Possible Link Between Obstructive Sleep Apnea and the Sense of Smell

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Possible Link Between Obstructive Sleep Apnea and the Sense of Smell
By Regina Patrick, RPSGT, RST

An overlooked symptom in people with obstructive sleep apnea (OSA) is impairment in the sense of smell, such as an inability to detect or distinguish between odors. A finding that the sense of smell improves soon after a person with OSA begins CPAP treatment corroborates a possible link between olfactory dysfunction and OSA.

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CONTRIBUTORS

EDITOR
Melinda Trimble, RST, RPSGT, LRCP

MANAGING EDITOR
Alexa Schlosser

SENIOR WRITER
Regina Patrick, RPSGT, RST

CONTRIBUTING WRITERS
Brandon R. Peters, MD
Kristina Weaver, RPSGT
Joseph W. Anderson, CCSH, RPSGT, RPFT, CRT-NPS

ART DIRECTOR
Bill Wargo

GRAPHIC DESIGNER
Alaina Kornfeld

AAST THANKS ITS PRESTIGE PARTNERS
From the Editor

Growing into Our Expanding Roles

By Melinda Trimble

I am excited about the content our members, collaborators and leaders have contributed to this issue of A_{zzz}. Scientific articles such as Regina Patrick’s “OSA and Sense of Smell” provide insight on new and exciting research that may someday affect how we diagnose sleep disorders. Joe Anderson’s “Emerging Technology” series has provided a wide view of how technology is affecting, and will continue to affect, our field. Support is emerging for a role for sleep technologists and educators in the use of CBTI. These techniques are helpful for addressing sleep onset insomnia in the sleep center, as explained in Brandon R. Peters-Mathews’ article on CBTI during sleep testing. Kristina Weaver provides a look at her experiences as a leader, and gives us some advice in her article “Be a Great Leader by Using Great Communication.” Her learning experiences are eye-opening, and her tips are useful for those at any level of leadership. All these articles highlight the changes that have been occurring and that will continue to occur as our field grows and sleep becomes an important health issue.

Thank you to our writers and the AAST board for all the work they do to ensure the success of our publication. Colin Powell said “A dream doesn’t become reality through magic; it takes sweat, determination and hard work.” Thanks to everyone for all the hard work.

Sweet Dreams,

Melinda Trimble
The AAST Learning Center is accessible 24/7 and provides you with on-demand videos, advanced learning modules that you can start and stop on your schedule, conference recordings and more!

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Get started by checking out the latest offerings, including the AAST 2018 Annual Meeting recordings.
AAST’s 40th Annual Meeting in Indianapolis was a fine display of AAST’s focus on professional education, a key component of keeping abreast of the changes occurring so rapidly in sleep medicine and technology. We must continue to learn and grow to keep up with the changes and expand our sleep careers. As the field expands and changes, AAST is working to address new and expanding educational needs. This issue of A₂Zzz includes a variety of topics that support this expansion in our field and our roles.

The AAST Board and our many volunteers are hard at work on projects that support our latest strategic plan. Top of the list is support for the CCSH credential. AAST created the standards to support the role of the sleep educator, including a standardized curriculum for patient education and competencies for those working in or seeking to fill this role.

These resources are currently available on the AAST website and soon will be moved to a special page where more information about the role of the sleep health educator and other supporting information will be available. The AAST Healthcare Reform Committee is currently working on gathering data to show that patient education and support results in improved outcomes for our patients, such as reduced hospitalizations or fewer health complications. The committee’s goal is to gather data that can be used to inform regulators and insurers that we can make a difference, thus improving health and reducing healthcare costs. This is a long road, but we are actively pursuing this with the ultimate goal of meeting the reimbursement requirements for patient education provided by CCSH credentialed sleep health educators. If you have any data to share, please contact me. Every bit of data we can gather from those who have successfully implemented a program that improves patient outcomes will help.

The AAST Program Committee is already planning this year’s meeting in St. Louis, scheduled for Sept. 6-8. AAST will also be participating in World Sleep this year, hosted by the Canadian Sleep Society in Vancouver, Canada, Sept. 20-25. AAST Board member Michael Eden is leading the committee that is developing the technologist education program for this prestigious meeting. We will be sharing much more information about both of these meetings — intentionally planned to avoid content overlap and deliver two outstanding educational opportunities for sleep professionals at all levels. I look forward to seeing you at either or both of these meetings this year.

Wishing you all a happy, healthy and peaceful new year. Sleep well!

Rita
Instructions for Earning Credit

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 May 20, 2019. 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.

READ AND EVALUATE THE FOUR FOLLOWING ARTICLES TO EARN 2.0 AAST CECs:

- **Possible Link Between Obstructive Sleep Apnea and Sense of Smell**
  - **Objective:** Readers should be able to understand that OSA and the sense of smell may be linked and understand possible implications for OSA treatment.

- **Using CBTI Techniques to Ease Insomnia During Sleep Testing**
  - **Objective:** Readers should be aware of preparations to make before arrival, how to establish a sleep sanctuary and how to implement relaxation techniques.

