



NATIONAL COMPETENCY SKILL STANDARDS FOR PERFORMING POLYSOMNOGRAPHY/SLEEP TECHNOLOGY

Polysomnography/Sleep Technology providers practice in accordance with the facility policy and procedure manual which details every aspect and modality of testing.

The American Society of Electroneurodiagnostic Technologists, Inc. (ASET) presents this document to provide national criteria for evaluating the competencies needed by technologists to perform Polysomnography/Sleep Technology. These national competencies were established following the analysis of survey data collected in the Fall of 2005. The tabulation was completed by ASET staff and the PSG Task Force, according to nationally recognized and accepted criteria. This document was updated in the Fall of 2010 according to nationally recognized and accepted criteria and approved by ASET's Board of Trustees in March 2011.

The standards referred to in this document are those defined by the American Academy of Sleep Medicine (AASM) in their Standards of Practice and Clinical Guidelines that are published on their website: www.aasmnet.org

Section I: General Competencies for Polysomnography/Sleep Technology

The PSG/Sleep technologist prepares for the study by:

- assessing the physician's order and reviewing the medical record to assure appropriateness of testing
- interviewing the patient to obtain additional information
- determining and making accommodations for the patient's age-specific needs, disability, and/or other special needs
- providing patient and family education as appropriate including expectations of technical procedures;
- answering questions related to sleep disorders testing
- determining the need for and selection of additional physiological monitors and recording devices, i.e., CO₂ monitoring indicated for pediatric polysomnogram
- anticipating the possible need for emergency intervention.

The PSG/Sleep technologist prepares appropriate documents including pre-sleep questionnaire and technologist data sheet. Information should include:

- patient's demographic information (name, age, gender, ID number, referring physician, reason for referral, etc.)
- procedure information (procedure type, procedure number, date of test, technologist name, recording time, etc.)
- chief complaint, relevant medical history and clinical findings specific to procedure
- height, weight, neck circumference, BMI, Epworth sleepiness scale
- sleeping medications taken or administered during the study
- any special circumstances necessitating changes in standard protocols outlined in the facility policy and procedures.

The PSG/Sleep technologist verifies the integrity of the recording equipment by:

- performing an all-channel and montage calibration
- recognizing and correcting recording equipment malfunction observed during calibration, including amplifiers, ancillary equipment, and audiovisual equipment
- performing a post-calibration procedure to verify the integrity of recorded data
- maintaining documentation of required safety equipment checks.

The PSG/Sleep technologist follows a method of electrode and sensor application that includes:

- identifying the appropriate method of electrode application
- determining setup and recording protocols including montage derivations
- using standard precautions for infection control during patient preparation
- measuring the patient's head according to the International 10–20 System of electrode placement;
- cleaning and preparing the patient's scalp and skin prior to electrode application
- following established standards and department protocols documented in facility policy and procedures for placement of ECG, EMG, EOG, and other recording electrodes and sensors, i.e., nasal/oral airflow, pressure transducers, respiratory effort devices, intercostal electrodes and oximeter sensors
- utilizing additional electrodes or modified placements based on the patient's history or medical needs
- ensuring security and integrity of electrodes for an extended period of time
- verifying and documenting balanced and acceptable electrode impedances according to facility policy and procedures.

The PSG/Sleep technologist obtains an accurate recording by:

- acquiring and verifying physiological calibrations prior to "lights out" to document integrity of the physiological monitors
- recognizing and minimizing artifacts so that all recording channels can be easily read and interpreted throughout the recording
- recognizing and documenting relevant data such as body position changes, life-threatening events, EEG and ECG abnormalities, parasomnias, etc.
- documenting periodically throughout the recording to include observed behaviors, montage and equipment change, sleep stages, respiratory events, limb movements, oxygen saturations, etc.
- recognizing the need for clinical interventions (oxygen, positive airway pressure titration, CPR, etc.) according to alarm criteria outlined in facility policy and procedures.

The PSG/Sleep technologist:

- report critical test results* to the interpreting physician and supervisor and documents this communication according to facility policy and procedures.

