

**THE VIRGINIA BOARD OF HEALTH PROFESSIONS  
THE VIRGINIA DEPARTMENT OF HEALTH PROFESSIONS**

**Study into the Need to Regulate  
POLYSOMNOGRAPHERS  
In the Commonwealth of Virginia**

**July 2010**

**Virginia Board of Health Professions  
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## **EXECUTIVE SUMMARY**

### ***Authority and Impetus***

At its February 2, 2008 meeting, the Advisory Board on Respiratory Care of the Board of Medicine recommended that the Board of Medicine request the Board of Health Professions to review polysomnography to determine if the activities of sleep technicians fall under the purview of respiratory care and to conduct a study into the need for regulation of sleep technicians. Pursuant to that request, the Regulatory Research Committee of the Board of Health Professions undertook the review and produced the following report.

This Virginia Board of Health Professions review was conducted pursuant to §54.1-2510 of the *Code of Virginia* which authorizes the Board to advise the Governor, the General Assembly, and the Department Director on matters related to the regulation and level of regulation of health care occupations and professions.

### ***Major Findings of the Study***

#### **1. The field of sleep medicine is a rapidly emerging discipline within medicine.**

In the past two decades, sleep medicine has grown from an obscure, multidisciplinary field pursued by neurologists, otolaryngologists, chest physicians, cardiothoracic physicians, psychiatrists and other specialists to a recognized subspecialty. The American Medical Association recognized sleep medicine as a self-designated practice specialty in 1995 and in 2006 the American Board of Medical Specialties began certifying Sleep Medicine subspecialists in Family Medicine, Internal Medicine, Pediatrics, Otolaryngology and Psychiatry and Neurology. As a business endeavor, sleep medicine has expanded into a multi-billion dollar industry within a short period.

The field of polysomnography (sleep medicine technology) has grown alongside sleep medicine. The Registered Polysomnographic Technologist (RPSGT) certification provides a nationally recognized credential for persons performing polysomnography. This credential is considered the gold-standard of credentials for sleep technicians by the American Academy of Sleep Medicine. The Board of Registered Polysomnographic Technologists (BRPT) registered eight polysomnographers in 1979. Today, there are over 13,000 registered polysomnographers.

#### **2. Several professions perform polysomnography.**

In keeping with the history of sleep medicine, personnel with diverse backgrounds developed expertise in sleep medicine technology (polysomnography) including electroneurodiagnosticians, pulmonary function technologists, respiratory therapists, registered nurses and polysomnographic technologists. Members of these professions continue to practice polysomnography, and are eligible to earn RPSGT credentials with

six months of experience in sleep medicine. Respiratory care and electroneurodiagnostic educational programs may include separately accredited polysomnography add-on tracks. Graduates of these tracks are immediately eligible for RPSGT certification. The National Board for Respiratory Care recently developed a Sleep-Disorders-Specialty exam for credentialed respiratory therapists.

Due to the variety of practitioners performing polysomnograms, it is difficult to estimate the number of persons performing polysomnography. Allowing for a great degree of uncertainty, staff roughly estimates that there may be up to 1,000 persons performing polysomnograms in the state. As of July 6, 2009, the BRPT website listed 293 RPSGT's with Virginia addresses. Many of these may also be licensed nurses or respiratory care practitioners.

### **3. Polysomnography is performed in diverse settings.**

As sleep medicine has developed, its practice has expanded from research facilities, into hospitals and recently into independent diagnostic testing facilities. These facilities may be accredited by the American Academy of Sleep Medicine or the Joint Commission. Many advertised sleep clinics are not accredited. While performing a brief internet search, staff identified 132 advertised sleep centers with independent addresses. Only 58 of these were accredited or associated with accredited facilities. More recently, devices that provide limited polysomnographic testing have been developed for home use.

Polysomnograms are usually performed at night. The delegating physician is usually only available by telephone contact.

### **4. Polysomnography shares only a few modalities with respiratory therapy, however respiratory-related conditions account for the greater majority of diagnoses and treatment.**

Polysomnograms measure a minimum of eleven parameters, but often include many more. Only a few of these may be related to respiration, including oximetry, airflow or capnography. Other measurements include eye movement, muscle movement and brainwave measurements. Over 80 sleep disorders have been identified. Only a few of these are related to respiration, including sleep-related apneas. Other disorders include narcolepsy, restless leg syndrome, REM sleep behavior disorder and insomnia.

One study, supported by anecdotal evidence, suggests that up to 95 percent of conditions diagnosed at sleep centers are respiratory sleep disorders, predominately sleep apnea. Polysomnographers treat these disorders using respiratory care-related modalities, specifically positive airway pressure and/or low flow supplemental oxygen. Polysomnographers often implement these interventions following a preliminary diagnoses made by the polysomnographer in prescribed split-night studies.

## **6. Eighteen states and the District of Colombia have taken some form of regulatory action regarding the unlicensed practice of polysomnography.**

Eleven states have created specific exemptions to respiratory care practice acts for the practice of polysomnography by qualified individuals. Seven states and the District of Colombia passed statutes requiring licensure of polysomnographic technologists that are otherwise unlicensed. Only three states have active programs, while four states and the District of Colombia are developing regulations.

Regulatory boards of several states have threatened to enforce respiratory care practice acts on unlicensed polysomnographers. These threats have generally resulted in a statutory solution. Staff did not find evidence of any sanctions resulting from enforcement of respiratory care practice acts on polysomnographers.

## **7. The unlicensed practice of polysomnography poses a risk of harm to patients.**

Several factors contribute to the risk of harm:

- The Commonwealth of Virginia has previously determined that the unlicensed practice of respiratory care poses a risk of harm to consumers.
- Patients are often alone with polysomnographers. These patients are often asleep, and are vulnerable to incompetence, negligence or malfeasance on the part of polysomnographers.
- Physicians rely on proper diagnostic tests performed by polysomnographers to diagnose sleep disorders. Improper testing may lead to improper diagnoses, diminishing the health and well-being of patients and possibly leading to further injury or death due to fatigue-related accidents which may also pose a risk to others.
- In the form of prescribed split-night studies, physicians delegate the task of preliminary diagnoses and preliminary treatment of sleep apnea in high probability cases to polysomnographers.

### ***Recommendations of the Board of Health Professions***

#### **1. The Board of Medicine should establish a license for polysomnographers based on proper training and education.**

The unlicensed practice of polysomnography creates a high potential for risk to patients and the public. Polysomnographers require specialized skills and knowledge that distinguish it from ordinary work. Under general supervision from a physician, polysomnographers practice autonomously and require independent judgment to perform their work. Polysomnographers often practice in independent testing facilities, and oversee home studies. Therefore, under the guidelines adopted by the Board of Health Professions, licensure is the least restrictive method of regulation that adequately protects the public from harm.

**2. Licensed respiratory care practitioners do not need an additional license to practice polysomnography.**

The education and experience required of licensed respiratory care practitioners provides the skills and abilities needed to perform polysomnography. As with any particular subspecialties, it is the responsibility of the respiratory care practitioner to obtain any additional knowledge and training necessary to practice polysomnography.

**3. The Advisory Board on Respiratory Care should advise the Board of Medicine on matters pertaining to polysomnography, and one licensed polysomnographer should be added to the Advisory Board on Respiratory Care, raising its total membership to six.**

The Board of Health Professions considered whether a separate advisory board should be established to advise the Board of Medicine on matters pertaining to polysomnography. The Board of Health Professions determined that polysomnography should be included with the Advisory Board on Respiratory Care for the following reasons:

- The greater majority of sleep medicine patients are diagnosed with respiratory-related diseases. This means that polysomnographers spend most of their time on work that may be characterized as respiratory care.
- Although respiratory care and polysomnography are distinct professions, respiratory care practitioners working as polysomnographers perform the same work as polysomnographers. Separate advisory boards providing advice on the same work may create confusion and conflict.
- Allowing for a great degree of uncertainty, staff estimates that only around 200 polysomnographers would apply for licensure, making it the second smallest profession regulated in Virginia. Only the midwifery advisory board regulates fewer licensees under the Board of Medicine. By comparison, existing Board of Medicine advisory boards regulate 2,718 licensees on average.
- Relative to other states and considering the number of licenses, the Board of Medicine has limited staff. Although an additional advisory board in itself would not require new staff, it would accelerate the need for additional staff and salaries.

**NOTE:** During the 2010 Session of the General Assembly, HB725 was introduced and passed. The final measure was published as Chapter 838 *2010 Acts of Assembly* and becomes effective 7/1/2010. A copy is provided in this report's Appendices.



## AUTHORITY & IMPETUS

This review of the Virginia Board of Health Professions is being conducted pursuant to §54.1-2510 of the *Code of Virginia* which authorizes the Board to advise the Governor, the General Assembly, and the Department Director on matters related to the regulation and level of regulation of health care occupations and professions.

At its February 2, 2008 meeting, the Advisory Board on Respiratory Care of the Board of Medicine recommended the Board of Medicine request that the Board of Health Professions study polysomnography to determine if the activities of sleep technicians fall under the purview of respiratory care and into the need for regulation of sleep technicians. Pursuant to that recommendation, Dr. William Harp, Executive Director of the Board of Medicine, sent a letter to Dr. Elizabeth Carter, Executive Director of the Board of Health Professions, requesting a study of polysomnographers. At its April 15, 2008 meeting, the Regulatory Research Committee of the Board of Health Professions discussed the request, and remanded the matter back to the Advisory Board on Respiratory Care for more information related to scope of practice issues.

Pursuant to that meeting, Dr. Carter attended the October 17, 2008 meeting of the Advisory Board on Respiratory Care and, following discussion, agreed to present the Advisory Board's concerns, along with pertinent research, to the Regulatory Research Committee at their February 3, 2009 meeting. Additionally, a public hearing was scheduled for emerging professions, including polysomnography, on February 3, 2009. Following the receipt of public comment, on February 3, 2009 the Regulatory Research Committee requested that staff continue the study. Particularly, they requested that staff collect information on reimbursement policies, the rapid growth of the industry and on supervisory arrangements. At the May 12, 2009 meeting of the Regulatory Research Committee, Justin Crow presented a summary of the research to date. That summary makes up the bulk of this document. The Regulatory Research Committee requested that Mr. Crow present the research to the Advisory Board on Respiratory Care for the Advisory Board's consideration and to seek a recommendation. Mr. Crow presented his research at the June 2, 2009 meeting of the Advisory Board on Respiratory Care and they took the following action:

*Robin Wilson moved that the Advisory Board recommend to the Board of Medicine that it seek to establish a license for the practice of polysomnograph based upon appropriate education and training. Further, her motion included that licensed respiratory care practitioners that practice polysomnography not be required to obtain a license to practice polysomnography. The motion was seconded and carried.*

The Board of Medicine adopted this recommendation at their June 25, 2009 meeting. During their meeting on August 11, 2009, the Regulatory Research Committee of the Board of Health Professions directed staff to develop a plan for licensure including fiscal analysis and options for advisory board structure with the Board of Medicine. Staff developed two options for the Regulatory Research Committee. These options appear in

the section entitled *The Feasibility of an Independent Advisory Board*. At their next meeting, on November 10, 2009, the Regulatory Review Committee recommended that staff develop a plan to include polysomnographers with the Advisory Board for Respiratory Care. The full Board of Health Professions approved the Committee's recommendations and report on May 4, 2010.

During the 2010 session of the General Assembly, representatives of the polysomnography community pursued their own legislation. HB 725, Chief Patron Christopher K. Peace of House District 97, required licensure of polysomnographers and created an independent advisory board for polysomnographers within the Board of Medicine. With one amendment, HB 725 passed the House and Senate. Governor Bob McDonnell offered an additional, minor recommendation and the bill was enacted as Chapter 838 *2010 Acts of Assembly*, effective 7/1/2010. The final text of the statute appears in Appendix D.

## OVERVIEW OF THE PROFESSION

### *A Brief History of Sleep Medicine*<sup>1</sup>

Recognition of sleep disorders and the relation of sleep to overall health began in ancient times. Ancient Egyptians administered opium to treat insomnia. Hippocrates included a theory of sleep in his *Corpus Hippocraticum*. By the 19<sup>th</sup> century, scientists were studying the physiology of sleep through observation and experiments on animals.<sup>2</sup>

The modern practice of sleep medicine, however, grew up alongside advances in medical science and technology. In 1929, German scientist Hans Berger developed the practice of the studying the brain using electroencephalography, more commonly known as EEG. By 1937, a New York based team of researchers headed by attorney, banker and amateur scientist Alfred Lee Loomis used EEG technology to document patterns of brainwaves during sleep. The stages of sleep, including the deep REM (Random Eye Movement) stage, were documented by University of Chicago scientists William C. Dement and Nathaniel Kleitman in the 1950s. The electrophysiological pattern they described forms the basis of sleep medicine today.

More recent advances have led to greater understanding of neurological functions and sleep. The development of the Positron Emission Topographic (PET) scan and Magnetic Resonance Imaging (MRI) as well as physiological and genetic advances have led to description and therapy for over 80 sleep disorders. A few of the most prevalent disorders are:

*Narcolepsy*: Excessive daytime sleepiness and irresistible sleep accompanied by loss of muscle tone in response to emotional stimuli. Severe cases include paralysis and

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<sup>1</sup> Except where noted, this section summarizes information found in Shepard, et al. 2005. "History of the Development of Sleep Medicine in the United States." *Journal of Clinical Sleep Medicine*. 1(1): 61-82

<sup>2</sup> Talk About Sleep. [www.talkaboutsleee.com](http://www.talkaboutsleee.com) . "A Brief History of Sleep Medicine." Accessed 10/07/2008. <http://www.talkaboutsleee.com/sleep-disorders/archives/history.htm>

hallucinations at the onset and end of sleep. Using EEG, Gerald Vogel of the University of Chicago discovered that narcoleptics skipped the Non-REM (NREM) stages of sleep, and dropped almost immediately into REM sleep, leading to the first therapies for the pathology.

*Restless Leg Syndrome:* Severe discomfort in legs while sitting or lying in bed, accompanied by an overwhelming desire to move and, usually, periodic jerking during sleep. Some studies suggest RLS could affect up to ten percent of the population.

*REM Sleep Behavior Disorder:* Patients retain skeleton-muscular control during sleep, resulting in patients acting out and vocalizing dreams. This disorder may be an early indicator of the onset of neurodegenerative diseases.

*Obstructive Sleep Apnea (OSA):* Until 1966, researchers believed a type of respiratory failure caused the excessive sleepiness associated with sleep apnea. However, by using polysomnographic sleep monitoring, researchers discovered that fragmented sleep, a result of closures in the upper respiratory tract, was the main concern.

To treat sleep apnea, doctors used tracheostomy. However, by 1981, Continuous Positive Airway Pressure (CPAP), administered through the nose became the predominant treatment. CPAP prevents the upper respiratory tract from closing and, when used properly, alleviates all symptoms.

Subsequent research sponsored by the National Institute of Health has linked sleep apnea to increased risk for hypertension, coronary heart disease, heart failure and stroke. Two percent of women and four percent of men are thought to suffer from sleep apnea.

*Insomnia:* Insomnia is the inability to sleep or to sleep well despite opportunity for sleep. Patients report insomnia; it is not determined by laboratory or other results. Studies show that between 30 and 45 percent of the population have experienced insomnia symptoms during the past year, and that 10 to 15 percent of the population suffer from insomnia disorders. Researchers have linked insomnia to headaches, gastrointestinal problems, lost work, impairment and accidents. A 1995 study estimated that costs associated with insomnia approached \$14 billion.

While not enough is known about the causes and physiology of insomnia, researchers have developed a litany of effective treatments, including behavioral, environmental and pharmacological treatments.

In addition to documenting sleep disorders, researchers began to gather more information on the importance of sleep for good health. Early experiments, in which rats were deprived of sleep, resulted in a 100 percent death rate within weeks. The use of sleep deprivation on human prisoners demonstrated that lack of sleep has a negative effect on organ system functioning. Researchers using surveys and statistical analysis discovered statistically significant increases in mortality rates among cancer patients reporting less than four or more than ten hours of sleep per week.

More recently, modern sleep medicine has referenced concurrent research into chronobiology, or biological clocks. Biological rhythms, known as circadian rhythms, regulate physiological patterns in plants and animals, including sleep patterns. In 1971 researchers discovered a molecular and genetic basis for circadian rhythms. Referencing this foundation, researchers demonstrated the physiological effects of light on circadian rhythms. Electric light, many believe, underlies many sleep problems. Not only can it have physiological effects, it also allows for around-the-clock work and activity.

The growth of the field of sleep medicine, including the development of associated professional organizations, led the American Medical Association to recognize Sleep Medicine as a self-designated practice specialty in 1995. In 2006, the American Board of Medical Specialties recognized and certified Sleep Medicine subspecialties in Family Medicine, Internal Medicine, Pediatrics, Otolaryngology and Psychiatry and Neurology. (Prior to 2006, the American Board of Sleep Medicine provided the “Diplomate, ABSM” credential.)<sup>3</sup>

### ***Polysomnography***

The American Association of Sleep Medicine considers polysomnography the “gold standard” in diagnosing sleep and sleep-related breathing disorders. The number of channels used to measure various parameters is often used to describe the quality of a sleep study. A full polysomnogram uses, at a minimum, eleven channels and employs 22 or more sensors. Some sleep studies, including home sleep studies approved by Medicare for diagnosing sleep apnea, use as little as three channels. The Centers for Medicare and Medicaid Services uses Harrison’s Principles of Internal Medicine to describe polysomnography:

...the definitive investigation for suspected OSA is polysomnography (PSG), a detailed overnight sleep study that includes recording of (1) electrographic variables (electroencephalogram, electrooculogram, and submental electromyogram) that permits the identification of sleep and its various phases, (2) ventilatory variables that permit the identification of apneas and their classification as central or obstructive, (3) arterial O<sub>2</sub> saturation by ear or finger oximetry, and (4) heart rate.<sup>4</sup>

An electroencephalogram (EEG) records electrical activity of the brain, an electrooculogram (EOG) records eye movements and an electromyogram (EMG) records muscle activation signals. An electrocardiogram (ECG) records heart rates. A pulse oximeter measures light sent through a fingertip or earlobe to record oxygen content and

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<sup>3</sup> For information on the Diplomate, ABSM see the American Board of Sleep Medicine: <http://www.absm.org/>, for the current American Board of Medical Specialties subspecialties see: <http://www.abms.org/>

<sup>4</sup> Centers for Medicare & Medicaid Services. March 13, 2008. “Decision Memo for Continuous Positive Airway Pressure (CPAP) Therapy for Obstructive Sleep Apnea (OSA) (CAG-00093R2).” <https://www.cms.hhs.gov/mcd/viewdecisionmemo.asp?from2=viewdecisionmemo.asp&id=204&>.

blood flow. Polysomnograms record airflow and respiration using combinations of physical and electronic measures of airflow, air temperature and lung volume. In addition to electronic monitoring, technicians performing polysomnograms record observed movements and sounds, sometimes including video or audio recordings. Polysomnograms may also record esophageal pH, blood pressure, or other relevant parameters depending on physician prescriptions or particular diagnoses.