- **Be a Great Leader by Using Great Communication**
  - **Objective:** Readers should be able to identify three areas of communication skills: intellectual empathy, intellectual integrity and intellectual perseverance.

- **Emerging Technology History in Sleep: The Evolution, Part II**
  - **Objective:** Readers should understand what the role of tomorrow’s sleep tech might be, both in the clinical and education realms.

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
- Decide how this information can improve the techniques and procedures that are used to evaluate sleep disorders patients and treatments
- Apply this knowledge in the practice of sleep technology

You must go online to claim your CECs by the deadline of May 20, 2019.
Possible Link Between OBSTRUCTIVE SLEEP APNEA and the SENSE OF SMELL

By Regina Patrick, RPSGT, RST
A n overlooked symptom in people with obstructive sleep apnea (OSA) is olfactory dysfunction (i.e., impairment in the sense of smell) such as an inability to detect or distinguish between odors. A finding that the sense of smell improves soon after a person with OSA begins continuous positive airway pressure (CPAP) treatment corroborates a possible link between olfactory dysfunction and OSA.1,2

OSA is the intermittent cessation of breathing during sleep. It occurs because the upper airway muscles relax excessively during sleep, which allows structures supported by the muscles to collapse into and obstruct the upper airway. This blockage restricts airflow and consequently decreases the blood oxygen level. A person makes increasingly strong efforts to breathe. Despite this effort, the blockage remains. When the blood oxygen level falls to a certain point, the respiratory center in the brain triggers a brief arousal (lasting for a few seconds) during which the upper airway muscle tone is restored. The person can then take some deep, quick breaths that restore the blood oxygen level.

The most common treatment for OSA is continuous positive airway pressure (CPAP). In this treatment, a continuous flow of pressurized air is delivered through a mask that fits over the nose or nose and mouth. The force of the air prevents the upper airway structures from collapsing into the airway as a person relaxes during sleep, thereby effectively preventing OSA episodes.

Another treatment for OSA is a surgery called uvulopalatopharyngoplasty (UPPP), which opens the upper airway by removing tissues (e.g., uvula, enlarged tonsils and adenoids) and reshaping the soft palate. With these tissues unable to collapse into and block the upper airway during sleep, OSA episodes can be reduced. An adverse effect of UPPP reported by some people is the loss of or a diminishment in the sense of smell.

The ability to perceive odors begins when chemical molecules come into contact with receptors on olfactory sensory neurons located in the upper nasal cavity. Chemical molecules can enter the nasal passage anteriorly after being inhaled through the nose or enter the nasal passage posteriorly from the nasopharynx with the ingestion of food. The molecules stimulate the olfactory sensory neurons to transmit signals to the olfactory bulb, which lies at the base of the brain. The olfactory bulb then relays the signals to different areas in the brain such as the primary olfactory cortex (which allows a person to perceive an odor before identifying it), hypothalamus (which allows smells to be associated with long-term memory) and limbic system (which allows smells to be associated with emotional responses).

An olfactory dysfunction may be conductive (i.e., the molecules of an odorant are impeded in stimulating the olfactory sensory neurons), sensorineural (i.e., an impairment in the transmission of signals from the olfactory sensory neurons) or central (i.e., impairment in the transmission of signals from the olfactory bulb to various areas within the brain). Some factors can contribute to conductive dysfunction are inflammation within the nasal cavity or structural defect of the nasal cavity (e.g., deviated septum). A factor that can contribute to sensorineural olfactory dysfunction is damage to the olfactory sensory neurons due to events such as viral infections, the use of certain medications, and head trauma. A factor that can contribute to central olfactory dysfunction is neurodegenerative disorders such as Parkinson’s disease or Alzheimer’s disease.

How OSA contributes to an impaired sense of smell is unclear. Two possibilities are inflammation and reduced olfactory bulb volume.

People with OSA have higher than normal levels of inflammatory chemicals (e.g., cytokines) and airway hyperreactivity. Some factors that could contribute to these findings are increased immunoreactivity and a chronic inflammatory response induced by intermittent episodes of hypoxia-reoxygenation and damage to upper airway tissues caused by the vibration of upper airway tissues against each other during snoring. Inflammation can narrow the nasal cavity and reduce the airflow needed to properly stimulate olfactory sensory neurons, and thereby reduce odor perception.

Inflammation can narrow the nasal cavity and reduce the airflow needed to properly stimulate olfactory sensory neurons, and thereby reduce odor perception.

A reduction in olfactory bulb volume has been noted in people with olfactory dysfunction.3 With this in mind, Salihoglu4 and colleagues used magnetic resonance imaging to measure nasal structures in people with and without OSA. They demonstrated that the olfactory bulb was smaller in people with OSA. This finding may explain olfactory dysfunction in people with OSA. Salihoglu further found the olfactory bulb volume decreased with increasing severity of the condition.