At the end of the recording, the PSG/Sleep technologist:

- performs a post-calibration following "lights-on" to document integrity of the recording
- removes electrodes and sensors from the patient
- documents a summary of the polysomnogram and clinical observations to assist with the interpretation (apnea-hyponea index, periodic limb movement index, clinically significant behavior, significant cardiac arrhythmia, lowest oxygen desaturation, etc.)

- completes patient's data and chart
- performs transfer of data, data backup, archiving in accordance with facility policy and procedures
- disposes of single-use items safely, and cleans and disinfects electrodes and other reusable equipment according to manufacturer's guidelines and/or facility policy and procedures.

The PSG/Sleep technologist identifies and provides a comprehensive report to the physician that includes:

- review of computer generated and/or final scoring report to assure accuracy
- sleep stages, arousals, respiratory events, movements, and ECG scored in accordance with the AASM Manual for the Scoring of Sleep and Associated Events and facility policy and procedures
- sleep latency, REM latency, total sleep time, sleep efficiency, and percentage of sleep stages
- respiratory event counts by type with indices
- periodic limb movement count with indices
- arousal count with indices
- documentation of bradycardia, tachycardia, asystole, atrial fibrillation, or significant ECG arrhythmias
- documentation of atypical EEG patterns and relevant sleep/wake behaviors
- summary of therapeutic intervention.

The PSG/Sleep technologist provides education and support for sleep disorders patients by:

- following facility policy and procedures to assist the patient in receiving follow-up care
- providing positive airway pressure support and education on equipment as needed
- providing a community support group (A.W.A.K.E.) to promote interaction and education
- maintaining contact with the referring physician when a patient using positive airway pressure is seen for issues with treatment
- recognizing the role of the technologist versus the role of the physician in the treatment and care of the patient using positive airway pressure recognizing when there is a need for physician contact/intervention according to facility policy and procedures
- participating in community awareness health and education programs to provide education about sleep disorders.

Section II: Positive Airway Pressure (PAP) Titration

The PSG/Sleep technologist will perform a positive airway pressure (PAP) titration by:

- assuring the PAP device is calibrated appropriately and interfaced properly to the recording equipment
- explaining the PAP procedure to the patient during the setup process and answering any questions
- sizing the patient with a mask and allowing the patient to acclimate to PAP prior to "lights out" and initiation of PAP
- assessing patient response to PAP following established standards and facility policy and procedures regarding the need to change to bi-level PAP

- understanding the contraindications and complications of PAP therapy
- identifying when to adjust the pressure to achieve optimal delivery (respiratory events, snoring, arousals, desaturations, etc.) providing documentation and reasons for changes in PAP
- verifying optimal pressure during REM and supine sleep, if possible
- identifying and correcting factors that may compromise delivery of effective PAP pressures, i.e., substantial mask leakage or mouth breathing
- recognizing the need to change to bi-level ST or other advanced PAP therapy
- recognizing need to contact the medical director or senior technologist for advice according to facility policy and procedures
- cleaning and disinfecting PAP equipment according to required manufacturer specifications.

Section III: Oxygen Titration

The PSG/Sleep technologist will perform oxygen titration by:

- assuring proper function of equipment providing oxygen delivery
- recognizing contraindications for supplemental oxygen
- properly fitting and adjusting the nasal cannula for oxygen delivery with or without PAP
- understanding the use of PAP and combined oxygen supplementation
- identifying when to adjust the level of supplemental oxygen to achieve optimal oxygenation saturation
- identifying clinical signs of the patient's reduced drive to breathe and making appropriate adjustments
- documenting changes in oxygen saturation on the recording and the technologist summary report.

Section IV: Multiple Sleep Latency Test (MSLT)

The PSG/Sleep technologist performs the multiple sleep latency test (MSLT) by:

- verifying and documenting use and/or discontinuation of all prescription medications, over-the-counter medications, herbal and dietary supplements, and other substances or activities that would impact test results
- obtaining sleep logs prior to the MSLT to assess sleep-wake schedules
- documenting by polysomnogram the previous night's sleep
- removing recording sensors used for the polysomnogram that are not needed for the MSLT
- encouraging the patient to dress in comfortable clothes
- obtaining a urine drug screen test if ordered
- following established standards and facility policy and procedures for the performance of the MSLT procedure
- administering questionnaires as appropriate
- providing documentation and reports, i.e., start and end times of each nap opportunity, latency from lights out to the first epoch of sleep, mean sleep latency, and number of sleep-onset REM periods.