A physician may directly refer a patient for a polysomnograph, or a physician may refer a patient to a physician specializing in sleep medicine who then refers the patient for a polysomnograph. Polysomnograms are performed over the patient's usual sleep routine, and typically involve the patient spending the evening at the sleep clinic before going to bed. To facilitate normal patterns, sleep clinic often outfit patient rooms like hotel rooms, with a television, a comfortable chair and bed. Spouses or parents are often able to spend the evening with the patient, or to stay at the clinic overnight.

Technicians monitor the patient and recording equipment overnight. If the patient shows signs of obstructive sleep apnea early in the study, the person performing the polysomnogram may choose to perform a "split night" study. In a split night study, technicians wake the patient and begin CPAP titration (adjusting CPAP devices until they have the proper pressure). Otherwise, a patient diagnosed with obstructive sleep apnea must return for a second sleep study involving CPAP titration. If necessary, patients may remain at the clinic the next day to perform alertness or wakefulness studies, such as Multiple Sleep Latency Tests.

A polysomnogram records large amounts of raw data. Technicians "score" this data, providing preliminary identification of sleep stages, artifacts and respiratory, cardiac or other events. Scoring may be done by the technician that performed the study or another staff technician. Alternatively, some sleep clinics outsource polysomnogram scoring to individuals or outside companies, sending raw data electronically or by mail.

Using the raw data and the sleep scoring report, a physician makes the final interpretation of the polysomnogram. This may be a supervising physician, a sleep medicine specialist on staff or the referring physician, depending on the type of referral. Like scoring, sleep clinics may also outsource interpretation of sleep studies to contracted or consulting physicians. The polysomnogram and scoring report may be sent electronically or by mail, without the interpreting sleep specialist seeing the patient.

### *Sleep Clinics*

The first sleep clinic opened in Stanford in 1964. Originally a narcolepsy clinic, it had expanded to a sleep disorders clinic by 1970. This clinic pioneered the practice of overnight sleep observation as the basis for clinical practice. Though sleep medicine was still a relatively new field with only a few practicing clinics, Blue Shield of California became the first third-party payer to cover sleep services in 1975. That same year, practitioners formed the Association of Sleep Disorders Centers (ASDC) in part to accredit sleep clinics. The ASDC began accrediting sleep clinics in 1977. Through many

organizational and name changes, the ASDC evolved into the American Academy of Sleep Medicine (AASM).<sup>5</sup> The AASM continues to provide accreditation to sleep clinics.

Standard	
1. Medical Director	Licensed Physician
2. Consulting sleep specialist	Centers must have at least one ABSM Diplomate or Board-certified Sleep Medicine specialist on staff. Laboratories may have on staff a physician that has completed an ACGME pulmonary fellowship and 12-month experience with a sleep specialist.
3. Technician Staff	A minimum of 1 Registered Polysomnographic Technologist.* Technicians must be certified or in a PSG specific training program.* BLS certified. Max. of two patients per technologist.
4. Patient Acceptance Policies	Written Procedures for accepting patients, including directly referred patients.
5. Unified Program	Must be a separate, unified program identified as either a “sleep center” or “sleep related breathing disorders laboratory”.
6. Patient Testing Rooms	Size, comfort, accessibility standards. At least one room must be handicap accessible.
7. Control Room	Must be adequate in size, design and comfort.
8. Equipment	Communication system, visual monitoring and recording, polygraphic equipment and CPAP and bilevel airway pressure, including remote control of pressure.
9. Written Policies and Procedures Manual	Emergency plan, technical procedures, equipment and facilities maintenance and AASM practice parameters.
10. Data Recording	Must include EEG, EOG, chin and leg EMG, respiratory monitoring, oxygen saturation and EKG.
11. Technician Log	For technician observations.
12. Multiple Sleep Latency Tests	Must be performed.
13. Written Protocols	Titration of CPAP, titration of PAP, bilevel positive airway pressure, other monitoring procedures.
14. Scoring	Reliable, detailed scoring with assigned sleep stages for each epoch. Computer assisted scoring must be reviewed. Periodic rater testing.
15. Full review	Sleep specialist must review polysomnographic recording in full.
16. Capability	Must diagnose all sleep disorders and treat all disorders on site or by referral. Must provide appropriate follow-up care.
17. Medical Charts	History and physical exam, physician approval for evaluation, all interactions with staff and associated practitioners. Cumulative record.

**Table 1:** AASM accreditation standards for sleep centers and sleep laboratories are almost identical. Only the credentials of the consulting sleep specialist differ.

\* Effective date: July 1, 2009.

The AASM accredits two types of sleep clinics. Sleep *Centers* test for all sleep disorders and are required to treat all sleep disorders. Clinics accredited as Sleep *Laboratories* specialize in treating breathing-related sleep disorders. Sleep laboratories are required to test for all sleep disorders, but are only required to treat patients with sleep-disordered breathing. Clinics or centers that only provide Polysomnography

<sup>5</sup> Shepard, et al.

studies for referring physicians, but that do not provide treatment or care, are not eligible for accreditation. See Table 1 (next page) for a summary of AASM accreditation standards.

Sleep clinics may be attached physically or organizationally to physician's offices, hospitals or other medical facilities or they may be independent clinics. Independent clinics receiving federal funding are categorized as Independent Diagnostic Testing Facilities (IDTF) by the Centers for Medicare and Medicaid Services (CMS). CMS only reimburses IDTFs for diagnostic tests (i.e., polysomnograms) performed by licensed or certified personnel.<sup>6</sup> Trailblazer Health Enterprises, LLC, Virginia's local Medicare provider, accepts six certifications, including Registered Electroencephalographic Technologists (R. EEG T), Registered Polysomnographic Technologists (RPSGT), Certified Pulmonary Function Technologists (CPFT), Registered Pulmonary Function Technologists (RPFT), Certified Respiratory Therapists (CRT) and Registered Respiratory Therapists (RRT). See "Certification" on page 12 for a complete listing of relevant certifications.

Additionally, CMS only reimburses sleep studies performed by an AASM accredited sleep clinic or at a Joint Commission accredited facility. The Joint Commission accredits sleep centers attached to larger healthcare facilities and, through its Ambulatory Care pathway, independent sleep centers. The Joint Commission accredits forty-nine facility-related sleep centers in Virginia, and two Virginia sleep centers through its ambulatory care pathway.<sup>7</sup> Joint Commission Accreditation focuses on patient safety and management protocols. The AASM, which accredits over 1500 facilities<sup>8</sup>, focuses on provider credentials and clinical practices directly associated with sleep medicine.<sup>9</sup> According to the AASM sponsored website, sleepcenters.org, there are 15 accredited facilities in Virginia.<sup>10</sup>

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<sup>6</sup> Federal Regulations for Independent Diagnostic Testing Facilities are located in Title 42 of the *Code of Federal Regulations* Chapter IV §410.33. See paragraph (c) for requirements for non-physician personnel. Under §410.32, sleep studies performed at hospitals or physician's offices are not required to use certified personnel.

<sup>7</sup> From the Joint Commission's "Quality Check" website:  
<http://www.qualitycheck.org/consumer/SearchOCR.aspx>. Accessed 1/5/2009.

<sup>8</sup> AASM Accreditation Fact Sheet, accessed 10/8/2008, available at:  
<http://www.aasmnet.org/FactSheets.aspx>

<sup>9</sup> *Sleep Review: The Journal for Sleep Specialists*. April, 2008. "The Pursuit of Accreditation."  
[http://www.sleepreviewmag.com/issues/articles/2008-04\\_05.asp](http://www.sleepreviewmag.com/issues/articles/2008-04_05.asp). Accessed 1/5/2009

<sup>10</sup> <http://www.sleepcenters.org/Centers.aspx?state=VA>. Accessed 4/14/2009.

## Home Sleep Studies

In March of 2008, the Centers for Medicare and Medicaid Services (CMS) began reimbursing CPAP treatment for Obstructive Sleep Apnea based on diagnosis using home sleep tests (HSTs). Many private insurers followed suit. The following restrictions limit CMS reimbursement of HSTs:

1. Only entities approved to perform sleep tests may provide HSTs. In Virginia, this is limited to diplomats of sleep medicine **or** a physician employed by a JCAHO or AASM accredited sleep clinic.
2. HSTs are only approved to diagnose Obstructive Sleep Apnea in patients with a high probability of sleep apnea, without comorbidities.<sup>11</sup>
3. The provider of the HST may not also provide CPAP equipment.
4. The provider must provide either an in-person demonstration of HST equipment use or 24-hour customer support. The provider, and not the HST device company, must provide this training and support.<sup>12</sup>

Device Type	Minimum Channels	Reimbursement Code	Reimbursement Rate
Type I (Full PSG)	11	95808*	\$607.70*
Type II (HST)	7	G0398	\$151.65
Type III (HST)	4	G0399	\$126.38
Type IV** (HST)	1	G0400	\$101.10

**Table 2:** Types of sleep studies. Type II, II and IV are unattended (home) sleep studies.

\*The code and reimbursement rate are for a single PSG w/o CPAP.

\*\* Medicare has only approved one, three-channel Type IV device.

Home sleep test devices are categorized into device types based primarily on the number and types of channels they use. Table 2 outlines the device types, Medicare codes and reimbursement rates for participating providers for Virginia. The relatively low reimbursement rates combined with the above restrictions may limit the use of home sleep testing. According to a survey conducted by Wachovia Capital Markets LLC in partnership with *Sleep Review*, the typical sleep clinic will not provide home sleep testing at rates lower than \$428 per study. No more than six percent of sleep clinics indicate they would provide HSTs at current Medicare reimbursement rates.<sup>13</sup>

<sup>11</sup> Trailblazer Health. Revised 12/19/2008. "Local Coverage Determination: Sleep Studies and Overnight Oximetry." <http://www.trailblazerhealth.com/Tools/Local%20Coverage%20Determinations/Default.aspx?id=3275&DoMainID=1>

<sup>12</sup> Ramon D. Paquette. December 2008. "The Economics of Home Sleep Testing" *HME Today* [www.hmetoday.com/issues/articles/2008-12\\_10.asp](http://www.hmetoday.com/issues/articles/2008-12_10.asp). Accessed 1/5/2009.

<sup>13</sup> Wachovia Capital Markets, LLC. July 9, 2008. "Equity Research: Q3 2008 Sleep Center Survey." [http://www.sleepreviewmag.com/issues/pdfs/2008\\_Q3\\_survey\\_results.pdf](http://www.sleepreviewmag.com/issues/pdfs/2008_Q3_survey_results.pdf)



## Growing Profession

Sleep medicine is a fast-growing and profitable field within the healthcare industry that has garnered much attention. The sleep medicine industry made the cover of the February 27, 2006 edition of *Forbes Magazine*, a national business magazine.<sup>14</sup> A market analysis report published by MarketData Enterprises estimated the total market for sleep aids in 2007 at \$23.7 billion, with sleep centers accounting for \$4.47 billion of the market in 2008. The median sleep center, according to a press release, conducts 1,250 sleep studies per year and has revenues of \$1.33 million. The report predicts the market for CPAP devices, already at \$2.4 billion, will increase at an annual rate of 18 percent through 2012.<sup>15</sup>



Figure 1: Sleep medicine specialist certified by year.

Researchers from the Institute of Medicine project it could cost over \$20.5 billion to test and treat every person in the United States who has sleep apnea,<sup>16</sup> dwarfing the current combined sleep center/CPAP market of \$6.87 billion.

Sleep medicine has grown from a largely ignored curiosity within the medical field to a fast growing and important medical specialty. Before the ABMS took over certification of sleep specialists in 2006, the American Board of Sleep Medicine (ABSM) had certified 3,445 Diplomates since 1978. Of those, almost 61 percent (2,099) certified in the year 2000 or later (See Figure 1).<sup>17</sup>

## Multidisciplinary

Sleep medicine uses knowledge and skills linked to multiple medical specialties. The Board of Health Science Policy of the Institute of Medicine describes the study of

<sup>14</sup> Wells, Melanie. 27 Feb 2006. "The Sleep Racket: Who's Making Big Bucks off your Insomnia?" *Forbes*. Available at *Forbes.com*: <http://www.forbes.com/forbes/2006/0227/080.html>.

<sup>15</sup> PRWeb: Press Release. June 9, 2008. "U.S. Sleep Aids Market Grows to \$23 Billion, As Americans Battle Insomnia, Sleep Disorders." <http://www.prweb.com/releases/2008/06/prweb1006354.htm>

<sup>16</sup> Colten, Harvey R. & Altevogt, Bruce M. (eds). (2006). *Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem*. Committee on Sleep Medicine and Research of the Board on Health Sciences Policy of the Institute of Medicine of the National Academies. Washington D.C.: The National Academies Press. P. 157.

<sup>17</sup> American Board of Sleep Medicine. "Total Number of Diplomates." <http://www.absm.org/Diplomates/listing.htm>. Accessed 4/14/2009.

sleep medicine as interdisciplinary and the practice of sleep medicine as a multidisciplinary clinical service that “requires linkages to other medical specialties.”<sup>18</sup>

The subspecialty of Sleep Medicine pulls from the medical specialties of neurology, psychiatry and internal medicine, among others. Board-certified practitioners from the specialties of Family Medicine, Internal Medicine, Pediatrics, Otolaryngology (head and throat specialists) and Psychiatry and Neurology are all eligible to take the Sleep Medicine subspecialty examination. However, the American Board of Medical Specialties (ABMS) Conjoint Board in Sleep Medicine administers the same examination regardless of primary specialty, encompassing knowledge from all relevant areas.<sup>19</sup> The Medicare Local Coverage Determination (LCD) for Virginia from Trailblazer Health Enterprises recognizes physicians Board Certified in Sleep Medicine as the only physicians reimbursable for sleep testing.

Likewise, polysomnographers use knowledge and skills often associated with the scopes of practice of other allied health professions, including respiratory therapists, electroneurodiagnostic technologists and cardiovascular technologists. Unlike the Sleep Medicine subspecialty, however the Medicare local coverage determination recognizes several allied health professional certifications for reimbursement of polysomnograms. Technologists with certifications from the American Board of Registration of Electroencephalographic and Evoked Potential Technologists (ABRET), the National Board of Respiratory Care (NBRC) as well as the Board of Registered Polysomnographic Technologists (BRPT) are all reimbursable for polysomnograms and sleep testing. (See “Certifications” on page 12.)

Polysomnography students may pursue formal education in polysomnography through each of these disciplines. Traditional students focusing on polysomnography may enroll in polysomnography-specific certificate or associate programs accredited by the Committee on Accreditation of Allied Health Education Programs (CAAHEP).<sup>20</sup> CAAHEP also accredits polysomnography add-on tracks to respiratory care and electroneurodiagnostic programs. (See “Education” on page 17.)

### ***Claiming Polysomnography***

The rapid growth of Sleep Medicine has not occurred without controversy. Though all practitioners put patient outcomes first, the interdisciplinary nature of the profession combined with the potential for profits has occasionally pushed divergent views to the forefront, especially concerning legal, regulatory and reimbursement issues.

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<sup>18</sup> Colten, Harvey R. & Altevogt, Bruce M. (eds). (2006). *Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem*. Committee on Sleep Medicine and Research of the Board on Health Sciences Policy of the Institute of Medicine of the National Academies. Washington D.C.: The National Academies Press. P. 27.

<sup>19</sup> American Board of Otolaryngology. “Booklet of Information.” <http://www.aboto.org/BOI.htm>. Accessed 1/9/2009.

<sup>20</sup> The CAAHEP is a nationally recognized accreditation body for allied health professional educational programs. It is made up of Committees on Accreditation (CoA) that provide expertise on individual professions and perform much of the legwork in accrediting programs.

For instance, a recent decision by Medicare to reimburse home sleep tests led to some controversy among physicians. Otolaryngologists (head and neck surgeons) supported home sleep testing as a means of expanded care. The American Academy of Sleep Medicine originally opposed the use of HSTs as less comprehensive and less effective. Underlying this issue is each profession's analysis of the pros and cons of surgery and CPAP therapy in treating sleep apnea. In the end, Medicare approved reimbursement for HSTs, but local coverage determinations limited coverage to those provided by a sleep specialist or a physician associated with an accredited sleep clinic.<sup>21</sup>

Despite a long history of collaboration between related allied health disciplines, the field of polysomnography has not avoided similar controversies related to scope of practice issues. In particular, disagreements over the proper method of regulating polysomnographers has led to competition between sleep and respiratory care professionals in some states. The two professions share a history of collaborating to uphold standards in polysomnography. For instance, the American Association for Respiratory Care (AARC) helped polysomnographic technologists develop a CAAHEP accreditation program for polysomnographic education. Likewise, the Committee on Accreditation for Respiratory Care of the CAAHEP has used the job analysis provided by the Board of Registered Polysomnographic Technologists (BRPT) to develop standards for polysomnography add-on tracks in respiratory care educational programs. However, overall cooperation has not prevented national professional organizations from taking contradictory and exclusionary stances on particular issues. See Table 3 (next page) for an overview of the positions of some national organizations.

Until December 15, 2008, the BRPT's Registered Polysomnographic Technologist (RPSGT) credential was the only credential for paraprofessionals that specialized in sleep studies and included the entire spectrum of skills needed to perform polysomnograms. Eligibility requirements for the RPSGT exam have historically embodied the multidisciplinary nature of polysomnography, and have included provisions for on-the-job training and health education in related fields. However, the BRPT has begun to roll out new eligibility requirements. By 2012, all candidates for the RPSGT credential must have completed an accredited polysomnography educational program or a polysomnography concentration within another discipline (see page 15).

The NBRC made a Sleep Disorder Specialist examination available to Certified Respiratory Therapists (CRT) and Registered Respiratory Therapists (RRT), resulting in the CRT-SDS and RRT-SDS credentials, respectively. NBRC administered the first exam on December 15, 2008. This new certification provides sleep technician credentials to CRTs and RRTs without requiring additional education.

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<sup>21</sup> See CMS. (2008, Dec. 23). "Decision Memo for Continuous Positive Airway Pressure (CPAP) Therapy for Obstructive Sleep Apnea (OSA) (CAG-00093R2)" Centers for Medicaid & Medicare Services <https://www.cms.hhs.gov/mcd/viewdraftdecisionmemo.asp?from2=viewdraftdecisionmemo.asp&id=227&>

<b>American Association of Sleep Technologists</b>
<ul style="list-style-type: none"> <li>• Polysomnography: A Distinct Profession</li> <li>• Exemption from existing RC regulation for RPSGT &amp; Technicians/Trainees</li> <li>• If regulated, not under RC board, independent control of scope of practice</li> </ul>
<b>American Association for Respiratory Care</b>
<ul style="list-style-type: none"> <li>• Respiratory Care tasks are regulated</li> <li>• Exemption from RC regulation for licensed or monitored practitioners only</li> <li>• Exemption for specific competencies only</li> <li>• Does not oppose exemption for licensed/monitored professions from RC regulation</li> </ul>
<b>American Society of Electroneurodiagnostic Technologists</b>
<ul style="list-style-type: none"> <li>• Polysomnographers do not need an RC license to perform non-invasive CPAP</li> <li>• Endorsed by American College of Neurology, American Clinical Neurophysiology Society</li> </ul>
<b>American College of Chest Physicians</b>
<ul style="list-style-type: none"> <li>• Does not support exclusionary regulation</li> <li>• Recognizes the need for regulation</li> <li>• RPSGT &amp; CRT/RRT need no additional credentials for licensure</li> <li>• Licensed PSGs should pass a CAAHEP accredited program specific to polysomnography</li> </ul>
<b>American Academy of Sleep Medicine</b>
<ul style="list-style-type: none"> <li>• Licensure of Polysomnographers as distinct profession</li> <li>• No specific listing of RC procedures/limits on scope of practice</li> </ul>

**Table 3:** Summary of positions of several professional associations interested in regulatory issues surrounding polysomnography. These positions were gleaned from reports in trade publications as well as official position statements.

