep consultation or sleep diagnostic testing (if appropriate). Patient safety indicators or “sentinel event estimators” should be included (per Joint Commission) in the report. This process takes about 30 minutes for each patient, and a sleep navigator can round on up to 15 patients each day.

Managing OSA Postoperatively = A Safer Recovery
Obstructive sleep apnea is associated with significantly increased adult post-surgical risks and complications (Poeran, 2019). To improve patient outcomes, especially during the inpatient clinical pathway, hospitals are also using the sleep navigator for various functions.

Workflows Performed on the Floor:
Education about the impact of SDB on comorbid conditions, PAP therapy and compliance should be provided following the AAST standardized Patient Education Curriculum guidelines. Emphasis should be placed on general patient education. Prior to discharge, patients with known OSA on PAP therapy and their caregivers should be educated to use their PAP therapy whenever sleeping. If the patient has a history of noncompliance, education should be provided regarding the risks of untreated OSA and barriers that resulted in noncompliance should be identified.

One underused opportunity is to have a robust variety of interfaces and auto BPAP machines available in recovery to promote positive postoperative results. And, again, having a sleep navigator present can facilitate a patient’s initial experience with a PAP mask and PAP therapy.

High-Level Workflows:
At this level, an overarching protocol can be put in place that identifies OSA patients throughout their stay. Some hospitals will place a separate, colored wristband on the patient that indicates OSA management. Queensway Carleton Hospital in Ottawa, Canada, issues red surgical hats. Whatever protocol is used, a visible sign for anesthesiologists, surgeons and nurses can be created to indicate OSA management is a priority. Training protocols can be another focus of this type of sleep navigator. Training nurses, respiratory therapists and other healthcare personnel can be an effective approach to increase awareness and management of OSA in this setting.

Before discharge, an OSA treatment plan should be in place for timely follow-up care by a board-certified sleep specialist and/or sleep health educator.

The Bird’s-Eye Preoperative Workflow:
When the ratio of patients in need of screening to sleep navigators is too great, a formalized protocol for notification of the hospitalist or PCP should be in place. One way is to program the EMR to put a notification through which contains a best practice advisory, a sort of recommendation to place an order for sleep testing. If the physician does not write the order, the EMR counters with language to the effect of, “This is against best practice for this patient at risk for OSA.” This workflow is the first to contrast from the sleep navigator who works directly with patients. Another difference is that this type of role calls for educating staff who work directly with patients, such as nurses. It can be difficult to get nursing buy-in due to the high patient ratios and scarce time with patients during preoperative screening. One of the recommendations is to select the most important question to add to the preoperative screen; for example, “Have you ever been told that you snore or stop breathing in your sleep?” If the patient answers “Yes,” then the rest of the STOP-Bang questionnaire pops-up. Otherwise, you are only adding time for one extra question, which one hospital we spoke to found was an easier “sell” to nursing and led to the ability to put in place a pilot program.

While in the hospital, safety is at the forefront; afterward, compliance is king.

An Effective Discharge Plan = Better Long-Term OSA Treatment Compliance (and Health)
OSA is a chronic condition. As such, sticking with treatment is the name of the game. While in the hospital, safety is at the forefront; afterward, compliance is king. Most important to this is to close the loop at discharge and ensure the patient has a positive and timely initial experience with PAP therapy. A sleep navigator, at discharge, should aim to control where the scripts go. One way to accomplish this is to have a good relationship with a sleep specialist practice(s) and schedule a sleep evaluation within the same week, if possible. Since the discharged patients have comorbidities and are already identified at risk for OSA, it is advisable to even pre-book the sleep study right after the evaluation takes place — you can start the insurance preauthorization process using a physician order in the two-day period after a face-to-face evaluation but before the study. Since the patient recovery is still being influenced by their OSA condition, it is also recommended...
to work closely with your DME providers and hold them to a short turnaround for PAP setup — as soon as two days post-therapeutic study if possible.

Maximizing the Role: High Level vs. On the Ground

Given the choice, the sleep navigator who has the ability to interface directly with every high-risk patient is the ideal scenario, especially in the moment. It is on the floor that they are able to safeguard and educate fully during the patient’s stay, without relying on healthcare professionals with a different focus on patient care. For example, there are many surgeons who have a secondary concern for OSA and the risk that surgery poses to patients at clear risk for or with known OSA. There are many anecdotal cases of patients with snoring and apneas observed on the floor by non-sleep personnel who do not take action. Having a more present sleep navigator can help facilitate this awareness and emphasis. But, in the long-term, the high-level sleep navigator has an advantage of being able to generate data by tracking the outcomes of large numbers of patients. The short- and long-term positive outcomes are often not enough to make the case for making the sleep navigator a fixture in the inpatient setting.

Change tends to happen when people feel the heat rather than see the light.

