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The Evolution of Sleep Studies
How to Start a Sleep Screening Program
The Sleep Navigator
SLEEP EDUCATION FOR THE SLEEP COMMUNITY

2018 ANNUAL MEETING
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AAST
THE COMMUNITY FOR SLEEP-CARE PROFESSIONALS
Digital Technology Takes on PAP Adherence
By Joseph W. Anderson, CCSH, RPSGT, RST, RPFT, CRT-NPS

As sleep technologists search for the proper definition of adherence, this article examines the effective process to implement digital technology as part of the approach.

The Changing Face of Sleep Technology: Part I
By Kent Caylor, RPSGT

The Sleep Navigator
By Kristina Weaver, RPSGT

Insufficient Sleep and the Dancing Plague of 1518: Part II
By Reg Hackshaw, EDD

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ABOUT A_{zzz}

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AAST THANKS ITS SUPPORTER MEMBERS
From the Editor

A Fresh Look at Content

By Laura Linley, CRT, RPSGT, FAAST

Who doesn’t love a starry night? Of course, there is “The Starry Night,” the iconic canvas piece by Dutch post-impressionist painter Vincent van Gogh, which everyone loves. But I had a different “starry night” in mind, one that was depicted on the cover of A2Zzz for years. In fact, it was depicted on every cover of the magazine (see below). And while consistency can be good, it can also get a bit stale when you are trying to convey innovation to the industry.

You may have noticed a change from that cover graphic over the last few issues. With the Q3 issue of 2017, we debuted a new design element to our cover, one that matches the content contained within that issue. You could consider it our proverbial toe in the water of a design refresh for A2Zzz.

And now, with our first issue of 2018, we are jumping right in! Working with our content and design teams over the past few months, our commitment was to infuse more character into the design of each issue to give it more of a magazine look and feel. I must emphasize that this isn’t a complete overhaul. We made a conscious effort to maintain some of the elements that you have come to know and embrace, ensuring we don’t lose the journal aspect of the publication.

So, as you flip through this issue, I urge you to take notice of the nuances that our team has infused — subtle tweaks to the layout of our feature articles, stylized pull quotes and callouts in our columns, and some slight modernization of the A2Zzz logo (you may have noticed a new AAST logo as well as of late).

Our commitment was to infuse more character into the design of each issue to give it more of a magazine look and feel.

This new approach even extends beyond the look of our content. Our content strategy has been given a new infusion as well, starting with the formation of a new AAST Strategic Content Committee. AAST members Kimberly Trotter, Tamara Sellman, Brendan Duffy and Sarah Brennecka have graciously volunteered to work with our AAST content team in an advisory role as we develop themes and topics, identify sources, and optimize format and channels of delivery for both the magazine and the AAST blog.

The idea is that with AAST’s position and reputation as a leader in sleep, we must rely on the development and execution of a comprehensive, integrated content strategy that aligns with the needs of our community. The goal is to position AAST as the thought leader for sleep technologists and managers who seek timely and applicable knowledge related to sleep.

And while much about the look and feel of our content seems to be changing, at the end of the day the mission remains the same: to generate content with the intent of building the sleep community and providing professional development to professionals in this field. Complete with a fresh, new look!
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An association is nothing without its members, and an industry is nothing without its professionals. The AAST Fellow Program recognizes both, and I’m proud to be included as an AAST Fellow and excited to welcome the other 13 inductees (two unfortunately recognized posthumously) into this program, newly developed in 2017. Over the years, these professionals have made significant contributions to the sleep technology field, and remain engaged and committed to our profession. They have all been credentialed in sleep technology for at least 15 years and have been AAST members for at least 10. I’d like to personally thank all of them for their service to AAST and our profession. The 2017 inductees, all AAST past presidents, include:

- Jon Atkinson, BS, RPSGT
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- Todd Eiken, RPSGT
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- Robert Turner, RPSGT, RRT

In 2018 and beyond, the AAST Fellow program will be open for nominations made by an AAST board member or a fellow of the AAST. Individuals who have made a significant professional contribution to the field of sleep technology in education, mentorship, publications, research or professional service to the AAST as well as those who have demonstrated prominent leadership, influence, and achievement in clinical practice, education or science will be considered for fellow status. Nominations will be evaluated annually by the Fellowship Selection Committee, consisting of AAST board members and fellows in good standing. New fellows, who will be inducted during the awards ceremony held at the annual AAST conference, will receive a FAAST pin and have their names and bio included in the AAST Fellow Directory on the website.

As we settle into 2018, I’d also like to take some time to remind you of AAST’s goals from our 2017-2018 Strategic Plan. The board of directors developed this plan to help guide the profession and association through the evolving and expanding field of sleep technology and to successfully navigate the changing landscape of sleep healthcare.

**Goal 1:** Define who the AAST is and why it exists.

**Goal 2:** Recognize and define the various roles in a sleep program, the skills required and professional standards for each role within the context of the changing healthcare environment.

**Goal 3:** Evolve the AAST from a people-driven organization to a process-driven organization.

**Goal 4:** Continue to improve communication with AAST stakeholders, including identifying how to best communicate with newly included stakeholders identified in Goal 1.

**Goal 5:** Expand the membership base of the AAST.

The AAST Board of Directors relies on you, our members, to keep us accountable. We exist for the 4,200-plus people who come to us for their professional and educational needs. We’re committed to meet those needs, and we’re excited to continue to do so in the New Year.