This ongoing dispute revolves around non-invasive practices that traditionally fall into the scope of practice of respiratory therapists, including titration of continuous positive airway pressure (CPAP) bi-level positive airway pressure (BiPAP), low-flow oxygen therapy, oximetry and capnography. Oximetry and capnography are central to polysomnograms, while CPAP, BiPAP and low flow oxygen therapy treat sleep related breathing disorders, particularly sleep apnea (See Table 4). The AARC, some state-level organizations and some respiratory care boards maintain that persons performing these tasks must be regulated in states where respiratory care is regulated. The AARC does not have an official position on *how* they are regulated (i.e., as respiratory therapists or as polysomnographers) but a few state Respiratory Care boards have moved the process of regulation along by threatening to strictly enforce the respiratory care scope of practice. Polysomnographers, particularly the American Association of Sleep Technologists, wish to develop as a profession organically, and independent of established professions.

<b>Procedure</b>	<b>Definition</b>
CPAP Titration	Uses a nose and/or mouth mask to increase pressure in the airway. This keeps the airway open when throat muscles relax during sleep. Titration refers to finding the right pressure.
BiPAP Titration	Similar to CPAP, but changes pressure between inhalation and exhalation
Low Flow Oxygen Therapy	Supplemental Oxygen
Oximetry	A small clip attached to the finger measures oxygen in the blood by sending an infrared light through the finger.
Capnography	A sensor that measures carbon dioxide in exhaled breath

**Table 4:** Respiratory care related procedures regularly performed by sleep technicians.

## CERTIFICATION

In Virginia, Medicare reimburses polysomnograms performed by persons with the following credentials:

**American Board of Registration of Electroencephalographic and Evoked Potential Technologists**

- Registered Electroencephalographic Technologist (R. EEG T)

**Board of Registered Polysomnographic Technologists**

- Registered Polysomnographic Technologist (RPSGT)

**National Board for Respiratory Care**

- Certified Pulmonary Function Technologist (CPFT)
- Registered Pulmonary Function Technologist (RPFT)
- Certified Respiratory Therapist (CRT)
- Registered Respiratory Therapist (RRT)

The Board of Registered Polysomnographic Technologists (BRPT) is the only organization that specifically certifies polysomnographers independent of other credentials. The National Board for Respiratory Care (NBRC) recently developed a Sleep Disorders Specialist (-SDS) credential available to currently credentialed CRTs and RRTs. The first exams for the credential were held on December 15, 2008.<sup>22</sup> Other credentials focus on separate disciplines, but include information on some aspects of polysomnography. See Table 5 for an overview of major content areas for entry level credentials. Detailed information on sleep-related exam content is available on page 15.

<b>Entry-level Credentials</b>	<b>Major Exam Content Areas</b>
R. EEG T	Fundamental concepts, Performing the EEG study, Post-study procedures, Ethics and professional issues
RPSGT	Analysis of pre-testing information, Study performance, Scoring, Patient support and education activities, Site management
CRT	Patient data, Equipment, Therapeutic procedures
CPFT	Instrumentation/equipment, Diagnostic procedures, Data management
-SDS	Pre-testing, Sleep disorders testing, Study analysis, Administrative functions, treatment plan

**Table 5:** Major content areas for entry-level credentials that allow reimbursement by Medicare for polysomnograms.

<sup>22</sup> See NBRC website, Sleep Disorder Specialist FAQ: <http://www.nbrc.org/Examinations/SDS/tabid/92/Default.aspx>. Accessed 3/20/2009.

## *National Board for Respiratory Care*

The NBRC certifies respiratory therapists and pulmonary function technologists. Respiratory therapists are allied health professionals trained to assess and treat respiratory and cardiovascular disorders. Pulmonary function technologists specialize in diagnostic technology relevant to respiratory and cardiovascular systems. Practitioners may seek credentials in each field at two levels: certified and registered. The certified credential is an entry-level credential, while the registered credential is for advanced or experienced candidates. Respiratory therapist and pulmonary function technologist certification exams are broad in scope and cover the gamut of respiratory and cardiovascular pathologies. The NBRC offers two specialty exams, one in neonatal/pediatrics and one in sleep disorders. See Table 6 on page 15 for a brief listing of sleep-specific content in each certification exam.

The NBRC is member of the National Organization for Competency Assurance (NOCA), a nationally recognized membership organization dedicated to ensuring quality in credentialing organizations. Most NBRC certification exams accredited by the National Commission for Certifying Agencies (NCCA), the independent accreditation arm of NOCA. Only the relatively new Sleep Disorders Specialty certification is not certified by the NCCA.

### Respiratory Therapists

The CRT certification provides credentials for entry-level Respiratory Therapists. Applicants for the CRT exam must be 18 years old and have a minimum of an associate degree from either a Committee on Accreditation for Respiratory Care (CoARC) or a Commission on Accreditation of Allied Health Education Programs (CAAHEP) approved program. Alternatively, credentialed Canadian therapists may sit for the exam.

The exam consists of 160 multiple-choice questions (20 pre-test). CRTs must renew their credentials every five years, either by completing 30 continuing education hours, retaking the exam or taking a NBRC advanced or specialist exam. Renewal requirements are equivalent for all practitioners credentialed by the NBRC.

The RRT certification provides advanced credentials for current CRTs. Candidates for the RRT credential must complete a minimum of an advanced-level associate's degree with no less than 62 credit hours. Alternatively an equivalent combination of education and experience as a practicing CRT is accepted. However, RRTs must have a minimum of 62 college level credits in designated subject areas. The exam consists of 115 multiple choice questions (15 pre-test) and a separate clinical exam consisting of 10 simulations. Renewal requirements are equivalent for all practitioners credentialed by the NBRC.

## Pulmonary Function Technologists

The CPFT credential may serve as an entry-level credential for pulmonary function technologists or as an advanced /specialist credential for respiratory therapists. CRTs and RRTs are automatically eligible to sit for the exam. Uncredentialed candidates must have a minimum of an associate degree from a CoARC or CAAHEP accredited program or two years of experience. Alternatively, candidates that have completed 62 hours of college coursework and have six months experience are eligible to sit for the exam. The exam consists of 115 multiple-choice questions (15 pre-test).

Only CPFTs are eligible to sit for the RPFT exam. The RPFT exam consists of 115 multiple-choice questions (15 pre-test). Renewal requirements are equivalent for all practitioners credentialed by the NBRC.

## Sleep Disorders Specialist

The SDS credential is a specialty credential available to CRTs or RRTs. CRTs and RRTs that have completed a CAAHEP accredited respiratory therapist program with a sleep add-on track are eligible to sit for the exam. Alternatively, CRTs with six months experience in sleep diagnostics and RRTs with three months experience in sleep diagnostics may sit for the exam. The exam consists of 180 multiple-choice questions (20 pre-test). The Sleep Disorders Specialist certification process is not currently NCCA accredited.

## ***Board of Registered Polysomnographic Technologists***

The BRPT offers the Registered Polysomnographic Technologist (RPSGT) credential for polysomnographers. Like the NBRC, the BRPT is a member organization of NOCA, and the RPSGT certification is accredited by NCCA.

**Note:** In March of 2010, BRPT implemented the Certified Polysomnographic Technologist (CPSGT) credential. This is an entry-level credential for polysomnographers with three months experience. Candidates must complete select modules from the A-STEP educational program (see Page 21).

## Registered Polysomnographic Technologist

The RPSGT is the only certification offered by the BRPT. To sit for the exam, candidates must first complete a CAAHEP accredited Polysomnographic Technology program, or have 18 months of on the job training and experience. Those using experience to meet eligibility requirements must also complete 14 modules of the A-STEP self-study module provided by the American Academy of Sleep Medicine (see page 20). Alternatively, persons with six months experience and holding credentials as health (i.e., doctors and nurses) or allied health (i.e., respiratory therapists and electroneurodiagnostics) practitioners in a related field may sit for the exam. Additionally, all candidates must hold a Basic Cardiac Life Support certification.

The exam consists of 200 multiple-choice questions. RPSGTs must recertify every five years by either retaking the exam or completing 50 hours of continuing education.

The BRPT is slowly phasing in formal educational requirements into their eligibility standards. The BRPT added the additional requirement of 14 A-STEP modules to complement experience on July 1, 2008. However, on August 24, 2009, the BRPT waived this requirement for some previously certified health professionals, notably respiratory therapists, electroneurodiagnosticians and nurses. On July 1, 2010, candidates using 18 months experience for eligibility will need to complete an additional A-STEP Introductory Course. After July 1, 2012, the BRPT will *only* accept candidates that have completed a CAAHEP accredited polysomnography program or add-on track, regardless of other credentials. This will prevent respiratory therapists and electroneurodiagnosticians, currently eligible with six months of experience, from attaining RPSGT credentials without additional training.

***American Board of Registration of Electroencephalographic and Evoked Potential Technologists***

The ABRET offers the Registered Electroencephalographic Technologist and Registered Evoked Potential Technologist credentials. Additionally, registered technologists may pursue advanced certification in Long Term Monitoring or Neurophysiologic Intraoperative Monitoring. Medicare only reimburses R. EEG T for polysomnograms, so this section will be limited to the R. EEG T credential.

Like NBRC and BRPT, ABRET is a member of NOCA. However, only the Certification in Neurophysiologic Intraoperative Monitoring is NCCA accredited. The R. EEG T credentialing process is not currently certified by the NCCA.

**Registered Electroencephalographic Technologist**

To be eligible for the R. EEG T credential, candidates must be enrolled in or have graduated from a CAAHEP accredited

Test or Procedure	CRT	CPFT	-SDS	RPSGT	R. EEG T
<b>General</b>					
Patient History	X		X	X	X
Polysomnogram (PSG)			X	X	
Maintenance of Wakefulness Test (MWT)			X	X	
Multiple Sleep Latency Test (MSLT)			X	X	
Sleep Disorders			X	X	
Medical Emergencies	X	X	X	X	X
<b>Diagnostics</b>					
PSG Scoring			X	X	
Sleep Stages			X	X	
Electromyograph (EMG)			X	X	
Electrooculogram (EOG)			X	X	
Electroencephalography (EEG)			X	X	X
Electrocardiography (ECG)	X	X	X	X	
Oximetry	X	X	X	X	
Capnography	X	X	X	X	
Spirometry	X	X	X	X	
<b>Interventions</b>					
PAP Titration	X		X	X	
Supplemental Oxygen Titration	X	X	X	X	
<b>Sleep-Related Pathologies</b>					
Respiratory	X	X	X	X	
Neurologic			X	X	X
Psychiatric			X	X	X

**Table 6:** Sleep-related content of entry-level credentials, as listed in content guidelines. Some diagnostic equipment is not specifically listed, however relevant procedures are. For instance, content regarding recording REM sleep resulted in a mark in the Electrooculogram row.



Electroneurodiagnostic (END) program or have three years of experience in END with at least 50 percent of the experience in EEG. Alternatively, persons with an associate degree in any other discipline are eligible with only one year of experience in END.

The eligibility exam consists of a 250 question multiple-choice exam and a half-day clinical simulation. R. EEG Ts must renew every 10 years by completing 60 continuing education hours.

**Overview**

While the RPSGT and –SDS certifications cover the breadth of polysomnography and sleep disorders, certifications for respiratory therapists, pulmonary function technologists and electroneurodiagnosticians cover only items related to their particular specialty. Respiratory therapists focus on respiratory care and treatment. Pulmonary function technologists focus on diagnostic tests of the cardiopulmonary system. Electroencephalographic technologists focus on diagnosis of neurological functions. Table 6 (previous page) provides an overview of subjects covered in each entry-level certification exam. Table 7, below, provides an overview of eligibility requirements, exams and continuing education requirements.

	Level	NCCA Accredited	Minimum Education*	Minimum Experience*	Written questions	Clinical Exam	CE Hours	Renewal Period	Fee (total)
<b>R. EEG T</b>	Entry	No	Associates	3 years	250	Yes	60	10 yr	\$620
<b>RPSGT</b>	Entry	Yes	1 yr Cert	18 month	200	NA	50	5 yr	\$350
<b>CPFT</b>	Entry	Yes	Associates	2 years	115	NA	30	5 yr	\$200
<b>RPFT</b>	Adv.	Yes		CPFT	115	NA	30	5 yr	\$250
<b>CRT</b>	Entry	Yes	Associates	NA	160	NA	30	5 yr	\$190
<b>RRT</b>	Adv.	Yes	Adv. Assoc.	4 yr as CRT	115	10	30	5 yr	\$390
<b>-SDS</b>	Adv.	No	Sleep add on track	6 months in sleep clinic	180	NA	30	5 yr	\$300

**Table 7:** An overview of relevant credentials

\*Minimum Education *or* Minimum Experience to qualify.

## ***Polysomnographic Job Descriptions***

Polysomnographers operate in most states based on general exemptions from professional regulation laws. Some states define general exemptions as tasks performed by persons with legitimate credentials within an appropriately limited scope of practice. Other states, such as Virginia, define exemptions as tasks delegated and supervised by licensed practitioners. Virginia's general exemption language is listed in Table 8.

The AAST, AASM, BRPT and ASET developed a set of job descriptions to provide a standard qualification and practice framework for polysomnographers receiving on-the-job training. These job descriptions provide standardized scopes of practice, allowing for ease of exemption of trainees and technicians that do not have more formal credentials. There are three job descriptions allowing progressively more responsibility and requiring progressively more experience and training: Polysomnographic Trainee, Polysomnographic Technician and Polysomnographic Technologists. To classify as a technologist in this framework, polysomnographers must attain the RPSGT credential. The text of each job description is listed in Appendix A.

## **EDUCATION**

Polysomnography is growing from a field that borrowed the knowledge and skills of related professionals to a field with distinct educational programs geared towards the particular needs of sleep medicine. Polysomnography-specific educational programs first developed in related fields. In 2003, the Committee on Accreditation of Respiratory Care (CoARC) approved an add-on polysomnography track to its CAAHEP accredited programs. That same year, the CAAHEP sponsored the formation of the Committee on Accreditation for Polysomnography (CoAPSG).<sup>23</sup> These programs augmented the existing polysomnography add-on track provided by the Committee on Accreditation for Education in Electroneurodiagnostic Technology (CoA-END). There are currently 21 accredited polysomnography programs, 11 accredited polysomnography add-on tracks in respiratory therapy programs and 11 polysomnography add-on tracks in

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### **Virginia' General Exemptions**

§ 54.1-2901. Exceptions and exemptions generally.

A. The provisions of this chapter shall not prevent or prohibit:

6. Any practitioner licensed or certified by the Board from delegating to personnel supervised by him, such activities or functions as are nondiscretionary and do not require the exercise of professional judgment for their performance and which are usually or customarily delegated to such persons by practitioners of the healing arts, if such activities or functions are authorized by and performed for such practitioners of the healing arts and responsibility for such activities or functions is assumed by such practitioners of the healing arts

19. Any person from performing services in the lawful conduct of his particular profession or business under state law

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**Table 8:** Virginia's general exemption language

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<sup>23</sup> Smalling, Tom. 10 December 2003. "Sleep Medicine: A Growing Opportunity for Respiratory Therapists." State University of New York at Stony Brook. PowerPoint Presentation to the 49<sup>th</sup> AARC International Respiratory Care Congress. Las Vegas, NV. <http://www.aarc.org/sections/education/swapshop/polysomnography.ppt#256,1,Slide 1, Slide 23>. Accessed 3/27/2009.

electroneurodiagnostic programs. Only one of these programs is located in Virginia, a polysomnography add-on track within the electroneurodiagnostician program at the Naval School of Health Sciences in Portsmouth, Virginia. Table 9 lists accredited programs within Virginia and its border states:

<b>Program</b>	<b>Location</b>	<b>Degree</b>	<b>Tuition* (in-state)</b>
<b>Polysomnography</b>			
Community College of Baltimore County	Dundalk, MD	Certificate	NA
Catawba Valley Community College	Hickory, NC	Certificate, <u>Associate</u>	\$4,500**
Lenoir Community College	Kinston, NC	<u>Associate</u>	\$3,195
Pitt Community College	Greenville, NC	Certificate, <u>Associate</u>	\$2,860
Sandhills Community College	Pinehurst, NC	Certificate, <u>Associate</u>	\$2,924
East Tennessee State University	Johnson City, TN	Certificate	NA
Roane State Community College	Harriman, TN	<u>Certificate</u>	\$1,100
Volunteer State Community College	Gallatin, TN	<u>Certificate</u> , Associate	\$3,596
<b>Electroneurodiagnostician Add-on</b>			
Naval School of Health Sciences	Portsmouth, VA	Associate	NA
Pamlico Community College	Grantsborough, NC	Associate	NA
<b>Respiratory Therapy Add-on</b>			
Pitt Community College	Greenville, NC	<u>Associate</u>	\$2,982
Northern Kentucky University	Highland Heights, KY	Associate	NA

**Table 9:** CAAHEP accredited polysomnography programs and add-ons.

\*Tuition is indicative of costs only. The tuition shown here is approximate and based on posted curriculum and per-credit tuition rates. It may not include fees, full-time discounts, equipment, insurance, uniforms, etc.

\*\*Total estimated cost including books, uniforms, insurance, etc.

Despite the rapid growth in accredited programs, demand for qualified polysomnographers has continued to outstrip supply. To facilitate on-the-job training of polysomnographers, the AASM developed the Accredited Sleep Technology Education Program (A-STEP) as a stopgap measure to fill the gap until CAAHEP accredited programs produce enough graduates to meet demand.

### ***CAAHEP Accredited Programs***

The Commission on Accreditation of Allied Health Education Programs (CAAHEP) is a nationally recognized educational accreditation program for allied health educational programs. The CAAHEP consists of member organizations, known as Committees on Accreditation (CoA) that set standards and administer accreditation programs for individual professions. As noted above, the CoAPSG administers accreditation for polysomnographic technologist programs, the CoARC administers accreditation for respiratory care programs, including polysomnography add-on tracks, and the CoA-END administers accreditation for electroneurodiagnostician programs, including polysomnography add-on tracks. Table 10 (next page) provides an overview of curriculum guidelines for each program.