Some reports regarding the loss of smell in people with OSA have been in relation to patients who have undergone UPPP.5,6 However, the patients were not assessed for the type of olfactory dysfunction (i.e., conductive, sensorineural, central). On noting this lack, researchers Jiang7 et al. used olfactory testing to assess two patients who complained of loss of the sense of smell after UPPP. They used the phenyl ethyl alcohol (PEA) odor detection threshold test to determine the patient’s odor threshold and used
the University of Pennsylvania Smell Identification Test (UPSIT) to determine a patient’s ability to identify an odor. After the patients’ baseline olfactory function was obtained, they were treated with steroids — one patient was additionally treated with zinc gluconate. On re-evaluations two months later and two to three months afterward, both patients subjectively reported progressive improvements in their sense of smell, which was corroborated by their progressively improved performance on the PEA and UPSIT tests. However, Jiang noted that olfactory function did not fully recover in either patient.

Continuous positive airway pressure treatment reduces inflammatory processes in people with OSA. Therefore, CPAP treatment, by reducing inflammatory processes, would theoretically improve the sense of smell in people with OSA. To this end, some researchers have investigated the impact of CPAP treatment on improving the sense of smell in people with OSA.

For example, Koseoglu and colleagues examined the impact of positive airway pressure (PAP) treatment on olfactory function in patients who had polysomnographically confirmed OSA. Sniffin’ Sticks (felt-tipped pen devices manufactured by Burghardt in Wedel, Germany), which contain different odorants, were used to assess the patients’ olfactory function before and three months after initiating PAP treatment. The Sniffin’ Stick test is used to determine three aspects of olfactory function: at what concentration a person can detect an odor (olfactory threshold), whether a person can distinguish between odors (olfactory discrimination) and whether a person can distinguish what a particular odor is (olfactory identification). Three months after initiating PAP treatment, the patients’ odor threshold, odor discrimination and odor identification had improved. Based on their findings, the authors suggested people with OSA can have olfactory dysfunction and this dysfunction can improve with PAP therapy. However, they had no explanation for the pathogenesis of olfactory dysfunction in OSA or how PAP therapy contributes to the improvement of olfactory function.

In a similar study, Boemer and colleagues assessed whether odor threshold, odor discrimination and odor identification would improve after three months of nasal CPAP treatment in people with moderate or severe OSA. The researchers similarly used Sniffin’ Sticks to assess the patients’ olfactory function before and after three months of CPAP treatment. As in the Koseoglu study, the patients’ olfactory function had improved significantly at three months.

Boemer then had a small group of CPAP-compliant patients undergo subtherapeutic air pressure treatment. At three weeks, their sense of smell had somewhat deteriorated. This finding indicated that improvement in the sense of smell is reversible. Thus, consistent treatment compliance may be necessary to maintain the improvement in the sense of smell.

The Sniffin’ Stick test involves some subjective input from an individual. A more objective measurement of olfactory function is chemosensory event-related potentials (CSERPs), which are recorded on an electroencephalogram while a person is exposed to different odors. After the exposure, certain waveforms (i.e., potentials) appear at specific times (i.e., latency) such as 100 ms or 300 ms and with a characteristic amplitude. A change in a waveform’s latency or in a waveform’s amplitude indicates olfactory dysfunction. The first waveforms that appear after odor exposure (i.e., early components) are modulated by the concentration of the odorant, whereas waveforms that appear later (i.e., the late positive complex) reflect the significance of the odor to the person (e.g., whether the odor is “pleasant” or “unpleasant.”)

Researchers Invitto and colleagues recently used CSERPs to more objectively assess olfactory perception in nonsmoking patients with polysomnographically confirmed OSA. Their results were compared with those nonsmoking volunteers without OSA. Invitto focused on two waveforms: N1 (an early signal) and the late positive complex (LPC; a late signal). A comparison of these waveforms between the OSA patients and the controls revealed that the N1 latency occurred sooner and the LPC amplitude was deeper in the OSA patients than in the controls. Invitto believes that the finding of the shorter N1 latency may reflect the patients’ difficulty in odor perception, and the deeper amplitude of the LPC may reflect an impairment in the patient’s subjective experience of an odor (e.g., its pleasantness).

The link between OSA and olfactory dysfunction is an interesting finding. Once scientists learn more about this association, it may prove to be important in OSA treatment. For example, OSA patients who have a pre-existing loss of smell and plan to undergo surgery for sleep apnea or snoring may need to avoid certain types of surgery or, to reduce any further loss in the sense of smell, they may first need to be treated for the olfactory dysfunction before undergoing the surgery. As the Boemer study...
suggests, consistent compliance with CPAP treatment may help restore and/or preserve the sense of smell in people with OSA. Future studies may soon clarify how olfactory dysfunction can be used beneficially in the treatment and possibly the diagnosis of 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.
You are invited to submit a session proposal to speak at the AAST 2019 Annual Meeting.

Submit your presentation by Monday, March 18.

www.aastweb.org/2019annualmeeting
There are few things as frustrating in the sleep lab as a patient who can’t — or won’t — sleep. Barring the use of a sleeping pill, how can this situation be avoided? Consider the role of cognitive behavioral therapy for insomnia (CBTI) techniques and how these may ease insomnia during an overnight sleep study.