Lastly, I’d be remiss if I didn’t mention our plans for our new annual meeting, being held in the fall this year in Indianapolis. This is the AAST’s 40th Annual Meeting, a significant milestone for our association and our profession. This is also our first completely independent annual meeting developed with our members interests and needs at the top of the list. It isn’t until Sept. 28-30, but we’re already working hard on it and are excited to bring forth a unique event experience to our growing community of sleep professionals. Stay tuned for much more information on this event. Happy 2018!
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 June 8, 2018. 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:

Digital Technology Takes on PAP Adherence
Objective: Discuss the use of digital technology into clinical practice, as well as patient experience with the use of digital technology.

The Changing Face of Sleep Technology: Part I
Objective: Develop a basic understanding of the evolution of sleep studies and technology.

Insufficient Sleep and the Dancing Plague of 1518: Part II
Objective: List ICSD-defined features of episodic mania; name behavioral as well as medical causes for manic presentations; and discuss how medical historians have identified and interpreted illness-related information from the past.

The Sleep Navigator
Objective: Understand the correlation between undiagnosed sleep apnea and exacerbation of underlying comorbid conditions. Have a better understanding of how to start a sleep screening program within your healthcare system.

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

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DIGITAL TECHNOLOGY Takes on PAP Adherence

By Joseph W. Anderson, CCSH, RPSGT, RST, RPFT, CRT-NPS
Despite all this talk of "adherence" or "compliance," few PAP users or technologists know the precise definition. This can be problematic not only in analyzing the effectiveness of therapy, but also in getting insurance to resupply the patient. For the sake of this article, we will use the more accepted term "adherence" interchangeably with the term "compliance."

What Is PAP Adherence?
Unfortunately, there is no single definition. However, most practices use the definition given by Medicare, which stipulates the following:

- Compliance (adherence) is measured over a 30-day consecutive period.
- CPAP is being used 70 percent or more of the time.
- CPAP is being used for four-plus hours every night.

So, for example, if you get an average of eight hours of sleep over 30 days (240 hours total), you would need to be using your PAP machine for an average of 5.6 hours each night.

There are problems qualifying what PAP adherence is, but there are still more problems quantifying how many patients are adherent. Estimates of patients' adherence range from 29-83 percent, which is an extremely wide margin.

Patients generally "decide" to comply (adhere) within the first week (generally by the second to fourth night) of using their CPAP. The duration of these therapy sessions may meet the minimum requirements for adherence (i.e., four hours), but there is evidence that duration gradually increases from this point onward.

There are problems with defining and measuring compliance that are quite significant. Though many tests have drawn conclusions about the risks of noncompliance, these problems beg the question of how salient they truly are.

One study has found that at least six hours of sleep is needed to alleviate certain symptoms of sleep apnea, such as memory problems and daytime drowsiness. This is two hours greater than the unofficial benchmark that Medicare uses, and it’s also one hour greater than the average sleep time of those who do qualify as "compliant or adherent."

So, is CPAP adherence truly that important? Despite all the problems with it, it nevertheless remains the best way to gauge how therapy is working for individual patients. But it is important to recognize the limitations of PAP adherence as a metric, given how it is currently quantified and qualified.

Some of the "hows" that we use with patient data have changed over the last several years: This includes how we accumulate the adherence data, how we can see real-time patient data, how we store the data and how we "rely" on a digital world to monitor adherence.

What Do We as Technologists and Providers Want?
We want the tools to meet the needs of our patients. We want to provide superior care in the most effective and cost-efficient way as possible. We want to be able to take full advantage of digital and other technologies available to us.

Most vendors now offer a sleep center the tools needed to be an integrated sleep disorders center. These tools include digital collection, digital storage, and now improved digital patient and sleep center data management across multiple products. These tools now allow us to view and manage this data much more easily across multiple platforms and brands.

Though many tests have drawn conclusions about the risks of noncompliance, these problems beg the question of how salient they truly are.

We can now improve patient outcomes by tracking patient demographics; equipment and supply inventories; device usage and therapy delivery; provider scheduling; education; and so much more through workflow automation through secure cloud storage.

Effective Processes to Implement the Use of Digital Technology
The number-one process to implement the use of digital technology is to understand that it is the way of the future. There was a time when many of us fought to continue to use paper to record a PSG, and, of course, we have all now transitioned from analog to digital. There was a time when we fought to keep all studies in-lab and to not use out of center sleep testing or HSAT.

There was a time when compliance data was downloaded directly from the SD card to software residing on the local computer or servers. And there was a time when the sleep technologist’s role was hookup and data collection.

We are now in a world where analog or local lab diagnostics, therapy and monitoring (including adherence) have gone to the cloud. Many, and soon to be most, sleep labs and durable medical equipment providers issue PAP machines with cellular or Wi-Fi modems.
These technologies are now often built right into the PAP units. In our Integrated Sleep Disorders Center, this is called store-it forward.

Now, from our home or office, we can use the cloud to monitor the patient’s usage:
- Have they turned the PAP unit on?
- What type of mask leakage are they having?
- What is the breath-by-breath analysis?

From our home or office, we can use the cloud to make changes to the PAP unit. We can:
- Adjust the pressure.
- Change the treatment modality.
- Adjust the ramp and other comfort settings.

We can also allow (encourage) the patient to follow their own adherence or compliance. This can easily be done through the cloud, using their home computers, tablets and cellphones. Adherence notices/alarms can be automatically generated and sent to the patient through email, secure messaging or digital device notices. Studies have shown that patient involvement will increase adherence. Using digital technology helps the patient to have an active role in their own adherence by taking some responsibility for their total therapy.

**The Patient Experience With Digital Technology**

Research has shown that the more the patient is involved in their own care, the higher the adherence or compliance is, so it would make sense to provide the patient with the tools needed to get and stay involved. In some cases, this is just informing them of their options. In other cases, you may need to take the time to instruct the patient how to access and use these tools.

More and more of our patients are savvy at some level with modern and digital technologies. Many have a basic or even an advanced understanding on enrolling and signing into medical portals to review their own test results, make appointments and exchange communications with providers. They may already use apps on their tablets and cellphones to do this.