<b>Respiratory Care</b>	<b>Electroneurodiagnostics</b>	<b>Polysomnography</b>
(1) Medical gas therapy	(1) Electroencephalogram (EEG)	(1) Infection Control
(2) Aerosol and humidity therapy	(2) Infection Control	(2) Basic Cardiac Life Support
(3) Airway management	(3) Cardiopulmonary resuscitation	(3) Polysomnographic instrumentation
(4) Lung inflation therapy	(4) 10/20 measurement system	(4) Sleep/wake physiology and pathophysiology
(5) Bronchial hygiene therapy	(5) Electrode placement	(5) Polysomnographic procedures
(6) Mechanical ventilation management	(6) EEG instrumentation	(6) Therapeutic interventions
(7) Infection control	(7) Waveform analysis	(7) Polysomnographic data analysis
(8) Arterial blood gases	(8) Neuroanatomy and neurophysiology	
(9) Hemodynamics	(9) Introductory Evoked Potential studies	
(10) Electrocardiography	(10) Introductory Polysomnography Studies	
(11) Cardiopulmonary diagnostics	(11) Introductory Nerve Conduction Studies	
(12) Exercise testing	(12) Introductory Interoperative Neurophysiological Monitoring	
(13) Survey of Polysomnographic assessment, monitoring, interpretation and treatment	(13) Introductory Long Term Monitoring	
(14) Cardiopulmonary resuscitation		
(15) Alternate site care		
<b>Polysomnography Add-ons</b>		
(1) Sleep staging & pattern recognition	(1) Polysomnographic equipment testing/calibration	
(2) Electroneurodiagnostic electronics & instrumentation	(2) Electrode placement for ECG, EMG, EOG, EEG, etc	
(3) Electroneurodiagnostic recording techniques	(3) Oxygen interventions	
(4) Electrographic & clinical correlations	(4) PAP interventions	
(5) Pharmacology for treatment of sleep/wake disorders	(5) Polysomnogram scoring	
(6) Neuroanatomy and Physiology related to sleep and sleep disorders	(6) Respiratory inductance plethysmography	
(7) Sleep disorders classifications	(7) Nasal/oral thermistor	
(8) Patient and equipment preparation	(8) Nasal/oral thermocouple	
(9) Fundamentals of Polysomnographic instrumentation	(9) Nasal pressure transducer	
(10) Polysomnographic monitoring techniques	(10) Pulse oximetry	
(11) Multiple sleep latency testing/maintenance of wakefulness testing	(11) End-tidal CO <sub>2</sub> monitor	
(12) Sleep scoring	(12) Transcutaneous CO <sub>2</sub> monitor	
(13) Supplemental O <sub>2</sub>	(13) Gastroesophageal pH monitor	
(14) PAP titration	(14) Esophageal Pressure monitor	
(15) Other treatment modalities	(15) Multiple Sleep Latency Test	
	(16) Maintenance Wakefulness Test	
	(17) Therapeutic modalities	

**Table 10:** Curriculum requirements of accredited Respiratory Care, Electroneurodiagnostician and Polysomnography programs, including polysomnography add-on tracks for Respiratory Care and Electroneurodiagnosticians.

Citing the organization’s maturity, in November of 2008, CoARC formally began the process of separating from the CAAHEP. CoARC plans to complete the separation by January 15, 2010. CoARC has been accrediting respiratory care programs for almost 40 years. CoARC intends to apply for recognition by the Council for Higher Education Accreditation (CHEA) and for membership in Association for Specialized and Professional Accreditors (ASPA).<sup>24</sup> CHEA is a nationally recognized body that provides a private counterpart to government recognition of organizations that accredit educational programs. Its membership includes about 3,000 colleges and universities and 60 accrediting organizations. ASPA is a professional organization of accrediting organizations. CAAHEP is recognized by CHEA and is a member organization of ASPA. CoARC is currently associated with both CHEA and ASPA its affiliation with CAAHEP, but will seek independent affiliation following its separation from CAAHEP.

<sup>24</sup> Committee on Accreditation for Respiratory Care. March, 2009. “2008 Year in Review.” Vol. 5 p. 4. Available at: <http://www.coarc.com/documents/2009%20Year%20In%20Review.pdf>

In 2003, CoARC incorporated polysomnography add-on curriculum into their accreditation program. The polysomnography add-on is currently based on the BRPT certification and job analysis.<sup>25</sup> Existing respiratory care programs may incorporate the polysomnography curriculum into the regular respiratory care curricula as a separate track or they may provide an additional certificate in polysomnography. Many associate level programs offer the add-on certificate, while baccalaureate and masters programs tend to incorporate the material as a separate concentration track.<sup>26</sup>

CoARC is currently developing new standards and guidelines in preparation for the forthcoming separation from CAAHEP. Draft versions of the standards and guidelines include a number of changes. Notably, the polysomnography add-on curriculum will be based on the new NBRC Sleep Disorder Specialist certification exam and job analysis rather than the BRPT certification and job analysis.

CoA-END accredits polysomnography add-on certificates to electroneurodiagnostics programs. Not all CoA-END programs are associate level, however, the guidelines recommend associate level programs, post-associate programs, or certificates that may be gained in conjunction with an associate degree. For instance, the certificate provided by Crozet-Chester Medical center in Upland, Pennsylvania may be applied to an associate degree at two local colleges. The polysomnography add-on must accompany electroneurodiagnostic education. It is not a stand-alone program.

CoAPSG accredits stand-alone polysomnography programs. Programs may offer certificates or diplomas alone, though CoAPSG recommends programs offer certificates in conjunction with an associate degree. Programs may be hosted by an accredited school, or by a full service, AASM accredited sleep center.

### ***Accredited Sleep Technology Education Program***

AASM developed the A-STEP training program to standardize on-the-job education until CAAHEP accredited programs gained sufficient capacity. A-STEP consists of two main parts. The 80-hour *Introductory Course* occurs within a clinical setting and provides a hands-on introduction to polysomnography. Fourteen online self-study modules make up the bulk of the program. Each section is followed by an exam. On July 1, 2008, BRPT required all candidates pursuing the RPSGT credential through experience to complete all fourteen self-study modules or an equivalent program. After July 1, 2010 all experiential candidates will have to complete the Introductory Course, or an equivalent program, as well. After July 1, 2012, BRPT will phase out experiential eligibility altogether, including eligibility through related credentials, and only accept candidates that have completed a CAAHEP accredited program or add-on track.

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<sup>25</sup> Commission on Accreditation of Allied Health Education Program. 2003, revised. "Standards and Guidelines for the Profession of Respiratory Care.

<sup>26</sup> Bunch, Debbie. May 2006. "Respiratory Care Programs Find Synergy with Sleep: CoARC's New Accreditation Program for Polysomnography Takes Off." *AARC Times* pp.60-66.

The Introductory Course is designed to orient new employees or students to polysomnography. Once the course and exam are completed, the employee or student fits the polysomnographic trainee job description (See page 17).

Up to 30 percent of the introductory course may be taken online. Though providers may choose a schedule that best fits their institution, the Introductory Course syllabus encourages specific topics for each day of training, covering 10 days:

- Day 1: Orientation and facility tour
- Day 2: EEG and sleep staging
- Day 3: Sleep and cardiovascular monitoring
- Day 4: Respiratory monitoring
- Day 5: Sleep related breathing disorders
- Day 6: Sleep related breathing disorders—continued
- Day 7: EMG and movement disorders
- Day 8: Narcolepsy, seizures, and parasomnias
- Day 9: Insomnia, circadian rhythm disorders, & psychiatric disorders
- Day 10: Pediatric polysomnography

The Sleep Disorders Center of Virginia, located in Richmond, is the only accredited Introductory Course provider in Virginia. Priority Health Education, a national provider of sleep-related training located in Chester, Virginia, administers the Virginia program. Priority Health Education is offering three courses in Richmond in 2009.<sup>27</sup>

Self-study modules add a didactic element to on-the-job-training. Each module should take between 45 and 90 minutes to complete. A short exam follows each module. The fourteen self-study modules are:

- Module 1: Introductory Topics
- Module 2: Patient Interaction & Professional Behaviour
- Module 3: Patient Assessment
- Module 4: Performing Polysomnography 1: Theory
- Module 5: Performing Polysomnography 1: Preparation & Setup
- Module 6: Performing Polysomnography 2: Recording and Monitoring
- Module 7: Scoring Sleep Studies
- Module 8: Arousals, Artifacts, & Arrhythmias
- Module 9: Sleep Related Breathing Disorders
- Module 10: Positive Airway Pressure & Oxygen
- Module 11: Evaluation of Sleepiness
- Module 12: Movement Disorders: Disorders of Arousals and Seizures
- Module 13: Pediatric Sleep
- Module 14: Miscellaneous Topics: Sleep Deprivation, Insomnia, Medications & Sleep, Esophageal pH, Alpha Intrusion

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<sup>27</sup> Priority Health Education. "Courses, Descriptions and Dates".  
<http://www.priorityhealtheducation.com/Courses/courses.htm>. Accessed 4/14/2009.

Students who complete the Introductory Course pay a \$50 fee to register for the online exam. The Introductory course itself is administered by approved providers. Priority Health Education offers Introductory Course programs, including programs in Richmond, for \$2,695. This does not include the exam fee.

The Self-Study modules cost \$30 each for persons who have completed the Introductory Course and \$40 for all others. Students that have not previously registered for the online Introductory Course exam must pay a \$50 registration fee to access the online system. The entire program, taken together, costs \$3,165. Taking the self-study modules alone costs \$610.

### A-STEP Equivalent Programs

The BRPT recognizes A-STEP equivalent programs for experiential eligibility. These programs must employ qualified instructors and teach information equivalent to that found in the self-study modules using recommended textbooks. Program directors submit program information, but it is not independently verified. The BRPT recognizes eleven A-STEP equivalent programs. The Piedmont Virginia Community College with Keswick Sleep Center is the only BRPT recognized A-STEP equivalent program in Virginia. Additionally, SleepMultiMedia offers an online A-STEP Equivalent program.

### *Other Educational Programs*

Several other educational programs were discovered during the course of the research. They are listed in Table 11:

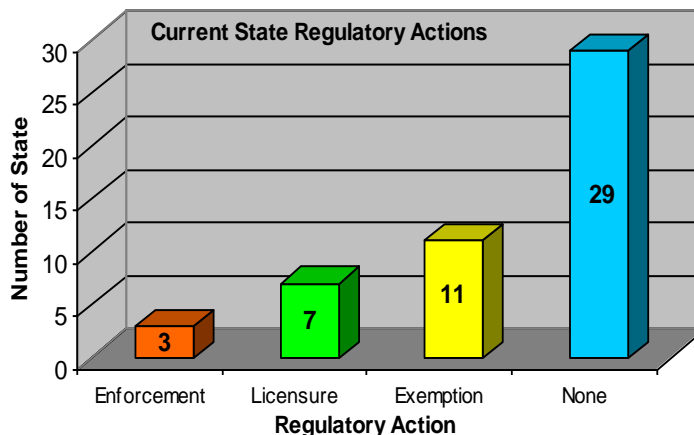
<b>Institution</b>	<b>State</b>	<b>Program Type</b>	<b>Length</b>	<b>Tuition</b>	<b>Accreditation</b>
Larryhead Institute, LLC	MI	Polysomnography Fundamentals Seminar	10-day	\$2,795	NA
Independence University	UT	Online Certificate	NA	NA	Distance Education and Training Council (CHEA-Recognized)*
Highline Community College	WA	Certificate/ Associate	3 quarter/ 2 year	NA	Northwest Commission on Colleges and Universities*
Tidewater Community College	VA	Certificate	3 Semester	NA	Southern Association of Colleges and Schools*
Sleep Med of Greater Washington	VA/DC /MD	Structured OTJ training for employees	3.5 month	NA	NA

**Table 11:** Other Educational Programs

\*The Polysomnography program is associated with a CAAHEP accredited respiratory care program, however the polysomnography add-on is not independently accredited.

## STATE REGULATION

States have pursued diverse statutory and regulatory provisions to deal with the scope of practice issues surrounding this fast developing field. Respiratory care boards in several states have threatened to strictly enforce their scope of practice over modalities routinely performed as part of polysomnograms and treatment for sleep apnea. However, most have refrained from actually pursuing enforcement. Others have instituted licensure or permitting requirements. Several other states have created exemptions to respiratory care acts. Table 12 on page 25 gives an overview of regulatory actions by state.



### *Enforcement*

In 1998 New York's State Board of Respiratory Therapy sent letters to local healthcare providers and facilities informing them of their intent to strictly enforce the state's respiratory therapy statute. Licensed physicians, and their unlicensed delegates, they warned, could face charges of professional misconduct or even criminal charges for respiratory care related activities undertaken by unlicensed polysomnographers. Eleven years later, however, the issue remains. The New York State Education Board, which administers professional regulation, has promised that it will not pursue enforcement pending legislative consideration of a polysomnography licensure bill. However, the two sides of the debate have not been able to come to terms, and the polysomnography bill has lingered in the New York State Assembly since 2007.<sup>28</sup>

Other states have followed suit. In a few states, such as Wyoming and New Jersey, threats of enforcement were followed by resolution. In others, such as Georgia, the possibility of enforcement remains, but is on hold pending legislative action. In California, however, the state Respiratory Care Board has begun to actively enforce California's Respiratory Care Act. While enforcement action had been on hold pending legislative action, on September 27, 2008, Governor Arnold Schwarzenegger vetoed compromise legislation due to the state's severe budget problems. The Respiratory Care Board reinstated its investigations shortly thereafter.<sup>29</sup>

<sup>28</sup> See New York State Society of Sleep Medicine for more information: [www.nysssm.org](http://www.nysssm.org).

<sup>29</sup> For information on California's enforcement action see California's Respiratory Care Board page on Polysomnography, [http://www.rcb.ca.gov/media\\_outreach/polysomnography.shtml](http://www.rcb.ca.gov/media_outreach/polysomnography.shtml), the California Sleep Society website, <http://www.californiasleepsociety.org/>, and Respiratory Care Board. Fall 2008. "Governor Vetoes Bill to Establish Scope of Practice for Sleep Techs, Board Enforcement." *Breathing Matters: The Biannual Newsletter from the Respiratory Care Board*. pp. 1&5.



## *Licensure*

Four states currently license or permit polysomnographers, while three states and the District of Columbia are in the process of implementing approved licensure statutes (See Table 12, page 25). One of the controversies surrounding licensure of polysomnographers revolves around who controls the licensure process. Nationally, state level respiratory care organizations tend to prefer that respiratory care boards administer licensure programs, while sleep-related organizations tend to prefer a licensure program independent of respiratory care. State medical boards or an independent polysomnography board administer, or will administer, licensing in five of the states. In Idaho, the Respiratory Care Board administers polysomnography permits, while in North Dakota, the Board of Respiratory Care administers licenses for polysomnographers.

## *Exemptions*

Exemptions take many forms. Exemptions for polysomnographers vary in three main areas: who is exempted, the scope of practice of exempted persons, and where the exempted persons may practice.

Eleven states provide specific exemptions from state respiratory care acts. Seven of these states specifically exempt persons that meet some or all of the job descriptions developed by AASM, AAST and BRPT (see page 17). Three states limit the exemption to credentialed RPSGTs or R. EEG Ts. Only one state, Colorado, exempts any person performing delegated and supervised tasks regardless of credentials.

Four states limit the exemption to specific, sleep-related tasks such as CPAP titration or oximetry. States that use the specific job descriptions provided by AASM, AAST and BRPT, ipso facto, limit the scope of practice to roles and tasks delineated in the job descriptions (see appendix A for the job descriptions).

Three states limit the exemption to appropriate persons working within a sleep facility. Nebraska and South Carolina limit the exemption to accredited sleep facilities, while Utah does not specify an accreditation requirement.

	Action	By	For	What	Where
<b>Enforcement</b>					
California	Enforcement	Respiratory Care Board	Persons without RC License	Any breathing related diagnostic, treatment or patient education	
New York	Enforcement	Respiratory Care Board	Persons without Respiratory Care license	Deferred action pending passage of legislation	
Georgia	Guidance	Respiratory Care Advisory Board	Unlicensed Persons	May not assess, educate, or treat patients for RC related conditions or tasks. Legislation pending	
<b>License</b>					
Louisiana	License	Independent Advisory Board	Polysomnographers		
Idaho	Permit	Respiratory Care Board	BRPT Job Descriptions	Related Scope of practice	
Maryland	License	Medical Board	Graduates of CAAHEP accredited program or PSG add-on	Must be licensed by October 1, 2009	
New Jersey	License	Independent Board	Polysomnographers		
New Mexico	License	Independent Advisory Board	Polysomnographers	Implementation by 2010	
North Dakota	License	Respiratory Care Board	RPSGTs		
Tennessee	License	Medical Board		Currently developing licensure program	
D.C.	License	Medical Board	BRPT Job Descriptions	Related Scope of Practice	
<b>Exemption</b>					
Illinois	Exemption	Respiratory Care Practice Act	BRPT Job Descriptions	Related Scope of Practice	
Iowa	Position Statement	Respiratory Care Board	RPSGT, REEGT	Qualified to perform sleep-related diagnostics and testing	
Nebraska	Exemption	Respiratory Care Practice Act	RPSGT	O2 therapy or noninvasive PAP	Accredited facilities
New Hampshire	Exemption	Respiratory Care Practice Act	CPFT, RPFT, RPSGT, BRPT Trainee	Limited scope of practice	
North Carolina	Interpretation	Respiratory Care Board	RPSGT & BRPT job descriptions	Sleep-related RC tasks	
Colorado	Exemption	Respiratory Care Practice Act	Any polysomnographer	RC tasks under the direction of a licensed practitioner or RT.	
Ohio	Exemption	Respiratory Care Board Ruling	RPSGT & BRPT job descriptions	PAP, oxygen, pulse oximetry, capnometry, patient education	
South Carolina	Exemption		RPSGT; BRPT Technician & REEGT who complete PAP titration course	PAP titration	Accredited facilities
Utah	Exemption		RPSGT & BRPT Job description	Related scopes of practice	Sleep facilities
Vermont	Exemption	Respiratory Care Practice Act	RSPGT & BRPT Job Description	Related scopes of Practice	
Wyoming	Exemption	Respiratory Care Board	RSPGT & trainees exempted.	Related scopes of practice	

**Table 12:** A brief summary of regulation by state.

## ECONOMIC IMPACT

As noted earlier, sleep medicine is a fast growing field. A MarketData report on the U.S. sleep aid market forecasted that the U.S. sleep market would grow through 2012 by 8.8 percent annually, and that the market for CPAP devices will grow by 18 percent

annually (see Table 13).<sup>30</sup> According to responses to a Wachovia Capital Markets survey, patient volume at sleep clinics grew by 11 percent in the 12 months prior to July 1, 2008.<sup>31</sup> By comparison, the Centers for Medicare and Medicaid Services expect health spending to increase by 6.2 percent annually through 2018.<sup>32</sup>

MarketData research suggests that the typical sleep clinic performs 1,250 sleep studies annually, and has revenues of \$1.33 million.<sup>33</sup> Medicare Participating Physicians receive up to \$607.70 for a polysomnogram, or \$798.03 for a polysomnogram with CPAP titration. The technical component (the part performed by the polysomnographer) accounts for around 77 percent of this fee.<sup>34</sup> By AASM accreditation standards, a single credentialed polysomnographer may perform up to two sleep studies per night. A polysomnographer that works three 12-hour shifts a week and performs two basic polysomnograms each night and has two-weeks vacation would facilitate \$182,310 in Medicare reimbursement.

