PSG A140: INTRODUCTION TO POLYSOMNOGRAPHY

Item	Value
Curriculum Committee Approval Date	10/19/2022
Top Code	121100 - Pharmacy Technician
Units	4 Total Units
Hours	108 Total Hours (Lecture Hours 54; Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

Fundamentals of PSG, including application of electrodes, basic wave forms, artifacts, and introduction to the PSG machine. All enrollees must be accepted into the Polysomnography program. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Prepare a patient for an EEG recording using the International 10/20 system to measure and apply the 21 standard EEG electrodes on a mannequin head accurately (to within 5mm), and within 45 minutes.
2. Define and identify on an EEG recording observed basic rhythms, activity, and artifacts after accurately calibrating the instrument and performing standard activations techniques while utilizing the major instrument controls such as high filters, low filters and sensitivity.

Course Objectives

- I Outline PSG montages used for the recording of overnight Polysomnogram Outline MSLT and MWY montages used for recording daytime Polysomnograms Determine proper instrument, calibration, and PSG equipment functions
- I. 1. Measure and apply the International 10/20 system to measure and apply the standard EEG electrodes on a mannequin head accurately (to within 5mm), and within 45 minutes
- I. 2. Define and identify on the recording, the basic PSG rhythms, activity, and artifacts
- I. 3. Describe, define, and perform the standard PSG activations used in routine recordings
- I. 4. Define, describe, and utilize the major instrument controls such as high and low filters, sensitivity, and calibration
- I. 5. Describe, list, and set up all of the recommended montages used in routine PSG, MSLT, and MWT recordings
- I. 6. Take an accurate and complete patient history
- I. 7. Apply electrodes using 10/20 Conductive Paste in an acceptable manner so as to record a PSG all-night Polysomnogram and MSLT and MWT daytime recording
- I. 8. Accurately calibrate PSG instrument and trouble shoot basic equipment malfunctions
- I. 9. Describe and perform proper cleaning/disinfection techniques of electrodes and equipment

Lecture Content

Introduction What is PSG. When is an PSG done. Duties of an PSG technician Terms Basic PSG terminology Neurological terms Basic Rhythms of PSG Configuration Normal wake patterns Normal sleep patterns Abnormal patterns Polarity and Localization Bipolar Referential Waveform Measurements Amplitude Duration Frequency Types of Montages Bipolar Referential Common Average Reference Electrode Application and Types of Electrodes Paste Discs Gold Caps Auxiliary Equipment Transduced Signals Other Electrode Equipment Care Proper Cleaning Technique Disinfection Technique Care of Electrodes Types of Artifacts Physiological Nonphysiological Instrumental Environmental Monitoring Parts of the PSG Machine Amplifiers Writer unit Power supply Electrode board and Montage Selection Microprocessor Functions Digital PSG (Analog/Digital Conversion, Digital Filtering) How to Take a Patient History Present illness Past history Reports Observations Amplitude Controls of the PSG Gain Sensitivity Filters High frequency filter Low frequency filter Active filters Digital filtering Frequency Response Curves AASM Guidelines Minimal standards of PSG Electrical Safety

Lab Content

1. The International 10-20 System of Electrode Placement A. Practice electrode measurements on Foam head B. Practice electrode measurements on short hair mannequin head C. Practice electrode measurements on long hair mannequin head D. Practice electrode measurements and electrode application on long hair mannequin head. 2. 10/20 Conductive Paste application technique and practice 3. Disinfection, Cleaning, and Care of PSG Electrodes A. Proper Cleaning Technique B. Disinfection Technique C. Care of Electrodes 4. Introduction to PSG Equipment A. Parts of the PSG Instrument 1. Computer/Monitor 2. Amplifier/Input Box 3. Photic Lamp 4. Electrodes B. PSG Programs 1. Montage 2. Impedance Meter 3. Acquisition 4. Intermittent Photic Stimulation 5. Hyperventilation Stimulation C. Amplifier 1. High Frequency Filter 2. Low Frequency Filter 3. Notch Filter 4. Sensitivity and Gain 5. Electrical baseline 6. Lead/Electrode Impedance C. Calibration 1. Square Wave Calibration nb 2. Bio-Calibration D. Activations 1. Hyperventilation 2. Sleep E. AASM Guidelines 1. Minimal Standards of PSG 2. Electrical Safety