More patients are watching YouTube videos to learn how to adjust their PAP devices on their own. We must be aware that we will have patients who will make changes to their PAP devices without a prescription or direction from their provider. Part of our education to these patients needs to include why they should not do these things “just because they can.”

**The Impact of Digital Technology on Enhanced Adherence**

Sleep labs are changing. We are becoming not just “diagnostic” sleep labs, but we are becoming true sleep disorders centers. Integrated sleep disorders centers not only diagnose sleep apnea but diagnose and treat a much broader spectrum of sleep disorders than we did even just a few years ago.

We are using technology today to diagnose and treat our patients that we could not have imagined when I began my sleep career journey back in the mid-1980s. Gone are paper polygraph recorders, VCR video recordings and manual calculations for report parameters. When I started in this field, I had to wear a tie and a lab coat (no scrubs allowed).

Today, the modern day sleep centers use an integrated digital approach to diagnose and treat a wide range of sleep disorders. Many sleep centers are now used 24/7 to meet the needs of the sleep disorders population.

Some real clinical adherence benefits and numbers using today’s digital technology in my center include:
- An average increase in patient adherence/compliance of 15 percent or more
- Fewer returned PAP units, which means less cost to treat patients
- Fewer face-to-face appointments using store-it-forward (modem) technology, e-consults, and remote pressure and modality adjustments
- A combined increase in adherence and increase in quality of life (QOL), resulting in less technologist or provider time per patient, which saves money
What Do Patients Really Want?

As sleep professionals and providers, it is our responsibility to use all the resources at our disposal to diagnose and treat our patients. Adherence and compliance numbers are an important tool in measuring the success of PAP therapy. They are certainly important to the payers. However, the number-one thing that patients really want is improved quality of life (QOL). They are not interested in RDI or AHI or the type of therapy or mask leak or adherence/compliance. They simply want a therapy/device/procedure that increases their QOL.

The true measure of successful treatment and subsequent adherence for the patient is their improved QOL. If we provide the tools, such as digital technology, for us to assist them to improve QOL, their adherence to the prescribed therapy will most likely continue.

What’s Next?

Socially, we are more connected now than ever. That means that our scientific resources are also more connected, resulting in faster experimentation and quicker outcomes. In less than a couple of generations, we have gone from candlelight to where we are now. One of the greatest things about tomorrow is that we don’t know what it will bring or who we will meet. What will be the next great advancement in sleep medicine?

We are using technology today to diagnose and treat our patients that we could not have imagined when I began my sleep career journey back in the mid-1980s.

JOSEPH W. ANDERSON, CCSH, RPSGT, RST, RPFT, CRT-NPS, is supervisor of the Integrated Sleep Disorders Center at McGuire Veterans Hospital in Richmond, Virginia.
A Brief History of Polysomnography

The earliest recorded theory of sleep is from c450 BC. At that time, a Greek physician by the name of Almaeon described sleep as a loss of consciousness as blood recedes from the surface of the body¹. A few other theories came out regarding sleep. However, all theories encompassed a similar theme: Sleep was seen as a passive state in which the brain was simply “turned off.” In other words, sleep was something that happened to the brain, as opposed to the brain taking an active part in initiating sleep.

In this article, we’ll take a trip back through time and see how we got from these earliest theories of sleep to the development of polysomnography. To get a better understanding of polysomnography, it is imperative we look at two branches of research that helped in its development. These two fields encompass both the study of the nervous system and an understanding of electricity. In the following sections, we’ll take a brief look at these two fields as they relate to the growth of polysomnography.

The Study of the Nervous System

Our knowledge of the nervous system evolved through several stages. Early thought was that the nerve itself was like a hollow tube. Early practitioners postulated that it was this hollowness that allowed the “animal spiritus” to flow through it. And it was this flow of the animal spiritus that created movement.

Another thought was that, yes, the nerve was hollow, but it was water, not spirit that flowed through it. Therefore, water pressure caused movement. It wasn’t until scientists began to actually dissect the human cadaver that a clearer understanding of the nervous system came about.

So, although ancient practitioners had a basic understanding of what the nervous system did, they didn’t know how it worked. They also questioned whether nerves originated from the heart or the brain. For instance, Aristotle believed that the heart was the first organ of the body, and therefore the seat of all motion and sensation.²

We now know, however, that the nervous system is a complex communication system. It starts with the brain and has an amazing pathway that would stretch out to 60 miles.
The Study of Electricity

Back in the late 18th century, an Italian biologist by the name of Luigi Galvani made a startling discovery. He was dissecting a frog when his steel scalpel came in contact with a brass hook. At that very moment, the frog leg twitched. It twitched, he reasoned, because of electric current within the frog muscles. Something he called “animal electricity.”

After that, an Italian physicist by the name of Alessandro Volta replicated the results of Galvani’s experiments. However, Volta drew a different conclusion. The frog leg twitched, Volta reasoned, not because of some “animal electricity,” but simply because the frog’s leg came into contact with two different metals. And Volta was right in this case.

However, Galvani did eventually prove “animal electricity.” And it was this discovery that living tissue generates an electric charge that paved the way for the discovery of brain waves. Although it wasn’t until the 18th century that physiologists made the connection between electricity and the nervous system.

It is these two scientific fields that form the basis for the study of sleep.

Milestones in Sleep Medicine

1875 – Richard Caton discovered the electrical nature of the brain and studied the electrical activity of animal brains. He also published what is believed to be the first account of brain waves.

1880 – Narcolepsy is recognized. The name is derived from two Greek words: narke, meaning numbness or stupor, and lepsis, meaning attack or to seize.