Market	2007 size	Projected Annual Growth
US Sleep Market	\$23.7 Billion	8.8%*
Sleep Labs	\$4.47 Billion	na
CPAP Devices	\$2.4 Billion	18%*
Health Care	\$2.2 Trillion	6.2%**
US Economy	\$13.2 Trillion	4.1%**

**Table 13:** Size and projected growth of sleep medicine industry compared to the health industry and the US economy.

\*Through 2012, Source: Marketdataenterprises (see note 30)

\*\*Through 2018, Source: Centers for Medicare & Medicaid Services (see note 31)

Equipment to perform polysomnograms is relatively inexpensive. The Respironics Alice 5 Diagnostic Sleep System, the latest system from Phillips Respironics, sells for \$31,795.00 at Medex Supply. Medex Supply lists the retail price at \$38,154.00. The system is network compatible and includes ECG sensors, but other channel sensors must be purchased separately for a couple of hundred to a couple of thousand dollars. Medex Supply sells the Alice 5 LE, a more affordable version of the Alice 5, for \$19,399, with the retail price of \$23,278.80.<sup>35</sup> Used equipment seems to be readily available as well. One polysomnogram machine used to perform a polysomnogram at the lowest Medicare reimbursement rate five nights a week will facilitate \$158,002 in annual revenues.

A fully stocked clinic requires additional equipment, including computer systems, ancillary medical equipment and supplies and hotel-like accommodations. It also includes staffing and overhead charges beyond those directly related to polysomnography.

<sup>30</sup> PRWeb: Press Release. June 9, 2008. "U.S. Sleep Aids Market Grows to \$23 Billion, As Americans Battle Insomnia, Sleep Disorders."

<sup>31</sup> Wachovia Capital Markets, LLC. July 9, 2008. "Equity Research: Q3 2008 Sleep Center Survey." [http://www.sleepreviewmag.com/issues/pdfs/2008\\_Q3\\_survey\\_results.pdf](http://www.sleepreviewmag.com/issues/pdfs/2008_Q3_survey_results.pdf)

<sup>32</sup> Centers for Medicare and Medicaid Services. 2008. "National Health Expenditures Projections, 2008-2018." The Office of the Actuary for Medicare and Medicaid Services.

[http://www.cms.hhs.gov/NationalHealthExpendData/03\\_NationalHealthAccountsProjected.asp#TopOfPage](http://www.cms.hhs.gov/NationalHealthExpendData/03_NationalHealthAccountsProjected.asp#TopOfPage). Accessed April 10, 2009.

<sup>33</sup> PRWeb: Press Release. June 9, 2008. "U.S. Sleep Aids Market Grows to \$23 Billion, As Americans Battle Insomnia, Sleep Disorders." <http://www.prwebdirect.com/releases/2008/6/prweb1006354.php>

<sup>34</sup> See appendix X for related Medicare fees from Trailblazer health.

<sup>35</sup> MedexSupply, Diagnostic Equipment and Accessories. [www.medexsupply.com](http://www.medexsupply.com). Accessed 4/14/2009.

## Salary Information

The Bureau of Labor Statistics (BLS) does not track polysomnographers. A 2003 survey by the Association of Polysomnographic Technologists noted that average salaries for polysomnographic technologists was \$1,719 every two weeks, or \$44,694 annually.<sup>36</sup> This was up from \$1,508 every two weeks, or \$39,208 in 1999<sup>37</sup>, for a 2.65 percent annual growth rate.

Four hundred visitors replied to a 2002 online survey of persons that visited the *ADVANCE for Sleep* and *ADVANCE for Managers of Respiratory* websites. The survey found that sleep professionals that provided direct patient care earned, on average, \$39,520. Respondents with less than 1 year experience earned, on average, \$35,403. Those with the RPSGT credential earned, on average, \$49,205 while those without any credentials earned, on average, \$37,839. This online survey did not use scientific techniques and included responses from respiratory therapists, electroneurodiagnosticians and polysomnographers working at all levels in the sleep field, as well as a few physicians.<sup>38</sup> It is likely skewed towards higher wage earners.

## Earnings Incentive

The Bureau of Labor Statistics, in its Occupational Employment Statistics (OES) program, collects salary and employment information for related professions, including information on respiratory therapists, respiratory technicians, and (in a combined category) for cardiovascular technologists and technicians. The BLS also collects salary information in the catchall category of “health technologists and technicians, all others”. Data is current as of May, 2007, and only includes employed (not self-employed) workers. Table 14 lists employment figures and earnings for these professions in Virginia.

Occupation (SOC code)	Employment (Virginia)	Hourly mean wage	Annual mean wage	Annual 10th %ile wage	Annual median wage
<b>Respiratory Therapists(291126)</b>	2110	\$25.17	\$52350	\$36610	\$52540
<b>Cardiovascular Technologists and Technicians(292031)</b>	1230	\$24.23	\$50400	\$26440	\$53050
<b>Respiratory Therapy Technicians(292054)</b>	330	\$21.84	\$45440	\$32370	\$45070
<b>Health Technologists and Technicians, All Other(292099)</b>	1410	\$16.93	\$35220	\$21550	\$30330

**Table 14:** Virginia employment figures and earnings for professions that compete with polysomnography for recruits, or that offer a recruitment pool.

<sup>36</sup> Green, Kathleen. Spring 2006. “You’re a What?: Polysomnographic Technologist” *Occupational Outlook Quarterly*. pp 54-55.

<sup>37</sup> Health Professions Network. 2002. “Allied Health Profession: Polysomnographic Technology.” [http://www.healthpronet.org/ahp\\_month/01\\_02.html](http://www.healthpronet.org/ahp_month/01_02.html). Accessed April 10, 2009.

<sup>38</sup> Bederka, Mike. 2002. “Salary Savvy.” *ADVANCE for Sleep*. <http://sleep-medicine.advanceweb.com/editorial/content/editorial.aspx?CC=4465>

While there are inherent weaknesses with making inferences using data from different sources and covering different time periods, it seems that polysomnographers earn similar or slightly lower salaries than respiratory therapists or cardiovascular technologists. This likely reflects differing educational, licensing and credentialing requirements among these professions. Additionally, polysomnographers work nights and often earn a night shift incentive rate.

Polysomnographers appear to earn more than health technologists and technicians in general indicating that the field does offer an earnings incentive to the broader technician community. As the profession pursues higher educational and regulatory standards, polysomnographers earnings may match their counterparts in respiratory care and cardiovascular technology.

### ***Cost of Entry***

Currently, polysomnographers may be uncredentialed and receive only on-the-job training. Until recently, the eligibility requirements for the RPSGT credential reflected the broader labor market, and had minimal requirements beyond on-the-job training. The BRPT, however, is swiftly raising entry standards for the RPSGT credential. The BRPT required candidates applying after July 1, 2008 to complete 14 A-STEP modules. After July 1, 2010, candidates must complete the full A-STEP program, which has costs and time commitments similar to formal certificate programs. After July 1, 2012, candidates must complete a formal CAAHEP approved polysomnography program or add-on curriculum. Though these programs are often certificate programs, the cost of entry into the profession of polysomnography is quickly moving towards the costs of other polysomnography-related professions requiring associates degrees.

### ***Virginia Polysomnography***

Since polysomnography is largely unregulated, the exact number of persons performing polysomnograms in Virginia is unknown. According to the BRPT website, 293 Virginia residents held current RPSGT credentials as of July 6, 2009.<sup>39</sup> By comparison, there were 3,482 respiratory care practitioners with active licenses in Virginia on the same date.

Similarly, the exact number of sleep centers is unknown. There are currently 15 AASM-accredited sleep centers and 48 Joint Commission accredited sleep centers attached to hospitals. Three of the Joint Commission accredited centers are federal and another seven are accredited by both AASM and the Joint Commission. There are two Joint Commission accredited independent sleep centers (one of which is federal). Altogether, this represents 58 accredited sleep centers, fifty-four of which are non-federal. In addition to accredited sleep centers, staff identified 78 additional sleep centers with individual addresses advertised on [www.yellowbook.com](http://www.yellowbook.com) and [www.verizon.com](http://www.verizon.com)

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<sup>39</sup> The Board of Registered Polysomnographic Technologists Online Database: <http://www.brpt.org/directory/search06.asp>.

business listings, bringing the total to 132 identified non-federal sleep centers (See Appendix

The Joint Commission does not require accredited facilities to have an RPSGT on staff. Many of these likely use respiratory therapists or other hospital staff in sleep centers in lieu of or to complement RPSGTs. AASM accredited facilities must maintain an RPSGT on staff and all other staff members performing polysomnograms must be enrolled in a sleep specific educational program. Unaccredited facilities have no restrictions.

The 2008 survey performed by Wachovia Capital Markets, LLC in conjunction with *Sleep Review* magazine found that sleep centers have an average of 7.2 beds per center. Using this estimate, we can estimate that Virginia has approximately 418 beds in accredited facilities and 561 beds in unaccredited facilities for a total of 979. Assuming polysomnographers work three twelve hour shifts per week and serve two patients per night, each bed running six nights per week would equate to one employed polysomnographer. This, however, is a very rough estimate for both number of beds and worker per bed, and assumes centers run at full capacity. Additionally, it is unknown what proportion of persons performing polysomnograms are licensed respiratory therapists.

## **HARM**

Concerns about the potential for harm in polysomnography come from three sources. The first source is interventions for breathing related disorders that have traditionally fallen into the scope of practice of respiratory care practitioners. The second is the potential for missed or misdiagnosis of sleep disorders. The third is vulnerability of patients undergoing sleep studies in clinics.

### ***Breathing-Related Interventions***

According to a Wachovia Capital Markets, LLC market research report, approximately 94 percent of the disorders diagnosed in sleep clinics are apnea-related breathing disorders.<sup>40</sup> To treat these and other disorders, polysomnographers often titrate CPAP, BiPAP and low flow supplemental oxygen.

A 2008 literature review by the Centers for Medicare and Medicaid Services “yielded almost no data on any harm from CPAP.”<sup>41</sup> One German study of nine patients did find that improper pressure could cause a variety of problems, such as acute central apneas or cardiac arrhythmias. However, these problems were quickly resolved once

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<sup>40</sup> Wachovia Capital Markets, LLC. July 9, 2008. “Equity Research: Q3 2008 Sleep Center Survey.” [http://www.sleepreviewmag.com/issues/pdfs/2008\\_Q3\\_survey\\_results.pdf](http://www.sleepreviewmag.com/issues/pdfs/2008_Q3_survey_results.pdf)

<sup>41</sup> Centers for Medicare & Medicaid Services. March 13, 2008. “Decision Memo for Continuous Positive Airway Pressure (CPAP) Therapy for Obstructive Sleep Apnea (OSA) (CAG-00093R2).” <https://www.cms.hhs.gov/mcd/viewdecisionmemo.asp?from2=viewdecisionmemo.asp&id=204&>. pp 16 & 24.

observers optimized the pressure. The researchers recommended monitoring during initial titration. Despite the lack of data on harm, CMS did note that there is a dearth of literature on some populations, particularly populations with apnea-related comorbidities.<sup>42</sup>

BiPAP is generally used for patients that cannot tolerate the higher air pressure that occurs during exhalation during CPAP. BiPAP lowers pressure during exhalation. Higher air pressure may cause aerophagia (discomfort or bloating due to swallowing air), or problems with ears and balance.<sup>43</sup> CPAP and BiPAP are associated with a few minor but common side effects. The most common are claustrophobia, feelings of suffocation, musculoskeletal chest discomfort, aerophagia and nasal or sinus discomforts such as dry mouth or congestion. Antihistamines or humidifiers are often effective at treating some of these effects, however compliance remains a major concern. The result is that up to 40 percent of patients for whom CPAP or BiPAP are indicated are not compliant. Proper patient education and follow up care increases compliance rates.<sup>44</sup>

### ***Misdiagnosis***

Misdiagnosis or under diagnosis of sleep disorders precludes patients from seeking treatment. Licensed physicians are responsible for the final diagnosis, including diagnosis done during split-night studies. Poorly performed polysomnograms may hinder the ability of physicians to make accurate diagnoses. However, research on the incidence of poorly performed polysomnograms is lacking and does not appear as a problem in the literature.

Rather, problems with misdiagnosis and under diagnosis are often associated with a lack of education of general practitioners and other physicians on sleep disorders and the recognition of excessive sleepiness. For instance, the National Center on Sleep Disorders Research and the National Highway Traffic Safety Administration Expert Panel on Driver Fatigue and Sleepiness (NCSDR/NHSTA Expert Panel) note that a lack of physician education is an impediment to diagnosis.<sup>45</sup> Recent evidence indicates a growing awareness of sleep disorders among physicians.<sup>46</sup>

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<sup>42</sup> Centers for Medicare & Medicaid Services. March 13, 2008. "Decision Memo for Continuous Positive Airway Pressure (CPAP) Therapy for Obstructive Sleep Apnea (OSA) (CAG-00093R2)." <https://www.cms.hhs.gov/mcd/viewdecisionmemo.asp?from2=viewdecisionmemo.asp&id=204&>. pp 16 & 24.

<sup>43</sup> James A. Rowley, MD. 2 April 2009. "Obstructive Sleep Apnea-Hypopnea Syndrome." Emedicine from WebMD. Treatment and Medication Page: <http://emedicine.medscape.com/article/302773-treatment>. Accessed April 7, 2009.

<sup>44</sup> Ralph Downey III and Philip M Gold. 7 November 2008. "Obstructive Sleep Apnea" Emedicine from WebMD. Treatment and Medication Page: <http://emedicine.medscape.com/article/295807-treatment>. Accessed April 7, 2009.

<sup>45</sup> NCSDR/NHSTA Expert Panel on Driver Fatigue and Sleepiness. 1997. *Drowsy Driving and Automobile Crashes*. National Highway Transportation Safety Administration. [http://www.nhtsa.dot.gov/people/injury/drowsy\\_driving1/Drowsy.html](http://www.nhtsa.dot.gov/people/injury/drowsy_driving1/Drowsy.html)

<sup>46</sup> See Namen et al. June 2002. "Increased Physician-Reported Sleep Apnea: The National Ambulatory Medical Care Survey." *CHEST*. Vol. 121 No. 6, pp 1741-1747.

There are a variety of morbidities associated with a lack of sleep problems and sleep apnea. These include<sup>47</sup>:

- Lower quality of life due to excessive daytime sleepiness and lower neurocognitive performance.
- Hypertension & Increased mortality due to heart failure and stroke
- OSA patients have twice the prevalence coronary artery disease
- Increased risk of diabetes (CPAP use may reverse insulin resistance in some patients, a common precursor of type 2 diabetes)

In addition to these health problems, persons suffering from lack of sleep may face increased risk of motor vehicle or other accidents. In 2007, 3,240 fatigued or apparently asleep drivers were involved in accidents in Virginia, resulting in 38 fatalities. By comparison, 11,133 crashes involved drivers who had been drinking, resulting in 192 fatalities. Many of the fatigued and apparently asleep drivers were also alcohol impaired (See Table 15).<sup>48</sup>

<b>Driver Condition</b>	<b>Number of Drivers</b>	<b>Percent of all Drivers</b>	<b>Fatalities</b>	<b>Percent of all fatalities</b>
Fatigued	1,517	0.6%	10	1.0%
Apparently Asleep	1,723	0.7%	28	2.9%
<b>Total</b>	<b>3,240</b>	<b>1.3%</b>	<b>38</b>	<b>3.9%</b>
Drinking-Impaired	7,019	2.9%	82	7.7%
Drinking- Not Impaired	1,913	0.8%	5	0.5%
Drinking- Impairment Unknown	2,201	0.9%	105	9.9%
<b>Total</b>	<b>11,133</b>	<b>4.6%</b>	<b>192</b>	<b>18.1%</b>
<b>Total -All Crashes</b>	<b>265,589</b>	<b>100%</b>	<b>1,391</b>	<b>100%</b>
Alcohol Related & Fatigued	277	2.7%		
Alcohol Related & Apparently Asleep	233	2.3%		

**Table 15:** The conditions of drivers involved in reported automobile crashes in Virginia and fatalities that resulted from those accidents. There were 145,405 reported crashes in Virginia in 2007, most involving more than one driver. *Source: Virginia Department of Motor Vehicles "2007 Virginia Traffic Crash Facts".*

Many experts note, however, that raw data collected by police and emergency services may underestimate the incidence of sleepiness as a factor in accidents and traffic fatalities. Drivers that survive traffic accidents may underreport fatigue. Additionally,

<sup>47</sup> Ibid, Rowley, James A. Overview page: <http://emedicine.medscape.com/article/295807-overview>

<sup>48</sup> Virginia Highway Safety Office. 2008. "2007 Virginia Traffic Crash Facts." Virginia Department of Motor Vehicles. Richmond, VA. Available at: [http://www.dmv.state.va.us/webdoc/pdf/vacrashfacts\\_07.pdf](http://www.dmv.state.va.us/webdoc/pdf/vacrashfacts_07.pdf)



sleepiness may be impossible to determine when fatalities do occur.<sup>49</sup> Some studies estimate that fatigue is a much more prevalent factor in accidents and accident-related fatalities than official records indicate. For instance, the National Transportation Safety Board estimated that 57 percent of trucker fatalities are the result of fatigued driving.<sup>50</sup> It is unclear, however, how many of these accidents or deaths are related to undiagnosed or untreated sleep disorders instead of other prominent causes of fatigue such as alcohol, drugs, shift work or sleep deprivation.

A review of the literature commissioned by the National Highway Safety Traffic Administration (NHSTA) found that persons with sleep apnea have a two to four fold increase in motor vehicle accidents over control groups. Two studies performed in 1988 and 1989 compared accident rates of persons with sleep apnea to Virginia drivers. Though the sample size is small and driving time is not considered, these results are similar to other findings. The results of each study appear in Table 16.<sup>51</sup>

1988*			1989**		
Pathology	Number	Crashes/driver: 5 years	Pathology	Number	Crashes/driver: 5 years
Sleep Apnea	29	0.41	Severe Sleep Apnea	13	0.46
No Sleep Apnea	35	0.06	Moderate Sleep Apnea	17	0.24
Licensed VA Drivers	3.7 million	0.16	Mild Sleep Apnea	16	0.13
			Licensed VA Drivers	3.7 million	0.16

**Table 16:** Two studies comparing crash rates for persons diagnosed with sleep apnea with the entire population of Virginia, as reported by the National Highway Traffic Safety Administration (See note 32).

\*Findley, L., Unverzagt, M.E., & Suratt, P.M. 1988. "Automobile accidents involving patients with obstructive sleep apnea." *American Review of Respiratory Disease*, 138, 337-340.

\*\*Findley, L., Fabrizio, M.J., Knight, H., Norcross, B.B., Laforte, A.J., & Suratt, P.M. 1989. "Driving simulator performance in patients with sleep apnea." *American Review of Respiratory Disease*, 140, 529-530.

In addition to studies that measure crash rates, researchers use computer performance simulations to measure the performance of sleep-disordered drivers. Though the significance of these findings on real-world driving is unclear, drivers with sleep apnea performed worse on these tests than control groups, adding credence to real

<sup>49</sup> See DrowsyDriving.Org, "Facts and Stats"

[http://www.drowsydriving.org/site/c.lqLPIROCKtF/b.3338585/k.8AB2/Facts\\_and\\_Stats.htm](http://www.drowsydriving.org/site/c.lqLPIROCKtF/b.3338585/k.8AB2/Facts_and_Stats.htm). Accessed 8 June 2009.

<sup>50</sup> Colten, Harvey R. and Bruce M. Altevogt, eds. 2006. *Sleep Disorders and Sleep Deprivation: An Unmet Public Health Problem*. Institute of Medicine Board on Health Science Policies. Washington D.C.: The National Academies Press Pg 149.

