

END-2510: PRINCIPLES OF POLYSOMNOGRAPHY

Cuyahoga Community College

Viewing: END-2510 : Principles of Polysomnography

Board of Trustees:

May 2022

Academic Term:

Fall 2022

Subject Code

END - Electroneurodiagnostic

Course Number:

2510

Title:

Principles of Polysomnography

Catalog Description:

Overview of the field of Polysomnography including job responsibilities, credentialing, medical ethics and patient confidentiality. Normal and abnormal sleep patterns, integrating the physiologic functions of the nervous system. Emphasis on basic sleep sciences, physiology, monitoring, montages, electrical safety, diagnosis and treatment of sleep disorders, and PSG patient hook-up and monitoring procedures.

Credit Hour(s):

3

Lecture Hour(s):

2

Lab Hour(s):

2

Requisites

Prerequisite and Corequisite

BIO-2341 Anatomy and Physiology II, and END-1450 Intermediate Electroencephalography (EEG), and END-1500 Basic Evoked Potentials, and END-1911 END Directed Practice I.

Outcomes

Course Outcome(s):

Apply basic knowledge of Polysomnographic principles and patient safety while achieving competency in performing an overnight sleep study under supervision.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Oral Communication: Demonstrate effective verbal and nonverbal communication for an intended audience that is clear, organized, and delivered effectively following the standard conventions of that language.

Objective(s):

1. Discuss the monitoring and staging of sleep.
2. Discuss all aspects of recording montage related to sleep stages, and sleep apneas.
3. Demonstrate application and removal of EEG electrodes according to the International 10-20 System to include modified sleep montages and full 10-20 set up.
4. Demonstrate application and removal of the following recording devices: EEG / Electrooculogram (EOG) /chin (EMG) Electromyography electrodes, leg EMG electrodes, respiratory effort belts, thermistor, thermocouples, & (PTAF) pressure transducer airflow devices, snoring monitor, EKG electrodes, pulse oximeter, and CO2 monitors.
5. Conduct amplifier & biological calibrations and annotate.
6. Evaluate EEG activity related to normal and abnormal sleep stages.
7. Discuss the basic ECG components and basic ECG arrhythmias.

8. Identify and take steps toward correcting artifacts in the PSG polysomnogram recording.
 9. Document events during recording of PSG.
 10. Discuss infection prevention and equipment disinfection practices.
 11. Review & discuss the ability to recognize electrical safety hazards, in the clinical and home setting.
 12. Discuss the history of sleep physiology, the stages of sleep, the effects of aging on sleep and sleep deprivation.
 13. Evaluate patient and provide age appropriate explanation of PSG procedure.
 14. Obtain patient history to include chief complaint, medications, and other relevant medical history.
 15. Contrast normal sleep to abnormal sleep, its impact on health, its presentation and diagnosis.
 16. Describe how some medications may alter normal sleep patterns.
 17. Differentiate Central versus Obstructive Sleep Apneas, and discuss the pathogenic, clinical and therapeutic aspects of snoring.
 18. Discuss Continuous Positive Airway Pressure (CPAP), Bilevel positive airway pressure (BiPAP), for treatment of sleep disordered breathing.
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Course Outcome(s):

Evaluate the scope of practice and future responsibilities of a Polysomnography technologist.

Objective(s):

1. Discuss the job responsibilities of a Polysomnography Technician, detailing the ethics of patient care, credentialing exams and credentials.
 2. Discuss all aspects of recording montage related to sleep stages, and sleep apneas.
 3. Discuss the history of sleep physiology, the stages of sleep, the effects of aging on sleep and sleep deprivation.
 4. Differentiate Central versus Obstructive Sleep Apneas, and discuss the pathogenic, clinical and therapeutic aspects of snoring.
 5. Discuss Continuous Positive Airway Pressure (CPAP), Bilevel positive airway pressure (BiPAP), for treatment of sleep disordered breathing.
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Methods of Evaluation:

- A. Quizzes
- B. Exams
- C. Comprehensive final exam, EEG analysis for sleep staging
- D. Oral presentations of patient histories
- E. Lab Competencies
 1. Taking patient histories.
 2. Explaining procedures to patients.
 3. Applying recording devices to patient for overnight PSG.