1907 – Two French physiologists, Legendre and Pieron, experimented on dogs. One of these experiments involved injecting blood serum from sleep-deprived dogs into non-sleep-deprived dogs. They found that the blood serum-induced sleep in the non-sleep-deprived dogs.

1913 – French Scientist Henri Pieron wrote a book titled “Le probleme physiologique du sommeil,” translated “The Physiological Problem of Sleep.” His work is considered the beginning of the modern approach to sleep research.

1925 – Physiologist Nathaniel Kleitman, known as the father of modern sleep medicine, set up the first lab exclusively devoted to the study of sleep.

1929 – German psychiatrist Hans Berger “discovers” electroencephalography, or EEG. Using his 15-year-old son as a test subject, he recorded the first human brain waves. The first waves he witnessed were with his son’s eyes closed, so he called them Alpha waves. He had his son open his eyes, and noticed a different type of signal. Because this was the second type of signal to be observed, he named them Beta waves.

1953 – REM sleep is discovered by Dr. Nathaniel Kleitman and his student Eugene Aserinsky. Up until this time, sleep was seen as a passive state, one in which the brain merely “switched off” for the night. The thought was that the brain needed outside stimulus to maintain wakefulness. With the lack of outside stimulus to put it to sleep, the brain itself was taking on a passive role. But the discovery of REM sleep changed that perception. We’ll discuss this more in the next section.

1965 – Obstructive Sleep Apnea (OSA) is defined.


1975 – Dr. William Dement forms the Association of Sleep Disorder Centers (ASDC). The name was later changed to the American Academy of Sleep Medicine (AASM).

1978 – A small group of people gathered in Minnesota and formed the Association of Polysomnographic Technologists (APT). This organization was created with the goal of developing a professional identity, as well as define standards and provide training for polysomnographers. The name of this organization was later changed to the American Association of Sleep Technologists (AAST).

1981 – Continuous positive airway pressure (CPAP) was invented by Dr. Collin Sullivan of Sydney, Australia, as a treatment for sleep apnea. The first CPAP masks were individually molded to the patient and held on with adhesive. Until then, the standard treatment for OSA was a tracheotomy.
More on the Discovery of REM Sleep

“People usually see only what they expect to find, and they do not see what they assume for whatever reason could not exist.” —Dr. William Dement

It turns out that REM sleep was discovered quite by accident. In fact, when Eugene Aserinsky first saw it, he and Dr. Kleitman thought it was artifact. Thus, they actually ignored it for a few nights. The reason they were so quick to assume these real eye movements were merely artifact is, in part, due to the quality of the equipment they were using at the time. The early Offner Dynograph was notorious for initiating pen movements, even when no patient was hooked up.³

However, they eventually decided to go in and physically observe the eyelids of the test subjects to see if their eyes were, in fact, moving. And of course, it turned out they were. This was a very significant finding. Initially, Aserinsky wanted to call these “jerky eye movements.” Also, when he measured them, they were not only more jerky than wake eyes, they were also slightly slower.

However, the slang meaning of the word “jerk” at the time caused Aserinsky to shy away from using that term. If he hadn’t been so slang sensitive, we’d now be using the phrase jerky eye movements, or JEMs, which, as it turns out, is actually a more accurate term for this type of eye movement.

Another interesting phenomenon that occurred during REM sleep was the activation of the cerebral cortex. In other words, the brain actually looked like it was awake, indicating that sleep was not a passive state after all. This discovery totally revolutionized sleep research. In fact, it was this discovery that turned the study of sleep into a real science.

However, these REM periods were not initially associated with dreaming. Therefore, the next step was to study them a little closer to see what they meant. Enter William Dement, a student of Dr. Kleitman’s and a self-described aspiring psychoanalyst. When Dr. Dement was told that REM periods might be related to dreaming, he got pretty excited.

People usually see only what they expect to find and they do not see what they assume for whatever reason could not exist. —Dr. William Dement

The reason for his excitement was due to the influence of Dr. Sigmund Freud’s theory of dream interpretation. In Freud’s own words, dreams represent “the royal road to a knowledge of the part the unconsciousness plays in mental life.” So, unlocking the meaning of dreams was huge. Thus, Dr. Dement was delighted when he was asked to sit up all night and watch people’s eyes move. If people were actually dreaming during REM periods, the implications could be quite significant.

Part of the experiments involved waking people during these REM periods and asking if they were, in fact, dreaming. Through these experiments, it was shown that REM periods were indeed associated with dreaming.

Thus began the study of sleep.

Early Sleep Labs

Sleep studies were initially recorded on analog polygraphs, which used paper and ink. However, these analog polygraphs were actually quite reliable. In fact, a sleep study rarely had to be rescheduled due to equipment failure. For example, a pen or galvanometer, even an amplifier, could be replaced on the fly, and you’d be good to go.

Another nice thing about those old analog polygraphs was the sound of the pen on paper. Each waveform had its own unique intonation. For instance, the sound of a cardiac arrhythmia could alert a technologist whose attention might be on something else at the time.

However, there were many problems that came with these machines. To begin with, they used paper … lots of paper. For example, two sleep studies could use enough paper to require over a cubic foot of storage space. Plus, these studies had to be saved for seven years. Besides that, the polygraphs themselves were huge. They measured 5 to 6 feet in height and weighed a couple hundred pounds. Then there were the paper cuts and ink stains.