<sup>51</sup> Dobbs, Bonnie M. September 2005. *Medical Conditions and Driving: A Review of the Scientific Literature (1960-2000)*. Association for the Advancement of Automotive Medicine for the U.S. Department of Transportation, National Highway Traffic Safety Administration. Report No. DOT HS 809 690. Section 7.3 Table 18.

world data. The report concluded that persons with untreated narcolepsy or sleep apnea should not drive (see Table 17, next page).<sup>52</sup>

Other studies indicate that CPAP treatment is effective in decreasing the crash rates of persons with sleep apnea. A 2006 study by Mazza, et al tested 40 drivers on a real-world driving course, 20 with OSA and 20 without OSA. Patients with untreated OSA reacted, on average, half a second slower than patients without, even among patients showing no overt signs of weariness. Ten OSA patients continued the study following treatment with CPAP. Following CPAP treatment, these patients exhibited normal performance.<sup>53</sup> A 2000 study by Findley, et al compared the driving records of 50 OSA patients, 36 of whom reported being compliant with CPAP treatment. The study found that CPAP compliant patients had reduced accident rates compared to the period before they began treatment, and reduced accidents compared to non-compliant patients.<sup>54</sup>

<b>Sleep Disorders</b>		
Narcolepsy	Should not drive until disorder fully investigated and treated and report considered by DLA.	Patients with a diagnosis of narcolepsy supported by a sleep study and with an episode of cataplexy in the past 12 months (with or without treatment) <i>should not drive any type of motor vehicle.</i>
Sleep Apnea	Should not drive. DLA may issue conditional license if condition stable. Annual review and neurologist opinion recommended.	<p><b>Obstructive Sleep Apnea:</b> Patients with obstructive sleep apnea documented by a sleep study that are compliant with CPAP and UPPP treatments should be safe to drive any type of motor vehicle.</p> <p>Patients with moderate to severe obstructive sleep apnea documented by sleep study who are non-compliant with treatment should not drive any type of motor vehicle.</p> <p>Patients with obstructive sleep apnea who are believed compliant with treatment and who are subsequently involved in a motor vehicle crash should not drive for at least 1 month after the motor vehicle crash. During this one- month period, their compliance must be reassessed. After the one-month period, they may or may not drive depending on the results of reassessment.</p>

**Table 17:** Recommendations from 2005 NHTSA report.

UPPP = Uvulopalato-pharyngoplasty, DLA = Driver Licensing Authority

Source: National Highway Traffic Safety Administration, *Medical Conditions and Driving: A Review of the Scientific Literature (1960-2000)* Bonnie M. Dobbs. Section 7, Table 21.

<sup>52</sup> Ibid, Section 7.3.

<sup>53</sup> Mazza, et al. 2006. "Driving Ability in Sleep Apnoea Patients Before and After CPAP Treatment: Evaluation on a Road Safety Platform." *European Respiratory Journal*. Vol. 28 No. 5. pp 1020-1028.

<sup>54</sup> Findley, L, C Smith, J Hooper, M Dineen & PM Suratt. 2000. "Treatment with Nasal CPAP Decreases Automobile Accidents in Patients with Sleep Apnea." *American Journal of Respiratory and Critical Care Medicine*. Vol 161. pp 857-859

The NCSDR/NHSTA Expert Panel recommends that sleepy drivers either take a nap or consume caffeine equivalent to two cups of coffee. The panel noted that researchers have not identified any other methods that increase driver alertness. Additionally, the panel noted that shoulder rumble strips might prevent accidents during specific instances of sleep, but work best when considered an indicator of sleepiness, not as an accident prevention measure. The panel recommended physician and public education about the effects of drowsy driving and sleep deprivation as the best means of lowering accident rates.<sup>55</sup>

### ***Patient Vulnerability and Practice Setting***

Polysomnograms are usually performed at night. In clinics not attached to hospitals or other healthcare institutions, the person(s) performing polysomnograms may be the only staff persons on premises. Many patients with sleep apnea suffer from related pathologies, such as seizures or cardiovascular problems. Polysomnographers must rely on their own observations and skills to recognize and manage any health care emergencies until community emergency services arrive. While credentialed polysomnographers (of any stripe) must have basic life support certification, only the due diligence of employers ensures that uncredentialed practitioners have appropriate skills.

Additionally, while many facilities allow family members to sleep in the room with patients, the patient is often alone and asleep while the polysomnogram is performed. Sometimes patients take or are given sleep aids. The media has reported several incidents of sexual assault by persons performing polysomnograms. Incidents in California were instrumental in pushing California's Respiratory Care Board to pursue regulation. See Table 18 (next page) for a list of incidents found during the course of the research.

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<sup>55</sup> Ibid, NCSDR/NHSTA Expert Panel.

Date	Location	What	Victim	Who
2006	CA- Salinas Valley Memorial Healthcare System	One Felony and two misdemeanor accounts of sexual battery	3 men	Lacanalale Amorsolo Jr, Sleep technician
2004	D.C.-Walter Reed Army Medical Center	Second Degree Sexual Assault after administering sleep medication. Tapes also revealed the tech had inappropriately touched two other patients.	Army corporal, another soldier & a 16 year old boy	Mario Alberto Echeverri, Contracted Sleep technician- had previously been convicted of disorderly conduct for inappropriately touching a US Park Service Officer. Had been warned by Walter Reed staff. Had been fired from another clinic over criminal complaints of inappropriate touching
2006 & 2007	NJ-Temple and Temple Children's Hospitals	Sexual assault	4 women: 2 patients, 2 staying with sick children	Mathew Philip-sleep study technician
2008	OH- Amherst Superior Medical Sleep Lab	Two counts of gross sexual imposition and two counts of sexual imposition	1 woman & a 17-year old girl	Mina N. Roufail

**Table 18:** An overview of sexual offenses committed by sleep technicians. These offenses were discovered during an internet search.

## PUBLIC COMMENT

The Regulatory Research Committee held a public hearing on February 3, 2009, and accepted written comment from January 6, 2009 to March 6, 2009. At the public hearing, Dr. Robert D. Vorona, President of the Virginia Academy of Sleep Medicine, provided comments in support of licensure of polysomnographers as a distinct profession. Additionally, extensive written comments were received from the Virginia Academy of Sleep Medicine and the Board of Registered Polysomnographic Technologists. Both of these organizations addressed the seven criteria the Board of Health Professions references when considering the need to regulate professions. Written comments are included in a separate document.

## POLICY OPTIONS

When examining other health professions regulated within the Department of Health Professions' health regulatory boards, the key factors that are associated with each form of professional regulation are: educational requirements, examination requirements, scope of practice, discipline, and continuing education. To assist the Committee in its review, Table 4, below, provided an essential overview of each factor in relation to the

form of traditional state regulation. It indicates whether the factor is necessarily required or associated with the form of regulation (Y), is optional (O), or is not required (N).

<b>Form of Regulation</b>	<b>Educational Requirement</b>	<b>Examination Requirement</b>	<b>Discipline</b>	<b>Standards of Practice</b>	<b>Continuing Education</b>
<b>Licensure</b>	O	O	Y	Y	O
<b>Voluntary Certification</b>	O	Y	Y	Y	O
<b>Registration</b>	N	N	Y	Y	O

### **Option 1-Licensure**

Licensure is the most restrictive level of state regulation and largely confers a monopoly to the group in question. Licensure ensures that the scope-of-practice and the professional title are reserved to individuals who meet certain minimal competencies to safely practice. To select this option for Polysomnographers, all six Criteria must be met.

- (1) There must be a high risk of harm to the consumer that results from the practices inherent in the profession, the characteristics of the clients served, and/or the setting or supervisory arrangements for health service delivery.
- (2) The profession must be viewed as requiring special skills and training.
- (3) Practitioners must generally practice autonomously.
- (4) The scope of practice is distinguishable from other health professions and occupations.
- (5) The economic costs to the public of regulation and the potential reduction of supply are justified.
- (6) Alternatives such as strengthening inspections and injunctions, disclosure requirements and consumer protection laws and regulations are insufficient to address the risk of harm to the public from the unregulated practice of the profession.

### **Option 2 – Voluntary Certification**

This is the second most restrictive level of regulation. It presumes a moderate potential for risk of harm to the public that is attributable to the nature of the practice, client vulnerability, or practice setting and level of supervision. It requires that all of the Criteria listed above be met, except #3 (Autonomous Practice). Voluntary certification provides assurances for the public that the individual practitioner who obtains certification has at least a minimal level of competency to safely practice. It affords discipline of the certificate holder. The scope-of-practice is not restricted, but the use of the professional titles or credentials would be reserved to those meeting the certification requirements. This method affords consumers and employers with a means of identifying competent practitioners but does not restrict the performance of their duties only to those certified.

### **Option 3 – Registration**

Registration simply requires that all practitioners be registered as individual practitioners. Discipline could be taken against the registrant and not simply the facility. There is no test of minimal competency. This option provides accountability of the individual without the potential economic impact of restricting the supply of practitioners. Clients, supervisors, and others would be able to track disciplinary history of the individual which should preclude incompetent or unscrupulous practitioners from leaving one area in Virginia only to go to another. Criteria #1, #4, #5 and #6 must be met.

For Options #1, #2 or #3, the regulation of practitioners should be housed within a recognized board which can assure competency, set appropriate standards of care, and take disciplinary action when necessary.

### **Option 4 – No Professional Regulation**

To select this option, the work of practitioners must be considered safe, ordinary work, with no special, distinguishable knowledge or skill required to adequately protect the public's health, safety and welfare.

## **THE FEASIBILITY OF AN INDEPENDENT ADVISORY BOARD**

Staff presented the following analysis of the feasibility for an independent advisory board for polysomnography under the Board of Medicine to the Regulatory Research Committee on September 30, 2009.

### ***Overview***

Polysomnography is a multifaceted discipline that draws on knowledge and technical skills from a variety of disciplines, including electroneurodiagnostics, psychology, pulmonary function technology and respiratory therapy. Nevertheless, up to 95 percent of diagnoses made in sleep centers may be breathing related sleep disorders. Detecting and treating these disorders uses skills and techniques that may fall within the scope of practice of respiratory therapy. These include oximetry, capnography and titration of positive airway pressure and supplemental oxygen. Despite this, these diagnostic techniques and interventions are ancillary to the full practice of polysomnography and sleep medicine.

Once an obscure discipline, sleep medicine has grown quickly over the past decade. While sleep medicine largely developed of its own accord, without significant attention from related disciplines, recent growth has led to scope of practice conflicts in several states. Respiratory therapists, in particular, have sought to protect patients from unscrupulous practitioners in this fast-growing field. In a few states, respiratory care boards have threatened to strictly enforce respiratory care practice acts— which prevent many qualified polysomnographers from practicing. Sleep medicine physicians and polysomnographers have sought to maintain autonomous control over the discipline and raise standards among current practitioners. Some proposed changes to professional credentialing would have made it more difficult for otherwise qualified respiratory therapists or pulmonary function technologists to earn the Registered Polysomnographic Technologist (RPSGT) credential. However, these impediments have been delayed and may be removed entirely.

National controversies concerning control of the discipline have often trickled down to state-level conflicts. Virginia is no exception. While state respiratory care and sleep medicine organizations have agreed on the desirability of licensing polysomnographers, they disagree on how to structure regulatory boards. Representatives of the Virginia Society for Respiratory Care (VSRC) prefer including polysomnography within the existing Advisory Board on Respiratory Care under the Board of Medicine. Representatives of the Virginia Academy of Sleep Medicine (VASM) prefer to have a separate advisory board dedicated to polysomnography.

## Virginia Polysomnography

Since polysomnography is largely unregulated, the exact number of persons performing polysomnograms in Virginia is unknown. According to the BRPT website, 293 Virginia residents held current RPSGT credentials as of July 6, 2009.<sup>56</sup> It is unknown, however, how many of these already hold credentials as Respiratory Therapists or Nurses. There were 3,482 respiratory care practitioners with active licenses in Virginia on the same date.

In the three states that have active licensure/permitting provisions, the number of licensees or permit holders is equal to or less than the number of RPSGTs

residing in the state. In North Dakota, only three of 46 RPSGTs residing in the state maintain polysomnography licenses independent of respiratory care licenses. Only 39 percent of RPSGTs in Louisiana have pursued polysomnography licenses there. This figure includes those also holding Respiratory Therapist licenses. In Idaho, 100 percent of RPSGTs hold polysomnography permits, although many of these may also hold respiratory care licenses. It is significant that none of these states require respiratory therapists to hold separate polysomnography licenses to practice as polysomnographers, leaving it unknown how many persons are practicing as polysomnographers in these states. Regulation in these states likely encouraged uncredentialed polysomnographers to pursue the RPSGT credential. This likely increased the number of RPSGTs in these states.

The exact number of sleep centers is unknown. There are currently 15 AASM-accredited sleep centers and 48 Joint Commission accredited sleep centers associated with hospitals. Three of the Joint Commission accredited centers are federal and another seven are accredited by both AASM and the Joint Commission. There are two Joint Commission accredited independent sleep centers (one of which is federal). Altogether, this represents 58 accredited sleep centers, fifty-four of which are non-federal. In addition to accredited sleep centers, staff identified 78 additional sleep centers with individual addresses advertised on [www.yellowbook.com](http://www.yellowbook.com) and [www.verizon.com](http://www.verizon.com) business listings, bringing the total to 132 identified non-federal sleep centers.

State	Effective Date	RPSGTs residing in State*	Number Licensed**	Percent of RPSGTs licensed
Louisiana	2005	186	72	39%
Idaho	2004	73	73	100%
Maryland	2011	196	-	-
New Jersey	-	270	-	-
New Mexico	2010	78	-	-
North Dakota	2005	46	3	7%
Tennessee	2010	446	-	-
District of Columbia	-	4	-	-
North Carolina	2012	550	-	-
Virginia	-	293	-	-

**Table 1:** Number of RPSGTs in states that regulate or propose to regulate polysomnographers, and the number of licensees.

\*May not include some RPSGTs that chose not to have public listing on the BRPT website. Includes RTs, Nurses, etc., that have earned the RPSGT credential.

\*\*From Board websites or newsletters, summer or fall 2009. May include RTs or nurses that also have a polysomnography license or permit.

<sup>56</sup> The Board of Registered Polysomnographic Technologists Online Database: <http://www.brpt.org/directory/search06.asp>.



The Joint Commission does not require accredited facilities to have an RPSGT on staff. Many of these likely use respiratory therapists or other hospital staff in sleep centers in lieu of or to complement RPSGTs. AASM accredited facilities must maintain an RPSGT on staff and all other staff members performing polysomnograms must be enrolled in a sleep specific educational program. Unaccredited facilities have no restrictions.

The 2008 survey performed by Wachovia Capital Markets, LLC in conjunction with *Sleep Review* magazine found that sleep centers have an average of 7.2 beds per center. Using this estimate, we can estimate that Virginia has approximately 418 beds in accredited facilities and 561 beds in unaccredited facilities for a total of 979. Assuming polysomnographers work three twelve hour shifts per week and serve two patients per night, each bed running six nights per week would equate to one employed polysomnographer. This, however, is a very rough estimate for both number of beds and worker per bed, and assumes centers run at full capacity. Additionally, it is unknown what proportion of persons performing polysomnograms are licensed respiratory therapists. The 48 Joint Commission accredited sleep centers associated with hospitals may rely heavily on respiratory therapists or nurses. These facilities represent over a third of identified sleep centers and could account for a majority of beds (and persons performing polysomnograms) in the state.

### Board of Medicine Advisory Board Structure

By statute, the Virginia Board of Medicine (BOM) consists of one medical physician from each of Virginia’s eleven congressional districts, one osteopathic physician, one podiatrist, one chiropractor and four citizen members. Except for seats reserved for citizen members, the statute directs the Medical Society of Virginia to provide the Governor a list of three recommendations for any vacant seats. The Governor, however, is not bound to select from among this list. Members sit for four-year terms.

Advisory Board	Number of Licensees*	Current Licensees*
Acupuncture	489	398
Radiological Technology	6319	3927
<i>Radiological Technologists</i>	<i>4951</i>	<i>3131</i>
<i>Radiological Technologists Limited</i>	<i>1368</i>	<i>796</i>
Occupational Therapy	3931	3306
<i>Occupational Therapist</i>	<i>3330</i>	<i>2705</i>
<i>Occupational Therapist Assistant</i>	<i>601</i>	<i>601</i>
Respiratory Care	4555	3451
Athletic Training	1373	942
Physician Assistants	2311	1869
Midwifery	45	37
<b>Average</b>	<b>2718</b>	<b>1990</b>
<b>Average excluding Midwifery</b>	<b>3163</b>	<b>2316</b>
Virginia RPSGTs (Active)		293**
Rough estimate of persons performing polysomnograms in Virginia (including RTs, Nurses, etc)		979***

**Table 1:** The number of licensees for the Board of Medicine’s advisory boards.

\* As of September 2, 2009

\*\* As of July 6, 2009. This figure may not include some RPSGTs who requested no public listing. It also includes RTs, nurses and other practitioners that pursued RPSGT credentials.

\*\*\*This is a rough estimate. Hospital-associated centers may rely disproportionately on respiratory therapists and nurses, and may account for most of the polysomnography beds in the state.

Seven Advisory Boards related to allied health professions advise the BOM on matters pertaining to allied health professions regulated by the Board (see Table 1). On average, these advisory boards serve 2718 licensees. These boards range in size by number of licensees from 45 for the Midwifery Advisory Board to 6,319 for the Radiological Technology Advisory Board. Due to the small number of licensees, the Midwifery Advisory Board is an extreme outlier, representing less than 2 percent of the average (arithmetic mean) for all Advisory Boards. Excluding Midwifery, the mean number of licensees rises to 3163. The Acupuncture Advisory Board is the second smallest advisory board, serving 489 licensees.

### Respiratory Care Practitioners Advisory Board

Another option is to include polysomnography with the Respiratory Care Practitioners Advisory Board (RCPAB). The RCPAB consists of five members: three respiratory care practitioners with at least three years experience, one licensed physician and one citizen-at-large. While the RCPAB is instrumental in advising the BOM on matters pertaining to the regulation of respiratory care practitioners, the BOM must approve all recommendations before they take effect.

The RCPAB is currently the second largest advisory board by number of current licensees, serving 4,555 licensed practitioners. If polysomnographers were added to the RCPAB, it would likely remain smaller than the current largest advisory board—radiological technology with 6,319 licensees. The Radiological Technology Advisory Board has the same number of members as the RCPAB, with a similar membership structure.

### **Regulatory Structures in other States**

Currently, only three states have active polysomnography licensure or permitting programs. Five states and the District of Columbia are developing regulatory programs. States that license polysomnographers have pursued a variety of regulatory structures. Two states have responsibility for polysomnography and respiratory care regulation housed in a single regulatory or advisory board, including two states with active programs. Six states and the District of Columbia have separated the two regulatory programs.

### Louisiana

The Louisiana Board of Medical Examiners (LBME) has an advisory committee for polysomnographers. The advisory committee consists of four licensed polysomnographers, one person active in the field of sleep medicine who is not a licensed polysomnographer, three licensed physicians active in sleep medicine, two of whom must be diplomats of the American Board of Sleep Medicine, and one hospital administrator. The Governor must select the licensed polysomnographer and person active in the field of sleep medicine from a list provided by the Louisiana Academy of Sleep Medicine. The Governor must select the physicians from a list provided by Louisiana State Medical

Society and the hospital administrator from a list provided by the Louisiana State Hospital Association. The LBME has a separate advisory committee for respiratory care.