Course Content Outline:

1. Job responsibilities of the Polysomnography Technician
 - a. Overall duties of the overnight Polysomnographic Technologist
 - b. Patient history taking
 - c. Verification of diagnosis and accuracy of written prescription for testing
 - d. Application of recording devices
 - e. Proper patient/equipment clean-up following following sleep testing
 - f. Proper documentation
2. Ethics of patient care
 - a. HIPAA and patient confidentiality
 - b. Scope of practice\limitations
3. Patient/Technologist Safety
 - a. Electrical safety
 - b. Infection prevention
 - c. Emergency situations/procedures
 - d. ECG arrhythmias
 - e. Safely transfer patient from wheelchair to bed
4. Normal sleep
 - a. Components
 - b. Sleep cycles
 - c. Stages of sleep
 - i. NREM
 - ii. REM
 - d. Effects of medication on normal sleep

5. Abnormal sleep
 - a. Abnormal sleep cycles
 - b. Changes in sleep cycles in sleep disorders
 - c. Changes in sleep stages in sleep disorders
 - i. NREM
 - ii. REM
6. Sleep breathing disorders
 - a. Obstructive sleep apnea (OSA)
 - b. Central sleep apnea (CSA)
 - c. Mixed sleep apnea
 - d. Hypopnea
7. Treatment for sleep apnea
 - a. CPAP
 - i. Purpose
 - ii. Function
 - b. BiPap
 - i. Purpose
 - ii. Function
8. Function, application and removal of recording devices for overnight PSG
 - a. EEG recording devices
 - b. Full 10-20 International system
 - c. Modified PSG
 - d. EOG recording devices
 - e. EMG recording devices
 - f. Chin
 - g. Leg
 - h. Respiratory airflow devices
 - i. Respiratory effort recording devices
 - j. ECG recording devices
 - k. Snoring monitoring devices
 - l. CO2 monitoring devices
9. Recording concepts
 - a. Recording montages
 - b. Calibrations
 - i. Amplifier
 - ii. Biological
 - c. Artifact recognition and steps toward correction
10. Documentation during PSG recording
 - a. Documentation of amplifier and biological calibration
 - b. Documentation of lights out
 - c. Routine documentation of hourly sleep events
11. Infection prevention practices
 - a. Proper cleaning techniques for various recording devices
 - b. Proper disinfection techniques for various recording devices
 - c. Proper personal infection prevention practices
 - i. Hand hygiene
 - ii. PPE
 - iii. Healthcare associated infections (HAI)

Resources

Chokroverty, S. *Sleep Disorders Medicine Basic Science, Technical*. 4th ed. New York: Springer Science Business Media, 2017.

Spriggs, William. *Essentials Of Polysomnography*. 2nd ed. Boston: Jones & Bartlett Pub, 2015.

Mattice, Brooks, Lee-Chiong. *Fundamentals of Sleep Technology*. 2nd ed. American Association of Sleep Technologists, 2012.

Kryger, Meir, Roth, Thomas, and Dement, William. *Principles and Practice of Sleep*. 6th ed. Philadelphia, Elsevier, 2017.

Multimedia. *CD-ROM, Sleep MultiMedia*. Sleep Multimedia. Scarsdale, NY, 2000.

Robertson, Bonnie, Marshall, Buddy, Carno, Margaret-Ann. *Polysomnography for the Sleep Technologist: Instrumentation, Monitoring, and Related Procedures*. 1st. St. Louis, Mosby/Elsevier, 2014.

Resources Other

1. American Academy of Sleep Medicine, Rochester, MN <http://www.aasmnet.org>
2. American Electroneurodiagnostic Technologist, Carroll, Iowa <http://www.aset.org>
3. CD-ROM, Sleep MultiMedia, version 7.0, Sleep Multimedia, Scarsdale, NY
4. American Association of Sleep Technologists, <http://www.aastweb.org>

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