

Sleep Technologist Education Program (A-Step)
National School of Sleep Medicine

Week 1

Day 1 - Monday Introduction to Sleep Technology and the Sleep Laboratory	Instructor	Time (hours)	Type
A. Welcome and Orientation - Tour of Sleep Center and Clinic - A-Step Goals and Expectations / Q&A Session - Discussion of Exam Protocols	TBA	1.0	Didactic
B. Sleep Technology - The Role and Expectations - Role description for Trainee, Technician, and Technologist professionalism, Ethic and Sleep Center Dress Code - Introduction to the (AASM, AAST, BRPT) and Registration for Professional Publications	TBA	1.5	Didactic
C. Patient Confidentiality - HIPAA, JCAHO and NPSGs - Medical Confidentiality, Accessing Pertinent Medical Records - Informed Consent and Other Legal Issues	TBA	1.0	Didactic
D. Practice Session : Confidentiality, HIPAA and Documentation	TBA	0.25	Simulation
E. Sleep Center Protocols For Patient and Staff Safety - Infection control, Equipment Sterilization - Universal Precautions / Hand Washing Protocols - Environmental & Electrical Safety - Fall Risk Assessment - Hazardous Materials, Emergencies, and Responses to: a. Fire, Weather, Security, Bob Threat, & Hazmat b. Cardiac/Respiratory c. Patient/Visitor - When to Call the Physician	TBA	0.75	Didactic
F. Emergency Responses, Physician Calls	TBA	0.05	Simulation
Anatomical Terms, Planes of Motion, and Basic Skeletal Anatomy			
A. Anatomical Terms, Planes of Motion, and Basic Skeletal Anatomy - Basic human anatomy - Anatomical Positioning and Planes of Motion - Sleep Terms and Definitions - Commonly used Medical Symbols and Approved Abbreviations - Medical Prefixes and Suffixes	TBA	1.0	Didactic
B. Introduction to Major Muscle Groups for Monitoring Polysomnography Data - Upper and Lower Limbs - Thoracic and Intercostal Lead Placements - Head and Facial Lead Placements (excluding EEG)	TBA	1.0	Didactic
C. Practice Session: Anatomical and Sleep Terminology	TBA	1.0	Practical
		6.25	Didactic Sessions
		1.75	Practice Sessions
		1.0	Breaks/Lunch
		8.00	Total Educ. Hours

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Day 2 - Introduction of Polysomnography	Instructor	Time (hours)	Type
Sleep Architecture	TBA	1.5	Didactic
A. Normal Human Sleep Architecture - Current Concepts - Sleep Physiology, Sleep Cycles and Circadian Rhythms - Sleep Latencies - Normal & Abnormal - NREM and REM - Calculation of Latencies - Reading and Understanding Sleep Histograms - Sleep Fragmentation and the Effects of EDS - Stanford/ Swiss / Epworth Sleepiness Scales			
B. Practice Session: Latency Calculation and Histogram Interpretations	TBA	1.0	Practical
C. Introduction to Polysomnography - History & Overview from a Technician's Perspective - polysomnography Defined - Normal Sleep and its Function - Effects of Sleep on the Musculoskeletal and Respiratory Systems - Effects of Sleep on Metabolism - Shift Work and the Importance of Sleep Hygiene	TBA	1.5	Didactic
D. Sleep Pharmacology - Impact of Medications on Sleep and Wakefulness - Therapeutic Use in Sleep Disordered Medicine - Effects of Alcohol, Caffeine, and Nicotine on Sleep	TBA	1.0	Didactic
Technical Aspects			
A. Introduction to the Technical Aspects of Polysomnography - Overview of EEG, EMG, ECG, & Derivations - Surface Electrodes, Thermistors and Thermocouples - Airway Pressure Transducer Technology (PTAF) - Elastometric, Impedance & Respiratory Inductance Plethysmography - Intercostal EMG, Esophageal Pressure Manometry - Pulse Oximetry - Capnography & End Tidal CO2 Monitoring - Understanding Electrode/ Sensor Mechanics and Accuracy	TBA	3.00	Didactic
		7.5 0.5 1.0 8.0	Didactic Sessions Practice Sessions Breaks/Lunch Total Educ. Hours