We’ve come a long ways in our journey through sleep medicine. But we have a ways to go. In the next article, well take a look at where we are now. ☯

References
1. www.howsleepworks.com/research.htm

Kent Caylor, RPSGT, has been performing sleep studies since May 2006. He works for Precision Diagnostic Services, located in Fargo, North Dakota. He has a blog called Kents Sleep Blog and is also an active contributor to the American Sleep Apnea Association.
The Sleep Navigator

By Kristina Weaver

With the rise of home sleep tests and stricter authorizations, sleep centers need to adapt to survive. The medical field is changing; there is a new focus on patient-centered and outcome-oriented results. Today’s healthcare is no longer a fee-for-service operation. In the past, when a patient was sick, admitted to the hospital or completed a test, it would generate revenue for the healthcare system. This resulted in our healthcare system thriving when individuals were sick. This is now no longer the case. Reimbursement is now based on hospital and physician scores that measure improvement in the patients’ quality of life, and target reduced exacerbations, reduced emergency department visits and/or hospitalizations, and reduced expenditures for medical care, and allow patients to lead more active and productive lifestyles. Makes sense, right? We now need to thrive based on how healthy we can keep our community.

Sleep centers and technologists need to start thinking of themselves as an integrated part of our patient’s overall healthcare. How can sleep centers help hospitals and physician practices keep their patients out of the hospital and live a better quality of life?

Let’s use an example of a study performed on a group of lab rats. In this study, it was shown that the average lifespan of a lab rat is about three years. The average lifespan of a sleep-deprived lab rat dropped to six months. These sleep-deprived lab rats also almost doubled their weight. This put them more at risk for diabetes, heart disease and more. Just simply by not sleeping well, their health declined just as bad as it would in someone who smokes. When we see a physician or a patient is admitted into the hospital they are asked about medication compliance, smoking cessation, exercise habits, eating habits, etc., shouldn’t we be asking about sleep, too? Shouldn’t sleep be a vital sign? Sleep should be the question at the top of this list.

Thinking back to my paramedic days, I remember countless patients who woke up with chest pain, shortness of breath or were constantly in and out of the hospital for heart failure. I think back, and I would bet you most of these patients had sleep apnea. For example, think about heart failure. Your heart pumps blood to your lungs expecting to receive oxygen. It then sends the oxygen back to your heart so it can pump oxygen to your body. When you have sleep apnea, this doesn’t happen. There is a lack of oxygen in your lungs caused by the sleep apnea. It would be just like you running a marathon and not training for it. You are three miles in and trying to catch your breath, but you can’t. Your lungs get tired. You become short of breath. Your heart starts pumping faster. You simply can’t get enough air. If you keep going, you’re probably going to pass out. If your heart can’t get the oxygen it needs, it then starts trying to pump even harder and becomes fatigued and enlarged. Now, due to the fatigue and stress on your heart, it’s not pumping blood to your body efficiently. It makes sense why sleep apnea can cause heart failure.

Sleep screening should be considered a vital sign, especially in a hospital setting. In 2014, I saw the need for better sleep education and screenings within our local hospital. This is when we implemented our sleep navigator program. Our sleep team works in collaboration with our hospitalists, nurses and our integrated care team to provide a more proactive approach to the patients with comorbidities who may be at risk for sleep disorders.

“Sleep navigator” is our term for the medical professional trained to perform brief screening interviews with patients to assess for sleep concerns during the patient’s hospital stay. This sleep navigator is ideally a registered sleep technologist with their CCSH credential.

Screening for sleep disorders, especially sleep apnea, in a hospital setting leads to improved patient outcomes and helps to prevent hospital readmissions.

Readmission outcomes compared to PAP compliance

Non-compliant untreated sleep apnea patients

- No readmitts 45%
- Readmitts 55%

Compliant sleep apnea treated patients

- No readmitts 83%
- Readmitts 17%
The sleep navigator spends most of their time reviewing the patient’s other health conditions and educating the patient’s healthcare team and the patient about the correlation between poor sleep and their health.

During the admission process for every patient, a nurse asks the patient about their past medical history, current concerns, medications and more. There are certain comorbid conditions that have evidence-based studies that show patients with these conditions are at a higher risk for sleep apnea. If the patient has a comorbid risk that we have flagged in the electronic medical record (EMR) as at risk, the patient is automatically ordered a sleep navigator consult. This happens within the system and is fully automated. Patients who are at highest need for a sleep apnea screening, performed by the sleep navigator during their visit, include those who are already on record for having any of the following comorbidities:

- Congestive heart failure
- Chronic obstructive pulmonary disease
- Stroke
- Heart disease
- Atrial fibrillation
- Resistant hypertension
- Obesity
- Nocturnal hypoxemia

If a sleep navigator finds a patient is at higher risk for a sleep disorder due to their comorbidities, the patient is given some specific educational tools to address these concerns (e.g., information about sleep apnea or sleep hygiene), and a consult with a sleep physician is arranged. Everything is integrated into the EMR system, which means that every healthcare professional who has access to these patients’ records will see this information and be able to respond to it more appropriately moving forward.

For example, a patient shown to be at high risk for sleep apnea will be handled differently if they are preparing for a surgical procedure, as preexisting respiratory conditions warrant different preparations for those scheduled for operations that require sedation or that may be prescribed pain medications.

**What Impact Has the Sleep Navigator Made on Our Local 210-Bed Hospital?**

In the first year of the program, a total of 176 sleep studies were completed with 86 percent positive for sleep apnea. Patients with cardiovascular-specific problems (e.g., arrhythmias, cerebrovascular accidents, heart failure) showed the most signs of severe (and often untreated or undertreated) sleep apnea. Forty-four percent of those who were found to have sleep disordered breathing were considered emergent (i.e., severe), meaning they had an apnea hypopnea index (AHI) greater than 50 and/or significant arrhythmias or SaO2 desaturations to less than 75 percent. Fifty-five percent of patients who had sleep apnea and were non-compliant to therapy were readmitted. That’s over half. Meanwhile, only 17 percent of the compliant patients were readmitted.