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

This is the beginning course for the Polysomnography program, designed to bring students with little or no previous skills or exposure to PSG, to a point where they have enough practical skills and knowledge for clinical practice. In the lab portion of the course students learn the technique for accurate electrode placement on the head. Once the measurement technique is perfected, students progress to equipment hook-up and recording limited EEG tracings on each other. LAB GOAL: TO MEASURE AND APPLY ALL STANDARD ELECTRODES ACCURATELY (within 5mm to homologous areas) WITHIN 45 MINUTES. The lecture portion of this course will instruct students in the fundamentals of PSG terminology, waveforms, artifacts, introduce some of the abnormal PSG patterns, PSG instrumentation, history taking, and guidelines for PSG recordings. The types of methods for instruction may include lecture, demonstration,

small group exercises, video and PowerPoint presentations, and hands-on lab activities.

Reading Assignments

Required Textbook reading (2 hours/week) Required supplemental reading including journal articles and online research. (2 hours/week)

Writing Assignments

1. A portion of the exams and quizzes include short answer "fill-in" to a maximum of one paragraph/question. (1 hour/week) 2. The limited PSG recordings include filling-out of a technician report which includes patient information (name, age, DOB...) and recording parameters. (30 min-1 hour/week) 3. Proficiency demonstrations include several evaluated "practicum" applications where students must accurately apply recording electrodes in the International 10/20 system. (1 hour/week) 4. Four to five homework assignments: including practice in writing technical impressions, measuring/recognition of waveforms and PSG instrumentation concepts (1 hour/week)

Out-of-class Assignments

Skills homework - Practice measuring, marking mannequin head. (2 hours/week)

Demonstration of Critical Thinking

Four or five homework assignments. Four quizzes covering material from reading and lectures. Quizzes are not comprehensive and will cover material from the previous segments. Comprehensive midterm exam. Final comprehensive exam. Electrode measurement check on mannequin head. Two lab practicums for measurement and application of electrodes on mannequin head. Final lab practicum for measurement and application of electrodes on mannequin head.

Required Writing, Problem Solving, Skills Demonstration

1. A portion of the exams and quizzes include short answer "fill-in" to a maximum of one paragraph/question. 2. The limited PSG recordings include filling-out of a technician report which includes patient information (name, age, DOB...) and recording parameters. 3. Proficiency demonstrations include several evaluated "practicum" applications where students must accurately apply recording electrodes in the International 10/20 system.

Eligible Disciplines

Diagnostic medical technology-diagnostic medical sonography, neurodiagnosti...: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Bonnie Robertson AAHA CRT RPSGT, Buddy Marshall MEd CRT-SDS RST RPSGT, Margaret-Ann Carno PhD MBA CPNP D ABSM FNAP. Polysomnography for the Sleep Technologist: Instrumentation, Monitoring, and Related Procedures, 1st ed. Mosby, 2013 Rationale: This is the lastest version of the textbook, and the information in the textbook is relevant. The textbook is one of the main references for the RPSGT board exam given by the BRPT. https://www.brpt.org/rpsgt/exam-prep/references/ Polysomnography for the Sleep Technologist: Instrumentation, Monitoring, and Related Procedures covers the procedural knowledge you need to understand sleep studies. A sequential learning model systematically covers electronics, instrumentation, recording parameters, data acquisition, ancillary equipment, troubleshooting, recording quality, infection control, basic positive pressure therapy, and cardiopulmonary monitoring and intervention essential to polysomnography. 2. Required Lisa M. Endee, MPH, RRT-SDS, RPSGT, RS. Spriggss Essentials of Polysomnography, 3rd ed. Jones Bartlett Learning, 2020