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Day 3 Neuroanatomy	Instructor	Time (hours)	Type
A. Basic Neuroanatomy - Brain anatomy, Function, and the Sources of EEG Activity - major Brain Structures and their Correlation to Sleep/Wakefulness - Neurotransmitters - Involvement with Sleep/Wakefulness Neurons, Synapses, Axons and Dendrites	TBA	1.0	Didactic
EEG and Sleep Staging			
A. EEG and Waveform Morphology - Waveform Identification - Frequency - Amplitude - Morphology - Waveform Frequency Ranges (Alpha, Beta, Theta, Delta) - Identification of K-Complexes, Vertex Sharp Transients, and Sleep Spindles - History - R&K Manual and the New AASM Scoring Criteria - Identification of Sleep Onset, NREM and REM Stages of Sleep - Identification of EEG Arousals and Assoc Scoring Rules	TBA	1.5	Didactic
B. Practice Session: Interactive Sleep Stage & EEG Arousal Scoring	TBA	1.5	Practical
The International 10-20 Electrode Placement System	TBA	2.0	Didactic
A. Mastering the International 10-20 Electrode Placement System - Overview and Significance of Getting it Right - Correlation to Underlying Brain Structure - Identification of Anatomical Landmarks - Electrode Placement - Development of proper Techniques - Understanding the Consequences of Getting it Wrong - Appropriate Modification of the 10/20 System - When & How			
B. Practice Session: International 10-20 Measurements - Worksheet & Mannikin Practice	TBA	2.0	Practical
		4.5	Didactic Sessions
		3.5	Practice Sessions
		1.0	Breaks/Lunch
		8.0	Total Educ. Hours

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Day 4 Respiratory Anatomy and Gas Exchange	Instructor	Time (hours)	Type
A. Introduction to Respiratory Anatomy and Gas Exchange - Basic Upper & Lower Respiratory Anatomy - Functions of the Adult Respiratory System - Mechanics of Breathing, Ventilation, Inspiration, and Expiration - Pulmonary Volumes and Capacities - Gas properties and Gas Exchange - Room Air, Supplemental O ₂ and changes in FiO ₂	TBA	2.0	Didactic
Airflow and Respiratory Effort Monitoring			
A. Monitoring Airflow - Thermal Sensors - Thermistors and Thermocouples - Nasal/Oral Airway Pressure Transducers (PTAF) Capnography and End Tidal CO ₂ Monitoring B. Monitoring Respiratory Effort - Elastometric, Impedance and Inductive Plethysmography - Esophageal Pressure Manometry - Intercostal EMG - Pulse Transit Time Monitoring	TBA	2.0	Didactic
Sleep Disordered Breathing & Scoring of Respiratory Events			
A. Sleep Disordered Breathing - Mallampati Airway Classifications - UARS, RERAs & Snoring - Hypopneas - defined - Sleep Apnea Obstructive, Central and Mixed - Clinical Consequences of Sleep Apnea - Paradoxical Breathing During Sleep - Scoring Respiratory Events	TBA	2.0	Didactic
B. Practice Session: Interactive Respiratory Event Scoring	TBA	1.5	Practical
C. Obesity Trends in the USA Population - Defining Obesity and its impact on Health - Understanding Body Mass Index and Calculations - Obesity Trends - Present in Adult and Pediatric Populations	TBA	0.5	Didactic
		6.5 1.5 1.0 8.0	Didactic Sessions Practice Sessions Breaks/Lunch Total Educ. Hours