**Preparations to Make Before Arrival**

In some cases, it is what happens before the patient arrives to the sleep lab that determines how easily they may be able to sleep. Education by the referring provider, or a set of clear instructions sent out ahead of time, may be helpful. There are a few considerations that should be prioritized.

The ability to fall asleep is highly dependent on two factors: the homeostatic sleep drive and the circadian alerting signal. The sleep drive can be enhanced by observing an earlier wake time, avoiding daytime naps and going to bed feeling sleepy.

The circadian alerting signal may dictate when a patient should schedule a sleep study. Accommodations should be made for people who have delayed sleep phase syndrome, or for shift workers, so that the timing of the test corresponds to their typical sleep patterns. In many cases, this will require daytime staffing and efforts to preserve a quiet and dark sleep environment.

Caffeine consumption should be discouraged the day of the testing. Alcohol use should reflect typical usage patterns, and moderation may be encouraged. Normal activity levels, including exercise, should be maintained.

**Establishing a Sleep Sanctuary**

Upon arriving to the sleep lab, the patient should be made comfortable. Reasonable requests for accommodation should be met. The bedroom should be kept cool and quiet, with the lights appropriately dimmed.

Ideally, the same optimal sleep hygiene habits promoted at home should be recommended in the sleep lab. The bedroom space should be a sleep
sanctuary. Unfortunately, televisions may be present to pass time before the sleep study commences. These should definitely be turned off during the study and may be best powered down in the hour preceding the anticipated bedtime.

The last hour of the day should be a time of transition to sleep. Work and electronics should be put aside. The time may be spent reading, listening to relaxing music or following a bedtime ritual to prepare for sleep. This will help to ease the transition when the lights are turned out, even in a sleep lab.

Using Relaxation Techniques

All patients should be encouraged to go to bed feeling sleepy or drowsy. This is different than feeling tired or fatigued. Ask: “Are you feeling sleepy and ready to fall asleep?” If the routine bedtime rolls around but sleepiness is not felt, the study onset should be delayed. This will make it easier to fall asleep when finally getting settled into bed.

Once the lights are turned out, it is normal for the mind to seek out a focus. With wires in place, in a strange bed and environment, and with the pressure of performance anxiety, sleep may not come naturally. If anxiety creeps in, the associated activation may make it even harder to fall asleep. To prevent this chain of events, distraction may be a helpful tool.

Not everyone will need help falling asleep. Many patients have excessive daytime sleepiness as a consequence of sleep apnea. These folks will fall asleep quickly, and any awakenings will be short-lived. Unfortunately, sleep apnea also contributes to chronic insomnia, especially in women and older patients, and this can be a problematic combination.

It is possible to use a few simple relaxation techniques for those who need a little extra help. Consider these options:

1. Breathing. Focus the mind on a slow, regular pattern of breathing. With eyes closed, breathe in and out through the nose. Feel the cool air drawn in through the tip of the nose. Pay attention to the temperature difference, breathing in and out. Also pay attention to the movement of the air, one side of the nose versus the other. Then shift the mind's attention to the upper part of the nose, the back of the throat and the lungs themselves, paying attention to both temperature differences (if apparent) and the air movement.

2. Progressive muscle relaxation. Tighten and relax the muscles of the body sequentially, starting at the feet and working up to the face (including the toes, hands, biceps, shoulders and face). Try to follow a 5-3-1 second pattern, tightening for the time specified and then fully relaxing before tightening for the next time suggested in the sequence.

3. Guided imagery. Recreate a relaxing experience, perhaps a favorite vacation, a trip to the beach, or a hike through the woods. Use the five senses to recall what was felt in that experience. What was seen, smelled, heard or felt? Recall the sense of relaxation and peace.

4. Creative recall. Try to recall a recent dream, recreating the memory and creatively filling in forgotten details. If dreams are not easily recalled, consider recreating the story of a favorite movie or book, remembering the plot, scenes and dialogue chronologically in as much detail as possible.

Importantly, the key to any of these techniques is distraction. It does not matter what is attempted as long as it shifts the focus from trying to fall asleep. With relaxation, sleep will more quickly come.

If a patient is feeling particularly agitated, tossing and turning for more than 15 to 20 minutes, it may be important to have them get up from bed. Offer some reassurance. Most patients are able to get enough sleep to make the study worthwhile. If a little time is spent reading out of bed, building the desire for sleep, this will make the experience more successful. In some cases, especially with early morning awakenings after enough study data has been collected, it may be best to just end the study early.

Fortunately, with a few simple interventions, it is possible to ease the frustration of insomnia during sleep studies for both patients and techs alike.

BRANDON R. PETERS, MD, is a double board-certified neurologist and sleep medicine physician who practices at Virginia Mason Medical Center in Seattle. He completed his sleep fellowship at Stanford University, where he also serves as an adjunct lecturer. He is the author of “Insomnia Solved,” available now via Amazon, and in the past decade has written more than 1,000 articles on sleep for Verywell.com.
Have you ever heard anyone say management is easy? I have been a manager for 10 years now, and I can attest to the immense challenges that come with the job.