Justifying the FTE for Your Hospital

The Hospital Readmissions Reduction Program (HRRP) is a Medicare value-based purchasing program that reduces payments to hospitals up to 3% for the following readmissions within 30 days post-discharge (CMS, 2019):

- Acute myocardial infarction (AMI)
- Chronic obstructive pulmonary disease (COPD)
- Heart failure (HF)
- Pneumonia
- Coronary artery bypass graft (CABG) surgery
- Elective primary total hip arthroplasty and/or total knee arthroplasty (THA/TKA)

We know that OSA is related to recovery from most of these conditions, and hospital administrators know that any reduction in readmissions leads to real value, and not just for patients.

For example, at Parrish Healthcare in Titusville, Florida, over the past five years, around 180 patients per year agreed to go to the sleep lab after discharge. This resulted in a 30% reduction in hospital readmissions (Weaver, 2018). When the program started, there was one one-on-one sleep navigator. Now they have five additional comorbid care navigators (called “care navigators”) that are disease-specific: They are a multidisciplinary clinical team (consisting of a sleep technologist studying for CCSH, a respiratory therapist, two nurses and a diabetes educator certified in diabetes education) trained by a psychiatrist and interns every six weeks on behavioral coaching. It is an integrated, multidisciplinary approach. Care navigators don’t just stay within the four walls of the hospital; they spend time in outpatient areas, the cardiopulmonary lab, etc., screening for sleep disorders.

Other hospitals are using sleep technologists and respiratory therapists with a sleep background. Others are specifically hiring RPSGTs for this role.

Even in the absence of an on-the-ground sleep navigator, there is minimal cost to have your EMR team incorporate some OSA risk indicators into the admission process and generate a request for a sleep referral to the inbox of the hospitalist/rounding PCP for peri-management of anesthesia and postoperative recovery care of medication management and BPAP.

The Next Step in Your Career?

This is a position where you can literally save lives on a daily basis. If you are a registered sleep technologist (RPSGT) or certified in clinical sleep health (CCSH), you already have the required foundation in sleep. The job descriptions are typically written for CCSHs and require an RPSGT. As described at Parrish, there is the potential for a sleep navigator to come from a variety of healthcare backgrounds as long as an organized training protocol is provided.

There is also the role of education, which was emphasized in the previous edition of Trends. Education, for the most part, makes for a well-rounded person. In order to succeed in the medical field, a formal degree that is built upon basic courses like English, mathematics, rhetoric and writing, as well as sleep technology, is important for communication and interpersonal effectiveness at a workplace as demanding as the inpatient setting. It teaches how to organize thoughts, formulate action plans, solve problems — all skills needed in the complex workplace where a modern sleep professional is always in the process of learning about emerging technologies, adapting to changing workflows, communicating up to administrators and medical staff as well as patients.
and co-workers, and staying up to date on changes in the role.

Without a doubt, the sleep navigator role has become a key indicator of where our field is headed. It has transformed in a short period from a “diagnose and treat” profession to longitudinal, chronic care management as part of an interdisciplinary care team.

Sources
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2. Byron Jamerson, RPSGT, CCSH | Population Health Manager at Wellstar Health System of Atlanta, GA
3. Andrea Ramberg, BA, RPSGT, CCSH | Business Development Manager at MedBridge Healthcare
4. Standards & Guidelines Committee (Matthew Anastasi; T. “Massey” Arrington; Kala Bingham; Lata Casturi; Lisa Endee; Laree Fordyce; Cynthia Roth; Russell Rozensky), AAST
5. Kristina Weaver, EMT-P, RPSGT | Director of Care Transition at Parrish Healthcare of Titusville, FL

References

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LAREE FORDYCE, BTech, CCRP, RPSGT, RST, CCSH, is the director of clinical sleep services at Maple Respiratory Group, the president and technical director of Sound Sleep Solutions, and a member of the AAST Board of Directors.

What did you want to be when you grew up?
A neurodiagnostic technologist. I wanted to do something in the medical field. I always thought the brain was fascinating. This job didn’t require any shift work.

Why did you decide to become a sleep technologist?
Being a sleep technologist came about by accident. I was working as a neurodiagnostic technologist. There was a staff shortage in the sleep lab due to an early maternity leave. They asked me if I could help out for a while. In my associate degree program, we learned all modalities (EEG, EP, EMG and sleep), so I was trained. This was only supposed to be for a few months. Here I am 25 years later.

Where was your first job in sleep technology?
Providence Hospital in Anchorage Alaska.

Why did you become an AAST member?
Honestly, when I wrote my RPSGT exam in 1995 (the three-part exam), if you became a member of the APT, you saved money off the exam fee. I have been a member ever since. There is so much educational information available from AAST. I have learned so much from the articles, and I have used this information throughout my career.

Who has had the greatest influence on your career?
There have been so many great people that have influenced my career. First would be Dr. Anne Morris. She taught me so much about the respiratory side of sleep medicine. Dr. Manisha Witmans has been another significant influence in my career. She has taught me everything I know about pediatric sleep. She has also encouraged me to get involved and educate others in sleep. With this, I have met the fantastic people within AAST, who have helped mentor me.