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Day 5 Sleep Disordered Breathing - Treatment Options	Instructor	Time (hours)	Type
A. Treatment Options for Sleep Disordered Breathing - Positional Therapy - Weight Loss - Oral Appliances - Surgical Interventions - Positive Airway Pressure (Gold Standard) B. Positive Airway Pressure Equipment - Intro to Mask Interface Styles - Choosing the Appropriate Interface - Acclimation and Desensitization Procedures - Understanding the Importance of Humidification - Complications of PAP Complaints - Effectiveness and Long Term Compliance Issues - Importance of a Patient Follow-Up Program	TBA	2.0	Didactic
C. Positive Airway Pressure Therapy - Mechanics of CPAP and Titration Protocols - Indications for Bi-level Therapy and Titration Protocols - Servo-Ventilation / Auto-Titration - Understanding Pressure Relief and Ramping Technology - Understanding Total and Minute Studies - Techniques to Avoid Over-Titration	TBA	2.0	Didactic
D. Practice Session: Assembly, Fitting and Wearing of PAP Interfaces	TBA	1.0	Demo/Practical
E. Supplemental Oxygen - Indications and Protocols for adding Supplemental Oxygen - Understanding Changes in FIO2 with Supplemental O2 - Knowledge of Equipment - Calculation of Oxygen Cylinder Reserves - O2 Safety	TBA	0.5	Didactic
F. Practice Session: Setting Up Supplemental Oxygen	TBA	0.5	Demo/Practical
Pediatric Polysomnography			
A. Pediatric Montages and How They Differ from Adults - Patient and Parent Rapport - Tips on Working with Children - Preparation Techniques for Pediatric Patients - Pediatric Montages and - Modification of the International 10-20 Electrode Placement System - Scoring Pediatric Sleep Stages	TBA	2.0	Didactic
		6.5 1.5 1.0 8.0	Didactic Sessions Practice Sessions Breaks/Lunch Total Educ. Hours

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Week 2

Day 6 Polysomnographic Instrumentation	Instructor	Time (hours)	Type
<p>A. Concept of Electrical Instrumentation (Part 1)</p> <ul style="list-style-type: none"> - Basic Electrical Principles of Polysomnography - Understanding Analog and Digital Polysomnographic Collection - Bio-potential Sources - Understanding Impedances - Electrical Safety <p>B. Concepts of Electrical Instrumentation (Part 2)</p> <ul style="list-style-type: none"> - Differential Amplification Principles - AC & DC - Filters - High Freq. Low Freq. and 60 Hz - Use and Abuse - Frequency Response Curves and Time Constants - Sensitivity Settings and Amplitude Calculations - Understanding Impedances & Signal Polarity <p>C. Intercom and Infrared Camera</p> <ul style="list-style-type: none"> - Use and Function <p>D. Introduction to Testing Software and Computer Functions</p> <ul style="list-style-type: none"> - Loading Patient Data and Software Set-Up - Calibration Procedures and Impedance Evaluations - Digital Documentation - Tech Notes, Tags, 30 min Checks - Adding/Deleting Channels - Effects of Filter and Sensitivity Changes - Report generation 	TBA	4.0	Didactic
E. Practice Session: Computer Data Entry, Software Functions & Equipment Use	TBA	1.5	Practical
Patient Assessment and Documentation			
<p>A. Sleep Center Documents</p> <ul style="list-style-type: none"> - Accessing History/Physical and Other Medical Information - Physician Montage Forms and Special Orders - Pre/Post Study Questionnaires <p>B. Patient Assessment for the Technician</p> <ul style="list-style-type: none"> - Assessing and Management of the Difficult or Special Needs Patient - Patient Emergency Situation <ul style="list-style-type: none"> - Assessment Protocol - Crash Cart/BLS/AED - overview - Pain Assessment - Recognition of Emergencies - Vital Signs/Blood Pressures / etc. <p>C. Blood Pressure Assessment</p> <ul style="list-style-type: none"> - procedure of Obtaining and Documenting Blood Pressures with Manual and Automated Equipment - Diastolic and Systolic Definitions - Assessment of Abnormal Blood Pressures 	TBA	2.0	Didactic
F. Practice Session: Obtaining Blood Pressures - Manual and Automated		0.5	Demo/Practical
		6.0	Didactic Session
		2.0	Practice Session
		1.0	Breaks/Lunch
		8.0	Total Educ. Hours