Many studies have shown sleep apnea has a direct impact on the cost of care, readmissions, length of stay and risk for mortality. Studies have repeatedly shown that sleep apnea puts a patient at an increased risk for all kinds of chronic health problems, from diabetes and stroke to congestive heart failure and atrial fibrillation, to mental illness and even cancer.

We need to get our healthcare teams treating sleep as a vital sign; having this additional knowledge about their patients can influence and personalize the way they diagnose and treat these patients.

Ask yourself, as a sleep technologist, what can you do to think outside of the box to adapt to our newer model healthcare system? What can you do to make a difference and save another life?

**KRISTINA WEAVER** is neurodiagnostic manager for Parrish Healthcare’s Sleep Disorders Center. Kristina has been involved in sleep medicine for 13 years. Prior to that, she was a paramedic. Kristina is the coordinator of Brevard AWAKE. She also serves as the past president of the Florida Association of Sleep Technologists.
Manic behavior is associated with psychomotor activity coupled with insufficient sleep relative to the amount typically required for functional alertness. In severe cases, episodes of sleeplessness may occur with no subjective complaint of tiredness. Choreomaniac episodes, also known as “dance frenzies” or irresistible dance attacks, are considered by many medical historians as presentations of mania. Records dating from approximately 1020 to the 1600s provide written accounts as well as images of choreomaniac outbreaks across regions of Belgium, France and Germany. The earliest outbreaks reportedly affected only a few individuals. Scholars generally identify 1374 as the year of the first choreomaniac epidemic in Western Europe. One of the most extensively documented of these epidemics plagued Strasbourg, France, during the summer of 1518.

Managing the Mania
Strasbourg’s leaders, who composed the city’s magistracy, viewed choreomania as a symptom as well as a cure. The frenzied dances of “unruly mobs” were indulged through the assistance of contracted musicians who discretely redirected the afflicted to less populated areas of the city. Such remedies employed during previous outbreaks may have inspired the legend of the Pied Piper, a character from Hamelin, Germany, during the 1300s who allegedly lured dancing children away from their homes with the hypnotic sounds of his enchanted flute. Unfortunately, musical accompaniments (which also were attempted during later outbreaks; see Figure 1) were as problematic in treating this behavior as is fighting a house fire by tossing gunpowder on the advancing flames. Bands of music traversed the country to cure the malady and, no doubt, often caused, or at least encouraged, it. The dancing generally continued from 10-14 hours daily, and from three to six successive days, and this amount of exertion we are told gave rise to no apparent fatigue. While the morbid impulse lasted, the physical endurance was truly extraordinary.

By early August, distraught citizens were hustling their manic relatives to various locations established for nonstop dancing with only “a few hours of occasional sleep … day after night, night after day, the dancers continued with their delirious motions.” The infectious nature of the mysterious malady was evident from an observation that puzzled onlookers were at risk by “merely seeing another person dance.” City magistrates, desperate to eradicate the disruptive contagion, dismissed the musicians and canceled public performances with tambourines and drums. The rhythms of percussive instruments were viewed as vectors of the mania because they “were infecting others to dance uncontrollably” according to a contemporary scholar. Furthermore, authorities established a citywide curfew by fining the families of individuals caught dancing in the streets. In a final (and successful) plan to establish civic order, “wagonloads of dancers and their hired attendants” were dispatched to a remote village shrine outside of Strasbourg for rest and eventual recovery.

Possible Causes of the Mania
The Dancing Plagues were public health threats for nearly 300 years due to the daily fatalities as well as the lost economic productivity of affected communities. A 19th century physician opened his investigation on the possible causes of dance mania with the following observations: “Everything is extraordinary about this illness; its name is ridiculous, its symptoms unique, its character equivocal, its cause unknown, its treatment problematic.” In this quincentennial anniversary of the Strasbourg epidemic, the phenomenon is still a subject of scholarly debate.

Given the presentation of choreomania preserved in historical records (specifically, psychomotor activity with few reports of daytime somnolence despite limited sleep time as well as obvious impairments in the personal lives of the afflicted), contemporary researchers have claimed the Dancing Plagues were examples of group psychopathology triggered by situational stressors; others identified toxic substance use as the causal agent. Possibly, the epidemics began as annual, ritualized dance ceremonies that eventually deteriorated into gatherings of “unruly mobs” because the participants were exhibiting behaviors associated with insufficient sleep.
References


REG HACKSHAW has over 20 years experience delivering diagnostic and therapeutic services to the sleep-deprived community. Currently, he works as a mentor for students enrolled in the PSG Certificate and Associate programs at Thomas Edison State University in Trenton, New Jersey.
Q&A with Brendan Duffy, RPSGT

BRENDAN DUFFY, RPSGT, is an AAST board member and a certified sleep educator. He is a former travel baseball/hockey coach and has been employed in sleep medicine clinical settings for over 20 years. He speaks nationally on sleep and athletic performance to other medical professionals and to high school sports teams. He is currently the athletic liaison for the national nonprofit group Start School Later and the clinical manager at St. Charles Sleep Disorders Center.

What did you want to be when you grew up?
A police officer, as I enjoy helping people in tough situations. Growing up in the Bronx, I had great respect for the job they performed on a daily basis in neighborhood policing. Unfortunately, I had a collapsed lung at age 19, and that hampered that path for a career at that time.

Why did you decide to become a sleep technologist?
I actually stumbled into this. I noticed a position listed for a sleep tech at Stony Brook University after returning to Long Island after working in the medical field as a pediatric nurse's aide at Moffitt Cancer Center in Tampa while studying for my RN degree. I still regret not finishing the RN program once I got into the sleep technology field. I had been more than halfway through the program.

Where was your first job in sleep technology?
Stony Brook University on Long Island, which was the site of the first RPSGT registry exam!