Section V: Maintenance of Wakefulness Test (MWT)

The PSG/Sleep technologist performs the maintenance of wakefulness test (MWT) by:

- verifying and documenting use and/or discontinuation of all prescription medications, over-the-counter medications, herbal and dietary supplements, and other substances or activities that would impact test results
- obtaining sleep logs prior to the MWT to assess sleep-wave schedules
- documenting by polysomnogram the previous night's sleep
- encouraging the patient to dress in comfortable clothes
- obtaining a urine drug screen test if needed, as ordered
- following established standards and facility policy and procedures for the performance of the MWT procedure
- administering questionnaires as appropriate
- providing documentation and reports, i.e., start and stop times for each trial, sleep latency, total sleep time, stages of sleep achieved for each trial, and the mean sleep latency if any.

Section VI: Knowledge Statements in Polysomnography/Sleep Technology

The PSG/Sleep technologist understands:

- the principles of polysomnography/sleep technology and the clinically relevant questions to be answered for each individual patient
- medical terminology and accepted abbreviations
- basic electricity and electrical concepts of analog and digital equipment
- anatomy and physiology, especially cardiopulmonary and neurology
- basic safety issues with multiple equipment interfaces to the patient
- polysomnographic patterns and correlations with specific disorders
- basic breathing mechanisms and airway physiology
- major medication classifications and their possible impact on sleep architecture
- therapeutic modalities (mechanical, pharmacological, surgical, etc.)
- infection control procedures
- professional ethics and appropriate age-specific behaviors.

The PSG/Sleep technologist can identify indications for sleep studies by understanding:

- International Classification of Sleep Disorders
- signs and symptoms for adult sleep disorders
- signs and symptoms for pediatric sleep disorders
- seizure manifestations and classifications.

The PSG/Sleep technologist maintains and improves knowledge and skills by:

- reviewing recordings with sleep medicine physicians on a regular basis
- reading journal articles
- attending continuing education courses relating to polysomnography and sleep medicine
- studying textbooks related to sleep medicine and polysomnography
- participating in hospital inservices, case presentations, and departmental conferences on sleep disorders
- completing online sleep courses
- participating in quality improvement activities and reviews
- participating in professional organizations for polysomnography and sleep medicine

- achieving sleep technologist certification and meeting periodic sleep credential recertification requirements.

The PSG/Sleep technologist understands details of polysomnographic/sleep technology instrumentation:

- computer operation, including file organization and storage
- various types of recording and storage media
- basic concepts of digital recording, including sampling rates, reformatting, aliasing, amplitude and horizontal resolution, digital video, etc.
- interfacing and calibration of ancillary equipment
- use of recording parameters (i.e., filter settings, sensitivity settings)
- electrical safety issues
- limitations of automated scoring modules
- technique for re-referencing and use of a system reference
- audio/video instrumentation, including digital video technology.

The PSG/Sleep technologist can perform duties specific to polysomnography/sleep technology:

- securing and protecting sensors and cables for extended monitoring
- cleaning and sterilization procedures for reusable equipment according to the facility policy and procedures
- reviewing, analyzing, scoring, and extracting clinical events from recorded data
- adjusting video recording system and troubleshooting problems
- adjusting ancillary recording equipment and troubleshooting problems.

The PSG/Sleep technologist understands the use of the following electrodes and sensors:

- surface electrodes for EEG, EOG, ECG, limb and other monitoring
- respiratory inductance plethysmography
- piezo-electric belts
- intercostal EMG
- nasal/oral thermistor
- nasal/oral thermocouple
- nasal pressure transducer
- positive airway pressure/bi-level flow, advanced PAP devices
- snore microphone
- pulse oximetry
- end-tidal CO₂ monitor
- transcutaneous CO₂ monitor
- gastroesophageal reflux monitor
- esophageal pressure monitor.

* Critical test results – any values/interpretations where delays in reporting may result in serious adverse outcomes for patients. MA Coalition for Prevention of Medical Errors; www.macoalition.org/document/CTRPractices.pdf

-- Approved by ASET Board of Trustees March 2011

© Copyright 2011 by the American Society of Electroneurodiagnostic Technologists, Inc.