Role and Qualifications of Technologists Performing Polysomnography

CLINICAL PRACTICE REVIEW COMMITTEE
AMERICAN SLEEP DISORDERS ASSOCIATION

Seventy-seven specific disorders of sleep and arousal are identified in the nosology of sleep disorders medicine recognized by the American Sleep Disorders Association. Among the diagnostic tools applied by physicians who diagnose and treat these disorders is polysomnography (PSG). Polysomnography refers to a class of tests which utilize polygraphic recording of electrophysiological measurements relevant to diagnosing sleep/arousal disorders. The specific parameters selected for study in any given polysomnography (the "montage") is determined by the nature of the patient's presenting complaints and the differential diagnosis.

The integrity of sleep is assessed through simultaneous measurement of a number of parameters, generally including electroencephalography, electro-oculography, and skeletal electromyography. Other functions commonly measured include electrocardiogram, breathing, limb and body movements.

The number and nature of parameters studied depends upon the judgment of the sleep disorders medical specialist. For example, when obstructive sleep apnea syndrome (OSAS) is part of the differential diagnosis, the PSG montage includes relevant cardiorespiratory parameters (such as nasal and oral airflow, chest and abdominal excursion, electrocardiogram, and oximetry) in addition to electroencephalography, electro-oculography, and electromyography. Similarly, additional monitoring channels are mandated if the differential diagnosis includes other disorders, e.g. lower extremity electromyography for periodic limb movement disorder of sleep, or esophageal pH monitoring for sleep-related gastroesophageal reflux.

Polysomnography plays an essential role in the titration of continuous positive airway pressure (CPAP) * for OSAS. This is an application of CPAP different from its traditional therapeutic use in intubated, ventilator-dependent patients. In CPAP titration for OSAS, air under elevated pressure is delivered non-invasively through the nose (or nose and mouth) to evaluate whether it can prevent collapse of the upper airway at the level of the palate, tonsils and tongue. The correct CPAP pressure eliminates pharyngeal collapse and arousals from sleep resulting from increased upper airway resistance. Determination of this optimal pressure is accomplished in the sleeping patient by titrating CPAP pressures against respiratory events and arousals from sleep.

Since the early 1970s, polysomnographic technologists have been the technical group specially trained to perform PSG for the diagnosis and treatment of sleep/arousal disorders, including the management of CPAP titration for OSAS. They work under the direction of a physician who practices sleep disorders medicine. The physician develops the protocols which the technologists follow in performing PSG studies, including utilization of PSG for CPAP titration.

The technologist who performs PSG-related procedures must:

- be thoroughly familiar with all instrumentation used in a sleep laboratory have a command of the sleep-induced changes in the physiology of various body systems including, but not limited to, the neurological, musculoskeletal, cardiac, and respiratory systems
- have a working knowledge of the physiological and behavioral aberrations associated with sleep/arousal pathology

be capable of rapid interpretation of electroencephalographic, electro-oculographic, electromyographic, electrocardiographic, and respiratory tracings so as to be able to intervene appropriately during a study

The specialized training of a PSG technologist includes instruction in the:

- use of specialized instruments to record (during sleep) electrical potentials from the brain (electroencephalography), from the eyes (electro-oculography), and from skeletal muscle (electromyography)
- use of specialized instruments to measure and record (during sleep) other physiological parameters including nasal and oral airflow, thoracic and abdominal respiratory effort, electrocardiogram, oximetry, snoring, esophageal pressure, and esophageal pH
- on-line monitoring and analysis of PSG recordings, including preparation of detailed reports of sleep architecture, cardiac, respiratory, and other physiologic events recorded through the night
- integration of PSG and CPAP equipment to titrate CPAP against respiratory events and arousals
- recognition of and appropriate response to critical events that can occur in sleep, such as cardiac arrhythmias, seizure disorders, and other medical emergencies
- interaction with patients to assure patient comfort and provide patient education on sleep/arousal disorders (including OSAS) and CPAP

The training of other related technical personnel, such as respiratory care practitioners and electroencephalographic technologists, is not equivalent to that of a polysomnographic technologist, although there may be some areas of overlap. Therefore, without specialized training, other technical personnel are not qualified to perform the functions of a polysomnographic technologist.

* The term CPAP, as used herein, refers broadly to positive airway pressure devices, including bilevel airway pressure devices commonly referred to as BiPAP.

Adopted by the Executive Committee of the American Sleep Disorders Association, April 1, 1998.