Why did you become an AAST member?
I believe it is important to learn and grow in whatever you choose to do. AAST is the recognized leader in assisting sleep technologists and others interested in the fascinating sleep field we work in. I enjoy the cutting-edge articles and the network of friends I have gained through my membership.

Who has had the greatest influence on your career?
Dr. Marta Maczaj. She hired me at Stony Brook, and her Friday case conferences (with pages and pages of paper charts spread across the conference table) helped me understand the science and art of the sleep medicine profession. When I took the job as Sleep Center Coordinator at St. Charles in 2006, I was able to “steal her” over here, and we still work together now going on 22 years! A second person would be Dr. Charles Czeisler, as he has my dream job: working with professional sports teams with regard to sleep education and information. I was humbled that I got to do presentations at the same sleep conference in Alaska this past September with both of these mentors on the program. That was really a fantastic experience.

What is the most challenging part of your profession?
Creating awareness about the importance of sleep. Too many people still feel that sleep is optional and don’t connect the dots as to how every cell in their body is impacted by their sleep health.

What do you like most about your profession?
The fact that we are learning so much each day about how important sleep is. Years ago, I chatted online on binariesleep.com about how I believed that my mom’s Alzheimer’s was possibly connected to sleep apnea. Now, articles are coming out daily about this possibility. It is truly a new frontier, and we need to continue to explore with a thirst and fascination for discovery of more information as to how sleep impacts our life and health.

What do you do for fun on days off from work?
Play guitar (I don’t play well, but I’m hoping it keeps my neural pathways pruned) and read great sleep books. Right now I am reading “Why We Sleep” by Matthew Walker, a great book. I also watch a lot of hockey in person and on TV and hang out with my two adopted Yorkies!

What is the biggest change you have seen in the profession since you started?
The advancement in my specific niche area of interest, which is the growth of sleep information as it pertains to sports performance. Now many, if not most teams, have sleep coaches, and I have been able to speak to several audiences, including high school athletes, about how sleep, or lack of, can determine their performance and injury rates.

Any words of advice for people who are new to the profession?
Dive in. Don’t just join AAST, but be active and volunteer on the committees! Be creative, and you will find you can be involved in a fascinating field with several areas to explore such as shiftwork, sleep and sports, school start time modification, or even sleep and crime forensics. My passion has allowed me to do presentations on sleep and sports and meet athletes such as Mike Scioscia and Olympian David Plummer.

What are your professional goals for the next five years?
Be a true advocate and friend of sleep technologists everywhere in my role as an AAST board member and continue to grow my niche passion of working with teams and athletes on sleep education and management. Continue to do presentations to these groups, as well as the sleep community at large, to show how we can serve this specialized population.
BRPT Unveils New and Improved Website

After months of designing, strategizing, vetting, copywriting, editing and testing, we are delighted to launch the new BRPT website. Not only is the new website modern and attractive, it’s also vastly more functional and promises an improved user experience.

The new site offers an easy-to-use intuitive interface and is centered around three key components:

- **Apply** (applying for the three BRPT examinations and the tools to facilitate and prepare for that process)
- **Recertify** (the necessary elements to keeping your credential up to date and on track for timely recertification)
- **Learn** (the educational resources available to clinical sleep health professionals)

The new website also includes some photos of you, real technologists in the field, showcasing the work you do each day. Huge thanks to all who submitted photos to help make this website a genuine depiction of who we are as an organization.

Click the image above to check out the new site!

The BRPT Blog

The new BRPT Blog, housed on the website, will help keep readers informed of BRPT and industry news, upcoming events and general musings on the clinical sleep health profession. We also welcome guest bloggers.

If you’re interested in sharing your ideas on a topic relevant to our profession, please send an email to lpelliccia@brpt.org with your name, credentials and suggested topic.

We look forward to your feedback and continuing to serve the field of clinical sleep professionals.

Click the image above to explore the blog!
From the Chairs

Check out the latest from the AAST committee chairs.

With 2018 in full swing, AAST committee chairs are hard at work executing on programs and initiatives that will set the stage for a banner year ahead. This issue, we asked our six committee chairs for details on the current programs in which they are engaged and what our members can expect.

First and foremost, Happy New Year to all from the Legislative Committee. The New Year has started out swiftly with the Legislative Committee tending to several topics at hand. We have been tasked by the AAST Board of Directors to create outlines that could be used in several selected scenarios as helpful tools. These outlines, which will be available to AAST members online as added value tools to your AAST membership, cover the following topics:

- How to schedule a meeting with a legislator
- School start time data and benefits
- Who is the AAST?
- How to hold a high-level, productive meeting with government members

Once refined, these outlines will be found on the AAST website for membership utilization.

Additionally, we have reviewed mocked-up versions of the previously reported interactive map that will allow members of the AAST a one-stop-shop tool that would give members relative information on all the states in terms of requirements needed to work in the state or additional relative information on legislative happenings within each state. The team is close to having this tool in the very near future, so keep your eyes open for this new content on the AAST website.

Next, the committee has taken on the process of integrating the annual conference and call for presentation abstracts with the speaker’s bureau to allow for a more seamless process of obtaining relative data on speakers, as well as speakers subject matter of expertise for annual national, state and regional meetings. AAST members will have access to a useful database on the AAST website to obtain pre-screened speakers with a vast array of subject matter topics.

Steven Lenik, RPSGT, CCSH
CEC Accreditation Committee

The Educational Products Committee continues to work on the titration case study as well as the bank of questions for the Question of the Week. We are also looking how we can better align the AAST education product offerings and online educational products.

Brandon Butters, RPSGT
Educational Products Committee

Currently, the Program Committee is working on putting together the AAST Annual Meeting. This year, as many of you know, we will be doing so in a new venue, and at a new time. This is a big initiative for us, but we are looking forward to the challenge and to a great meeting.