Most managers do not have any real management training and are frequently asked to lead a team because of their display of confidence in knowledge, ability to delegate and their interactive communication skills. But sometimes using those skills as an individual employee don’t translate to using them as a manager.

Throughout my career, I have confronted many obstacles as a manager at various levels within many different types of organizations. The No. 1 thing I had to quickly learn was to communicate better. Balancing your communication with those over you and those under your direction is very challenging.

After 10 years, I learned that most of the time we do not listen to understand. We listen to reply. I quickly had to readjust several of the ways I think to communicate more effectively, starting with getting you and your team to listen to understand. It helps us communicate and critically think through our decisions.

To further help my staff with our communication skills, I developed three areas of communication skills to improve my management style: intellectual empathy, intellectual integrity and intellectual perseverance.

**Intellectual Empathy**

To have intellectual empathy is to routinely imagine yourself in the place of others so you can genuinely try to understand where their coming from.

I had a tech argue with me on why a patient should have one-on-one care if they have to return to the lab. I was listening to her concerns but wasn’t taking the time to truly understand. I was pressured from my upper management team to meet volume goals. I was being self-centered when I was listening to the technologists’ concerns.

When that patient arrived to the lab for their titration, I happened to be working late. What I read in this patient’s chart was not at all what he was presenting. I was not listening to understand what the technologist went through on her first night with him. I was too worried about making sure we had all the beds filled. I was wrong. It was a true safety concern for the patient and my tech to not be one-on-one.

Moving forward, a communication strategy I liked to use was taking the time to speak to the patient's viewpoint and summarizing what I thought they were saying. Then clarifying before sharing my viewpoint. We need to take a time out to put ourselves in each other's shoes to see if we can come to a common ground. Using intellectual empathy can help us better understand the patient, and forge a better plan of care for them too.

**Intellectual Integrity**

Intellectual integrity involves holding oneself to the same standards that you expect others to meet. It means practicing daily what you expect out of others.

This seems easy, and I assumed I was already doing this. It wasn’t until one day I started questioning mistakes that were made in quite a few patient charts. As I grew frustrated on the apparent lack of detail, I investigated who the tech was that made
this many mistakes, who I assumed was obviously rushing through their work. The tech was me. It was a big eye-opener. The old saying ‘Do as I say, not as I do’ will quickly lose you respect and integrity. Hold yourself accountable to what you hold your team, too. Take the time to consistently reflect your own behaviors.

Every excuse was thrown at our program on why it would fail. But we didn’t give up. We figured workarounds.

Intellectual Perseverance

Intellectual perseverance means to refuse to give up easily. It means you work your way through complexities and frustration. I did a sleep study on my dad years ago. He had severe sleep apnea and refused any type of treatment. A year after his study, he died of a heart attack in his sleep. This reflection of what happened to my dad drives my passion to want to persevere even more.

Years ago, I started a sleep navigator program in our hospital, which has now expanded across to many departments in and out of our hospital. In the beginning, I ran into many barriers. Many people said it would not work. Every excuse was thrown at our program on why it would fail. But we didn’t give up. We figured workarounds.

When you’re talking to your management team, has there been ever a time for example when they told you “No” to getting that day staff person you need? Or getting the right supplies you need? Being intellectually perseverant involves a person understanding that carefully and methodically reasoning through complex issues and problems takes precedence over coming to conclusions quickly.

In order to communicate effectively and have confidence in these three communication traits, you must fully understand your business. To allow you to continue to learn your team and your business, you need regular staff meetings. Your staff should feel like they are a part of a team and can have open and honest dialogue about some of the challenges within the sleep center.

Your staff meetings are the time to allow your technologists to learn, discuss needs, collaborate and build that team rapport. To run safe, efficient and happy labs, you need informed techs. You also need to know your budget, volume goals and predictions, strategic plan, supply needs, barriers to patient care, computer issues and moral issues. In my personal experience, I know technologists want to be heard. Communication is the real work of leadership. Great communicators understand the people they’re trying to reach and what they can and can’t hear. It’s been said many times, but leaders lead by example.

KRISTINA WEAVER is neurodiagnostic manager for Parrish Healthcare’s Sleep Disorders Center. Weaver has been involved in sleep medicine for 13 years. Prior to that, she was a paramedic. Weaver has established many programs that include but are not limited to sleep navigator, COPD navigator and corporate sleep navigator programs within her community. Weaver is the coordinator of Brevard AWAKE. She also serves as the past president of the Florida Association of Sleep Technologists and is on the AAST Board of Directors.

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Emerging Technology History in Sleep: The Evolution, Part II

By Joseph W. Anderson, CCSH, RPSGT, RPFT, CRT-NPS

In Part I of this article from the Q2 issue of 2018, I discussed the emerging and growing technology of the sleep medicine community. I also talked about the mantra of that time as “entering the field on the cutting edge of technology that would revolutionize the field of sleep medicine.” Just a few decades ago, there were no state licensure laws or any “real” credentialing requirements. And, of course, no HIPAA laws, either.