### Idaho

A separate, though not independent, Licensure Board administers licenses for polysomnographers and respiratory therapists for the Idaho Board of Medicine. This includes investigations, discipline and licensing. The Idaho Board of Medicine appoints members to the Licensure Board. The Licensure Board consists of five members. Three must be licensed respiratory therapists, one must be a licensed respiratory therapist whom is also a permitted registered polysomnographic technologist and one additional member who may be public or from the health professions. Two of the licensed respiratory therapists are selected from a list provided by the Idaho Society of Respiratory Care. The permitted polysomnographer is selected from a list provided by the Idaho Sleep Disorder Association.

### Maryland

The Maryland Board of Physicians (MBP) has a Polysomnography Professional Standards Committee. The standards committee recommends regulations and standards for licensure to the MBP. The committee consists of seven members appointed by the MBP: three licensed polysomnographic technologists, three physicians Board certified in sleep medicine (one specialist in psychiatry or internal medicine, one specialist in pulmonary medicine and one specialist in neurology), and one consumer member. The MBP has a separate Respiratory Care Professional Standards Committee. All polysomnographers (including respiratory therapists) must be licensed by October 1, 2011.

### New Jersey

New Jersey has an independent State Board of Polysomnography. Although New Jersey created this board in 2005, it is still creating rules for licensure of polysomnographers. The Board consists of eleven members: six licensed polysomnographic technologists, one medical director, one licensed physician who is also Board certified in sleep medicine, two public members and one state executive department member (not approved by the State Senate). The governor appoints the members. Respiratory care has a separate board.

### New Mexico

The New Mexico Medical Board is currently developing rules for the licensure of polysomnographer. The Polysomnography Practice Advisory Committee, consisting of two RPSGTs, two MDs and one public member, is advising the Medical Board.

The Respiratory Care Advisory Board (RCAB) is not associated with the Medical Board. Rather, the RCAB is an independent Board housed in the New Mexico Regulation and Licensing Department.

### North Dakota

The North Dakota State Board of Respiratory Care, an independent board, issues licenses to polysomnographers. The Board consists of seven members: four respiratory therapists, one registered polysomnographic technologist, one physician and one public member. The governor selects each professional member from a list provided by the corresponding interest group, the North Dakota Society for Respiratory Care, the Association of Polysomnographic Technologists and the North Dakota Medical Association, respectively.

### Tennessee

By July 1, 2010, polysomnographers practicing in Tennessee must be licensed.

The Tennessee Board of Medical Examiners (BME) licenses polysomnographers through the Polysomnography Professional Standards Committee (PPSC). The PPSC has many of the functions of an independent board, including issuing licenses, conducting disciplinary hearings, collecting fees and setting standards, however all actions must be approved by the BME. The PPSC consists of seven members: three registered polysomnographic technologists, one physician Board certified in sleep medicine, one director of an accredited, hospital based sleep center, one respiratory therapist who is also a registered polysomnographic technologist and one consumer member.

An independent Board of Respiratory Care regulates respiratory care practitioners.

### District of Columbia

Effective July 20, 2009, Washington DC began the process of creating a polysomnography license. Regulation of polysomnography was placed under the DC Board of Medicine following resistance from sleep technicians to provisions in the original bill that would have placed regulation under DC's independent Respiratory Care Board. The amended law creates an Advisory Committee on Polysomnography to advise the Board of Medicine on standards and regulations. The advisory committee consists of five members: two physicians board certified in sleep medicine, two licensed polysomnographers, and the Director of the Department of Health or his designee.

### North Carolina

On August 7, 2009 Governor Bev Perdue signed the Polysomnography Practice Act. The act provides for registration of polysomnographers by the Board of Medicine. Exemptions listed in the law effectively limit this act to a title protection law. No

additional advisory body is stipulated in the law. North Carolina has an independent Respiratory Care Board. Prior to implementation of this new law, polysomnographers have practiced under an interpretation of the Respiratory Care Board that referred to the AAST Job Descriptions. All polysomnographers in North Carolina must be registered by July 1, 2012.

State	Separate License?		Regulating Board	Advisory Board	w/ Resp. Care?	Total Members	RPSGT	RT	MD	Admin-istrator	Public
	RCP	END									
Louisiana	No	Yes	Medical Examiners	Polysomnography	No	9	4	-	3	1	1
Idaho	No	Yes	Medicine	Licensure Board	Yes	5	1*	3	-	-	1
Maryland	Yes	Yes	Physicians	Polysomnography Standards Committee	No	7	3	-	3	-	1
New Jersey	No	-	Polysomnography	-	No	11	6	-	1	2	2
New Mexico	-	-	Medical	Polysomnography	No	5	2	-	2	-	1
North Dakota	No	-	Respiratory Care	-	Yes	7	1	4	1	-	1
Tennessee	No	-	Medical Examiners	Polysomnography Standards Committee	No	7	3	1*	1	1	1
District of Columbia	-	-	Medicine	Polysomnography	No	5	2	-	2	1	-
North Carolina	No	No	Medicine	-	No	-	-	-	-	-	-

**Table 2:** Regulatory Structures in other states. Many of these programs are still under development  
 \*Indicates a polysomnographer also credentialed as a respiratory therapist.

### *Estimate of Numbers*

There may be up to 979 persons that perform polysomnograms in Virginia. However, most of these are likely already regulated as nurses or as respiratory care practitioners. Experiences from other states indicate that not all of these practitioners—even ones that pursue RPSGT credentials—will pursue a separate polysomnographer license. Additionally, only three states have active regulatory programs for polysomnographers. The ease, cost and desirability of gaining a polysomnography license or permit varies within each of these states. These factors make estimates of the number of potential polysomnography licensees in Virginia particularly problematic. It is likely to be fewer than the number of RPSGTs residing in the state. This number, however, is likely to grow as the practice of sleep medicine expands and licensure requirements become effective. Nevertheless, with the exception of midwifery, an independent advisory board for polysomnographers would likely be the smallest of the Board of Medicine's advisory boards. Allowing for a great degree of uncertainty, it is the feeling of staff that about 175 to 225 persons would seek a polysomnography license if the Department implemented a program at this time.

## ***Fiscal Impact***

The finance department developed financial impact estimates for 275 licensees. This number of licensees would not require additional full time employee, and would have a small impact on the Department of Health Profession’s Budget, totaling approximately \$3,515 annually. Support for an independent advisory board would cost add an additional \$5,000 annually (See Table 3). Using current fee structures for all Board of Medicine licensees (\$135 per biennium), revenues from 275 licenses would exceed \$37,125 per biennium, or \$18,652.50 per year. To break even, a regulatory structure with an independent advisory board would require 64 licensees. A regulatory structure without an independent advisory board would break even with 27 licensees.

Grandfathering or other provisions may cause the number of licensees to be low initially, and any new program may operate at a loss before revenue ramps up. Additionally, Board of Medicine staff have indicated that current staffing per licensee is low relative other states. Although polysomnography alone may not require additional staff, they will accelerate the need for additional staff.

## ***Policy Options***

This section presents two policy options, and a rationale for each option.

### Create an Independent Advisory Board under the Board of Medicine

Polysomnography is a distinct profession that incorporates aspects of several disciplines. Despite performing a small number of respiratory care related tasks, polysomnographers do not perform respiratory care. Basic respiratory care education does not include non-respiratory sleep disorders such as narcolepsy or restless leg syndrome; sleep related tests such as Maintenance of Wakefulness Testing; or even the performance of polysomnograms.

An independent advisory board, consisting of licensed polysomnographers and a Board certified physician in sleep medicine have the knowledge and background to advise on standards related to the regulation of polysomnographers. Including polysomnography within the RCPAB would result in respiratory therapists and others without sleep-specific training setting these standards. As the practice of sleep medicine

<b>Direct Cost</b>	<b>Annual Costs</b>
Office Supplies/Postage	\$700
<b>Indirect/Allocated Cost</b>	
Data Center	-
Human Resources	-
Finance	\$485
Directors Office	\$265
Enforcement	\$1,280
Administrative Proceedings	\$580
Impaired Practitioners	Negligible
Attorney General	Negligible
Board of Health Professions	\$155
Program Development and Implementation	\$50
<b>Total</b>	<b>\$3,515</b>
Independent Advisory Board Support	\$5,000
<b>Total w/ Ind. Adv. Board</b>	<b>\$8,515</b>

**Table 3:** Costs associated with regulation of polysomnographers

and polysomnography develops, respiratory therapists may not be inclined to change standards for entry into the profession—especially if they might affect respiratory therapists performing polysomnograms.

### Incorporate Polysomnographers into the Advisory Board for Respiratory Care

Although polysomnography incorporates only a small number of respiratory-related tasks, the greater majority of patients seen by polysomnographers have sleep-related respiratory problems. Many respiratory therapists already perform polysomnograms. Many respiratory-care educational programs (including the program at Tidewater Community College) incorporate polysomnography tracks. Respiratory therapist professional organizations have a long track record working with polysomnography, and respiratory therapists have the knowledge and background to advise on polysomnography regulations.

The language adopted by the Board of Medicine in supporting licensure proscribes an additional licensure requirement for licensed respiratory therapists performing polysomnograms. The RC Advisory Board will continue to advise the BOM on standards related to RTs performing polysomnograms regardless of the advisory board structure. Dividing the two groups into different advisory boards may result in competing standards or claims and would likely require significant coordination. A single advisory board may better facilitate coordination.

Finally, the potentially small number of polysomnography licensees may not warrant an independent advisory board.

Polysomnographers may be incorporated into the RCPAB through three possible methods:

Option 1: One of the three current seats dedicated to a licensed respiratory care practitioner may be “switched” from to a licensed polysomnographer.

Option 2: One of the current seats may be dedicated to a licensed respiratory care practitioner could include a requirement that the member also has the qualifications to obtain a polysomnography license.

Option 3: An additional seat, dedicated to a licensed polysomnographer, may be added to the RCPAB.

Additionally, two of these options (particularly options 2 & 3) may be combined.

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## APPENDIX

### Appendix A Polysomnographic Job Descriptions

<http://www.aastweb.org/JobDescriptions.aspx>

Accessed 4/14/2009

#### SLEEP TRAINEE

##### Position Summary

A Sleep Trainee develops competency in and performs the basics of polysomnographic testing and associated interventions under direct supervision of a Sleep Technician or a Sleep Technologist.

##### Domains of Practice

##### Gather and Analyze Patient Information

- Verify the medical order and protocol.
- Complete and verify documentation.
- Explain the procedure and orient the patient to the sleep center.

##### Testing Preparation Procedures

- Prepare and calibrate equipment required for testing to determine proper functioning.
- Apply electrodes and sensors according to accepted published standards.
- Perform appropriate physiologic calibrations to ensure proper signals.
- Perform routine positive airway pressure (PAP) mask fitting.

##### Polysomnographic Procedures

- Follow procedural protocols [such as Multiple Sleep Latency Test (MSLT), Maintenance of Wakefulness Test (MWT), parasomnia studies, PAP and oxygen titration, etc.] to ensure collection of appropriate data.
- Follow “lights out” procedures to establish and document baseline values (such as body position, oxyhemoglobin saturation, respiratory and heart rates, etc.)
- Perform polysomnographic data acquisition while monitoring study-tracing quality to ensure signals are artifact-free. Identify and report signal abnormalities.
- Document routine observations, including sleep stages and clinical events, changes in procedure, and other significant events in order to facilitate scoring and interpretation of polysomnographic results.
- Assist with appropriate interventions (including actions necessary for patient safety and therapeutic intervention such as continuous and bi-level positive airway pressure, oxygen administration, etc.).
- Follow “lights on” procedures to verify integrity of collected data and complete the data collection process (e.g. repeats the physiological and instrument calibrations and instructs the patient on completing questionnaires, etc.).

Demonstrate the knowledge and skills necessary to recognize and provide age specific care in the treatment, assessment, and education of neonatal, pediatric, adolescent, adult, and geriatric patients.

### **Service Management and Professional Issues**

Comply with applicable laws, regulations, guidelines and standards regarding safety and infection control issues.

Participate in equipment care and maintenance.

Maintain current CPR or BCLS certification.

Demonstrate effective written and spoken communication skills.

Demonstrate appropriate social skills.

Demonstrate ability to follow direction.

### **Education and/or Experience**

High school diploma or GED plus 6 months of direct patient care experience or 1 year of postsecondary education.

### **OR**

Current enrollment in an accredited educational program leading to an associate degree with an emphasis in polysomnography.

### **Physical Demands**

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions.

While performing the duties of this job, the employee is frequently required to stand; use hands to finger, handle, or feel; reach with hands and arms; climb or balance; and talk or hear. The employee is occasionally required to walk; sit; and stoop, kneel, crouch, or crawl. The employee must regularly lift and/or move up to 10 pounds, frequently lift and/or move up to 25 pounds, and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision, distance vision, color vision, peripheral vision, depth perception, and ability to adjust focus.

### **Work Environment**

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. In the performance of this job, the employee may be exposed to chemical vapors such as acetone, ether, or glutaraldehyde. There may also be skin contact with these substances. The employee may also be exposed to infectious agents including blood-borne pathogens.

## **SLEEP TECHNICIAN**

### **Position Summary**

A Sleep Technician performs comprehensive polysomnographic testing and analysis, and associated interventions under the general oversight of a Sleep Technologist (RPSGT) and/or the clinical director (MD, PhD, DO) or designee. A Sleep Technician may provide supervision of a Sleep Trainee.

### **Domains of Practice**

#### **Gather and Analyze Patient Information**

Review history, physical information, medications, procedure request, and study protocol.

Complete and verify documentation.

Explain the procedure and orient the patient to the sleep center.

#### **Polysomnographic Procedures**

Prepare and calibrate equipment required for testing to determine proper functioning and make adjustments, if necessary.

Apply electrodes and sensors according to accepted published standards.

Perform appropriate physiologic calibrations to ensure proper signals and make adjustments, if necessary.

Perform routine positive airway pressure (PAP) mask fitting.

#### **Testing Preparation Procedures**

Follow procedural protocols [such as Multiple Sleep Latency Test (MSLT), Maintenance of Wakefulness Test (MWT), parasomnia studies, PAP and oxygen titration, etc.] to ensure collection of appropriate data.

Follow “lights out” procedures to establish and document baseline values (such as body position, oxyhemoglobin saturation, respiratory and heart rates, etc.)

Perform polysomnographic data acquisition while monitoring study-tracing quality to ensure signals are artifact-free and make adjustments, if necessary.

Document routine observations, including sleep stages and clinical events, changes in procedure, and other significant events in order to facilitate scoring and interpretation of polysomnographic results.

Implement appropriate interventions (including actions necessary for patient safety and therapeutic intervention such as continuous and bi-level positive airway pressure, oxygen administration, etc.)

Follow “lights on” procedures to verify integrity of collected data and complete the data collection process (e.g. repeats the physiological and instrument calibrations and instructs the patient on completing questionnaires, etc.)

Demonstrate the knowledge and skills necessary to recognize and provide age specific care in the treatment, assessment, and education of neonatal, pediatric, adolescent, adult, and geriatric patients.

### **Polysomnographic Record Scoring**

Assist with scoring sleep/wake stages by applying professionally accepted guidelines.

Assist with scoring clinical events (such as respiratory events, cardiac events, limb movements, arousals, etc.) with center specific protocols.

Assist with the generation of accurate reports by tabulating sleep/wake and clinical event data.

### **Service Management and Professional Issues**

Comply with applicable laws, regulations, guidelines and standards regarding safety and infection control issues.

Perform routine equipment care and maintenance and inventory evaluation.

Maintain current CPR or BCLS certification.

Demonstrate effective written and spoken communication skills.

Demonstrate appropriate social skills.

Demonstrate ability to follow direction.

Respond to study participant's procedural-related inquiries by providing appropriate information.

### **Education and/or Experience**

Successful completion of a polysomnography program, of no less than one year duration, associated with a state licensed and/or a nationally accredited educational facility.

### **OR**

A minimum of 6 months of experience as a Sleep Trainee with documented proficiency in all required competencies.

### **Physical Demands**

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. While performing the duties of this job, the employee is frequently required to stand; use hands to finger, handle, or feel; reach with hands and arms; climb or balance; and talk or hear. The employee is occasionally required to walk; sit; and stoop, kneel, crouch, or crawl. The employee must regularly lift and/or move up to 10 pounds, frequently lift and/or move up to 25 pounds, and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision, distance vision, color vision, peripheral vision, depth perception, and ability to adjust focus.

### **Work Environment**

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. In the performance of this job, the employee may be exposed to chemical vapors such as acetone, ether, or glutaraldehyde. There may also be skin contact with these substances. The employee may also be exposed to infectious agents including

blood-borne pathogens.

## **SLEEP TECHNOLOGIST**

### **Position Summary**

A Sleep Technologist works under the general supervision of the clinical director (M.D., D.O., or PhD) or designee to provide comprehensive evaluation and treatment of sleep disorders. This may involve polysomnography, diagnostic and therapeutic services or patient care and education. A Sleep Technologist may perform the duties defined for a Sleep Technician and may provide oversight of other staff.

### **Domains of Practice**

#### **Gather and Analyze Patient Information**

Collect, analyze and integrate patient information in order to identify and meet the patient-specific needs (Physical/mental limitations, current emotional/physiological status regarding the testing procedure, pertinent medical/social history), and to determine final testing parameters/procedures in conjunction with the ordering physician or clinical director and laboratory protocols.

Complete and verify documentation.

Explain pre-testing, testing, and post-testing procedures to the patient.

#### **Testing Preparation Procedures**

Prepare and calibrate equipment required for testing to determine proper functioning and make adjustments if necessary.

Apply electrodes and sensors according to accepted published standards.

Perform appropriate physiologic calibrations to ensure proper signals and make adjustments if necessary.

Perform positive airway pressure (PAP) mask fitting.

#### **Polysomnographic Procedures**

Follow procedural protocols [such as Multiple Sleep Latency Test (MSLT), Maintenance of Wakefulness Test (MWT), parasomnia studies, PAP, oxygen titration etc.] to ensure collection of appropriate data.

Follow “lights out” procedures to establish and document baseline values (such as body position, oxyhemoglobin saturation, respiratory and heart rates, etc.)

Perform Polysomnographic data acquisition while monitoring study-tracing quality to ensure signals are artifact-free and make adjustments, if necessary.

Document routine observations including sleep stages and clinical events, changes in procedure, and significant events in order to facilitate scoring and interpretation of polysomnographic results.



Implement appropriate interventions (including actions necessary for patient safety and therapeutic intervention such as continuous and bi-level positive airway pressure, oxygen administration, etc.)

Follow “lights on” procedures to verify integrity of collected data and complete the data collection process (repeats the physiological and instrument calibrations and instructs the patient on completing questionnaires, etc.)

Demonstrate the knowledge and skills necessary to recognize and provide age specific care in the treatment, assessment, and education of neonatal, pediatric, adolescent, adult, and geriatric patients.

Oversees and performs difficult and unusual procedures and therapeutic interventions.

### **Polysomnographic Record Scoring**

Score sleep/wake stages by applying professionally accepted guidelines.

Score clinical events (such as respiratory events, cardiac events, limb movements, arousals etc.) according to center specific protocols.