What is the most challenging part of your profession?
There are many challenges in sleep technology. The biggest one would be educating people on the importance of sleep. We spend one-third of our lives sleeping, but there’s still a gap. As Matthew Walker, Ph.D., said in his TED Talk, sleep is now an epidemic. Why doesn’t everyone see this?

What do you like most about your profession?
Sleep is still in its infancy. There is still so much we need to learn. This has given me the opportunity to wear many hats throughout my career. I have been involved in research that has helped change patient management for various sleep disorders. That is so awesome not only seeing the changes in the field but also being able to be a part of it.

What do you do for fun on days off from work?
I go to yoga. I like watching baseball. I love to read. I just finished reading, “Why We Sleep” by Matthew Walker, a great book. I guess on my days off, I still think about sleep.

What is the biggest change you have seen in the profession since you started?
One of the biggest changes in the profession has been the role of the sleep technologist. We not only have to explain “I’m going to apply these electrodes,” we have be able to educate our patients and families on different tests, treatments and disorders, depending on which area you have chosen to work in.

Any words of advice for people who are new to the profession?
Read articles. Things are changing rapidly. You need to keep up. Get involved with professional sleep organizations or local chapters. Join AAST, not only for the great educational information, but consider being a volunteer. There are many committees to volunteer for. Apply to speak at the AAST Annual Conference or present a poster. These things have helped me advance in my career, and I have also met some great people and friends along the way.

What are your professional goals in the next five years?
Educate, educate, educate. This is my passion. I want to continue to give presentations nationally and internationally to spread the awareness about sleep. In my role as an AAST board member, I hope I can mentor other technologists to get more involved in sleep technology and sleep education.
Compliance Corner

With Laura Linley CRT, RPSGT, FAAST

The Importance of Adopting Service Behaviors

The opportunity sleep programs have in making lives better never rests. Our passion for our field is delivered in every moment of patient contact — in what we say, what we do and who we serve. Our patients rely on our expertise. In reviewing my articles this last year, I realized there was an increased emphasis on regulatory compliance. I wanted to end the year with balancing my message to focus on the service standards of care we all use in servicing our patient.

There are critical moments of service; behaviors we can adopt for our patients, their families and other caregivers.

• Commit to being respectful and compassionate.
• Communicate with active listening and appropriate responses.
• Demonstrate professionalism in our behavior, appearance and interactions.
• Ensure privacy and confidentiality in all interactions and in all settings.
• Provide a healing, healthy and safe environment.

It is important to understand how we can habitually adopt service behaviors to address these moments. It starts with a warm welcome and ends with a fond farewell.

Acknowledge patients and visitors immediately with a warm welcome, and use patients’ names. Address adult patients by Mr./Mrs./Ms., plus their surname (patient may give you permission to use another name). Being courteous and respectful along with “please,” “thank you” and “you’re welcome” should be automatic. If appropriate, sit down next to the patient to help them feel you are truly listening and care for their concerns.

You can exceed care expectations by responding to patient’s needs by focusing on the patient while limiting distractions, clarifying requests and responding with a sense of urgency. Being proactive and anticipating a patient’s need for assistance goes far in establishing trust. Asking questions can clarify patient needs, such as “I may need to come into your room during testing. If you are sleeping, what is your preferred way for me to wake you? Call your name, tap your toe or shoulder? Turn on a light?”

Strive for excellence in all patient/customer interactions, even when on the phone. Simple measures include answering calls in a timely manner, smile and use a positive tone of voice, and find out and use the caller’s name and proper pronunciation. Ask permission to put caller on hold and apologize if there is a delay. When ending the call, summarize the conversation, ask if there is anything additional you can do and thank the caller.

Documenting the conversation allows for other caregivers to pick up where you left off.

I recently was introduced to the “Fond Farewell.” This standard ensures that each interaction has exceeded the patient’s needs, provides opportunity for identification of additional needs, keeps our patient informed of next steps and provides follow-up information. Our after-care interaction should include expectations of next steps needed for care, such as “follow up with your referring MD or sleep specialist.”

It is important to understand how we can habitually adopt service behaviors to address these moments. It starts with a warm welcome and ends with a fond farewell.

Service recovery is essential in taking ownership of our patients’ concerns. There must be a focused effort to resolve concerns quickly and effectively. You can often anticipate concerns that may come up for patients. Look for signs that your patient may have a complaint. Here are some sample statements you can use:

Ask questions for clarification: “Please tell me about your concerns.” “I want to make sure I understand.” “Can you tell me about that?” By empathizing and acknowledging the patient’s perspective, we show we value them. Documentation of the patient’s concern and the service recovery tools/process must be logged. Tracking allows for identifying problematic trends and implementing plans for process improvement.

These standards, along with facility specific expectations, help create a caring environment for our patients, their families and our co-workers. I am proud to work in this profession that strives to deliver extraordinary care with each and every interaction. We are the leaders of sleep wellness, and our passion never rests.