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Day 7	Instructor	Time (hours)	Type
Mathematical Calculations			
A. Mathematics for Polysomnography - Understanding and Calculating: - Epoch/Minute Conversions - Body Mass Index (BMI) - Sleep Efficiencies - Sleep Onset and REM Latencies - MSLT Sleep Latencies (Mean) - Apnea/Hypopnea & Respiratory Disturbance Indices - PLM and Associated EEG Arousal Indices	TBA	1.0	Didactic
B. Practice Session: PSG Math Formulas and Calculations	TBA	1.0	Practical
Cardiovascular System and ECG Monitoring			
A. Basic Cardiac Anatomy - Overview of Cardiovascular System and Associations with Sleep - Arterial & Venous Circulation - Chambers, valves and Systemic Circulation - Systolic and Diastolic Pressures B. Cardiac Electrophysiology - Components of the Heart's Electrical Conduction System - Control of the Heart Rate and Rhythm - Components of the ECG Waveform - ECG Electrode Placement of Polysomnography C. Cardiac Arrhythmias - Basic Rhythm Analysis - Sinus Mechanisms - Ectopic Beats - Atrial Arrhythmias - Ventricular Arrhythmias - 1st, 2nd, and 3rd Degree Heart Blocks - Cardiac Emergencies	TBA	3.0	Didactic
Respiratory Anatomy and Gas Exchange - Intermediate			
A. Pulmonary Physiology - Intermediate - Mechanical and Chemical Control of Breathing - Ventilatory Control in REM and NREM - Cheyne-Stokes Breathing and Congestive heart Failure - Disorders of the respiratory system (not sleep-related) - COPD (Chronic Obstructive Pulmonary Disease) - Asthma - Chronic Bronchitis - Emphysema - Pneumonia - Tuberculosis	TBA	1	Didactic
D. Practice Session: Identification of ECG Arrhythmias	TBA	1.0	Practical
E. Cardiopulmonary Resuscitation (CPR) Overview - CPR Basics for Adults, Children and Infants - Patient Assessment - EMS Activation - Demonstration of Head Tilt-Chin Lift - Airway Assessment and Management - Non-invasive - Proper Hand Placement and Compression Depth - All Ages - Compression/Rescue Breathing Ration - 1 & 2 Rescuer - All Ages	TBA	1.0	Practical
		6.0 2.0 1.0 8.0	Didactic Session Practice Session Breaks/Lunch Total Educ. Hours

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Day 8 Movement Disorders	Instructor	Time (hours)	Type
A. Restless Legs Syndrome and Periodic Limb Movement Disorder <ul style="list-style-type: none"> • Clinical Features and Diagnostic Criteria • “Hard to Describe” Sensations in the Legs • Associated Arousals and Sleep Fragmentation • Recording Limb Movements <ul style="list-style-type: none"> o Standard and Alternative Electrode Placements o Calculating Leg Movement Indices o Scoring Criteria • Pharmacology for Treating Movement Disorders 	TBA	2.0	Didactic
B. Practice Session: Electrode Placement and Interactive Scoring of PLMs	TBA	1.0	Practical
C. Sleep Bruxism <ul style="list-style-type: none"> • Polysomnographic Manifestations • Treatment options D. Rhythmic Movement Disorder <ul style="list-style-type: none"> • Polysomnographic Manifestations and Monitoring Techniques 	TBA	0.5	Didactic
Narcolepsy, Seizures, and Other Parasomnias			
A. Narcolepsy (with and without cataplexy) <ul style="list-style-type: none"> • Associated Features, Demographics and Manifestations • Onset and Complications • The Narcolepsy Tetrad: <ul style="list-style-type: none"> o Excessive Daytime Sleepiness – EDS o Sleep Paralysis o Hypnagogic Hallucinations o Cataplexy • Sleep Diary • Treatment Options • MSLT and MWT Testing <ul style="list-style-type: none"> o Purpose, Protocols, and Interpretation o Associated Calculations 	TBA	2.0	Didactic
B. Practice Session: Calculations and Interpretation of MSLT Testing	TBA	0.5	Practical
C. Nocturnal Seizures <ul style="list-style-type: none"> • Generalized Seizures, Absence (Petit mal), & Tonic-Clonic Seizures (Grand mal) • Partial Seizures: Simple and Complex • Spike and Wave Discharges • Patient and Staff Safety • Clinical Interventions and Management of Postictal Periods 	TBA	1.0	Didactic
D. Parasomnias <ul style="list-style-type: none"> • Polysomnographic Manifestations of: <ul style="list-style-type: none"> o Sleep Terrors o Nightmare Disorder o Confusional Arousals o REM Sleep Behavior Disorder – RBD • Monitoring Techniques & Technical Interventions • Association with REM and NREM Sleep 	TBA	1.0	Didactic
		6.5 1.5 1.0 8.0	Didactic Sessions Practice Sessions Breaks/Lunch Total Educ. Hours