Generate accurate reports by tabulating sleep/wake and clinical event data.

### **Service Management and Professional Issues**

Comply with applicable laws, regulations, guidelines and standards regarding safety and infection control issues.

Perform routine and complex equipment care and maintenance.

Evaluate sleep study related equipment and inventory.

Maintain current CPR or BCLS certification.

Demonstrate effective written and spoken communication skills.

Demonstrate appropriate social skills.

Respond to study participant’s procedural-related inquiries by providing appropriate information.

Demonstrate the ability to analyze complex situations and apply policy.

Comply with the BRPT Standards of Conduct.

### **Education and/or Experience**

Successful completion of an accredited educational program leading to an associate degree with an emphasis in polysomnography.

**OR**

Successful completion of a polysomnography program of no less than one than one year duration associated with a state licensed and/or a nationally accredited educational facility or equivalent experience and documented proficiency at all competencies required of a Sleep Technician.

**AND**

Certification by the Board of Registered Polysomnographic Technologists as a Registered Polysomnographic Technologist or equivalent.

**Physical Demands**

The physical demands described here are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. While performing the duties of this job, the employee is frequently required to stand; use hands to finger, handle, or feel; reach with hands and arms; climb or balance; and talk or hear. The employee is occasionally required to walk; sit; and stoop, kneel, crouch, or crawl. The employee must regularly lift and/or move up to 10 pounds, frequently lift and/or move up to 25 pounds, and occasionally lift and/or move up to 50 pounds. Specific vision abilities required by this job include close vision, distance vision, color vision, peripheral vision, depth perception, and ability to adjust focus.

**Work Environment**

The work environment characteristics described here are representative of those an employee encounters while performing the essential functions of this job. Reasonable accommodations may be made to enable individuals with disabilities to perform the essential functions. In the performance of this job, the employee may be exposed to chemical vapors such as acetone, ether, or glutaraldehyde. There may also be skin contact with these substances. The employee may also be exposed to infectious agents including blood-borne pathogens.

## Appendix B

Trailblazer Health Medicare Fee Schedule for Virginia:

<http://www.trailblazerhealth.com/Tools/Fee%20Schedule/MedicareFeeSchedule.aspx>

Select:

Year: 2009

State: Virginia

Locality: All of Virginia

Once these parameters are selected, the entire fee schedule may be downloaded. The fee schedule does not include procedure names. These have been added. Likewise, codes TC (technical component) and 26 (professional component) codes are written out. Percentage TC was calculated using Excel. Fees do not include the cost of interpreting Medicare fee schedules, which the author believes may be significant.

MD	PAR FEE	NPAR FEE	LMTD FEE	ST	YEAR		Percent TC
Total	396.68	376.85	433.38	VA	2009	Multiple Sleep Latency Test	0.775713
Technical Component	307.71	292.32	336.17	VA	2009	Multiple Sleep Latency Test	
Professional Component	88.96	84.51	97.19	VA	2009	Multiple Sleep Latency Test	
Total	463.11	439.95	505.94	VA	2009	Sleep Study, attended	0.831401
Technical Component	385.03	365.78	420.65	VA	2009	Sleep Study, attended	
Professional Component	78.07	74.17	85.3	VA	2009	Sleep Study, attended	
Total	607.7	577.32	663.92	VA	2009	Polysomnography 1-3	0.794043
Technical Component	482.54	458.41	527.17	VA	2009	Polysomnography 1-3	
Professional Component	125.16	118.9	136.74	VA	2009	Polysomnography 1-3	
Total	724.28	688.07	791.28	VA	2009	Polysomnography, 4 or more	0.772243
Technical Component	559.32	531.35	611.05	VA	2009	Polysomnography, 4 or more	
Professional Component	164.96	156.71	180.22	VA	2009	Polysomnography, 4 or more	
Total	798.03	758.13	871.85	VA	2009	Polysomnography w/ CPAP	0.777815
Technical Component	620.72	589.68	678.13	VA	2009	Polysomnography w/ CPAP	
Professional Component	177.31	168.44	193.71	VA	2009	Polysomnography w/ CPAP	

## Appendix C

### List of Sleep Centers in Virginia: July, 2009

Sources:

The Joint Commission: [www.qualitycheck.org](http://www.qualitycheck.org)

The American Academy of Sleep Medicine: [www.sleepcenters.org](http://www.sleepcenters.org)

The Yellow Book: [www.yellowbook.com](http://www.yellowbook.com)

Verizon: [www.verizon.com](http://www.verizon.com)

Please note: The purpose of this list was obtain a ballpark count of individual centers. Addresses may not contain suite, floor or apartment numbers and may not be accurate.

<b>Name</b>	<b>Address</b>	<b>City</b>
1st Class Sleep Diagnostic Center	19420 Golf Vista Plaza	Leesburg
1st Class Sleep Diagnostic Center	3949 Pender Dr	Fairfax
Alleghany Regional Hospital	One ARH Lane	Low Moor
AMC Sleep Lab	96 Medical Center Dr	Fishersville
American Sleep Medicine	8300 Boone Blvd	Vienna
Arlington Sleep Medicine	3833 Fairfax Dr	Arlington
Augusta Medical Center-Sleep Laboratory	78 Medical Center Dr	Staunton
Bedford Memorial Hospital	1613 Oakwood St	Bedford
Bluefield Pulmonary Consultants	103 Westwood Commons	Bluefield
Bon Secours DePaul Medical Center	150 Kingsley Lane	Norfolk
Bon Secours Maryview Medical Center	3636 High St	Portsmouth
Bon Secours Memorial Regional Medical Center-Sleep Lab	5500 Monument Ave	Richmond
Bon Secours St Mary's Hospital	5801 Bremo Rd	Richmond
Buchanan General Hospital	1535 Slate Creek Rd	Grundy
Capital Sleep Center	2616 Sherwood Hall	Alexandria
Capital Sleep Specialists & Diagnostic Centers LLC	1395 Piccard Drive	Rockville
Capital Sleep Specialists & Diagnostics Centers, LLC	3289 Woodburn Rd	Fairfax
Carillion New River Valley Medical Center	2900 Lamb Circle	Christiansburg
Carillion Sleep Center	1030 South Jefferson St	Roanoke
Carillion Sleep Center	278 Westlake Rd	Hardy
Carillion Sleep Center	701 Randolph St	Radford
Carillion Stonewall Jackson Hospital	One Health Circle	Lexington
Center for Cardiac Sleep	3301 Woodburn Rd	Annandale
Center for Cardiac Sleep	4000 Genesee Pl	Woodbridge
Centra health Forest Sleep Center	1084 Thomas Jefferson Rd	Forest
Centra Lynchburg General Hospital	1901 Tate Springs Rd	Lynchburg
Central Virginia Sleep Disorders Center	1601 Rolling Hills Dr	Richmond
Charette Health Care Center	620 John Paul Jones Circle	Portsmouth
Chesapeake General hospital	736 N. Battlefield Blvd	Chesapeake
Children's hospital of the King's Daughters	601 Children's Lane	Norfolk
Children's Pulmonary and Sleep Services	2103 N. Parham Rd	Richmond
CJW Medical Center-Chippenham	7101 Jahnke Rd	Richmond
Clinch Valley Medical Center-Sleep Studies	2949 West Front St	Richlands

Community Sleep & Diagnostic Lab	510 W. Ridge Rd	Wytheville
Comprehensive Sleep Care Center LLC	19441 Golf Vista Plaza	Leesburg
Danville Pulmonary Sleep Center	4545 Riverside Drive	Danville
Diagnostic Sleep Disorder Centers	422 West Main	Wise
EO2 Sleep Center	1224 Executive Blvd	Chesapeake
Fauquier Hospital Sleep Laboratory	500 Hospital Dr	Warrenton
First Class Sleep Diagnostic Center	3911 Old Lee Hwy	Fairfax
Greater Washington Area Sleep Disorders Center	8344 Traford Ln	Springfield
Health Matters	13234 Kings Highway	King George
Henrico Doctors' Hospital	7660 East Parham Rd	Richmond
Inova Alexandria Hospital	4320 Seminary Rd	Alexandria
Inova Fair Oaks Hospital	3600 Joseph Siewick Drive	Fairfax
JMH Medias Sleep Center	320 Valley Street	Abingdon
Johnston Memorial Hospital	351 Court St, NE	Abingdon
Keswick Sleep Institute	154 Hansen Rd	Ste 101 Pennington Gap
Lee Regional Medical Center	1800 Combs Rd	Leesburg
Leesburg Sleep Disorders Center	19450 Deerfield	Salem
Lewis-Gale Physicians LLC-Sleep Center	1802 Braeburn Dr.	Lynchburg
Lynchburg Pulmonary Sleep Disorders Clinic	2011 Tate Springs Rd	Charlottesville
Martha Jefferson Hospital	459 Locust Avenue	Fredericksburg
Mary Washington Hospital, Inc	1001 Sam Perry Blvd	Christiansburg
Medias	10 Hickok St	Galax
Medias	500 Glendale Rd	Galax
Medias Inc Sleep Center (Twin River Valley)	199 Hospital Dr	Lebanon
Medias-Russell County Medical Center	Carroll & Tate St	Tazewell
Medias--Tazewell Community Hospital	141 Ben Bolt Ave	
Memorial Hospital of Martinsville & Henry County	320 Hospital Dr	Martinsville
Mountain View Regional Medical Center	310 Third St NE	Norton
Mt. Vernon Sleep Center	3500E Plank Rd	Fredericksburg
Neurology Consultants & Sleep Disorder Center	1540 Breezeport Way	Suffolk
Neurology Consultants & Sleep Disorder Clinic	637 Kingsborough S	Chesapeake
Northern VA Sleep Diagnostic Center	8503 Arlington Blvd	Fairfax
Nova Sleep Apnea Center	1800 Town Center	Reston
Obici Sleep Disorders Center	2800 Godwin Blvd	Suffolk
Omega Sleep Disorders and Diagnostics Center	5230 Hickory Park Dr	Glen Allen
Pnhs Sleep Lab	12359 Sunrise Valley Dr	Reston
Potomac Hospital	2300 Opitz Blvd	Woodbridge
Prince William Neurology and Sleep Disorder Center	14401 Hereford Rd	Woodbridge
River City Sleep Medicine	3111 Northside Ave	Richmond
Riverside Regional Medical Center	500 J. Clyde Morris Blvd	Newport News
Riverside Sleep Disorder Center	12420 Warwick Blvd	Newport News
RMH Center for Sleep Medicine	640 S. Main St	Harrisonburg
Rockingham Memorial Hospital	100 E. Grace St	Harrisonburg
Salem VA Medical Center	1970 Roanoke Blvd	Salem
Sentara Bayside Sleep Disorders Center	800 Independence Blvd	Virginia Beach
Sentara CarePlex Hospital	3000 Coliseum Dr	Hampton
Sentara Hospitals Norfolk	600 Gresham	Norfolk

Sentara Norfolk General Hospital	6015 Poplar Hall Dr	Norfolk
Sentara Virginia Beach General Hospital Sleep Disorder Center	1060 First Colonial Rd	Virginia Beach
Sentara Williamsburg Regional Medical Center	100 Sentara Circle	Williamsburg
Shenandoah Memorial Hospital	759 South Main St	Woodstock
Shore Memorial Hospital	9507 Hospital Ave	Nassawadox
Sleep Center	24 S. Main St	Kilmarnock
Sleep Center Commonwealth	7001 Heritage Village Plaza	Gainesville
Sleep Center-Twin County RGNL	160 N Main St	Hillsville
Sleep Clinic for Children	5 E Clay St	Richmond
Sleep Diagnostics	7305 Boulder View Ln	Richmond
Sleep Disorder INCE NE	4080 Lafayette Center Dr	Chantilly
Sleep Disorders Center	1603 Santa Rosa Rd #201	Richmond
Sleep Disorders Center	1800 Glenside Dr	Richmond
	2354 Colony Crossing	
Sleep Disorders Center	Place	Midlothian
Sleep Disorders Center	8405 N. Run Medical Dr	Mechanicsville
Sleep Disorders Center of Richmond	7603 Forest Ave	Richmond
		Colonial Heights
Sleep Disorders Center of Virginia	130 Temple Lake Dr	Fairfax
Sleep Disorders Centers of Mid-Atlantic	10875 Main St	
Sleep Disorders Centers of Pulmonary Associates	1000 Boulders Parkway	Richmond
Sleep Disorders Centers of the Mid Atlantic	2235 Cedar Ln	Vienna
Sleep Disorders Center-UVA	302 W Rector St	Charlottesville
Sleep Disorders Network	710 W. Ridge Rd	Wytheville
Sleep Disorders Network of Southwest Virginia	2955 Market St	Christiansburg
Sleep EZ Diagnostics Center, Inc	1957 W. Main St	Salem
Sleep Lab of Alfa Neurology	1500 N Beaugard St	Alexandria
Sleep Medical Digitrace Care	7233 Hanover Parkway	Falls Church
Sleep Solutions of Fredericksburg	521 Park Hill Dr	Fredericksburg
Sleepmed	3299 Woodburn Rd	Annandale
Sleepmed Digitrace	8505 Arlington Blvd	Fairfax
Sleepmed Hampton Roads	200 Medical Pkwy	Chesapeake
Sleepmed Hampton Roads	2115 Executive Dr	Hampton
Sleepmed Hampton Roads	4480 Holland Park	Virginia Beach
Sleepmed Hampton Roads	606 Denbigh Blvd	Newport News
Sleepmed Therapy	2905 Fox Mill Rd	Herndon
Sleepworks	8101 Hinson Farm Rd	Alexandria
Smyth County Community Hospital	565 Radio Hill Rd	Marion
Southampton Sleep Disorders Center	110 Fairview Dr	Franklin
Southern Virginia Psychiatry and Sleep Medicine	727 N. Main St	Emporia
Southside Community Hospital Sleep Clinic	800 Oak St	Farmville
The Neurology & Sleep Clinic of Southern Virginia	2206 Wilborn Ave	South Boston
Tidewater Neurologists & Sleep Disorder Specialists	154 Burnetts Way	Suffolk
Tidewater Neurologists & Sleep Disorder Specialists	3235 Academy Ave	Portsmouth
Tri City Sleep Center	603 Eppes St	Hopewell
Tri-Cities Medical Specialist	602 North 6th Ave	Hopewell

VCU Health System	1250 East Marshall	Richmond
Virginia Baptist Hospital Sleep Disorders Center	1900 Tate Springs Road	Lynchburg
	1701 North George Mason	
Virginia Hospital Center	Dr	Arlington
Warren Memorial Hospital	1000 N. Shenandoah Ave	Front Royal
Williamsburg Neurology PC & Sleep Disorders	120 Kings Way	Williamsburg
Winchester Medical Center, Inc	1840 Amherst St	Winchester
Wythe County Community Hospital	600 West Ridge Rd	Wytheville

## Appendix D

### 2010 RECONVENED SESSION

#### REENROLLED

#### 1 VIRGINIA ACTS OF ASSEMBLY — CHAPTER

2 *An Act to amend the Code of Virginia by adding in Article 4 of Chapter 29 of Title 54.1 sections*  
3 *numbered 54.1-2957.14 and 54.1-2957.15, relating to licensure of polysomnographic*  
4 *technologists.*

4 [H 725]

5 Approved

#### 6 **Be it enacted by the General Assembly of Virginia:**

7 **1. That the Code of Virginia is amended by adding in Article 4 of Chapter 29 of Title 54.1**  
8 **sections numbered 54.1-2957.14 and 54.1-2957.15 as follows:**

9 § 54.1-2957.14. *Advisory Board on Polysomnographic Technology; appointment; terms; duties.*

10 *A. The Advisory Board on Polysomnographic Technology shall assist the Board in carrying*  
11 *out the*

12 *provisions of this chapter regarding the qualifications, examination, and regulation of*  
13 *licensed*

14 *polysomnographic technologists.*

15 *The Advisory Board shall consist of five members appointed by the Governor for four-year*  
16 *terms.*

17 *Three members shall be at the time of appointment polysomnographic technologists who have*  
18 *practiced*

19 *for not less than three years, one member shall be a physician who specializes in the practice*  
20 *of sleep*

21 *medicine and is licensed to practice medicine in the Commonwealth, and one member shall be*  
22 *appointed by the Governor from the Commonwealth at large.*

23 *Vacancies occurring other than by expiration of term shall be filled for the unexpired term. No*  
24 *person shall be eligible to serve on the Advisory Board for more than two consecutive terms.*

25 *B. The Advisory Board shall, under the authority of the Board, recommend to the Board for its*  
26 *enactment into regulation the criteria for licensure as a polysomnographic technologist and*  
27 *the*

28 *standards of professional conduct for holders of polysomnographic licenses.*

29 *The Advisory Board shall also assist in such other matters dealing with polysomnographic*  
30 *technology as the Board may in its discretion direct.*

31 § 54.1-2957.15. *Unlawful to practice as a polysomnographic technologist without a license.*

32 *A. It shall be unlawful for any person not holding a current and valid license from the Board*  
33 *of*

34 *medicine to practice as a polysomnographic technologist or to assume the title "licensed*

35 *polysomnographic technologist," "polysomnographic technologist," or "licensed sleep tech."*

36 *B. Nothing in this section shall be construed to prohibit a health care provider licensed*  
37 *pursuant to*

38 *this title from engaging in the full scope of practice for which he is licensed, including, but not*  
39 *limited*

40 *to, respiratory care professionals.*

41 *C. For the purposes of this chapter, unless the context requires otherwise:*

42 *"Polysomnographic technology" means the process of analyzing, scoring, attended*  
43 *monitoring, and*



**34** recording of physiologic data during sleep and wakefulness to assist in the clinical assessment and  
**35** diagnosis of sleep/wake disorders and other disorders, syndromes, and dysfunctions that either are sleep  
**36** related, manifest during sleep, or disrupt normal sleep/wake cycles and activities.  
**37** "Practice of polysomnographic technology" means the professional services practiced in any setting  
**38** under the direction and supervision of a licensed physician involving the monitoring, testing, and  
**39** treatment of individuals suffering from any sleep disorder. Other procedures include but are not limited  
**40** to:  
**41** a. Application of electrodes and apparatus necessary to monitor and evaluate sleep disturbances,  
**42** including application of devices that allow a physician to diagnose and treat sleep disorders, which  
**43** disorders include but shall not be limited to insomnia, sleep-related breathing disorders, movement  
**44** disorders, disorders of excessive somnolence, and parasomnias;  
**45** b. Under the direction of a physician, institution and evaluation of the effectiveness of therapeutic  
**46** modalities and procedures including the therapeutic use of oxygen and positive airway pressure (PAP)  
**47** devices, such as continuous positive airway pressure (CPAP) and bi-level positive airway pressure of  
**48** non-ventilated patients;  
**49** c. Initiation of cardiopulmonary resuscitation, maintenance of patient's airway (which does not  
**50** include endotracheal intubation);  
**51** d. Transcription and implementation of physician orders pertaining to the practice of  
**52** polysomnographic technology;  
**53** e. Initiation of treatment changes and testing techniques required for the implementation of  
**54** polysomnographic protocols under the direction and supervision of a licensed physician; and  
**55** f. Education of patients and their families on the procedures and treatments used during  
**56** polysomnographic technology or any equipment or procedure used for the treatment of any  
**57** sleep disorder.