Today, HIPAA impacts everything we do in the modern sleep lab. And in a growing number of states and countries, you now need a license, in addition to your credentials, to practice sleep. We are also seeing the emergence of multiple credentials being preferred in our labs, especially on day shifts. The need for multiple credentials has meant additional education. We are expected to be more educated ourselves, and we are expected to have the knowledge and skill sets to educate our patients. This means that in order to advance in our field and best serve our patients’ needs, we are more clinically focused than ever before.

It is becoming more and more common to see the RPSGT credential paired with the CCSH (Certification in Clinical Sleep Health), RRT, CRT, RRT/CRT-SDS, LPN/RN, RPFT or REEGT credentials. In fact, we are also seeing some providers such as nurse practitioners (NP) and physicians obtain the RPSGT credential to further enhance their expertise in sleep medicine. In 2018, we saw AAST introduce the first “Fellows” recognition for some of the industry’s more prominent sleep allied health professionals. We are also seeing more RPSGTs obtaining a college degree to pair with their credential.

Let’s look into the sleep medicine crystal ball and see what the role of tomorrow’s sleep tech might be, both in the clinical and education realms. Let’s also imagine what tools might be available to us in order to perform the very best for our patients and where we might be five years from now.

Let’s start with computers and computer technology. In the sleep field, we have seen tremendous changes in the use of computers both in acquisition and treatment of a variety of sleep disorders. This goes back to the transition from analog (paper) acquisitions to the current digital world. But what might be next?

Maybe we will see the current tactile keyboard be replaced with a more friendly and portable style. Something more on the line of a hologram or projection style. The keyboard itself might be projected from a desktop projector similar to a desk lamp, or it may be more portable using a tablet or cellphone.

Will we see our studies collected from a more nontraditional location? Will we still be limited by the number of beds that we have for the patients to sleep in? Or the number of our labs or the geography of our offices? We are already seeing great progress in remote acquisitions and scoring. Tele-sleep and the expansion of the internet’s abilities to access data, the speed to see said data in real-time or to move data from one location to another, and the security of the information being collected, reviewed or moved means that we will be able to do most things faster, cheaper and far more remotely than we currently do.
Even though we will have better access to potential patients across the globe, these same patients will have access to more sleep centers than just the one located in their hometown.

The use of cloud storage, perhaps in exclusive health medicine server farms, will make the storage of large files more cost effective and accessible to all involved in a patient’s care. This nearly unlimited method of storing all forms of data means not being tethered to an acquisition stations local hard drive or a local institution’s server.

The use of social media pages are reducing the dependence for maintaining a facility or sleep lab website. This reduces overheard in designing and maintaining web pages. Social media can provide a static location for patients to obtain information (like a website does), but it can also be used to actively reach out to patients using automated and specific criteria that our patients can opt in or opt out of. This can include appointment reminders, education, billing, surveys and more.

The technology of tomorrow also will bring great advances in patient therapy with more masks, PAP modalities and patient adherence monitoring. In addition to social media, we will most likely see an increase in specific patient information being delivered to the patient through phone and tablet apps, smart TVs, through the PAP units themselves via PAP unit displays or audio-delivered messages. This can include real-time adherence data, future appointments and specific education identified to be delivered to a certain patient population.

The treatment hardware and software will continue to advance as the different providers of these systems compete with each other to bring to the market the latest and greatest widget in an attempt to stay ahead of the market. Competition always ensures that these vendors will spend large capital on research and manufacturing dollars to guarantee that they are always ahead of the competition.

Technology can be a double-edged sword — meaning that even though we will have better access to potential patients across the globe, these same patients will have access to more sleep centers than just the one located in their hometown. Customer service and clinical expertise will always be the keys to growing a lab’s population base. Staying abreast of the changes of today and preparing for the changes of tomorrow puts each of us in the best position for individual growth, a sleep lab’s success and the best patient care available.

As I said in Part I of this series, the technology we have available to us today will certainly be replaced again in the not-so-distant future — just like it has been for many decades. And with it comes opportunities to those of us who prepare and evolve.

JOSEPH W. ANDERSON, CCSH, RPSGT, RST, RPFT, CRT-NPS, is a certified clinical sleep health educator and supervisor with Integrated Sleep Disorders Center, McGuire Veterans Hospital, Richmond, Virginia.
IN THE MOONLIGHT

Q&A with Bretton Hevener, RPSGT

BRETTON HEVENER, RPSGT, is an AAST board member. Bretton has over 17 years of experience in sleep medicine. She began her career at the National Jewish Medical and Research Sleep Center and the University of Colorado’s Children’s Hospital Sleep Center in Denver as a sleep technologist. In 2005, she transitioned from the clinical side of sleep medicine to operations at Pacific Sleep Medicine in Southern California. Bretton had direct involvement and oversight responsibilities for the sleep labs, clinical trials and DME fulfillment. During that time, she directly administered thousands of sleep studies as a clinician and tens of thousands more in an oversight capacity as general manager. In 2010, Bretton took her expertise to Sleep Data in San Diego. As president/COO of Sleep Data, she has woven her experiences together to present a sleep care management service focused on improving patient outcomes and providing population management metrics to customers.