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Day 9 Insomnia, Circadian Rhythm, and Psychiatric Disorders	Instructor	Time (hours)	Type
A. Insomnia <ul style="list-style-type: none"> • Inadequate Sleep Hygiene • Idiopathic, Behavioral, Physiological • Sleep Diary and its Role in Managing Insomnia • Difficulty in Initiating and Maintaining Sleep - DIMS B. Circadian Rhythm Disorders <ul style="list-style-type: none"> • Circadian Rhythms Defined • Control of the Human Circadian Clock • Environmental Factors Impacting Circadian Rhythms • Advanced & Delayed Sleep Phase Disorders • Shift Work <ul style="list-style-type: none"> o Sleep Hygiene Day 9 Insomnia, Circadian Rhythm, and Psychiatric Disorders <ul style="list-style-type: none"> o Safety issues Related to Sleepiness/Fatigue o Coping Mechanisms C. Psychiatric and behavioral sleep disorders <ul style="list-style-type: none"> • Psychiatric emergency response 	TBA	2.0	Didactic
Artifact Recognition and Correction			
A. Artifact Recognition <ul style="list-style-type: none"> • Sources of Artifact • Desirable versus Undesirable Artifact • Diagnostic Consequences B. Artifact Resolution <ul style="list-style-type: none"> • Single Channel vs Multi-Channel Artifact • High and Low Frequency Artifact Resolution • Physiologic – Mechanical - Environmental o Muscle <ul style="list-style-type: none"> o Respiratory o Cardiac o Sweat o Electrode popping o Salt Bridging o Movement 	TBA	1.0	Didactic
C. Practice Session: Open Forum - Artifact Recognition and Correction	TBA	1.0	Practical
Introduction to Polysomnography			
A. History and Overview of Sleep Disorders Medicine <ul style="list-style-type: none"> • Early Development of Sleep Medicine Prior to the 1970's • Discovery of the Biological Clock • Scientific progress in the Last 40 Years • Development and Revision of the ICSD & ICSD II • Changes in Scoring Standards • What Employers Need from the Qualified Technician 	TBA	1.0	Didactic
B. Practice Session - Day 1: Full Hook-Up and Role Playing With Class Partner	TBA	3.0	Practical
		4.0 4.0 1.0 8.0	Didactic Sessions Practice Sessions Breaks/Lunch Total Educ. Hours

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Day 10 Performing a Routine Polysomnogram (Day2)	Instructor	Time (hours)	Type
A. Review of Hook-Up Procedure • Q & A Session Regarding Previous Day's Practical B. Patient Preparation and Hook-Up Procedures - Review • Equipment and Supplies • Anatomical Landmark Review • Electrode Site Preparation • Tape and/or latex allergies • Development of patient rapport, setting expectations • Significance of Impedances C. Standardized Physiologic Bio-Calibrations • What is Measured and Why it is Important • Technique and Observation	TBA	2.0	Didactic
B. Practice Session – Day 2: Full Hook-Up and Role Playing w/ Class Partner	TBA	3.0	Practical
C. Clinical Skills Assessment	TBA	1.0	Review
Final Course Review			
A. Final Course Review - Interactive Q & A Session	TBA	1.0	Interactive Review
Final Introductory Course Examination			
A. Final Examination	TBA	3.0	Exam
		2.5 3.0 1.0 3.0 8.5	Didactic Sessions Practice Sessions Breaks/Lunch Testing Total Educ. Hours

Total Didactic Sessions: 56.25 Hours (70%)
Total Practice Sessions: 21.25 Hours (26%)
Final Examination Time: 3.00 Hours (04%)

Total of Program: 80.5 Hours