We hope to see you all there!

Laree Fordyce, RPSGT, CCRP, CCSH
Program Committee

We have embarked on creating two technical guidelines. One is for end-tidal CO2 monitoring, and the other is for transcutaneous monitoring.

Roxanne Taylor, RPSGT, BA, RST
Standards & Guidelines Committee

We are in the process of developing a theme for Sleep Technologists Appreciation Week (STAW), which will take place later this year. This is a significant event for our profession as it allows the sleep field community an opportunity to applaud the numerous accomplishments made in the sleep disorders centers, laboratories, educational facilities and in AAST.

Sherri Hanson, RPSGT, RST
Membership & Communications Committee
It is important that both clinical and administrative personnel in a sleep program understand what a local coverage determination (LCD) is, both for billing sleep studies and for providing home therapy, and how to access the National Coverage Database (NCD) to find the LCD. All providers who report services for Medicare payment must fully understand and follow all existing laws, regulations and rules for Medicare payment for outpatient sleep services, and must properly submit only valid claims for them.

What is a Local Coverage Determination?
Each Medicare contractor has the discretion to establish local policies for covered (necessary) and non-covered (not reasonable) services; these will vary from region to region. The policies assist in determining the procedural and billing criteria for approved services. The LCD is always based on medical necessity. The provider of services (the sleep center in our case) uses the LCD to determine the documentation requirements for medical necessity and billing standards to meet.

Sections of a LCD
For my discussion, I will be referencing Novitas Solutions Inc. LCD: Outpatient Sleep Studies (L35050)
The top portion of the LCD will contain the:
- LCD title and identification number
- Contractor name and number
- Type of contractor
- Jurisdiction
- States within the jurisdiction
- Effective revision dates
Next are the CMS National Coverage references and coverage guidance; relevant policies regarding outpatient sleep services are cataloged for reference in this section.
Coverage guidance is where you find the specific requirements on what parameters must be recorded and length of testing required. Examples of some of the requirements include:
- Polysomnogram recordings must be six or more hours with physician review, interpretation and report while a multiple sleep latency test can only be run following a polysomnography performed on the preceding night.
- Proper medical supervision shall be provided by a physician (MD/DO) who is a sleep specialist, and the testing should be attended by an appropriately trained technologist. (The documentation section of the LCD will drill down to what appropriately trained means along with any other specific standards for billing).

General Information
Novitas does include wording that the non-hospital-based sleep clinic or IDTF must be certified by the American Academy of Sleep Medicine (AASM), The Joint Commission (formerly known as JCAHO) or the Accreditation Commission for Health Care Inc. (ACHC). This is the requirement that many CMS contractors are expanding on; reference to this can be found out the Q4 2017 issue of A2Zzz.
Sleep studies performed in the home shall only be covered under special circumstances listed below under “Out of Center Sleep Testing (OCST).” All home sleep studies, to be covered, must be under the supervision of the hospital based sleep lab, a sleep clinic that is a direct extension of the physician’s office, an IDTF, or entity accredited by AASM as an OCST entity.
The LCD continues with the medical conditions for which testing is covered. Diagnostic testing is covered only if the patient has the symptoms or complaints of one of narcolepsy, sleep apnea or parasomnia.

Coding Information
Bill type is a hospital outpatient claim. The LCD lists approved CPT/HCPCS (e.g., 95810 for baseline PSG) procedure codes as well as the approved ICD-10 Codes (e.g., G47.00 Obstructive Sleep Apnea).
If an improper CPT/ICD-10 pairing is submitted on a claim, the service will be denied.

General Information
This is where the documentation requirements are listed. Novitas
lists the required certification for sleep centers, physicians, and technical personal and medical record documentation requirements necessary to justify coverage for services. At the bottom on the LCD, you will find the revision history. This is a catalog of revisions to the document along with an explanation of updates.

Remember to look at your region’s LCD for positive airway pressure (PAP) devices for the treatment of OSA as well. Here you will find other documentation requirements, such as the definition of an approved sleep test, qualified respiratory events and the medical record requirements for coverage.

**Documentation Requirements**

1. Face-to-face clinical evaluation by the treating physician has been performed prior to the patient undergoing a sleep test.

2. Clinical notes obtained clearly document the need for a sleep test and may 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

3. Specific reason(s) for referral for sleep test must be documented in patient medical record.

4. To qualify for PAP: Patient had a qualifying sleep test, either an in-lab PSG or a HST, and meets the following criteria:
   - Diagnosis of OSA (327.23)
   - Apnea-hypopnea index (AHI) or Respiratory Disturbance Index (RDI) is ≥ 15 events/hour with a minimum of 30 events
   - The AHI or RDI is ≥ 5 and ≤ 14 events/hour with a minimum of 10 events and documentation of:
     - excessive daytime sleepiness,
     - impaired cognition,
     - mood disorders, or insomnia; or,
     - hypertension, ischemic heart disease or history of stroke.

It is important that you establish an LCD monitoring process at your facility. The Medicare Coverage Database contains the LCDs in an easy to search platform.

Go to [www.cms.gov/medicare-coverage-database/](http://www.cms.gov/medicare-coverage-database/). You can do a quick search by entering your LCD document ID or by searching by LCD documents in your state and use key word sleep study or 95810 and search by type.

As another benefit to our members the Regulatory and Legislative Advisory Committee has developed an interactive map that provides a useful “one-stop-shop” resource for state legal and licensure information. The map will provide requirements needed to work in each state and state sleep society contact information.

**LAURA LINLEY, CRT, RPSGT, FAAST, is the immediate past president of AAST and the VP of operations at Advanced Sleep Management.**