What did you want to be when you grew up? I wanted to be a veterinarian, a pilot, an actress, a landscape designer, an architect, a doctor, a lawyer, a singer (scary), a writer … With all these interests, I was never able to force myself down a path. I did work hard, I did explore options and in the end I never needed to force myself; I came upon the field of sleep medicine.

Why did you decide to become a sleep technologist? When I graduated from college, I was at a crossroads. I suddenly did not feel as if I knew what career I really wanted. I did know one thing: I wanted to live in Denver, Colorado. So, off I went with a small amount of savings in my pocket. About three weeks later, at a job interview at The Sleep Center at National Jewish Health in Denver, as I watched a technician scroll through an overnight polysomnograph, I discovered exactly what I wanted to do. I wanted to understand this fascinating mechanism of sleep.

Why did you become an AAST member? Initially, I became a member of AAST in order to have access to the network of sleep-care professionals. Through this network, AAST has created and provided educational materials that have made me the sleep-care professional I am today.

Who has had the greatest influence on your career? I have been fortunate to have many wonderfully significant influences on my career. In order to answer this at all, I do have to call out at least two people. First, I would say Dr. Teofilo Lee-Chiong Jr., my medical director at The Sleep Center at National Jewish Health. Dr. Lee-Chiong is one of the most passionate and energetic individuals in sleep medicine. He challenged me often and provided me with opportunities to “think beyond the known” in sleep medicine, to speak publicly on sleep medicine, and to research and write on the various sleep topics I was interested in. My second greatest influence would be my current CEO, David French. From the moment I met him, David has offered a strong foundation of business ethics and knowledge, experience and support. He has believed in me and empowered me to grow.

What is the most challenging part of your profession? Published research shows us the increased risks of heart disease, high blood pressure, weight gain, diabetes, cancer, mood disorders, accidents, poor work productivity, poor school performance and a lower quality of life. However, there are few studies that have been able to tease the complexities of sleep and their associations or causations with these conditions apart to determine the true financial consequences of not treating poor sleep. Therefore, our industry struggles to incentivize others for proactive awareness and identification processes and for appropriate financial reimbursement models.

What is the biggest change you have seen in the profession since you started? The biggest change that I have seen in the profession since I started is awareness. Fifteen years ago, I could mention my profession among a group of people and become the center of conversation. People were fascinated that a job existed where someone would watch another person sleep. Today, there are CPAP machines everywhere at the airport. The television and radio station commercials are often discussing CPAP cleaning devices, oral appliances and surgical procedures to treat sleep apnea, or medications for insomnia. Today, if I mention my profession among a group of people, at least half of them start discussing either their or their loved one’s experiences with their CPAP mask or reporting their sleep statistics from their wearable devices.

What are your professional goals in the next five years? I would like to continue to work with others in the sleep community to make a positive impact on the lives of people living with sleep disorders. I would like to be a part of the team that works to simplify the complex process from diagnosis to treatment while providing superior clinical outcomes. In order to do this, we need to share our intellectual property, embrace technology and break down the silos of care in our industry. As a sleep-care professional, I would like to have a voice in the changing environment of sleep care.
Tips for Success to Meet Medicare Documentation Guidelines for Continuous Positive Airway Pressure (CPAP) Therapy (E0601)

It is vital to keep in mind that as we are providing diagnostic services for our Medicare population, we must meet the end goal of providing the documentation necessary to assure the patient can receive proper therapy.

In a previous Compliance Corner, A2Zzz Volume 27, Number 1, we discussed the documentation requirements necessary to support a diagnosis of OSA. In this article, I will outline the DME program documentation requirements.

Medicare will cover Continuous Positive Airway Pressure (CPAP) therapy with a supportive diagnosis of obstructive sleep apnea (OSA). Medicare offers an initial three-month trial of CPAP therapy and may cover it longer once the beneficiary has a face-to-face visit with their treating physician and the MD documents in the medical record that the patient has meet certain conditions surrounding use of the device and the CPAP therapy is helping the patient. The beneficiary (patient) will pay 20 percent of the Medicare-approved amount for rental of the machine and purchase of related supplies (like masks and tubing). The Part B deductible applies. Medicare pays the supplier to rent the machine for 13 months if the patient has been using it without interruption. After the unit has been rented for 13 months, the patient will own it.

Medicare will only cover durable medical equipment (DME) if the physician or supplier is enrolled in Medicare. If a DME supplier doesn’t accept assignment, Medicare does not limit how much the supplier can charge.

The Department of Health and Human Services, Center for Medicare & Medicaid Services, provides a fact sheet titled Positive Airway Pressure (PAP) Devices: Complying with Documentation Coverage Requirements. This publication should be reviewed with all staff performing sleep studies. This guideline lists the common PAP device errors:

1. No documentation of the treating physician’s initial face-to-face clinical evaluation conducted prior to the sleep study to assess the patient for OSA.
2. No documentation of a Medicare-covered sleep study supporting medical necessity.
3. No documentation of the treating physician’s signed and dated order describing the item(s) dispensed.
4. No documentation of the treating physician’s face-to-face reevaluation, within the first three months of initiating therapy (but no sooner than the 31st day), which documents both improvement in subjective symptoms of OSA and objective data related to adherence to PAP therapy.

Sleep centers have a role in preventing errors surrounding therapy requirements. The first thing we can do is request the treating physician’s initial face-to-face evaluation performed prior to the sleep study. This evaluation assesses the patient for OSA and is one of the criteria needed to qualify the patient for PAP therapy. Reviewing the office visit notes requires a critical eye. A proactive standard that includes additional clinical review prior to testing is recommended to assure the notes are sufficiently supportive for therapy and not just for testing. This is especially critical for our direct referrals to the sleep center. Clinical notes obtained that clearly document the need for a sleep test should include the following:

- Signs/symptoms of OSA, including duration
- Epworth or other validated sleep hygiene inventory results
- Physical exam – BMI, neck circumference, cardiopulmonary and upper airway system evaluation
- Specific reason(s) for referral for sleep test must be documented in the patient medical record

If the documentation does not meet these standards, the patient should be referred to a sleep specialist for consultation prior to testing.

PAP devices for the treatment of OSA are covered only if the diagnostic sleep test shows the patient met the criteria in the following outline:

**Initial Coverage HCPC Code E0601**

**Criteria**

1. A face-to-face clinical evaluation by the treating physician prior to the sleep study test to assess the patient for OSA.
2. A Medicare-covered sleep test that meets either of the following:
   a. The apnea-hypopnea index (AHI) or Respiratory Disturbance Index (RDI) is greater than or equal to 15 events with a minimum of 30 events; or
   b. The AHI or RDI is greater than or equal to 5 and less than or equal to 14 events per hour with a minimum of 10 events and documentation of:
      i. Excessive daytime sleepiness, impaired cognition, mood disorders, or insomnia; or
      ii. Hypertension, ischemic heart disease, or history of stroke.
3. The patient and/or their caregiver have received instruction from the supplier of the PAP device and accessories in the proper use and care of the equipment.

**Detailed Order**
- Patient name
- The description of items(s) to be dispensed
- The ordering physician's legible signature: and
- The date of the ordering physician's signature.

**Initial Coverage HCPC Code E0470**

*Criteria Meets coverage criteria 1-3, as outlined above, and criterion 4.*

4. HCPCS code E0601 device has been tried and proven ineffective based on a therapeutic trial conducted in either a facility or in a home setting.

*Note: Ineffective is defined as documented failure to meet therapeutic goals using a HCPCS code E0601 device during the titration portion of a facility-based study or during home use despite optimal therapy (i.e., proper mask selection and fitting and appropriate pressure settings).*

**Detailed Order - Same as above**

**Continued Coverage Of HCPC Code E0601 and E0470 Beyond the First 3 Months**

Criteria: The treating physician must perform a clinical reevaluation no sooner than the 31st day, but no later than the 91st day after initiating therapy, which documents the following:

- A face-to-face clinical reevaluation by the treating physician with documentation that symptoms of OSA are improved; and
- Objective evidence of adherence to use (defined as use of PAP devices for 4 or more hours per night on 70% of nights during a consecutive 30-day period anytime during the first 3 months of initial use) of the PAP device, reviewed by the treating physician.

*Note: Documentation of adherence to PAP therapy shall be accomplished through direct download or visual inspection of usage data with documentation provided in a written report format to be reviewed by the treating physician and included in the patient's medical record.*

Patients who fail the initial 12-week trial are eligible to requalify for a PAP device but must have both:

1. Face-to-face clinical reevaluation by the treating physician to determine the etiology of the failure to respond to PAP therapy; and
2. Repeat sleep test in a facility-based setting (attended in lab study).

For patients who received a PAP device prior to enrollment in FFS Medicare and are seeking Medicare coverage of either rental of the device, a replacement PAP device, and/or accessories, both of the following coverage requirements must be met:

1. The patient had a documented sleep test prior to FFS Medicare enrollment that meets the Medicare AHI/RDI coverage criteria in effect at the time that the patient seeks Medicare coverage of a replacement PAP device and/or accessories; and
2. The patient had a face-to-face clinical evaluation following FFS Medicare enrollment by the treating physician who documented in the patient's medical record that:
   a. The patient has a diagnosis of OSA, and
   b. The patient continues to use the PAP device.

If either criterion 1 or 2 above are not met, the claim will be denied as not medically necessary.

In these situations, there is no requirement for a clinical reevaluation or for objective documentation of adherence to use of the device. AAST offers more learning opportunities on understanding the criteria for treatment of sleep disorders. You can access the Learning Center at https://onlinelearning.aastweb.org/courses. Courses can be accessed anytime, anywhere with a computer, tablet or smartphone. The courses are supported with videos, quizzes and interactive content designed for a proven learning experience.